Identifying significant indicators of unsuppressed viral load using client level data in the Boston EMA

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Introduction

As part of the National HIV/AIDS Strategy, the Ryan White HIV/AIDS Program plays an important role in reaching newly diagnosed PLWH and those not fully engaged in care. The goal of HIV services is to achieve and maintain HIV viral suppression, both to improve client health and reduce HIV transmission. Depending on the data source reported viral suppression rates in the Boston EMA range from 85 to 89%. The Boston Public Health Commission (BPHC) uses e2Boston, a cloud-based data system, to collect detailed client level data from Ryan White Part A funded providers. These data were analyzed in order to identify factors associated with lack of viral suppression.

Methods

BPHC funds 36 agencies for services. Agencies are required to report data for clients served, including (but not limited to) ethnicity, race, age, HIV risk exposure, housing status, and last medical visit date.

Inclusion Criteria

The client received at least one instance of Part A services during FY15 (March 1, 2015 – February 29, 2016) and had a reported viral load during that period.

Definitions

- **Viral Suppression:** viral load < 200 copies/mL blood
- **Mental Health Status:** Client's need, or lack thereof, for psychiatric and/or emotional support.
- **Support Network Status:** The need for a support network that may include family, friends, religious groups, or peer groups.
- **Housing Status:** Stability and affordability of a client's living situation.
- **HIV Risk Exposure - MSM:** MSM+IDU were counted in the MSM exposure category. (MSM + IDU was 1% of the sample population.)
- **HIV Risk Exposure - Heterosexual:** Sexual contact with a partner of the opposite sex who is either HIV-positive or at high risk for HIV infection. This category did not include persons who also indicated MSM and/or IDU risk factors.

Statistics

- Chi square tests determined if outcome measure scores and demographic variables differed among suppressed and unsuppressed clients at alpha = 0.05.
- Outcome variables with statistical significance and additional demographic variables were added into a logistic regression model.
- Backwards selection eliminated several variables from the initial model, including: Gender, Long Term Survivor Status, and MCM Status.
- Factors were retained in the model at alpha=0.2.
- Observations were omitted that were missing values for any variables included in the model.

Table 1: Comparing selected characteristics between suppressed and unsuppressed clients

Variable	*Virally Suppressed* *N = 4,265*	*Unsuppressed* *N = 346*	*P value*
Gender	%	%	**P = 0.01**
Male	66	58	
Female	33	41	
Transgender	1	1	
Race Categories			**P = .0004**
White	51	42	
Black or African-American	35	44	
Asian	2	1	
Other	11	4	
Unknown/Unreported	1	9	
Hispanic or Latino/a			P = 0.11
Hispanic or Latino/a	31	35	
Not Hispanic or Latino/a	69	65	
Unknown/Unreported	< 1	< 1	
HIV Risk Exposure			**P<.0001**
Men who have sex with men	36	23	
Injecting drug users	16	20	
Heterosexual contact	41	45	
Other risk	4	10	
Risk factor not reported or identified	3	2	
Age (years)			**P <.0001**
< 45	25	47	
≥45	75	53	
Mental Health Status			**P<.0001**
Reported mental health problems	54	72	
No reported mental health problems	46	28	
Support Network Status			**P<.0001**
Limited or poor support network	44	62	
Strong support network	56	38	
Housing Status			**P<.0001**
Insecure housing or needs financial assistance	27	52	
Stable housing, no assistance required	73	48	

References: JSI Clinical Chart Review, 2015. Colasanti, Jonathan, et al. "Continuous retention and viral suppression provide further insights into the HIV care continuum compared to the cross-sectional HIV care cascade." *Clinical Infectious Diseases* (2015): civ941.; Novak, R. M., Hart, R. L., Chmiel, J. S., Brooks, J. T., Buchacz, K., & HIV Outpatient Study (HOPS) Investigators. (2015). Disparities in Initiation of Combination Antiretroviral Treatment and in Virologic Suppression Among Patients in the HIV Outpatient Study, 2000–2013. *JAIDS Journal of Acquired Immune Deficiency Syndromes*, *70*(1), 23-32.; Valdisseri, R. O. (2014). Improving Outcomes along the HIV Care Continuum: Paying Careful Attention to the Non-Biologic Determinants of Health. *Public Health Reports*, *129*(4), 319. Morin, S. F. (2015). The Future of the Ryan White HIV/AIDS Program. *JAMA internal medicine*, *175*(10), 1660-1661.; Weiser, J., Beer, L., Frazier, E. L., Patel, R., Dempsey, A., Hauck, H., & Skarbinski, J. (2015). Service Delivery and Patient Outcomes in Ryan White HIV/AIDS Program–Funded and–Nonfunded Health Care Facilities in the United States. *JAMA internal medicine*, *175*(10), 1650-1659.

Table 2: Multivariate regression analysis of factors related to HIV viral non-suppression

Variable	Comparison	Odds Ratio	95% Confidence Interval
Age Group (yrs)	Age <45 vs. age ≥45	2.610	2.060, 3.307
HIV Risk Exposure	IDU vs. MSM	2.329	1.634, 3.320
Housing Status	Clients has housing needs vs. no housing needs (stably housed)	2.181	1.711, 2.780
HIV Risk Exposure	Other/Unknown risk vs. MSM	2.056	1.368, 3.090
HIV Risk Exposure	Heterosexual vs. MSM	1.566	1.165, 2.106
Mental Health	Reported mental health problems vs. no reported mental health problems	1.430	1.074, 1.903
Race	Black vs. all races combined	1.321	1.046, 1.668
Support Network	Limited/no support network vs. strong support network	1.276	0.976, 1.667

Who is less likely to be virally suppressed in the Boston EMA?

- Clients < 45 years old
- Unstably housed clients or those who need housing services
- Clients with non-MSM risk exposure
- Clients with reported mental health problems
- Black clients compared to other races
- Clients with no or a limited support network

Limitations

- Data include a small pool of unsuppressed clients (n=346)
- Data in this report are cross-sectional and do not address trends.
- Utilization of specific services is not factored into the analysis.
- Selection bias may have impacted results if clients with missing data were significantly different from clients with without missing data. 431/5,042 observations were excluded in the analysis.

How does BPHC use these data to inform Part A activities?

Health outcome data are provided for needs assessment and program planning activities.

- BPHC updates the Boston EMA Planning Council annually on the current health status of PLWH served by Part A services. The Council uses these data to identify populations with unmet HIV service needs, persistent barriers to care (such as housing, mental health, & substance abuse), and other factors that hinder viral suppression
- BPHC publishes e2Boston data reports that allow stakeholders to better understand how Part A funds are contributing to the health of PLWH in the Boston EMA.

BPHC is making strategic investments in agencies and services that focus on improving viral suppression and retention in care for PLWH.

- BPHC requires applicants competing for Part A funds to describe available viral suppression data and tailor staffing and program activities that maximize opportunities to improve client health outcomes.
- Agencies develop annual workplans that are realistic and data-driven by reviewing their past performance within e2Boston, identifying gaps and disparities within their own client population.

The data system allows funded providers to generate reports that can be used for program monitoring and evaluation.

- BPHC staff generate e2Boston reports and reviews them during monthly calls with their providers.

Conclusions and Next Steps for BPHC

Key findings:

- Analysis of client level data is important to identify unaddressed and emerging needs among people living with HIV (PLWH).
- In the Boston EMA, mental illness, unstable housing and lack of support networks were significantly associated with unsuppressed viral load.
- Additional results from this analysis, which are that, race, age and HIV risk exposure are linked to unsuppressed viral load, are consistent with other research, including an EMA unmet needs assessment.

Next steps:

- Analyzing longitudinal trends related to viral suppression
- Helping agencies develop innovative systems to address health disparities that contribute to viral non-suppression.

Part A Recipient Profile

Jurisdiction: Boston Eligible Metropolitan Area
Part A Designee: Boston Public Health Commission, Infectious Disease Bureau

EMA Geography: 7 Massachusetts counties (Bristol, Essex, Middlesex, Norfolk, Plymouth, Suffolk, & Worcester), 3 New Hampshire counties (Hillsborough, Rockingham, & Strafford)

FY 2016 Part A Award: $14,570,656
Total Programs: 54
Total Clients Served in FY15: 5,534

Funded Service Categories (in priority ranked order): Medical Case Management, Housing, AIDS Drug Assistance Program, Mental Health, Oral Health Care, Psychosocial Support (Peer Support, Mental Health, Substance Abuse), Residential Substance Abuse, Food & Home Delivered Meals, Medical Transportation, Medical Nutrition Therapy

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