Managing Cases with Human Immunodeficiency Virus Infection: Knowing the Dynamics from Voluntary Counselling and Testing Clients in Bobo-Dioulasso for Better Planning in Burkina Faso (1996-2014)

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Abstract

Background: The Anonymous Screening and Information Centre (CADI) is the oldest screening centre of HIV from Burkina Faso. Since its opening, no analysis on the evolution of Human Immunodeficiency Virus (HIV) prevalence has been carried out. **Objective:** The study aimed to describe the dynamics of HIV infection when managing centres offering voluntary counselling and testing to client, such as the Screening and Counselling Centre (CADI), in Bobo Dioulasso, Burkina Faso. **Patients and Methods:** A cross-sectional study was performed including people screened at the CADI from May 1996 to June 2014. Pearson khi^2 test and Cuzick trend test were used with a 5% significance level. **Results:** From 7.1% of the 11,451 cases analyzed, the average age of clients screened was 30 ± 10.83 year-old. There was a female predominance (sex ratio = 0.8). The 16.4% (15.7 - 17.1) of the cases from the 11,451 clients included in our study were tested HIV positive. The global prevalence rate of HIV in the centre has significantly decreased from 46.2% in 1996 to 1.5% in 2014 (p < 0.0001). In 1999, 2001, and 2006, the peaks of the HIV prevalence rates were noted: 22.9%, 34.1%, and 22.8% respectively. CADI's customers' profile has significantly changed. Therefore between 1996 and 2000, people

with HIV symptoms were more common at the centre (42.7%). From 2001 to 2008, physician-prescribed screenings were best predominant (83.95%). From 2008 to 2014, a total of 72.7% people reported with reason for the screening a desire to know their serological status. **Conclusion**: The behaviour change could be a justification for the decline in HIV prevalence at the centre, hence the importance of sensitization campaigns.

Keywords

Burkina Faso, Clients, Prevalence, HIV, Screening, Case Management

1. Introduction

Significant progress has been achieved in Human Immunodeficiency Virus (HIV) infection control [1]. In Burkina Faso, many dynamic associations and Non-Governmental Organizations (NGO's) are involved in the preventing of HIV as well as the management of HIV-infected and affected people [2]. The provision of HIV screening services has therefore expanded rapidly in Burkina Faso with the establishment of many HIV screening centres and increased access to HIV screening in public health centres [2]. The Screening and Counselling Centre (CADI in French) was initiated in Bobo-Dioulasso, Burkina Faso, in 1996 at a time when there was not this kind of screening centre, except private laboratories with excessive screening costs. The motto of the centre was "Faire Face" (Facing up) to recall how important it is to cope with one's serological status [3] [4]. Very few studies discussed the issue of screening centres in Burkina Faso. However, Somé *et al.* reported that customers of voluntary screening centres (CDV) differed depending on the strategies and screening period [2]. No study was carried out on the 1st screening centre in Burkina Faso. This study aimed to describe the evolution of HIV prevalence infection from the Screening and Counselling Centre (CADI) from 1996 to 2014.

2. Patients and Methods

CADI is the first HIV screening centre still in operation in Burkina Faso set up since 1996. Located in the premises of Centre Muraz, Bobo-Dioulasso, it permitted the HIV screening of 161,382 people from May 1996 to June 2014. The attendance of the activities has kept on growing from one year to another [5]. HIV is tested on the basis of the screening algorithm performed in Burkina Faso [6]. A first rapid and very high sensitivity and non-discriminating test such as *Determine HIV®*, *swift-HIV®*, and *Double check Gold HIV®* is performed. If positive, the result is confirmed by another rapid and high specificity test discriminating both types of viruses, such as *immunocomb II HIV®*, *Tridot. HIV®*, *Genie II HIV®* and *SD Bioline®*.

The present study used a retrospective cross-sectional study based on the cohort of people tested for HIV at CADI from May 1996 to June 2014. A yearly

random sampling was carried out. The sample size was calculated to highlight a 5-percentage point difference in the prevalence recorded over two distinctive years. The minimum value requested was 80% for a 5% error limit [6]. The sample size was 755 observations per year. A yearly 755 random number table was determined with Epi info 6 software. A total of 13,590 observations were expected. When less than 755 tests were registered (from 1996 to 2000), all available data were used.

The medical files were used to collect data on socio-demographic features (age, sex, marital status, level of education, occupation), behaviour characteristics (reason for testing, existence of sexual partner(s), use of condoms, information share on serological status), and HIV test results. The outcomes of the present study targeted the prevalence of HIV infection and the epidemiological profile of CADI clients.

Data were analysed using Stata SE 13 software. Quantitative variables were described on the basis of their average and standard deviation, whereas qualitative variables were described on the basis of their proportion and confidence interval. Pearson khi2 test was used to compare qualitative variables, whereas Cuzick trend test was used to compare the yearly prevalence of HIV infection at CADI from 1996 to 2014. A 5% significance level was applied.

This study was carried out using the anonymous data sheets from the CADI screening centre. Approval was obtained from the people in charge of the centre. No committee gave its approval

3. Results

Our study included 11,451 (7.1%) clients out of the 161,382 people tested at CADI from May 1996 to June 2014.

Table 1 summarizes the socio-demographic characteristics and the main reasons for screening among the centre's clients.

Table 1. Socio-demographic characteristics and the main reasons for screening among the centre's clients.

Characteristics	N	%
Sex		
Male	5099	44.53
Female	6352	55.47
Age (years)		
[0 - 5]	79	0.69
[5 - 10]	156	1.36
[10 - 15]	96	0.84
[15 - 20]	1007	8.79
[20 - 25]	2556	22.32
[25 - 30]	2434	21.26
[30 - 35]	1848	16.14

Continued

[35 - 40]	1243	10.85
[40 - 45]	827	7.22
[45 - 50]	508	4.44
[50 - 55]	344	3
[55 - 60]	189	1.65
[60 - 65]	95	0.83
[65 - 70]	41	0.36
[70 - 75]	18	0.16
[75 - 80]	2	0.02
[80 - 85]		
[85 - 90]		
Median age (min-max)	28	(1 - 87)
Average age (standard deviation)	30.00	10.83
Marital status		
Single	8.36	8.36
Married	31.29	31.29
Divorced	5.27	5.27
Widowers	6.06	6.06
School level		
Out of school	2445	22.05
Primary	2173	19.6
Secondary school	5207	46.97
College	1261	11.37
Screening reason		
Know its status	3109	36.52
Prenuptial assessment	578	6.79
Job	46	0.54
Symptoms	814	9.56
Death of the sexual partner	209	2.46
Seropositivity of sexueal partner	138	1.62
Risky sexuak intercourse	529	6.21
Transfusion	2	0.02
Other	3087	36.27
Existence of a current sexual partner		
Yes	8463	78.32
Non	2342	21.68
Screening test results		
Positive	1875	16.37
Negative	9277	81.01
Undetermined		

3.1. Evolution of Clients' Profile at the Centre

The average age was 30 ± 10.8 years. The most represented age group was 20 - 25. Depending on years, the average age of CADI's clients ranged between 27.9-year-old and 31.8-year-old with extremes varying from 1.0-year-old to 87.0-year-old. Significant progress was made from one year to the other (p < 0.0001). Women were mostly represented (55.5%) with a sex ratio of 0.80. But between 1996 and 2000, male was predominant. Subsequently, the number of women attending the centre increased and was higher than that of men. Most clients were living in couple (79.5% [78.6 - 80.4]). From 1996 to 2000, attendance rates increased although between 2001 and 2007, numbers decreased. The number of widowers attending the centre considerably declined since 1996, whereas the bachelors were stable except in 2003, 2004, and 2007 (**Figure 1**).

Among centre's clients, 52.90% [52 - 53.8] had no occupational activity. Over three-quarters were educated representing 78.3% [77.5 - 79.1]. From 1996 to 2014, educated people attended the centre more often (**Figure 2**).

Almost half of the educated people (46.3%) attended secondary school, 19.47% primary school, and 11.43% high school. 23.82% of clients always used condoms. When testing was conducted, 21.5% stated that they have several sexual partners.

The desire to know their serological status was the first reason for screening reported by 36.4% [35.35 - 37.41] of the clients.

The reasons for HIV testing have improved in 5 steps (**Figure 3**).

The first stage was the first two years during which testing was determined by the appearance of symptoms. Between 1998 and 2000, the desire to know one's status was more common. From 2001 to 2007, testing was mostly requested by a third person (physician), and then from 2008 to 2014 seeking to know one's status became the main reason put forward (**Figure 4**).
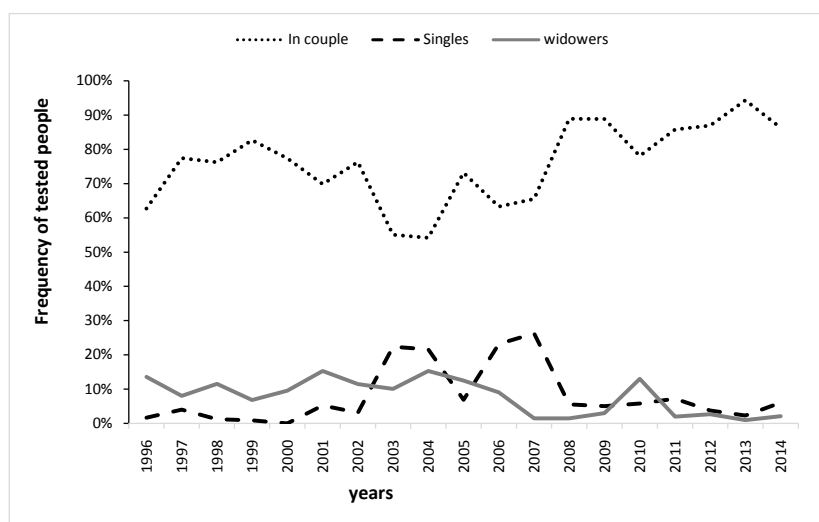

Figure 1. Frequency of the people tested at CADI from 1996 to 2014 based on marital status.
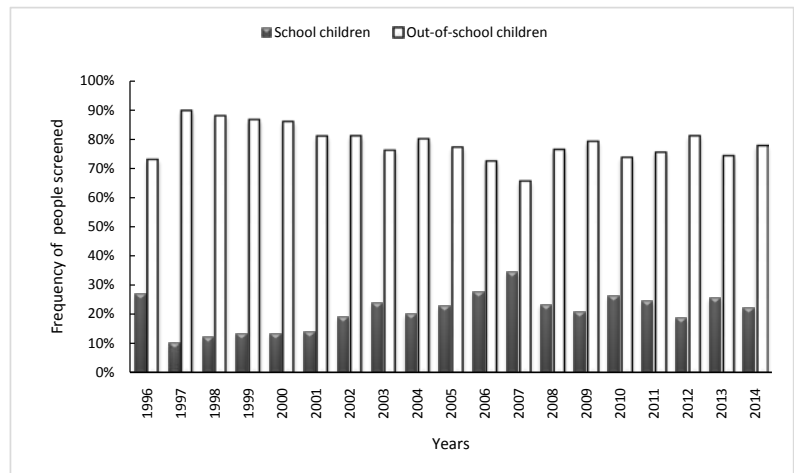
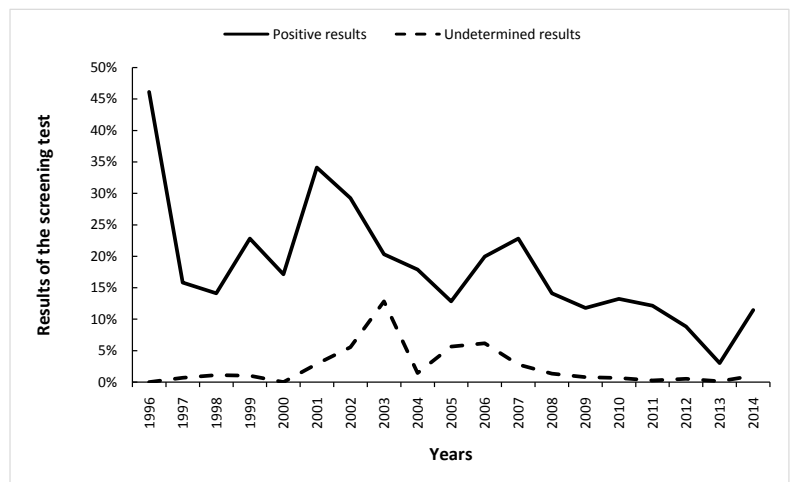**Figure 2.** Frequency of the people tested at CADI from 1996 to 2014 based on the level of education.

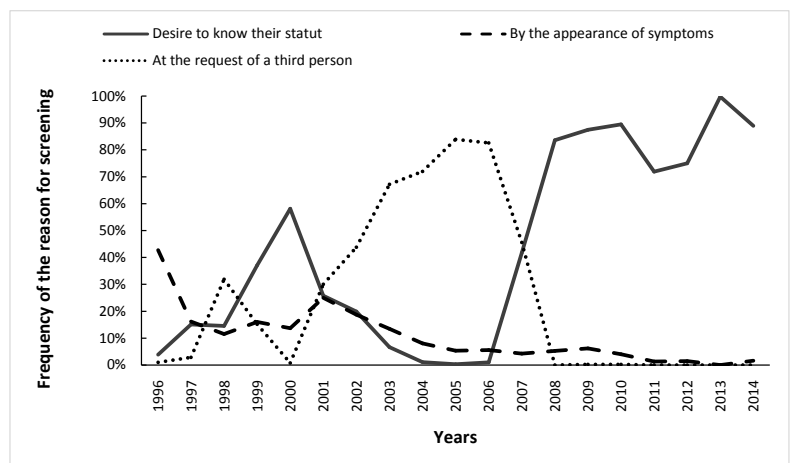**Figure 3.** Frequency of the HIV prevalence among CADI customers from 1996 to 2014.

Figure 4. Reasons for coming for HIV screening reported by the clients of CADI from 1996 to 2014.

3.2. Evolution of HIV Prevalence at CADI

The 16.4% (15.7 - 17.1) of the cases from the 11,451 clients included in our study were tested HIV positive. The results were indeterminate for 299 clients (2.6%); 9277 clients were tested HIV negative. Figure 4 shows the progression of HIV prevalence from 1996 to 2014, with the peaks of 22.9%, 34.1%, and 22.8% noted in 1999, 2001, and 2006 respectively. In 1996, almost one out of two clients had a positive HIV result against 4.2% in 2014. From 1996 to 2014, HIV prevalence among the clients considerably decreased. From 1997 to 1998, the average prevalence rate was about 15%. From 2007 to 2011, the average of the HIV sero-positivity rate was stable (13%). The year 2013 was characterized by the lowest HIV prevalence rate (3%) despite high attendance at the centre where 23,279 voluntary screenings. In 2014, an increase in HIV prevalence (11.5%) was recorded compared to 2013. From 1996 to 2003, the number of undetermined results was growing. Since 2003, this number has been decreasing. The peaks of indeterminate HIV results were noted in 2000, in 2003, and in 2006 with 17, 13, and 06 cases respectively, for 100 screenings performed. The number of indeterminate results since 2007 was relatively less than 1%.

Clients aged from 30-year-old to 35-year-old were more affected by HIV infection (21.9%; $p < 0.0001$). Sero-positivity rate was significantly higher among women (66.4%; $p < 0.0001$). Widowers were more HIV-affected (41%; $p < 0.0001$). The sero-positivity rates were higher among uneducated clients representing 36.73%, against 31.88% for those who attended secondary school; it was 26.32% for those with primary school background and 16. 81% for high school background ($p < 0.0001$). The sero-positivity rate was significantly higher among clients with several sexual partners (19.82%; $p < 0.0001$) and those who never or occasionally use condoms (83.3%; $p < 0.0001$). Sharing information related to the serological status with another person was significantly lower among HIV positive patients (84.3%; $p < 0.0001$) compared to HIV negative clients (93.2%; $p < 0.0001$).

4. Discussion

The aim of the study was to describe the evolution of HIV prevalence infection from the Screening Counselling Centre (CADI) from 1996 to 2014. With 16.4% of cases tested HIV positive, the HIV prevalence has significantly decreased from 46.2% in 1996 to 1.5% in 2014. There was a statistical difference between the HIV test result and the following variables: genre, class age, having sexual partners, use of condoms, sharing information related to the serological status with another person. Despite these interesting results, two main methodological limits have to be considered in the present study: its retrospective nature and its cross-sectional type.

4.1. Evolution of Clients' Profile at the Centre

In 2006, the average age of screened people in our centre was higher than the average age of the general population (21.8-year-old) with the most represented

age group from 20-year-old to 25-year-old [7]. In a study carried out among the general population in Ouagadougou (in Burkina Faso) targeting attendants of a screening centre [8], Kirakoya *et al.* noted an average age (29 ± 8 years) closed to our study.

Related to the gender, our population was mainly composed of women which is similar to the structure of the general population in Burkina Faso [7]. Somé *et al.* reported a considerable number of women in fixed sites [2]. This was also noted by Biadglegne *et al.* [8] from Ethiopia and Dagnan *et al.* [9] from Côte d'Ivoire who respectively recorded 56.4% and 6 times more HIV-positive women. Such data express the increasing number of women with HIV due to their biological, socio-cultural and economical vulnerability. From 1996 to 2000 where there was a predominance of men and more women from 2001 to 2014, that could be explained is the fact that, since 2000, the national policy for HIV control gives more opportunities to women for counselling relating to the voluntary HIV screening, especially during prenatal visits. In addition, women tend to get themselves tested as part of a fixed strategy compared to men [2].

The education rate in our study (78.3%) was higher than that of the general population (26.8%) [7]. Such data probably result from the various sensitization campaigns in schools [10]. Our study showed that more educated people get themselves tested compared to the uneducated. In addition, more uneducated clients were HIV-infected while most of Burkinabe people were uneducated [11]. From Dillnessa *et al* in Addis Ababa [12], people with primary school level were four times more likely to use voluntary testing facilities.

From 1996 to 2000, most clients (79.5%) were in couple because in the 1996's, HIV infection was considered as occurring among individuals at risk (singles and couples) [13]. This was noted by Kirakoya *et al.* who highlighted that 48.6% of HIV screening Centre's clients were married couples living in Burkina Faso [14]. In the same line, Fiorillo *et al.* [15] from Tanzania and Hensen *et al.* [16] from Zambia noted a high testing rate among married people and widowers. We also noted that widowers were significantly more HIV-affected (41%). On the other hand, divorced people were the least HIV-affected (9.03%). Biadglegne *et al.* [8] observed that married people (2.8 OR; 95% IC: 1.70 to 4.71, p < 0.001) and those in couple (3.8 OR; 95% IC: 2.47 to 6.09, p < 0.001) were the most exposed to HIV infection. Such data draw attention to the importance of preventing HIV infection among couples considered by some authors as high-risk persons. An infected person can contaminate his/her partner and this raises challenging ethical, human rights and public health issues [17] [18] as well as the sharing of serological information within the couple.

Few bachelors attended the centre since its opening though between 2002 and 2008 their number slightly increased. Such results raise concerns because this group of people is considered at risk by some authors [19]. Yet in the USA, Schechter-Perkins *et al.* reported that bachelors were people more likely to accept being tested [20].

Less than half of the people tested at the centre (23.8%) said they regularly use

condoms. Sero-positivity rate was considerably higher among clients with multiple sexual partners (21.5%). More than 83% of the clients said that they never or occasionally use condoms were HIV positive. These results show high rates in risky behaviours especially among the youth. It should be reminded that it is very delicate asking questions on one's sexual behaviour; so risky behaviours might not be reported. Is risk taking an indication of slackening vigilance or trivialization of the HIV infection? Studies show that in the general public reactions changed from one extreme to the other, that is, from a deep fear to be contaminated to the fact that HIV has become very common since efficient therapy have been introduced [19]. An increasing number of people are no longer scared of the disease as it is considered chronic. In a prospective study conducted in New York Calderon *et al.* [21] noted that 24.3% of patients admitted to the emergency unit who accepted to be HIV tested did not use condoms. Sherr *et al.* [22] in a Zimbabwean rural cohort found no relationship between risky behaviours and screening counselling. People want to know their serological status, therefore the first reason for them to get tested [14]. In the same line, for Ndiaye *et al.* [23] in 69% cases, curiosity to know one's status was the first reason for testing [14] whereas in Great Britain Mc Garrigle CA *et al.* [24] pointed out that attendance to screening centres was closely related to having many sexual partners and new foreign sexual partners. Fiorillo *et al.* [25] reported that infidelity and the existence of new sexual partners were the main reasons for screening. They also considered reasons for leading people who have already been tested to ask for another testing. Decision to share one's serological status with another person was considerably low among HIV-positive patients (84.3%) compared to negative ones (93.2%; p < 0.0001). Disclosing one's serological status depends on the testing results. Very few of those tested positive share the information in this regard. In Burkina Faso, Guiro *et al.* [26] reported that only 22% of patients share their serological information with their partner. Stigmatization and moral conflicts are apparently the major reasons for which information is not shared, which is an obstacle to HIV infection control, especially optimal treatment management.

4.2. Progression of HIV Infection

The general prevalence of HIV infection among CADI clients was 16.4%, close to 18.4% reported by Fiorillo *et al.* [15] in Tanzania. In Uganda, Johnston *et al.* noted a prevalence of 12.3% [16]. In 2013, Dagnan *et al.* [9] reported a lower rate of 5.30% [17] which can be explained by the size of the sample, the duration and site of the study [10].

HIV prevalence among clients of the centre considerably reduced from 46.15% to 11.5% between 1996 and 2014. Progression in the prevalence stems from the increasing number of people attending the centre. At the beginning of HIV infection in Burkina Faso, fear and inaccessibility of screening centres were the major causes for a very late screening, often at the AIDS stage [26]. Most

clients were therefore sick by the time they attend the centre. In 1996, almost one over two clients (42.7%) showed HIV symptoms with high prevalence (46.1%). From 1997 to the 20s, mainly high-risk people attended the centre, *i.e.* those having unprotected sex very often with several sexual partners, those whose partner is seropositive, or died of Acquired immunodeficiency syndrome (AIDS). Later, with sensitization conducted by the various actors of HIV infection control, prevalence reduced and reasons for screening changed. Therefore, prevalence reduced after 2001; from 2007 to 2011, sero-positivity rates remained unchanged about 13%. From 2006 to 2014 no other reason than the wish to know one's serological status motivated CADI clients to get tested. Since 2006, HIV testing seems to be performed as a routine though attendance rate has remained low.

Over time some authors reported different variations in HIV prevalence. Indeed, during voluntary screening campaigns held from 2006 to 2010 in Burkina Faso, Somé *et al.* reported a 24.6% prevalence rate [2].

Kee *et al.* indicated that HIV prevalence among patients attending health centres in Korea increased from 2000 to 2005 (1.3% for 10,000 clients to 5.3 for 10,000 clients) [27]. Yet, they noted that HIV prevalence remained stable since 2005. Baryarama *et al.* [28] noted that HIV prevalence reduced from 1999 (23%) to 2000 (13%), then went up to 15% in 2013.

United Nations Programme on HIV and AIDS (UNAIDS) reports on HIV epidemic indicated a decrease in the prevalence [1]. Such results show the progress achieved in the world and particularly in Sub-Saharan Africa as part of HIV control.

5. Conclusion

The Screening and Counselling Centre (CADI) is the first and oldest HIV screening centre in Burkina Faso. Progress achieved by people using this facility is likely to reflect the progress and challenges in HIV infection control. Since inception of the centre, HIV prevalence rate decreased until 2014. The profile of clients also changed considerably explaining a variation in prevalence. When the epidemic started, very few patients were courageous enough to get screened; but since 2006, HIV screening has become a routine test for people desiring to know their serological status. It should be noted that despite this change in behavior, the World Health Organization estimates that only 51% of HIV infected people knew their serological status in 2014. There is a need to achieve a revolution in screening services because, to recall, screening is an entry point for addressing efficient management of HIV infected people. From this perspective, many authors would be moving towards HIV self-screening.

Conflicts of Interest

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

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