HIV Viral Load Suppression in Patients Utilizing an Integrated Health System Specialty Pharmacy Compared to a Non-Integrated Specialty Pharmacy Model

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Background

Patients with HIV who adhere to antiretroviral (ARV) therapy can achieve and maintain viral suppression (defined as <200 copies of HIV/mL).[1-3] Integrated Health System Specialty Pharmacies (HSSPs) help patients overcome barriers to ARV adherence, but there are limited data on the impact of HSSPs on clinical outcomes.[4] This study compared viral suppression for patients filling ARVs at UMass Memorial Specialty Pharmacy to those utilizing a non-integrated specialty pharmacy (non-HSSP).

Methods

Retrospective cohort study, patients aged ≥18 years living with HIV, encounter at the UMass Memorial Medical HIV Clinic, an ARV medication order, and at least one viral load (VL) result between January 2018 and May 2022 were identified from the medical record. Data included: age, sex, race, ethnicity, comorbidities, and all VL results over the study period. Time of first HSSP fill date was used to identify patient start in HSSP. VL results were divided into time under HSSP or non-HSSP(Figure 1). The index time was first VL for patients in either the HSSP or non-HSSP group.

To account for multiple VL measures per patient, a Generalized Estimating Equation logistic regression estimated odds ratios (OR) and a 95% confidence interval. An OR>1 indicates greater viral suppression.

Figure 1: Illustration of patient viral load lab results over time. Viral load (VL) lab results were collected while patients were in Integrated Health System Specialty Pharmacies (HSSP) or Non-Integrated Specialty Pharmacy (non-HSSP). Index time (time=0) is first VL result while in HSSP or non-HSSP. Examples of 3 patient timelines. Each vertical line represents a lab result.
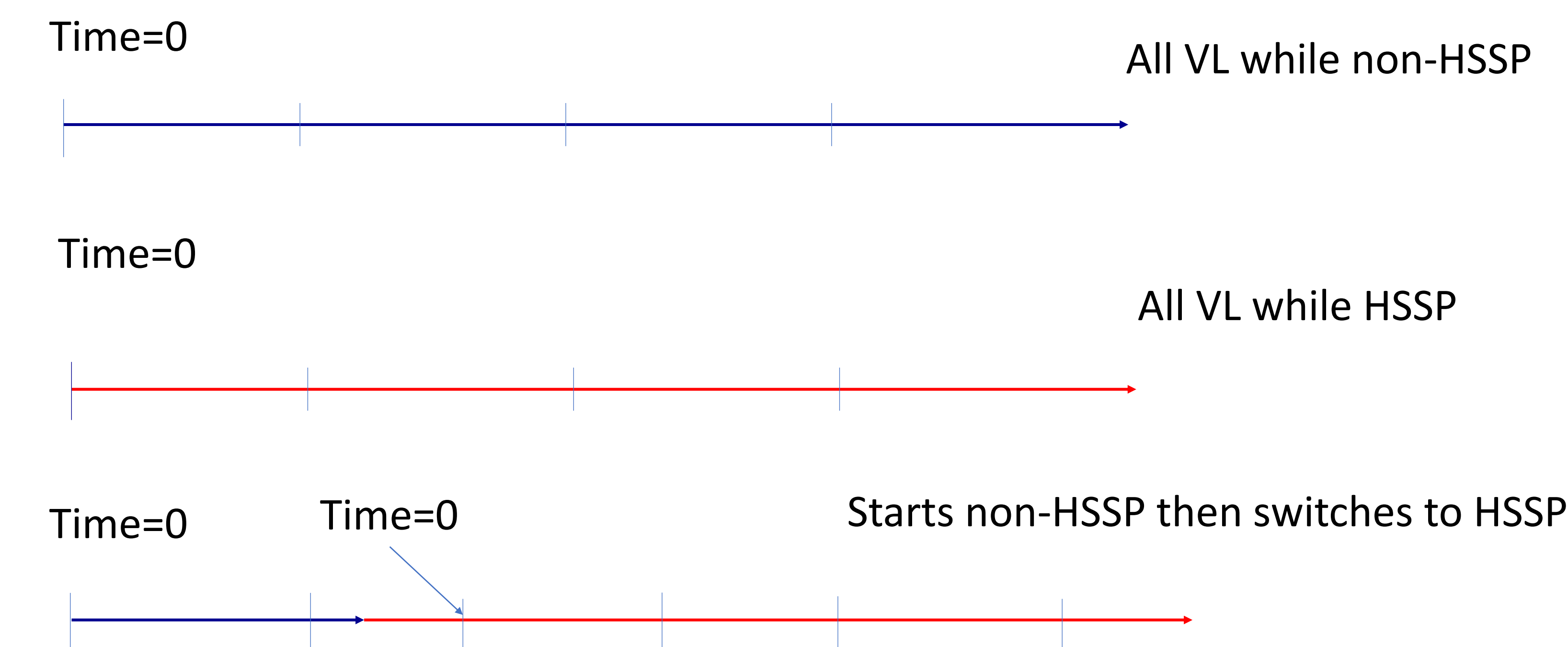
Results

Of the 889 patients identified, 326 provided VL results under HSSP while 681 contributed results for non-HSSP; 118 patients provided results for both groups (Figure 2). Of the 5,295 VL results, 2,028 were from HSSP patients and 3,267 from the non-HSSP group. Of the 5,295 total VLs, 90.6% indicated viral suppression, with the average rate of 91.0% in the HSSP group vs 86.0% in the non-HSSP group.

Figure 2: Patients who contributed viral load (VL) results under in Integrated Health System Specialty Pharmacies (HSSP) or Non-Integrated Specialty Pharmacy (non-HSSP)
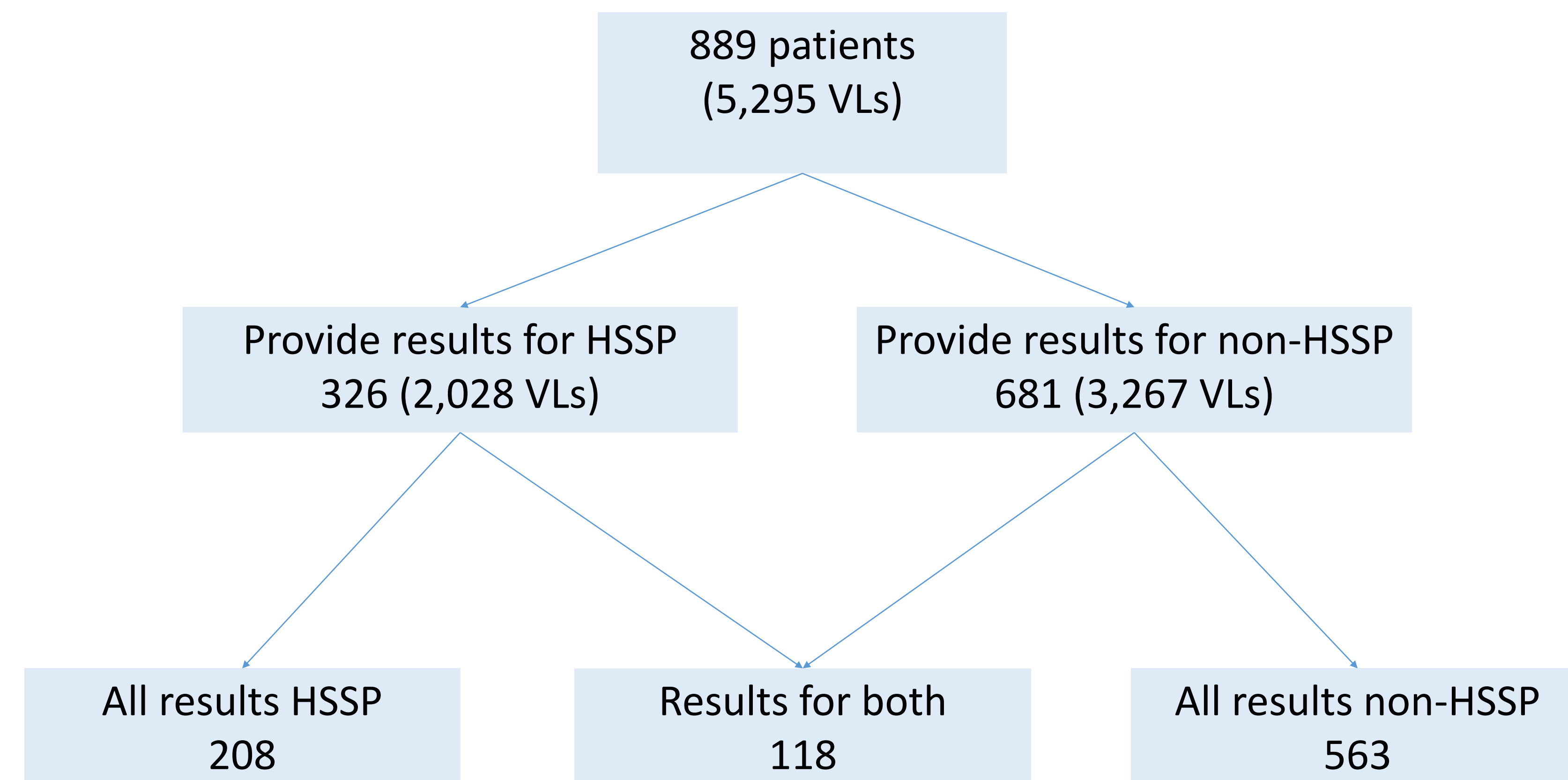
Table 1: Patient characteristics for patients who provided any viral load results all under non-HSSP, all under HSSP and those who changed status and provided results for both groups

	All Non-HSSP (n=563)	Both (n=118)	All HSSP (n=208)	p-value
Female (n, %)	177 (31.4%)	52 (44.1%)	85 (40.9%)	0.005
Age (years)[1]	49.3 (12.7)	50.0 (13.1)	48.4 (13.0)	0.536
Race (n, %)				
White	317 (56.3%)	49 (41.5%)	85 (40.9%)	<0.001
Black or African-American	118 (21.0%)	25 (21.2%)	63 (30.3%)	
Other	128 (22.7%)	44 (37.3%)	60 (28.9%)	
Hispanic or Latino (n, %)	146 (25.9%)	47 (39.8%)	60 (28.9%)	0.010
CCI (w/o HIV)[1]	1.37 (2.0)	1.89 (2.0)	1.31 (1.7)	0.024
Follow-up (months)[1]	24.4 (18.9)	36.4 (12.8)	32.0 (16.8)	<0.001

[1] Mean (SD) Means compared using ANOVA; Categories compared using Fisher's exact test

Table 2: Results of Generalized Estimating logistic regression. Unadjusted and Adjusted Odds Ratios (ORs) with 95% confidence intervals.

Covariate	Unadjusted OR [95% CI]	Adjusted* OR [95%CI]
Non-HSSP	1(ref)	1 (ref)
HSSP	1.95 [1.45, 2.62]	1.89 [1.40, 2.56]
Male	1(ref)	1 (ref)
Female	0.92 [0.68, 1.26]	0.94 [0.67, 1.30]
Hispanic/Latino	1(ref)	1 (ref)
Not-Hispanic/Latino	1.18 [0.85, 1.63]	1.35 [0.86, 2.13]
Unknown	2.96 [0.12, 71.9]	1.89 [0.09, 41.3]
White	1 (ref)	1(ref)
Black or African American	0.72 [0.51, 1.02]	0.75 [0.51, 1.10]
Other	0.94 [0.65, 1.35]	1.30 [0.79, 2.13]
Charlson Comorbidity Index (w/o HIV)		
0	1(ref)	1(ref)
1	0.78 [0.55, 1.12]	0.61 [0.42, 0.89]
2-3	1.06 [0.71, 1.58]	0.56 [0.36, 0.87]
>3	1.85 [1.03, 3.32]	0.81 [0.44, 1.47]
Age (yrs)	1.04 [1.03, 1.06]	1.05 [1.03, 1.06]
Time from Index (yrs)	1.03 [1.02, 1.03]	1.02 [1.02, 1.03]

*adjusted for all other covariates

The HSSP group had a higher rate of viral suppression (adjusted OR = 1.89 95% CI: [1.40, 2.56]).

Sex, ethnicity, and race were not significantly associated with viral suppression, which decreased with Charlson Comorbidity Index (CCI) 1-3; increased with age; and increased over time (from index date of VL).

Conclusion

Among patients evaluated at UMass Memorial HIV Clinic, those filling ARV medications at the HSSP demonstrated higher rates of viral suppression compared to patients utilizing a non-HSSP.

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