

COVID-19 Vaccine Uptake Among People Living with HIV receiving antiretroviral therapy in Western Kenya

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BACKGROUND

While sub-Saharan Africa reported fewer COVID-19 cases than anticipated, the impact on people living with HIV (PLHIV), a particularly vulnerable group due to their immunocompromised status, remains insufficiently explored. Given their compromised immune systems, PLHIV are at a heightened risk of severe illness from infections, making assessment of their vaccine uptake in this region critical. Addressing these gaps will enable more tailored healthcare responses in potential future crises.

STUDY AIMS

The study aims to describe the prevalence and patterns of COVID-19 vaccine uptake among PLHIV in a cohort residing in Western Kenya, differentiating between early and late adopters while also exploring their motivations for vaccination and evaluating the distinctions among partial, complete, and booster vaccinations. In my detailed analysis, I aimed to assess the rate and barriers to COVID-19 vaccine uptake among PLHIV, offering insights into the willingness and accessibility for this specific group to get vaccinated.

METHODS

Study Population: Participants for this cross-sectional study (N=600) were recruited between October 2022 – March 2023 from two Ministry of Health (MOH) health facilities in western Kenya: Lumumba Sub-County Hospital in Kisumu County and Siaya County Referral Hospital. The choice of these facilities was made considering factors, such as their status as referral hospitals, proximity in adjacent counties, and a substantial population of PLHIV currently receiving antiretroviral therapy (ART). Additionally, both facilities offer comprehensive services, including Tuberculosis and Antenatal Care. Inclusion criteria were as follows:

1. Age: 15 years or older.
2. HIV-positive status.
3. Current ART recipients.
4. Language proficiency in English, Kiswahili, and/or Dholuo.
5. Access to a mobile phone.
6. Capacity for informed consent (or assent for those under 18).

Vaccination Status Definitions: Partial vaccination against COVID-19 refers to an incomplete immunization process, typically involving the administration of one dose of a two-dose COVID-19 vaccine regimen. According to the guidelines from manufacturers such as Pfizer-BioNTech, Moderna, and AstraZeneca-Oxford, two doses are required for complete immunization. Complete vaccination, therefore, refers to full immunization achieved per these guidelines. Notably, both health facilities began their vaccine administration in April/May 2021.

Data Collection: In-person interviews were conducted with all participants, and routine clinical and laboratory data were collected from medical records.

Statistical Analyses: Data was descriptively and inferentially analyzed using the Statistical Analysis System (SAS) software.

RESULTS

Table 1: Distribution of Participant Characteristics

			Lumumba Sub-County Hospital (N=396)		Siaya County Referral Hospital (N=204)	
	N	%	N	%	N	%
Gender (N=600)						
Male	290	48%	218	55%	72	35%
Female	310	52%	178	45%	132	65%
Age (years) (N=600)						
<30	76	13%	52	13%	24	12%
30-39	162	27%	102	26%	60	29%
40-49	186	31%	123	31%	63	31%
50-59	116	19%	84	21%	32	16%
60-69	48	8%	26	7%	22	11%
>70	12	2%	9	2%	3	1%
Employment status (N=600)						
Employed	158	26%	112	28%	46	23%
Unemployed	442	74%	284	72%	158	26%
Tuberculosis (N=598)						
Prior history of TB	175	29%	126	32%	49	24%
TB diagnosis at study enrollment	16	3%	1	25%	15	7%
HIV Viral Load (N=519)						
< 20 copies/ml	141	27%	107	27%	34	17%
21-199 copies/ml	292	56%	181	46%	111	54%
200-999 copies/ml	63	12%	36	9%	27	13%
> 1000 copies/ml	23	4%	15	4%	8	4%
Current ART regimen (N=600)						
First-line regimen	529	88%	347	88%	181	89%
DTG-based	510	85%	330	83%	179	88%
NNRTI-based	19	3%	17	4%	2	0.98%
Second-line regimen	71	12%	47	12%	24	12%
Pregnant at study enrollment						
	20	8%	5	1%	15	7%
			Mean	SD	Mean	SD
Time since HIV diagnosis			11.40	4.91	8.53	4.98

Footnotes

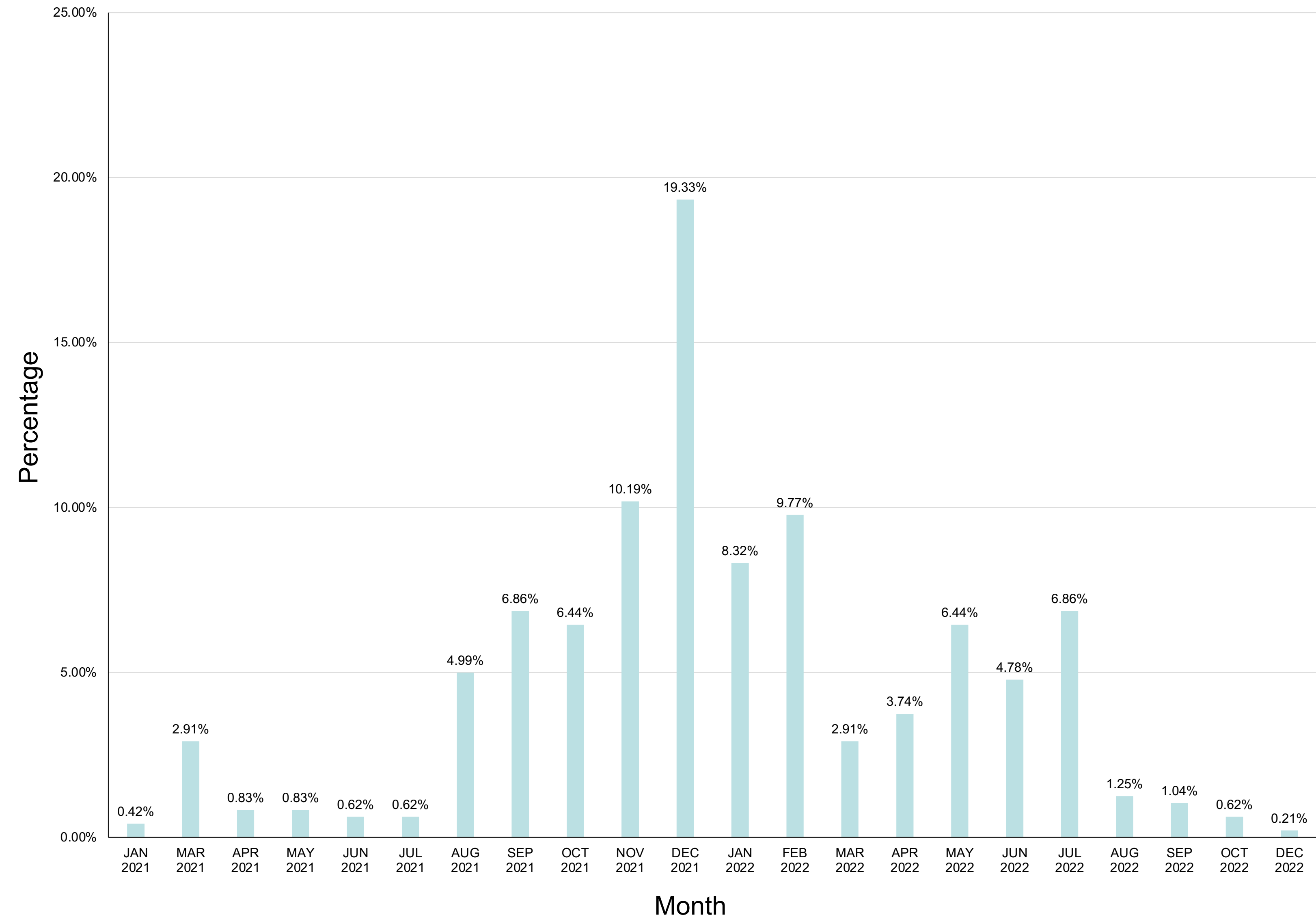
N missing for Household Size = 1

N missing for History of TB = 15 (10 from Lumumba, 5 from Siaya)

N missing for Current ART Regimen = 1

First-line regimen includes DTG-based or NNRTI-based drugs; Second-line regimen includes all other drugs.

Figure 1: Date of First COVID-19 Dose by Month (N=481)



- Of the 600 participants, 396 (66%) were enrolled at Lumumba Sub-County Hospital, and 204 (34%) were from Siaya County Referral Hospital (Table 1).
- The study population was 48% male and 2% female. The median age was 42 years with an interquartile range of 16 years (Table 1).
- The mean time since HIV diagnosis was 11 years (SD=4.91) in Lumumba Hospital and 9 years (SD=4.81) in Siaya Hospital (Table 1).
- The median time since HIV viral load was 11 years (IQR=28.54) in Siaya and 12 years (IQR=14.85) in Lumumba (Table 1).
- Among the 600 participants, 150 (25%) participants were partially vaccinated, 378 (63%) were fully vaccinated, and 72 (12%) were unvaccinated individuals.
- Individuals who received their vaccinations are divided into two groups: Early Adopters and Late Adopters. The Early Adopters are characterized as the first 25% of individuals to receive their vaccinations. The Late Adopters are characterized as the latter 75% of individuals to get vaccinated. Early Adopters in the context of this study were vaccinated between January 2021 and October 2021. Late Adopters were individuals vaccinated between November 2021 and December 2022.
- The primary reasons for vaccination, ranked by prevalence, were personal safety (77%), avoiding severe COVID-19 cases (44.4%), healthcare provider recommendations (29%), feeling safe around others (17%), family safety (21%), community safety (9.0%), managing chronic health conditions (6.0%), and achieving post-vaccination normalcy (1%).
- The number of participants receiving their first dose increased steadily, with the highest number in December 2021 and lowest in December 2022 (Figure 1).

CONCLUSION

This study sheds light on the vaccination landscape among PLHIV receiving ARV therapy in Western Kenya. A significant majority (63%) of the participants achieved complete vaccination status, indicating a commendable uptake. However, with 12% remaining unvaccinated and 25% only partially vaccinated, there's a critical need to address barriers and motivate these segments for vaccination. The reliance on personal safety and healthcare recommendations underscores the importance of community and healthcare-driven awareness campaigns. Given the heightened vulnerability of PLHIV to severe infections, enhancing vaccine uptake in this group is imperative. Future efforts should delve deeper into the barriers to full vaccination and strategize targeted interventions to bridge these gaps, ensuring robust healthcare responses in any subsequent health crises.

STUDENT CONTRIBUTION

- 1) Conducted literature review
- 2) Drafted comprehensive report
- 3) Revised and edited the document with approval
- 4) Utilized SAS to analyze data collected from study participants

COMPETENCIES

1. Appraise epidemiological literature critically in a defined problem area using advanced bibliographic and informatics resources for purposes of evaluation, summary, and translation.
2. Analyze public health problems in terms of: magnitude; person, time, and place; and the distribution and determinants of both chronic and infectious diseases; and principles of disease prevention in different populations
4. Apply appropriate epidemiologic and statistical measures to generate, calculate, and draw valid inferences from public health data.