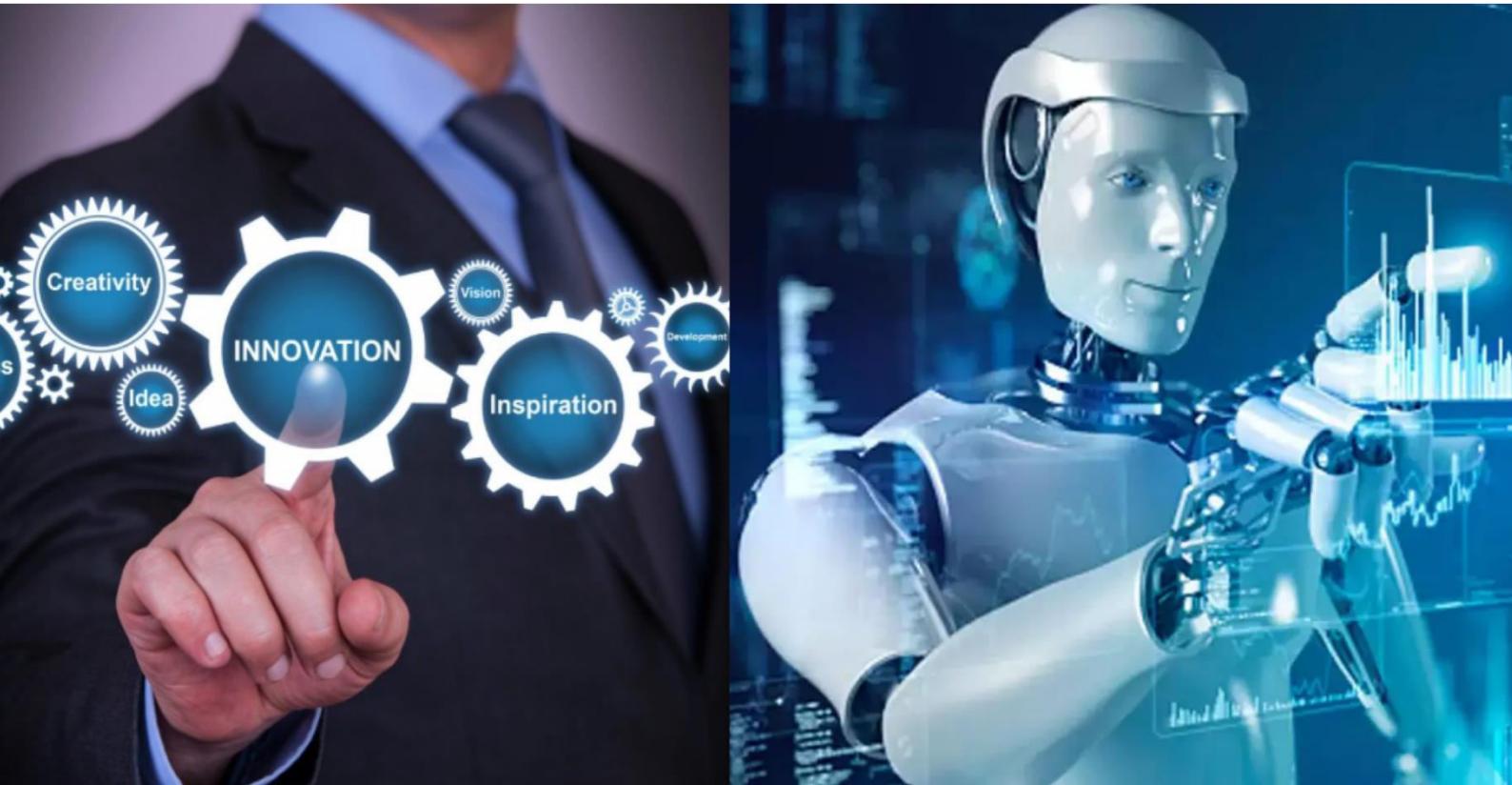




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# Analysis of Data on People Living with HIV in Commune IV of the District of Bamako from 2021 to 2024

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## ABSTRACT:

**Introduction:** Human immunodeficiency virus (HIV) infection remains a major public health problem, particularly in sub-Saharan Africa. In Mali, despite the adoption of the World Health Organization's "Test and Treat" strategy and the expansion of access to antiretrovirals, few analyses utilize routine databases to assess patient characteristics and the performance of care, hence the purpose of our study.

**Materials and Methods:** This was a cross-sectional study conducted from November to December 2025, using HIV data recorded between 2021 and 2024. Data were extracted from the DHIS2 tracker, medical records, and consultation registers. Descriptive analysis was performed using Epi Info 7.2.6.

**Results:** A total of 2,193 patients on antiretroviral therapy were included. The median age was 34 years (range 1–80 years). Women represented 71.8% of the patients. The 26–35 age group was the most affected, at 33.5%. The majority resided outside Commune IV (75.7%). HIV-1 was predominant, accounting for 94.9% of cases, while TB/HIV coinfection was low (0.96%).

**Conclusion:** The care of people living with HIV in Commune IV is characterized by good treatment coverage among the patients assessed. However, the low rate of viral load testing remains a major challenge. Strengthening biological monitoring and continuity of care is essential to improve the performance of the HIV program.

**KEYWORDS:** Analysis, data, HIV, Commune IV, Bamako, Mali

## I. INTRODUCTION

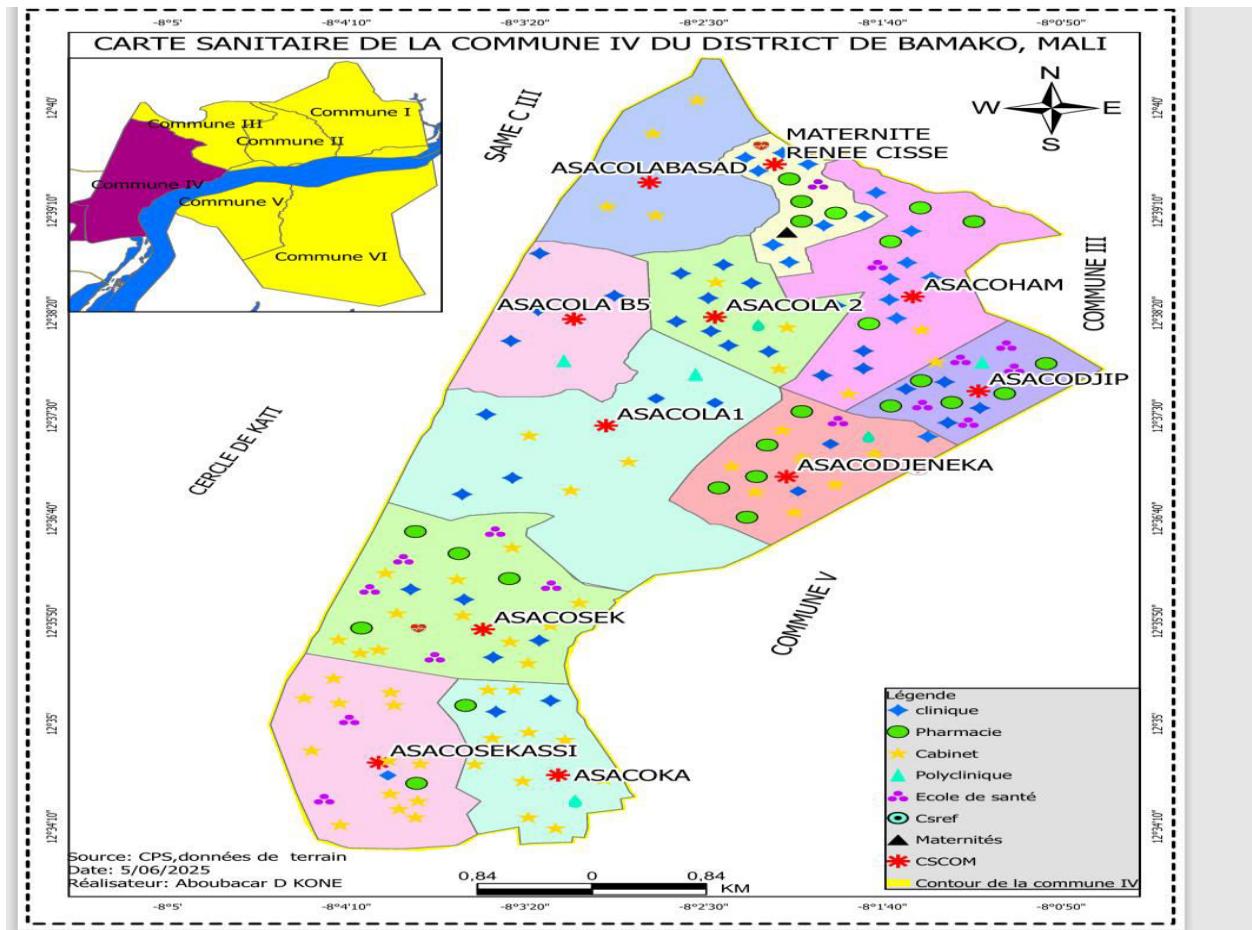
The human immunodeficiency virus (HIV) is a retrovirus that attacks immune system cells, destroying them and rendering them ineffective (1). It is transmitted parenterally, sexually, and from mother to child. Tuberculosis (TB)/HIV co-infection can occur in the same patient. HIV remains a major public health problem worldwide, with a particularly high impact in sub-Saharan Africa (2). In 2024, approximately 40.8 million people were living with HIV worldwide (3); 1.3 million new infections and 630,000 deaths were recorded (3). Nearly 31.6 million people had access to antiretroviral (ARV) treatment (3). Globally, 45% of new infections were among women and girls (3). In sub-Saharan Africa, these accounted for 63% of new infections, while in other regions, approximately 73% of new infections occurred in men and boys (3). In 2024 in Mali, the total number of people living with HIV was estimated to be between 110,000 and 120,000, including approximately 12,000 children (4). The national prevalence decreased to 0.76% from 1% in 2021. There were approximately 4,000 new infections and 3,236 deaths (4). In 2024 in Bamako, 3,438 people were newly diagnosed HIV-positive, including 446 pregnant women, with a seropositivity rate of 0.43%. A total of 18,590 people were placed on antiretroviral therapy (ART) (5). In 2024 in Commune IV, 474 new cases were diagnosed, representing 13.78% of new cases in the Bamako District, with 26 deaths and 2,241 people receiving ART (5). Since 2016, the World Health Organization (WHO), through its "test and treat" strategy, has recommended treating all individuals who test positive for HIV, regardless of clinical stage or CD4 count (2). This strategy has led to a gradual increase in treatment coverage. Mali has also adopted a national strategic plan for the fight against HIV (2023–

2026) to coordinate interventions. Despite these efforts by the state and its partners, routine data from health information systems remain insufficiently analyzed at the local level to guide decision-making. This study aims to analyze the database of people living with HIV in Commune IV of the Bamako District.

## II. MATERIALS AND METHODS

### 1. Study Setting

Our study took place in Commune IV, which has an area of 38 km<sup>2</sup>, a population of 492,974 inhabitants, and a population density of 12,973 inhabitants/km<sup>2</sup>. It is bordered to the north and south by Commune III, to the west by the Kati health district, and to the south by the Niger River. The health system comprises: 11 health areas, all providing comprehensive care for people living with HIV, and a Reference Health Center (CSRef). The municipality also has 106 Private facilities, including 11 that are Prevention of Mother-to-Child Transmission (PMTCT) sites, provide screening and care for pregnant women who test positive for HIV. After delivery, these HIV-positive women and their newborns are referred to the CSRef (Regional Health Center) for follow-up care.



**Figure 1:** Health map of the Commune IV, 2025 (6).

**2. Study type:** We conducted a cross-sectional study.

**3. Study period:** The study covered the period from November to December 2025, using data on people living with HIV (PLHIV) from 2021 to 2024.

**4. Study population:** The study population included all patients living with HIV registered in the CSRef database of Commune IV between 2021 and 2024.

- Inclusion criteria: Patients living with HIV, with usable medical records, and receiving care in Commune IV were included.
- Exclusion criteria:
- -Patients with HIV registered in the database with more than 10% missing data were excluded from this study.

-Patients registered in the database but not followed up in the CIV (Clinical Investigation Center).

## 5. Data Collection

**5.1 Data Collection Tools:** Data was collected through the DHIS2 tracker, patient medical records, and the consultation register.

**5.2 Data Collection Technique:** We conducted a literature review of the data recorded in the collection tools. From the DHIS2 tracker instance, we extracted the data using an extraction form created in Excel 2007.

## 6. Study Variables:

- Sociodemographic variables: Age, sex, marital status, occupation, home address, education level;
- Clinical variables: HIV type, WHO final classification, TB/HIV coinfection;
- Therapeutic variables: Prescribed ART, treatment status;
- Performance indicators: Year of ART initiation, point of entry for testing, viral load testing, viral load result, detectable and undetectable viral load.

## 7. Data Management

**7.1 Data Entry and Processing:** The data was entered into Excel 2007. Outliers were corrected and missing data were completed from patient records.

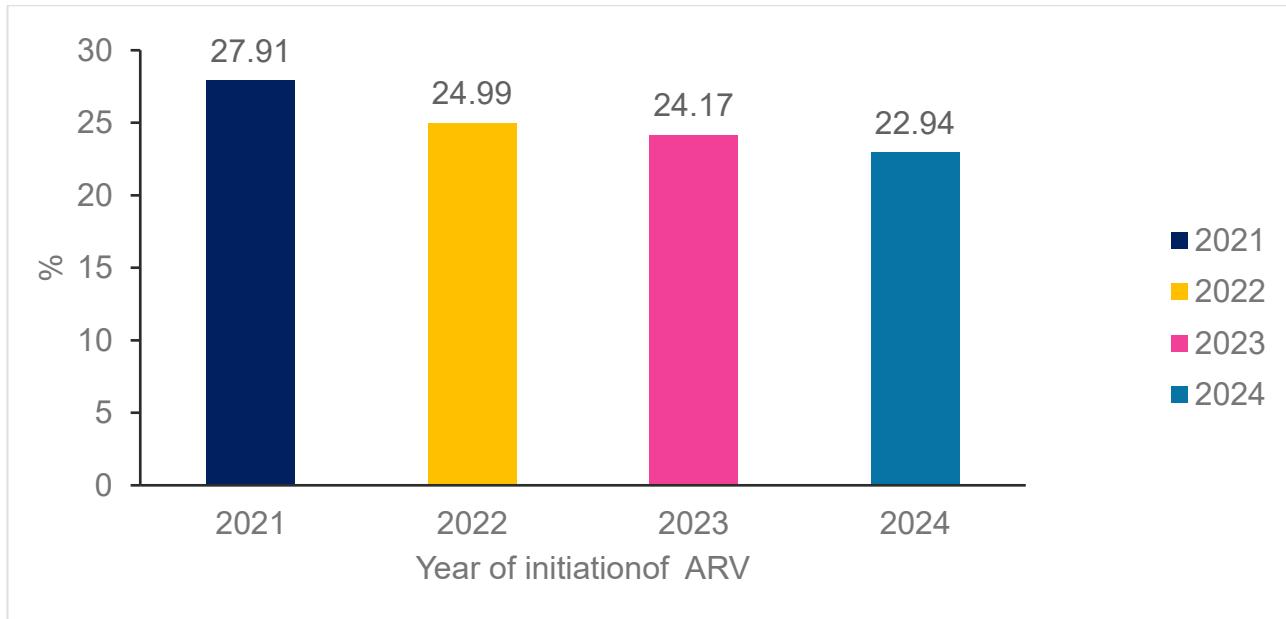
**7.2 Data Analysis:** A descriptive analysis was performed. Qualitative variables were presented as proportions with 95% confidence intervals, and quantitative variables as medians. The analysis was carried out using Epi Info software version 7.2.6.

## 8. Ethical considerations

The study received approval from the Chief Medical Officer of Commune IV. The data were used anonymously and confidentially.

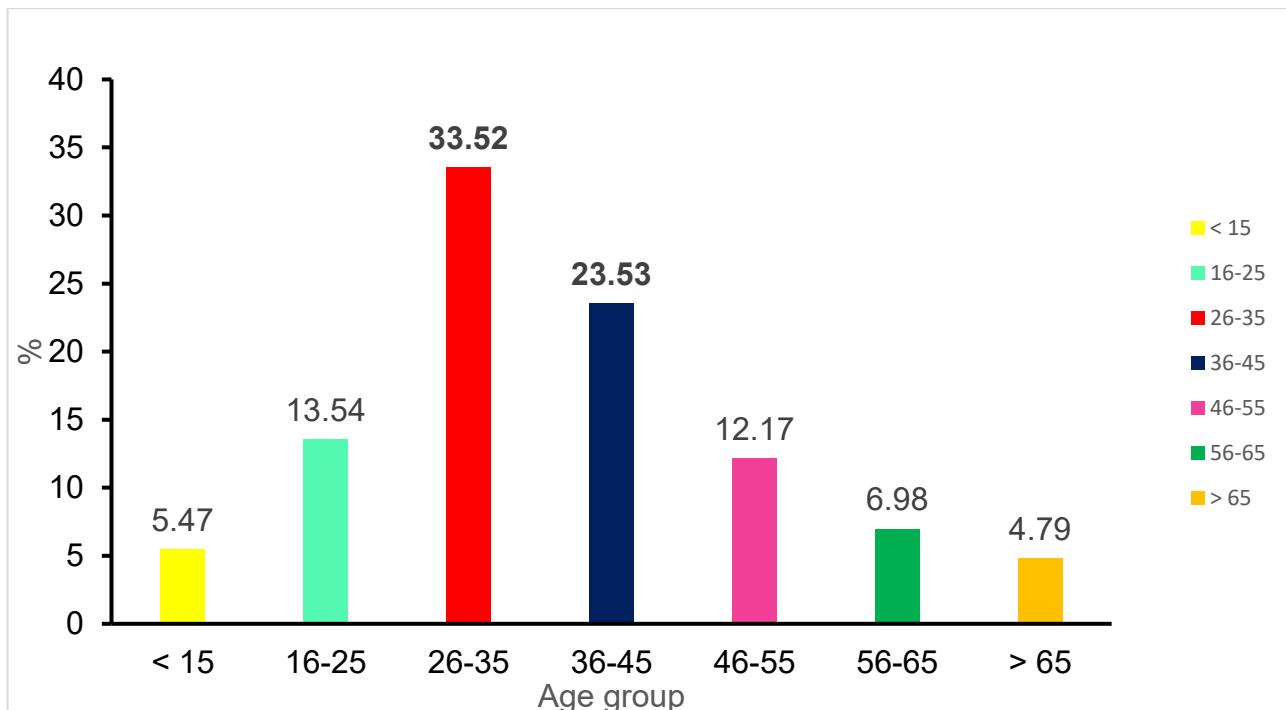
## III. RESULTS

Our study included 2,193 patients receiving antiretroviral therapy (ART) in Commune IV of the Bamako District. The median age was 34 years, with a range from 1 to 80 years. According to the study, HIV infection primarily affects young, married, unemployed women aged 26-35 years, residing outside Commune IV, and with no formal education. These women seek medical care at stage I of the disease. Regarding patients residing in Commune IV, the majority (3.60%) were in Sébénikoro. Among those residing in other regions, 9.94% lived in Koulikoro. The commune also received patients from other countries (2.01%). Screening and counseling initiated by the healthcare provider was the most frequent circumstance of discovery, accounting for 46.97% of cases. Most of the patients followed were infected with HIV type 1 (94.94%). TB/HIV coinfection was present in 0.96% of patients followed. The majority of patients followed (88.60%) are on ART. It was noted that more patients were started on ART in 2021 than in previous years. A low rate of viral load testing was observed at 6 months of treatment, as well as a low rate of results reporting, with 27.88% and 23% of cases respectively. Of the results received, 97.76% were undetectable.



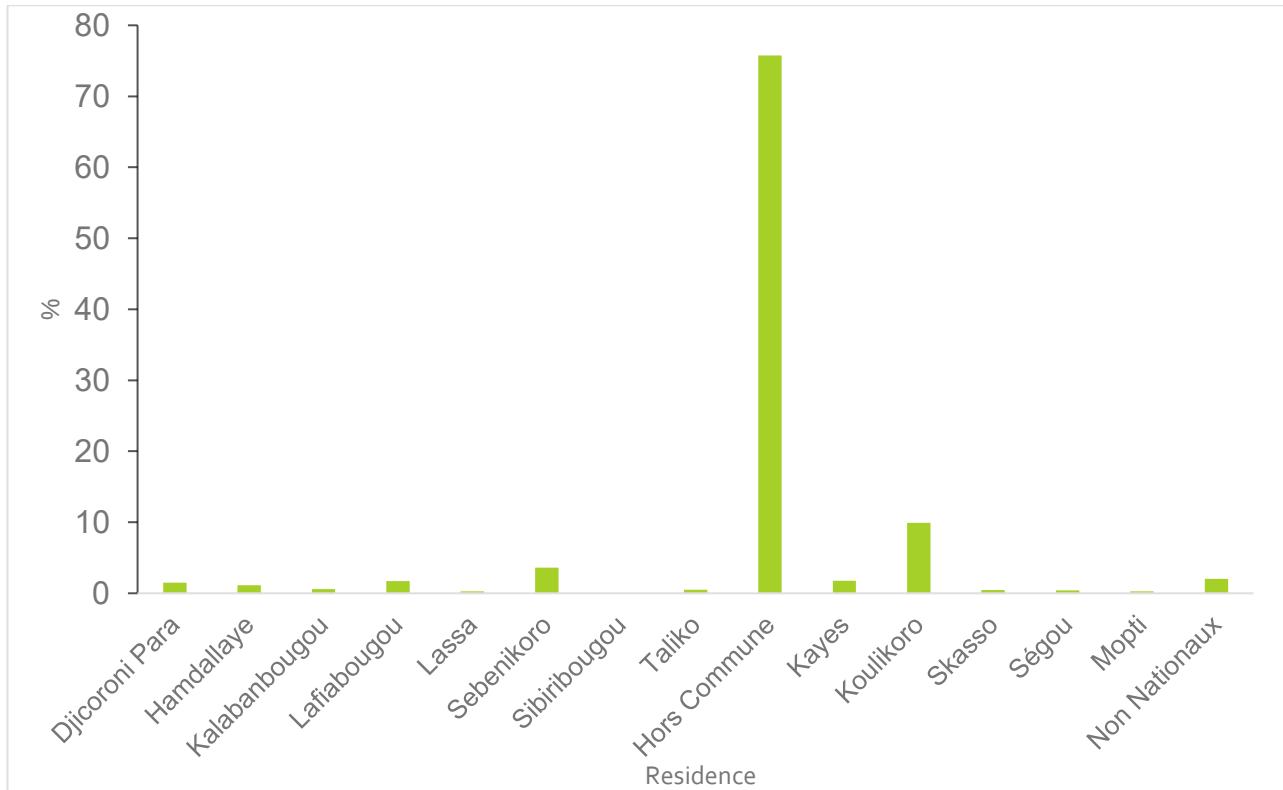
**Figure 2:** Distribution of patients according to the year of ART initiation in Commune IV of the Bamako District from 2021 to 2024.

More patients were initiated on ART in 2021 than in any other year.



**Figure 3:** Distribution of patients by age group in Commune IV of the Bamako district from 2021 to 2024.

The 26-35 age group was the largest, representing 33.52%.



**Figure 4:** Distribution of patients according to residence in Commune IV of the Bamako district from 2021 to 2024

The majority of patients followed reside in other communes with 75.74% and a 95% CI [73.9-77.4].

**Table I:** Distribution of patients according to marital status in Commune IV of the Bamako district from 2021 to 2024

Marital status	Frequency	%	IC95%
Polygamous married	1 323	60,33	[58,3 - 62,4]
Single	445	20,29	[18,7 - 22,0]
Widower	178	8,12	[7,1 - 9,3]
Monogamous married	163	7,43	[6,4 - 8,6]
Divorce	84	3,83	[3,1 - 4,7]

More than half of the patients followed were married and polygamous (60.33%) with a 95% CI [58.26–62.36].

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**Table II:** Distribution of patients according to their screening point in Commune IV of the Bamako district, 2021 to 2024

Entry point for screening at the facility level	Frequency	%	IC95%
Tested at the initiative of the service provider	1030	46,97	[44,8-49,0]
Indexe testing/familial	733	33,42	[31,4-20,3]
Voluntary counseling and testing	409	18,65	[17-20,33]
Prevention of mother – child transmission	7	0,32	[0,15-0,66]
Tuberculosis screening and treatment center	11	0,50	[0,28-0,90]
Family planning service	3	0,14	[0,05-0,40]

Patients who were tested at the provider's initiative in a clinic or emergency facility accounted for 46.97%. However, few people are tested in family planning (FP) services (0.14%) and in Tuberculosis Screening and Treatment (TST) centers (0.50%).

**Table III:** Distribution of patients according to the final WHO classification at initiation in Commune IV of the Bamako district 2021 to 2024.

OMS classification	Frequency	%	IC 95%
Stage I	2108	96,12	[95,2 - 96,9]
Stage II	58	2,64	[2,0 - 3,4]
Stage III	26	1,19	[0,8 - 1,7]
Stage IV	1	0,05	[0,01 - 0,3]

Most patients at initiation were at stage I of the disease (96.12%), with a 95% confidence interval (CI) of [95.23–96.85].

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**Table IV:** Distribution of patients according to HIV type in Commune IV of the Bamako district from 2021 to 2024.

Type of VIH	Frequency	%	IC95%
VIH 1	2082	94,94	[93,9-95,7]
VIH 2	24	1,09	[0,74-1,62]
VIH 1+2	87	3,97	[3,23-4,87]

The majority of patients followed were of type 194.94%.

**Table V:** Distribution of patients according to treatment status in Commune IV of the District of Bamako 2021 to 2024

Treatment status	Frequency	%	IC95%
Under TAR	1943	88,60	[87,2-89,86]
Lost sight of	97	4,42	[3,64-5,37]
Referred elsewhere	69	3,15	[2,49-3,96]
Documented death	54	2,46	[1,89-3,20]
Treatment refused	30	1,37	[0,96-1,95]

The patients followed were on ART at 88.60% and the loss to follow-up rate was 4.42%.

**IV. DISCUSSIONS**

This study, the first to be conducted in Commune IV of the Bamako district, obtained information on the epidemiology, clinical presentation, and treatment of HIV-infected patients undergoing antiretroviral therapy. A total of 2193 patients were included in this study. Females were the most affected, representing 71.82% of cases. This female predominance reflects gender inequalities and the socioeconomic vulnerability (polygamy, poverty, marriage, and early marriage) of women in Mali. This observation is similar to the studies by Cissoko Y et al. in Bamako (70.9% in 2018) (7) and by Bassandja O et al. in Congo (71% in 2021) (8). The median age at initiation of ART was 39 years for men and 32 years for women. The largest proportion of patients were those with a "polygamous married" marital status (60.3%). This result is higher than that of Cissoko Y, who reported 58.6% of married patients (7). As can be seen, young adults [26-35] are the most affected by HIV infection, at 59.17%. This is the most sexually active population. This result is similar to that of Bassandja O in his study in Kayes and of Dembele E, who obtained 37.1% and 33.9% respectively as the most affected age group [26-35] years (8, 9). Housewives were the most affected, representing 42.86% of cases. This result differs from that of EESSEDIK E in Morocco in 2020, who found 42.4% of patients to be divorced (10). This status of "housewife" often implies economic dependence on the partner. The majority of patients followed resided in other communes of Bamako (75.74%). This could be due to the stigmatizing nature of the disease; consequently, people prefer to visit health facilities far from their place of residence to avoid stigma and maintain discretion regarding their HIV infection monitoring. Provider-initiated testing accounts for 46.97% of cases, demonstrating the effectiveness of integrating testing into the community's health services. However, the low screening rate in FP (0.14%) and CDT (0.50%) services suggests missed opportunities for targeted screening. This result is close to that of Bassandja O et al. in Congo in 2021, who found 52.4% of patients screened at the provider's initiative (8), and differs from that of Yapo-Hien in their study at the Bouaké University Hospital in 2024, who found 57.7% of patients screened voluntarily (11). This could be explained by the fact that healthcare staff are well-trained in the management of HIV infection and offer

HIV testing for any clinical presentation suggestive of HIV disease. The TDF/3TC/DTG combination therapy was the most frequently prescribed product, with 87.46% of prescriptions compliant with WHO recommendations. This result is comparable to that of Lanfia in the Bamako District, which found 90.1% (12).

## V. CONCLUSION

The care of people living with HIV in Commune IV is characterized by good treatment coverage among the patients assessed. However, major challenges persist, such as a low rate of viral load testing and reporting, limiting optimal patient follow-up.

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