



## Sociodemographic characteristics and clinical parameters of HIV-infected pregnant women under ARV treatment in 3 hospitals in Abidjan

Thanou Mariam<sup>1\*</sup>, Ouattara-Soro Fatou Shcherazade<sup>1</sup>, Abo Yao<sup>2</sup>, Minga Albert<sup>2</sup>, Yao Konan Bertin<sup>1</sup>, Abizi Georges<sup>1</sup>, Kouadio Kouakou John<sup>1</sup>

<sup>1</sup>Laboratory of Biology and Health, UFR Biosciences, Université Felix Houphouët Boigny, Abidjan, Côte d'Ivoire

<sup>2</sup>National Blood Transfusion Center (NBTS), Abidjan, Côte d'Ivoire

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### Abstract

The Human Immunodeficiency Virus (HIV) is an undeniable public health problem in the world and particularly in Africa. The pregnant woman infected with HIV constitutes a potential risk not only for the mother but also for the newborn. In Côte d'Ivoire, data on mother-to-child transmission are still insufficient. It is within this framework that this study was conducted in order to evaluate the socio-demographic characteristics and some clinical parameters of HIV-infected pregnant women under antiretroviral treatment in three (03) hospitals in Abidjan. This is a retro prospective, descriptive and analytical cross-sectional study conducted in three hospitals in Abidjan. It took place from October 2019 to June 2021. Of 529 HIV-positive women, 22.3% came from the Treichville General Hospital (TGH), 37.4% from the Community-based Urban Health Training Center (CUHTC) and 40.3% from the Abobo Regional Hospital Center (RHC). The average age of the patients was 30.94 years, with a minimum of 15 years and a maximum of 50 years. The majority of patients were between 27 and 38 years old (68.1%). Single women accounted for 57.3%, those not attending school for 40.4% and shopkeepers for 42%. They had a prevalence of 98% HIV 1, stage 1 (70%). The preferred therapeutic combination was TDF-3TC-EFV with a satisfactory Karnofsky index of 99.6%. The results obtained in this study showed that ARVs have a good influence on the clinical parameters of these HIV-infected mothers under antiretroviral treatment.

\* Corresponding Author: Thanou Mariam ✉ [maria29thanou@gmail.com](mailto:maria29thanou@gmail.com)

## Introduction

The Human Immunodeficiency Virus, commonly known as HIV, is a retrovirus that primarily affects CD4 T cells and is a pathogen responsible for Acquired Immunodeficiency Syndrome (AIDS). The evolution of the infection caused by the virus leads to a weakening of the immune system and increased vulnerability to other infections. It is now an undeniable public health problem in the world and particularly in Africa (Costagliola, 2008; PNPEC, 2012; UNAIDS, 2018). Thus, Africa remains the most affected continent with 4.7 million people living with HIV in West and Central Africa; 20.6 million in East and Southern Africa in 2020 (UNAIDS, 2021). In Côte d'Ivoire, the number of people living with HIV (PLHIV) in 2017 was 500,000, a nearly constant figure since 2010 (UNAIDS, 2018). Among those infected, women of childbearing age are the most numerous, with mother-to-child transmission rates ranging from 25 to 30% (Kacou, 2020). Mother-to-child transmission (MTCT) of HIV, or vertical transmission, has remained the primary mode of transmission to the child during pregnancy, childbirth, or breastfeeding. The prevention of mother-to-child transmission of HIV (PMTCT) is an

important component of the fight against HIV. Indeed, these measures implemented in developed countries have resulted in rates of mother-to-child transmission of HIV of less than 2%. The introduction of antiretroviral therapy (ARVs) in HIV-positive pregnant women, cesarean deliveries, and artificial milk have been successful in significantly reducing vertical transmission of human immunodeficiency virus (HIV) Ouédraogo *et al.* (2015). However, although ARVs are primarily intended to prevent mother-to-child transmission of HIV, taking them could have impacts on the infected pregnant woman's body. With this in mind, this study was conducted to assess the sociodemographic characteristics and some clinical parameters of HIV-infected pregnant women on antiretroviral therapy.

## Material and methods

### Presentation of the study setting

This study was conducted in three health centers in the city of Abidjan, namely the Treichville General Hospital (TGH), the Yopougon Port-Bouët 2 the Community-based Urban Health Training Center (CUHTC) and the Abobo Regional Hospital Center (RHC) (Fig.1).

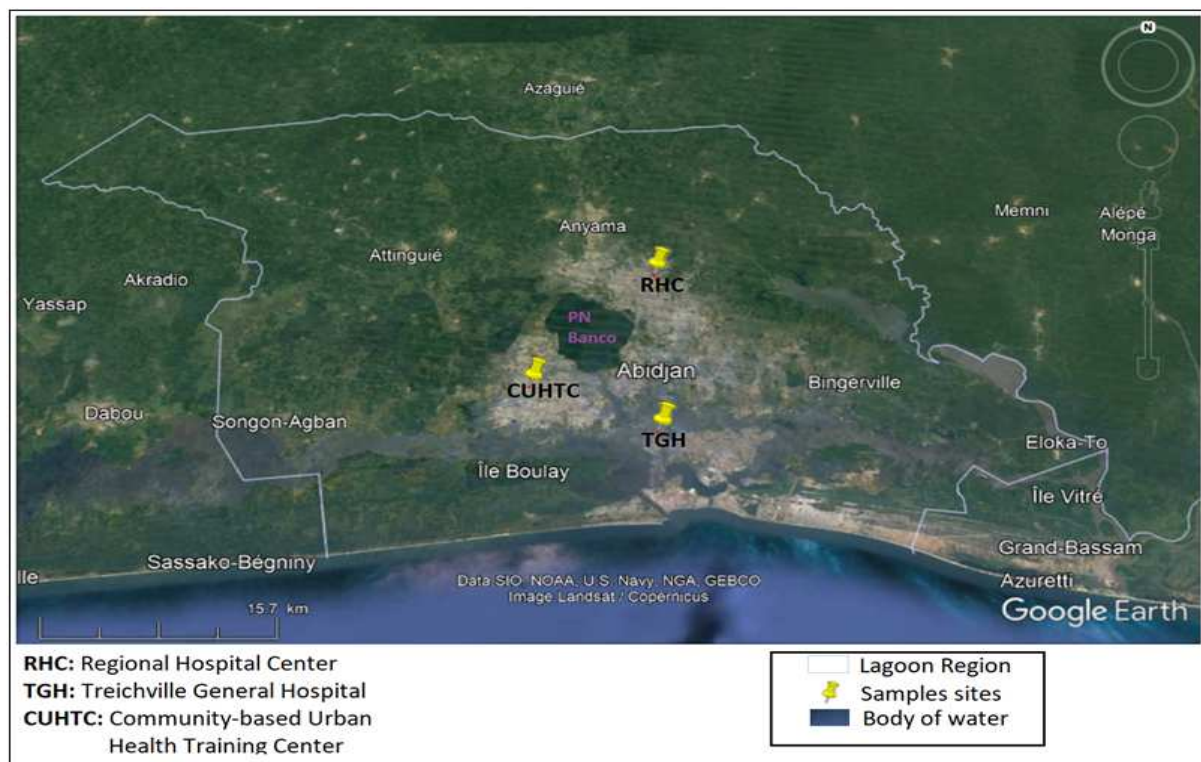


Fig. 1. Sample sites.

These facilities were selected based on the population density of the communes and the capacity of the health facilities.

#### *Selection criteria for the study population*

##### *Inclusion criteria*

All HIV-positive pregnant women attending antenatal clinics in the 3 centers were included.

##### *Exclusion criteria*

The following were excluded from this study: those who were lost to follow-up, pregnant women who did not attend their appointments regularly, patients whose records could not be found or were incomplete, and pregnant women who tested positive for HIV in the delivery room.

##### *Type of study*

This is a retrospective, descriptive and analytical cross-sectional study. It took place from October 2019 to June 2021. The records were analyzed with the help of the different managers of each site.

##### *Sampling*

For this study, survey forms were developed. With the collaboration of midwives, physicians, database

managers, social workers, and community counselors, information on each patient was recorded on the various survey forms. Data were collected through screening registers, prenatal consultation (PNC) registers, and medical follow-up record.

##### *Statistical analysis*

The data collected were entered using Excel 2013 and analyzed using Statistical Package for Social Sciences (SPSS) version 25. Also the graphical representations were made using Excel software. The variables are represented as percentages.

## **Results**

### *Descriptive analysis of HIV-positive women on antiretroviral treatment*

*Distribution according to the place of consultation* Of 529 HIV-positive pregnant women surveyed, 22.3% were from TGH, 37.4% from CUHTC Port-Bouët 2 and 40.3% from the Abobo RHC (Fig. 2).

### *Distribution of patients by age*

The average age of HIV-positive pregnant women was  $30.94 \pm 0.24$  years with a minimum of 15 years and a maximum of 50 years. The majority age range was 27 to 38 years in all 3 hospitals.

**Table 1.** Distribution of patients by profession and location of consultation.

Professions	Hospitals (%)		
	TGH	CUHTC	RHC
Housewives	31,4	19	23,4
Shopkeepers	39	44,6	42,4
Employees	8,5	9,2	4,9
Students	1,6	5,6	5,4
Autres	19,5	21,6	23,9
Total	100	100	100

Thus, at TGH this age group represented 65.8% of the population, at CUHTC it was 67.2%, and at RHC its proportion was 71.4%. For the 15 to 26 age group, TGH had a rate of 29.1%. At CUHTC this rate was 27.3% and 17.8% at the RHC. Low rates were observed in the 39 to 50 age group. Thus, the results showed 5.1% at TGH, 5.5% at CUHTC and 10.8% at RHC (Fig. 3).

### *Distribution of patients by marital status*

In terms of marital status, single women were the most represented in the population of HIV-positive pregnant women (57.3%). At CUHTC and TGH, single women were represented by 67.7% and 63.2% respectively. This status was represented at 41% at the RHC. In the latter structure, the majority of the population was represented by concubines with a rate

of 47.5%. This is in contrast to TGH and CUHTC, which had 14.5% and 27.1% of concubines respectively. As for married women, the proportions were 20.5% in TGH, 11.0% in RHC and 5.2% in CUHTC. In this study, divorced women were the least represented with proportions of 1.8%; 0% and 0.5%

respectively for TGH, CUHTC and RHC (Fig. 4).

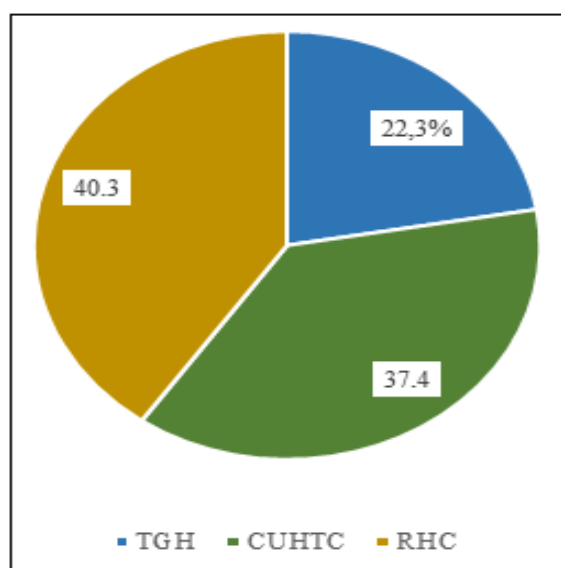
#### *Distribution of patients by education level*

Women with no education were the most represented population among HIV-positive pregnant women with a proportion of (40.4%).

**Table 2.** Distribution of patients by combination therapy and location of consultation.

Combination therapies	Hospitals (%)		
	TGH	CUHTC	RHC
TDF 3TC EFV	95,5	99,5	52,7
AZT 3TC EFV	1,8	0	25
TDF 3TC LOPI/RIT	1,8	0	1,9
TDF 3TC DTG	0,9	0	1
AZT 3TC NVP	0	0,5	15,5
AZT 3TC LOPI/RIT	0	0	3,4
ABC 3TC LOPI/RIT	0	0	0,5
TOTAL	100	100	100

Specifically, the proportion of women with no schooling was 45.7% at TGH, 32.5% at CUHTC and 41.3% at RHC. As for the primary level, it was represented at 22.9% in TGH, 29.9% in CUHTC and 24.9% in RHC. As for the secondary level, the proportions of patients surveyed were 22.0% at TGH, 24.9% at CUHTC and 25.4% at the RHC.



**Fig. 2.** Distribution of patients according to the place of consultation.

TGH: Treichville General Hospital

CUHTC: Community-based Urban Health Training

RHC: Regional Hospital Center.

Patients with the highest level of education represented the lowest rate in this study. TGH had 7.6%, CUHTC 12.7% and RHC 8.4% of patients (Fig.5).

#### *Distribution of Patients by Occupation*

The majority of women were shopkeepers (42%) in the population of HIV-positive women. At TGH, 39% of the patients were shopkeepers, 31.4% were housewives and 19.5% were women working in other sectors (Table I). At CUHTC, 44.6% were shopkeepers, 19% were housewives and 21.6% were women working in other sectors. At the RHC, 42.4% of the respondents were shopkeepers, 23.4% housewives and 23.9% women working in other sectors. Employees, students were the least represented.

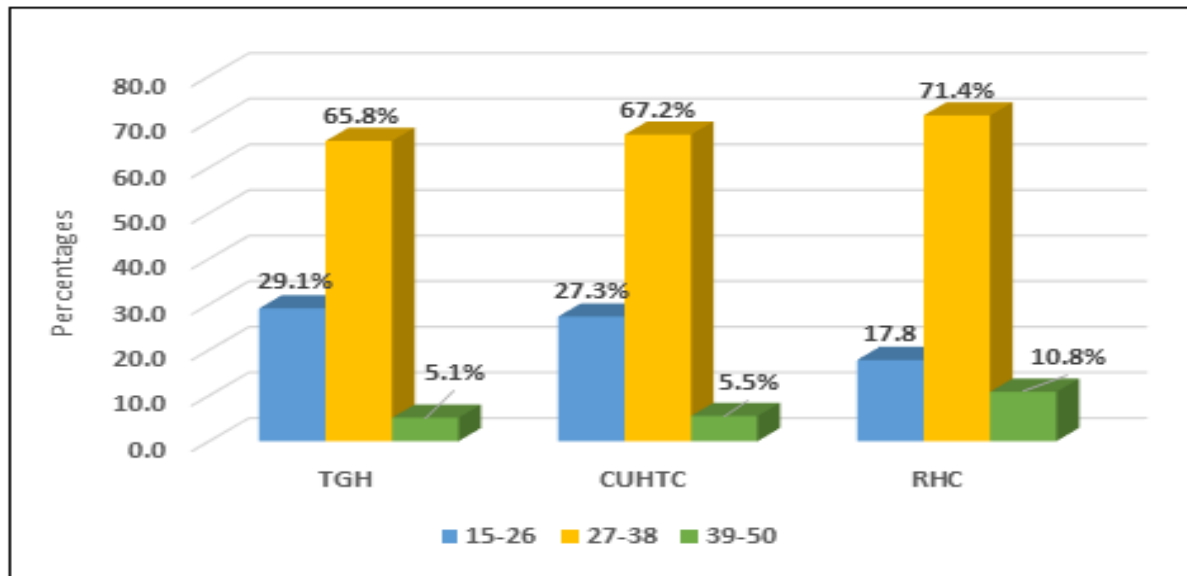
#### *Distribution of patients according to clinical parameters*

##### *Distribution of patients according to HIV type*

The distribution of patients by HIV type showed that 98% of the women were infected with HIV 1, compared with 1.6% and 0.4% with HIV 2 and HIV 1 and 2, respectively. At each facility, 99.2% of patients at the TGH, 99% at the CUHTC, and 95.8% at the

RHC were HIV-1 infected. In particular, patients infected with HIV 2 represented 0.8%, 0.5% and 3.3% at the TGH, CUHTC and RHC respectively. In

addition, patients with HIV 1 and 2 co-infection were represented at 0% at TGH; 0.5% at CUHTC and 0.9% at RHC (Fig.6).



**Fig. 3.** Distribution of patients by age and place of consultation.

TGH: Treichville General Hospital

FSUCOM: Community-based Urban Health Training

RHC: Regional Hospital Center.

#### *Distribution of patients by WHO clinical stage of HIV infection*

The distribution of patients according to WHO stage gave the following results: 70% for stage I, 16.9% for stage II, 11.9% for stage III and 1.2% for stage IV. Thus, at TGH 56% of patients were stage I, 15.5% stage II, 26.7% stage III and 1.8% stage IV. CUHTC patients had 85.6% stage I, 11.2% stage II, 3.2% stage III and 0% stage IV. And those of the RHC had 68.6% in stage I, 23.5% in stage II, 5.9% in stage III and 2% in stage IV (Fig.7).

#### *Distribution of patients according to the Karnofsky Index (KI)*

The Kanofsky index was 100% valid at FSUCOM. At TGH, it was 99.1% valid and 0.9% ambulatory, and at RHC it was 99.5% valid and 0.5% ambulatory (Fig.8). In the general population, 99.6% had a valid KI and 0.4% ambulatory.

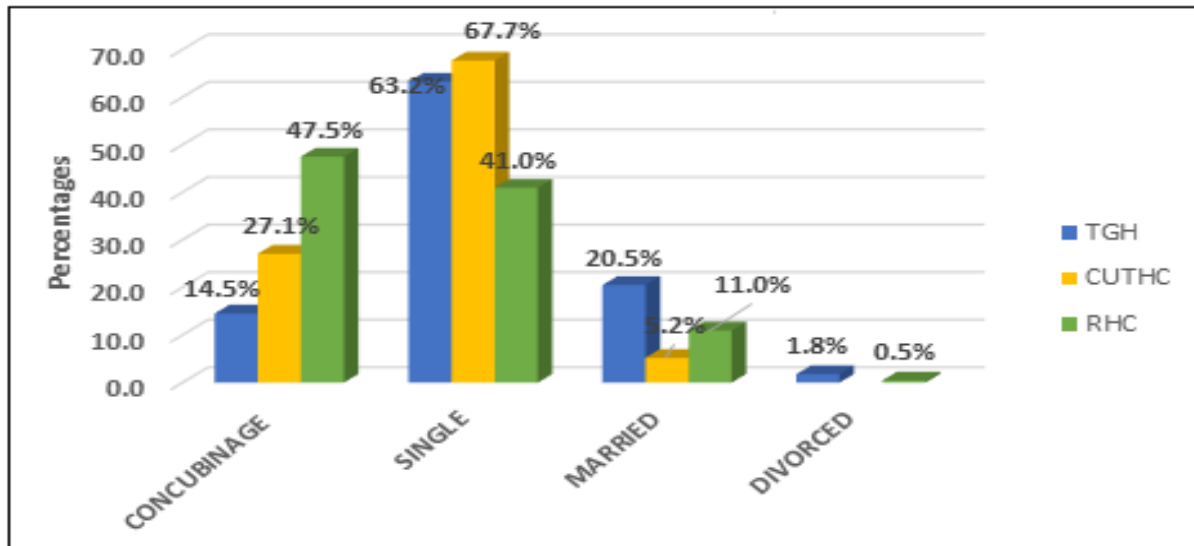
#### *Distribution of patients by combination therapy*

The 2INTI + 1INNTI regimen (82% TDF 3TC EFV;

9% AZT 3TC EFV and 5.3% AZT 3TC NVP) was the most prescribed followed by 2INTI + 1IP (1.2% TDF 3TC LOPI/RIT; 0.1% ABC 3TC LOPI/RIT and 0.1% AZT 3TC LOPI/RIT) and 2INTI + 1II (0.6% TDF 3TC DTG). The most frequently administered combination therapies were TDF 3TC EFV; AZT 3TC EFV; AZT 3TC NVP. The combination therapy TDF 3TC EFV was the most administered with 95.6% at TGH, 99.5% at CUHTC and 52.7% at RHC. AZT 3TC EFV was administered at 1.8% at the TGH and 25% at the RHC. AZT 3TC NVP was prescribed to 0.5% at CUHTC and 15.5% at the RHC (Table. 2).

#### **Discussion**

Out of 529 HIV-positive pregnant women who came for consultation, the results obtained showed that 37.4% of patients were from the CUHTC of Yopougon Port-Bouët 2 and 40.3% from the RHC of Abobo, compared to 22.3% from the TGH. This could be explained by the density of these communes and the capacity of these structures (CUHTC and the RHC compared to the TGH).



**Fig. 4.** Distribution of patients according to marital status and place of consultation.

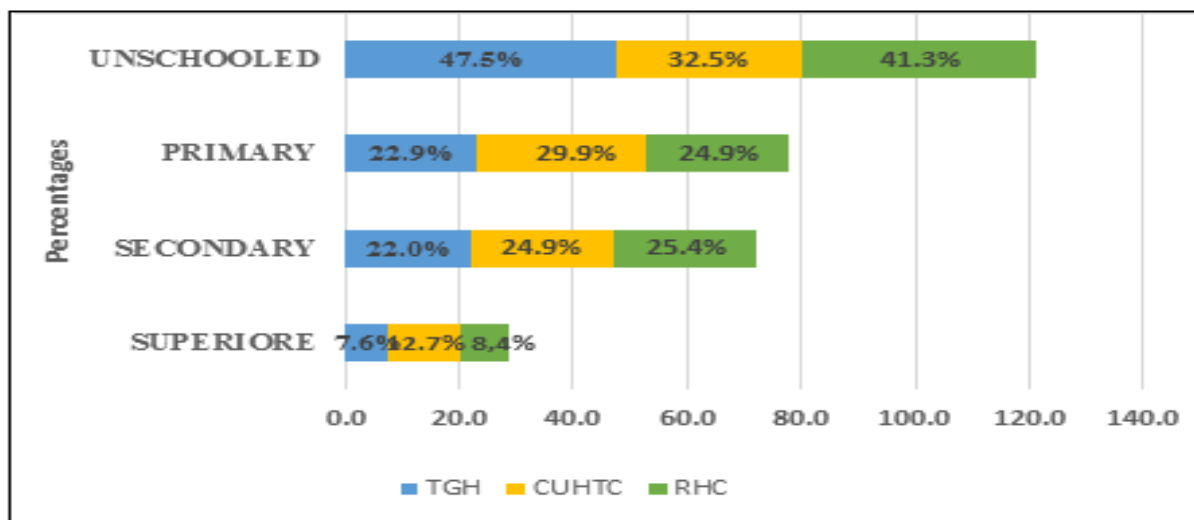
TGH: Treichville General Hospital

CUHTC: Community training in urban health

RHC: Regional Hospital Center.

Indeed, the commune of Yopougon (1,071,543 inhabitants) and Abobo (1,030,658 inhabitants) are among the most populated communes in Abidjan (RGPH, 2014). Thus, two communes are home to

many sexually active women of reproductive age. After the investigation, the 27-38 year old age group had a higher rate in all 3 health centers and a mean age of 30.94±0.24 years.



**Fig. 5.** Distribution of patients according to level of education and place of consultation.

TGH: Treichville General Hospital

CUHTC: Community-based Urban Health Training Center

RHC: Regional Hospital Center.

This is explained by the fact that this age group would be the most sexually active in the study population. The relatively young mean age in this study could be explained by the high exposure of women of

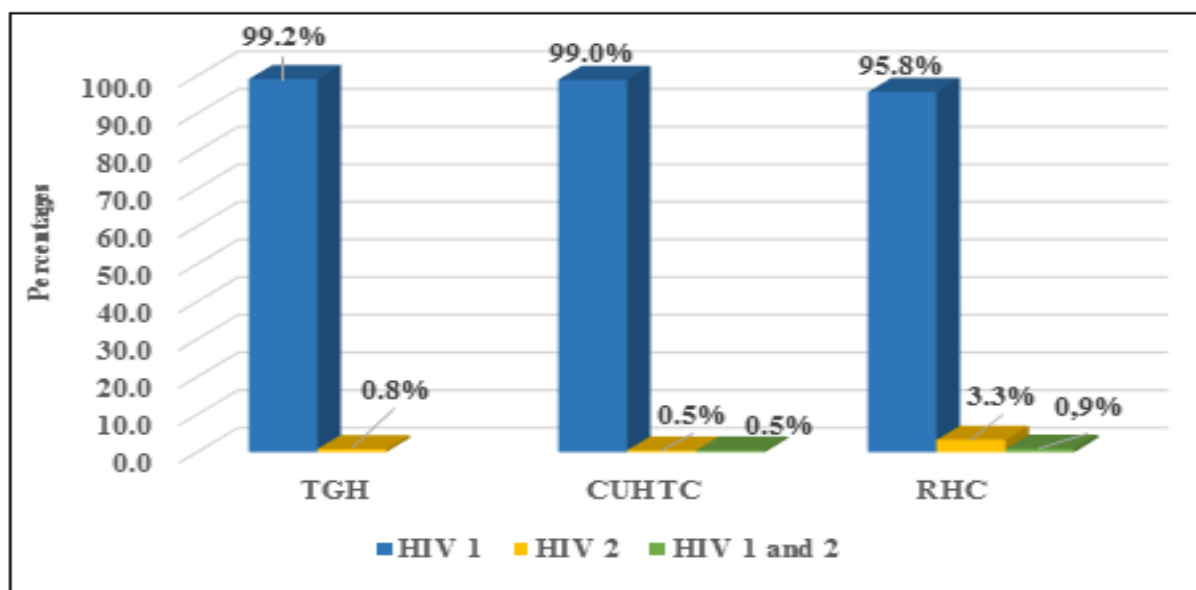
childbearing age to heterosexual transmission, which is the main mode of transmission in Côte d'Ivoire. However, these results are not in line with those of Effoh *et al*, (2018) who obtained a mean age of 28.3

years with extremes of 16 and 40 years. These results could be explained by the relatively very young age in his study.

The distribution of the study population according to marital status showed that singles represented more than half of the population. This high rate of single HIV-positive women is thought to be due to an unstable sex life, marked by the presence of several sexual partners (Ferry, 1996). These results are similar to those of Berthé (2020) who found in his

study that single women had a higher rate. This work is contrary to that of Diarra (2018), who had obtained a high frequency of married women.

This could be because most women of childbearing age are already married in the African context. Also according to the work of Saye (2018), all women in her study were married. And this high frequency of married women could be explained by the fact that in the general population, married women are the most common among women in their reproductive years.



**Fig. 6.** Distribution of Patients by HIV Type.

HGT: Hôpital Général de Treichville

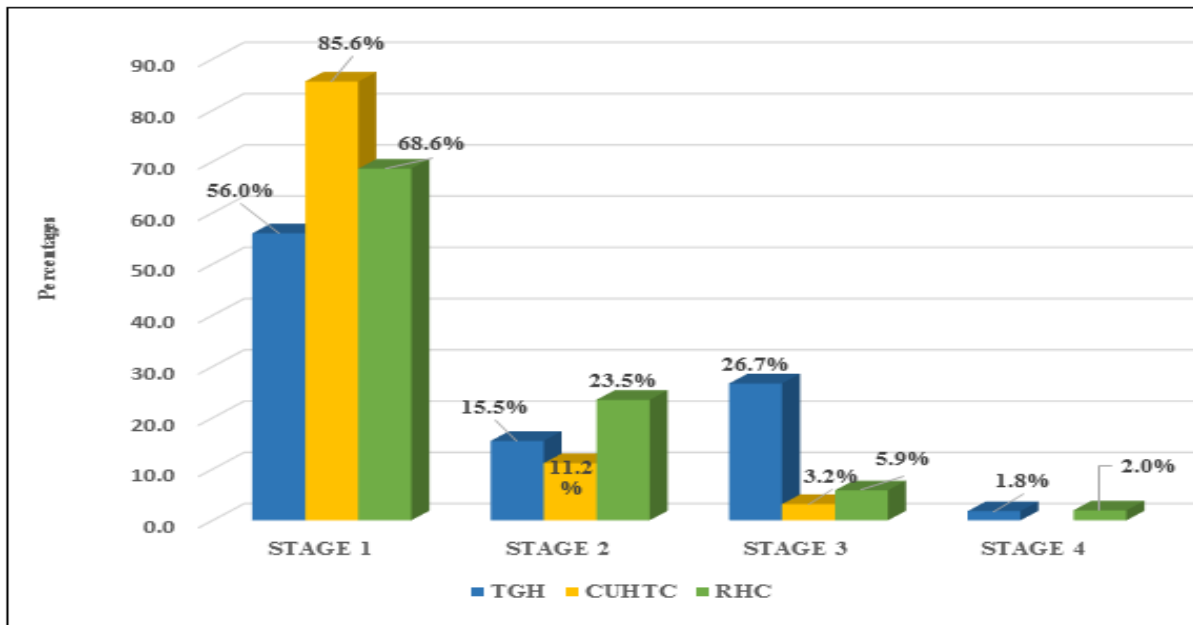
FSUCOM: Community-based Urban Health Training

RHC: Regional Hospital Center.

Women who were not in school were the most HIV-infected in this study. This result helps explain that schooling may contribute to the reduction of infection rates in women. These results are similar to those of Hota *et al.* (2019). According to these authors, the high infection rate could be justified by the difficulties in accessing information on HIV due to ignorance. Studies have reported that in the field of health in general, education is a favorable factor in decoding communication messages issued for behavior change or for mobilization and social marketing for disease control Lozes *et al.* (2012); Bilong *et al.* (2015). With regard to professional status, the results of this survey showed that women traders dominated (42%) in the

population. These results could be explained by the fact that trade is an activity dominated by women. In fact, trade allows pregnant women to be autonomous and to take charge of their lives. Contrary to the studies done by Diarra (2018), housewives were the most infected compared to other occupational groups.

This difference could be explained by the fact that the vast majority of women in Mali are housewives. The same is true for the work of Saye (2018), he had obtained 60% housewives. This can be explained by the status of women in Mali. The prevalence of HIV type 1 was 98% in the population of HIV positive pregnant women.



**Fig. 7.** Distribution of patients according to WHO clinical stage.

HGT: Treichville General Hospital

FSUCOM: Community-based Urban Health Training

RHC: Regional Hospital Center.

This could be justified by the fact that HIV 1 is more frequent and virulent in the world, specifically in West Africa. These results are similar to those of Kacou (2020) and Kouakou *et al.* (2016). These authors obtained respectively 95.8% and 95.9% of HIV-1 positive pregnant women who came for prenatal consultation at the University Hospital of Bouaké. Goita (2008) also obtained a similar result. Indeed, 95.4% of pregnant women who came to the Fousseyni Daou Hospital in Kayes, Mali, during his study were HIV 1 positive.

These results could confirm that HIV 1 is indeed the most widespread subtype in Sub-Saharan Africa (Amat-Rose, 2003; Alssandri, 2018). It is believed to be, the result of interspecies transmission of SIV from chimpanzees Keele *et al.* (2006).

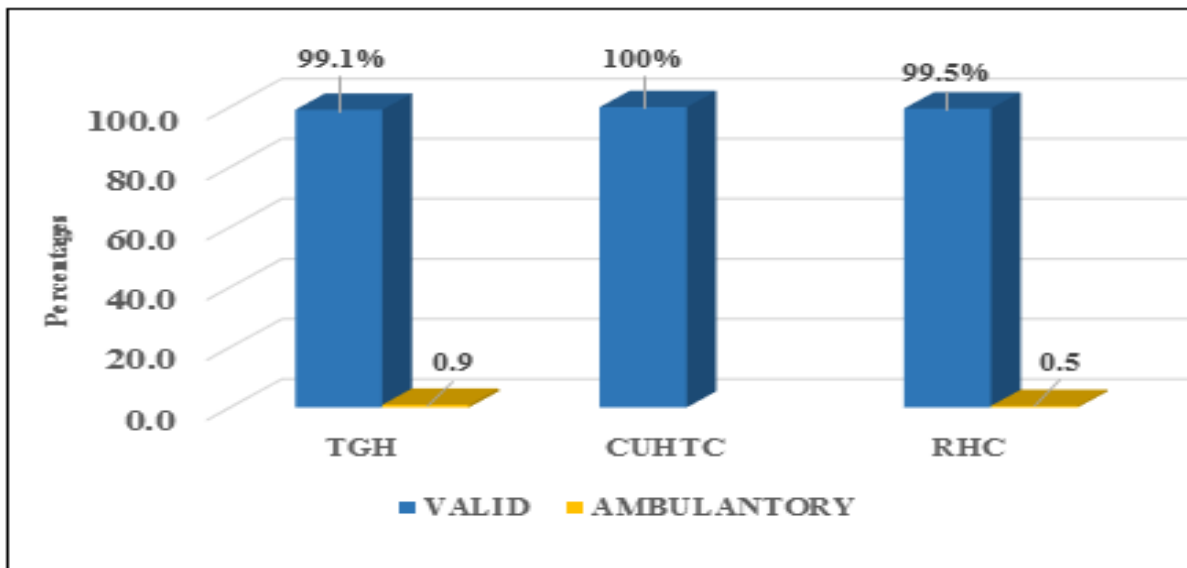
In this study, 70% of the patients were at stage 1 of HIV infection. This would be due to the fact that these patients were managed quickly, contrary to the results of Diarra (2008) and Maud (2010). Indeed, these authors showed respectively that patients in sub-Saharan Africa were managed late with 41% and 54.80% at stage 3.

Almost all the pregnant women in this study had a Karnofsky index between 100-80 with a frequency of 99.6% which justified the satisfactory condition of the pregnant women. These results are similar to those obtained by Sako *et al.* (2012).

The 2INTI + 1NNTI regimen was the most represented. The combination TDF+3TC+EFV was the most used, followed by the combination AZT+3TC+NPV. This is explained by the fact that these combinations have been retained as first-line regimens by national policy (Côte d'Ivoire) according to current recommendations for HIV/AIDS management.

These results are comparable to those of Abalé (2019). According to Abalé, the TDF 3TC EFV regimen is the most widely used because of its virological efficacy, its lower cost than the other molecules and the restrictive storage conditions adapted to developing countries Bashi *et al.* (2010) obtained similar results, according to them, HIV 1 patients received TDF 3TC EFV as combination therapies, which could be explained by the high prevalence of HIV 1 infected patients.





**Fig. 8.** Distribution of patients by Kanofsy Index (KI).

HGT: Treichville General Hospital

FSUCOM: Community-based Urban Health Training

RHC: Regional Hospital Center.

### Conclusion

The present work has made it possible to know the socio-demographic situation and some clinical parameters of the pregnant women received in consultation in the three health structures. The majority of the women interviewed were in the 27-38 year age group and were single, uneducated and merchants. Also, the results obtained in this study showed that ARVs had a good influence on the clinical parameters of these HIV-infected mothers on ARV treatment. In order to eliminate mother-to-child transmission, it is important to systematically screen all pregnant women and ensure their follow-up during prenatal consultations.

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