

## EFFECTS OF THE COVID-19 PANDEMIC ON THE UNAIDS PERFORMANCE INDICATORS AT THE YAOUNDE CENTRAL HOSPITAL, CAMEROON

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### ABSTRACT

**Background:** The COVID-19 pandemic caused significant disruptions in the care of people living with HIV, creating fear among patients attending hospitals, even leading to border closures and total population confinement. The main objective of this study was to determine the effects of the COVID-19 pandemic on UNAIDS performance indicators at the Yaoundé Central Hospital. **Methodology:** We conducted a cross-sectional study comparing UNAIDS performance indicators before and during COVID-19 pandemic at the HIV/AIDS care unit of the Yaoundé Central Hospital. The sampling was exhaustive. Data were collected monthly from the registers, unit database and other relevant tools using an extraction grid. **Results:** We analyzed data from 10303 and 9741 patients corresponding to the period before and during the COVID-19 pandemic respectively. Compared to the pre-COVID-19 period, the number of days of antiretroviral drug stockouts increased significantly from 177 to 840 days. Significant reductions in HIV testing (24.91%), linkage to antiretroviral treatment (10.14%, p-value=0.0003) and patient retention in HIV care (1.55%, p-value<0.0001) were also observed during the COVID-19 period. Paradoxically, the rate of viral load collection increased significantly by 4.04% (p-value=0.0072) during this COVID-19 period. **Conclusion:** The COVID-19 pandemic had a negative effect on UNAIDS performance indicators, particularly on testing and retention in the management of people living with HIV. Considering self-center care and community differentiated services may ameliorate UNAIDS performance indicators.

**KEYWORDS:** COVID-19; Impact; Performance indicators; HIV.

### 1. INTRODUCTION

A viral-like pneumonia outbreak of unknown etiology emerged in Wuhan City in December 2019.<sup>[1]</sup> It quickly spread throughout China, and then abroad causing a global epidemic that was qualified as a pandemic by the WHO on March 11, 2020.<sup>[2]</sup> On February 9, 2021, Cameroon was the eighth most affected country in Africa with more than 118,933 confirmed cases and more than 1,918 deaths.<sup>[3]</sup>

Knowing that patients who remain in the care system are more likely to adhere to antiretroviral therapy (ART) and have better health outcomes, they are therefore less likely To transmit Human Immunodeficiency Virus (HIV) to

others.<sup>[4]</sup> Missed medical appointments are unduly associated with an increased risk of HIV-related illness and death.<sup>[5,6]</sup>

Although some international institutions, in collaboration with governments and community partners, are working to maintain service delivery to people living with HIV, the COVID-19 pandemic presents several barriers and challenges to the continuity of HIV care.<sup>[7]</sup> Firstly, the health care system is overwhelmed with patients with COVID-19, interventions used to slow the transmission of COVID-19 have reduced access to routine HIV testing, and the supply of drugs is disrupted, preventing the achievement of UNAIDS global targets.<sup>[8,9]</sup> Secondly, newly identified HIV patients, by fear may delay their

initiation to HIV care in the hospital. Furthermore, services and resources that are normally readily available may have been disrupted, affecting resumption to care.<sup>[7,10]</sup>

In a survey of people living with HIV conducted by the Human Sciences Research Council in South Africa, 13% of people reported not having access to their chronic medications during confinement.<sup>[11]</sup>

In Cameroon, apart from the measures taken by the government to avoid the spread of the virus such as the closure of borders, the arrival of COVID-19 has created a psychosis among the general population which has prevented a certain number of people from attending hospitals, especially those taking care of COVID-19 cases. Since the Yaoundé Central Hospital is one of the sites for the management of COVID-19 and HIV cases, we decided to conduct this study to determine the effect of the COVID-19 pandemic on UNAIDS performance indicators.

## 2. METHODS

This was a cross-sectional study of patients followed at the HIV unit of the Yaoundé Central Hospital (YCH) before and during the COVID-19 pandemic to determine the effects of the pandemic on UNAIDS performance indicators. These indicators were assessed by describing the availability of inputs, the number HIV tests performed, retention of patients, and the viral load collection and suppression rate. Then these parameters were compared before and during COVID-19 pandemic to determine his effects on these performance indicators.

The study was conducted at YCH because it houses both the largest HIV unit in the country and a COVID-19 management unit. This 2nd category hospital is located in the Mfoundi department and the Cité Verte health district.

Sampling was exhaustive, all patients followed from March to July 2019 (before COVID-19) and from March

## 3. RESULTS

### 3.1 Comparison of input availability before and during COVID-19

#### 3.1.1 Drugs

**Table 1: Distribution of The Number of Days of Stock-Out of Antiretroviral Drugs Before and During Covid-19 Pandemic In Ych.**

Number of days of out of stock		
Intrants	Before COVID-19	During COVID-19
LPV/r - 200/50mg - Cp Bte/120	22	0
Darunavir (DRV) 600mg- Cp Bte/60	29	153
Dolutegravir(DLV) 50mg- Cp Bte/30	97	10
Ritonavir 100mg- Cp Bte/30	29	153
TDF/EMT 300/300mg Bte/30	0	58
AZT/3TC - 300/150mg - Cp Bte/60	0	142
ABC/3TC - 600/300mg - Cp Bte/30	0	2
ABC/3TC - 120/60mg - Cp Bte/30	0	105

to July 2020 (during COVID- 19) were included. Monthly aggregated data were collected from registers, stock records and the HIV unit database using an extraction grid.

Epi Info software version 7.2.2.6 and Microsoft Excel 2013 were used for data entry and analysis. The availability of inputs was evaluated by the number of days of stock out and the other indicators by proportions (%). Then the results obtained during the two periods were compared at a significance level of 5% using the McNeymar test.

#### Definition of indicators and terms<sup>[12]</sup>

**Stock out:** complete exhaustion of an input. (it is collected from the stock records)

**Antiretroviral Treatment Enrollment Rate (Linkage):** Percentage of people testing positive and initiated on treatment

$$\frac{\text{Number of people tested positive and initiated on treatment}}{\text{Number of people tested positive}}$$

**Retention in care:** Percentage of people living with HIV who receive regular HIV care and are still active after a given period.

$$\frac{\text{Active queue} - (\text{Lost to follow-up} + \text{Died} + \text{Transferred})}{\text{Total active queue}}$$

**Viral load collection rate:** percentage of people who have completed virological tests among those eligible.

$$\frac{\text{Number of people who have completed a virological examination}}{\text{Number of eligible people}}$$

**Viral load suppression rate:** Percentage of people with a suppressed viral load among the people who performed a virological examination.

$$\frac{\text{Number of people with suppressed viral load}}{\text{Number of people who completed virological testing}}$$

AZT/3TC - 60/30mg - Cp Bte/60	0	56
NVP - 50mg - Cp Bte/60	0	8
3TC/NVP/AZT 150/200/300mg	0	153
<b>TOTAL</b>	<b>177</b>	<b>840</b>

We found a considerable increase in the number of days of stockouts during COVID-19. We recorded 3 times more stock out of antiretroviral drugs compared to the period before COVID-19 pandemic. The average number

of days out of stock of medicines per month increased from  $35.3 \pm 5.03$  to  $168 \pm 11.3$  days, representing a significant difference of 132.6 days ( $p < 0.0001$ ).

### 3.1.2 Testing and viral load inputs

**Table II: Distribution of The Number of Stock out Days of Hiv Testing and Viral Load Inputs Before and During Covid-19 Pandemic In Ych.**

Number of days of out of stock		
Screening inputs	Before COVID-19	During COVID-19
Determine	0	0
Oraquick	0	0
Shanghai	0	0
Kits DBS	0	0
Extraction Kits GTX NA	0	130
Biocentric Kits	0	135

We did not observe any stock-outs of HIV tests either before or during the occurrence of COVID-19. However, we observed a stock out of viral load inputs during

COVID-19: 130 and 135 days for Gene X-pert extraction kits and biocentric kits respectively as shown in Table II.

### 3.2 Comparison of testing indicators before and during COVID-19

**Tableau III: Specific Presentation of Testing and Linkage Indicators Before and During Covid-19 Pandemic At Ych.**

Variables	Before COVID-19	During COVID-19	Variation rate
People tested	11862	8906	-24,91%
People tested positive	666	507	-23,87%
HIV-positive rate	5,61%	5,69%	0,08%
People initiated on ART	258	145	-43,79%
ART enrollment rate	38,74%	28,60%	-10,14%

The number of people tested went from 11862 before COVID-19 to 8906 during this period, causing a decrease of 24.91%. There was a proportional reduction in the number of people who were tested positive (23.87%). Thus, just a little variation of the seropositivity rate were observed (0.08%). The link to treatment

decreased by 10.14% during the COVID-19 pandemic, with the rate of enrolment in ART falling from 38.74% to 28.60%. This variation differed according to the facility entry points, particularly between the blood bank and the other entry points as shown in table IV.

**Tableau IV: Comparison of Art Enrollment Rates Before and During Covid-19 Pandemic At Ych.**

Taux d'enrôlement au TARV	Avant COVID-19	Pendant COVID-19	Degré de significativité
Blood Bank	6,87%	3,17%	0.0239
Other services	80,56%	83,23%	0.4850
YCH	38,74%	28,60%	0.0003

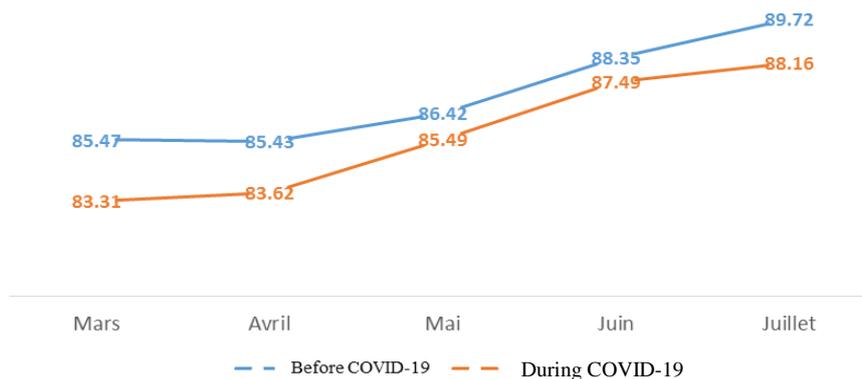
We found a significant decrease ( $p$ -value=0.0003) in the global ART enrollment rate of 10.14% during the COVID-19 period. The same trend was observed for the ART enrollment rate in the blood bank service ( $p$ -value=0.0239). In contrast, an increase of 2.67% in the

ART enrollment rate of other services was observed, although this increase was not statistically significant (Table IV).

**3.3 Comparison of monthly retention of patients in HIV care before and during COVID-19**

**Tableau V: Comparison of Patient Retention Before and During Covid-19 Pandemic At Ych.**

Period	Retention rate Before COVID-19	Retention rate During COVID-19	Significance Level
March	85,47%	83,31%	<0.0001
April	85,43%	83,62%	0.0004
May	86,42%	85,49%	0.0603
June	88,35%	87,49%	0.0635
July	89,72%	88,16%	0.0004
Average	87,09%	85,54%	<0.0001



**Figure 1: Evolution of the monthly patient retention before and during covid-19 pandemic ych.**

We found a significant decrease of 1.55% (p-value<0.0001) in retention rate during COVID-19 which was a bit more pronounced in the month of April. The evolution of these retention rates varied from 85.47% to

89.72% for the period before COVID-19 and from 83.31% to 88.16% during COVID-19 as shown in Table V and Figure 1.

**3.4 Comparison of viral load cascade before and during COVID-19**

**Tableau VI: Comparison of Viral Load Cascade Before and During Covid-19 Pandemic At Ych.**

Period	Before COVID-19	During COVID-19	Significance Level (p-value)
Number of people eligible for Viral Load testing	2996	3983	
Number of individuals sampled for Viral Load	1716	2442	
Viral Load collection rate	57,27%	61, 31%	0.0007
Number of people who received their results	1600	2360	
Withdrawal rate of results	93,24%	96,64%	<0.0001
Number of persons with a deleted Viral Load	1303	2095	
Viral Load suppression rate	81,43%	88,77%	<0.0001

Apart from a significant increase (p-value=0.0007) of 4.04% in the viral load collection rate, we also observed an increase of 7.34% (p-value <0.0001) in the viral load suppression rate during COVID-19 pandemic.

**4. DISCUSSION**

During the COVID-19 pandemic, the management of people living with HIV/AIDS suffered from several stock out of inputs. Compared to the pre-COVID-19 period, the number of days of stockouts of antiretroviral drugs increased significantly from 177 days to 840 days. This increase in the number of days was caused by pre-existing reasons such as slowness in administrative procedures, delay in national supply, but also by the closure of borders since all antiretroviral drugs are imported. Furthermore, as part of the pandemic control measures, closure of borders has greatly impacted the

transport and delivery of antiretroviral drugs.<sup>[13]</sup> This pre-COVID-19 stockout was more pronounced on dolutegravir 50mg because dolutegravir 50mg which had been recommended by World Health Organization (WHO) as a treatment option in 2019 could only be effective in 2020.<sup>[14]</sup> We also noted a stockout of inputs for viral load because of the reasons mentioned above. In addition, these inputs were also used for COVID-19 assessments and had subsequently been redirected to these services due to the state of emergency.

In terms of HIV testing, we found a significant reduction of 24.91% during the COVID-19 period. These results are in line with those described in Zimbabwe<sup>[15]</sup> and Malawi<sup>[16]</sup> in 2021 where there was a reduction in the testing of 4% and 39% respectively during the COVID-19 period. This can be explained by the fact that access to health facilities has been impeded. This hindrance to access is caused not only by the community's fear of attending these health facilities but also because people living with HIV (PLHIV) are a population that may be at greater risk. This risk among PLHIV is based on the high rates of social burdens in the form of discrimination and stigma. Indeed, it was shown in a study conducted in 2020 at the Yaoundé Central Hospital that 85.80% of patients with COVID-19 were self-stigmatized.<sup>[17]</sup> A significant decrease of 10.14% in ART enrolment rate during the COVID-19 period was also found overall. This result is similar to the one described in Zimbabwe<sup>[15]</sup>, while in Malawi the enrollment rate remained unchanged and seems to have improved in Kenya.<sup>[16,18]</sup> It should be noted here that the blood bank entry point alone accounts for more than half of the tests performed, i.e. 65.48% before COVID-19 and 69.92% during COVID-19, but it nevertheless records the lowest ART enrollment rate (6.74% before COVID-19 and 3.17% during COVID-19). This is because this service initially conducts a mobile screening to collect blood bags. Once collected, these blood bags will only be tested in a hospital setting and without identification. Secondly, among the people who tested positive, there are known cases and finally, the Psychosocial Agents (PSA) in charge of the link to the treatment and of taking the coordinates of the newly tested people do not work at night or on weekends. All these factors lead to the low rate of enrolment in ART observed in this service. We subsequently observed a significant decrease (p-value=0.0239) of more than 50% in the ART enrollment rate in this service during the COVID-19 period. This decrease can be explained not only by pre-existing reasons but also because more and more people who were tested positive were scheduled for linkage, refused to return to the health facilities for fear of contracting COVID-19.

A significant decrease (p-value<0.0001) of 1.57% in monthly retention of patients in HIV care was found during the pandemic period. This result is in agreement with that observed in Guinea during the Ebola epidemic in 2014 where retention of care of PLWH already in active follow-up was affected during the epidemic period.<sup>[5]</sup> This decline implies the non-compliance of patients with medical appointments, caused not only by pre-existing reasons (travel out of town, distance from the health facility, huge financial cost)<sup>[19]</sup>, but also by the fear of being exposed to the COVID-19 virus. A study conducted by Budak et al in 2021 demonstrated the consistency of retention of patients in HIV care during the COVID-19 period: this was facilitated by the introduction of telemedicine to allow PLHIV to stay at home and not go to clinics for care visits.<sup>[20]</sup>

Regarding biological examinations, we observed a significant increase (p-value=0.0007) of 4.04% in the rate of viral load collection, anecdotally with the stock-outs of kits for virological examinations noted during the COVID-19 period. Samples collected during this stock-out period had been redeployed to other sites for analysis. This increase can be explained not only by the introduction of free care for people living with HIV, which has been effective since January 1, 2020<sup>[21]</sup> but also by the "call center" strategy implemented at the HIV care unit, which consists of calling all patients eligible for virological tests during the month to remind them of their appointment. It should be noted here that, given that access to health facilities is restricted during this period of the COVID-19 pandemic, this free care does not allow us to assess the effect of COVID-19 on virological tests. Regarding virological suppression, we found a significant increase of 7.34% (p-value <0.0001) in the virological suppression rate during the COVID-19 period. This result is in line with that found in 2020 in San Francisco where the odds of viral non-suppression were 31% higher before the pandemic. This was facilitated by the introduction of telemedicine in response to COVID-19.<sup>[22]</sup> Another study conducted at the Midwestern University Clinic in 2020 showed that the rate of viral suppression remained unchanged during the COVID-19 period.

## 5. CONCLUSION

At the end of our study, the main objective of which was to determine the effects of the COVID-19 pandemic on UNAIDS performance indicators at the Yaoundé Central Hospital, we noted a stockout of inputs for viral load and an increase in the number of days of stockout of certain drugs for the management of PLHIV; A significant reduction of 24.91% in HIV testing performed and a significant decrease of 10.14% in the enrolment rate were found during the COVID-19 period in general; a significant decrease (p-value<0.0001) of 1.57% in retention of patients in HIV care was observed during the COVID-19 period; and Paradoxically, a significant increase (p-value=0.0007) of 4.04% in viral load realization rate and virological suppression rate of 7.34% (p-value <0.0001) were observed during the COVID-19 period. Considering self-center care and community differentiated services may ameliorate UNAIDS performance indicators and move the country to epidemic control.

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