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Sandra McGinnis

University at Albany, State University of New York

Lauren Polvere

University at Albany, State University of New York

Devin Smith

University at Albany, State University of New York

Diane Dewar

University at Albany, State University of New York

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Department
of Health

Medicaid Redesign Team Supportive Housing Evaluation:
UTILIZATION REPORT 1

MAY 2017



**MEDICAID REDESIGN TEAM
SUPPORTIVE HOUSING EVALUATION:**

Utilization Report 1

Sandra McGinnis, PhD; Lauren Polvere, PhD
Center for Human Services Research
School of Social Welfare, University at Albany

Devin Smith; Diane Dewar, PhD
Institute for Health System Evaluation
School of Public Health, University at Albany

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EXECUTIVE SUMMARY



Background

- The current study examines clinical and Medicaid health service utilization outcomes for enrollees in the Medicaid Redesign Team Supportive Housing programs. Specifically, this report documents the Medicaid health service utilization incurred by supportive housing participants over the 12 months prior to their enrollment (the pre-period) and the 12 months after enrollment (the post-period). The analysis measures utilization changes pre- and post-supportive housing enrollment in the context of inpatient care and emergency department visits, including those for mental health and substance abuse, as well as changes in outpatient mental health and substance abuse services. Participant demographic and clinical characteristics are also analyzed. Utilization characteristics are analyzed for the MRT-SH programs overall, as well as by program. Further analyses are provided for the key diagnostic groups served by the MRT-SH programs, which include individuals with Serious Mental Illness (SMI), Substance Use Disorders (SUD), HIV, and chronic conditions. An accompanying report covers Medicaid spending, program descriptions, and eligibility requirements.
- The analysis includes clients who were enrolled in supportive housing for at least one year before January 1, 2016, who had consistent Medicaid coverage during the year before and after their supportive housing start date. A few included programs use a six- or nine-month pre/post-period as needed. Nonparametric tests of statistical significance are typically used throughout the report, including the McNemar test for pre/post differences in binary variables and the Wilcoxon test for pre/post differences in continuous variables. Ordinary least-squares regression analysis is also used to model pre-post differences in inpatient admissions, inpatient days, and emergency department visits. These models demonstrate which client characteristics are associated with greater or lesser pre-post changes in utilization of these high-cost services.

Key Findings

- The average age of Medicaid Redesign Team Supportive Housing (MRT-SH) service recipients is 47.1. Across the MRT-SH programs, men slightly outnumber women (55% to 45%), though differences are seen across the programs. The population served by the MRT-SH programs is racially and ethnically diverse (23% Hispanic/Latino, 42% non-Hispanic black, 30% non-Hispanic white, and 5% Asian/Pacific Islanders, American Indian/Alaska Natives, others, or unknown).
- The MRT-SH programs are serving a seriously ill population who experience high rates of comorbidities. Sixty-six percent have an active diagnosis of a Serious Mental Illness (SMI), 46% have a Substance Use Disorder (SUD), 40% are HIV+, and 53% have one or more other chronic conditions, not including HIV. In terms of chronic conditions, hypertension and diabetes are the most commonly experienced illnesses. A significant number of participants have asthma, coronary heart disease, osteoarthritis, or COPD.
- MRT-SH participants had high rates of inpatient and emergency department utilization in the pre-period, prior to enrollment in supportive housing. Across the various programs, 44% percent had at least one inpatient admission and 60% had at least one emergency department visit in the pre-period. The mean number of inpatient days was 10.1, and the mean number of emergency department visits was 3.1. More than 7% of MRT-SH participants had spent time in inpatient substance abuse rehabilitation centers.
- Post-enrollment in supportive housing, participants across the MRT-SH programs used virtually all of the measured services significantly less. The findings show statistically significant decreases in inpatient care, inpatient mental health services, inpatient substance abuse services, average inpatient days, emergency department visits (including those for mental health and substance abuse), psychiatric inpatient stays, and inpatient rehabilitation services.
- The extent of changes in service utilization from the pre-period to the post-period differed across the programs.
- OASAS Rental Subsidies, OMH Rental Subsidies Statewide, the AIDS Institute “services only” program, and OTDA Homeless Housing Assistance Program showed particular promise in terms of reducing inpatient days and/or emergency department visits.
- The OASAS Rental Subsidies program and the OMH Rental Subsidies Statewide program showed especially strong findings in the current study, with statistically significant decreases in inpatient stays, emergency department visits, and other high cost services.
- In the context of diagnostic groups (individuals with an SMI, SUD, HIV, or other chronic condition), statistically significant reductions in inpatient days and emergency department visits were found for all groups in the post-period.
- Individuals with an SUD experienced the largest average net reductions in inpatient days and emergency department visits, which suggests that this diagnostic group is especially benefitting from supportive housing.
- Across the MRT-SH programs overall, use of outpatient behavioral health services decreased in the post-period. This result was unexpected, as previous supportive housing research finds that once participants are housed, high cost services (e.g. inpatient and emergency department visits) tend to decrease and less expensive, more community-based outpatient services tend to increase.
- The Medicaid service utilization findings to date are encouraging. MRT-SH program participants appear to be benefitting from supportive housing, as evidenced by decreases in the receipt of high-cost Medicaid services. Additional research is needed to better understand which program participants benefit most from supportive housing. Further research should also address the unexpected finding of decreases in the use of outpatient health services among supportive housing participants.

INTRODUCTION



Permanent Supportive Housing has been credited with reducing homelessness, particularly among those with complex needs (HUD, 2010; Culhane et al., 2002; Metraux et al., 2003, Stefanic & Tsemberis, 2007). Studies of supportive housing using a Housing First approach show improvements in housing stability (Palepu et al, 2013; Stergiopoulos et al, 2015), reductions in criminal justice involvement (Larimer et al., 2009; Srebnik 2013), and reductions in substance use (Padgett et al, 2011). Following placement in permanent supportive housing, participants spend fewer days homeless and in justice settings (Henwood, Katz, and Gilmer, 2014).

Research indicates an association between housing instability, high utilization of acute hospital services, poor health outcomes, and high costs of care (Wright, 2016). Homeless individuals use emergency departments and require inpatient hospitalization at rates three to four times higher than other citizens (Chambers et al, 2013; Kushel et al., 2002; Kushel et al., 2001). However, rates of primary care use are low among homeless populations (Chambers et al., 2013; Hwang et al., 2001).

Outcomes and Costs Associated with Supportive Housing

Previous studies of supportive housing outcomes and costs have focused on housing stability, health care utilization, shelter use, and incarceration rates. Health care utilization outcomes have been tracked through Medicaid data in most studies, with specific focus on emergency department visits, hospitalizations, hospital days, outpatient behavioral health, and primary care visits (Sadowski et al., 2009; Wright et al., 2016; Metraux et al., 2003; Culhane et al., 2002). Studies have also focused on overall system spending beyond Medicaid, tracking outcomes such as shelter stays, sobering center use, and jail/prison incarceration (Srebnik et al., 2013; Goering et al., 2015; Culhane et al., 2002; Metraux et al., 2003).

Emerging research has shown reductions in costs associated with health care utilization among formerly homeless individuals residing in supportive housing, guided by a Housing First model¹ (Metraux et al., 2003; Srebnik et al., 2013; Goering et al., 2015; Sadowski et al., 2009; Wright et al., 2016). Cost savings related to supportive housing are due to reductions in acute or “crisis-centered” services, such as emergency department use and inpatient hospitalization. These reductions offset increases in “community-based” services, such as primary care visits (Goering et al., 2015). Cost reductions are also reflected through reduced use of psychiatric inpatient services and reductions in incarcerations (Goering et al., 2015).

This report offers a preliminary look at some of the clinical outcomes for enrollees in the programs sponsored by the New York State Medicaid Redesign Team’s Supportive Housing initiative (MRT-SH). For those programs which began enrolling participants prior to January 2015, the report offers a first look at health care utilization for their clients over the 12 months prior to and after program enrollment.

¹ Housing First models of housing do not require residents to achieve or maintain sobriety

**MEDICAID REDESIGN TEAM
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METHODOLOGY



This analysis includes all clients who were enrolled in supportive housing for at least one year prior to January 1, 2016 and had consistent Medicaid coverage during the year before and after their supportive housing start².

The following programs began enrolling or placing clients before January 2015, and thus had enrollees that met the above criteria:

- AIDS Institute Rental Subsidies (AIRS)
 - AIDS Institute – Services only
 - AIDS Institute – Services and Subsidies
- Metro East 99th Street
- Office of Alcohol and Substance Abuse Services - Rental Subsidies and Supports (OASAS-RS)
- Office of Mental Health Rental Subsidies – Brooklyn (RSB)
- Office of Mental Health Rental Subsidies – Statewide (RSS)
- Office for Persons with Developmental Disabilities - Expansion of Existing Rental/Services (OPWDD)
- Office of Temporary and Disability Assistance - Disability Housing Subsidy Program (aka Eviction Prevention for Vulnerable Adults [EPVA])

Additionally, we will examine enrollees in some of the newer projects using either a 6-month (for the Health Homes Supportive Housing Pilot [HHSP] and the Office of Temporary and Disability Assistance Homeless Senior and Disabled Placement Pilot [OTDA Pilot] or 9-month (for the Homeless Housing and Assistance Program [HHAP]) post-period.

Nonparametric tests of statistical significance are typically used throughout the report because of the non-normal distribution of most of the dependent variables– the McNemar test for pre-post differences in binary variables, and the Wilcoxon test for pre-post differences in continuous variables. Ordinary least-squares regression analysis is also used to model pre-post differences in inpatient admissions, inpatient days, and emergency department visits. These models demonstrate which client characteristics are associated with greater or lesser pre-post changes in utilization of these high-cost services.

The following section will provide an overview of pre-enrollment and post-enrollment health care use for all of these programs, followed by separate sections looking at each of the programs listed in greater detail.

² Because of changes to the procedures for billing managed care encounters, data quality for managed care clients was only assured through December 31, 2015; therefore analyses were restricted to those who enrolled in supportive housing prior to January 1, 2015. Consistent Medicaid coverage was defined as having gaps in full Medicaid coverage not exceeding sixty consecutive days in either the pre- or the post-enrollment period.

THE MEDICAID REDESIGN TEAM SUPPORTIVE HOUSING (MRT-SH) POPULATION IN NEW YORK STATE

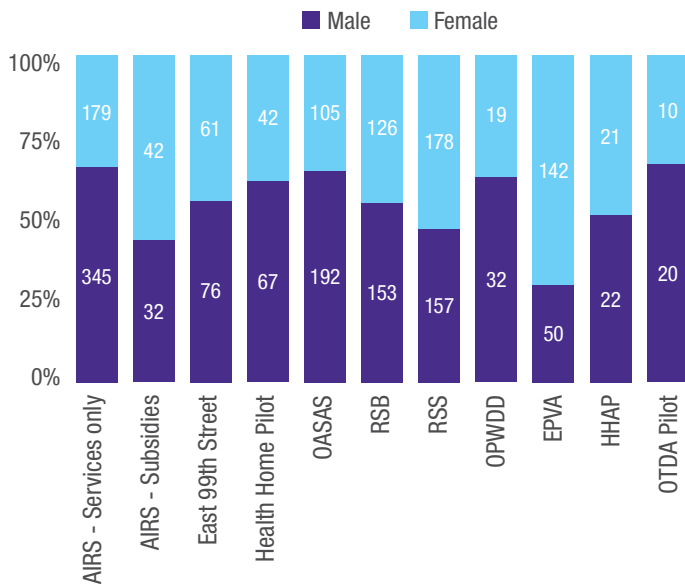
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Demographic characteristics

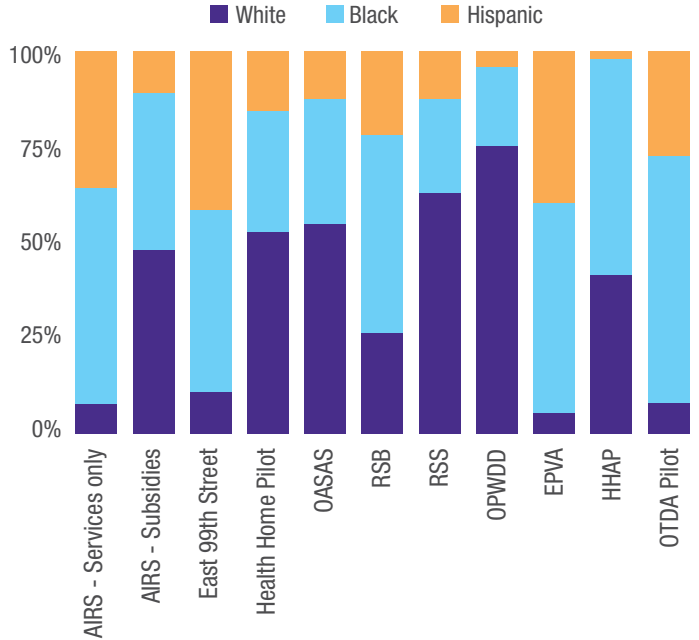
Sex. Among supportive housing recipients in all programs, men slightly outnumber women (55% versus 45%). This varies by program as shown below, with the AIDS Institute services-only programs and the Office of Temporary and Disability Assistance Homeless Senior and Disabled Placement Pilot (OTDA Pilot) most heavily weighted towards men (66%, 70% and 67%, respectively). The Office of Temporary and Disability Assistance Eviction Prevention for Vulnerable Adults (EPVA) program is the only program in which women substantially outnumber men (at 74%).

Figure 1. Distribution of MRT-SH Enrollees by Sex and Program



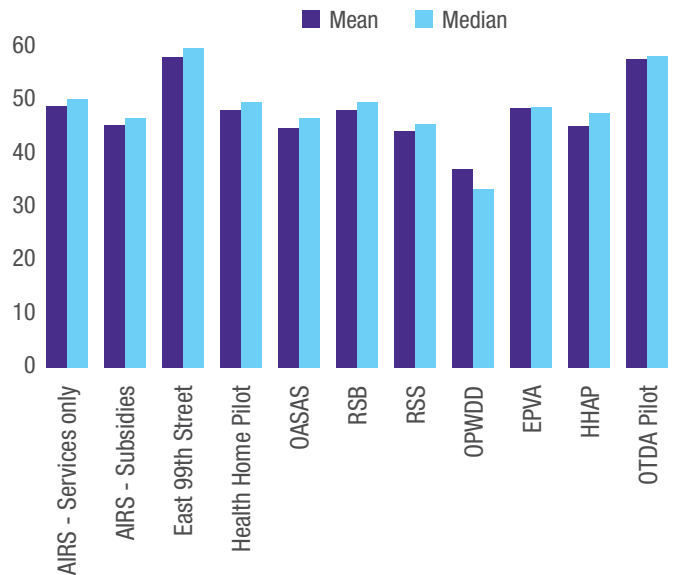
Race/ethnicity. The population served was racially and ethnically diverse across all programs, with 23% indicating Hispanic or Latino heritage (of any race); 42% non-Hispanic black; 30% non-Hispanic white; and the remaining 5% including Asian/Pacific Islanders, American Indian/Alaska Natives, others, or unknown. This varied by program and by geography. The highest percentages of Hispanic recipients were found in the East 99th Street and EPVA programs (39% and 38%, respectively), while the lowest percentages were found in the HHAP and OPWDD programs (2% and 4%, respectively). The highest percentage of non-Hispanic black recipients was in OTDA Pilot (63%), and the fewest in the OPWDD program (20%). Non-Hispanic whites were by far the highest percentage of the population in the OPWDD program (71%), and the lowest percentages in EPVA, OTDA Homeless Senior and Disabled Placement Pilot, and the AIDS Institute “services only” program (5%, 7%, and 8%, respectively).

Figure 2. Distribution of MRT-SH Enrollees by Race/Ethnicity and Program



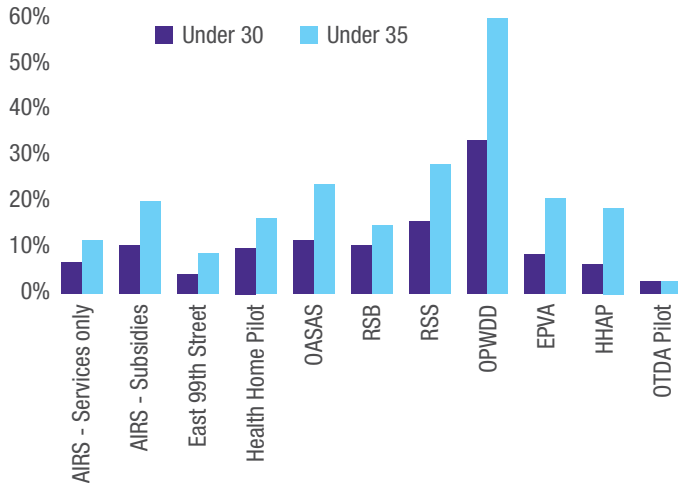
Age at SH Enrollment. The average age of recipients was 47.1 (median = 49), but this also varied by program. The lowest average age in any program was 36.6 for OPWDD Expansion, while the highest average age was 57.4 in East 99th.

Figure 3. Average Age at Enrollment among MRT-SH Enrollees by Program



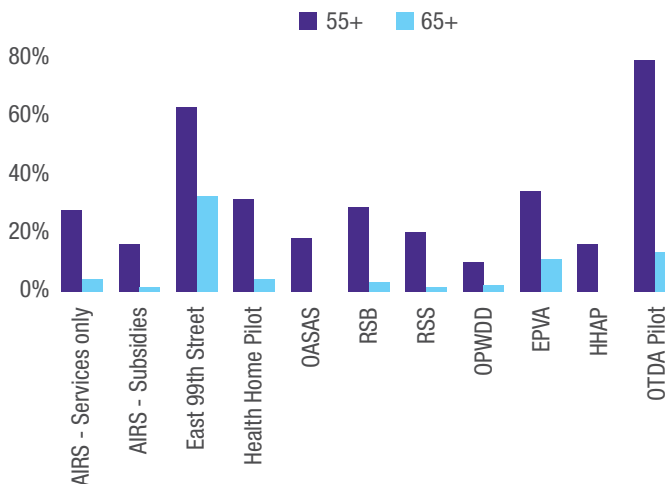
Relatively few MRT-SH participants were under the age of 30 (10%) or 35 (19%) at the time of their enrollment in MRT-SH. The primary exception is in the OPWDD program, where 59% of participants were under age 35 when they enrolled, and 33% were under age 30.

Figure 4. Percent Age <30 and <35 at MRT-SH Enrollment, by Program



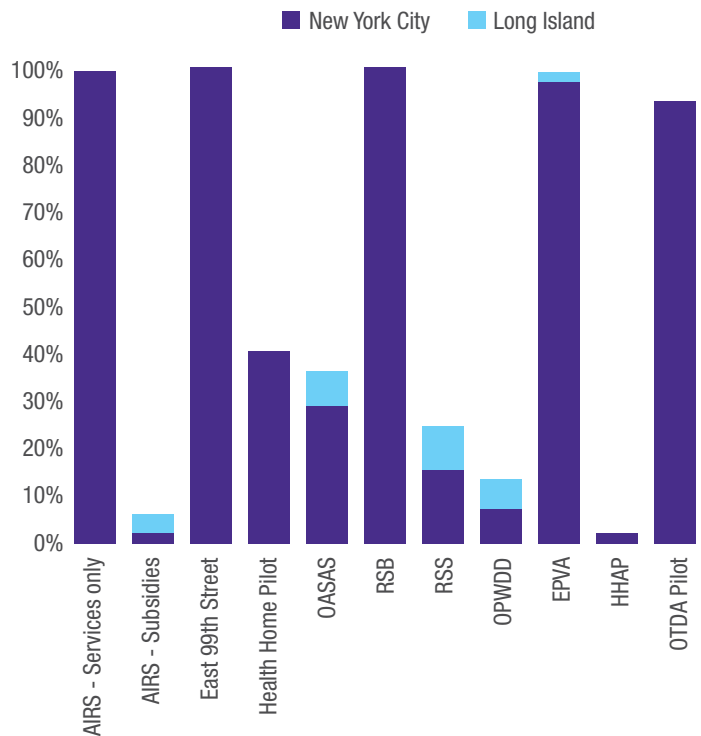
There was a relatively high percentage of people age 55 and older at enrollment (28%), but relatively few were 65 and older were a much smaller group (5%). The programs with the highest percentages of older adults were the OTDA Pilot (with 77% age 55 and over), and East 99th Street (with 61% ages 55 and older).

Figure 5. Percent Age 55+ and Age 65+



Geography. While projects are found throughout New York State, certain programs are concentrated primarily in New York City and Long Island. The AIDS Institute services-only programs are exclusively downstate, as well as the East 99th, RSB, EPVA, and OTDA Homeless Senior and Disabled Placement Pilot programs. Overall, 65% of participants are recorded as living in New York City, and another 3% on Long Island.

Figure 6. Percent of MRT-SH Enrollees Residing in New York City and Long Island, by Program

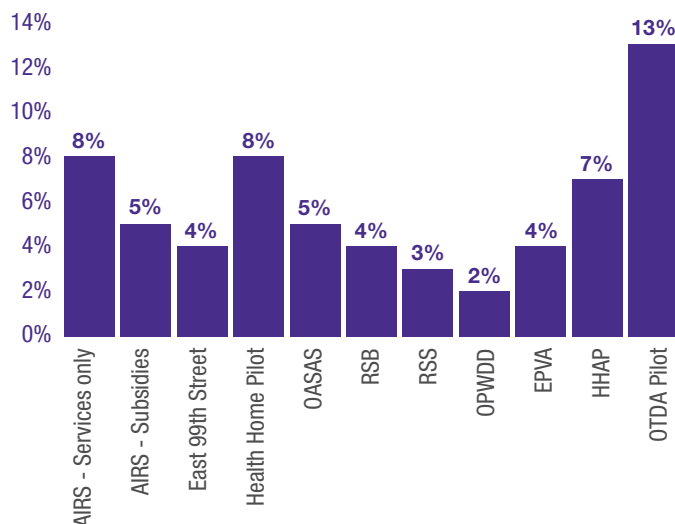


Deaths. Everyone included in this analysis survived for at least 6-12³ months after their supportive housing enrollment (as only those who remained on the Medicaid rolls for that period were selected). It is instructive, however, to look at the number of deaths that occurred after that period among participants in the various programs.

Overall, 6% of the participants have died. The highest mortality rates to date have been among those in the OTDA Homeless Senior and Disabled Placement Pilot at 13%, followed by the AIDS Institute “services only” program and Health Home Supportive Housing Pilot, both at 8%. Relatively few deaths occurred among the OMH and OPWDD populations.

3 As noted in the Methodology section, most programs used a 12-month follow-up, but HHAP used a 9-month follow-up and the HHSP and OTDA Homeless Senior and Disabled Placement Pilot programs used a 6-month follow-up.

Figure 7. Percent of MRT-SH Enrollees Deceased to Date, by Program



Note: These data are not appropriate for cross-program comparisons, as programs have different start dates, and therefore different lengths of time that participants have been at risk of mortality.

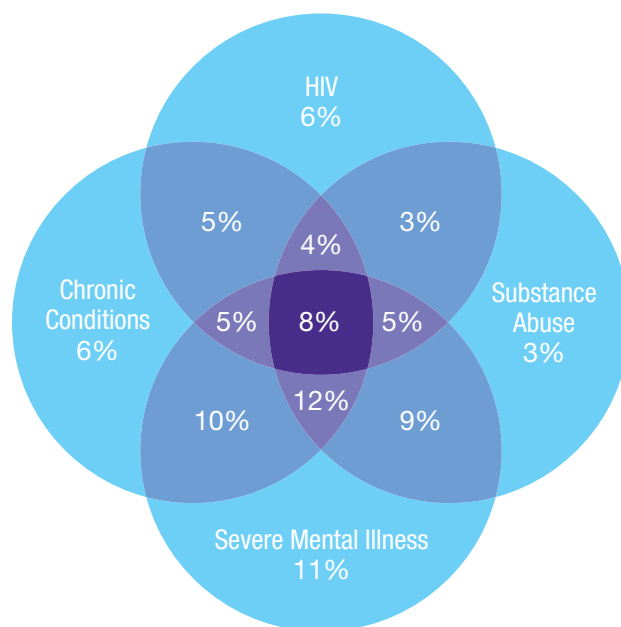
Clinical Characteristics

The population served by the MRT-SH programs is a seriously ill population, with high rates of comorbidities⁴. Sixty-six percent had an active diagnosis of a severe mental illness (SMI)⁵ at the time of enrollment, 46% had an active substance abuse disorder (SUD)⁶, and 40% had HIV⁷. Fifty-three percent had one or more other chronic medical conditions (see Table 2).

Clearly, the prevalence of specific types of conditions varies by the population served by each program. All recipients in the AIDS Institute program should have a diagnosis of HIV, in the OMH programs have a mental health diagnosis, and in the OASAS-RS program have a substance abuse disorder⁸.

At the same time, there is a great deal of overlap between populations. Eight percent have a SMI and a SUD and HIV and at least one other chronic medical condition, and 26% have three of these (most commonly SMI, SUD, and a chronic medical condition other than HIV [12%]). Fewer than 6% of participants did not have claims associated with any of these diagnoses.

Figure 8. Overlap Between Types of Chronic Conditions among MRT-SH Enrollees



Note: Not shown are substance use + chronic medical condition (3%) and severe mental illness + HIV (4%).

Note: To obtain total percentage of participants with a given diagnosis, sum all percentages that fall into the relevant circle (but may not exactly match text due to rounding). Circles are not sized proportionately.

⁴ It should be noted that the interim report defined diagnostic conditions based on the diagnosis in any position on a claim, at any point during the observed period. The current report uses a more stringent definition of only the primary diagnosis.

⁵ ICD9 codes 290, 293-302, 306-319

⁶ ICD9 codes 291-292, 303-305

⁷ ICD9 code 042

⁸ There are a handful of enrollees in these diagnostic-specific programs that do not have any Medicaid claims for the appropriate primary diagnosis during the period. This does not mean that they have never been diagnosed with the condition; only that no Medicaid claims were submitted for the condition as the primary diagnosis during this specific time period. For the purposes of this report, they are included in the appropriate diagnostic category for their program, even if no claims were observed.

Table 1. Types and Combinations of Chronic Conditions Present in MRT-SH Population

	All	AIDS Institute		East 99th	HHSP	OASAS	OMH		OPWDD	OTDA		
		Services only	Services & Subsidy				RSB	RSS		EPVA	HHAP	Pilot
<i>All four conditions</i>												
Mental health + Substance abuse + HIV + Other chronic condition	8%	16%	14%	2%	4%	6%	10%	3%	0%	2%	0%	7%
<i>Three conditions</i>												
Mental health + Substance abuse + chronic condition (other than HIV)	12%	--	--	2%	12%	36%	15%	20%	4%	5%	0%	7%
HIV + Mental health + Other chronic condition	5%	10%	10%	3%	1%	1%	11%	2%	0%	3%	0%	7%
Mental health + Substance abuse + HIV	5%	12%	19%	0%	5%	4%	3%	1%	0%	1%	2%	0%
HIV + Substance abuse + Other chronic condition	4%	11%	11%	0%	5%	2%	--	--	0%	0%	0%	0%
<i>Two conditions</i>												
Mental health + Chronic condition	10%	--	--	18%	7%	2%	21%	25%	29%	12%	9%	13%
Mental health + Substance abuse	9%	--	--	2%	19%	24%	9%	16%	2%	3%	16%	0%
Substance abuse + Chronic condition	3%	--	--	1%	2%	11%	--	--	2%	4%	2%	13%
Mental health + HIV	4%	11%	7%	4%	2%	--	7%	2%	0%	1%	0%	3%
HIV + Chronic condition	5%	12%	18%	4%	2%	--	--	--	0%	3%	0%	17%
Substance abuse + HIV	3%	11%	4%	0%	2%	0%	--	--	0%	1%	0%	3%
<i>One condition</i>												
Only Mental health	11%	--	--	14%	17%	2%	25%	24%	26%	17%	12%	0%
Only Chronic condition	6%	--	--	31%	11%	1%	--	--	--	--	--	--
--	--	6%	22%	14%	10%	--	--	--	--	--	--	--
Only HIV	6%	18%	15%	3%	1%	--	--	--	0%	2%	0%	7%
Only Substance abuse	3%	--	--	0%	5%	11%	--	--	2%	3%	7%	0%
None identified in study period*	6%	--	--	18%	7%	--	--	--	29%	22%	16%	13%

*This item does not mean that these recipients have never been diagnosed with any of these; only that none of these appeared as a diagnosis on any claims for services received during the pre-enrollment period

Note: "0%" is used when no clients fell into a particular category, while "--" is used when a diagnosis-based program would not enroll anyone in that category

The specific other chronic medical conditions measured are shown in the table below. Hypertension and diabetes are the most common of these diagnoses, affecting 20% and 18% of the MRT-SH participants, respectively. Significant num-

bers also had asthma, coronary heart disease, osteoarthritis, or COPD. One in a hundred suffered an acute myocardial infarction (heart attack) during the pre-enrollment period.

Table 2. Specific Types of Chronic Medical Conditions (Other than HIV) Present in MRT-SH Population

	All	AIDS Institute		East 99th	HHSP	OASAS	OMH		OPWDD	OTDA		
		Services only	Services & Subsidy				RSB	RSS		EPVA	HHAP	Pilot
Hypertension	20%	13%	8%	23%	15%	26%	27%	20%	16%	22%	14%	37%
Diabetes	18%	12%	12%	28%	12%	13%	24%	21%	27%	17%	12%	37%
Asthma	14%	14%	8%	10%	6%	15%	20%	16%	6%	14%	12%	20%
Coronary Heart Disease	11%	8%	14%	10%	13%	14%	15%	8%	0%	12%	5%	27%
Osteoarthritis	10%	11%	9%	10%	6%	10%	9%	12%	2%	8%	12%	17%
Chronic obstructive pulmonary disease	8%	7%	12%	6%	10%	11%	5%	10%	4%	5%	7%	27%
Cerebrovascular Disease	6%	5%	5%	5%	6%	7%	8%	7%	2%	5%	2%	13%
Chronic kidney disease	7%	9%	9%	9%	6%	7%	3%	3%	2%	6%	7%	27%
Congestive heart failure	3%	3%	3%	7%	3%	3%	2%	1%	2%	4%	7%	13%
Cancer	3%	3%	5%	7%	2%	3%	3%	1%	0%	3%	0%	0%
Angina	2%	3%	0%	1%	3%	3%	2%	1%	0%	3%	0%	0%
Acute Myocardial infarction	1%	1%	1%	1%	1%	2%	1%	1%	0%	2%	0%	0%

Health Care Utilization

The MRT-SH participants have high rates of inpatient and emergency department utilization, especially for care related to mental health conditions or substance abuse. In the 12 months prior to MRT-SH enrollment⁹, 44% had at least one inpatient admission, and more than half (60%) had at least one emergency department visit. These patients averaged, in the year prior to their MRT-SH enrollment, 10.1 inpatient days and 3.1 emergency department visits. More than 7% had spent time in an inpatient substance abuse rehabilitation center.

Virtually all of these services, however, were used significantly less following MRT-SH enrollment, regardless of whether they were measured by any use of the services or by volume of use.

Table 3. Inpatient and Emergency Department Utilization, Pre- and Post-Enrollment

	Pre	Post	Significance
<i>Inpatient utilization</i>			
Any inpatient care	44%	36%	***
Any inpatient mental health (defined by Dx)	12.0%	8.8%	***
Any inpatient substance abuse	18%	12%	***
Average number inpatient days	10.1	6.1	***
<i>Emergency department utilization</i>			
Any ED visits	60%	53%	***
Any ED visits - mental health	11.2%	7.8%	***
Any ED visits - substance abuse	10.2%	7.7%	***
Average number of ED visits	3.1	2.3	***
Average number of ED visits - mental health	0.22	0.17	***
Average number of ED visits - substance abuse	0.28	0.16	***
<i>Specific behavioral health services</i>			
Any Comprehensive Psychiatric Emergency Program (CPEP)	3.2%	3.3%	n.s.
Any psychiatric inpatient	10.0%	7.3%	***
Inpatient rehab	7.2%	4.0%	***
Inpatient detox	3.5%	2.6%	*

Note: Significance testing is done with nonparametric techniques, specifically the Wilcoxon test for count variables and the McNemar test for dichotomous variables. *** $p < 0.001$, * $p > 0.01$ & ≤ 0.05 , n.s. = not significant

There was, however, some variation by program in the extent of the reduction in service use. Specifically, the AIDS Institute program serving the New York City area (services only), the OASAS-RS and RSS programs, and HHAP

showed particular promise in terms of reducing inpatient days and/or emergency department visits.

Table 4. Inpatient Days and Emergency Visits by Program, Pre- and Post-Enrollment

	Inpatient Days			Emergency Visits		
	Pre	Post	Sig.	Pre	Post	Sig.
AIDS Institute						
Services only	8.8	6.0	**	2.5	1.9	**
Services + Subsidy	4.5	6.9	n.s.	4.1	3.8	n.s.
East 99th	3.5	3.3	n.s.	1.0	1.1	n.s.
Health Home Pilot	11.0	6.0	*	2.6	1.7	†
OASAS Rental Subsidies	23.4	12.0	***	6.1	3.6	***
OMH Rental - Brooklyn	8.6	5.1	*	2.1	2.0	n.s.
OMH Rental - Statewide	11.8	6.5	***	4.5	3.1	**
OPWDD	0.5	0.8	n.s.	0.6	0.7	n.s.
OTDA Eviction Prevention	3.4	2.1	n.s.	2.0	1.7	n.s.
Homeless Housing Program	4.1	1.3	*	2.3	1.5	**
OTDA Pilot	2.6	4.0	n.s.	1.3	0.7	†

*** $p < 0.001$, ** $p > 0.001$ & ≤ 0.01 , * $p > 0.01$ & ≤ 0.05 , † $p > 0.05$ & ≤ 0.10 , n.s. = not significant

Statistically significant reductions in both inpatient days and emergency department visits were obtained for all four major diagnostic groups studied, with persons with substance use disorders experiencing the largest average net reductions (7 inpatient days and 1.5 emergency department visits).

Table 5. Inpatient Days and Emergency Visits by Diagnostic Group, Pre- and Post-Enrollment

	Inpatient Days			Emergency Visits		
	Pre	Post	Sig.	Pre	Post	Sig.
Severe mental illness	12.0	6.8	***	3.7	2.6	***
Substance use disorder	15.8	8.8	***	4.4	2.9	***
HIV	8.2	5.9	***	3.0	2.3	***
Chronic medical condition	11.7	7.4	***	4.3	3.1	***

Note: There is significant overlap between these diagnostic groups; the categories are not mutually exclusive.

*** $p < 0.001$

The use of inpatient and emergency department services prior to MRT-SH enrollment varied according to the combinations of diagnoses these clients had. Generally, combinations that include a SUD were associated with higher utilization than combinations that did not include a SUD.

9 Six months for those in the Health Homes Supportive Housing Pilot or the OTDA Homeless Senior and Disabled Placement Pilot, and 9 months for those in the Homeless Housing and Assistance Program capital projects.

Table 6. Average Pre-Enrollment Inpatient Admissions, Inpatient Days, and ED Visits for Combinations of Comorbidities

	Inpatient Admissions	Inpatient Days	ED Visits
<i>All four conditions</i>			
SMI + SUD + HIV + Other chronic condition	3.0	14.8	4.9
<i>Three conditions</i>			
SMI + SUD + chronic condition (other than HIV)	2.7	20.3	6.8
HIV + SMI + Other chronic condition	1.2	6.2	3.6
SMI + SUD + HIV	1.6	11.1	2.9
HIV + SUD + Other chronic condition	2.5	11.5	3.8
<i>Two conditions</i>			
SMI + Chronic condition (other than HIV)	1.1	8.9	3.6
SMI + SUD	3.0	18.2	3.3
SUD + Chronic condition (other than HIV)	4.1	15.0	3.6
SMI + HIV	0.4	3.5	1.6
HIV + Chronic condition	1.0	5.4	3.8
SUD + HIV	1.4	10.1	1.8
<i>One condition</i>			
Only SMI	0.4	5.6	1.3
Only Chronic condition	0.6	3.3	1.4
Only HIV	0.2	0.8	0.7
Only SUD	6.0	12.4	3.4
<i>None identified in study period*</i>	0.1	3.2	0.6

*This does not mean that these recipients have never been diagnosed with any of these, only that none of these appeared as a diagnosis on any claims for services received during the study period.

Among those MRT-SH clients with a known referral source, the highest prevalence of inpatient care during the pre-enrollment period is among those referred from Article 28/31 hospitals, state psychiatric centers, and behavioral health treatment. This finding is not surprising, as those referred by hospitals or psychiatric centers were likely to have been receiving inpatient services from those institutions. Only those referred by behavioral health treatment had a statistically significant reduction in the likelihood of using inpatient care

post-enrollment, but this may have been because of the small numbers for Article 28/31 hospitals and psychiatric centers, as the absolute size of the reductions was substantial. Clients referred by Article 28/31 hospitals did, however, experience a significant reduction in inpatient days. Those referred by a homeless shelter or by Health Home care coordination also experienced significant reductions in both the likelihood of at least one inpatient stay and the average number of inpatient days.

Clients referred by homeless shelters and behavioral health treatment are the most likely to have had at least one ED visit during the pre-enrollment period. Both groups experienced significant drops in the percentage with an ED visit post-enrollment, as did those referred by self/family.

Table 7. Percent with Any Inpatient or Emergency Utilization and Average Inpatient Days, Pre- and Post-, by Referral Source

	Any Inpatient Admissions		Any ED Visits		Avg. Inpatient Days	
	Pre	Post	Pre	Post	Pre	Post
Self/Family/Other (n=224)	41%	37%	64%	55%*	7.3	6.1†
Homeless shelter (n=208)	49%	36%**	76%	58%***	11.0	5.9***
Health home care coordination (n=203)	46%	35%*	63%	59%	7.9	4.5***
Behavioral health treatment (n=93)	72%	57%*	71%	55%*	27.2	13.8***
Prevention/Intervention service (n=24)	58%	42%	67%	67%	11.6	5.9
Article 28/31 hospitals (n=22)	82%	64%	55%	73%	64.1	21.1*
Employer/Educational/Special service (n=22)	5%	9%	23%	36%	0.2	0.2
State psychiatric centers (n=15)	73%	47%	60%	67%	58.9	31.5
Other (n=81)	48%	37%	58%	49%	12.4	5.6**
Unknown (n=726)	36%	33%	52%	46%**	5.7	4.5*
Missing † (n=429)	44%	37%**	61%	54%*	11.2	6.5***

† Referral source data not updated for corrected sample

*** $p < 0.001$, ** $p > 0.001$ & $p < 0.01$, * $p > 0.01$ & $= < 0.05$, † $p > 0.05$ & < 0.10

It was anticipated that the decrease in behavioral health services received in an inpatient or emergency department setting would be partially explained by greater use of behavioral health services in outpatient settings¹⁰, preventing clients

¹⁰ Behavioral health services in an outpatient setting were defined as those for which the primary diagnosis was a severe mental illness or substance abuse disorder and where the category of service was one of the following: hospital-based outpatient; diagnostic and treatment center; physician services; case management; nurse practitioner; clinical social worker; or clinical psychology.

from reaching a level of acuity that would require inpatient or emergency care. In fact, overall outpatient behavioral health services also decreased. The decreases were statistically significant for all outpatient mental health and substance abuse services, for therapy and counseling, and for outpatient behavioral health not elsewhere classified. This finding, in combination with the lower rates of inpatient and emergency utilization, may instead represent stabilization in the condition of behavioral health clients, thus causing them to require fewer services overall.

Table 8. Utilization of Outpatient Mental Health and Substance Abuse Services, Overall and Selected Services, Pre- and Post-Enrollment

	Pre	Post	Sig.
<i>Outpatient behavioral health</i>			
All outpatient mental health services	12.5	11.3	***
All outpatient substance abuse services	17.8	13.0	***
Methadone maintenance	3.6	3.5	n.s.
Therapy and counseling	9.9	8.7	***
Medication management ¹¹	2.3	2.3	n.s.
Other outpatient behavioral health	15.2	10.1	***

*** $p < 0.001$, n.s. = not significant

¹¹ Medication management was defined by the combination of evaluation and management (E&M) codes with a behavioral health diagnosis.

PROGRAM SPECIFIC ANALYSES

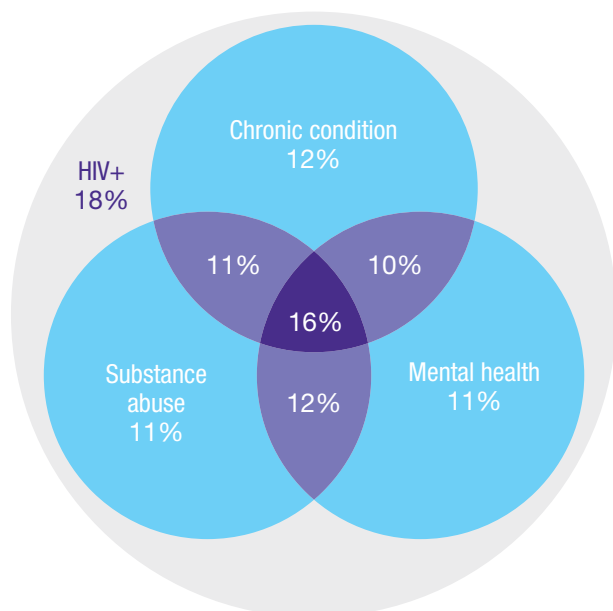
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AIDS Institute – Services Only

Persons enrolled in the AIDS Institute services-only programs (n=524) are all HIV positive. Forty-eight percent have a diagnosed severe mental illness (SMI), 50% have an active substance abuse disorder diagnosis, and 48% have another chronic condition. Sixteen percent have all four types of conditions, while 18% have HIV alone.

Figure 9. Overlap Between Types of Chronic Conditions Among AIDS Institute Services-Only Enrollees



Note: To obtain total percentage of participants with a given diagnosis, sum all percentages that fall into the relevant circle (sum may not exactly match text due to rounding). The “18%” that falls below the “HIV+” label refers to the proportion of the participants who have no other diagnosis. Circles are not sized proportionately.

Inpatient hospitalizations were high among this group in both the pre- and post-period, with 46% experiencing at least one inpatient hospitalization during the year prior to MRT-SH enrollment and 42% experiencing at least one inpatient hospitalization during the year following enrollment. This difference was not statistically significant. There was, however, a statistically significant decrease in the average number of inpatient days between the pre- and post-periods – from 8.8 to 6.0 (p=0.003).

Enrollees were less likely to have any emergency department visits (from 56% to 52%, p=0.078), and also had significantly fewer emergency department visits (from 2.5 to 1.9, p=0.002). The percentage of enrollees with any emergency department visits for mental health or substance abuse also dropped.

Table 9. Inpatient and Emergency Department Utilization, Pre- and Post-Enrollment

	Pre	Post	Sig.
<i>Inpatient utilization</i>			
Any inpatient care	46%	42%	n.s.
Any inpatient mental health	5.2%	4.4%	n.s.
Any inpatient substance abuse	20%	19%	n.s.
Average number inpatient days	8.8	6.0	**
<i>Emergency department utilization</i>			
Any ED visits	56%	52%	†
Any ED visits - mental health	4.2%	2.9%	n.s.
Any ED visits - substance abuse	8.8%	6.5%	n.s.
Average number of ED visits	2.5	1.9	**
Average number of ED visits - mental health	0.07	0.04	†
Average number of ED visits - substance abuse	0.19	0.12	n.s.
<i>Specific behavioral health services</i>			
Any CPEP	2.3%	2.3%	n.s.
Any psychiatric inpatient	3.8%	2.3%	*
Inpatient rehab	5.0%	4.2%	n.s.
Inpatient detox	3.6%	3.1%	n.s.

** p > 0.001 & ≤ 0.01, *p > 0.01 & ≤ 0.05, †p > 0.05 & < 0.10, n.s. = not significant

Enrollees in the AIDS Institute “services only” program had more outpatient mental health visits in the 12 months following their enrollment, as well as more outpatient substance abuse services (although neither difference was statistically significant). In particular, they had more medication management visits (1.7 versus 1.3, p=0.036).

Table 10. Utilization of Outpatient Mental Health and Substance Abuse Services, Overall and Selected Services, Pre- and Post-Enrollment

	Pre	Post	Sig.
<i>Outpatient behavioral health visits</i>			
All outpatient mental health services	4.9	5.5	†
All outpatient substance abuse services	13.2	15.6	n.s.
<i>Specific outpatient behavioral health services</i>			
Methadone maintenance	6.9	6.8	n.s.
Therapy and counseling	5.5	7.0	n.s.
Medication management	1.3	1.7	*
Other outpatient behavioral health	5.5	5.9	n.s.

*p > 0.01 & ≤ 0.05, †p > 0.05 & < 0.10, n.s. = not significant

Use of inpatient and emergency department visits during the pre-enrollment period for AIDS Institute “services only” clients tended to be predicted primarily by comorbidities (although there was a negative effect of age on inpatient admissions that was not quite statistically significant). Clients with a comorbid substance use disorder had signifi-

cantly more inpatient admissions (about 1.7) and inpatient days (about 9.7) than those without. Similarly, those with a comorbid chronic medical condition had significantly more inpatient admissions and ED visits, as well as more inpatient days (the latter not quite statistically significant).

Table 11. Predictors of Pre-Enrollment Inpatient Admissions, Inpatient Days, and Emergency Department Visits among AIDS Institute “Services only” Clients

Model	Inpatient Admissions			Inpatient Days			ED Visits		
	Unstandardized Coefficients		Sig.	Unstandardized Coefficients		Sig.	Unstandardized Coefficients		Sig.
B	Std. Error	B		Std. Error	B		Std. Error		
(Constant)	-0.263	0.500		2.264	3.289		0.276	1.082	
Age at Enrollment (in years, mean-centered for HIV population)	-0.025	0.013	†	0.016	0.089		-0.042	0.029	
<i>Race/Ethnicity</i>									
Non-Hispanic white (Ref. category)	--	--		--	--		--	--	
Non-Hispanic Black (1=yes)	-0.029	0.495		-1.103	3.257		0.780	1.071	
Hispanic (1=yes)	0.063	0.514		-1.941	3.381		0.380	1.112	
Multiracial/Other (1=yes)	0.665	0.835		3.652	5.492		0.500	1.806	
<i>Sex</i>									
Male (Ref. category)	--	--		--	--		--	--	
Female (1=yes)	0.271	0.283		-0.257	1.860		-0.120	0.612	
<i>Comorbidities</i>									
Severe mental illness (1=yes)	0.370	0.271		2.292	1.781		-0.126	0.586	
Substance use disorder (1=yes)	1.736	0.271	***	9.741	1.781	***	0.747	0.586	
Other chronic condition (1=yes)	1.451	0.279	***	3.553	1.832	†	2.799	0.603	***

*** $p < 0.001$, † $p > 0.05$ & < 0.10

Male clients had a greater pre-post reduction in inpatient days than female clients (3.3 versus 1.6), while female clients had a greater reduction in the likelihood of any ED visits (11 percentage points versus 2 for men). Generally, only Hispanic clients had statistically significant reductions in inpatient or emergency care, although non-Hispanic black clients had a smaller but significant reduction in ED visits. Multiracial clients or those of other or unknown race experienced increases in their inpatient and emergency utilization, but their

number in the program was relatively small (n=19), and none of these increases were statistically significant (although the increase in any inpatient admissions was close to significant).

The largest decreases in inpatient and emergency care were observed among those with a comorbid substance use disorder, although those with comorbid severe mental illness or chronic medical conditions also experienced significant decreases in at least some of these metrics.

Table 12. Pre- and Post-Enrollment Utilization of Inpatient and Emergency Care by Client Characteristics

AIDS Institute “services only”	Inpt Days		ED Visits		Any Inpt		Any ED	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
<i>Sex</i>								
Male (n=345)	8.8	5.5*	2.5	1.8*	43%	41%	51%	49%
Female (n=179)	8.7	7.1†	2.6	2.1*	50%	45%	67%	56%*
<i>Race/ethnicity</i>								
Non-Hispanic white (n=44)	9.3	3.5	1.8	1.9	32%	41%	52%	57%
Non-Hispanic black (n=285)	8.5	6.8	2.8	2.2*	46%	44%	58%	55%
Hispanic (any race) (n=176)	8.7	4.7***	2.4	1.4**	51%	38%**	54%	43%*
Multiracial/Other (n=19)	12	13.1	1.8	1.9	26%	53%†	63%	68%
<i>Comorbidities</i>								
Severe mental illness (n=252)	10.9	8.1**	2.7	2.0*	53%	47%	64%	54%**
Substance use disorder (n=261)	13.9	7.8***	3	2.0***	63%	52%**	62%	57%*
Chronic condition (n=254)	11.1	8.6†	3.9	2.8**	58%	52%	68%	61%†

*** $p < 0.001$, ** $p > 0.001$ & $p < 0.01$, * $p > 0.01$ & $= < 0.05$, † $p > 0.05$ & < 0.10

Very few factors significantly predicted the magnitude of pre-post change in the AIDS Institute “services only” program. The decreases in inpatient admission and inpatient days were larger for clients with a substance use disorder than for those with no comorbid conditions. The decrease in

ED visits was also significantly greater for clients with another chronic medical condition beyond HIV. Client demographics, however, were not predictive of changes in utilization between the pre- and post-enrollment period.

Table 13. Predictors of Pre-Post Changes in Inpatient and ED Utilization among AIDS Institute “Services Only” Clients

Model	Δ Inpatient Admissions			Δ Inpatient Days			Δ ED Visits		
	Unstandardized Coefficients		Sig.	Unstandardized Coefficients		Sig.	Unstandardized Coefficients		Sig.
	B	Std. Error		B	Std. Error		B	Std. Error	
(Constant)	0.388	0.430		-4.238	3.250		0.703	0.719	
Age at Enrollment (in years, mean-centered for HIV population)	0.006	0.012		-0.113	0.088		0.011	0.019	
<i>Race/Ethnicity</i>									
Non-Hispanic white (Ref. category)	--	--		--	--		--	--	
Non-Hispanic Black (1=yes)	0.003	0.426		4.007	3.218		-0.686	0.712	
Hispanic (1=yes)	-0.448	0.442		2.392	3.341		-1.100	0.740	
Multiracial/Other (1=yes)	0.245	0.718		6.732	5.427		-0.274	1.201	
<i>Sex</i>									
Male (Ref. category)	--	--		--	--		--	--	
Female (1=yes)	0.107	0.243		1.143	1.838		0.258	0.407	
<i>Comorbidities</i>									
Severe mental illness (1=yes)	-0.113	0.233		0.876	1.760		0.081	0.390	
Substance use disorder (1=yes)	-0.712	0.233	**	-6.824	1.759	***	-0.539	0.390	
Other chronic condition (1=yes)	-0.328	0.240		1.534	1.811		-0.911	0.401	*

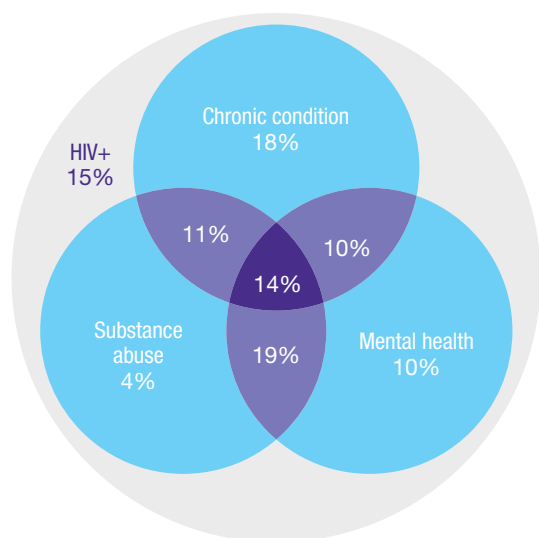
*** $p < 0.001$, ** $p > 0.001$ & $p < 0.01$, * $p > 0.01$ & $= < 0.05$

Summary. The AIDS Institute services-only program serves a very at-risk population with high rates of medical and behavioral health comorbidities. Following MRT-SH enrollment, these patients experienced fewer inpatient days and fewer emergency department visits. While clients with a SUD or other chronic condition particularly saw reductions, this decrease in service utilization was not especially linked to any demographic factors. Clients also receive more outpatient mental health services following enrollment, particularly medication management.

AIDS Institute – Services + Subsidy

Persons enrolled in the AIDS Institute Rental Subsidy programs (n=74) are all HIV positive. Fifty-three percent have a diagnosed severe mental illness (SMI), 49% have an active substance abuse disorder diagnosis, and 53% have another chronic condition. Fourteen percent have all four types of conditions, while 15% have HIV alone.

Figure 10. Overlap Between Types of Chronic Conditions Among AIDS Institute Rental Subsidy Enrollees



Note: To obtain total percentage of participants with a given diagnosis, sum all percentages that fall into the relevant circle (sum may not exactly match text due to rounding). The “15%” that falls below the “HIV+” label refers to the proportion of the participants who have no other diagnosis. Circles are not sized proportionately.

The percentage of clients with at least one inpatient hospitalization appeared to increase among this group between the pre- and post-period, from 36% to 45% (not statistically significant, however). Enrollees were less likely to have any emergency department visits (from 73% to 64%), but this was also not statistically significant.

Table 14. Inpatient and Emergency Department Utilization, Pre- and Post-Enrollment

	Pre	Post	Sig.
<i>Inpatient utilization</i>			
Any inpatient care	36%	45%	n.s.
Any inpatient mental health	9.5%	12.2%	n.s.
Any inpatient substance abuse	12%	14%	n.s.
Average number inpatient days	4.5	6.9	n.s.
<i>Emergency department utilization</i>			
Any ED visits	73%	64%	n.s.
Any ED visits - mental health	10.8%	8.1%	n.s.
Any ED visits - substance abuse	9.5%	12.2%	n.s.
Average number of ED visits	4.1	3.8	n.s.
Average number of ED visits - mental health	0.16	0.23	n.s.
Average number of ED visits - substance abuse	0.24	0.28	n.s.
<i>Specific behavioral health services</i>			
Any CPEP	4.1%	4.1%	n.s.
Any psychiatric inpatient	8.1%	10.8%	n.s.
Inpatient rehab	6.8%	5.4%	n.s.
Inpatient detox	1.4%	1.4%	n.s.

n.s. = not significant

Enrollees in the AIDS Institute Rental Subsidies program had more outpatient behavioral health services in the 12 months following their enrollment (although difference was not statistically significant). This was true of all of the categories broken out, but only methadone maintenance approached statistical significance ($p=0.068$).

Table 15. Utilization of Outpatient Mental Health and Substance Abuse Services, Overall and Selected Services, Pre- and Post-Enrollment

	Pre	Post	Sig.
<i>Outpatient behavioral health visits</i>			
All outpatient mental health services	4.9	5.1	n.s.
All outpatient substance abuse services	3.7	6.6	n.s.
<i>Specific outpatient behavioral health services</i>			
Methadone maintenance	0.7	1.7	†
Therapy and counseling	2.3	4.4	n.s.
Medication management	1.0	1.2	n.s.
Other outpatient behavioral health	4.9	5.0	n.s.

†p>0.05 & <0.10, n.s. = not significant

As in the AIDS Institute “services only” program, the primary predictors of inpatient admissions, inpatient days, and ED visits for “services and subsidy” clients tended to be comorbid conditions. Having a comorbid SMI was associated with 3.3 more ED visits, while having a comorbid SUD was associated with 0.9 additional inpatient admissions and 8.5 additional inpatient days. Having a chronic medical condition was associated with 3.9 additional ED visits.

Greater age at enrollment was, somewhat unexpectedly, associated with significantly fewer ED visits, and Hispanic clients had 8.6 fewer inpatient days than non-Hispanic whites. There were few clients who were multiracial or some other race (n=5), but they experienced significantly more inpatient admissions and ED visits than non-Hispanic white clients. Given the very small number of clients, caution should be used in attaching any importance to this latter finding.

Table 16. Predictors of Pre-Enrollment Inpatient Admissions, Inpatient Days, and Emergency Department Visits among AIDS Institute “Services and Subsidies” Clients

Model	Inpatient Admissions			Inpatient Days			ED Visits		
	Unstandardized Coefficients		Sig.	Unstandardized Coefficients		Sig.	Unstandardized Coefficients		Sig.
B	Std. Error	B		Std. Error	B		Std. Error		
(Constant)	-0.113	0.531		3.421	2.982		-0.699	1.437	
Age at Enrollment (in years, mean-centered for HIV population)	-0.011	0.021		0.165	0.120		-0.118	0.058	*
<i>Race/Ethnicity</i>									
Non-Hispanic white (Ref. category)	--	--		--	--		--	--	
Non-Hispanic Black (1=yes)	-0.348	0.475		-1.605	2.666		-1.015	1.285	
Hispanic (1=yes)	-0.586	0.730		-8.629	4.098	*	-0.054	1.974	
Multiracial/Other (1=yes)	2.227	0.830	**	0.776	4.664		11.878	2.247	***
<i>Sex</i>									
Male (Ref. category)	--	--		--	--		--	--	
Female (1=yes)	-0.212	0.466		-1.208	2.618		-1.626	1.262	
<i>Comorbidities</i>									
Severe mental illness (1=yes)	0.839	0.427	†	1.478	2.399		3.292	1.156	**
Substance use disorder (1=yes)	0.906	0.435	*	8.511	2.443	***	1.914	1.177	
Other chronic condition (1=yes)	0.718	0.419	†	-1.779	2.353		3.882	1.134	***

*** $p < 0.001$, ** $p > 0.001$ & $p < 0.01$, * $p > 0.01$ & $= < 0.05$, † $p > 0.05$ & < 0.10

No demographic or clinical subgroup experienced a significant pre-post change in inpatient or emergency department

use, although clients with a SMI had a close-to-significant drop in the likelihood of having at least one ED visit.

Table 17. Pre- and Post-Enrollment Utilization of Inpatient and Emergency Care by Client Characteristics

	Inpatient Days		ED Visits		Any Inpatient Admissions		Any ED Visits	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
<i>Sex</i>								
Male (n=32)	4.8	7.5	4.2	2.7	31%	34%	66%	50%
Female (n=42)	4.2	6.5	4.0	4.7	40%	52%	79%	76%
<i>Race/ethnicity</i>								
Non-Hispanic white (n=33)	6.1	7.6	3.6	3.5	42%	45%	79%	64%
Non-Hispanic black (n=29)	3.2	8.3	2.8	2.7	28%	41%	66%	59%
Hispanic (any race) (n=7)	1.3	1.0	3.3	3.3	29%	57%	71%	86%
Multiracial/Other (n=5)	6.0	2.8	15.47	13.4	60%	40%	80%	80%
<i>Comorbidities</i>								
Severe mental illness (n=39)	6.6	6.8	5.5	5.2	54%	54%	85%	67%†
Substance use disorder (n=36)	8.6	7.2	5.4	4.4	61%	58%	92%	69%
Chronic condition (n=39)	3.9	8.5	5.5	4.9	44%	59%	82%	79%

† $p > 0.05$ & < 0.10

Table 18. Predictors of Pre-Post Changes in Inpatient and ED Utilization among AIDS Institute “Services and Subsidies” Clients

Model	Δ Inpatient Admissions			Δ Inpatient Days			Δ ED Visits		
	Unstandardized Coefficients		Sig.	Unstandardized Coefficients		Sig.	Unstandardized Coefficients		Sig.
B	Std. Error	B		Std. Error	B		Std. Error		
(Constant)	0.126	0.679		3.335	8.787		-0.880	1.655	
Age at Enrollment (in years, mean-centered for HIV population)	-0.021	0.027		-0.063	0.353		0.021	0.067	
<i>Race/Ethnicity</i>									
Non-Hispanic white (Ref. category)	--	--		--	--		--	--	
Non-Hispanic Black (1=yes)	0.686	0.607		1.799	7.856		0.976	1.480	
Hispanic (1=yes)	0.522	0.933		0.937	12.074		0.714	2.274	
Multiracial/Other (1=yes)	-0.931	1.061		-6.237	13.742		-0.961	2.588	
<i>Sex</i>									
Male (Ref. category)	--	--		--	--		--	--	
Female (1=yes)	0.212	0.596		0.753	7.715		3.033	1.453	*
<i>Comorbidities</i>									
Severe mental illness (1=yes)	0.449	0.546		-1.830	7.070		0.219	1.331	
Substance use disorder (1=yes)	-1.300	0.556	*	-6.960	7.199		-1.992	1.356	
Other chronic condition (1=yes)	0.716	0.536		4.452	6.934		-0.969	1.306	

* $p > 0.01$ & $= < 0.05$

Few factors predicted pre-post differences among AIDS Institute “services and subsidies” clients. Clients with a SUD experienced a significantly greater decrease in inpatient

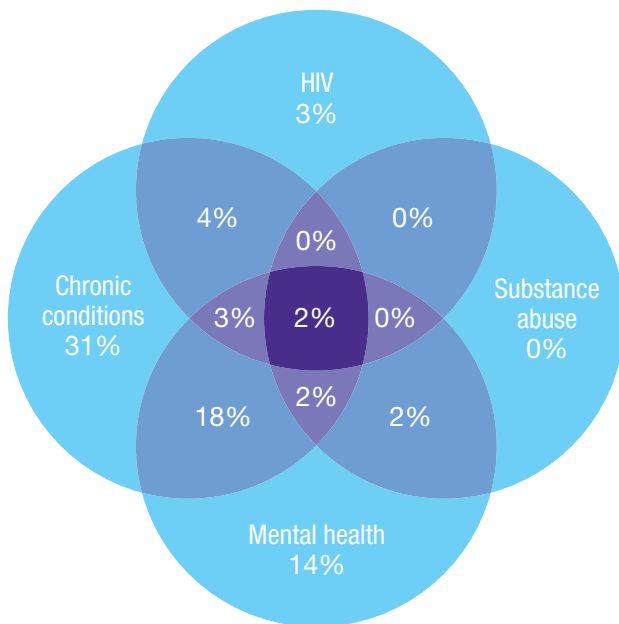
admissions than those without a SUD, while women in the program experienced a significant increase in ED visits net of other factors.

Summary. For unknown reasons, the use of inpatient services appeared to increase following MRT-SH enrollment for clients in the AIDS Institute Rental Subsidy program. These findings, however, were not statistically significant and therefore may be due to random variation. The lower likelihood of using the emergency department is in the expected direction, although also not statistically significant. There may be an increase in the use of outpatient behavioral health services, particularly methadone maintenance. While these trends are interesting and raise many questions, the lack of statistical significance for any of these findings makes it difficult to determine if these patterns are genuine.

East 99th Street

The East 99th Street population (n=137) has a high rate of chronic medical conditions other than behavioral health or HIV. Sixty percent had at least one chronic condition, while 43% had an active SMI diagnosis, 6% had a substance abuse disorder, and 15% had HIV. Two percent had all four types of chronic conditions; 31% had a chronic medical condition (other than behavioral health and HIV) alone.

Figure 11. Overlap Between Types of Chronic Conditions among East 99th Street Enrollees



Not shown are HIV+SMI (3.6%), SUD + chronic conditions (0.7%), and none (18%).
 To obtain total percentage of participants with a given diagnosis, sum all percentages that fall into the relevant circle (sum may not exactly match text due to rounding).
 Circles are not sized proportionately.

The percentage of enrollees experiencing at least one inpatient hospitalization was slightly higher in the year after MRT-SH enrollment than before (31% versus 27%), but this was not statistically significant. The average number of inpatient days declined slightly (from 3.5 to 3.3), but this was not statistically significant either. Very small numbers of this population had inpatient stays for mental health or substance abuse either before or after MRT-SH enrollment. Similarly, the likelihood of experiencing at least one ED visit increased slightly (from 35% to 37%), but this was not a statistically significant difference.

Table 19. Inpatient and Emergency Department Utilization, Pre- and Post-Enrollment

	Pre	Post	Sig.
<i>Inpatient utilization</i>			
Any inpatient care	27%	31%	n.s.
Any inpatient mental health	2.2%	2.9%	n.s.
Any inpatient substance abuse	1.5%	2.2%	n.s.
Average number inpatient days	3.5	3.3	n.s.
<i>Emergency department utilization</i>			
Any ED visits	35%	37%	n.s.
Any ED visits - mental health	1.5%	2.9%	n.s.
Any ED visits - substance abuse	1.5%	1.5%	n.s.
Average number of ED visits	1.0	1.1	n.s.

n.s. = not significant

These participants received more outpatient substance abuse services following their MRT-SH enrollment, with methadone maintenance being statistically significant. They also had significantly more visits for medication management for behavioral health conditions, despite receiving fewer outpatient mental health services overall and fewer visits for therapy and counseling.

Table 20. Utilization of Outpatient Mental Health and Substance Abuse Services, Overall and Selected Services, Pre- and Post-Enrollment

	Pre	Post	Sig.
<i>Outpatient behavioral health visits</i>			
All outpatient mental health services	12.1	9.9	n.s.
All outpatient substance abuse services	0.9	3.2	†
<i>Specific outpatient behavioral health services</i>			
Methadone maintenance	0.4	1.6	*
Therapy and counseling	4.5	3.1	†
Medication management	1.1	1.4	*
Other outpatient behavioral health	7.1	7.0	n.s.

*p>0.01 & =<0.05, †p>0.05 & <0.10, n.s. = not significant

There were few significant predictors of inpatient or ED use during the pre-enrollment period for clients in East 99th Street. Age at enrollment was associated with significantly fewer ED visits, although the effect was small (a decrease of about 0.4 visits per 10-year increase in age). Those with

a SUD experienced significantly more inpatient days (11.7 on average) and ED visits (3.6). Having a chronic medical condition was also associated with greater utilization – in all 3 categories – but none of these relationships were quite statistically significant.

Table 21. Predictors of Pre-Enrollment Inpatient Admissions, Inpatient Days, and Emergency Department Visits among East 99th Street Residents

	Inpatient Admissions			Inpatient Days			ED Visits		
	Unstandardized Coefficients		Sig.	Unstandardized Coefficients		Sig.	Unstandardized Coefficients		Sig.
	B	Std. Error		B	Std. Error		B	Std. Error	
(Constant)	-0.040	0.429		-0.411	2.960		-0.444	0.594	
Age at Enrollment (in years, mean-centered for chronic conditions population)	-0.007	0.010		-0.083	0.071		-0.038	0.014	**
<i>Race/Ethnicity</i>									
Non-Hispanic white (Ref. category)	--	--		--	--		--	--	
Non-Hispanic Black (1=yes)	0.498	0.463		2.830	3.194		0.992	0.641	
Hispanic (1=yes)	0.214	0.482		1.724	3.330		0.254	0.668	
Multiracial/Other (1=yes)	-0.188	0.629		4.364	4.342		1.119	0.871	
<i>Sex</i>									
Male (Ref. category)	--	--		--	--		--	--	
Female (1=yes)	-0.210	0.262		-0.036	1.811		0.440	0.363	
<i>Comorbidities</i>									
Severe mental illness (1=yes)	0.293	0.303		-0.107	2.095		0.652	0.420	
Substance use disorder (1=yes)	0.829	0.564		11.710	3.893	**	3.648	0.781	***
HIV+ (1=yes)	-0.257	0.352		-2.377	2.426		-0.186	0.487	
Other chronic condition (1=yes)	0.532	0.270	†	3.398	1.862	†	0.733	0.374	†

*** $p < 0.001$, ** $p > 0.001$ & $p < 0.01$, † $p > 0.05$ & < 0.10

Statistically significant pre-post changes were not found for any of the demographic and clinical subgroups examined except for those with a SUD, who experienced an average

decrease of 3.9 ED visits. Some of the changes were large, but the modest sizes of the subgroups kept most from approaching statistical significance.

Table 22. Pre- and Post-Enrollment Utilization of Inpatient and Emergency Care by Client Characteristics

	Inpatient Days		ED Visits		Any Inpatient Admissions		Any ED Visits	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
<i>Sex</i>								
Male (n=76)	3.9	2.9	0.9	1.0	26%	33%	36%	34%
Female (n=61)	3.1	3.9	1.1	1.3	28%	28%	34%	39%
<i>Race/ethnicity</i>								
Non-Hispanic white (n=13)	1.8	7.1	0.6	0.6	23%	31%	23%	15%
Non-Hispanic black (n=60)	4.0	3.3	1.2	1.3	28%	30%	45%	42%
Hispanic (any race) (n=54)	2.9	1.5	0.6	1.7	30%	33%	30%	41%
Multiracial/Other (n=10)	6.2	8.8	2.0	0.7	10%	20%	20%	10%
<i>Comorbidities</i>								
Severe mental illness (n=59)	4.5	3.0	1.8	1.4	31%	24%	49%	39%
Substance use disorder (n=8)	14.8	11.0	4.9	1.0*	63%	38%	75%	25%
HIV+ (n=21)	2.6	2.5	1.3	1.2	19%	33%	33%	43%
Chronic condition (n=82)	5.0	4.3	1.3	1.4	34%	35%	39%	44%

* $p > 0.01$ & $= < 0.05$

The only factor that significantly predicted the magnitude of pre-post changes among East 99th Street residents was having a SUD. Clients with a SUD experienced a greater decrease in ED visits than clients without a SUD. Black and

Hispanic clients also experienced a greater decrease in inpatient days than non-Hispanic white clients, but these relationships were not quite statistically significant.

Table 23. Predictors of Pre-Post Changes in Inpatient and ED Utilization among East 99th Street Residents

Model	Δ Inpatient Admissions			Δ Inpatient Days			Δ ED Visits		
	Unstandardized Coefficients			Unstandardized Coefficients			Unstandardized Coefficients		
	B	Std. Error	Sig.	B	Std. Error	Sig.	B	Std. Error	Sig.
(Constant)	1.072	0.586	†	6.162	3.192	†	0.678	0.661	
Age at Enrollment (in years, mean-centered for chronic conditions population)	-0.010	0.014		-0.023	0.076		0.020	0.016	
<i>Race/Ethnicity</i>									
Non-Hispanic white (Ref. category)	--	--		--	--		--	--	
Non-Hispanic Black (1=yes)	-0.963	0.632		-6.756	3.444	†	-0.571	0.714	
Hispanic (1=yes)	-0.765	0.659		-6.984	3.591	†	-0.106	0.744	
Multiracial/Other (1=yes)	0.566	0.859		-1.988	4.682		-1.505	0.970	
<i>Sex</i>									
Male (Ref. category)	--	--		--	--		--	--	
Female (1=yes)	0.476	0.358		2.433	1.953		-0.151	0.405	
<i>Comorbidities</i>									
Severe mental illness (1=yes)	-0.625	0.415		-2.937	2.259		-0.107	0.468	
Substance use disorder (1=yes)	0.507	0.770		-3.701	4.198		-4.111	0.870	***
HIV+ (1=yes)	-0.056	0.480		1.361	2.616		0.169	0.542	
Other chronic condition (1=yes)	-0.176	0.369		-0.255	2.008		0.027	0.416	

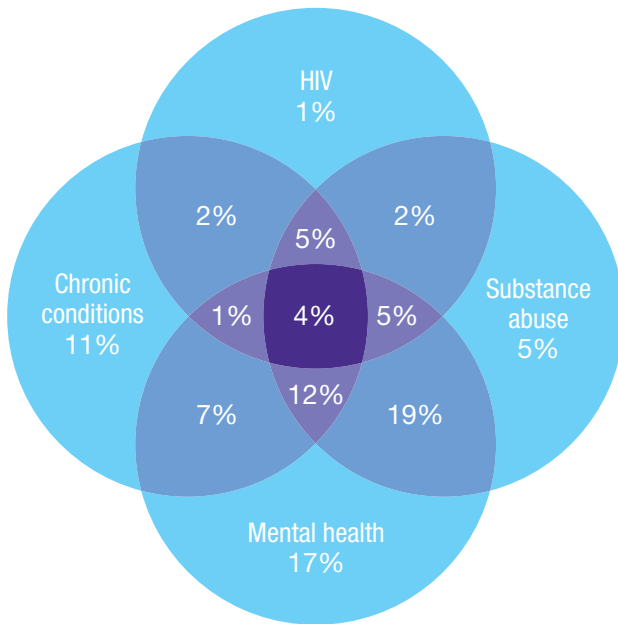
*** $p < 0.001$, ** $p > 0.001$ & $p < 0.01$, * $p > 0.01$ & $= < 0.05$, † $p > 0.05$ & < 0.10

Summary. There were no statistically significant differences in the use of inpatient or emergency department care or primary care among East 99th residents overall following their MRT-SH enrollment, although a decrease in ED visits was significantly associated with having a SUD diagnosis. East 99th residents used significantly more outpatient substance abuse services (specifically more methadone maintenance) and had more visits for medication management for behavioral health.

Health Homes Supportive Housing Pilot

The Health Homes Supportive Housing population (n=109) are Health Home enrolled and have two or more chronic conditions or one single qualifying condition (HIV/AIDS or SMI). Sixty-five percent of the persons enrolled in the program have a high rate of SMI (65%), SUD (52%), HIV (20%) and other chronic medical conditions (42%).

Figure 12. Overlap Between Types of Chronic Conditions among HHSP Project Enrollees



Not shown are SUD + chronic medical condition (2%), SMI + HIV (2%), and none (7%).
To obtain total percentage of participants with a given diagnosis, sum all percentages that fall into the relevant circle (sum may not exactly match text due to rounding).
Circles are not sized proportionately.

While the percent with at least one inpatient admission did not significantly decline, the average number of inpatient days was significantly lower in the year after enrollment (6 versus 11). Emergency department visits also declined, especially for mental health, substance abuse, but these relationships did not quite meet the threshold for statistical significance.

Table 24. Inpatient and Emergency Department Utilization, Pre- and Post-Enrollment

	Pre	Post	Sig.
<i>Inpatient utilization</i>			
Any inpatient care	39%	29%	n.s.
Any inpatient mental health	16%	11%	n.s.
Any inpatient substance abuse	14%	6%	†
Average number inpatient days	11.0	6.0	*
<i>Emergency department utilization</i>			
Any ED visits	62%	55%	n.s.
Any ED visits - mental health	14%	6%	†
Any ED visits - substance abuse	13%	6%	†
Average number of ED visits	2.6	1.7	†

* $p > 0.01$ & $= < 0.05$, † $p > 0.05$ & < 0.10 , n.s. = not significant

For the most part, the volume of outpatient behavioral health services did not significantly change following MRT-SH enrollment. Use of overall outpatient mental health services increased slightly, while use of overall outpatient substance abuse services decreased (neither change was statistically significant). Clients did, however, receive significantly more methadone maintenance. There was also a significant decrease in outpatient behavioral health other than methadone, therapy, and medication management.

Table 25. Utilization of Outpatient Mental Health and Substance Abuse Services, Overall and Selected Services, Pre- and Post-Enrollment

	Pre	Post	Sig.
<i>Outpatient behavioral health visits</i>			
All outpatient mental health services	6.8	7.2	n.s.
All outpatient substance abuse services	11.0	7.9	n.s.
<i>Specific outpatient behavioral health services</i>			
Methadone maintenance	0.7	1.4	**
Therapy and counseling	7.4	6.9	n.s.
Medication management	1.5	1.5	n.s.
Other outpatient behavioral health	8.3	5.5	*

** $p > 0.001$ & $= < 0.01$, * $p > 0.01$ & $= < 0.05$, n.s. = not significant

There were very few statistically significant predictors of inpatient admissions, inpatient days, or ED visits during the pre-enrollment period for the HHSP clients. Those with a

chronic medical condition experienced 1.0 more inpatient admission than those with none, while those with a SUD experienced 2.0 more ED visits than those without.

Table 26. Predictors of Pre-Enrollment Inpatient Admissions, Inpatient Days, and Emergency Department Visits among HHSP Clients

	Inpatient Admissions			Inpatient Days			ED Visits		
	Unstandardized Coefficients		Sig.	Unstandardized Coefficients		Sig.	Unstandardized Coefficients		Sig.
	B	Std. Error		B	Std. Error		B	Std. Error	
(Constant)	0.271	0.616		8.875	10.149		1.386	1.089	
Age at Enrollment (in years, mean-centered for MRT population)	-0.034	0.021		0.028	0.339		-0.023	0.036	
<i>Race/Ethnicity</i>									
Non-Hispanic white (Ref. category)	--	--		--	--		--	--	
Non-Hispanic Black (1=yes)	0.065	0.615		4.377	10.138		-0.025	1.087	
Hispanic (1=yes)	-0.170	0.745		-7.805	12.281		2.153	1.317	
Multiracial/Other (1=yes)	-0.643	0.775		-9.473	12.768		-2.114	1.369	
<i>Sex</i>									
Male (Ref. category)	--	--		--	--		--	--	
Female (1=yes)	-0.150	0.472		9.545	7.780		0.103	0.834	
<i>Geography</i>									
New York City (1=yes)	0.227	0.545		11.156	8.975		-1.459	0.963	
Other NYS (Ref. category)	--	--		--	--		--	--	
<i>Comorbidities</i>									
Severe mental illness (1=yes)	0.140	0.500		-6.659	8.235		0.146	0.883	
Substance use disorder (1=yes)	0.694	0.480		1.773	7.906		2.033	0.848	*
HIV+ (1=yes)	-0.272	0.607		-4.136	9.994		-0.011	1.072	
Other chronic condition (1=yes)	1.032	0.455	*	-2.813	7.490		1.287	0.803	

* $p > 0.01$ & $= < 0.05$,

While there are differences between subgroups in whether pre-post changes are statistically significant, much of this seems to be more driven by the size of the group than by the size of the change. Male clients clearly have a larger reduction in ED visits than female clients (statistically significant), but female clients have a larger (but not statistically significant) reduction in inpatient days. Only non-Hispanic white clients have a statistically significant reduction in inpatient days, although the net size of the reduction is larger for non-Hispanic black clients.

Clients with a diagnosed SMI or SUD are significantly less likely to have any inpatient days and have significantly fewer inpatient days on average during the post-enrollment period. Clients with a SUD or a chronic medical condition also have significantly fewer ED visits (and those with a chronic medical condition are significantly less likely to have any ED visits). Those with HIV have fewer ED visits, but this is not quite statistically significant.

Table 27. Pre- and Post-Enrollment Utilization of Inpatient and Emergency Care by Client Characteristics

	Inpatient Days		ED Visits		Any Inpatient Admissions		Any ED Visits	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
<i>Sex</i>								
Male (n=67)	8.5	4.9*	2.5	1.2*	42%	33%	58%	48%
Female (n=42)	14.9	7.8	2.7	2.4	36%	24%	69%	67%
<i>Race/ethnicity</i>								
Non-Hispanic white (n=52)	9.4	4.6*	3.0	2.0†	23%	31%	23%	15%
Non-Hispanic black (n=31)	19.4	11.8	1.9	1.8	28%	30%	45%	42%
Hispanic (any race) (n=15)	4.7	3.1	3.7	0.9	30%	33%	30%	41%
Multiracial/Other (n=11)	3.0	0.3	0.8	0.9	10%	20%	20%	10%
<i>Geography</i>								
New York City (n=45)	16.5	7.6	1.9	1.1	38%	29%	49%	51%
Other NYS (n=64)	7.1	4.9†	3.1	2.1	41%	30%	72%	58%†
<i>Comorbidities</i>								
Severe mental illness (n=71)	8.4	4.4**	2.8	1.6†	45%	24%*	68%	59%
Substance use disorder (n=57)	10.9	3.5***	3.4	1.7*	47%	26%*	70%	61%
HIV+(n=22)	11.5	4.7	3.2	1.8†	41%	36%	73%	68%
Chronic condition (n=46)	10.7	6.3†	3.3	2.2*	46%	39%	83%	63%*

*** $p < 0.001$, ** $p > 0.001$ & $p < 0.01$, * $p > 0.01$ & $= < 0.05$, † $p > 0.05$ & < 0.10

Few factors were significantly associated with the magnitude of pre-post changes among HHSP clients. Older age was associated with a lesser decrease in inpatient admissions, while Hispanic clients experienced a significantly

larger decrease in ED visits (by about 2.5) than non-Hispanic white clients. Clients with a SUD experienced a larger decrease in ED visits (by about 2) than those without a SUD.

Table 28. Predictors of Pre-Post Changes in Inpatient and ED Utilization among HHSP Clients

Model	Δ Inpatient Admissions			Δ Inpatient Days			Δ ED Visits		
	Unstandardized Coefficients		Sig.	Unstandardized Coefficients		Sig.	Unstandardized Coefficients		Sig.
	B	Std. Error		B	Std. Error		B	Std. Error	
(Constant)	0.518	0.614		-1.208	11.693		0.001	1.034	
Age at Enrollment (in years, mean-centered for overall MRT-SH population)	0.043	0.020	*	-0.077	0.390		-0.011	0.034	
<i>Race/Ethnicity</i>									
Non-Hispanic white (Ref. category)	--	--		--	--		--	--	
Non-Hispanic Black (1=yes)	0.744	0.614		1.573	11.680		0.355	1.032	
Hispanic (1=yes)	-0.093	0.744		5.561	14.149		-2.494	1.251	*
Multiracial/Other (1=yes)	0.009	0.773		3.927	14.710		0.963	1.300	
<i>Sex</i>									
Male (Ref. category)	--	--		--	--		--	--	
Female (1=yes)	0.414	0.471		-5.933	8.963		0.839	0.792	
<i>Geography</i>									
New York City (1=yes)	-0.850	0.543		-8.797	10.340		0.706	0.914	
Other NYS (Ref. category)	--	--		--	--		--	--	
<i>Comorbidities</i>									
Severe mental illness (1=yes)	-0.383	0.499		3.665	9.487		-0.275	0.839	
Substance use disorder (1=yes)	-0.424	0.479		-5.609	9.108		-1.991	0.805	*
HIV+ (1=yes)	0.103	0.605		0.856	11.514		0.164	1.018	
Other chronic condition (1=yes)	-0.620	0.453		2.308	8.629		-0.441	0.763	

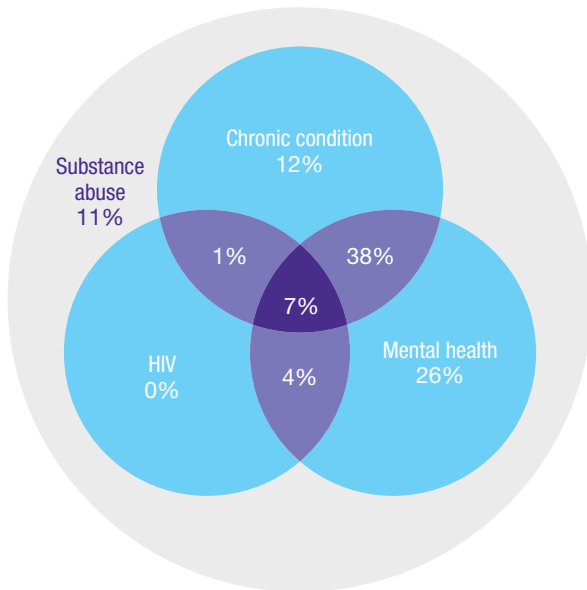
* $p > 0.01$ & $= < 0.05$

Summary. While still in its early stages, the Health Home Supportive Housing Pilot shows a trend towards reducing inpatient and emergency care among a high-risk client population, although only a reduction in inpatient days is statistically significant. In particular, the lesser use of inpatient and emergency services for mental health and substance abuse problems suggests an improved quality of life in which these clients are less likely to experience behavioral health crises. This decrease may also be associated with a SUD diagnosis, race, and age.

OASAS Rental Subsidies

Persons enrolled in the OASAS Rental Subsidies program (n=297) should all have a history of substance abuse. Seventy-five percent also have a mental health diagnosis, 59% have another chronic medical condition (other than HIV), and 13% have HIV. Six percent of the enrollees have all four types of conditions, while only 11% have a substance use disorder only.

Figure 13. Overlap Between Types of Chronic Conditions among OASAS Rental Subsidy Enrollees



Note: To obtain total percentage of participants with a given diagnosis, sum all percentages that fall into the relevant circle (sum may not exactly match text due to rounding). The "11%" that falls below the "Substance abuse" label refers to the proportion of the participants who have no other diagnosis. Circles are not sized proportionately.

The percentage of enrollees who experienced at least one inpatient hospitalization was dramatically lower in the 12 months after MRT-SH enrollment compared to the 12 months before (52% post-enrollment versus 77%, pre-enrollment, $p < 0.001$). The average number of inpatient days also declined from 23.4 to 12.0 ($p < 0.001$). In particular, the percentages with at least one inpatient hospitalization for a primary diagnosis of mental health or of substance abuse also declined markedly (from 21% to 14% [$p=0.005$] and from 55% to 31% [$p < 0.001$], respectively).

The percentage with at least one emergency department visit also declined, from 85% to 70% ($p < 0.001$); this was particularly true of emergency department visits for mental health or substance abuse (22% versus 14% [$p=0.007$] and 30% versus 19% [$p < 0.001$], respectively). Similar findings were obtained for the average number of emergency

department visits, which declined from 6.1 to 3.6 overall ($p < 0.001$); from 0.4 to 0.3 for mental health ($p=0.014$); and from 1.0 to 0.5 for substance abuse ($p < 0.001$).

Enrollees in this program also had significantly fewer inpatient rehabilitation stays and inpatient detox stays, as well as fewer psychiatric inpatient stays as defined by rate codes (although the latter was not quite statistically significant).

Table 29. Inpatient and Emergency Department Utilization, Pre- and Post-Enrollment

	Pre	Post	Sig.
<i>Inpatient utilization</i>			
Any inpatient care	77%	52%	***
Any inpatient mental health (by Dx)	21%	14%	**
Any inpatient substance abuse	55%	31%	***
Average number inpatient days	23.4	12.0	***
<i>Emergency department utilization</i>			
Any ED visits	85%	70%	** *
Any ED visits - mental health	22%	14%	**
Any ED visits - substance abuse	30%	19%	***
Average number of ED visits	6.1	3.6	***
Average number of ED visits - mental health	0.4	0.3	*
Average number of ED visits - substance abuse	1.0	0.5	***
<i>Specific behavioral health services</i>			
Any CPEP	3.7%	2.7%	n.s.
Any psychiatric inpatient (by rate code)	15%	11%	†
Inpatient rehab	25%	13%	***
Inpatient detox	13%	8%	*

*** $p < 0.001$, ** $p > 0.001$ & ≤ 0.01 , * $p > 0.01$ & ≤ 0.05 , † $p > 0.05$ & < 0.10 , n.s. = not significant

The OASAS Rental Subsidy enrollees received significantly fewer outpatient substance abuse services in the 12 months following MRT-SH enrollment than in the 12 months previous to enrollment. If their substance abuse disorders were improving, however, they may have required fewer services. Outpatient visits for medication management for behavioral

health conditions increased, although this was not quite statistically significant ($p=0.063$). These enrollees also had significantly fewer outpatient visits for behavioral health other than methadone, therapy, and medication management, which could possibly be indicative of stabilization in their condition.

Within the OASAS-RS program, Hispanic clients have significantly more inpatient admissions and inpatient days during the pre-period than non-Hispanic white clients, while women have significantly fewer inpatient admissions than men. Age at enrollment is negatively associated with inpatient days, and clients living on Long Island have significantly more inpatient days than those living in upstate New York.

Table 30. Utilization of Outpatient Mental Health and Substance Abuse Services, Overall and Selected Services, Pre- and Post-Enrollment

	Pre	Post	Sig.
<i>Outpatient behavioral health visits</i>			
All outpatient mental health services	10.4	11.2	n.s.
All outpatient substance abuse services	60.0	37.1	***
<i>Specific outpatient behavioral health services</i>			
Methadone maintenance	5.9	5.0	n.s.
Therapy and counseling	18.4	16.7	n.s.
Medication management	2.1	2.5	†
Other outpatient behavioral health	40.2	20.4	***

*** $p < 0.001$, † $p > 0.05$ & < 0.10 , n.s. = not significant

Table 31. Predictors of Pre-Enrollment Inpatient Admissions, Inpatient Days, and Emergency Department Visits among OASAS-RS Clients

	Inpatient Admissions			Inpatient Days			ED Visits		
	Unstandardized Coefficients		Sig.	Unstandardized Coefficients		Sig.	Unstandardized Coefficients		Sig.
	B	Std. Error		B	Std. Error		B	Std. Error	
(Constant)	9.523	1.701	***	14.448	5.795	*	3.972	1.337	**
Age at Enrollment (in years, mean-centered for SUD population)	0.005	0.067		-0.625	0.228	**	0.070	0.053	
<i>Race/Ethnicity</i>									
Non-Hispanic white (Ref. category)	--	--		--	--		--	--	
Non-Hispanic Black (1=yes)	1.241	1.753		10.962	5.974	†	0.340	1.379	
Hispanic (1=yes)	6.781	2.284	**	15.953	7.783	*	0.910	1.796	
Multiracial/Other (1=yes)	-0.404	2.648		-2.972	9.023		-1.497	2.082	
<i>Sex</i>									
Male (Ref. category)	--	--		--	--		--	--	
Female (1=yes)	-3.050	1.436	*	-9.349	4.895	†	-0.019	1.129	
<i>Geography</i>									
New York City (1=yes)	-3.143	1.817	†	-2.065	6.192		-1.397	1.429	
Long Island (1=yes)	-1.896	2.651		40.802	9.033	***	0.660	2.085	
Other NYS (Ref. category)	--	--		--	--		--	--	
<i>Comorbidities</i>									
Severe mental illness (1=yes)	-3.023	1.582	†	7.127	5.391		1.717	1.244	
HIV+ (1=yes)	-1.224	2.062		-7.051	7.027		1.654	1.622	
Other chronic condition (1=yes)	-2.445	1.423	†	-0.911	4.849		1.693	1.119	

*** $p < 0.001$, ** $p > 0.001$ & $p < 0.01$, * $p > 0.01$ & $= < 0.05$, † $p > 0.05$ & < 0.10

Nearly every subgroup in the OASAS-RS program has statistically significant pre-post reductions in inpatient and/or ED use. The size of the effect varies between group and

between measures, but a broad diversity of clients appear to benefit from participation in this program.

Table 32. Pre- and Post-Enrollment Utilization of Inpatient and Emergency Care by Client Characteristics

	Inpatient Days		ED Visits		Any Inpatient Admissions		Any ED Visits	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
<i>Sex</i>								
Male (n=192)	24.7	13.1***	6.1	3.3***	82%	51%***	83%	65%***
Female (n=105)	21.1	10.1**	6.1	4.3**	70%	53%*	89%	79%†
<i>Race/ethnicity</i>								
Non-Hispanic white (n=151)	22.0	9.6***	6.0	3.9***	74%	47%***	86%	72%**
Non-Hispanic black (n=90)	23.7	13.8**	6.2	3.3***	82%	52%***	80%	68%†
Hispanic (any race) (n=35)	33.7	19.3†	6.9	4.2*	83%	69%	91%	71%†
Multiracial/Other (n=21)	15.4	10.0	6.1	2.4**	71%	52%	90%	67%†
<i>Geography</i>								
New York City (n=85)	20.9	16.8*	5.9	3.2***	83%	56%***	80%	66%*
Other NYS (n=212)	24.4	10.1***	6.2	3.8***	75%	50%***	87%	72%***
<i>Comorbidities</i>								
Severe mental illness (n=224)	24.7	11.6***	6.6	3.9***	77%	52%***	88%	71%***
HIV+ (n=39)	15.9	9.7	7.5	3.2***	77%	59%	90%	87%
Chronic condition (n=175)	22.5	11.9***	7.0	4.4***	78%	57%***	85%	74%*

*** $p < 0.001$, ** $p > 0.001$ & $p < 0.01$, * $p > 0.01$ & $= < 0.05$, † $p > 0.05$ & < 0.10



Hispanic clients experienced a significantly greater decrease in inpatient admissions than non-Hispanic white clients. Clients in New York City or who had HIV or a SMI experienced a lesser decrease, although these relationships were not quite statistically significant. The decrease in inpatient days

became significantly smaller as client age increased, while clients on Long Island experienced a much greater decrease in inpatient days than those in the rest of New York State outside of New York City. The pre-post change in ED visits did not vary by any demographic or clinical characteristics.

Table 33. Predictors of Pre-Post Changes in Inpatient and ED Utilization among OASAS-RS Clients

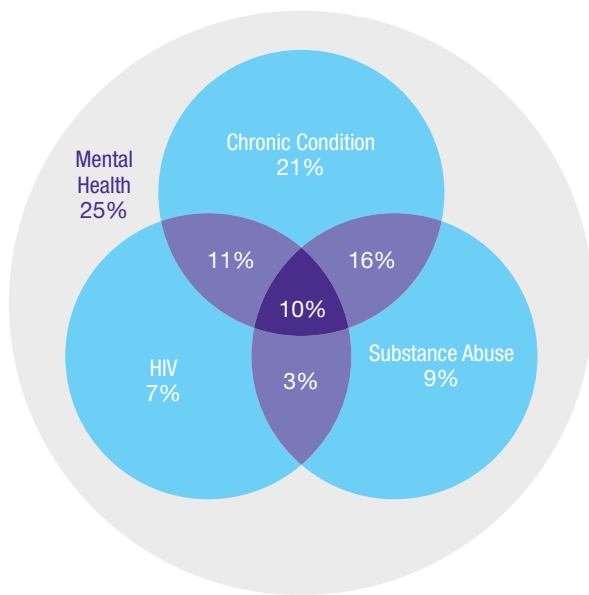
Model	Δ Inpatient Admissions			Δ Inpatient Days			Δ ED Visits		
	Unstandardized Coefficients			Unstandardized Coefficients			Unstandardized Coefficients		
	B	Std. Error	Sig.	B	Std. Error	Sig.	B	Std. Error	Sig.
(Constant)	-6.818	1.863	***	-3.682	5.410		-1.608	1.056	
Age at Enrollment (in years, mean-centered for SUD population)	0.038	0.073		0.561	0.213	**	-0.007	0.042	
<i>Race/Ethnicity</i>									
Non-Hispanic white (Ref. category)	--	--		--	--		--	--	
Non-Hispanic Black (1=yes)	-1.770	1.920		-8.412	5.577		-0.987	1.089	
Hispanic (1=yes)	-6.482	2.502	**	-8.649	7.265		-0.653	1.418	
Multiracial/Other (1=yes)	-1.048	2.900		3.342	8.423		0.209	1.644	
<i>Sex</i>									
Male (Ref. category)	--	--		--	--		--	--	
Female (1=yes)	2.931	1.573†		6.268	4.569		1.171	0.892	
<i>Geography</i>									
New York City (1=yes)	3.463	1.990	†	8.425	5.781		0.494	1.128	
Long Island (1=yes)	1.620	2.904		-36.175	8.433	***	-1.252	1.646	
<i>Other NYS (Ref. category)</i>									
	--	--		--	--		--	--	
<i>Comorbidities</i>									
Severe mental illness (1=yes)	2.967	1.733	†	-7.299	5.032		-0.965	0.982	
HIV+ (1=yes)	3.899	2.259	†	1.550	6.560		-1.923	1.281	
Other chronic condition (1=yes)	1.538	1.558		-0.290	4.526		0.021	0.884	

Summary. Overall, the findings for the OASAS-RS program are overwhelmingly positive, with enrollees clearly needing less inpatient or emergency care overall, and particularly for their behavioral health conditions. Given the level of comorbidities in the population served, these results are striking. These decreases appeared relatively constant throughout the population, without being moderated by any particular client characteristic, although client age, race and geography did show some significant effects. It is difficult to effectively interpret findings for a population with a primary condition of substance use disorders, because unlike other chronic conditions found in the MRT-SH population, full recovery from the effects of substance abuse is possible. Some of the services that this population is receiving less of, such as primary care services and outpatient substance abuse services, may be less needed if substance use decreases.

Office of Mental Health Rental Subsidies – Brooklyn

Persons enrolled in Office of Mental Health Rental Subsidies programs (n=279) should all have a history of mental health conditions¹². Fifty-seven percent have some other chronic medical condition (other than substance abuse or HIV); 37% have a substance use disorder; and 30% have HIV. Ten percent of enrollees have all four types of conditions, while twenty-five percent had a mental health condition alone without any of the other types of conditions.

Figure 14. Overlap Between Types of Chronic Conditions among Office of Mental Health - Brooklyn Rental Subsidy Enrollees



Note: To obtain total percentage of participants with a given diagnosis, sum all percentages that fall into the relevant circle (sum may not exactly match text due to rounding). The “25%” that appears below the “Mental Health” label refers to the proportion of the participants who have no other diagnosis. Circles are not sized proportionately.

The percentage of enrollees who experienced at least one inpatient hospitalization was 28% following MRT-SH enrollment compared to 33% before, but this difference was not statistically significant. Enrollees did, however, spend significantly fewer days in an inpatient setting after their MRT-SH enrollment (5.1 versus 8.6).

There were no significant differences in ED visits, either overall or for behavioral health conditions.

Table 34. Inpatient and Emergency Department Utilization, Pre- and Post-Enrollment

	Pre	Post	Sig.
<i>Inpatient utilization</i>			
Any inpatient care	33%	28%	n.s.
Any inpatient mental health	13%	10%	n.s.
Any inpatient substance abuse	8.6%	7.5%	n.s.
Average number inpatient days	8.6	5.1	*
<i>Emergency department utilization</i>			
Any ED visits	51%	48%	n.s.
Any ED visits - mental health	13%	9%	n.s.
Any ED visits - substance abuse	5.4%	4.7%	n.s.
Average number of ED visits	2.1	2.0	n.s.
Average number of ED visits - mental health	0.23	0.25	n.s.
Average number of ED visits - substance abuse	0.12	0.09	n.s.
<i>Specific behavioral health services</i>			
Any CPEP	5.0%	6.1%	n.s.
Any psychiatric inpatient	10.4%	9.3%	n.s.
Inpatient rehab	3.6%	3.2%	n.s.
Inpatient detox	2.9%	2.5%	n.s.

*p>0.01 & =<0.05, †p>0.05 & <0.10, n.s. = not significant

¹² For the purposes of this section, it is assumed that participants in the program by definition have had a SMI diagnosis even if such a primary diagnosis was not identified in the year prior to enrollment.

These enrollees consumed significantly fewer outpatient mental health and substance abuse visits in the year following MRT-SH enrollment, particularly significantly fewer visits for therapy and counseling and for other outpatient behavioral health services other than methadone maintenance and medication management.

Table 35. Utilization of Outpatient Mental Health and Substance Abuse Services, Overall and Selected Services, Pre- and Post-Enrollment

	Pre	Post	Sig.
<i>Outpatient behavioral health visits</i>			
All outpatient mental health services	26.8	21.4	***
All outpatient substance abuse services	16.1	5.3	***
<i>Specific outpatient behavioral health services</i>			
Methadone maintenance	1.6	1.6	n.s.
Therapy and counseling	16.0	11.2	***
Medication management	5.1	4.6	†
Other outpatient behavioral health	21.0	10.5	***

*** $p < 0.001$, † $p > 0.05$ & < 0.10 , n.s. = not significant

The only statistically significant predictors of pre-enrollment inpatient and emergency department use among RSB clients are comorbidities, especially SUDs. Those with a comorbid SUD had significantly more inpatient admissions and inpatient days, and also more ED visits (although the latter was not quite statistically significant). Those with HIV had significantly more ED visits, and those with another chronic condition had significantly more inpatient admissions and ED visits.

Table 36. Predictors of Pre-Enrollment Inpatient Admissions, Inpatient Days, and Emergency Department Visits among RSB Clients

	Inpatient Admissions			Inpatient Days			ED Visits		
	Unstandardized Coefficients		Sig.	Unstandardized Coefficients		Sig.	Unstandardized Coefficients		Sig.
	B	Std. Error		B	Std. Error		B	Std. Error	
(Constant)	0.214	0.263		4.494	4.053		0.425	0.552	
Age at Enrollment (in years, mean-centered for SMI population)	-0.011	0.010		-0.171	0.161		-0.031	0.022	
<i>Race/Ethnicity</i>									
Non-Hispanic white (Ref. category)	--	--		--	--		--	--	
Non-Hispanic Black (1=yes)	-0.174	0.280		-4.972	4.309		-0.159	0.587	
Hispanic (1=yes)	-0.102	0.334		-4.918	5.146		-0.602	0.701	
Multiracial/Other (1=yes)	-0.713	0.548		-8.154	8.434		-1.849	1.149	
<i>Sex</i>									
Male (Ref. category)	--	--		--	--		--	--	
Female (1=yes)	0.149	0.229		4.921	3.521		0.655	0.480	
<i>Comorbidities</i>									
Substance use disorder (1=yes)	0.877	0.238	***	9.030	3.658	*	0.923	0.498	†
HIV+ (1=yes)	0.183	0.249		-1.727	3.838		1.611	0.523	**
Other chronic condition (1=yes)	0.613	0.243	*	5.724	3.747		1.678	0.511	***

*** $p < 0.001$, ** $p > 0.001$ & $p < 0.01$, * $p > 0.01$ & $= < 0.05$, † $p > 0.05$ & < 0.10

Women in the RSB program appeared to have a greater reduction than men in inpatient days and ED visits following enrollment. Non-Hispanic whites appeared to have a larger reduction in inpatient days and ED visits than their black and Hispanic peers. The decreases for most demographic

subgroups were not statistically significant, however, with the exception of the reduction of inpatient days for women. The only clinical subgroup with a significant pre-post difference was clients with chronic conditions, who experienced significantly fewer inpatient days post-enrollment.

Table 37. Pre- and Post-Enrollment Utilization of Inpatient and Emergency Care by Client Characteristics

	Inpatient Days		ED Visits		Any Inpatient Admissions		Any ED Visits	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
<i>Sex</i>								
Male (n=153)	6.5	5.7	1.8	1.7	28%	23%	46%	43%
Female (n=126)	11.0	4.2**	2.6	2.3†	39%	35%	58%	53%
<i>Race/ethnicity</i>								
Non-Hispanic white (n=70)	10.6	4.6†	1.9	1.5	27%	27%	37%	31%
Non-Hispanic black (n=136)	8.1	5.8	2.4	2.1	39%	32%	55%	57%
Hispanic (any race) (n=59)	8.0	5.0	2.1	2.4	31%	24%	61%	49%
Multiracial/Other (n=14)	4.7	0.2	0.8	1.0	14%	21%	43%	36%
<i>Comorbidities</i>								
Substance use disorder (n=103)	14.2	9.2	2.9	2.9	48%	41%	63%	61%
HIV+ (n=84)	8.4	5.7†	3.5	3.3	39%	29%	46%	43%
Chronic condition (n=158)	11.1	6.6*	2.9	2.7	43%	35%	63%	55%

** $p > 0.001$ & $p < 0.01$, † $p > 0.05$ & < 0.10

There were no client characteristics that significantly predicted the magnitude of pre-post changes among RSB clients.

Table 38. Predictors of Pre-Post Changes in Inpatient and ED Utilization among RSB Clients

Model	Δ Inpatient Admissions			Δ Inpatient Days			Δ ED Visits		
	Unstandardized Coefficients		Sig.	Unstandardized Coefficients		Sig.	Unstandardized Coefficients		Sig.
B	Std. Error	B		Std. Error	B		Std. Error		
(Constant)	-0.274	0.353		-2.326	3.959		-0.209	0.585	
Age at Enrollment (in years, mean-centered for SMI population)	0.012	0.014		0.243	0.157		0.001	0.023	
<i>Race/Ethnicity</i>									
Non-Hispanic white (Ref. category)	--	--		--	--		--	--	
Non-Hispanic Black (1=yes)	0.520	0.375		5.134	4.208		0.030	0.622	
Hispanic (1=yes)	-0.210	0.448		4.184	5.026		0.801	0.743	
Multiracial/Other (1=yes)	-0.024	0.734		2.219	8.237		0.598	1.217	
<i>Sex</i>									
Male (Ref. category)	--	--		--	--		--	--	
Female (1=yes)	-0.125	0.306		-5.991	3.439	†	-0.187	0.508	
<i>Comorbidities</i>									
Substance use disorder (1=yes)	0.292	0.318		-3.002	3.572		0.321	0.528	
HIV+ (1=yes)	0.220	0.334		2.134	3.749		-0.144	0.554	
Other chronic condition (1=yes)	-0.063	0.326		-3.500	3.660		-0.286	0.541	

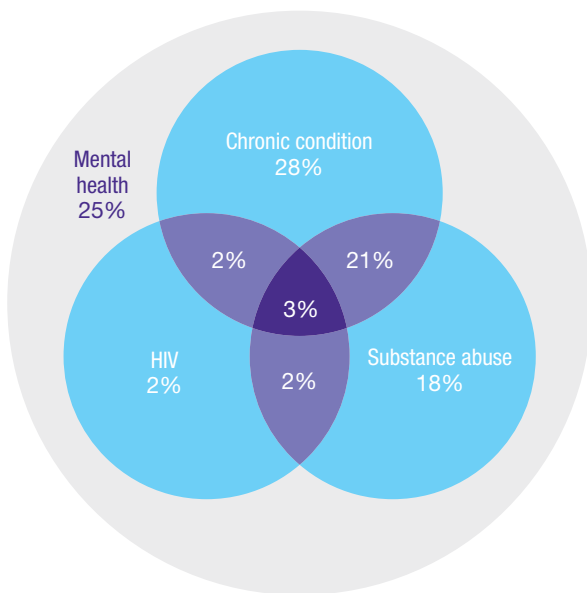
† $p > 0.05$ & < 0.10

Summary. The findings for the RSB program are trending in the right direction, with reductions in the use of inpatient and emergency department services. These reductions were not significantly moderated by any demographic or clinical factors. Unexpectedly, however, receipt of outpatient behavioral health care tended to decrease, although this is clearly not causing greater use of hospital inpatient and emergency department care. More detailed studies are needed to better understand the relationship between program enrollment and outcomes.

Office of Mental Health Rental Subsidies – Statewide

Persons enrolled in Office of Mental Health Rental Subsidies Statewide program (n=335) should all have a history of mental health conditions¹³. Forty-three percent also had a substance use disorder, and 53% had some other chronic medical condition other than HIV. Eight percent had HIV. Three percent had all four types of conditions, while only 25% had a mental health condition alone, without any of the other types of conditions.

Figure 15. Overlap Between Types of Chronic Conditions among Office of Mental Health - Statewide Rental Subsidy Enrollees



Note: To obtain total percentage of participants with a given diagnosis, sum all percentages that fall into the relevant circle (but may not exactly match text due to rounding). The “25%” that falls below the “Mental Health” label refers to the proportion of the participants who have no other diagnosis. Circles are not sized proportionately.

The percentage of enrollees who experienced at least one inpatient hospitalization was 37% following MRT-SH enrollment, compared to 48% before ($p < 0.001$). They were also significantly less likely to experience an inpatient hospitalization for a mental health diagnosis or a substance abuse diagnosis, and spent significantly fewer days in an inpatient setting after their MRT-SH enrollment (11.8 versus 6.5).

This group was also significantly less likely to have at least one ED visit in the months following enrollment (61% versus 69% before enrollment), and had significantly fewer ED visits (3.1 on average, compared to 4.5 prior to enrollment). Specifically, they were less likely to experience an ED visit for a primary SMI diagnosis, and averaged fewer ED visits for SMI.

Enrollees were also significantly less likely to have an inpatient psychiatric stay as defined by rate codes, and less likely to have an inpatient rehabilitation stay for substance abuse.

Table 39. Inpatient and Emergency Department Utilization, Pre- and Post-Enrollment

	Pre	Post	Sig.
<i>Inpatient utilization</i>			
Any inpatient care	48%	37%	***
Any inpatient mental health	27%	17%	***
Any inpatient substance abuse	12%	6%	**
Average number inpatient days	11.8	6.5	***
<i>Emergency department utilization</i>			
Any ED visits	69%	61%	**
Any ED visits - mental health	22%	17%	*
Any ED visits - substance abuse	9.6%	10%	n.s.
Average number of ED visits	4.5	3.1	**
Average number of ED visits - mental health	0.5	0.4	*
Average number of ED visits - substance abuse	0.14	0.16	n.s.
<i>Specific behavioral health services</i>			
Any CPEP	5.4%	3.3%	n.s.
Any psychiatric inpatient	23%	14%	***
Inpatient rehab	6.3%	1.2%	***
Inpatient detox	0.6%	0.9%	n.s.

*** $p < 0.001$, ** $p > 0.001$ & $= < 0.01$, * $p > 0.01$ & $= < 0.05$, n.s. = not significant

¹³ For the purposes of this section, it is assumed that participants in the program by definition have had a SMI diagnosis even if such a primary diagnosis was not identified in the year prior to enrollment.

Use of outpatient behavioral health services declined following MRT-SH enrollment. Enrollees had significantly fewer outpatient visits for mental health services, particularly for therapy and counseling. There was also a decline in the use of outpatient substance abuse services, although this did not reach the level of statistical significant ($p=0.086$).

Among the RSS clients, age at enrollment was negatively associated with ED visits, while non-Hispanic black clients and female clients had significantly fewer inpatient admissions and inpatient days. Clients with a comorbid SUD or chronic medical condition had significantly more inpatient admissions and ED visits.

Table 40. Utilization of Outpatient Mental Health and Substance Abuse Services, Overall and Selected Services, Pre- and Post-Enrollment

	Pre	Post	Sig.
<i>Outpatient behavioral health visits</i>			
All outpatient mental health services	24.9	21.6	**
All outpatient substance abuse services	11.6	8.9	†
<i>Specific outpatient behavioral health services</i>			
Methadone maintenance	1.4	1.3	n.s.
Therapy and counseling	14.0	11.7	*
Medication management	3.7	3.5	n.s.
Other outpatient behavioral health	19.3	15.0	**

** $p > 0.001$ & $= < 0.01$, * $p > 0.01$ & $= < 0.05$, † $p > 0.05$ & $= < 0.10$, n.s. = not significant

Table 41. Predictors of Pre-Enrollment Inpatient Admissions, Inpatient Days, and Emergency Department Visits among RSB Clients

	Inpatient Admissions			Inpatient Days			ED Visits		
	Unstandardized Coefficients			Unstandardized Coefficients			Unstandardized Coefficients		
	B	Std. Error	Sig.	B	Std. Error	Sig.	B	Std. Error	Sig.
(Constant)	1.305	0.411	**	16.321	3.512	***	0.170	1.242	
Age at Enrollment (in years, mean-centered for SMI population)	-0.019	0.016		0.024	0.137		-0.133	0.049	**
<i>Race/Ethnicity</i>									
Non-Hispanic white (Ref. category)	--	--		--	--		--	--	
Non-Hispanic Black (1=yes)	-0.927	0.432	*	-7.479	3.688	*	-2.036	1.304	
Hispanic (1=yes)	-0.332	0.601		-4.096	5.131		-0.749	1.815	
Multiracial/Other (1=yes)	-0.357	0		-8.154	8.434		-1.849	1.149	
<i>Sex</i>									
Male (Ref. category)	--	--		--	--		--	--	
Female (1=yes)	-0.742	0.365	*	-8.575	3.121	**	2.037	1.104	
<i>Geography</i>									
New York City (1=yes)	-0.484	0.532		-1.939	4.547		-0.342	1.608	
Long Island (1=yes)	-0.726	0.651		-2.509	5.557		-2.352	1.965	
Other NYS (Ref. category)	--	--		--	--		--	--	
<i>Comorbidities</i>									
Substance use disorder (1=yes)	1.401	0.360	***	3.438	3.074		2.986	1.087	**
HIV+ (1=yes)	-0.598	0.663		-7.321	5.660		-2.386	2.002	
Other chronic condition (1=yes)	0.742	0.367	*	4.722	3.136		5.345	1.109	***

*** $p < 0.001$, ** $p > 0.001$ & $p < 0.01$, * $p > 0.01$ & $= < 0.05$

Both men and women experienced statistically significant reductions in almost all the metrics of inpatient and ED use, but men appeared to generally have the larger decrease (with the exception of ED visits, where a larger, but not statistically significant, decrease was observed for women).

Except for the very small number of multiracial clients, all racial/ethnic groups experienced a statistically significant decrease in inpatient days, with the largest absolute decrease observed among non-Hispanic white and the smallest observed among non-Hispanic blacks. Black and Hispanic clients experienced a statistically significant decrease in ED visits, while non-Hispanic white clients did not. (Nor did multiracial clients, but this was likely due to the very small number of clients.) Non-Hispanic black clients were the only

racial/ethnic subgroup to show a statistically significant decrease in the percentage with any inpatient stays or any ED visits.

Clients who lived outside of New York City and Long Island had significant decreases in all the metrics, while clients in New York City only had a statistically significant decrease in ED visits, but this may be more of a reflection of the much larger number of clients in RSS who lived upstate, rather than a larger effect for these clients.

Statistically significant decreases in all metrics were observed for clients with a comorbid SUD or chronic medical condition, but not for clients with HIV.

Table 42. Pre- and Post-Enrollment Utilization of Inpatient and Emergency Care by Client Characteristics

	Inpatient Days		ED Visits		Any Inpatient Admissions		Any ED Visits	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
<i>Sex</i>								
Male (n=157)	16.0	6.4**	3.2	2.4**	49%	36%**	65%	52%
Female (n=178)	8.1	6.5*	5.6	3.8†	48%	39%*	72%	68%**
<i>Race/ethnicity</i>								
Non-Hispanic white (n=197)	14.0	8.1***	5.2	3.6	49%	43%	70%	64%
Non-Hispanic black (n=88)	8.3	4.2**	3.1	2.6*	49%	32%**	70%	56%*
Hispanic (any race) (n=38)	10.3	4.9*	4.6	2.4**	45%	29%	66%	58%
Multiracial/Other (n=12)	7.2	2.0	1.8	1.1	42%	17%	50%	50%
<i>Geography</i>								
New York City (n=53)	10.5	5.7	3.4	2.4*	36%	28%	66%	49%†
Long Island (n=29)	9.8	7.0	1.9	1.4	31%	21%	24%	34%
Other NYS (n=253)	12.3	6.6***	5.1	3.6*	53%	41%**	74%	66%*
<i>Comorbidities</i>								
Substance use disorder (n=144)	14.1	8.8***	6.3	4.3**	59%	46%**	82%	67%***
HIV+ (n=26)	4.8	3.5	3.2	2.8	50%	31%†	73%	65%
Chronic condition (n=177)	13.7	7.0**	6.4	4.3*	55%	45%*	76%	67%*

*** $p < 0.001$, ** $p > 0.001$ & $p < 0.01$, * $p > 0.01$ & $= < 0.05$, † $p > 0.05$ & < 0.10

Women in the RSS program experienced a significantly lesser reduction in inpatient admissions and inpatient days compared to men, while those with a chronic condition experienced a significantly greater reduction in ED visits than those without a chronic condition. Clients with a SUD

experienced a greater reduction in inpatient admissions, but this was not quite statistically significant. Similarly, the reduction in ED visits decreased as client age increased, but this did not reach statistical significance.

Table 43. Predictors of Pre-Post Changes in Inpatient and ED Utilization among RSB Clients

Model	Δ Inpatient Admissions			Δ Inpatient Days			Δ ED Visits		
	Unstandardized Coefficients		Sig.	Unstandardized Coefficients		Sig.	Unstandardized Coefficients		Sig.
B	Std. Error	B		Std. Error	B		Std. Error		
(Constant)	-0.856	0.430	*	-10.222	3.276	***	0.496	1.063	
Age at Enrollment (in years, mean-centered for SMI population)	0.012	0.017		0.128	0.128		0.075	0.042	†
<i>Race/Ethnicity</i>									
Non-Hispanic white (Ref. category)	--	--		--	--		--	--	
Non-Hispanic Black (1=yes)	0.447	0.452		2.728	3.440		0.995	1.116	
Hispanic (1=yes)	0.061	0.629		0.478	4.786		-0.613	1.553	
Multiracial/Other (1=yes)	-0.287	1.017		2.219	8.237		0.647	2.510	
<i>Sex</i>									
Male (Ref. category)	--	--		--	--		--	--	
Female (1=yes)	0.804	0.383	*	9.041	2.911	**	-0.798	0.944	
<i>Geography</i>									
New York City (1=yes)	0.298	0.557		2.423	4.241		-0.045	1.128	
Long Island (1=yes)	0.360	0.681		4.179	5.183		0.682	1.682	
Other NYS (Ref. category)	--	--		--	--		--	--	
<i>Comorbidities</i>									
Substance use disorder (1=yes)	-0.628	0.377	†	1.107	2.867		-1.099	0.930	
HIV+ (1=yes)	0.185	0.694		3.643	5.279		1.464	1.713	
Other chronic condition (1=yes)	-0.021	0.384		-3.828	2.925		-2.164	0.949	*

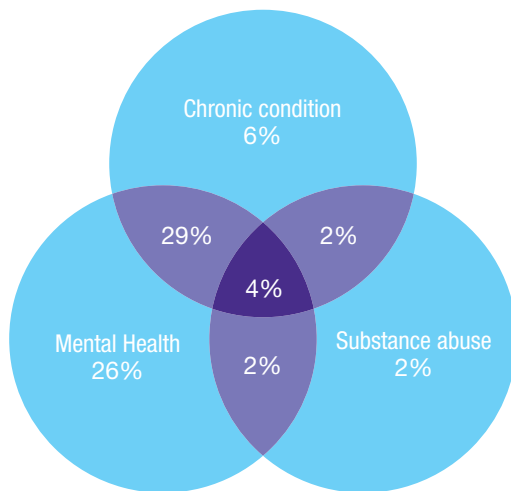
*** $p < 0.001$, ** $p > 0.001$ & $p < 0.01$, * $p > 0.01$ & $= < 0.05$, † $p > 0.05$ & < 0.10

Summary. The RSS program presents a clearly positive picture of improved outcomes. Enrollees end up in the hospital or the emergency department less often, particularly for their mental health conditions, as well as having fewer stays in inpatient substance abuse rehabilitation. By and large, these effects are not moderated by client characteristics, with a couple of exceptions: women experience a smaller reduction in inpatient utilization than men, and those with a comorbid chronic medical condition experience a larger decrease in ED visits.

OPWDD Expansion Program

This program serves persons with developmental disabilities (n=51), most of which fall under the ICD-9 category of mental disorders. However, 61% additionally have an active SMI diagnosis. Forty-one percent of this population has a chronic medical condition, and 10% have a substance use disorder. None have HIV. Four percent have a mental health diagnosis, a substance use disorder, and a chronic medical condition in addition to their developmental disability. Only 29% do not have any of these conditions.

Figure 16. Overlap Between Types of Chronic Conditions among Office for Persons with Developmental Disabilities Expansion Program Enrollees



Note: 29% of enrollees had none of these primary diagnoses during the observed period

Note: To obtain total percentage of participants with a given diagnosis, sum all percentages that fall into the relevant circle (but may not exactly match text due to rounding). Circles are not sized proportionately.

Differences in the utilization of inpatient and emergency department services from the pre-enrollment to the post-enrollment periods were minimal for the enrollees in this program. Enrollees were more likely to have at least one inpatient stay or at least one emergency department visit during the post-enrollment period, but this was not statistically significant.

Summary. There are no significant findings for the OPWDD Expansion population. The current findings do not present a clear and consistent picture. The percentage of clients with at least one inpatient stay increased following enrollment, but this result was not statistically significant and there was little difference in the average number of inpatient days. The use of overall outpatient mental health and substance abuse services decreases very slightly. Visits for medication management for behavioral health conditions show a decrease that approaches statistical significance ($p=0.081$), while the use of outpatient behavioral health care other than therapy and counseling and medication management increased slightly (also only trending towards significance, [$p=0.097$]). The small number of clients enrolled in this program to date may be contributing to the lack of statistical significance.

Table 44. Inpatient and Emergency Department Utilization, Pre- and Post-Enrollment

	Pre	Post	Sig.
<i>Inpatient utilization</i>			
Any inpatient care	6%	16%	n.s.
Any inpatient mental health	2%	6%	n.s.
Any inpatient substance abuse	0%	0%	--
Average number inpatient days	0.5	0.8	n.s.
<i>Emergency department utilization</i>			
Any ED visits	24%	26%	n.s.
Any ED visits - mental health	2%	6%	n.s.
Average number of ED visits	0.6	0.7	n.s.
Average number of ED visits - mental health	0.02	0.00	n.s.
Average number of ED visits - mental health	0.23	0.25	n.s.

n.s. = not significant

Enrollees in the OPWDD program received fewer outpatient mental health services overall after enrollment, but this was not statistically significant. In particular, they had fewer visits for medication management.

Table 45. Utilization of Outpatient Mental Health and Substance Abuse Services, Overall and Selected Services, Pre- and Post-Enrollment

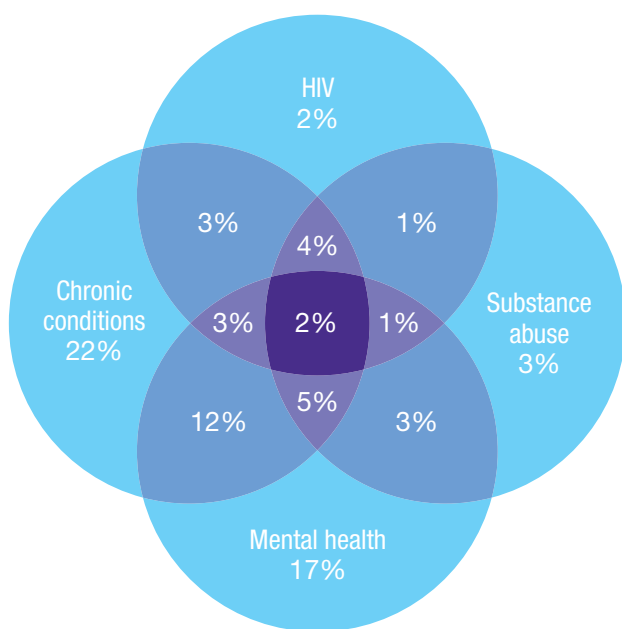
	Pre	Post	Sig.
<i>Outpatient behavioral health visits</i>			
All outpatient mental health services	8.5	7.0	n.s.
All outpatient substance abuse services	0.14	0.10	n.s.
<i>Specific outpatient behavioral health services</i>			
Methadone maintenance	0	0	--
Therapy and counseling	6.3	4.5	n.s.
Medication management	1.5	1.1	†
Other outpatient behavioral health	0.9	1.5	†

† $p>0.05$ & <0.10 , n.s. = not significant

Eviction Prevention for Vulnerable Adults

More than half (51%) of the enrollees in this program (n=192) have a chronic medical condition other than behavioral health or HIV, while 44% have a mental health diagnosis, 19% have a substance abuse disorder, and 12% have HIV. Twenty-two percent did not have a Medicaid claim for a diagnosis in one of these categories in the 12 months prior to MRT-SH enrollment.

Figure 17. Overlap Between Types of Chronic Conditions among Eviction Prevention for Vulnerable Adults Enrollees



Note: Not shown are SUD + chronic condition (4.2%), SMI + HIV (1.0%) and none (22%).

Note: To obtain total percentage of participants with a given diagnosis, sum all percentages that fall into the relevant circle (but may not exactly match text due to rounding). Circles are not sized proportionately.

The percentage of enrollees who experienced at least one inpatient hospitalization decreased slightly from 24% to 22%, but this difference was not statistically significant. The average number of inpatient days also declined, from 3.4 to 2.1, but also was not statistically significant. There were very small numbers of inpatient hospitalizations for mental health or substance abuse.

The percentage with at least one emergency department visit also decreased, from 51% to 40%, which was statistically significant (p=0.006). Numbers of emergency department visits for mental health or substance abuse were very small for this population.

Table 46. Inpatient and Emergency Department Utilization, Pre- and Post-Enrollment

	Pre	Post	Sig.
<i>Inpatient utilization</i>			
Any inpatient care	24%	22%	n.s.
Any inpatient mental health	2.1%	1.0%	n.s.
Any inpatient substance abuse	0.5%	1.0%	n.s.
Average number inpatient days	3.4	2.1	n.s.
<i>Emergency department utilization</i>			
Any ED visits	51%	40%	**
Any ED visits - mental health	2.6%	1.6%	n.s.
Any ED visits - substance abuse	1.6%	2.1%	n.s.
Average number of ED visits	2.0	1.7	n.s.

** p > 0.001 & ≤ 0.01, n.s. = not significant

Enrollees in the Eviction Prevention for Vulnerable Adults program received significantly fewer outpatient substance abuse services after enrollment, in particular, fewer visits for methadone maintenance (although the latter was not statistically significant).

Table 47. Utilization of Outpatient Mental Health and Substance Abuse Services, Overall and Selected Services, Pre- and Post-Enrollment

	Pre	Post	Sig.
<i>Outpatient behavioral health visits</i>			
All outpatient mental health services	4.9	4.7	n.s.
All outpatient substance abuse services	7.0	4.5	*
<i>Specific outpatient behavioral health services</i>			
Methadone maintenance	4.8	3.5	†
Therapy and counseling	3.2	2.5	n.s.
Medication management	1.4	1.1	n.s.
Other outpatient behavioral health	2.0	1.7	†

*p > 0.01 & ≤ 0.05, †p > 0.05 & ≤ 0.10, n.s. = not significant

Among EPVA clients, older age was associated with fewer inpatient admissions and ED visits in the pre-enrollment period (although only the latter was statistically significant). Having a chronic medical condition was associated with significantly fewer inpatient admissions, and also with fewer ED visits (not statistically significant).

Table 48. Predictors of Pre-Enrollment Inpatient Admissions, Inpatient Days, and Emergency Department Visits among EPVA Clients

	Inpatient Admissions			Inpatient Days			ED Visits		
	Unstandardized Coefficients			Unstandardized Coefficients			Unstandardized Coefficients		
	B	Std. Error	Sig.	B	Std. Error	Sig.	B	Std. Error	Sig.
(Constant)	-0.018	1.415		0.729	8.821		0.994	3.410	
Age at Enrollment (in years, mean-centered for SMI population)	-0.041	0.022	†	-0.212	0.137		-0.129	0.053	*
<i>Race/Ethnicity</i>									
Non-Hispanic white (Ref. category)	--	--		--	--		--	--	
Non-Hispanic Black (1=yes)	-0.298	1.250		-3.724	7.793		-0.601	3.012	
Hispanic (1=yes)	0.336	1.260		1.119	7.857		0.963	3.037	
Multiracial/Other (1=yes)	-0.862	1.593		-4.434	9.935		-1.684	3.840	
<i>Sex</i>									
Male (Ref. category)	--	--		--	--		--	--	
Female (1=yes)	0.056	0.652		1.483	4.069		-0.535	1.573	
<i>Comorbidities</i>									
Severe mental illness (1=yes)	0.556	0.561		2.380	3.501		1.486	1.353	
Substance use disorder (1=yes)	-0.316	0.706		-0.270	4.402		-1.027	1.701	
HIV+ (1=yes)	-0.389	0.835		-3.058	5.208		-0.573	2.013	
Other chronic condition (1=yes)	1.200	0.546	*	5.566	3.408		2.366	1.317	†

*** $p < 0.001$, ** $p > 0.001$ & $p < 0.01$, * $p > 0.01$ & $= < 0.05$, † $p > 0.05$ & < 0.10

Few subgroups of EPVA clients experienced any statistically significant decrease in inpatient or emergency care. Women and Hispanic clients were significantly less likely to have any ED visits post-enrollment.

Table 49. Pre- and Post-Enrollment Utilization of Inpatient and Emergency Care by Client Characteristics

	Inpatient Days		ED Visits		Any Inpatient Admissions		Any ED Visits	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
<i>Sex</i>								
Male (n=50)	0.8	0.9	1.5	1.2	24%	14%	50%	38%
Female (n=142)	4.2	2.5	2.2	1.9	24%	25%	51%	40%*
<i>Race/ethnicity</i>								
Non-Hispanic white (n=10)	4.0	3.3	0.9	1.1	20%	30%	60%	40%
Non-Hispanic black (n=97)	1.2	1.2	1.4	1.4	26%	19%	48%	39%
Hispanic (any race) (n=73)	6.3	3.2	3.1	2.3†	23%	26%	55%	40%*
Multiracial/Other (n=12)	2.1	1.0	0.9	1.4	17%	25%	42%	42%
<i>Comorbidities</i>								
Severe mental illness (n=84)	5.5	1.8	3.3	2.5	29%	25%	54%	43%
Substance use disorder (n=36)	2.2	2.2	1.0	1.4	22%	17%	53%	44%
HIV+ (n=23)	1.3	2.5	2.0	1.6†	30%	39%	52%	52%
Chronic condition (n=97)	5.3	3.6	2.8	2.2†	34%	29%	49%	40%

† $p > 0.01$ & $= < 0.05$, † $p > 0.05$ & < 0.10

There were no statistically significant predictors of the magnitude of pre-post changes among EPVA clients. Increasing client age was associated with a smaller decrease in inpatient days, while having a chronic condition was associated with a greater decrease in ED visits, but neither of these relationships were quite statistically significant.

Table 50. Predictors of Pre-Post Changes in Inpatient and ED Utilization among EPVA Clients

Model	Δ Inpatient Admissions			Δ Inpatient Days			Δ ED Visits		
	Unstandardized Coefficients		Sig.	Unstandardized Coefficients		Sig.	Unstandardized Coefficients		Sig.
B	Std. Error	B		Std. Error	B		Std. Error		
(Constant)	-0.156	0.802		-0.878	8.499		0.175	1.337	
Age at Enrollment (in years, mean-centered for Overall MRT-SH population)	0.013	0.012		0.238	0.132	†	0.033	0.021	
<i>Race/Ethnicity</i>									
Non-Hispanic white (Ref. category)	--	--		--	--		--	--	
Non-Hispanic Black (1=yes)	0.232	0.709		2.024	7.508		-0.018	1.181	
Hispanic (1=yes)	0.049	0.714		-0.714	7.571		-0.598	1.191	
Multiracial/Other (1=yes)	0.499	0.903		1.468	9.572		0.903	1.506	
<i>Sex</i>									
Male (Ref. category)	--	--		--	--		--	--	
Female (1=yes)	0.226	0.370		0.734	3.920		0.233	0.617	
<i>Comorbidities</i>									
Severe mental illness (1=yes)	-0.400	0.318		-3.055	3.373		-0.647	0.531	
Substance use disorder (1=yes)	0.272	0.400		0.602	4.241		0.846	0.667	
HIV+ (1=yes)	0.205	0.474		3.640	5.018		0.674	0.789	
Other chronic condition (1=yes)	-0.373	0.310		-2.366	3.283		-0.938	0.516	†

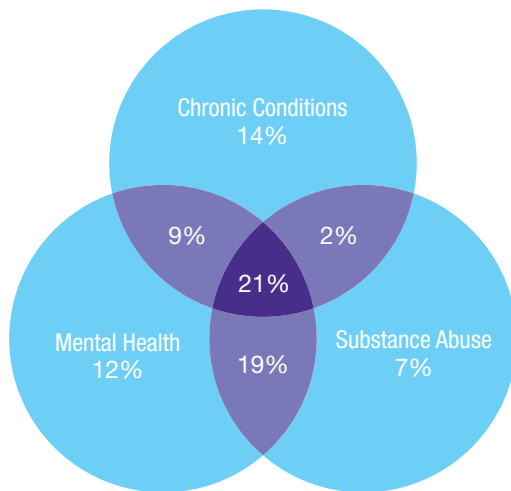
†p>0.05 & <0.10

Summary. Because all clients were housed in the pre-period, it is not surprising that the EPVA program shows less evidence of positive effects than many of the other MRT-SH programs on a pre-post basis. Enrollees were less likely to experience an emergency department visit in the year after enrollment compared to the previous year, and used fewer outpatient substance abuse services. The impact of this program may be better observed in future analyses that include a comparison group.

Homeless Housing and Assistance Program (HHAP)

Sixty percent of the enrollees in this program (n=43) have an active diagnosis of a severe mental illness, while 49% have a substance use disorder and 47% have a chronic medical condition other than behavioral health or HIV. Only 2% have HIV (not pictured below). Twenty-one percent had diagnoses of SMI, SUD, and a chronic medical condition, while 16% did not have a Medicaid claim for a diagnosis in one of these categories in the 9 months prior to MRT-SH enrollment¹⁴.

Figure 18. Overlap Between Types of Chronic Conditions among HHAP Project Enrollees



Note: 16% of enrollees had none of these primary diagnoses during the observed period

Note: To obtain total percentage of participants with a given diagnosis, sum all percentages that fall into the relevant circle (but may not exactly match text due to rounding). Circles are not sized proportionately.

Inpatient and emergency care decreased following MRT-SH enrollment, with respondents being significantly less likely to have any inpatient stays and having significantly fewer inpatient days and emergency department visits. The differences are only statistically significant across diagnoses, however, not for behavioral health stays specifically.

Table 51. Inpatient and Emergency Department Utilization, Pre- and Post-Enrollment

	Pre	Post	Sig.
<i>Inpatient utilization</i>			
Any inpatient care	28%	9.3%	*
Any inpatient mental health	7.0%	2.3%	n.s.
Any inpatient substance abuse	14%	4.7%	n.s.
Average number inpatient days	4.1	1.3	*
<i>Emergency department utilization</i>			
Any ED visits	60%	42%	†
Any ED visits - mental health	4.7%	4.7%	n.s.
Any ED visits - substance abuse	12%	4.7%	n.s.
Average number of ED visits	2.3	1.5	**

** $p > 0.001$ & $= < 0.01$, * $p > 0.01$ & $= < 0.05$, † $p > 0.05$ & $= < 0.10$, n.s. = not significant

Findings were mixed in regard to outpatient behavioral health care. The use of overall outpatient mental health services increased somewhat, while the use of overall outpatient substance abuse services decreased. Neither finding was statistically significant, however. No differences in specific types of services were statistically significant, although the small increase in visits for medication management was close, with a p-value of 0.06.

Table 52. Utilization of Outpatient Mental Health and Substance Abuse Services, Overall and Selected Services, Pre- and Post-Enrollment

	Pre	Post	Sig.
<i>Outpatient behavioral health visits</i>			
All outpatient mental health services	3.4	3.8	n.s.
All outpatient substance abuse services	16.1	9.8	n.s.
<i>Specific outpatient behavioral health services</i>			
Methadone maintenance	0.8	0.9	n.s.
Therapy and counseling	9.2	4.3	n.s.
Medication management	0.8	0.9	n.s.
Other outpatient behavioral health	9.5	8.4	n.s.

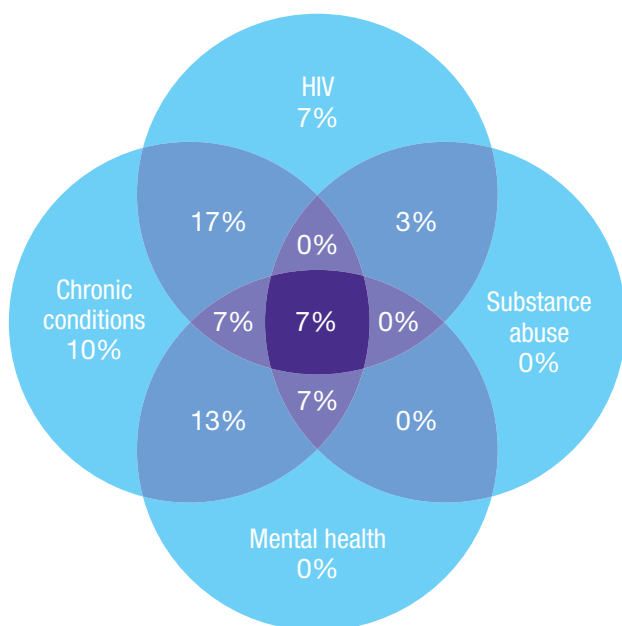
n.s. = not significant

¹⁴ Because HHAP residences began placing clients later than some other programs, only a 9-month pre- and post-period are used here.

OTDA Homeless Senior and Disabled Placement Pilot (New York City)

More than two-thirds (73%) of the enrollees in this program (n=30) have a chronic medical condition (other than behavioral health or HIV), while 43% have HIV. Thirty-seven percent have an active diagnosis of a severe mental illness, and 30% have a substance use disorder. Seven percent had all four types of diagnoses, while 13% did not have a Medicaid claim for a diagnosis in one of these categories in the 6 months prior to MRT-SH enrollment¹⁵.

Figure 19. Overlap Between Types of Chronic Conditions among OTDA Homeless Senior and Disabled Placement Pilot Enrollees



Note: Not shown are SMI+HIV (3%), chronic conditions + SUD (13%), and none (13%)
 Note: To obtain total percentage of participants with a given diagnosis, sum all percentages that fall into the relevant circle (sum may not exactly match text due to rounding).
 Circles are not sized proportionately.

While inpatient utilization appeared to rise for these clients following the MRT-SH enrollment, the differences were not statistically significant. Emergency department use declined sharply, and while these differences were not quite statistically significant, they were close to being so.

Summary. The early view of the OTDA Homeless Senior and Disabled Pilot Program shows possible increases in inpatient utilization along with decreases in emergency department utilization, primary care, and outpatient behavioral health services. These findings are particularly limited, however, by the fact that the pre- and post-periods were only 6 months in duration and that only 30 cases were available for the analyses. A much clearer picture of this program is likely to emerge going forward.

Table 59. Inpatient and Emergency Department Utilization, Pre- and Post-Enrollment

	Pre	Post	Sig.
<i>Inpatient utilization</i>			
Any inpatient care	37%	40%	n.s.
Any inpatient mental health	7%	10%	n.s.
Any inpatient substance abuse	0%	0%	--
Average number inpatient days	2.6	4.0	n.s.
<i>Emergency department utilization</i>			
Any ED visits	57%	33%	†
Any ED visits - mental health	3%	7%	n.s.
Any ED visits - substance abuse	0%	0%	--
Average number of ED visits	1.3	0.7	†

†p>0.05 & <0.10, n.s. = not significant

Similarly, the use of outpatient behavioral health services declined after MRT-SH enrollment, but none of these changes were statistically significant.

Table 60. Utilization of Outpatient Mental Health and Substance Abuse Services, Overall and Selected Services, Pre- and Post-Enrollment

	Pre	Post	Sig.
<i>Outpatient behavioral health visits</i>			
All outpatient mental health services	5.1	2.6	n.s.
All outpatient substance abuse services	3.4	3.3	n.s.
<i>Specific outpatient behavioral health services</i>			
Methadone maintenance	2.0	2.4	n.s.
Therapy and counseling	1.2	0.7	†
Medication management	0.4	0.6	n.s.
Other outpatient behavioral health	5.0	2.3	n.s.

†p>0.05 & <0.10, n.s. = not significant

15 Because OTDA Homeless Senior and Disabled Placement Pilot began enrolling clients later than some other programs, only a 6-month pre- and post-period are used here.

ANALYSES BY DIAGNOSTIC GROUPS

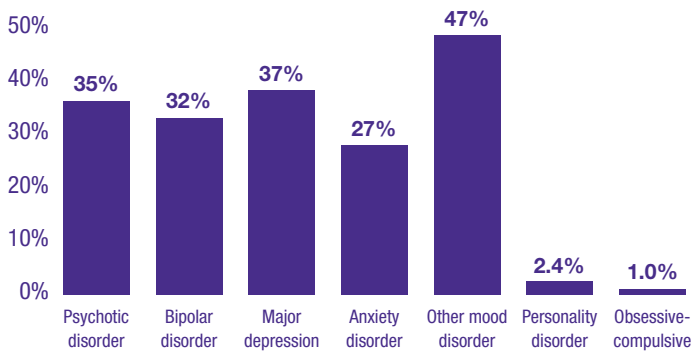
Outcomes for the SMI Population	49
Outcomes for the SUD Population	54
HIV Population	59
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SMI Population

Sixty-six percent of all the MRT-SH recipients had an active diagnosis of a SMI in the 12 months before their enrollment (n=1,356). The most common type of SMI in this population was an “other mood disorder” (which included dysthymic disorder; cyclothymic disorder; depressive disorder not elsewhere classified; and “other and unspecified episodic mood disorder”). Additionally, there were high percentages diagnosed with major depression; psychotic disorders (schizophrenia, delusional disorder, or unspecified psychosis); and bipolar disorder. Slightly fewer were diagnosed with a qualifying anxiety disorder, while only a handful had qualifying personality disorders or obsessive-compulsive disorder. More than half (51%) of the MRT-SH enrollees with a SMI were diagnosed in more than one of these categories.

Figure 20. Specific Categories of Severe Mental Illness (SMI)



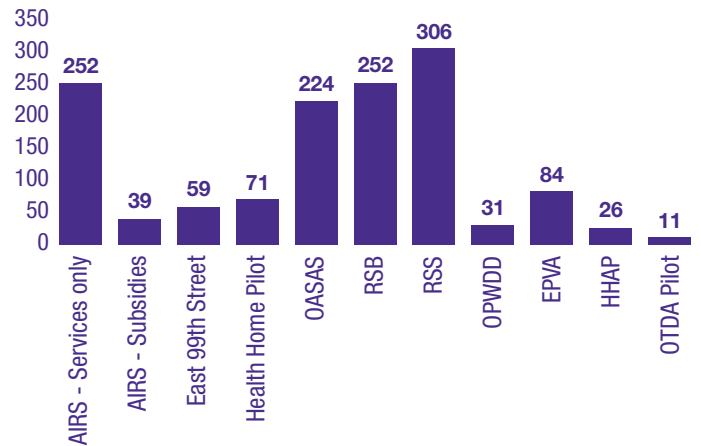
Compared to the MRT-SH recipients overall, those with a SMI diagnosis were slightly younger and more likely to be White, and less likely to be Black or to live in New York City. They were substantially more likely to have a SUD diagnosis.

Table 61. Characteristics of MRT-SH Recipients with Severe Mental Illness (SMI) Diagnosis

	MRT SMI Population	Overall MRT Population
Average age (in years)	45.6	47.1
<i>Race/ethnicity</i>		
Non-Hispanic white	36%	30%
Non-Hispanic Black	37%	42%
Hispanic/Latino	21%	23%
Other race or multiracial	5%	5%
<i>Gender</i>		
Male	52%	55%
Female	48%	45%
<i>Geography</i>		
New York City	58%	65%
Long Island	4%	3%
Other New York State	38%	33%
<i>Comorbidities</i>		
Has HIV	34%	40%
Has a SUD	52%	46%
Has another chronic medical condition	54%	53%

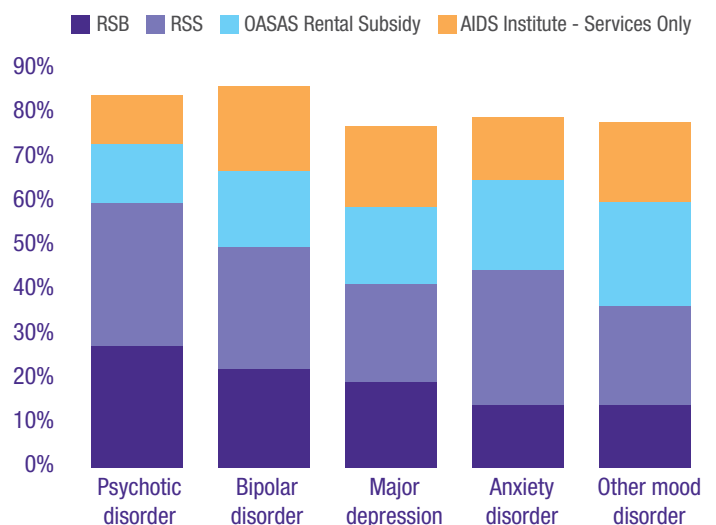
Recipients with a SMI diagnosis were most likely to be found in one of the OMH programs (558 or 41% of the SMI population), but a significant number were also enrolled in the AIDS Institute and OASAS rental subsidy programs (291 [21%] and 224 [17%] respectively).

Figure 21. Number of MRT-SH Clients with SMI by Program



Program enrollment varied somewhat by diagnosis. As shown below, the majority of clients with psychotic disorders were enrolled in one of the OMH programs (RSB or RSS), but clients with other types of disorders were found in a wider variety of programs. Almost two-thirds of clients (64%) with an “other mood disorder” are enrolled in programs other than an OMH program.

Figure 22. Program Enrollment by Specific Mental Health Diagnosis



Note: Diagnostic categories are not mutually exclusive; many clients have diagnoses in more than one category.

Table 62. Specific Mental Health Diagnoses by Program Enrollment (All Clients)

Program	% Any SMI	Psychotic Disorder	Bipolar Disorder	Major Depression	Other Mood Disorder	Anxiety Disorder
AIDS Institute “Services Only”	48%	10%	16%	17%	22%	11%
AIDS Institute “Subsidies and Services”	53%	12%	9%	22%	28%	22%
East 99th Street	43%	13%	7%	27%	18%	9%
Health Home Pilot	65%	14%	17%	24%	35%	15%
OASAS Rental Subsidies and Supports	75%	20%	26%	29%	49%	26%
OMH Rental Subsidies: Brooklyn	100%	47%	34%	33%	31%	19%
OMH Rental Subsidies: Statewide	100%	45%	36%	32%	42%	36%
OPWDD Expansion of Existing Rental/Services	61%	18%	8%	2%	37%	16%
Eviction Prevention for Vulnerable Adults	44%	8%	12%	19%	20%	11%
HHAP Capital Programs	60%	28%	7%	5%	21%	19%
OTDA NYC Disability Housing Subsidy Pilot	37%	7%	4%	11%	7%	14%
All MRT-SH Programs	66%	23%	21%	24%	31%	19%

Note: Diagnostic categories are not mutually exclusive; many clients have diagnoses in more than one category.

The table above shows the percentage of all clients (not just those with SMI) enrolled in each program that has each category of diagnosis. This gives a very different picture of the impact of these disorders on each program. For example, while only 3% of MRT-SH clients with a psychotic disorder are found in the HHAP program (not shown), 28% of HHAP clients have a diagnosed psychotic disorder (Table 62). For most programs other than the OMH programs, other mood disorders are the most heavily represented SMI diagnosis in their client population. (East 99th, HHAP, and OTDA Homeless Senior and Disabled Placement Pilot Program are exceptions, with major depression most common in East 99th Street, anxiety disorders most common in OTDA Homeless Senior and Disabled Pilot and psychotic disorders most common in HHAP.)

While most programs showed a reduction in overall inpatient days (not just inpatient stays related to behavioral health) among their clients with SMI (except for AIDS Institute “subsidies and services,” OPWDD and OTDA Homeless Senior and Disabled Placement Pilot), the relationship was clearly more robust in some programs than in others (Table 63). The AIDS Institute “services only”, OASAS-RS, RSB, RSS, and Health Home Pilot programs in particular seemed to reduce inpatient days among clients with SMI.

When looking at the percent of clients with SMI who had at least one emergency room visit for a primary diagnosis of SMI, there were similar levels of variation. The clients most likely to have one or more ED visits in the year prior to enrollment were those in the OASAS-RS and OMH Statewide rental subsidy programs. While most programs did experience a reduction in the percentage of their clients who had an ED visit for SMI, this was only statistically significant for the AIDS Institute “services only” program, OASAS-RS, and

RSS (although the p-values for HHSP, RSB, and EPVA were close to statistical significance). It should also be noted that the HHSP, HHAP, and OTDA Homeless Senior and Disabled Placement Pilot programs had a shorter pre- and post-period than the other programs, which may account for their lower numbers overall.

Table 63. Average Overall Inpatient Days and Percent with >=1 Emergency Visits for SMI among the SMI Population by Program, Pre- and Post-Enrollment

	# Inpatient Days – for any reason			% with Emergency Visits – for SMI		
	Pre	Post	Sig.	Pre	Post	Sig.
AIDS Institute – Services only	10.9	8.1	**	8.7%	4.8%	*
AIDS Institute – Services + Subsidy	6.6	6.8	n.s.	21%	13%	n.s.
East 99th	4.5	3.0	n.s.	3%	3%	n.s.
Health Home Pilot	8.4	4.4	**	10%	4.1%	†
OASAS Rental Subsidies	24.7	11.6	***	29%	18%	**
OMH Rental - Brooklyn	9.1	5.1	*	14%	9.1%	†
OMH Rental - Statewide	12.8	7.1	***	25%	18%	*
OPWDD	0.7	1.0	n.s.	3.0%	0%	n.s.
OTDA Eviction Prevention	5.5	1.8	n.s.	6.0%	0%	†
Homeless Housing Program	6.5	1.8	†	7.7%	7.7%	n.s.
OTDA Pilot	3.8	4.6	n.s.	9.1%	18%	n.s.

*** p < 0.001, ** p > 0.001 & < 0.01, * p > 0.01 & < 0.05, † p > 0.05 & < 0.10, n.s. = not significant

The results were less striking when looking at mental-health specific metrics, like the percentage of clients who used CPEP services or had at least one psychiatric hospitalization. The pattern for CPEP was not clear across programs, with some experiencing increases and others decreases in the percentage of their SMI clients who used CPEP services. None of these changes were statistically significant. The percent of clients with a SMI who had at least one psychiatric hospitalization decreased among almost all programs (except for AIDS Institute “services only”, OP-WDD and OTDA NYC Senior Disabled Housing), but these decrease were only statistically significant for the AIDS Institute “services only” program, OASAS-RS, and RSS.

Table 64. CPEP and Psychiatric Inpatient Stays among the SMI Population by Program, Pre- and Post-Enrollment

	Any CPEP			Any Psychiatric Inpatient		
	Pre	Post	Sig.	Pre	Post	Sig.
AIDS Institute – Services only	3.6%	2.4%	n.s.	7.9%	4.4%	*
AIDS Institute – Services + Subsidy	7.7%	2.4%	n.s.	15%	18%	n.s.
East 99th	1.7%	1.7%	n.s.	8.5%	5.1%	n.s.
Health Home Pilot	4.2%	8.5%	n.s.	15%	13%	n.s.
OASAS Rental Subsidies	4.5%	3.6%	n.s.	19%	12%	**
OMH Rental - Brooklyn	5.5%	6.7%	n.s.	12%	9.5%	n.s.
OMH Rental - Statewide	5.9%	3.6%	n.s.	25%	16%	***
OPWDD	3.2%	3.2%	n.s.	3.2%	6.5%	n.s.
OTDA Eviction Prevention	0%	3.6%	†	6.0%	2.4%	n.s.
Homeless Housing Program	12%	3.9%	n.s.	15%	3.9%	†
OTDA Pilot	0%	2.7%	†	18%	27%	n.s.

*** $p < 0.001$, ** $p > 0.001$ & ≤ 0.01 , * $p > 0.01$ & ≤ 0.05 , † $p > 0.05$ & < 0.10 , n.s. = not significant

Overall, inpatient services were used most intensively by clients with psychotic disorders, bipolar disorders, or other mood disorders, and these diagnostic groups also had the highest rate of any psychiatric hospitalization during the pre-period. All diagnostic groups showed statistically significant decreases in the average number of inpatient admissions and inpatient days, and in the percentage with at least one psychiatric hospital stay.

Table 65. Pre- and Post-Enrollment Utilization of Inpatient Care by Specific Diagnosis

	Inpt Adm		Inpt Days		Psych Adm	
	Pre	Post	Pre	Post	Pre	Post
Psychotic disorder	2.2	1.7***	18.3	9.5***	28%	18%***
Bipolar disorder	2.3	1.5***	16.1	8.8***	22%	16%**
Major depression	1.8	1.4***	12.8	7.3***	17%	11%***
Anxiety disorder	1.9	1.3***	11.6	6.5***	16%	11%**
Other mood disorder	2.3	1.6***	16.5	8.2***	21%	12%***

*** $p < 0.001$, ** $p > 0.001$ & ≤ 0.01

In contrast, clients with an anxiety disorder used emergency department services most intensively, although those with a psychotic disorder were most likely to receive CPEP services. Once again, all diagnostic groups had statistically significant decreases in both ED visits overall and ED visits for a primary SMI diagnosis. None of the groups had statistically significant changes in the use of CPEP services.

Table 66. Pre- and Post-Enrollment Utilization of Emergency Care by Specific Diagnosis

	ED Visits		ED Visits for SMI		Any CPEP	
	Pre	Post	Pre	Post	Pre	Post
Psychotic disorder	4.8	3.3***	0.6	0.4***	8.9%	7.8%
Bipolar disorder	4.2	3.2***	0.5	0.4*	5.9%	7.1%
Major depression	3.8	2.8***	0.4	0.2***	4.7%	3.8%
Anxiety disorder	5.2	3.6***	0.7	0.4***	4.8%	4.4%
Other mood disorder	4.9	3.3***	0.6	0.4***	6.4%	5.5%

*** $p < 0.001$, * $p > 0.01$ & ≤ 0.05

There are a few interesting observations when examining the types of procedures billed for clients with a SMI before and after MRT-SH enrollment (especially when compared to the other diagnostic groups [see Tables 76, 81, and 87]). Most types of services went down post-enrollment. However, genitourinary system procedures went up 44% and gastrointestinal system procedures went up 22% (these procedures increased across all the diagnostic groups, not just SMI). Also, otolaryngologic system procedures decreased slightly for clients with SMI, but increased for the other diagnostic groups. Finally, neurologic procedures decreased slightly for clients with SMI as well as clients with chronic medical conditions, while increasing for clients with a SUD [Table 76] or with HIV [Table 81].

Table 67. Top 20 APG Service Lines from Claims for Clients with SMI, Number of Procedures Pre- and Post-Enrollment

	Pre	Post	Total	% Change
Mental illness and substance abuse therapies	52,299	45,122	97,421	-14%
Laboratory	34,002	34,539	68,541	2%
Incidental procedures and services	35,507	32,366	67,873	-9%
Other ancillary tests and procedures	10,740	9,661	20,401	-10%
Radiology	5,484	4,602	10,086	-16%
Dental procedures	5,162	4,009	9,171	-22%
Radiologic procedures	3,891	3,653	7,544	-6%
Rehabilitation	2,799	2,610	5,409	-7%
Chemotherapy and other drugs	2,478	2,685	5,163	8%
Pathology	1,006	980	1,986	-3%
Skin and integumentary system procedures	868	768	1,636	-12%
Cardiovascular procedures	700	655	1,355	-6%
Neurologic system procedures	671	655	1,326	-2%
Hematologic, lymphatic, and endocrine procedures	683	585	1,268	-14%
Genitourinary system procedures	485	697	1,182	44%
Musculoskeletal system procedures	605	488	1,093	-19%
Anesthesia	374	366	740	-2%
Gastrointestinal system procedures	304	372	676	22%
Respiratory procedures	342	292	634	-15%
Otolaryngologic system procedures	278	263	541	-5%

Note: A single claim may include multiple procedures, including multiple procedures within the same category

The Enhanced Ambulatory Patient Group classification system (version 13.2.17.1), a product of the 3M Health Information Systems, Inc., categorizes the amount and type of resources used in various ambulatory visits so that patients within each APG have similar resource use and cost. APGs group together procedures and medical visits that share similar characteristics and resource utilization patterns. APGs are designed to predict the average pattern of resource use of a group of patients in a given APG.

A look at specific APG types (more detailed than service lines) is also interesting. Therapeutic drug monitoring greatly increased (389%). Furthermore, while group psychotherapy decreased substantially (-31%), individual comprehensive psychotherapy increased (6%). Full-day day rehabilitation decreased markedly (-80%), and mental hygiene assessments also decreased (-25%). It would appear that mental health care for these clients post-enrollment is more likely to consist of medication management and individual comprehensive therapy rather than day rehab and group therapy.

Table 68. Top 25 APG Types from Claims for Clients with SMI, Number of Procedures Pre- and Post-Enrollment

	Pre	Post	Total	% Change
Medical visit indicator	30,509	27,562	58,071	-10%
Medication administration & observation	18,596	19,195	37,791	3%
Group psychotherapy	12,375	8,524	20,899	-31%
Individual comprehensive psychotherapy	8,075	8,590	16,665	6%
Level I chemistry tests	6,914	6,610	13,524	-4%
Counseling or individual brief psychotherapy	5,933	5,746	11,679	-3%
Organ or disease oriented panels	4,969	4,498	9,467	-9%
Incidental to medical visit or significant procedure	4,688	4,473	9,161	-5%
Plain film	4,862	3,962	8,824	-19%
Level I hematology tests	3,281	2,869	6,150	-13%
Level I immunology tests	3,026	2,753	5,779	-9%
Venipuncture	2,679	2,451	5,130	-9%
Physical therapy	2,685	2,424	5,109	-10%
Cardiogram	2,747	2,275	5,022	-17%
Basic chemistry tests	2,658	2,356	5,014	-11%
Level II microbiology tests	1,899	2,042	3,941	8%
Level II immunology tests	1,775	1,831	3,606	3%
Level I endocrinology tests	1,824	1,728	3,552	-5%
Mental hygiene assessment	1,976	1,484	3,460	-25%
Minor pharmacotherapy	1,748	1,633	3,381	-7%
Day rehabilitation, full day	2,758	544	3,302	-80%
Level II chemistry tests	1,669	1,620	3,289	-3%
Therapeutic drug monitoring	469	2,293	2,762	389%
Urinalysis	1,304	1,271	2,575	-3%
Diagnostic ultrasound except obstetrical and vascular of lower extremities	1,233	1,301	2,534	6%
Blood and urine dipstick tests	1,268	1,206	2,474	-5%
Level I clotting tests	1,052	921	1,973	-12%

Note: A single claim may include multiple procedures, including multiple procedures within the same category

The average decrease in inpatient admissions for MRT-SH clients with a SMI was 0.5 admissions. This reduction was greater for Hispanic clients than non-Hispanic white clients, but less for women than for men. Clients with a comorbid SUD had a greater reduction, while clients with HIV had a lesser reduction.

The average decrease in inpatient days for MRT-SH clients with a SMI was 5.3 days. There is less of a reduction as client age increases. Clients with a psychotic disorder, bipolar disorder, or other mood disorder experience a greater reduction in inpatient days than those with major depression only. While clients in the OMH rental subsidy programs did not experience a significantly greater reduction in inpa-

tient days than those in programs that were not behavioral-health focused, clients in OASAS-RS did experience a significantly greater reduction.

The average decrease in emergency department visits for MRT-SH clients with a SMI was 1.1. This was significantly larger for clients with a comorbid chronic condition or with

a psychotic disorder or other mood disorder (versus major depression only). The decrease was also greater for clients who were enrolled in managed care for at least part of the pre-enrollment period. Finally, clients in the OASAS-RS program had a significantly larger reduction in inpatient days than those in a program that was not behavioral-health focused.

Table 69. Predictors of Pre-Post Changes in Inpatient and ED Utilization among Clients with SMI

Model	Δ Inpatient Admissions			Δ Inpatient Days			Δ ED Visits		
	Unstandardized Coefficients B	Std. Error	Sig.	Unstandardized Coefficients B	Std. Error	Sig.	Unstandardized Coefficients B	Std. Error	Sig.
(Constant)	0.028	0.449		1.587	2.645		1.267	0.571	*
Age at Enrollment (in years, mean-centered for SMI population)	0.014	0.012		0.161	0.069	*	0.027	0.015	†
<i>Race/Ethnicity</i>									
Non-Hispanic white (Ref. category)	--	--		--	--		--	--	
Non-Hispanic Black (1=yes)	-0.214	0.318		1.884	1.870		0.048	0.404	
Hispanic (1=yes)	-1.104	0.366	**	-2.434	2.153		-0.385	0.465	
Multiracial/Other (1=yes)	-0.557	0.591		2.626	3.478		0.678	0.751	
<i>Sex</i>									
Male (Ref. category)	--	--		--	--		--	--	
Female (1=yes)	0.593	0.256	*	1.492	1.510		-0.018	0.326	
<i>Comorbidities</i>									
Substance use disorder (1=yes)	-0.548	0.281	*	-2.563	1.653		-0.452	0.357	
HIV+ (1=yes)	0.844	0.305	**	2.639	1.798		0.024	0.388	
Other chronic condition (1=yes)	-0.021	0.264		-1.363	1.554		-0.798	0.335	*
<i>Specific Diagnoses</i>									
Major Depression (Ref. category)	--	--		--	--		--	--	
Psychotic disorder (1=yes)	-0.063	0.277		-6.134	1.634	***	-0.967	0.353	**
Bipolar disorder (1=yes)	-0.427	0.275		-2.989	1.620	†	0.060	0.350	
Anxiety disorder (1=yes)	-0.178	0.293		0.557	1.728		-0.573	0.373	
Other mood disorder (1=yes)	-0.137	0.258		-4.777	1.517	**	-0.760	0.328	*
<i>Program Enrollment</i>									
Other program - not behavioral health-focused (Ref. category)	--	--		--	--		--	--	
OMH Rental Subsidies – Brooklyn (1=yes)	0.391	0.370		0.318	2.180		0.549	0.471	
OMH Rental Subsidies – Statewide (1=yes)	-0.053	0.379		0.308	2.231		-0.463	0.482	
OASAS Rental Subsidies (1=yes)	-0.674	0.419		-6.464	2.470	**	-1.430	0.533	**
<i>Managed Care in Pre-Period</i>									
No months managed care enrollment (Ref. category)	--	--		--	--		--	--	
1+ months managed care enrollment (1=yes)	-0.190	0.291		-0.784	1.716		-0.779	0.371	*

*** $p < 0.001$, ** $p > 0.001$ & $= < 0.01$, * $p > 0.01$ & $= < 0.05$, † $p > 0.05$ & < 0.10 , n.s. = not significant

SUD Population

Forty-six percent of all the MRT-SH recipients had an active diagnosis of a substance abuse disorder (SUD) in the 12 months before their enrollment (n=959).

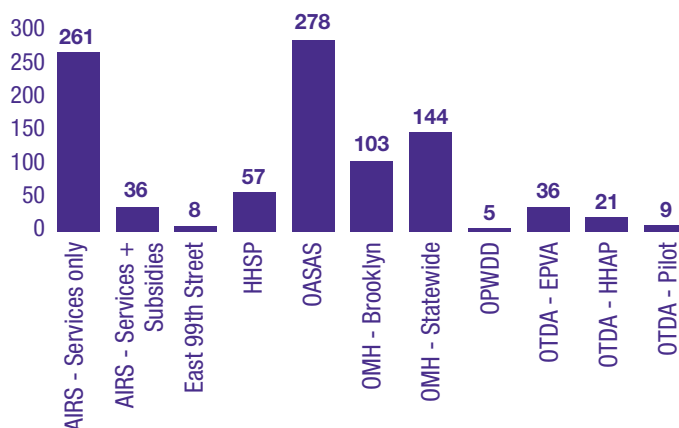
Compared to the MRT-SH clients overall, those with a SUD diagnosis were more likely to be men and somewhat more likely to be white. They were less likely to live in New York City, and more likely to have a co-occurring severe mental illness.

Table 70. Characteristics of MRT-SH Recipients with Substance Use Disorder (SUD) Diagnosis

	MRT SUD Population	Overall MRT Population
Average age (in years)	46.2	47.1
<i>Race/ethnicity</i>		
Non-Hispanic Black	40%	42%
Hispanic/Latino	20%	23%
Other race or multiracial	6%	5%
Non-Hispanic white	35%	30%
<i>Gender</i>		
Male	61%	55%
Female	39%	45%
<i>Geography</i>		
New York City	56%	65%
Long Island	3%	3%
Other New York State	41%	33%
<i>Comorbidities</i>		
Has HIV	43%	40%
Has a SMI	73%	66%
Has another chronic medical condition	57%	53%

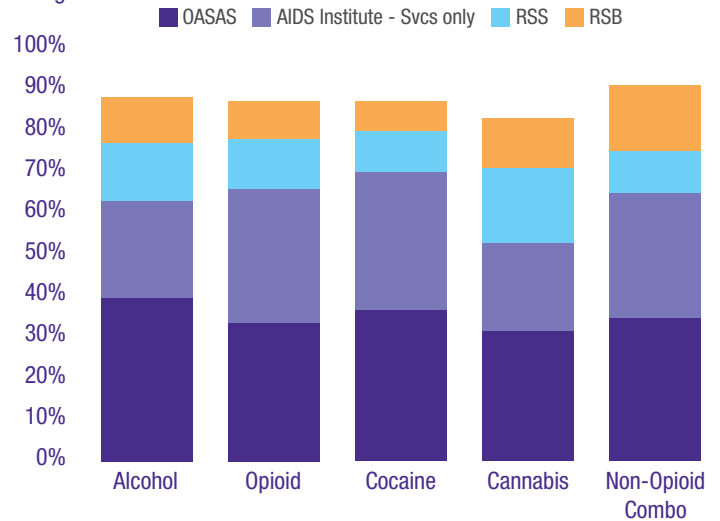
Interestingly, the greatest raw number of clients with a SUD diagnosis are enrolled in one of the AIDS Institute programs (297, or 31% of all clients with SUD), although nearly as many are enrolled in the OASAS rental subsidy program. Large numbers of people with SUDs are also found in the two OMH rental subsidy programs.

Figure 23. Number of MRT-SH Clients with SUD, by Program



Program enrollment varied somewhat by diagnosis. Interestingly, those diagnosed with an alcohol use disorder were more likely than those with other kinds of SUDs to be enrolled in the OASAS-RS program. While it might be expected that a high percentage of those with an opioid use disorder would be enrolled in the AIDS Institute “services only” program (due to the prevalence of intravenous abuse of opioids and the potential for HIV transmission), almost as high a percentage of those with a cocaine use disorder were enrolled in that program (33% and 32%, respectively). Those with a cannabis use disorder were more likely than any other diagnostic group to be enrolled in an OMH program.

Figure 24. Program Enrollment by Specific Substance Use Disorder Diagnosis



Note: Diagnostic categories are not mutually exclusive; many clients have diagnoses in more than one category.

The table below shows the percentage of all clients (not just those with a SUD) enrolled in each program that has each category of diagnosis. This gives a very different picture of the impact of these disorders on each program. For ex-

ample, while only a small fraction of MRT-SH clients with an alcohol or cocaine use disorder are enrolled in HHAP, a significant proportion of the HHAP clients have an alcohol or cocaine use disorder (33% and 21%, respectively).

Table 71. Specific Substance Use Disorder Diagnosis by Program Enrollment

Program	% Any SUD	Alcohol Use Disorder	Opioid Use Disorder	Cocaine Use Disorder	Cannabis Use Disorder	Non-Opioid Combination Disorder	Other SUD
AIDS Institute “Services Only”	50%	21%	23%	15%	5%	8%	20%
AIDS Institute “Subsidies and Services”	49%	15%	16%	20%	9%	3%	19%
East 99th Street	6%	2%	1%	0%	0%	1%	2%
Health Home Pilot	52%	24%	16%	6%	4%	6%	18%
OASAS Rental Subsidies and Supports	100%	62%	41%	28%	13%	16%	46%
OMH Rental Subsidies: Brooklyn	37%	19%	12%	5%	5%	8%	15%
OMH Rental Subsidies: Statewide	43%	20%	14%	7%	7%	4%	16%
OPWDD Expansion of Existing Rental/Services	10%	2%	0%	0%	0%	0%	0%
Eviction Prevention for Vulnerable Adults	19%	2%	7%	1%	2%	2%	5%
HHAP Capital Programs	49%	33%	12%	21%	14%	2%	19%
OTDA Pilot	30%	4%	14%	0%	0%	0%	4%
All MRT-SH Programs	46%	23%	18%	11%	6%	7%	19%

Note: Diagnostic categories are not mutually exclusive; many clients have diagnoses in more than one category.

Overall, inpatient days decreased for clients with SUD in all programs except for OTDA Homeless Senior and Disabled Placement Pilot, which had very small numbers. The decreases were statistically significant for clients enrolled in the AIDS Institute “services only” program, the Health Home Pilot, the OASAS-RS, and the OMH Statewide Rental Subsidy program.

The percent of clients with at least one ED visit for a primary diagnosis of a SUD similarly tended to decline following enrollment, but most of these decreases were not significant. Only the AIDS Institute “services only”, OASAS-RS, and HHSP had statistically significant reductions in ED visits for SUD among their clients with a diagnosed SUD.

Table 72. Overall Inpatient Days and Emergency Visits for SUD among the SUD Population by Program, Pre- and Post-Enrollment

	# Inpatient Days – for any reason			% with >=1 Emergency Visits – for SUD		
	Pre	Post	Sig.	Pre	Post	Sig.
AIDS Institute – Services only	13.9	7.8	***	18%	11%	*
AIDS Institute – Services + Subsidy	8.6	7.2	n.s.	19%	19%	n.s.
East 99th	14.8	11.0	n.s.	25%	0%	n.s.
Health Home Pilot	10.9	3.5	***	25%	7%	*
OASAS Rental Subsidies	24.2	12.5	***	32%	19%	***
OMH Rental - Brooklyn	14.2	9.2	n.s.	15%	13%	n.s.
OMH Rental - Statewide	14.1	8.8	***	22%	19%	n.s.
OPWDD	0	0	--	0%	0%	--
OTDA Eviction Prevention	2.2	2.2	n.s.	8.3%	5.6%	n.s.
Homeless Housing Program	6.0	1.2	†	24%	9.5%	n.s.
OTDA Pilot	2.2	5.1	n.s.	0%	0%	--

Note: As shown in Figure 22, above, the East 99th, OPWDD, and OTDA Homeless Senior and Disabled Placement Pilot programs have very small numbers of clients with diagnosed SUDs and their results must be interpreted with considerable caution.

*** $p < 0.001$, ** $p > 0.001$ & $= < 0.01$, * $p > 0.01$ & $= < 0.05$, † $p > 0.05$ & < 0.10 , n.s. = not significant

Similar results were found for the percent of clients with at least one inpatient rehabilitation or detox stay. There was a statistically significant decrease in inpatient rehab among clients in the Health Home, OASAS, or OMH Statewide programs. Only OASAS-RS clients experienced a significant reduction in the likelihood of having an inpatient detox, although the p-values for the AIDS Institute and Health Home pilot programs were close to significance.

Table 73. Percent of Clients with ≥ 1 Inpatient Rehabilitation or Detoxification Stay among the SUD Population by Program, Pre- and Post-Enrollment

	% with Inpatient Rehab			% with Inpatient Detox		
	Pre	Post	Sig.	Pre	Post	Sig.
AIDS Institute – Services only	10%	6.6%	†	7.3%	4.2%	†
AIDS Institute – Services + Subsidy	14%	5.6%	n.s.	2.8%	2.8%	n.s.
East 99th	0%	0%	--	0%	0%	--
Health Home Pilot	16%	3.5%	*	7.0%	1.8%	†
OASAS Rental Subsidies	27%	13%	***	13%	8.3%	**
OMH Rental - Brooklyn	9.7%	8.7%	n.s.	7.8%	6.8%	n.s.
OMH Rental - Statewide	15%	2.8%	***	1.4%	1.4%	n.s.
OPWDD	0%	0%	--	0%	0%	--
OTDA Eviction Prevention	0%	0%	--	2.8%	0%	--
HHAP	9.5%	4.8%	n.s.	0%	0%	--
OTDA Pilot	0%	0%	--	0%	0%	--

*** $p < 0.001$, ** $p > 0.001$ & ≤ 0.01 , * $p > 0.01$ & ≤ 0.05 , † $p > 0.05$ & < 0.10 , n.s. = not significant

Note: As shown in Figure 21, above, the East 99th, OPWDD, and OTDA Homeless Senior and Disabled Placement Pilot programs have very small numbers of clients with diagnosed SUDs and their results must be interpreted with considerable caution.

Overall, inpatient services were used most intensively by clients with a diagnosed non-opioid combination disorder (measured by both admissions and days). Those with alcohol use disorders had the second-highest average number of inpatient admissions, but both those with cannabis use disorders and cocaine use disorders had higher average numbers of inpatient days. Those with cocaine use disorders were also the most likely to have at least one inpatient rehab stay, while those with alcohol use disorders were most likely to have at least one inpatient detox during the pre-enrollment period.

All diagnostic groups showed statistically significant decreases in the average number of inpatient admissions and inpatient days and in the percentage with at least one rehab stay. Only those with an alcohol use disorder or an opioid use disorder had a significant decrease in the percent with at least one inpatient detox.

Table 74. Pre- and Post-Enrollment Utilization of Inpatient Care by Specific Diagnosis

	Inpt Adm		Inpt Days		Inpt Rehab		Inpt Detox	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Alcohol use disorder	4.2	2.3***	20.5	11.4***	23%	11%***	12%	8%**
Opioid use disorder	3.3	1.6***	16.6	8.6***	18%	7%***	10%	6%**
Cocaine use disorder	3.9	2.1***	20.7	10.4***	28%	13%***	10%	7%
Cannabis use disorder	2.9	1.2***	21.1	7.0***	20%	7%***	7%	2%†
Non-opioid combination	5.5	2.2***	26.4	11.2***	26%	13%***	10%	9%
Other SUD	3.6	2.2***	20.2	11.2***	20%	10%***	9%	7%

*** $p < 0.001$, ** $p > 0.001$ & ≤ 0.01 , † $p > 0.05$ & < 0.10

Those with an alcohol use disorder had both the highest number of ED visits overall and the highest number of ED visits for substance abuse. All diagnostic groups showed statistically significant decreases in the number of emergency department visits both overall and for substance use, except that the reduction in ED visits for substance abuse was not quite statistically significant for those with cannabis use disorders.

Table 75. Pre- and Post-Enrollment Utilization of Emergency Care by Specific Diagnosis

	ED Visits		ED Visits for SUD	
	Pre	Post	Pre	Post
Alcohol use disorder	5.6	3.4***	1.0	0.5***
Opioid use disorder	4.1	2.6***	0.6	0.2***
Cocaine use disorder	4.3	3.0***	0.5	0.3**
Cannabis use disorder	3.6	2.6*	0.4	0.2†
Non-opioid combination	4.4	3.1**	0.9	0.3**
Other SUD	5.4	3.4***	0.7	0.4***

** $p < 0.001$, * $p > 0.001$ & ≤ 0.01 , † $p > 0.01$ & ≤ 0.05 , ‡ $p > 0.05$

Overall, the patterns of pre- and post-enrollment utilization of specific service types were similar for SUD clients as for other diagnostic groups. Most types of services went down post-enrollment. However, genitourinary system procedures went up by 290% and gastrointestinal system procedures went up by 8% (these increased in all the diagnostic groups, not just SUD). Also, otolaryngologic system procedures increased (15%), which was true of all diagnostic groups except for SMI. Neurologic procedures increased for clients with SUD (14%). Perhaps most strikingly, claims for rehabilitation (physical therapy, occupational therapy, speech therapy, etc.) declined much more for SUD clients (-31%) than for other diagnostic groups (see Tables 67, 81, and 87).

Table 76. Top 20 APG Service Lines from Claims for Clients with SUD
Number of Procedures Pre- and Post-Enrollment

	Pre	Post	Total	% Change
Mental illness and substance abuse therapies	61,309	53,550	114,859	-13%
Laboratory	29,390	31,093	60,483	6%
Incidental procedures and services	25,766	23,130	48,896	-10%
Other ancillary tests and procedures	8,258	7,294	15,552	-12%
Radiology	4,327	3,646	7,973	-16%
Dental procedures	3,841	2,838	6,679	-26%
Radiologic procedures	3,145	2,827	5,972	-10%
Chemotherapy and other drugs	1,866	1,990	3,856	7%
Rehabilitation	2,125	1,456	3,581	-31%
Pathology	737	658	1,395	-11%
Cardiovascular procedures	568	551	1,119	-3%
Hematologic, lymphatic, and endocrine procedures	560	511	1,071	-9%
Skin and integumentary system procedures	587	467	1,054	-20%
Neurologic system procedures	468	532	1,000	14%
Musculoskeletal system procedures	491	383	874	-22%
Genitourinary system procedures	118	460	578	290%
Anesthesia	257	238	495	-7%
Respiratory procedures	267	223	490	-16%
Otolaryngologic system procedures	204	235	439	15%
Gastrointestinal system procedures	196	211	407	8%

Note: A single claim may include multiple procedures, including multiple procedures within the same category

Overall, the patterns seen in top 25 types of procedures among clients with SUDs closely mirror those for clients with SMI. There is the same transition from group therapy (-30%) to individual therapy (+8%) and from full day rehab (-78%) to therapeutic drug monitoring (+547%). The magnitude of the latter change is perhaps the most striking finding.

Table 77. Top 25 APG Types from Claims for Clients with SUD
Number of Procedures Pre- and Post-Enrollment

	Pre	Post	Total	% Change
Medical visit indicator	28,464	30,004	58,468	5%
Medication administration & observation	21,808	19,542	41,350	-10%
Group psychotherapy	14,514	10,231	24,745	-30%
Level I chemistry tests	6,447	6,360	12,807	-1%
Individual comprehensive psychotherapy	5,324	5,739	11,063	8%
Counseling or individual brief psychotherapy	4,415	4,239	8,654	-4%
Organ or disease oriented panels	4,131	3,697	7,828	-11%
Plain film	3,988	3,123	7,111	-22%
Incidental to medical visit or significant procedure	3,704	3,366	7,070	-9%
Level I immunology tests	2,608	2,387	4,995	-8%
Level I hematology tests	2,580	2,235	4,815	-13%
Day rehabilitation, full day	3,824	853	4,677	-78%
Cardiogram	2,309	1,818	4,127	-21%
Basic chemistry tests	2,120	1,866	3,986	-12%
Level II microbiology tests	1,857	2,040	3,897	10%
Venipuncture	2,064	1,819	3,883	-12%
Level II immunology tests	1,792	1,916	3,708	7%
Physical therapy	2,073	1,409	3,482	-32%
Therapeutic drug monitoring	413	2,671	3,084	547%
Mental hygiene assessment	1,772	1,300	3,072	-27%
Level II chemistry tests	1,564	1,452	3,016	-7%
Level I endocrinology tests	1,363	1,312	2,675	-4%
Minor pharmacotherapy	1,257	1,258	2,515	0%
Blood and urine dipstick tests	1,170	1,083	2,253	-7%
Diagnostic ultrasound except obstetrical and vascular of lower extremities	964	1,038	2,002	8%

Note: A single claim may include multiple procedures, including multiple procedures within the same category

The average decrease in inpatient admissions among SUD clients is 1.1. There is significantly less of a decrease for women, however, compared to men. There is also less of a decrease for clients who are HIV+ than for those who are not. Compared to those with alcohol use disorder only, clients with a non-opioid combination disorder experience a significantly greater decrease.

The average decrease in inpatient days among SUD clients is 7 days. There is significantly less of a decrease for black

clients, however, compared to non-Hispanic white clients. Compared to clients with alcohol use disorder only, clients with cocaine use disorders, cannabis use disorders, and non-opioid combination disorders experience significantly greater decreases in inpatient days.

The average decrease in emergency department visits among SUD clients is 1.5. This decrease was significantly larger for clients with a comorbid chronic condition and those who were enrolled in managed care for at least part of the pre-period.

Table 78. Predictors of Pre-Post Changes in Inpatient and ED Utilization among Clients with SUD

Model	Δ Inpatient Admissions			Δ Inpatient Days			Δ ED Visits		
	Unstandardized Coefficients B	Std. Error	Sig.	Unstandardized Coefficients B	Std. Error	Sig.	Unstandardized Coefficients B	Std. Error	Sig.
(Constant)	-1.361	1.017		-6.129	3.914		0.690	0.905	
Age at Enrollment (in years, mean-centered for SUD population)	0.027	0.026		0.134	0.099		0.023	0.023	
<i>Race/Ethnicity</i>									
Non-Hispanic white (Ref. category)	--	--		--	--		--	--	
Non-Hispanic Black (1=yes)	0.199	0.636		5.549	2.449	*	-0.016	0.566	
Hispanic (1=yes)	-1.019	0.737		3.073	2.837		-0.232	0.656	
Multiracial/Other (1=yes)	0.643	1.128		7.467	4.343	†	0.011	1.004	
<i>Sex</i>									
Male (Ref. category)	--	--		--	--		--	--	
Female (1=yes)	1.142	0.511	*	2.468	1.968		0.503	0.455	
<i>Comorbidities</i>									
Severe mental illness (1=yes)	0.767	0.582		-2.905	2.241		-0.543	0.518	
HIV+ (1=yes)	1.344	0.633	*	1.647	2.436		0.004	0.563	
Other chronic condition (1=yes)	0.448	0.517		-0.143	1.991		-0.905	0.460	*
<i>Specific Diagnoses</i>									
Alcohol use disorder (Ref. category)	--	--		--	--		--	--	
Opioid use disorder (1=yes)	-0.778	0.520		-1.564	2.001		0.320	0.463	
Cocaine use disorder (1=yes)	-1.043	0.585	†	-4.538	2.251	*	0.295	0.520	
Cannabis use disorder (1=yes)	-0.347	0.762		-7.230	2.933	*	0.699	0.678	
Non-opioid combination disorder (1=yes)	-2.372	0.704	***	-9.151	2.710	**	0.406	0.627	
Other SUD (1=yes)	0.219	0.508		-1.174	1.954		-0.762	0.452	†
<i>Program Enrollment</i>									
Other program - not behavioral health-focused (Ref. category)	--	--		--	--		--	--	
OMH Rental Subsidies – Brooklyn (1=yes)	0.977	0.883		1.961	3.396		1.390	0.785	†
OMH Rental Subsidies – Statewide (1=yes)	-0.152	0.855		3.581	3.292		-0.832	0.761	
OASAS Rental Subsidies (1=yes)	-1.264	0.722	†	-2.173	2.779		-1.208	0.642	†
<i>Managed Care in Pre-Period</i>									
No months managed care enrollment (Ref. category)	--	--		--	--		--	--	
1+ Months Managed Care Enrollment (1=yes)	-0.440	0.624		0.891	2.403		-1.357	0.555	*

*** $p < 0.001$, ** $p > 0.001$ & $= < 0.01$, * $p > 0.01$ & $= < 0.05$, † $p > 0.05$ & < 0.10 , n.s. = not significant

HIV Population

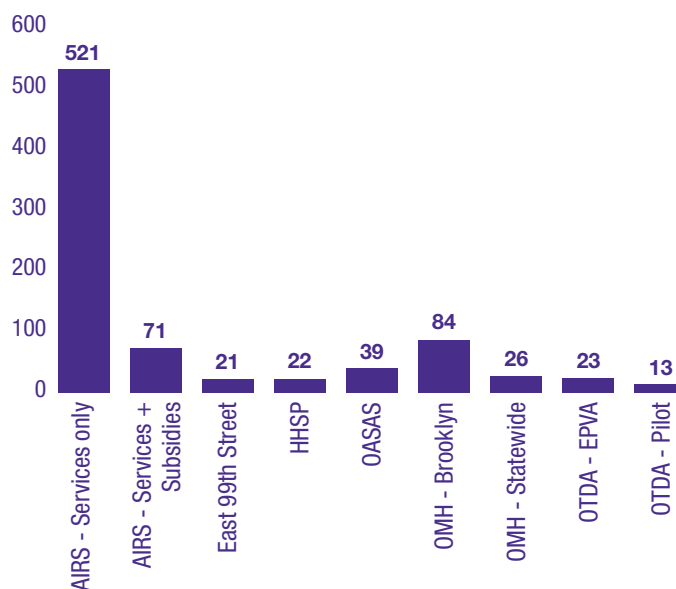
Forty percent of all the MRT-SH clients had an active diagnosis of HIV (n=821). Compared to the overall MRT-SH population, those with HIV were somewhat older, and more likely to be black, Hispanic, or male. They were also much more likely to live in New York City and less likely to live on Long Island. They were more likely to have a substance abuse diagnosis than the MRT-SH population at large. Because many of the AIDS Institute programs are concentrated in New York City, much of the demographic differences observed may be related to the geographical availability of the programs.

Table 79. Characteristics of MRT-SH Recipients with HIV Diagnosis

	MRT HIV Population	Overall MRT Population
Average age (in years)	49.7	47.1
<i>Race/ethnicity</i>		
Non-Hispanic Black	52%	42%
Hispanic/Latino	28%	23%
Other race or multiracial	5%	5%
Non-Hispanic white	15%	30%
<i>Gender</i>		
Male	60%	55%
Female	40%	45%
<i>Geography</i>		
New York City	86%	65%
Long Island	1%	3%
Other New York State	13%	33%
<i>Comorbidities</i>		
Has SMI	57%	66%
Has a SUD	50%	46%
Has another chronic medical condition	54%	53%

The majority of clients with HIV were enrolled in one of the AIDS Institute programs (521, or 72% of all clients with HIV), but more than one-quarter were enrolled in programs run by other agencies, particularly the OMH rental subsidy programs (110, or 13%). The OPWDD program had no clients with HIV, and the HHAP program had extremely few.

Figure 25. Number of MRT-SH Clients with HIV by Program



Although most programs are associated with a decrease in inpatient days and the percent of clients with at least one emergency department visit among their HIV-positive population, the change is not statistically significant in any program except for inpatient days in the AIDS Institute services-only program.

Table 80. Overall Inpatient Days and Emergency Visits among the HIV Population by Program, Pre- and Post-Enrollment

	# Inpatient Days – for any reason			% with ≥1 Emergency Visits – for any reason		
	Pre	Post	Sig.	Pre	Post	Sig.
AIDS Institute “Services only”	8.8	6.0	**	56%	52%	†
AIDS Institute “Services + Subsidy”	4.5	6.9	n.s.	73%	65%	n.s.
East 99th	2.6	2.5	n.s.	33%	43%	n.s.
Health Home Pilot	11.4	4.7	n.s.	73%	68%	n.s.
OASAS Rental Subsidies	15.9	9.7	n.s.	90%	87%	n.s.
OMH Rental - Brooklyn	8.4	5.7	†	63%	60%	n.s.
OMH Rental - Statewide	4.8	3.5	n.s.	73%	65%	n.s.
OTDA Eviction Prevention	1.3	2.5	n.s.	52%	52%	n.s.
OTDA Pilot	3.5	4.2	n.s.	69%	38%	n.s.

*** $p < 0.001$, ** $p > 0.001$ & ≤ 0.01 , * $p > 0.01$ & ≤ 0.05 , † $p > 0.05$ & < 0.10 , n.s. = not significant

Looking at the categories of procedures used by clients with HIV, one of the most striking findings is that mental illness and substance abuse therapies increased (11%), in direct contrast to the other diagnostic groups (see Tables 67, 76, and 87). As with the other groups, gastrointestinal and genitourinary procedures increased (24% and 55%, respectively). Otolaryngologic procedures and neurologic procedures increased as well. The other diagnostic groups all experienced a decrease in respiratory procedures, while clients with HIV actually experienced a slight increase. Chemotherapy and other drugs also increased for these clients (14%)

Table 81. Top 20 APG Service Lines from Claims for Clients with HIV Number of Procedures Pre- and Post-Enrollment

	Pre	Post	Total	% Change
Laboratory	27,931	29,657	57,588	6%
Mental illness and substance abuse therapies	25,967	28,856	54,823	11%
Incidental procedures and services	21,225	20,430	41,655	-4%
Other ancillary tests and procedures	6,438	6,365	12,803	-1%
Radiology	3,219	2,669	5,888	-17%
Dental procedures	2,962	2,409	5,371	-19%
Radiologic procedures	2,258	2,091	4,349	-7%
Chemotherapy and other drugs	1,822	2,075	3,897	14%
Rehabilitation	1,674	1,563	3,237	-7%
Pathology	1,027	873	1,900	-15%
Genitourinary system procedures	663	1,025	1,688	55%
Cardiovascular procedures	447	433	880	-3%
Hematologic, lymphatic, and endocrine procedures	408	360	768	-12%
Skin and integumentary system procedures	377	324	701	-14%
Neurologic system procedures	300	367	667	22%
Musculoskeletal system procedures	281	219	500	-22%
Anesthesia	220	205	425	-7%
Respiratory procedures	210	214	424	2%
Gastrointestinal system procedures	157	194	351	24%
Otolaryngologic system procedures	127	174	301	37%

Note: A single claim may include multiple procedures, including multiple procedures within the same category

An examination of more detailed procedure types provides more findings of interest. First of all, while medication administration and observation increased for all diagnostic groups (Tables 68, 77, and 88), it increased quite a bit more for clients with HIV (14%). Group psychotherapy increased slightly for this population (2%), but decreased markedly for the other groups. Individual psychotherapy increased for all diagnostic groups, but the increase was much larger for clients with HIV (44%). Therapeutic drug monitoring showed

dramatic increases in all groups, but the increase was most dramatic for clients with HIV, for whom it increased more than eightfold (836%). Minor pharmacotherapy also increased (17%), while staying the same or decreasing for other groups. Clients with HIV were the only group for whom full-day day rehab was not in the top 25.

Table 82. Top 25 APG Types from Claims for Clients with HIV Number of Procedures Pre- and Post-Enrollment

	Pre	Post	Total	% Change
Medical visit indicator	18,025	17,133	35,158	-5%
Medication administration & observation	16,243	18,512	34,755	14%
Level I chemistry tests	4,919	4,918	9,837	0%
Group psychotherapy	3,814	3,898	7,712	2%
Organ or disease oriented panels	3,913	3,684	7,597	-6%
Incidental to medical visit or significant procedure	3,096	3,125	6,221	1%
Level II immunology tests	2,956	3,057	6,013	3%
Level II microbiology tests	2,692	2,768	5,460	3%
Plain film	2,817	2,377	5,194	-16%
Level I immunology tests	2,588	2,299	4,887	-11%
Counseling or individual brief psychotherapy	2,383	2,465	4,848	3%
Basic chemistry tests	2,469	2,351	4,820	-5%
Individual comprehensive psychotherapy	1,875	2,704	4,579	44%
Level I hematology tests	2,305	2,094	4,399	-9%
Venipuncture	1,695	1,717	3,412	1%
Physical therapy	1,645	1,531	3,176	-7%
Cardiogram	1,471	1,345	2,816	-9%
Level II chemistry tests	1,156	1,276	2,432	10%
Therapeutic drug monitoring	233	2,182	2,415	836%
Minor pharmacotherapy	1,048	1,231	2,279	17%
Blood and urine dipstick tests	1,001	948	1,949	-5%
Level I endocrinology tests	980	919	1,899	-6%
Urinalysis	807	801	1,608	-1%
Diagnostic ultrasound except obstetrical and vascular of lower extremities	723	720	1,443	0%
Mental hygiene assessment	737	644	1,381	-13%

Note: A single claim may include multiple procedures, including multiple procedures within the same category

There was very little pre-post decrease in inpatient admissions, on average, for MRT-SH clients with HIV (0.05 admissions). There was a significantly greater decrease for Hispanic clients, however, relative to non-Hispanic white clients. Clients in the AIDS Institute “services only” program also had a significantly greater decrease compared to those in programs that were not HIV-focused. Those with comorbid chronic conditions also had a larger decrease, while those in managed care previous to enrollment had a smaller

decrease, but these latter two findings were not quite statistically significant.

The average decrease in inpatient days for MRT-SH clients with HIV was 2.2. Black clients, however, experienced a smaller decrease than non-Hispanic white clients. Clients with a comorbid SUD experienced a significantly greater decrease. Surprisingly, enrollment in the AIDS Institute “services and subsidies” program was associated with a signifi-

cantly lesser decrease relative to enrollment in a program that was not HIV-focused.

The average decrease in ED visits for clients with HIV was 0.7, and this did not vary significantly based on client characteristics. Those with a comorbid SUD had a large decrease in ED visits than those without a SUD, but this was not quite statistically significant.

Table 83. Predictors of Pre-Post Changes in Inpatient and ED Utilization among Clients with HIV

Model	Δ Inpatient Admissions			Δ Inpatient Days			Δ ED Visits		
	Unstandardized Coefficients			Unstandardized Coefficients			Unstandardized Coefficients		
	B	Std. Error	Sig.	B	Std. Error	Sig.	B	Std. Error	Sig.
(Constant)	0.958	0.561	†	-5.782	2.947	*	0.341	0.702	
Age at Enrollment (in years, mean-centered for HIV population)	0.013	0.013		0.008	0.069		0.007	0.016	
<i>Race/Ethnicity</i>									
Non-Hispanic white (Ref. category)	--	--		--	--		--	--	
Non-Hispanic Black (1=yes)	-0.380	0.415		4.357	2.178	*	-0.373	0.519	
Hispanic (1=yes)	-0.945	0.454	*	3.409	2.387		-0.650	0.569	
Multiracial/Other (1=yes)	-0.822	0.717		2.980	3.765		-0.662	0.897	
<i>Sex</i>									
Male (Ref. category)	--	--		--	--		--	--	
Female (1=yes)	-0.022	0.279		0.887	1.466		0.553	0.350	
<i>Comorbidities</i>									
Severe mental illness (1=yes)	-0.023	0.288		0.266	1.513		-0.076	0.361	
Substance use disorder (1=yes)	-0.434	0.274		-5.155	1.441	***	-0.670	0.343	†
Other chronic condition (1=yes)	-0.523	0.281	†	0.120	1.479		-0.571	0.353	
<i>Program Enrollment</i>									
Other program - not HIV-focused (Ref. category)	--	--		--	--		--	--	
AIDS Institute – services only (1=yes)	-0.693	0.324	*	-0.182	1.702		0.364	0.406	
AIDS Institute – services and subsidies (1=yes)	-0.286	0.540		5.816	2.835	*	0.515	0.676	
<i>Managed Care in Pre-Period</i>									
No months managed care enrollment (Ref. category)	--	--		--	--		--	--	
1+ Months Managed Care Enrollment (1=yes)	0.630	0.338	†	2.234	1.774		-0.568	0.423	

*** $p < 0.001$, * $p > 0.01$ & $= 0.05$, † $p > 0.05$ & < 0.10 , n.s. = not significant

Chronic Conditions Population

Fifty-three percent of the MRT-SH clients had a chronic medical condition other than HIV or a behavioral health diagnosis (n=1,091). The conditions included were osteoarthritis; asthma; cancer; coronary heart disease; cerebrovascular disease; hypertension; congestive heart failure (CHF); acute myocardial infarction or MI (while this is an acute event rather than a chronic condition, a cardiac infarction leaves the heart muscle permanently damaged); angina; chronic kidney disease (CKD); chronic obstructive pulmonary disorder (COPD); and diabetes.

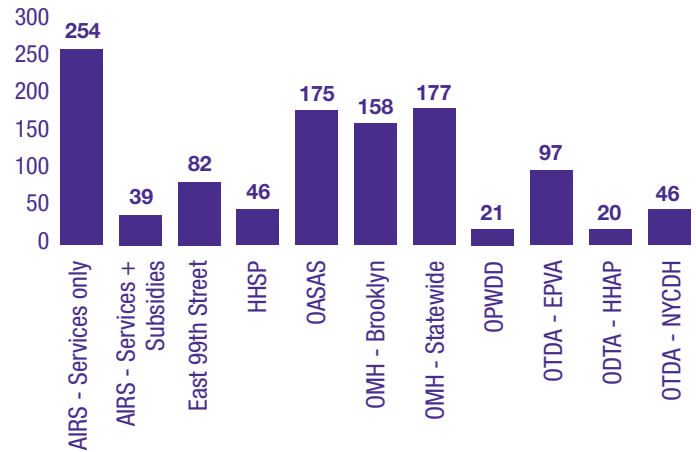
Compared to the MRT-SH population overall, those with at least one chronic medical condition were somewhat older on average. Aside from age, their characteristics were much the same as their MRT-SH peers overall.

Table 84. Characteristics of MRT-SH Recipients with Chronic Medical Condition Diagnosis

	MRT Chronic Conditions Population	Overall MRT Population
Average age (in years)	49.8	47.1
<i>Race/ethnicity</i>		
Non-Hispanic Black	45%	42%
Hispanic/Latino	24%	23%
Other race or multiracial	5%	5%
Non-Hispanic white	26%	30%
<i>Gender</i>		
Male	55%	55%
Female	45%	45%
<i>Geography</i>		
New York City	66%	65%
Long Island	3%	3%
Other New York State	31%	33%
<i>Comorbidities</i>		
Has SMI	67%	66%
Has a SUD	50%	46%
Has HIV	40%	40%

There was a wide distribution of clients with chronic conditions across MRT-SH programs, with the greatest numbers in the AIDS Institute programs (293, or 27% of clients with chronic conditions), but large numbers also in the OASAS-RS and OMH RSB and RSS programs. (These are the largest MRT-SH programs overall.) For information about the specific chronic medical diagnoses by program, see Table 2 in the first section of the report.

Figure 26. Number of MRT-SH Clients with Chronic Medical Conditions by Program



Several programs showed statistically significant or close to significant decreases in the average number of inpatient days among their chronic conditions clients. OASAS-RS and RSS programs had statistically significant effects, while AIDS Institute “services only”, HHSP, and HHAP were close. The OASAS-RS and RSS programs showed statistically significant reductions in the percentage of chronic conditions clients who had at least one ED visit, while AIDS Institute “services only”, HHSP, and OTDA Homeless Senior and Disabled Placement Pilot had p-values between 0.05 and 0.10.

Table 85. Overall Inpatient Days and Emergency Visits among the Chronic Conditions Population by Program, Pre- and Post-Enrollment

	# Inpatient Days – for any reason			% with >=1 Emergency Visits – for any reason		
	Pre	Post	Sig.	Pre	Post	Sig.
AIDS Institute – Services only	11.1	8.6	†	68%	61%	†
AIDS Institute – Services + Subsidy	3.9	8.5	n.s.	82%	79%	n.s.
East 99th	5.0	4.3	n.s.	39%	44%	n.s.
Health Home Pilot	10.7	6.3	†	83%	63%	†
OASAS Rental Subsidies	22.5	11.9	***	85%	74%	*
OMH Rental - Brooklyn	11.1	6.6	*	63%	55%	n.s.
OMH Rental - Statewide	13.7	7.0	**	76%	67%	*
OPWDD	1.1	1.5	n.s.	38%	33%	n.s.
OTDA Eviction Prevention	5.3	3.6	n.s.	49%	40%	n.s.
HHAP	6.2	1.6	†	80%	60%	n.s.
OTDA Pilot	3.1	4.7	n.s.	73%	41%	†

*** $p < 0.001$, ** $p > 0.001$ & ≤ 0.01 , * $p > 0.01$ & ≤ 0.05 , † $p > 0.05$ & < 0.10 , n.s. = not significant

The highest number of inpatient admissions was among clients with angina, followed by those treated for myocardial infarction (heart attack) during the pre-period. (Although one would expect their utilization to thus be quite high during the pre-period, they also had the second-highest average number of inpatient admissions during the post-period.) All diagnostic groups experienced a statistically significant decrease in inpatient admissions, except for those with asthma, osteoarthritis and cancer (and the latter two approached statistical significance).

The highest average number of inpatient days in the pre-period was among those with congestive heart failure, myocardial infarction, and angina. During the post-period this was angina, followed by chronic kidney disease (those who had suffered a heart attack presumably being on their way to recovery). Inpatient days were significantly lower during the post-period for clients with hypertension, diabetes, coronary heart disease, COPD, cerebrovascular disease, chronic kidney disease, congestive heart failure, and myocardial infarction.

The highest number of ED visits was among clients who experienced myocardial infarction or angina. All groups experienced a significant reduction in ED visits except for those with chronic kidney disease, cancer, and myocardial infarction.

Table 86. Pre- and Post-Enrollment Utilization of Inpatient and Emergency Care by Specific Diagnosis (sorted by prevalence in the population)

	Inpatient Admissions		Inpatient Days		ED Visits	
	Pre	Post	Pre	Post	Pre	Post
Hypertension	2.2	1.7**	14.1	8.8***	4.2	3.0***
Diabetes	1.6	1.2*	10.5	6.5**	3.4	2.7*
Asthma	2.2	1.7	10.9	8.4	5.7	4.1***
Coronary heart disease	3.4	2.2***	19.6	9.9***	7.4	4.7***
Osteoarthritis	1.7	1.4†	10.1	7.1†	4.7	2.9***
COPD	3.0	2.1***	18.4	9.7***	6.1	3.9***
Cerebrovascular disease	2.3	1.7*	14.2	7.0***	6.8	4.0***
Chronic kidney disease	2.8	2.3*	18.2	12.0*	5.0	4.1
Congestive heart failure	3.5	2.3**	26.7	11.5**	5.6	3.0**
Cancer	1.4	1.0†	8.0	4.6†	4.1	3.3
Angina	5.2	3.5*	21.1	15.4†	11.8	6.2**
Acute myocardial infarction	4.8	3.2*	22.8	9.3**	10.0	10.0

*** $p < 0.001$, ** $p > 0.001$ & ≤ 0.01 , * $p > 0.01$ & ≤ 0.05 , † $p > 0.05$ & < 0.10 , n.s. = not significant

At the service line level, the procedures used by MRT-SH clients with chronic medical conditions were fairly similar to those for other MRT-SH clients (see Tables 67, 76, and 81). There was a larger drop in cardiovascular procedures (-14%) among this group than others. The only broad categories of procedures that increased were genitourinary system procedures (35%), chemotherapy and other drugs (7%) and laboratory procedures (1%).

Table 87. Top 20 APG Service Lines for Claims for Clients with Chronic Conditions, Number of Procedures Pre- and Post-Enrollment

	Pre	Post	Total	% Change
Mental illness and substance abuse therapies	40107	33662	73769	-16%
Laboratory	31279	31724	63003	1%
Incidental procedures and services	31838	28731	60569	-10%
Other ancillary tests and procedures	10743	9820	20563	-9%
Radiology	5782	4537	10319	-22%
Radiologic procedures	3945	3597	7542	-9%
Chemotherapy and other drugs	3339	3558	6897	7%
Dental procedures	3885	2954	6839	-24%
Rehabilitation	3050	2749	5799	-10%
Genitourinary system procedures	1074	1446	2520	35%
Pathology	990	790	1780	-20%
Cardiovascular procedures	907	780	1687	-14%
Skin and integumentary system procedures	854	800	1654	-6%
Hematologic, lymphatic, and endocrine procedures	712	616	1328	-13%
Neurologic system procedures	673	639	1312	-5%
Musculoskeletal system procedures	595	431	1026	-28%
Anesthesia	392	355	747	-9%
Respiratory procedures	374	328	702	-12%

Note: A single claim may include multiple procedures, including multiple procedures within the same category

When examining the more specific procedure types, it is notable that clients with chronic conditions were the only group with a reduction (albeit an extremely modest one) in individual comprehensive psychotherapy. As with the other groups, the most striking change was the dramatic increase in therapeutic drug monitoring.

Table 88. Top 25 APG Types from Claims for Clients with Chronic Conditions, Number of Procedures Pre- and Post-Enrollment

	Pre	Post	Total	% Change
Medical visit indicator	27,061	24,101	51,162	-11%
Medication administration & observation	17,249	17,635	34,884	2%
Group psychotherapy	9,012	5,390	14,402	-40%
Level I chemistry tests	6,356	6,007	12,363	-5%
Individual comprehensive psychotherapy	4,749	4,710	9,459	-1%
Plain film	5,035	4,007	9,042	-20%
Organ or disease oriented panels	4,630	4,209	8,839	-9%
Incidental to medical visit or significant procedure	4,472	4,303	8,775	-4%
Counseling or individual brief psychotherapy	3,772	3,602	7,374	-5%
Level I hematology tests	3,060	2,669	5,729	-13%
Basic chemistry tests	2,949	2,631	5,580	-11%
Physical therapy	2,965	2,527	5,492	-15%
Cardiogram	2,934	2,407	5,341	-18%
Level I Immunology tests	2,545	2,274	4,819	-11%
Venipuncture	2,341	2,234	4,575	-5%
Minor pharmacotherapy	2,191	2,121	4,312	-3%
Level II immunology tests	1,669	1,751	3,420	5%
Level II microbiology tests	1,663	1,748	3,411	5%
Level II chemistry tests	1,622	1,494	3,116	-8%
Level I endocrinology tests	1,424	1,403	2,827	-1%
Day rehabilitation, full day	2,203	499	2,702	-77%
Therapeutic drug monitoring	326	2,119	2,445	550%
Diagnostic ultrasound except obstetrical and vascular of lower extremities	1,194	1,246	2,440	4%
Mental hygiene assessment	1,255	1,058	2,313	-16%
Blood and urine dipstick tests	1,181	1,086	2,267	-8%

Note: A single claim may include multiple procedures, including multiple procedures within the same category

The average pre-post reduction in inpatient admissions for clients with chronic medical conditions is 0.5. There are relatively few characteristics that moderate the size of this decrease. Hispanic clients have a larger decrease than non-Hispanic white clients, while women have a lesser decrease than men. Clients in the OASAS-RS program have a significantly larger decrease compared to those who are in programs not focused on behavioral health.

The average pre-post reduction in inpatient days for clients with chronic medical conditions is 4.3 days. The magnitude of the decrease is moderated by several client characteristics, however. Black clients have a significantly lesser decrease in inpatient days than non-Hispanic white clients. Those with coronary heart disease, chronic obstructive pulmonary disease (COPD), or congestive heart failure (CHF) experience a greater decrease.

The average pre-post reduction in ED visits for these clients is 1.2. Older client age is associated with a lesser decrease in ED visits between the pre- and post-enrollment periods. Those with cerebrovascular disease also experience a lesser reduction, while those with angina experience a greater reduction.

Table 89. Predictors of Pre-Post Changes in Inpatient and ED Utilization among Clients with Chronic Medical Conditions

Model	Δ Inpatient Admissions			Δ Inpatient Days			Δ ED Visits		
	Unstandardized Coefficients B	Std. Error	Sig.	Unstandardized Coefficients B	Std. Error	Sig.	Unstandardized Coefficients B	Std. Error	Sig.
(Constant)	-0.131	0.464		-3.577	2.928		0.415	0.740	
Age at Enrollment (in years, mean-centered for chronic conditions population)	0.015	0.013		0.132	0.079	†	0.055	0.020	**
<i>Race/Ethnicity</i>									
Non-Hispanic white (Ref. category)	--	--		--	--		--	--	
Non-Hispanic Black (1=yes)	0.070	0.332		4.969	2.093	*	0.430	0.529	
Hispanic (1=yes)	-0.913	0.381	*	2.020	2.402		-0.224	0.607	
Multiracial/Other (1=yes)	0.245	0.611		3.345	3.859		0.434	0.975	
<i>Sex</i>									
Male (Ref. category)	--	--		--	--		--	--	
Female (1=yes)	0.571	0.262	*	1.523	1.652		-0.051	0.417	
<i>Comorbidities</i>									
Severe mental illness (1=yes)	0.069	0.299		-2.174	1.889		0.017	0.477	
Substance use disorder (1=yes)	-0.377	0.283		-2.705	1.785		-0.515	0.451	
HIV+ (1=yes)	0.231	0.291		0.747	1.838		0.042	0.464	
<i>Specific Diagnoses</i>									
Hypertension (Ref. category)	--	--		--	--		--	--	
Diabetes (1=yes)	0.115	0.275		-0.153	1.734		0.382	0.438	
Asthma (1=yes)	-0.140	0.300		2.725	1.895		-0.162	0.479	
Coronary heart disease (1=yes)	-0.469	0.371		-4.981	2.342	*	-1.124	0.592	†
Osteoarthritis (1=yes)	0.133	0.321		0.588	2.027		-0.690	0.512	
Chronic obstructive pulmonary dis. (1=yes)	-0.385	0.360		-4.490	2.272	*	-1.003	0.574	†
Cerebrovascular disease (1=yes)	0.030	0.396		-1.063	2.497		-1.449	0.631	*
Chronic kidney disease (1=yes)	0.045	0.389		-1.662	2.458		0.118	0.621	
Congestive heart failure (1=yes)	-0.483	0.557		-9.592	3.519	**	-1.150	0.889	
Cancer (1=yes)	-0.104	0.561		-0.774	3.538		-0.124	0.894	
Angina (1=yes)	-0.747	0.687		3.964	4.336		-3.646	1.095	***
Acute myocardial infarction (1=yes)	-0.573	0.868		-1.641	5.477		2.524	1.384	†
<i>Program Enrollment[†]</i>									
Other program - not behavioral health-focused (Ref. category)	--	--		--	--		--	--	
OMH Rental Subsidies – Brooklyn (1=yes)	0.299	0.399		-2.229	2.521		0.542	0.637	
OMH Rental Subsidies – Statewide (1=yes)	-0.317	0.416		-2.342	2.623		-1.116	0.663	†
OASAS Rental Subsidies (1=yes)	-1.176	0.422	**	-4.961	2.665	†	-1.205	0.673	†
<i>Managed Care in Pre-Period</i>									
No months managed care (Ref. category)	--	--		--	--		--	--	
1+ Months Managed Care Enrollment (1=yes)	0.020	0.290		2.607	1.919		-0.652	0.462	

*** $p < 0.001$, ** $p > 0.001$ & ≤ 0.01 , * $p > 0.01$ & ≤ 0.05 , † $p > 0.05$ & < 0.10 , n.s. = not significant

[†] Note: The OASAS-RS and OMH programs were featured in the regression versus other programs because these three programs were the ones that showed the most promise in bivariate analysis (Table 85). When this was reversed and the AIDS Institute programs, East 99th, EPVA, OTDA Homeless Senior and Disabled Placement Pilot, and HHSP were the featured categories (compared to the three behavioral health-focused programs as a reference category, with OPWDD and HHAP excluded) none of the program coefficients were statistically significant (not shown).

**MEDICAID REDESIGN TEAM
SUPPORTIVE HOUSING EVALUATION:**

Utilization Report 1

SUMMARY AND CONCLUSIONS



The MRT-SH programs are serving a diverse population, with serious health needs and high rates of comorbidities. Consistent with the design and intention of the MRT-SH initiative, the programs are serving a seriously ill population with high rates of comorbidities. The program participants are racially and ethnically diverse, with a mean age of 47.1 years. Across the programs, there is a significant overlap in the populations served, given this high rate of comorbidities.

Most programs are serving participants who utilized a significant amount of high cost Medicaid services prior to enrollment in supportive housing. Prior to enrollment in supportive housing, in general, participants experienced high rates of inpatient and emergency department utilization, especially for care related to mental health conditions and substance abuse. This finding suggests that most programs are enrolling high cost Medicaid utilizers.

When considering the MRT-SH programs overall, inpatient and emergency department services are being used less. Following enrollment in supportive housing, virtually all inpatient and emergency department services were used significantly less when considering the MRT-SH program participants overall. This finding is consistent with previous supportive housing research, which noted reductions in acute, high cost services, such as inpatient and emergency department visits (Goering et al., 2015; Metraux et al., 2003; Srebnik et al., 2013; Sadowski et al., 2009; Wright et al., 2016). Unquestionably, this reduction in utilization is a positive finding within the current study. Not only is care in these settings more costly, but an inpatient admission or emergency department visit may be suggestive of a chronic condition or health crisis that negatively impacts a patient's quality of life overall (particularly for mental health and substance abuse conditions). Patients may also use emergency departments inappropriately to seek care for conditions that could be more effectively managed in a doctor's office or clinic. The current study suggests that housing and supportive services provided by the MRT-SH programs may be effectively reducing these types of visits as well.

The findings of the pre-post analyses varied substantially across programs. A number of programs showed particular promise in terms of reducing inpatient and emergency department utilization in the current study, including the AIDS Institute "services only" program, OASAS Rental Subsidies, OMH Rental Subsidies Statewide, and the OTDA Homeless Housing and Assistance Program (HHAP) programs. Of these programs, OASAS Rental Subsidies and OMH Rental Subsidies Statewide showed especially strong findings, with significant reductions across all (for OASAS Rental Subsidies) or almost all (for OMH Rental Subsidies Statewide) major inpatient and emergency department service categories measured. Some programs showed less promising findings to date, though it is important to note that at this early stage, findings may change as the evaluation continues. There were no statistically significant differences in use of inpatient or emergency department care for the East 99th Street program and the OPWDD Expansion program. For the OPWDD program in particular, it is important to note that participants typically did not have high rates of acute service utilization in the pre-period. Since these participants are transitioning from more intensive supervised settings into supportive housing, a trajectory leading to Medicaid cost savings is likely to differ from the other programs (e.g., potential costs savings are more likely to result from reductions in cost of the program setting, rather than savings from participants' utilization of high cost Medicaid services).

MRT-SH enrollees are receiving fewer outpatient behavioral health services. An unexpected finding emerged in the current study, which suggests that MRT-SH participants are receiving less primary care and preventative services in a number of the programs. This finding is difficult to interpret, and contrasts with previous supportive housing research, which generally finds increases in more "community-based" outpatient services, alongside decreases in high cost, acute care services (Goering et al., 2015). In the current study, increases to primary care services are not observed, but neither are increases in inpatient and emergency services. This finding suggests that the MRT-SH enrollees are suffering no ill effects of a primary care decrease; if they were not receiving needed care, they would be more likely to require acute hospital services (e.g. inpatient/emergency department services). It may be the case that the overall health of these enrollees has improved, reducing a need in the overall volume of health services. Additional hypotheses are that supportive services provided by some of the MRT-SH programs (e.g. home visits, interactions with peer counselors) may be taking the place of some outpatient behavioral health services, and that stable housing is reducing the need for hospital use among populations who had previously been homeless.

All four diagnostic groups (SMI, SUD, HIV+, and chronic conditions) experienced statistically significant reductions in inpatient days and emergency department visits, with individuals with an SUD showing the largest reductions in utilization. While all diagnostic groups experienced reductions in utilization, individuals with a SUD experienced the largest average net reductions in inpatient days and emergency department visits. This finding held whether or not the clients were enrolled in the OASAS-RS program or another program, although the reductions tended to be greater for SUD clients in the OASAS-RS program. This finding suggests that individuals with an SUD may especially benefit from supportive housing. Indeed, previous research has found that supportive housing, informed by a Housing First approach, leads to reductions in substance abuse, which may positively impact the health of participants (Padgett et al., 2011). This relationship is one potential trajectory that may be influencing the positive findings among individuals with an SUD in supportive housing. Individuals with an SUD may be a key population for all programs to target, but with the caveat that utilization among individuals with an SUD tends to be highly unstable from one year to the next. Comparison group analysis will be important for determining whether these reductions are significantly greater than those observed for individuals with an SUD not enrolled in the in MRT-SH programs.

More research is needed to understand how the MRT-SH programs are impacting the trajectories of program participants. While these findings are promising, there is still much to learn about how MRT-SH programs may improve the lives of enrollees. One critical element is to learn more about the content of the supportive services that are being provided by different MRT-SH programs, which will be highlighted in the upcoming implementation study. Another approach is to conduct more sophisticated statistical modeling that holds constant for demographic characteristics and other variables known to affect health care outcomes. In sum, this is only a first look at a promising new approach to housing as health care. As more data become available, there is much more to learn about the potential of the MRT-SH initiative.



MEASUREMENT OF KEY CONSTRUCTS



Chronic conditions. Most of the chronic conditions included in these analyses were selected based on the New York State Community Health Indicators, and were identified in the data using the ICD-9 codes used to construct these indicators.

https://www.health.ny.gov/statistics/chac/indicators/about_chr.htm

Inpatient care. Inpatient hospitalizations defined as category of service = 285

Inpatient mental health. Analyses included two slightly different measures of mental health inpatient care. The first was based on having a primary diagnosis of a mental health condition. The second, slightly more exclusive, definition was based on having a rate code for psychiatric inpatient treatment.

Inpatient substance abuse treatment. Similarly, the analyses included three different measures for inpatient substance abuse - an inpatient stay with a primary diagnosis of a substance abuse disorder, an inpatient rehabilitation stay, or an inpatient detox.

ED visits. Emergency department visits were defined by having either a procedure code or a rate code associated with emergency department care.

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Medicaid Redesign Team Supportive Housing Evaluation:
UTILIZATION REPORT 1

