



HENNEPIN COUNTY

MINNESOTA

Public Health

Measuring Clients' Movement along the Treatment Cascade Using Multivariate Analysis

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Background

- In 2018, Hennepin County conducted three interconnected analyses of the Ryan White (RW) clients within the Minneapolis-St. Paul Transitional Grant Area (MSP-TGA) for CY2017.
- In October 2017, the Minnesota Commissioner of Health authorized the upload of surveillance data (eHARS) into CAREWare for all RW clients.

Purpose

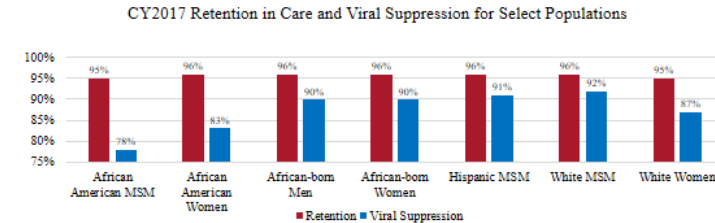
- Understand disparities in the Ryan White (RW) system
- Evaluate what RW services predict viral suppression
- Compare the RW services with predictive power against demographic utilization
- Hypothesize and test public health interventions based on these analyses to improve health equity

Recommendations

- Use these three analyses to design public health interventions that work towards health equity and ending the epidemic:
 - Stratify demographic variables to show intersectional identities (e.g. African American MSM) to provide a better picture of health (in)equities;
 - Use logistic regression to determine the social determinants of health and Ryan White (RW) services that predict viral suppression;
 - Calculate service utilization percentages and identify gaps.
- Some RW services that predict the positive likelihood of viral suppression are underutilized by demographic groups experiencing disparities.
- Targeted enrollment in these RW services could improve viral suppression rates and move these clients along the HIV treatment cascade.
- Devoting additional resources to housing is hypothesized to significantly improve population level viral suppression for unstably housed clients but would not have a large impact on viral suppression for temporarily housed clients.

Identifying Disparities

- 95% of Ryan White (RW) clients in the Minneapolis-St. Paul Transitional Grant Area (MSP-TGA) are retained in care.
- No disparities identified in care retention.
- 88% of RW clients in the MSP-TGA with a documented viral load in CAREWare are virally suppressed.
- Large health inequities exist in this final stage of the HIV treatment cascade.



Using Logistic Regression to Predict Viral Suppression

Methods:

- Logistic regression was performed in R with viral suppression as the outcome variable. The cohort included Ryan White (RW) clients retained in care.
- Thirteen RW services were coded as dummy variables to indicate if a client received the service in CY2017. (1 = received service, 0 = did not receive service).
- Insurance was coded as a dummy variable (1 = insured, 0 = not insured).
- Poverty level was a continuous variable from 0.0 (no income) to 4.0 (400% Federal poverty level).
- The three HRSA defined housing statuses were recoded as three dummy variables.

Findings:

- Coefficients for temporary and stable housing do not significantly differ.
- Housing strongly predicts viral suppression, so housing was controlled for in three subsets.

Findings, continued

- RW services were identified for stably housed and temporarily housed clients that predict viral suppression.
- No RW services positively predicted viral suppression for unstably housed clients. It is hypothesized only housing services would improve viral suppression for this subset of clients.

All Clients (n=2702), social determinants of health (SDOH) only

Variable	Coefficient *	Sig. Level**
Stable	1.68508	<0.0001
Temporary	1.36971	<0.0001
Insurance Status	0.66866	0.004945
Poverty Level	0.28732	0.000141

* Larger value means the service or social determinant of health is more strongly associated with viral suppression.
 ** Significance level. Smaller means the variable is more statistically significant. Only independent variables with a significance level less than 0.1 were kept on the poster.
 † The most likely interpretation is substance abuse; outpatient services acts as a proxy for clients with a substance use disorder, not that the service itself is associated with worse health outcomes.

Stably Housed Clients (n=2262); RW services and SDOH

Variable	Coefficient*	Sig. Level**
Insurance Status	0.74953	0.00887
Legal Services	0.60155	0.04403
Non-medical Case Management	0.33747	0.08081
Poverty Level	0.18378	0.04966
Substance Abuse: Outpatient †	-0.56962	0.01247

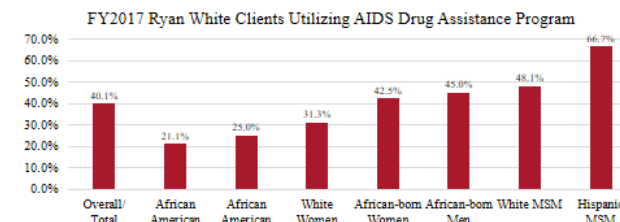
Temporarily Housed Clients (n=284); RW services and SDOH

Variable	Coefficient*	Sig. Level**
AIDS Drug Assistance Program	2.07492	0.00355
Insurance Status	1.43629	0.03705
Medical Case Management	0.89175	0.02706

Unstably Housed Clients (n=156); RW services and SDOH

Variable	Coefficient*	Sig. Level**
Substance Abuse: Outpatient †	-0.81779	0.0584

Service Utilization



- African Americans were enrolled in ADAP well below the overall Ryan White system in FY2017.
- Targeted ADAP enrollment of African Americans is hypothesized to increase viral suppression.
- Service utilization gaps were also evaluated for legal services, non-medical case management, and medical case management but produced less obvious public health intervention options.
- Fiscal year, compared to calendar year, was selected for service utilization analysis, so the Minnesota HIV Council could make informed allocation decisions.

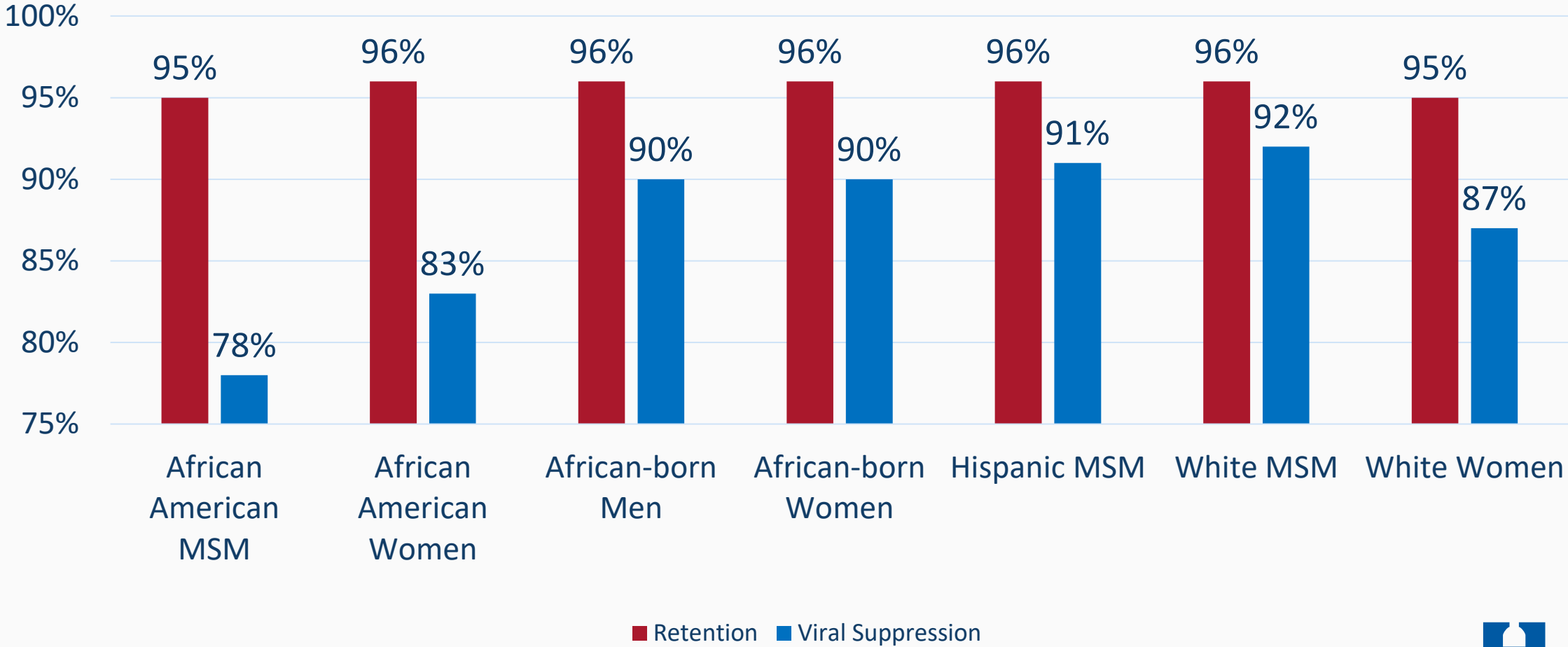
Measuring Clients' Movement along the HIV Care Continuum

- Presented at the 2018 National Ryan White Conference on HIV Care & Treatment
- Three interrelated analyses were presented together
 - Disparities in viral suppression among Ryan White clients
 - What Ryan White services and social determinants of health predict viral suppression among Ryan White clients retained in care?
 - Gaps in Ryan White service utilization

Background

- Made possible by the eHARS to CAREWare upload
- In Oct 2017, the Minnesota Commissioner of Health authorized the upload of surveillance data (eHARS) to the Ryan White database (CAREWare)
- Ties together programmatic work of the recipients and community engagement through the Council and other bodies

CY2017 Retention in Care and Viral Suppression for Select Ryan White Populations in the Minneapolis-St. Paul Transitional Grant Area



Exploratory Data Analysis

Two step process

1. What services/social determinants of health (SDOH) correlate predict viral suppression?
2. Once these key variables are identified, are there service utilization gaps or differences in SDOH?

Hypothesis development: Develop public health interventions that address these gaps or differences for key variables to see if viral suppression changes for populations.

What are we looking at?

Ryan White Services:

- AIDS Drug Assistance Program
- Emergency Financial Assistance
- Emergency Housing Assistance
- Food Bank/Home-delivered Meals
- Health Insurance Program
- Legal Services
- Housing
- Medical Case Management
- Medical Case Management: Treatment Adherence
- Medical Nutrition Therapy
- Mental Health Service
- Psychosocial Support
- Oral Health Services
- Outpatient/Ambulatory Healthcare Services
- Substance Abuse: Outpatient Services

Social Determinants of Health:

- Income/Poverty Level
- Housing Security
- Health insurance (insured or not insured)

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graph TD; A[Social Determinants of Health] --> B((Viral Suppression)); C[Ryan White Services] --> B;
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Viral Suppression

Why did I choose not to include demographics?

- Social determinants of health (SDOH) and medical care are basic health and human needs.
- Service and SDOH data are collected on a client level, so differences by demographics are already captured.
- Race, age, sex, gender identity, sexual orientation, etc. are *not* social determinants of health.
- *Discrimination* on any of these demographic is a social determinant of health.
 - Access: certain demographics cannot/do not access SDOH/services at equitable levels.
 - Impact: Services may not have equitable impact if it is not provided in a culturally responsive manner.

Does including demographics change the analyses?

- Since I received a suggestion to run the analyses again with demographic variables, I ran the same logit models including:
 - Race/ethnicity
 - Gender
 - MSM (yes/no)
 - Age
- The coefficients remain similar. In my opinion, they are similar enough for results presented in this presentation not to change.

Analysis Explained

- This analysis focused on viral suppression among those *already* retained in care.
- What is the most important variable to achieve viral suppression?
- Correlation does not mean causation
 - 95% of Ryan White clients receiving oral health care are virally suppressed.

HIV Care Continuum and Wellbeing

- Ryan White services can have positive health influences beyond viral suppression.
- Positively Hennepin envisions a Hennepin County where:
 - All people living with HIV/AIDS have healthy, vibrant lives
 - There are no new HIV infections
 - All people have equitable access to HIV prevention and health care services

Social determinants of health and HIV:

What predicts viral suppression among clients retained in care?

- There was *not* a large difference between being stably housed or temporarily housed.
- Housing is the most important variable for viral suppression.

Variable	Impact
Stable Housing	High
Temporary Housing	High
Insurance status	Medium
Poverty Level	Low

Population Size	Viral Suppression	Missing Viral Load
2,702	89%	11%

For those clients who are unstably housed, what predicts viral suppression?

- Reminder: These are clients who are already retained in medical care.
- No Ryan White service predicted a likelihood to increase viral suppression rates.
- Being insured also did not predict a likelihood to increase viral suppression rates.
- Without housing, it is unlikely any other public health intervention will improve this population's viral suppression rate (currently, 60%-70%).

Variable	Impact
Substance abuse: outpatient services †	Negative medium/high

† Likely proxying for substance use disorder, not saying these services result in worse health outcomes.

Population Size	Viral Suppression	Missing Viral Load
156	66%	15%

For those clients who are temporarily housed, what predicts viral suppression?

- This group of clients is a great opportunity for improvement, as three different variables could be influenced to increase viral suppression.

Variable	Impact
AIDS Drug Assistance Program (ADAP)	Very High
Medical case management	High
Insurance status	High

Population Size	Viral Suppression	Missing Viral Load
284	87%	11%

For those clients who are stably housed, what predicts viral suppression?

- This analysis appears to show that stably housed clients are likely to have their core medical needs met.
- Outside of ensuring access to substance abuse services and that clients are insured, this population is doing well comparatively.

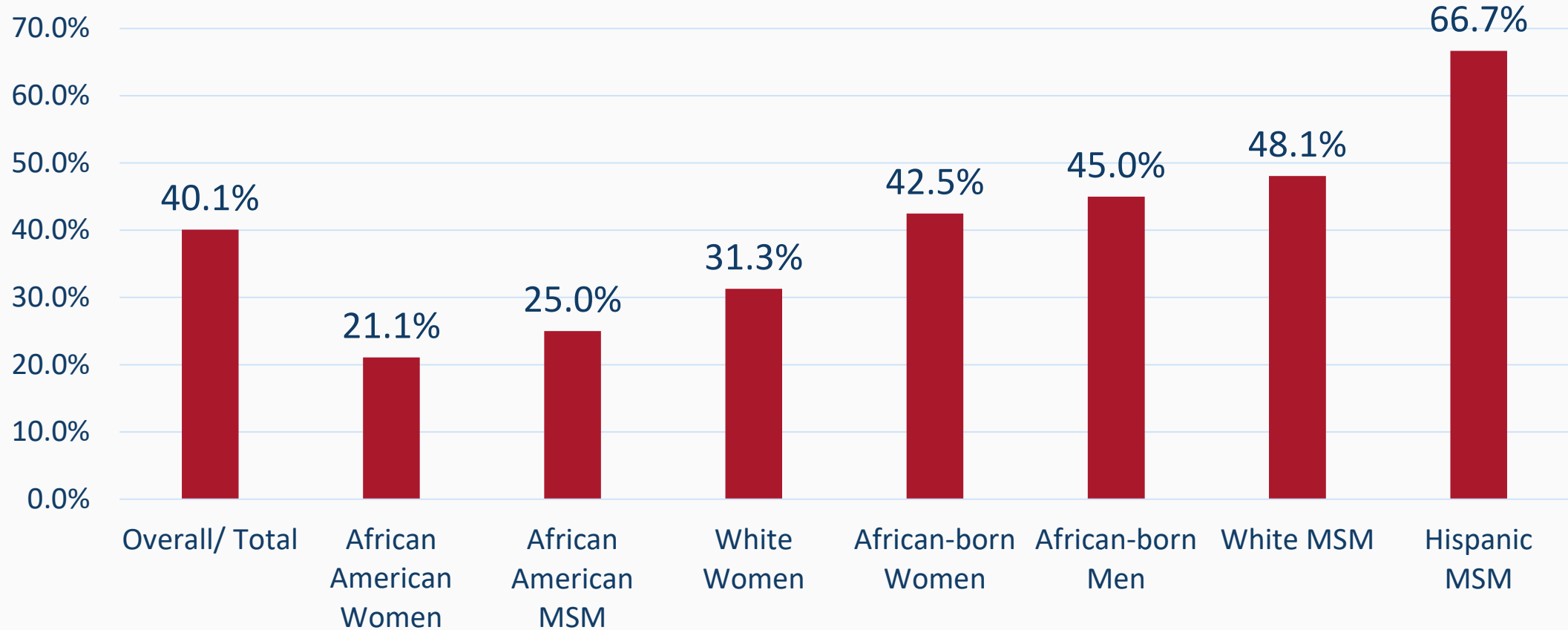
Variable	Impact
Insurance Status	Medium
Legal Services	Medium
Non-medical case management	Low
Poverty level	Very low
Substance abuse: outpatient services †	Negative medium

† Likely proxying for substance use disorder, not saying these services result in worse health outcomes.

Population Size	Viral Suppression	Missing Viral Load
2,262	91%	11%



FY2017 Ryan White Clients Utilizing AIDS Drug Assistance Program



Service Utilization Gaps?

- Could ADAP utilization gaps explain racial/ethnic disparities?
 - Further analysis is needed to look at Medicaid and other public insurance options enrollment.
 - In fact, a comprehensive analysis of insurance within the Ryan White system has not been conducted recently.
- Medical Case Management does show differences in utilization that might explain demographic disparities.

Main points

- In these analyses, housing is shown to be the most important variable for designing public health interventions to improve viral suppression.
 - Housing security continuum on which different services are more or less impactful depending where a client is on the continuum
- Unstably housed clients, even if retained in care and provided other Ryan White services, will likely continue to have poor viral suppression rates without housing.
- Opportunity for improvement: There are three independent interventions that could improve viral suppression for temporarily housed clients: ADAP, Insurance status, and Medical Case Management.
- Stably housed clients already achieve good viral suppression rates, comparatively, but could be improved through select services.

Acknowledgements

- Ryan White providers who collected the client level data
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Discussion with the Council

- Your decision to increase housing funds for FY2019 is helping unstably housed clients.
- How can we find permanent housing solutions for temporarily housed clients? HOPWA, etc.
- How can we ensure temporarily housed clients have access to ADAP, Medical Case Management, and health insurance?
 - Integration of Ryan White services, insurance, and housing
- What gaps are there in HIV services?
- Other questions?

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