

Measuring the Impact of Health-Related Support Services on Client Outcomes

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INTRODUCTION

People living with HIV/AIDS in the Boston Eligible Metropolitan Area (EMA) receiving care and services from organizations that receive Ryan White Part A funding through the Boston Public Health Commission (BPHC) may be eligible for a range of health-related support services intended to maintain and enhance HIV care and management. Funded core-medical and health-related support services in the Boston EMA are illustrated in Table 2. As part of the Outcomes Measurement project, providers with Ryan White Part A funding are required to report on client outcomes twice a year; this includes four “health” and five “quality of life” outcomes (Table 1). Currently, there is interest in an evaluation to determine if these support services are associated with outcomes and the extent to which they contribute to improving health and quality of life among clients with HIV.

Past analyses of outcome measurement data have consistently shown that the majority of clients have outcome scores that fall into the “good” or “excellent” categories, with these scores remaining stable from year to year. Given the overall high scores, the ability to determine association between receipt of services and outcome or improvement is limited. As such, in order to explore this relationship, investigators focused on a subgroup of clients whose total outcome scores were below the bottom 25% (this group had total outcome scores lower than 75% of clients in the sample; one can assume these are the clients in the most need of services). This allowed a wider range for observing and measuring improvement or change. Throughout this report, this group will be referred to as the “lower quartile.”

The purpose of this analysis is to evaluate the association between a) receipt of Ryan White Part A funded support services and b) health and quality of life outcomes among clients with mid-year FY 2009 total outcome scores in the lower quartile. Analyses were conducted to identify services that were associated with improvement or change in scores in FY 2010. The results described in this report answer the following questions:

- (1) Was there a relationship between receiving Ryan White Part A funded services and client outcome scores as measured in mid-year FY 2010? If so, which services were associated with client outcomes?**
- (2) Was there an association between receiving Ryan White Part A funded services and improvement in outcomes – defined as moving above the bottom 25% in FY 2010? If so, which services were associated with improvement?**
- (3) Did outcome scores differ depending on whether clients received the service(s) in the current year (FY 2010) or in the previous year (FY 2009)?**

EXECUTIVE SUMMARY

Analyses revealed that some health-related support services were associated with outcomes or improvement in health and quality of life outcomes among HIV clients receiving Ryan White Part A services.

- Of the five service categories examined, **transportation assistance** was the only factor that was not significantly associated with any of the composite outcome scores.
- Two service categories – **psychosocial support services and meals/food assistance services** – were consistently found to be positively associated with outcome scores. However, this was only true if these services were received in FY 2010 or the year in which the outcome scores were measured. Services received in the previous year, FY 2009, were not significantly associated with outcomes in FY 2010.
- Receipt of **housing services** in the previous year (FY 2009) was positively associated with the health outcome composite score and the short-term modifiable factors outcome score in 2010.
- Receipt of advocacy services in FY 2009 was negatively associated with the total outcome score and the health outcome score.
- Receipt of housing services in 2010 was negatively associated with the quality of life score.

METHODS

Data Collection

Providers receiving funding from the Boston Public Health Commission through the Ryan White Part A Program submit reports every six months on client outcomes and ancillary services delivered. See **Appendix A** for the Outcomes Measurement Report data collection tool and instructions. This particular analysis focuses on services in FY 2009 and FY 2010 and outcomes measured in mid-year FY 2009 and mid-year 2010.

Analytic sample

To examine the association between services received and outcomes or change/improvement in outcome scores, investigators focused on a subgroup of clients with total outcome scores that were below the bottom 25%, or the lower quartile. In FY 2009, the bottom 25% cutoff score was $\leq 67\%$, which coincidentally is the threshold differentiating the “fair” and “good” outcome score categories.

Outcome score categories	Poor	=	0-32%
	Fair	=	33-66%
	Good	=	67-99%
	Excellent	=	100%

Of the 3,143 clients with outcomes data in both FY 2009 and FY 2010, 854 clients (27%) had a total outcome score measured in mid-year FY 2009 in the lower quartile ($\leq 67\%$). The other 73% of clients were above the lower quartile and had either “good” or “excellent” outcome scores.

Data Analysis

To evaluate change or improvement in outcomes, the mid-year FY 2010 outcome scores were examined. Regression modeling was used to identify services and patient factors associated with each of the four composite outcome scores (see below and Table 1) measured in mid-year FY 2010. Linear regression models were used to identify any potential significant association between the mid-year FY 2010 total outcome score and receipt of specific services, controlling for client factors and the mid-year FY 2009 total score. Logistic regression models were used to determine the odds of moving above the bottom 25% in FY 2010 by receipt of specific services in either 2009 or 2010.

Four Composite Outcome Scores in FY 2010

A *total outcome score* was created including all nine outcomes measured. The components of each of the three other composite outcome scores are shown in Table 1.

In addition to the Health Outcome and Quality of Life Outcome composites, a “Short-Term Modifiable Factors Outcome” composite score was created through discussions with BPHC staff. It consists of four indicators that were considered most likely to be positively impacted within a one-year time frame given receipt of Ryan White Part A funded support services.

Table 1: Composite Outcome Score Components			
	Health Outcome	Quality of Life Outcome	Short-Term Modifiable Factors Outcome
CD-4 Count	X		
Viral Load	X		
Maintenance of Primary Medical Care	X		
Adherence to Prescribed HIV-Related Medical Therapies	X		X
Impact of Side-Effects From HIV-Related Medications		X	
Mental Health Status		X	X
Access to Psychosocial Support		X	X
Level of Self-Sufficiency		X	X
Housing Status		X	

Potential Factors Associated with Health & Quality of Life Outcomes

Service Categories

Five of the 11 service categories¹ reportable by providers were included in the analyses (Table 2) – client advocacy, food service/meals, housing, psychosocial support, and transportation assistance. Services received in the prior year (FY 2009) and services received in the current year (FY 2010) were examined in two separate sets of models to evaluate the association between the time of receipt of service and outcomes or change in outcome scores in FY 2010.

The remaining six service categories: dental, drug reimbursement, medical case management, mental health, primary medical care and substance abuse services are core-medical services and were excluded from the analysis, because clients may obtain these or similar services from non-Part A funded providers. Thus, true rates of utilization or receipt of these services could not be accurately approximated.

¹ Technically, there are 12 service categories funded within the EMA; however, the Minority AIDS Initiative (MAI) service category data is run separately and is not included in this analysis.

This analysis was based on the five Ryan White Part A service categories, which were accessed the most by the sample population. This allowed for a more precise estimation of the relationship between client outcomes and receipt of Ryan White Part A health-related support services.

Table 2. Service Categories (Core-Medical and Health-Related Support Services)	
	Included in Analysis?
Core-Medical	
Dental	-
Drug Reimbursement	-
Medical Case Management	-
Mental Health	-
Primary Medical Care	-
Substance Abuse (Outpatient)	-
Health-Related Support	
Client Advocacy	+
Food Services/Meals	+
Housing	+
Psychosocial Support	+
Substance Abuse (Residential)	-
Transportation	+

Other adjustments: Client Characteristics & Past Outcome Score

Final analytic models controlled for two client level characteristics – IDU risk and client age – which were significantly associated with some individual and composite outcome scores in preliminary analyses, and therefore had the potential to confound the results. Investigators also adjusted for the total outcome score measured in mid-year 2009, since past outcome scores were highly predictive of current outcomes or outcome scores in FY 2010. Ryan White Part A funded support services were considered significantly associated with outcomes or improvement in outcomes if $p < 0.05$.

Limitations

Study design and data limitations do not allow us to infer causality, that is, findings that receipt of services *caused* an improvement in outcomes or lack of services *caused* a decrease in outcomes cannot be derived. However, there is a *correlation* between receipt of services and outcomes improvement.

Although the analyses were limited to services that are considered mainly available via the Ryan White Part A program, it may still have been possible for clients to receive similar services elsewhere that were undocumented in these data. Providers were only required to report on services for which they receive Ryan White Part A funding.

RESULTS

Descriptive Characteristics of Analytic Sample (N= 854)

Of the 854 clients included in this analysis, 67% were male, 49% White, 41% Black/African American, 84% were permanently housed, 13% non-permanently housed and 2% other/unknown housing status. Additional demographic information is illustrated below in Table 3.

Table 3. Demographic Information (N= 854)		
		%
Transmission		
	MSM	30%
	IDU	38%
	Heterosexual	68%
Place of Birth		
	US	77%
	Non-US	23%
Ethnicity		
	Hispanic	33%
	Non-Hispanic	67%
AIDS Status		
	HIV+	69%
	HIV+, AIDS Status Unknown	10%
	AIDS	20%

Individual & Composite Outcome Score Averages in FY 2009 & FY 2010

From 2009 to 2010, the lower quartile average scores on all outcomes improved. Five of the nine individual outcomes had increases of +10 percentage points or more (Viral Load, Maintenance of Primary Medical Care, Adherence, Impact of Side Effects and Housing Status). The health outcome composite had the highest average percentage points increase of +9.5, followed +8.1 points for the total outcome composite, +7.3 points for the quality of life composite, and +6.5 points increase for the short-term modifiable factors composite (Table 5).

Furthermore, average scores for *the total sample* (including those in the lower quartile) with outcomes data in both years also improved, but the degree of change was less since scores were already high. Composite scores improved, ranging from an increase of +1 (short-term modifiable factors) to +2.5 percentage points (health outcome) from 2009 to 2010.

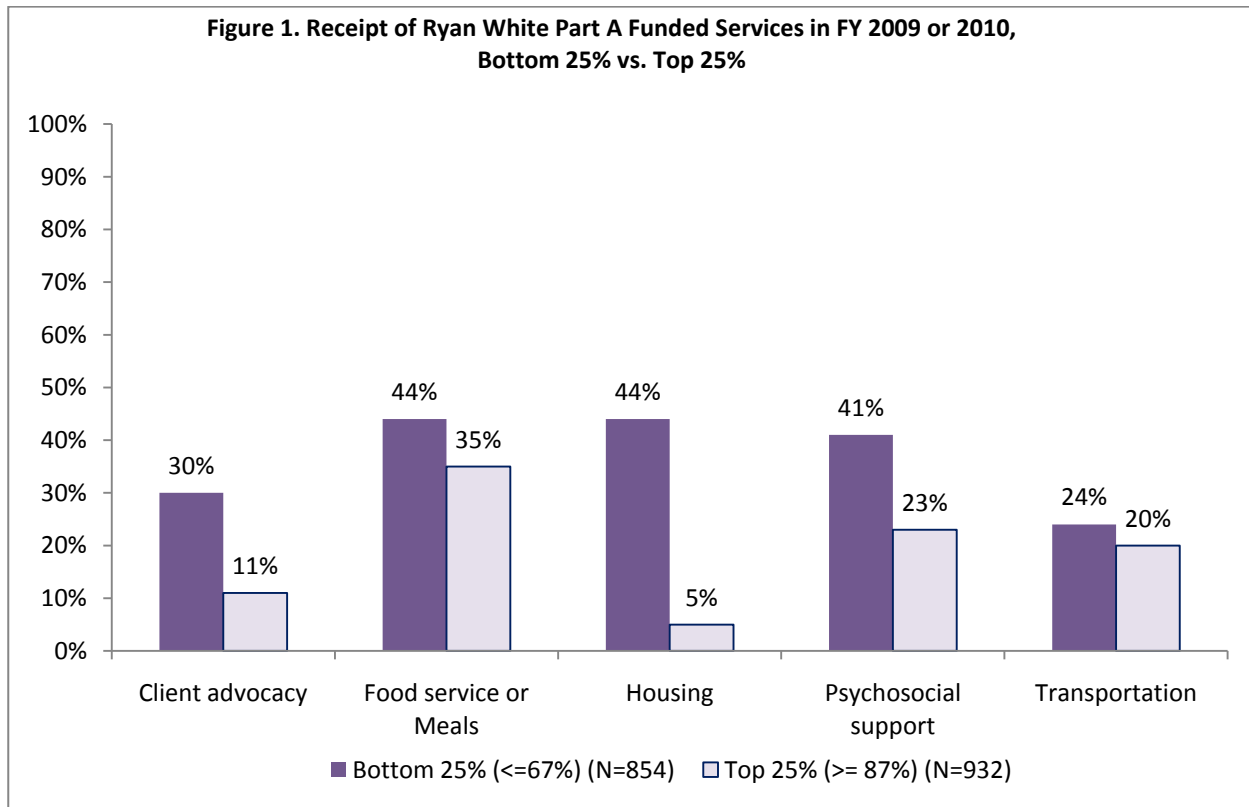
Table 4. Individual & Composite Outcome Score Averages in FY 2009 and FY 2010: Lower Quartile vs. Total Sample

Outcomes	Lower Quartile Analytic Sample (N=854)		Sample of Clients With Reported Outcomes in Both FY2009 and FY2010 (N=3,143)	
	Average Score Mid-Year FY 2009	Average Score Mid-Year FY 2010	Average Score Mid-Year FY 2009	Average Score Mid-Year FY 2010
CD-4 Count	57.4	62.1	74.6	75.6
Viral Load +	61.3	72.4	82.6	85.5
Maintenance of Primary Medical Care +	50.7	63.0	74.6	78.3
Adherence to Prescribed HIV-Related Medical Therapies +	57.8	69.3	80.6	83.4
Impact of Side-Effects From HIV-Related Medications +	52.1	62.1	74.2	75.4
Mental Health Status	61.4	63.2	73.4	73.0
Access to Psychosocial Support	51.6	60.8	71.6	73.4
Level of Self-Sufficiency	60.3	63.6	77.8	77.7
Housing Status +	55.6	67.4	76.4	81.4
Composite Scores				
Total Outcome Score	56.5	64.6	76.6	78.5
Health Outcome Score	56.2	65.7	77.6	80.1
Quality of Life Outcome Score	56.8	64.1	76.5	78.1
Short-Term Modifiable Factors Outcome Score	58.1	64.6	77.2	78.2

+ Increase of 10 percentage points or more for lower quartile

Service Receipt by Client Outcome Score Grouping – Lower Quartile versus Upper Quartile

The percentage of clients who received any of the services of interest in either FY 2009 or 2010 was examined. As expected, receipt of services or service utilization rates among clients with outcome scores in the lower quartile (bottom 25%) were higher than among clients in the upper quartile (top 25%) (Figure 1). To the extent that receipt of service is indicative of need, clients in the lower quartile have a much greater need, particularly in the areas of client advocacy (30%), housing assistance (44%), and psychosocial support (41%) than clients in the upper quartile (11%, 5% and 23% respectively).



Service Receipt in 2009 and/or 2010

Figures 2-6. Among clients who received any of the five health-related support services, about 50% received services in both 2009 and 2010. For example, of the 374 clients (44%) who received any food/meals assistance, 50% (188) received it in both years. Of those who received services in only one year, a similar percentage received food/meals and transportation in either 2009 or 2010. However, a higher percentage of clients received housing assistance in 2009 than in 2010 and a higher percentage of clients received psychosocial support in 2010 than in 2009.

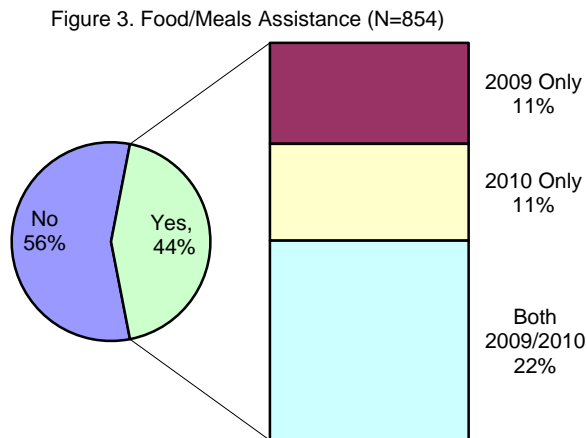
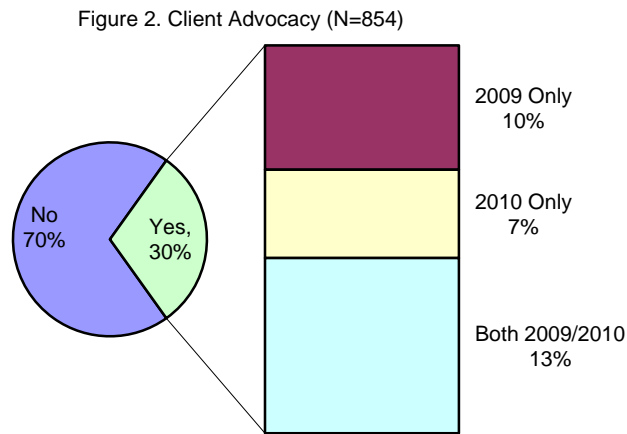


Figure 4. Housing Assistance (N=854)

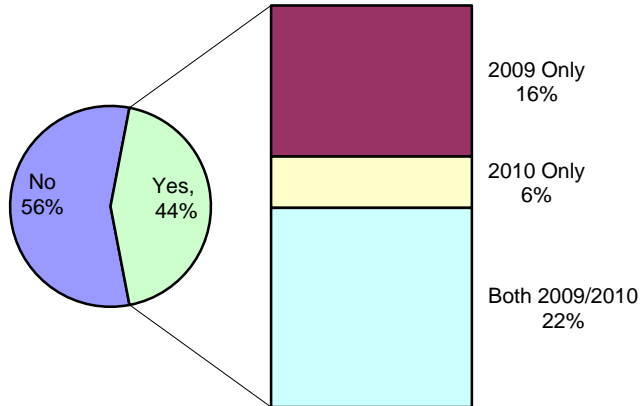


Figure 5. Psychosocial Support (N=854)

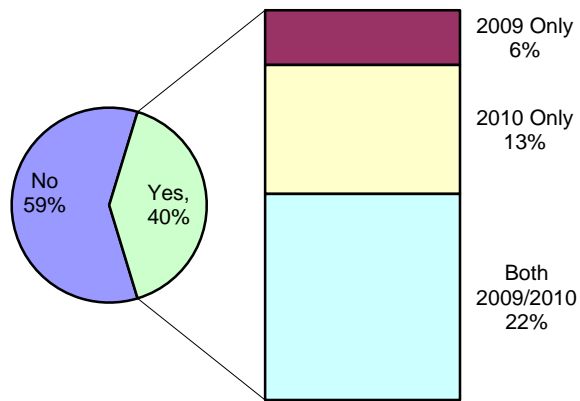
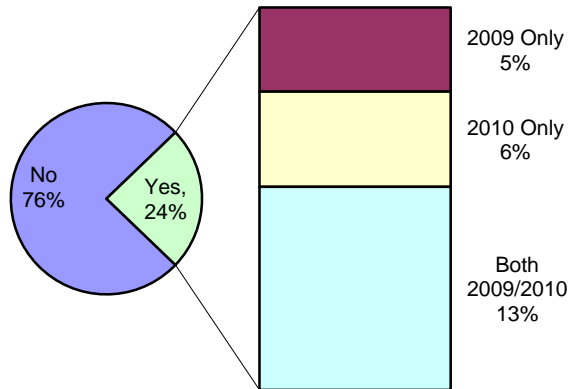


Figure 6. Transportation Assistance (N=854)



Significant Associations between Services Received and Outcome Scores

(1) Was there a relationship between receiving Ryan White Part A funded services and client outcome scores measured in mid-year 2010? If so, which services were associated with client outcomes?

-And-

(3) Did outcome scores differ depending on whether clients received the service(s) in the current year (FY 2010) or in the previous year (FY 2009)?

The following summarizes the significant associations between services received in 2009 or 2010 and each of the four composite outcome scores (Table 5):

- Receiving client advocacy services in 2009 was associated with lower total outcome composite scores ($\downarrow 2.93$, $p < 0.05$) and lower health outcome scores ($\downarrow 3.79$, $p < 0.05$). Receipt of client advocacy services in 2010 was not associated with outcomes in 2010.
- Food/meals assistance received in 2010 was associated with higher scores on all composite outcomes (Total outcome: $\uparrow 4.93$, $p < 0.01$; health outcome: $\uparrow 3.83$, $p < 0.05$); quality of life outcome: $\uparrow 5.08$, $p < 0.01$; short-term modifiable factors outcome: $\uparrow 5.55$, $p < 0.01$). However, food/meals assistance received in 2009 was not significantly associated with any composite outcome scores in 2010.
- Housing assistance received in 2009 was associated with higher scores in the health outcome composite ($\uparrow 3.81$, $p < 0.05$) and the short-term modifiable composite ($\uparrow 3.23$, $p < 0.05$). However, housing assistance received in 2010 was associated with lower quality of life outcome scores in 2010 ($\downarrow 5.80$, $p < 0.0001$).
- Psychosocial support services received in 2010 was associated with higher scores on all composite outcomes (Total outcome: $\uparrow 4.44$, $p < 0.01$; health outcome: $\uparrow 4.93$, $P < 0.01$; quality of life outcome: $\uparrow 3.93$, $p < 0.01$; short-term modifiable factors: $\uparrow 6.65$, $p < 0.0001$).
- Transportation assistance received in either 2009 or 2010 was not associated with any of the composite outcomes.

Table 5. Significant associations between receiving client services by year and composite outcome scores in 2010					
		Total Outcome	Health Outcome	Quality of Life Outcome	Short-Term Modifiable Factors
Client Advocacy					
	2009	↓2.93*	↓3.79*	ns	ns
	2010	ns	ns	ns	ns
Food/Meals					
	2009	ns	ns	ns	ns
	2010	↑4.93**	↑3.83*	↑5.08**	↑5.55**
Housing Assistance					
	2009	ns	↑3.81*	ns	↑3.23*
	2010	ns	ns	↓5.80***	ns
Psychosocial Support					
	2009	ns	ns	ns	ns
	2010	↑4.44**	↑4.93**	↑3.93**	↑6.65***
Transportation					
	2009	ns	ns	ns	ns
	2010	ns	ns	ns	ns

*p<0.05, **p<0.01, ***p<0.0001

Significant Associations between Services and Outcome Improvement

(2) Was there an association between receiving Ryan White Part A funded ancillary services and improvement in outcomes – defined as moving above the bottom 25% in FY 2010? If so, which services were associated with improvement in the total outcome score?

-And-

(3) Did outcome scores differ depending on whether clients received the service(s) in the current year (FY 2010) or in the previous year (FY 2009)?

Thirty-five percent of clients (298/854) had improved total outcomes scores and moved above the bottom 25% in FY 2010. Sixty-five percent or 554 remained in the bottom 25%. Despite this, among the 854 clients, the average total outcome score overall improved from 56.5% in FY 2009 to 64.6% in FY 2010, a gain of +8.1 percentage points. This compares to a gain of +2.0 percentage points increase across all clients with outcomes data in both years, indicating greater improvement among clients who were doing less well relative to the group.

Again, controlling for age and IDU risk, we utilized logistic regression modeling to identify services associated with “improvement or moving above the bottom 25%” in 2010. Services received in 2009 and in 2010 were analyzed separately.

Services received in FY 2009

- Services received in the previous year – 2009 –were not significantly associated improvement above the bottom 25% in 2010.

Services received in FY 2010

- Receiving housing assistance in 2010 was associated with lower odds of improving in 2010. (Odds Ratio: 0.5, $p < 0.0001$)
- Receiving food services/meals in 2010 was associated with greater odds of improving in 2010 (Odds Ratio: 2.6, $p < 0.0001$)
- Receiving psychosocial support in 2010 was associated with greater odds of improving in 2010 (Odds Ratio: 1.8, $p < 0.01$).

CONCLUSION

Client need for services is a large determining factor in whether services are provided. Clients with relatively lower outcome scores were more likely to access or receive client advocacy services, housing, and psychosocial support than clients with higher outcome scores.

Analyses revealed that some health-related support services were associated with outcomes or improvement in health and quality of life outcomes among HIV clients receiving Ryan White Part A services. In fact, transportation assistance was the only service *not* significantly associated with any of the composite outcome scores.

Receipt of advocacy services in FY 2009 was negatively associated with the total outcome score and the health outcome score. This may suggest that issues (financial, legal, or other) for which clients received advocacy services may not have yet been resolved by 2010 or may have continued to have a negative impact on outcomes.

Psychosocial support services and meals/food assistance services were consistently found to be positively associated with outcome scores. However, this was only true if these services were received in FY 2010 or the same year in which the outcome scores were examined or measured. Services received in the previous year, FY 2009, were not significantly associated with outcomes in FY 2010.

Receipt of housing services in the previous year (FY 2009) was positively associated with the health outcome composite score and the short-term modifiable factors selected outcome composite score in 2010 – suggesting that the services received in the previous year may have successfully improved housing stability which led to improved outcomes. However, receipt of housing services in 2010 was negatively associated with the quality of life score – suggesting that any current housing instability or housing issues that have not yet been resolved negatively impacts quality of life.

While there are specific limitations to this analysis, it is clear that a subgroup of clients have a great need for health-related support services. This report has demonstrated that certain support services are associated with improved health and quality of life outcomes. The relationship between receipt of services and client level outcomes will be monitored each fiscal

year, as there are always emerging populations with specific needs and as the HIV-services landscape continues to change.

7. <u>Access to Psychosocial Support</u>	<input type="checkbox"/> Has no access to psychosocial support when needed	<input type="checkbox"/> Has limited access to psychosocial support when needed	<input type="checkbox"/> Has moderate access to psychosocial support when needed	<input type="checkbox"/> Fully connected to psychosocial support when needed
8. <u>Level of Self Sufficiency</u>	<input type="checkbox"/> Unable to manage day to day activities	<input type="checkbox"/> Able to manage some day to day activities	<input type="checkbox"/> Able to manage most day to day activities	<input type="checkbox"/> Able to manage all day to day activities
9. <u>Housing Status</u>	<input type="checkbox"/> Homeless, recently evicted, or home is uninhabitable	<input type="checkbox"/> Limited stability in housing (e.g., facing eviction or will need housing placement)	<input type="checkbox"/> Housing is stable but may need assistance (e.g., rental or utility assistance)	<input type="checkbox"/> Stable and satisfactory housing