

The Role of Insurance Coverage in Achieving Viral Suppression Among HIV Patients: A Quality Assurance Study of a Ryan White Funded HIV Clinic in Utah



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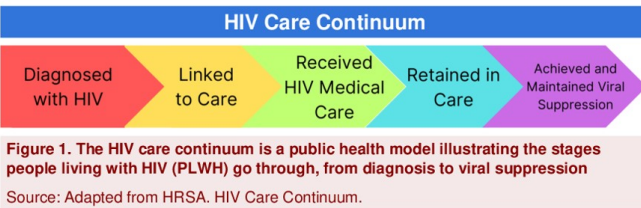


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I. Introduction

Global health efforts have transformed HIV from a fatal diagnosis to a manageable disease with antiretroviral therapy (ART), reducing the number of HIV cases. Despite fewer global cases, HIV remains a public health challenge. In Utah, HIV cases rise annually, with 136 new diagnoses in 2021.¹ The HIV care continuum and 90-90-90 initiative focus on rapid, effective ART to achieve viral suppression (VS) by reducing viral load to undetectable levels.^{2,3} At least one-third of people living with HIV in Utah rely on Ryan White Funding (RWF), a federally funded program that provides HIV care to uninsured/underinsured patients.¹



II. Methods

Study design: A single-center, retrospective qualitative and quantitative observational case-control study.

• January 1, 2023 - December 31, 2023

Population: Patients with a confirmed HIV diagnosis who presented to the University of Utah Infectious Disease Clinic E10 (a RWF clinic) to establish HIV care.

Purpose: The findings of this study were aimed to improve overall patient outcomes in the HIV care continuum.

Inclusion criteria: 18-90 years of age with a confirmed HIV diagnosis prior to established care at Clinic E10.

Exclusion criteria: Ages <18 or >90, elite HIV controllers, VS achieved with ART at first office visit.

Primary outcomes: The frequency of VS achievement and the comparison of time to VS between patients receiving RWF and those with non-RWF.

Secondary outcomes: No-show appointments and utilization of interpretive services impacting time to VS.

Data analysis: The statistical analysis was performed using Statistical Analysis System (SAS®).

III. Results

Table 1. Baseline characteristics of enrolled patients (n =149) (% , percentage)

	RW Funding ⁱ 128 (85.90)	No RW Funding 21 (14.10)	Total 149 (100)
Gender			
Female	13 (10.20)	1 (4.80)	14 (9.40)
Male	114 (89.06)	20 (95.20)	134 (89.93)
X ⁱⁱ	1 (0.78)	0 (0.00)	1 (0.70)
p-value			p _i = 0.7364
Need for Interpretive Services			
No	68 (53.13)	18 (85.71)	86 (57.72)
Yes	60 (46.88)	3 (14.29)	63 (42.28)
p-value			p = 0.0051
Visit Type			
New Diagnosis ⁱⁱⁱ	56 (43.75)	7 (33.30)	63 (42.28)
Return to Care ^{iv}	10 (7.81)	1 (4.76)	11 (7.38)
Transfer of Care ^v	62 (48.44)	13 (6.79)	75 (50.34)
p-value			p = 0.5116
Additional Outside Coverage at First Visit			
No	89 (69.53)	1 (4.76)	90 (60.40)
Yes	39 (30.47)	20 (95.24)	59 (39.60)
p-value			p = <0.0001
No Show Rate			
None	48 (37.50)	4 (19.05)	52 (34.90%)
0 to 25%	53 (41.41)	8 (38.10)	61 (40.94%)
25% to 50%	25 (19.53)	7 (33.33)	32 (21.48%)
≥50%	2 (1.56)	2 (9.52)	4 (2.68%)
p-value			p _i = 0.0528

RW: Ryan White HIV/AIDS Program Parts B, C, or D;

VL: Viral Load (HIV viral copies/mL blood);

p: Calculated by Chi-squared Test; p_i: Calculated by Fisher's Exact Test.

ⁱ Patient was approved for ≥1 part of Ryan White funding.

ⁱⁱ Non-binary, transgender, or other unlisted gender.

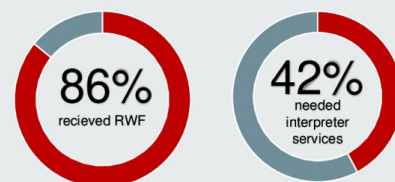
ⁱⁱⁱ Patients received a recent diagnosis and never received comprehensive HIV treatment.

^{iv} Patients were out of care for 3+ years.

^v Patient was transferred care from another clinic or state and had established HIV care regimen.

Patient Characteristics (n=149):

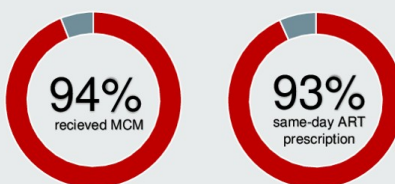
- Power and sample size: $\alpha = 0.0502$, power = 0.9180.



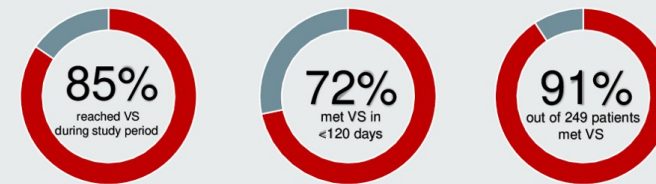
- Between the RWF and non-RWF groups, RWF demonstrated a significant statistical difference in the need for interpretive services ($p = 0.051$).

Timelines in the Care Continuum:

- The median time from benefits check to medical case management (MCM) was 14 days.
- The median time from MCM to provider appointment was 19 days.



Viral suppression (VS) outcomes:



Comparative Analysis:

- Comparing patients with RWF vs. non-RWF coverage, there was **no** statistical difference in the average time to achieve VS ($p_{ij} = 0.2821$).
- Sensitivity:** Hazard ratios of patients with RWF vs. without RWF, adjusted with covariates^{vi}: 1.037, with $p_i = 0.9127$.
- Comparing those who received RWF pharmacy benefits versus those who did not receive RWF pharmacy benefits, there was **no** statistical difference in the average time to achieve VS.
- Sensitivity:** Hazard ratios of patients with RWF pharmacy benefits vs. without RWF pharmacy benefits, adjusted with covariates^{vi}: 0.827 with $p_i = 0.0684$.

^{vi} p_{ij} calculated by Wilcoxon Rank Sum Test.

^{vi} Covariates included gender, need of an interpreter, visit types, insurance status at the first visit, no-show rate, and service quarter.

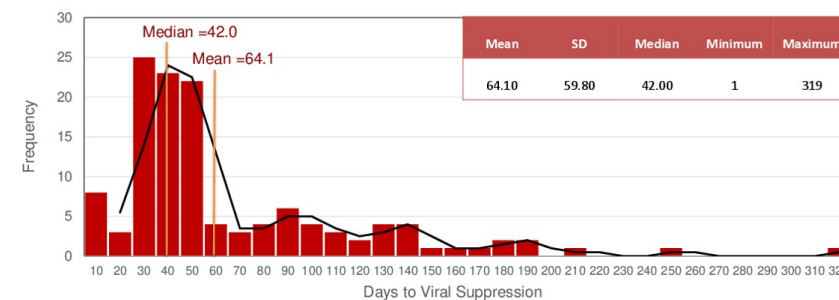


Figure 3 (a) Distribution of Time to Viral Suppression (n =129)

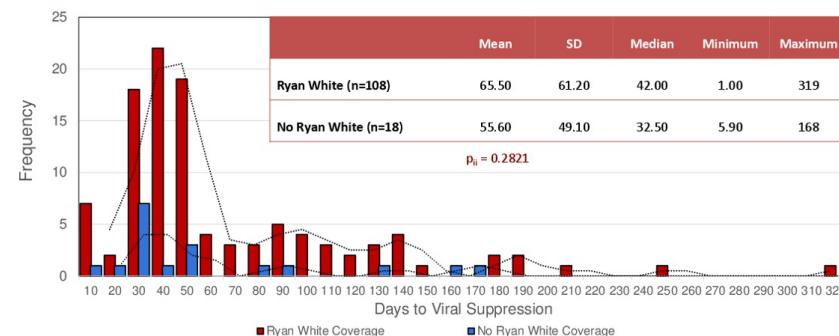


Figure 3 (b). Distribution of Time to Viral Suppression, Stratified by RWF Status

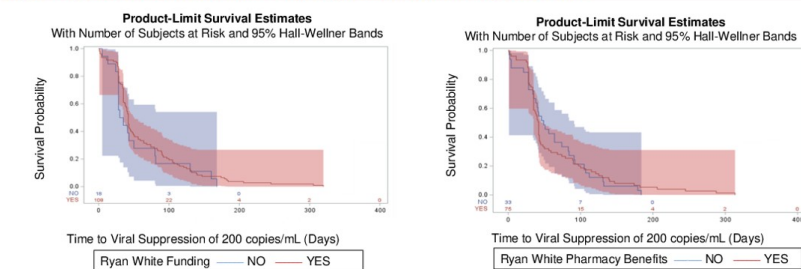


Figure 4. Kaplan-Meier Survival Curves Demonstrated No Significant Intergroup Differences with Respect to RWF status and RW Pharmacy Benefits to Reach Viral Suppression

IV. Discussion

No statistical difference in the average viral load suppression time between patients receiving Ryan White funding and those with alternative funding ($p_{ij} = 0.2821$) was found. The median time for viral load suppression from the time of ART prescription was 42 days. Also investigated were appointment no-shows and interpreter services utilization as potential factors that could impact time to viral suppression. The percentage of appointment no-shows between those with or without Ryan White funding was negligible ($p_i = 0.0528$). The patients receiving Ryan White funding had a statistically significant higher need for interpreter services ($p = 0.0051$).

Limitations included technological issues, inter-rater variability, patient variability, and retrospective chart review constraints. Despite these limitations, the study had strengths in its comprehensive dataset, with a sizable dataset of 3,237 data points collected, statistical power confirmation, and rigorous data analysis. A sample size and power analysis using SAS® determined $\alpha = 0.0502$ and power = 0.9180, confirming the study's statistical power.

V. Conclusions

In evaluating the success of clinic quality assurance measurements, the findings suggested Clinic E10 effectively met clinic quality goals. Patients receiving RWF had a greater need for interpretive services and socioeconomic needs. Despite those barriers, these patients reached viral suppression within the time goal, implying successful clinical outcomes to provide high-quality and equitable care. Additional successes included same-day ART start, with 93% of patients receiving an ART prescription on the same day as the first provider visit, adherence to the 90-90-90 Initiative goals, and timely viral load suppression. Furthermore, the findings supported the continued need for federal funding for programs like the Ryan White program.

VI. Future Research

Future research in focusing on patient outcomes and reducing viral transmission include tracking long-term viral suppression and changes in CD4 cell counts from ART initiation to viral suppression providing insights into treatment effectiveness and public health impacts.

References:

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