

Resilient Viral Load Suppression in an Acutely-Treated Cohort of People with HIV During the COVID-19 Pandemic in Bangkok, Thailand

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Background

- Measures to reduce the spread of SARS-CoV-2 had the potential to compromise HIV treatment.
- Targeted and scheduled VL monitoring, adherence support and adapted service delivery methods (telemedicine, ART home delivery) were implemented to help maintain viral load suppression (VLS).
- We studied viral load (VL) outcomes in acutely-treated people with HIV before and during the COVID-19 pandemic in Bangkok, Thailand.

Methods

We analyzed differences in VL measurements among people with HIV diagnosed and treated during acute HIV in the RV254/SEARCH010 cohort from January 2018 to October 2023 based on COVID restriction periods:



- RV254/SEARCH010 enrolls participants who are diagnosed and initiated treatment during acute HIV infection and follows participants for up to 20 years.
- HIV VL was measured using COBAS Amplicor HIV-1 test which can detect up to less than 20 copies/ml
- Online support was given during the lockdown periods

Inclusion and Exclusion Criteria:

- Included all participants unless:
 - Fiebig stage VI at enrollment
 - were never on ART, or
 - if they participated in analytic treatment interruption trials.
- VL measurements from 3 to 6 monthly protocol study visits were included

Evaluated outcomes and statistical methods:

1

Viral Load (VL) Monitoring

- Estimated number of VL measurements by restriction period using GEE with Poisson regression and an offset for time in years reported as:
 - Relative rate (RR) and 95% confidence interval (95% CI)**
 - Number of VL measures per person years**

2

Viral Load Suppression (VLS: <1,000 copies/ml)

- Estimated the odds of VLS by restriction period using GEE with logistic regression adjusted for:
 - Treatment regimen (NNRTI vs INSTI)
 - Age in 10-year increments
 - Sex
 - Time on ART in years
 - Reported as:
 - Adjusted odds ratios (aOR) and 95% confidence intervals (95% CI) were reported.**

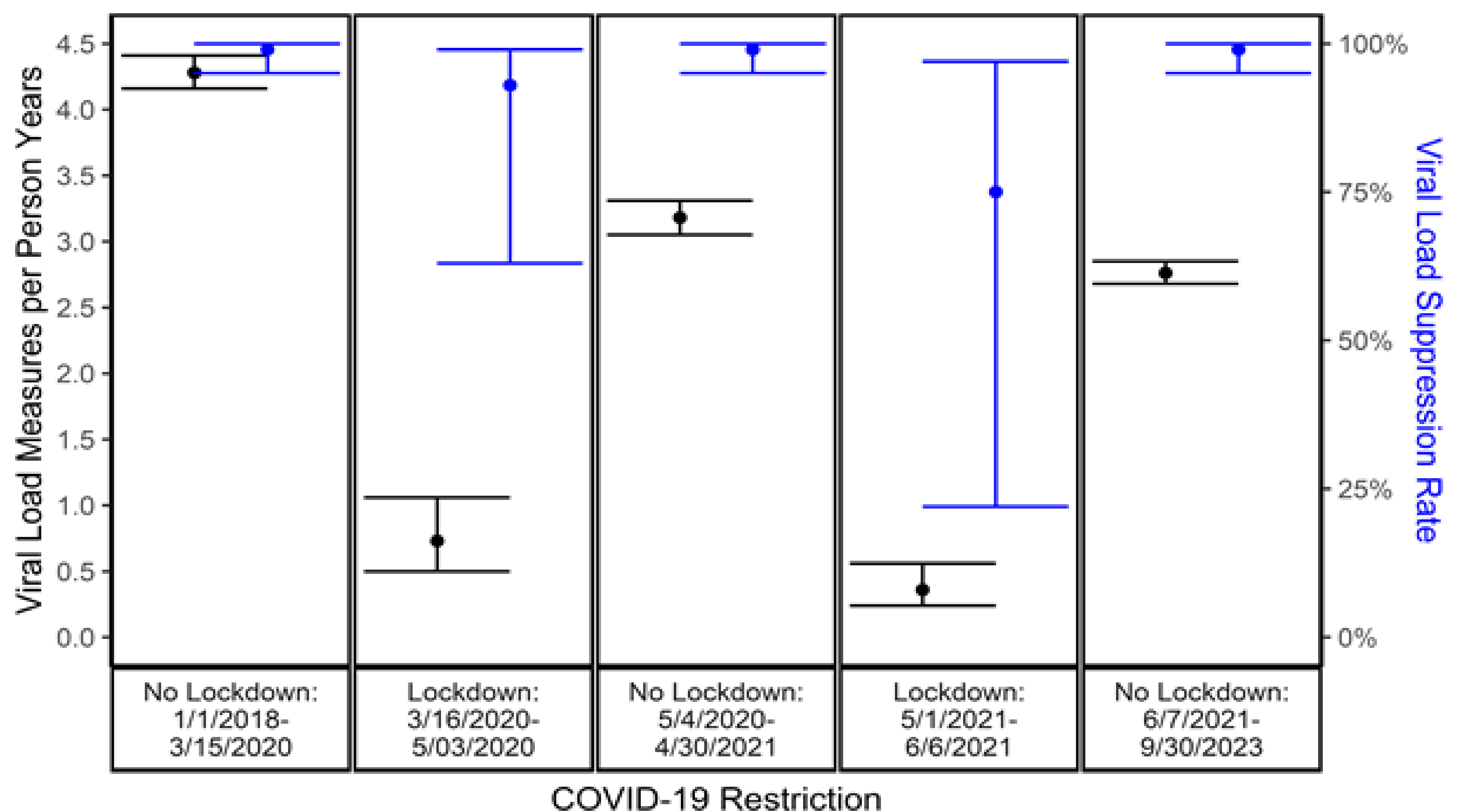


Figure 1. Viral load measures per person-years and viral load suppression during the COVID-19 pandemic in RV254/SEARCH010 Cohort

Results

- 9,643 samples from 622 participants predominantly 584 males (98%) with a mean (SD) age of 30.80(7.85) were analyzed (Table 1).

Table 1: The mean (SD) of measures, years, and measures per year by period for each grouping

Period	N	Measures	Years	Measures Per Year
None: 1/1/2018-3/15/2020	533	8.20 (2.25)	1.96 (0.52)	5.21 (8.41)
First Lockdown: 3/16/2020-5/03/2020	518	0.09 (0.42)	0.13 (0.01)	1.61 (16.92)
None: 5/4/2020-4/30/2021	543	3.03 (1.30)	0.96 (0.14)	3.53 (3.15)
Second Lockdown: 5/1/2021-6/6/2021	537	0.03 (0.18)	0.10 (0.01)	0.42 (2.73)
None: 6/7/2021-9/30/2023	590	6.04 (2.05)	2.16 (0.46)	3.27 (2.95)

- VL measurements significantly declined from pre-COVID (4.28/PY [95%CI 4.16-4.41]) to subsequent periods, especially the first (0.73/PY [95%CI 0.50-1.06]) and second (0.36/PY [95%CI 0.24-0.56]) lockdowns (Figure 1).
- The number of measures by year statistically significantly differed by period (Table 2). Each particular comparison between periods was statistically significant, and in each case, the period had fewer measures per person years than did the pre-COVID period: 01 Jan 2018 to 15 Mar 2020.

Table 2: Regressions of counts of VL measures on restriction period

Period	RR (95% CI)	p
First Lockdown: 3/16/2020-5/03/2020 vs. None: 1/1/2018-3/15/2020	0.17 (0.12, 0.25)	<0.001
None: 5/4/2020-4/30/2021 vs. None: 1/1/2018-3/15/2020	0.74 (0.71, 0.77)	<0.001
Second Lockdown: 5/1/2021-6/6/2021 vs. None: 1/1/2018-3/15/2020	0.08 (0.06, 0.13)	<0.001
None: 6/7/2021-9/30/2023 vs. None: 1/1/2018-3/15/2020	0.65 (0.62, 0.67)	<0.001

- VLS rates remained >98% during pre-COVID and non-lockdown periods; VLS rates were 95% and 80% in the first and second lockdowns respectively (Figure 1).
- The second lockdown decline was statistically significant after controlling for other factors (aOR 0.04 [95%CI 0.01-0.32]). VLS rates did not differ by the other periods, age, sex, regimen, or duration of ART (Table 3).

Table 3. Univariable and multivariable regressions on being viral load suppressed

Variable	Univariable		Multivariable	
	OR (95% CI)	p	OR (95% CI)	p
First Lockdown: 3/16/2020-5/03/2020*	0.22 (0.03, 1.50)	0.123	0.19 (0.03, 1.23)	0.082
None: 5/4/2020-4/30/2021*	1.40 (0.59, 3.29)	0.444	1.35 (0.57, 3.18)	0.494
Second Lockdown: 5/1/2021-6/6/2021*	0.04 (0.00, 0.38)	0.005	0.04 (0.01, 0.32)	0.002
None: 6/7/2021-9/30/2023*	0.99 (0.49, 2.00)	0.978	0.93 (0.47, 1.84)	0.832
Gender: Female vs. Male	0.96 (0.14, 6.66)	0.969	0.88 (0.11, 6.84)	0.902
Age: 10-year increments	1.52 (0.85, 2.70)	0.155	1.80 (0.88, 3.70)	0.109
Time on Art: 1-year increments	0.93 (0.79, 1.08)	0.316	0.87 (0.73, 1.04)	0.126
Regimen: INSTI vs. NNRTI or Other	2.14 (0.38, 11.96)	0.385	1.96 (0.35, 11.03)	0.444

*The reference category was "None: 1/1/2018-3/15/2020".

Conclusions

- VL monitoring decreased during COVID-19 lockdowns. VLS decrease in lockdown may be affected by targeted VL monitoring.
- We did not find evidence of a longer-lasting reduction in VLS, indicating resilience despite COVID-related barriers to care.

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