COVID-19-associated ART disruptions and HIV suppression: a population-based study in Uganda

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BACKGROUND

- Following confirmation of SARS-CoV-2 in Uganda, a national lockdown was imposed. Subsequent movement restrictions may have limited access to HIV services, including antiretroviral therapy (ART).
- We assessed the population burden of COVID-19 pandemic associated ART disruptions and their potential impacts on viral load suppression (VLS) among people living with HIV who self-reported taking ART in Uganda.

METHODS

- We used cross-sectional data collected between October 2020 and March 2023 from the Rakai Community Cohort Study (RCCS), a population-based HIV surveillance cohort in southern Uganda, to assess occurrence of COVID-19-related ART disruptions and impact on VLS (<1,000 RNA copies/ml).

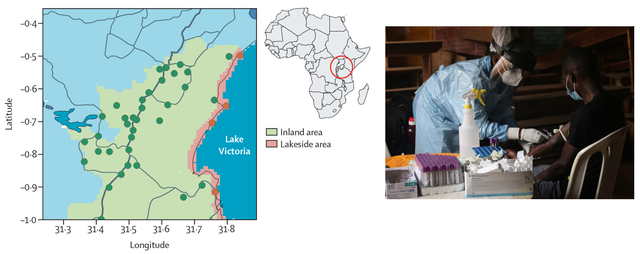

Figure 1. (Left) RCCS surveillance area, including 30 semi-urban and agrarian communities and 4 Lake Victoria fish landing sites. (Right) RCCS participant undergoing a blood draw for HIV serologic and viral load testing.

- Participants were asked to self-report ART disruptions in the year preceding COVID-19 emergence (March 2019 – March 2020) and after its emergence (March 2020 to interview date).
- Disruptions included missed HIV care appointments, running out of ART before the next refill, and reducing ART use to conserve medication supply.
- Proportions of participants reporting ART disruptions before and after the start of COVID-19 lockdown were compared using McNemar's test.
- Log-binomial regression models were used to estimate associations (adjusted prevalence risk ratios [PRR] and 95% confidence intervals [CI]) between demographic factors and ART disruptions since COVID-19 and viral load suppression status (<200 copies/ml defined as suppressed).

ART disruptions among persons living with HIV increased significantly following COVID-19 emergence.

While viral load suppression among persons living with HIV and on ART was high following COVID-19, those reporting disruptions were significantly less likely to be suppressed

RESULTS

- Overall, 2,634 of 2,786 (94.5%) participants self-reported being on ART at time of survey.
- Of these, 4.8% (n=126) self-reported any ART disruptions prior to COVID-19 emergence, and 13.5% (n=355) after COVID-19 emergence (**Table 1**).
- Females, fishing community residents, persons <35 years, and persons with a prior self-reported history of ART disruption before COVID-19 were significantly more likely to report an ART disruption following COVID-19 emergence (**Table 2**).

Table 1. ART disruption experiences before and after COVID-19 among 2,634 participants living with HIV and self-reporting ART use in the Rakai Community Cohort Study, 2020-2023

Type of ART disruption	Experienced in the one year prior to COVID-19	Experienced since COVID-19	McNemar Test p-value
Missed scheduled visit for HIV care	86 (3.3)	258 (9.8)	<0.001
Run out of ART before next refill	61 (2.3)	142 (5.4)	<0.001
Taken ART pills less frequently / in smaller amounts to conserve supply	28 (1.1)	66 (2.5)	<0.001
Any ART disruption	**126 (4.8)**	**355 (13.5)**	**<0.001**

Table 2. Factors associated with any ART disruption experiences since COVID-19 among 2,634 participants living with HIV and self-reporting ART use in the Rakai Community Cohort Study, 2020-2023

Predictor variable	Number reporting any ART disruption/ Total (%)	Unadjusted PRR (95%CI)	p-value	Adjusted PRR (95%CI)*	p-value
Sex					
Male	107/983 (10.9)	Ref.	-	Ref.	-
Female	248/1651 (15.0)	1.38 (1.12-1.71)	0.003	1.42 (1,15-1.77)	0.002
Community type					
Inland community	118/1189 (9.9)	Ref.		Ref.	-
Fish landing site	237/1445 (16.4)	1.65 (1.35-2.04)	<0.001	1.66 (1.35-2.05)	<0.001
Age group					
15-24	25/143 (17.5)	1.02 (0.67-1.47)	0.932	1.05 (0.70-1.51)	
25-34	133/775 (17.2)	Ref.	-	Ref.	Ref.
35-44	155/1180 (13.1)	0.77 (0.62-0.95)	0.014	0.83 (0.67-1.03)	0.093
45+	25/536 (7.8)	0.46 (0.32-0.63)	<0.001	0.53 (0.38-0.74)	<0.001
Self-reported history of any ART disruption prior to COVID-19 emergence					
No ART disruption history	269/2508 (10.7)	Ref.	-	-	-
ART disruption history	86/126 (68.3)	6.36 (5.37-7.46)	<0.001	-	-

*Models adjusted for age, community type, and gender.

RESULTS

- Overall, 95.1% (n=2503**)** of participants were virally suppressed.
- Those who reported experiencing ART disruption following COVID-19 emergence were less likely to be suppressed than those who did not experience any disruption **(Table 3)**

Table 3: Experience of ART disruption during COVID-19 and viral load suppression status among 2,634 participants in the RCCS living with HIV and self-reporting ART use, 2020-2023

Group	No disruption since COVID-19	Experienced disruption since COVID-19	Adjusted PRR (95%CI)*	p-value
	Viremic/Total (%)	Viremic/Total (%)		
Overall	**102/2277 (4.7)**	**27/355 (7.6)**	**1.55 (1.01-2.20)**	**0.034**
Men	55/876 (6.3)	13/107 (12.1)	1.81 (0.98-2.67)	0.041
Women	47/1401 (3.3)	14/248 (5.6)	1.33 (0.72-2.30)	0.332
Inland community	38/1069 (3.6)	5/118 (4.2)	1.38 (0.56-4.10)	0.485
Fish landing site	64/1208 (5.3)	22/237 (9.3)	1.62(1.00-2.51)	0.040
<35 years	58/759 (7.6)	20/158 (12.7)	1.67 (1.01-2.64)	0.033
≥35 years	44/1518 (2.9)	7/197 (3.6)	1.28 (0.53-2.63)	0.536
No ART disruption history	99/2237 (4.4)	19/269 (7.1)	1.41 (0.63-3.03)	0.354
ART disruption history	3/40 (7.5)	8/86 (9.3)	1.26 (0.40-5.51)	0.712

*Models adjusted for age, community type, and gender.

CONCLUSIONS

- Among people self-reporting ART use, ART disruptions, including missed HIV care appointments and running out of ART, increased significantly following COVID-19 emergence in Uganda.
- VLS was significantly lower among ART-experienced individuals who reported ART disruptions since COVID-19.
- Developing interventions effective in maintaining care engagement for people living with HIV is crucial to mitigate treatment disruptions during future pandemics.

ADDITIONAL KEY INFORMATION

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