

# Progress towards attaining viral suppression among people living with HIV in Burkina Faso, 2018: A Secondary Data Analysis

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## ABSTRACT

**Introduction:** HIV is a major public health problem though some progress has been made globally. Monitoring progress towards globally set targets and data quality is important in helping policymakers refine the policy direction and further investment decisions. We estimated the proportion of people living with HIV (PLHIV) who have achieved viral suppression using nationally representative data and at the subnational level while evaluating the HIV reporting system. **Methods:** We conducted a secondary data analysis of a cohort of PLHIV enrolled into care from 1 January 2018 to 1 December 2018 and estimate cohort indicators over 12 months after antiretroviral therapy (ART) initiation. We evaluated the concordance between routine data collected through a monthly reporting system and data from the register of PLHIV enrolment, and the register of ART dispensing. The level of achievement of the 3rd 90 target was assessed by dividing the number of PLHIV under ART with a suppressed plasmatic viral load (PVL) by the total of PLHIV under ART. To determine the efficacy of ART, we divided the number of PLHIV with a suppressed PVL by the total of PLHIV with a PVL test result. **Results:** On 1 December 2018, the exact number of PLHIV followed up in Burkina Faso was 59,755. The level of achievement of the indicator on the suppression of PVL (3rd 90) remained low, at 22.0% nationwide with regional variations going from 1.3% in the Central South region to 31.6 in the Northern region. On a national scale, 83.9% of PLHIV who got a PVL test had a suppressed PVL. **Conclusion:** The prescription of PVL test and the level of achievement of the 3rd 90% target remain low. This situation requires urgent intervention measures such as training and supervision of healthcare workers and improving the geographical and financial access to PVL testing in order to quickly reach the new country target of 95%.

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## Introduction

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The human immunodeficiency virus (HIV) infection remains a public health concern worldwide. The number of people living with HIV (PLHIV) increased from 30.7 million to 38.0 million between 2010 and 2019 according to UNAIDS[1]. The number of new infections decreased from 2.1 million to 1.7 million and HIV-related deaths from 1.1 million to 690 thousand over the same period [1]. Africa remains the continent that is most affected by the pandemic. In 2018, it recorded 25.7 million PLHIV which accounts for 68% of the global figures. Africa also recorded more than 62.5% of new infections and 61% of death linked to AIDS [1,2]. In Burkina Faso, the number of PLHIV in 2021 was estimated at 88,000 (75,000 - 100,000); in the same year, 1,700 newly-infected people were registered and HIV prevalence was 0.6% (0.5 - 0.8)[3].

Several international efforts have been made to control the effect of the HIV pandemic. This includes the declaration to stop and reverse the course of the HIV epidemic and AIDS by 2025. These efforts have contributed to reducing the death toll related to AIDS by more than 60% since the 2005 surge [4]. The target goal by 2030 is to end AIDS and this requires a large screening coverage, a systematic treatment of all PLHIV, and a proper clinical and biological follow-up. One of the elements of the 95-95-95 target was achieving viral suppression among PLHIV. Reaching such a goal will lead to the suppression of plasma viral load (PVL) by at least 73% in all PLHIV worldwide [5].

Therefore, the measurement of the level of achievement of the 95-95-95 target will require strong follow-up and evaluation systems, capable of generating high-quality data [6]. In Burkina Faso, these indicators are not routinely monitored. Programmed data estimates that only 29.08% of PLHIV on ART achieved viral suppression at the end of 2019 [7,8], which is far below the target goal of 95%. We, therefore, reviewed the progress in achieving the 90% target of viral suppression among the PLHIV using the 2018 national HIV database.

## Methods

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### Study setting

The population of Burkina Faso was estimated at 21,510,181 inhabitants with 51.7% being women and a large majority of youth in 2020 [9]. According to the fifth general census population and housing in Burkina Faso, the demographic growth and fecundity rates were respectively 2.94% and 5.4 children per woman in 2019 [9]. The prevalence of HIV in the general population varied according to gender. This prevalence was 1.2 % in women and 0.8 % in men. The prevalence of HIV is higher among women aged 15-49 years who are living in urban settings (1.7%) compared to those living in rural settings (0.9%) [7]. In 2021 the total number of facilities providing care for PLHIV was 125 and included 95 public centres, and 30 private centres, as compared to 110 centres in

2018. Among the private centres, 9 were faith-based, and 7 were for-profit centres [10]. There are also several community-based organizations (CBO) involved in the care of PLHIV. In 2020, the country decided to allow the dispensation of ART by CBO at a community level as part of implementing differentiated approaches to HIV services.

In Burkina Faso, access to ART and biological monitoring tests for PLHIV, notably PVL, is free. In 2020, there were around 100,000 PLHIV in the country. The level of achievement of the 1st 90 was 76%, and those of the 2nd and 3rd 90 were 70% and 15% respectively [3]. The proportion of PLHIV who have achieved PVL remains low. Indeed, although the decentralization of HIV care has been effective since 2015, and PVL measurement is available in 13 national laboratories, its coverage nevertheless remains insufficient. Only 23.3% of PLHIV had their PVL performed in 2020 [10].

### Routine HIV data reporting system

Every PLHIV has a medical file. This record contains socio-demographic information at the time of enrolment, as well as the patient's clinical, biological and therapeutic information. Routine HIV data are collected from the main sources: the register of PLHIV and the register of ART dispensing at the pharmacy. The PLHIV register collects socio-demographic, clinical, biological and therapeutic data at the time of enrolment and during the follow-up. The register of ART dispensing at the pharmacy collects information on ART dispensed, and PLHIV status like loss to follow-up (LTF), discontinuation and cessation of treatment. These primary data are consolidated in monthly reports from public and private health facilities. The paper-based facility monthly reports are sent to the health district in the health facility's area, where they are entered into the Health Data Warehouse (Entrepôt de données sanitaires du Burkina Faso "ENDOS-BF") by agents from the Center for Health Information and Epidemiological Surveillance. At the hospital level, the Hospital Planning and Information Service (SPIH) and the Medical Information Service are responsible for data entry into ENDOS-BF. These monthly reports are then extracted and consolidated at the national level by the Ministry of Health's Department of Sectoral Studies and Statistics, to produce national health statistics.

### Study design and population

We conducted a secondary data analysis of the cohort of PLHIV enrolled into care from January 1st 2018 to 1st December 2018 and estimate cohort indicators over 12 months after ART initiation.

The study target population included all PLHIV cohorts of all 110 medical care centers for PLHIV that were recorded in Burkina Faso in 2018. We included all PLHIV enrolled into care from all 110 health facilities nationwide during the period.

## Data source

The data for this work was obtained from National HIV monthly routine data reporting system, PLHIV and ART dispensing registers.

## Study variables

The study's main variables include the number of PLHIV in Burkina Faso on December 31st 2018; the proportion of PLHIV who were virally suppressed, this was estimated by dividing the total number of PLHIV who had a suppressed viral load in the preceding 12 months after ART initiation and the exact number of PLHIV followed up during the same period; and the effectiveness of ART estimated using the number of PLHIV under ART who had a PVL test result and the number of PLHIV on ART who had a suppressed PVL in the last 12 months after ART initiation. The other variables included the sociodemographic characteristics of PLHIV such as age, gender and place of residence.

## Data management and statistical analysis

Data were analyzed with SPSS version 27 software. In order to determine the exact size of the cohort, we proceeded to verification of the received reports. This verification started first by counting the number of received monthly reports versus expected reports, and verifying that all these reports were used to calculate the value of the indicator nationwide. We searched for omitted reports and made sure that reports were not double-counted. We updated data when reports were omitted. We acted similarly in suppressing reports that were counted twice. After suppressing double reports and incorporating omitted reports, we proceeded to calculate indicators. Any discrepancy between the calculated value and the reported value had to be explained. After verification, we calculated the verification factor (VF) that is obtained in dividing the value of the indicator obtained through the survey (validated or verified data) by the value obtained through routine data collection.

$(VF = (\text{Total of the indicator in validated or verified reports}) / (\text{Total of the indicator in routine reports.}))$

This approach allowed us to compare the level of concordance between data from routine reports and data from the survey; the VF was determined on each site. The routine reporting was satisfactory when VF was found between 90% and 110%. There was an under-report or over-report when the value of VF was over 110% or less than 90% respectively [11]. To assess the level of achievement of the 3rd 90 target we divided the number of PLHIV on ART with a suppressed PVL by the total number of followed up PLHIV on ART. In order to get a proxy of ART efficacy, we calculated the proportion of PLHIV on ART with a suppressed PVL among PLHIV who had a PVL test. We then presented these different indicators according to regions, gender, and age. The average numbers and the proportions were calculated with their confidence intervals at 95% and were reported in tables or figures.

## Ethical considerations

This study was conducted as part of second-generation routine surveillance activities and was authorized by the ministry in charge of health. We did not interview patients. The researchers were all healthcare workers. Confidentiality was ensured since no patient name was revealed.

## Results

On December 31st 2018, the total number of PLHIV followed up in the cohorts of the 13 regions of Burkina Faso was 59,755. The central region (22,898 PLHIV) and the Haut Bassin region (10,941 PLHIV) accounted for more than half of PLHIV (56.6%). The Sahel region had the lowest number of PLHIV (620). The mean age of PLHIV was 43.4 years with a confidence interval at 95 % (confidence interval at 95 % "CI": (43.2-43.5)) [Table 1](#). Regarding the quality of data, 57 sites (51.8 %) had overestimated routine data ( $VF < 90\%$ ), 48 sites (43.6%) had concurring data ( $90\% \leq VF \leq 110\%$ ) and 5 sites (4.6 %) had under-estimated data ( $VF > 110\%$ ) [Table 2](#).

The children less than 5 years old represented 0.6 % of PLHIV (374 / 59 734) and those aged 5 to 14 years, 3 % (1,775 / 59,734). The majority of PLHIV were at least 15 years old. The girls and the women represented 72.3 % (43,158 / 59,734) of PLHIV [Table 3](#).

Less than one-third (26.2 %) of PLHIV had a PVL test during the 12 months that followed ART start. We also noticed regional discrepancies with proportions going from 1.6% in the Central South region to 35.7% in the Northern region. The level of the indicator on PVL suppression (3rd 90) among PLHIV remained globally low, at 22.0% nationwide with regional variations ranging from 1.3% in the Central South region to 31.6% in the Northern region. At a national level, 83.9% of PLHIV who had a PVL test had a suppressed PVL. Cascades and North regions reported the highest proportions of PLHIV who had a PVL test that had a suppressed PVL (89.1% and 88.6% respectively) while Sahel region had the lowest (68.9%) [Table 4](#). Seventy-one-point-three per cent (71.3%) of PVL tests were run on women. The proportions of men who realized PVL tests were 33.1% and 30.5% in the Boucle du Mouhoun and the Central regions, respectively (Figure 1).

The distribution based on age revealed that the level of achievement of the 3rd 90 target was 21.4 % (CI: {12.3-30.4 %}), 37.8 % (CI: {34.1-41.5 %}) and 21.5 % (CI: {20.8-22.3 %}) respectively in those less than 5 years old, those between 5 and 14 years old and those aged 15 years and older.

Globally, 83.9% (CI: {83.3%-84.6%}) of PLHIV with a PVL test result presented a suppressed PVL. Among the children under 5 years of age with PVL results, 58.1% (CI: {42.2%-69.0%}) had a suppressed PVL. These proportions were 72.9% (CI: {69.5%-76.3%}) and 84.9% (CI: {84.2%-85.5%}) for children between 5 and 14 years of age and those aged at least 15 years.

## Discussion

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Our study was based on a PLHIV cohort of 59,755 people. However, viral load testing was not done on all PLHIV who were eligible for testing hence the proportion of PLHIV who were virally suppressed was very low. On the contrary, the proxy of ART efficacy that was calculated by dividing the number of PLHIV on ART with suppressed PVL by the total number of PLHIV who had a PVL test result was satisfactory although still below the target of 90%.

Despite the existence of an organized information system that used national management tools, data recording and activity reports, this study revealed major discrepancies between reported data and validated or verified data during the survey. There was a gap of more than 15,000 PLHIV (more than 20%) between the reported data and the verified or validated data during the survey. The proportion of sites that had reported data within acceptable value interval (between 90 and 110%) represented only 43.6% while the proportion of sites with underreporting or overreporting was 4.6% and 51.8 % respectively. These facts command the reinforcement of data gathering quality control on the HIV/AIDS management sites. The lack of quality in data gathering with the collateral effect of estimation error on the number of PLHIV, could lead to consequences in the riposte against HIV infection given the increasing need to use proper data to plan health interventions. In Uganda, the results of the study on disease morbidity load were used to edict national health policies and define the specifics of the national minimum package of healthcare. The quantification and classification of the HIV/AIDS morbidity load were analyzed by decision-makers and used for resource pleading, mobilization and reallocation. These results also brought up information that was used to define priorities and strategic planning [12]. In the United States, the burden of HIV infection is followed up by a complete surveillance system. The data of this system are used at the federal, state, or local level to plan, implement, and evaluate public health programs and policies [13].

Government and international donors first ordered a study to help understand the determinants of HIV/AIDS treatment costs before deciding to extend ART to more than 6 million PLHIV in countries with low or intermediary resources. Data were therefore collected in 54 clinical sites in Botswana, Ethiopia, Mozambique, Nigeria, Uganda and in Vietnam. The study concluded that there was substantial cost reduction of health services per patient when the onsite management was matured and the patient cohort sizes increased [14].

The ART follow-up using the measure of PVL is mandatory for quality of care and treatment warranty as well as the success of HIV infection control programs [15]. In 2013, the WHO recommended that PVL should be the preferred follow-up approach to diagnose and confirm ART failure [16]. Although it is a routine practice in countries with high resources, the testing for HIV PVL is not systematically done in developing countries [17,18]. In many African countries including Burkina Faso, the PVL test was recognized as a guide for clinical decision-

making when considering a switch to second-line treatment or for optimizing the duration of a first-line treatment regimen [19]. Moreover, PVL is a useful tool to control treatment adherence, set watchful surveillance, and diagnose HIV infection in a child less than 18 months old [17]. Instead of looking at PVL data as a luxury that can't be afforded, efforts should be made to increase PVL's financial and geographical accessibility and make the test simple and easy to use in limited resource settings. In our study, less than one-third of PLHIV on ART had at least one PVL test. This low performance in PVL testing could be explained by financial obstacles (high cost of the test), geography (diagnostic tools not readily available geographically) but also technical factors such as the complex needs in terms of blood draw and sample transportation [17,20].

The regional and gender factor seems to account for differences in PVL testing in Burkina Faso. Our study revealed regional disparities in PVL testing. The proportion of PLHIV in the cohort who had a PVL test was lower than 1.6% in the Central South region and almost 36% in the Northern region. Overall, due to insecurity linked to the activities of armed groups operating in Burkina Faso since 2015, some laboratories equipped to perform plasma viral load tests in these areas were not functional. As a result, only a few PLHIV who had the opportunity to perform their plasma viral load test outside these insecure areas did so. Besides the low prescription rate of the test, the obstacles listed above and the insecurity due to terrorism, the low testing rate in the Central South region could be due to the lack of required material to run the test prior to July 2020. Almost 3 out of 4 patients who had a PVL test were female. This trend could be explained by the initiatives that are developed countrywide to prevent HIV transmission from mother to child and the possible effect of policies aiming at eliminating HIV transmission from mother to child.

The UNAIDS has set goals for countries that wish to improve HIV prevention, care, and treatment. The UNAIDS encouraged countries to work so that by the end of 2020, 90% of PLHIV know their medical status, 90% of those tested positives are on continuous ART, and 90% of patients on ART have suppressed PVL (no detectable PVL). Reaching the 90-90-90 target will allow the elimination of AIDS by the horizon 2030 [21]. Many studies showed that the risk of HIV transmission is higher in PLHIV who are not on ART or are not complaint to treatment. Seemingly there was an increase in life expectancy in PLHIV who started ART very early in the course of the disease [22]. That is why UNAIDS recommended the strategy « test and treat ». According to the UNAIDS statistics on HIV/AIDS, almost 66% of PLHIV on ART had a suppressed PVL [2]. In this study, less than one patient out of four was able to get a PVL test. This performance is far from expected and urgent actions are required to improve it. Since 2020, Burkina Faso decided to vulgarize PVL testing through the availability of required technologies for testing at the regional levels. In the same way, medical devices for the approach « point of care » were made available on several sites so that PLHIV could have access to the test. However, PVL

should be performed early in conformity to the national treatment follow up guidelines since several studies revealed that the WHO predictive value of immune criteria was mediocre when trying to identify virologic failure. Moreover the delay in identifying therapeutic failure lead to increases in HIV drug resistance [23-25].

Almost 84% of PLHIV on ART with at least one PVL test result had a suppressed PVL during our survey with regional disparities, the highest at 89% Cascades region and lowest in Sahel at 69%. Even though this performance is below 90%, it is comfortable as it could reflect good compliance to treatment from patients, the efficacy of PLHIV care and follow-up, or even low levels of therapeutic failures. The surveillance of PVL is a major factor in the management of PLHIV. ART is the recommended treatment for HIV patients and aims at viral suppression and PVL reduction below thresholds of detection. Prior studies revealed significant statistical differences PVL between patients on ART and those who were not treated. They clearly indicated that adherence to ART played a role in PVL suppression by supporting the immune system of patients infected by HIV. The success of ART in a PLHIV depends on the timely start of treatment, the right choice of ARV combination, and the control of treatment efficacy through PVL surveillance [22].

The results of this study stem from retrospective data analysis using multiple record books that were often incompletely filled up. During this study, it was not possible to collect certain information that would have enabled us to determine the level of barriers to PVL testing. It would have been interesting to know whether all patients who, according to the follow-up protocol, should have received a prescription for a PVL test actually received their test bulletins. Were all those who received the bulletins for the test actually able to do this test? If not, what were the reasons? Also, the profile of those who were able to perform the test was not known, as the routine data collection form contained only age, sex and place of residence, whereas information on education level, occupation and income could have been useful in understanding the non-availability of PVL in this population. Despite this shortcoming, one of the strengths of our study is that it did estimate an overall number of followed-up PLHIV in Burkina Faso. It also gave a proxy of the ART effectiveness nationwide.

## **Conclusion**

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Our study that allowed the exact recording of PLHIV followed up in Burkina Faso also revealed a low rate of PVL testing in patients and a relatively comfortable level of treatment success that remains below the target of 90%. The UNAIDS goal of “ 90-90-90 ” is still not reached and commands more action in order to allow the country to be ready for AIDS elimination by the horizon of 2030 through the speed-up of the 95-95-95 target. Efforts must therefore be made to improve the quality of information, awareness-raising and therapeutic education for PLHIV

to encourage them to undergo this examination, which is essential for patient follow-up.

## **What is known about this topic**

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- Like many other African countries, Burkina Faso faces gaps in the quality of HIV-related data
- A good assessment of progress in the HIV response is dependent on the quality of the data reported
- Although UNAIDS provides estimates on the potential number of PLHIV, the estimation of the exact number of PLHIV followed in the different cohorts as well as the level of achievement of the 3rd 90 of the response to HIV still has shortcomings linked to the poor quality of the data in Burkina Faso

## **What this study adds**

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- One of the strengths of the study is that it did estimate the overall number of followed-up PLHIV in Burkina Faso
- This study provides estimates of the level of viral suppression among PLHIV and PLHIV who have been tested for viral after 12 months

## **Competing interest**

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The authors declare no competing interests.

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## **Authors' contributions**

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SO, ID, CK: conception et finalization of the manuscript; IR, MS: data collection and analysis; CK, SO, NM: manuscript proofreading.

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## Tables and figures

**Table 1:** Comparison of the number of people living with HIV from routine reports (reported data) to that of the survey (validated data) per region in Burkina Faso by December 31st 2018

**Table 2:** Distribution of the management sites for people living with HIV according to quality of data reporting in Burkina Faso by December 31st 2018 (N = 110)

**Table 3:** Distribution of people living with HIV by region, gender, age range, in Burkina Faso by December 31st 2018 (N = 59,734)

**Table 4:** Proportion of people living with HIV (PLHIV) who had a plasmatic viral load (PVL) test, achieved the 3rd 90 target of the UNAIDS with a suppresses PVL among the PLHIV who had PVL test in the 13 health regions of Burkina Faso by December 31st 2018

**Figure 1:** Proportion of people living with HIV who had a plasmatic viral load test according to age, gender, and region by December 31st 2018 (N = 59,755)

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**Table 1:** Comparison of the number of people living with HIV from routine reports (reported data) to that of the survey (validated data) per region in Burkina Faso by December 31<sup>st</sup> 2018

<b>Region</b>	<b>Validated data (N = 59,755)</b>	<b>Reported data N = 75,391</b>	<b>Gap between reported data and validated data (N = 15,636)</b>
Boucle du Mouhoun	3,705	4,527	822
Cascades	1,598	1,784	186
Central	22,898	29,104	6,206
Central-East	3,353	3,934	581
Central-North	2,240	2,497	257
Central- West	4,386	6,069	1,683
Central-South	1,526	1,773	247
Eastern	1,048	1,371	323
Haut-Bassins	10,941	13,723	2,782
Northern	3,476	4,391	915
Plateau Central	1,506	1,797	291
Sahel	620	816	196
South-West	2,458	3,605	1,147

<b>Table 2:</b> Distribution of the management sites for people living with HIV according to quality of data reporting in Burkina Faso by December 31st 2018 (N = 110)		
<b>Quality of reporting</b>	<b>Number of sites</b>	<b>Proportion (%)</b>
Overestimation of reporting ( <i>verification factor &lt; 90 %</i> )	57	51.8%
Concordance between verified value and reported value ( $90\% \leq \textit{verification factor} < 110\%$ )	48	43.6%
Underestimation of reporting ( <i>verification factor <math>\geq 110\%</math></i> )	05	4.6%

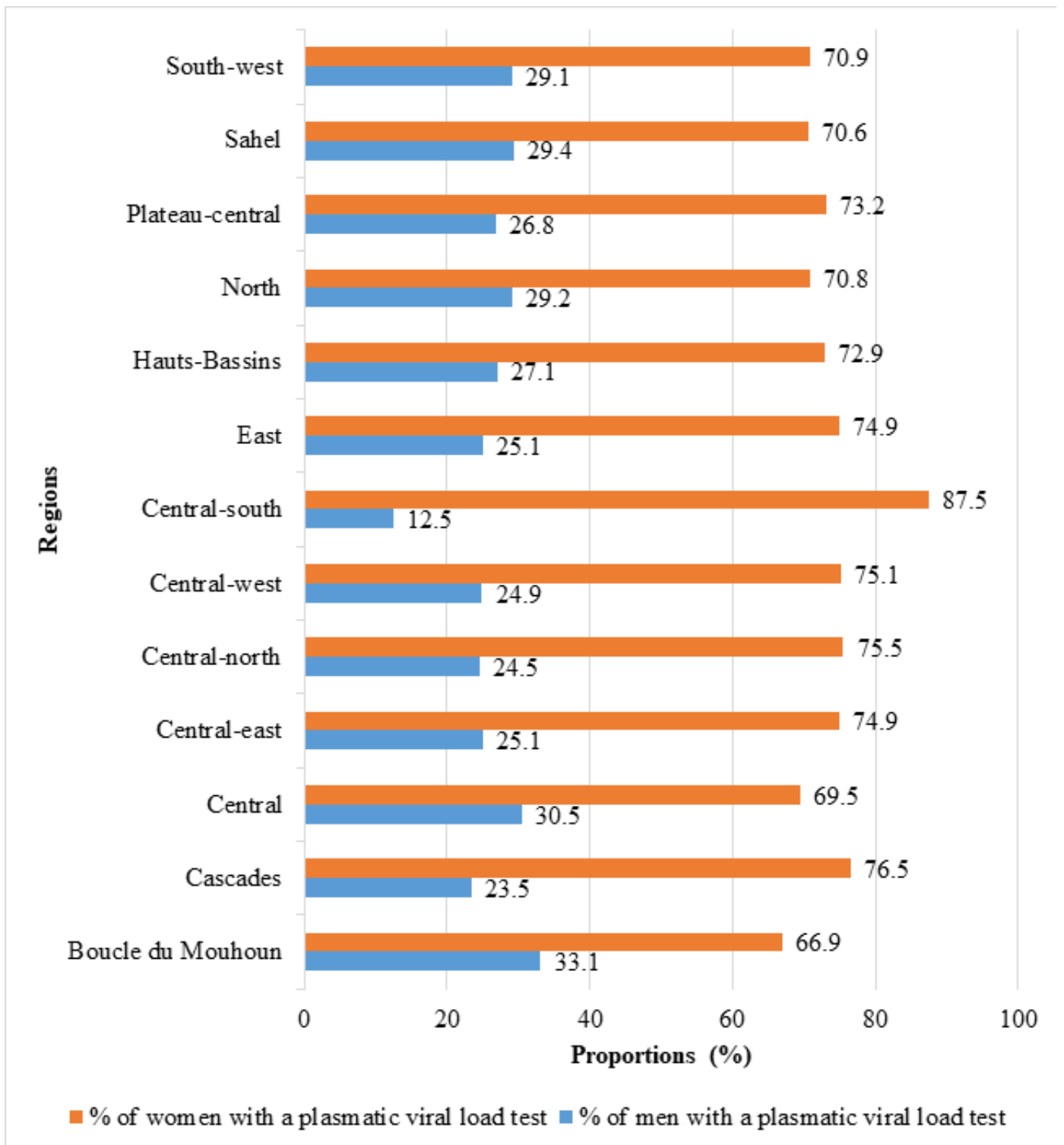
**Table 3:** Distribution of people living with HIV by region, gender, age range, in Burkina Faso by December 31st 2018 (N = 59,734)

Region	Less than 5 years		Between 5 and 14 years		15 years and over		Total
	Female	Male	Female	Male	Female	Male	
Boucle du Mouhoun	3	7	26	20	2,655	992	3,703
Cascades	11	5	27	24	1,151	380	1,598
Central	66	54	291	284	15,896	6,296	22,887
Central-east	7	6	70	61	2,392	816	3,352
Central-north	9	12	31	34	1,705	449	2,240
Central-west	14	14	61	55	3,057	1,185	4,386
Central-south	5	4	18	28	1,100	371	1,526
Eastern	5	4	16	11	754	256	1,046
Hauts-bassins	28	27	201	238	7,806	2,640	10,940
Northern	9	18	54	76	2,415	900	3,472
Plateau-central	8	5	29	35	1,068	361	1,506
Sahel	1	2	6	5	431	175	620
South-west	42	8	54	20	1,636	698	2,458
Nationwide	208	166	884	891	42,066	15,519	59,734

**Table 4:** Proportion of people living with HIV (PLHIV) who had a plasmatic viral load (PVL) test, achieved the 3<sup>rd</sup> 90 target of the UNAIDS with a suppresses PVL among the PLHIV who had PVL test in the 13 health regions of Burkina Faso by December 31<sup>st</sup> 2018

Region	% of PLHIV on ART with a PVL (N = 59,755)	% of PLHIV who suppressed their PVL (3 <sup>rd</sup> 90) (N = 59,755 )	% of PLHIV with a suppressed PVL among PLHIV who had a PVL (N = 15,656 )
Boucle du Mouhoun	13.9 (10.9-16.9)	10.5 (7.4-13.5)	75.5 (71.2-79.8)
Cascades	18.4 (14.0-22.8)	16.4 (11.9-20.9)	89.1(85.3-92.9)
Central	32.9 (31.8-33.9)	27.5 (26.4-28.6)	83.7 (82.8-84.6)
Central-east	19.6 (16.5-22.6)	15.7 (12.6-18.8)	80.2 (76.7-83.6)
Central-north	26.9 (23.3-30.4)	22.3 (18.6-25.9)	82.9 (79.6-86.2)
Central-west	18.5 (15.8-21.2)	15.5 (12.8-18.2)	83.6 (80.8-86.4)
Central-south	1.6 (-3.4-6.6)	1.3 (-3.7-6.3)	83.3 (67.0-99.7)
East	24.9 (19.6-30.2)	20.2 (14.8-25.6)	81.1 (75.8-86.4)
Hauts-Bassins	26.5 (24.9-28.1)	22.8 (21.2-24.5)	86.3 (84.9-87.6)
North	35.7 (33.0-38.4)	31.6 (28.9-34.4)	88.6 (86.7-90.5)
Plateau-central	20.9 (16.4-25.4)	17.7 (13.1-22.3)	84.3 (80.0-88.7)
Sahel	19.3 (12.2-26.4)	13.3 (5.9-20.6)	68.9 (58.9-78.9)
South-west	16.0 (12.4-19.6)	12.5 (8.8-16.2)	78.3 (73.7-82.9)
<b>Overall</b>	26.2 (25.5-26.9)	22.0 (21.3-22.7)	83.9 (83.3-84.6)

PLHIV: People living with HIV; ART: antiretroviral treatment; PVL: plasmatic viral load



**Figure 1:** Proportion of people living with HIV who had a plasmatic viral load test according to age, gender, and region by December 31st 2018 (N = 59,755)