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JUNE 2020

Medicaid Redesign Team
Supportive Housing Evaluation

Overall Summary Report

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EXECUTIVE SUMMARY

New York has allocated substantial funding from the state's Medicaid Redesign dollars to provide supportive housing to homeless, unstably housed, and/or other individuals with complex needs, who are high-cost, high-need Medicaid users. It is anticipated that the Medicaid Redesign Team-Supportive Housing initiatives (MRT-SH) will reduce the more expensive forms of health care utilization (e.g., emergency department visits, inpatient hospitalizations, and nursing home stays), potentially reduce overall health care costs, and improve quality of life and health outcomes.

The MRT-SH initiative includes a diverse collection of programs that take a variety of approaches to providing housing and supportive services to different target populations. MRT-SH programs to date include 54 capital projects, 49 of which have opened; 18 rental subsidy and supportive services programs and pilots; and one accessibility modification program. In total, the programs included in this series of reports had served more than 6,000 people at the time of the analyses.

The evaluation team at the Center for Human Services Research at the University at Albany was contracted to evaluate and report on the impact, effectiveness, and cost savings of the MRT-SH initiatives. Specifically, the evaluation plan consisted of a detailed **cost and outcomes analysis** using a pre-post and comparison group design and a mixed method **process study** that provided detailed information about program implementation.

The findings from this evaluation were summarized in a series of reports written between 2016 and 2019. The first four reports were early examinations of costs, outcomes, targeting, and access. These four reports were superseded by later versions which included more programs and a larger client population.

This report provides background on the project and the supportive housing literature, followed by an overview of the full set of final reports, including their purpose and a brief description of the methodology used in each. The ten reports included are:

- Cost Report II, Volume 1: Pre-Post Analyses;
- Cost Report II, Volume 2: Treatment versus Comparison;
- Cost Report Year 3: Treatment versus Comparison Group, Investments versus Savings Analyses;
- Outcomes Report II, Volume 1: Pre-Post Analyses;
- Outcomes Report II, Volume 2: Treatment versus Comparison;
- Implementation Report;
- Final Targeting Report;
- Access Report II;
- Effects of 6- and 12-Month Program Retention on Client Outcomes; and
- Comparison Group Report.

Part I of this report identifies and discusses the following cross-cutting themes and supporting data that emerged from the findings of these evaluation reports:

- Enrollment in MRT-SH is associated with improvement in several key outcomes compared to a group of matched Medicaid clients who did not enroll in MRT-SH.
- Treatment effects for spending are greater among the highest-cost clients
- Treatment effects are greater for those who stay in the program longer. If you simply get clients enrolled, you see a 4% cost savings, 16% reduction in ER visits, and 21% reduction in inpatient days. If you keep them for at least 12 months, you see a 19% savings, 29% reduction in ER visits, and 48% reduction in inpatient days.
- Primary care use does not increase even as inpatient and ED utilization decrease. It is possible that not only do MRT-SH clients require fewer visits because they are healthier, but that they also see their physicians earlier when something is wrong, resulting in fewer visits in the long-term (as well as less use of more intensive services such as ED and inpatient).
- Success looks different depending on the population. For example, HIV is a condition that must be intensively managed, and appropriate HIV care is costly. It is not always reasonable or appropriate to look for cost savings among this group of clients.

Part II is a collection of the detailed key findings and overall conclusions drawn from the Executive Summaries of each of the reports. This includes both those reports that have been released publicly in their entirety and those which were written for internal use.

Appendix A provides summaries of each of the MRT-SH programs for which data were analyzed in at least one of the reports, as well as a table of the programs and sample sizes used in each set of reports (those based on a pre-post methodology and those based on a Treatment versus Comparison methodology).

INTRODUCTION

GOALS OF THE MEDICAID REDESIGN TEAM SUPPORTIVE HOUSING (MRT-SH) INITIATIVE

To address unprecedented health care cost growth and improve health care quality in New York's Medicaid program, Governor Andrew M. Cuomo created the Medicaid Redesign Team to develop a multi-year reform plan. Medicaid Redesign is premised on the idea that the only way to successfully control costs is to improve the health of program participants.

Studies have shown the powerful effects of social determinants of health, such as safe housing, nutrition, and education. However, the public spending dedicated to these social determinants is small relative to national health care spending overall.¹ Research also indicates that 5% of consumers are responsible for 50% of health care costs.² In particular, the population targeted for the supportive housing program has high rates of emergency department utilization and inpatient hospitalizations, due in part to their greater likelihood of suffering from multiple chronic medical problems, behavioral health problems, and environmental risk factors associated with a lack of stable housing.

New York has recognized housing as a critical health intervention, with supportive housing identified as a promising model. Supportive housing is affordable housing paired with supportive services, such as on-site case management and referrals to community-based services³. As a result, New York has allocated substantial funding from the State's Medicaid Redesign dollars to provide supportive housing to homeless, unstably housed, and/or other individuals with complex needs, who are high-cost, high-need Medicaid users. It is anticipated that the Medicaid Redesign Team-Supportive Housing initiatives (MRT-SH) will reduce the more expensive forms of health care utilization (e.g., emergency department visits, inpatient hospitalizations, and nursing home stays), potentially reduce overall health care costs, and improve quality of life and health outcomes.

SUPPORTIVE HOUSING AND HOMELESSNESS

Research indicates an association between housing instability, high utilization of acute hospital services, poor health outcomes, and high costs of care⁴. Homeless individuals use emergency departments and require inpatient hospitalization at rates three to four times higher than other citizens^{5,6,7}. At the same time, rates of primary care use are low among homeless populations^{8,9}. Permanent Supportive Housing has been credited with reducing homelessness, particularly among those with complex needs^{10,11,12,13}, and two studies of supportive housing using a Housing First approach show improvements in housing stability^{14,15}.

OUTCOMES ASSOCIATED WITH SUPPORTIVE HOUSING

Previous studies of supportive housing outcomes 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

¹ Bradley EH, Elkins BR, Herrin J, Elbel B. 2011.

² Stanton MW, Rutherford MK. 2005.

³ Doran KM, Misa EJ, Shah NR. 201.

⁴ Wright et al, 2016.

⁵ Chambers et al, 2013.

⁶ Kushel et al., 2001.

⁷ Kushel et al, 2002.

⁸ Chambers et al., 2013.

⁹ Hwang, 2001.

¹⁰ HUD, 2010.

¹¹ Culhane et al., 2002.

¹² Metraux et al., 2003.

¹³ Stefanic & Tsemberis, 2007.

¹⁴ Palepu et al., 2013.

¹⁵ Stergiopoulos et al., 2015

care visits^{16,17,18,19}. Studies have also focused on overall system use beyond Medicaid, tracking outcomes such as shelter stays, sobering center use, and jail/prison incarceration^{20,21,22,23}.

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 model (in which residents are not required to achieve or maintain sobriety)^{24,25,26,27,28}. 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 cost reductions offset increases in “community-based” services, such as primary care visits, and are also reflected through reduced use of psychiatric inpatient services and reductions in incarcerations²⁹. Other studies show reductions in criminal justice involvement^{30,31}, and reductions in substance use³². Following placement in permanent supportive housing, participants spend fewer days homeless and/or in criminal justice settings³³.

DESCRIPTION OF MRT-SH PROGRAMS

The MRT-SH initiative includes a diverse collection of programs that take a variety of approaches to providing housing and supportive services to different target populations. MRT-SH programs to date include 54 capital projects, 49 of which have opened; 18 rental subsidy and supportive services programs and pilots; and one accessibility modification program. The programs included in this series of reports had together served more than 6,000 people at the time of the analyses.

There are seven state agencies sponsoring MRT-SH programs: the Department of Health (Office of Health Insurance Programs [OHIP]), the AIDS Institute (AI), Homes and Community Renewal (HCR); Office of Temporary and Disability Assistance (OTDA), Office for Mental Health (OMH), Office for Alcoholism and Substance Abuse Services (OASAS), and Office for People with Developmental Disabilities (OPWDD). Some of these programs are capital building programs, while others provide rental subsidies.

Some programs are statewide, while others are focused on New York City. The programs are administered at the community level by more than a hundred different community providers throughout the state. Some of the sites provide congregate housing; while others provide scattered-site housing. The menu of supportive services available varies by program and by provider.

Programs focus on diverse client populations, but four of the most commonly targeted diagnostic groups are people with severe mental illness (SMI), substance use disorder (SUD), HIV, or other chronic medical conditions³⁴. Details of each program or capital project included in the evaluation are included at the end of this report in Appendix A.

¹⁶ Sadowski et al., 2009

¹⁷ Wright et al., 2016

¹⁸ Metraux et al., 2003

¹⁹ Culhane et al., 2002

²⁰ Srebnik et al., 2013.

²¹ Goering et al., 2015.

²² Culhane et al., 2002.

²³ Metraux et al., 2003.

²⁴ Ibid.

²⁵ Srebnik et al., 2013.

²⁶ Wright et al., 2016

²⁷ Sadowski et al., 2009

²⁸ Goering et al., 2015

²⁹ Ibid.

³⁰ Larimer et al., 2009.

³¹ Srebnik et al., 2013

³² Padgett et al., 2011.

³³ Henwood et al., 2014.

³⁴ Hypertension, coronary heart disease, cerebrovascular disease, myocardial infarction, diabetes, asthma, chronic obstructive pulmonary disorder (COPD), chronic kidney disease, congestive heart failure (CHF), osteoarthritis, angina

OVERVIEW OF EVALUATION

The evaluation team at the Center for Human Services Research at the University at Albany was contracted to evaluate and report on the impact, effectiveness, and cost savings of the MRT-SH initiatives. Specifically, the evaluation plan consisted of a detailed **cost and outcomes analysis** using a pre-post and comparison group design and a mixed method **process study** that provided detailed information about program implementation. A mixed method evaluation was chosen because utilizing several methods of data collection offsets the weaknesses inherent in single method approaches and allows researchers to confirm and cross-validate key findings. The overall evaluation design incorporated multiple data sources to provide a comprehensive perspective of the impact, effectiveness, and cost savings of the diverse supportive housing pilots and projects. Each evaluation component is described below.

Cost Analysis. Client data from all the program sites overall were included in this analysis. Additionally, separate analyses were performed by program. Data were analyzed for one year prior to MRT-SH placement, and one year post-placement. Health care costs were exact dollar amounts spent in Medicaid claims, adjusted to 2015 dollars. Later analyses incorporated program costs and cross-sector (i.e. non-Medicaid) spending.

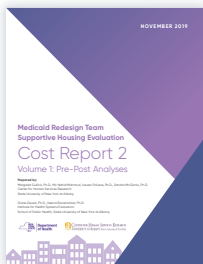
Outcome Analysis. Beyond the issue of lowered health care costs, effective housing programs should result in better health and improved quality of life for those receiving services. One indicator of better health is reduced use of intensive or restrictive health care settings such as inpatient hospitalizations, emergency department use, and residential care such as nursing home or rehabilitation center stays. Other outcomes such as housing stability, medication adherence, program retention, and overall mortality were examined in various analyses.

Process Study. To assess the implementation of the supportive housing interventions, this part of the evaluation focused on the process factors that helped or hindered the achievement of program goals. The process study, designed to specifically address the diversity of programs and pilots, provided detailed descriptions of selected programs to set the context for the cost and outcomes analyses. Data were collected through focus groups, key informant interviews, and a survey for program managers to better understand program operations and overall implementation, including program strengths and challenges.

OVERVIEW OF REPORTS: PURPOSE AND METHODOLOGIES

The findings from this evaluation were summarized in a series of reports written between 2016 and 2019. The first four reports were early examinations of costs, outcomes, targeting, and access. These four reports were superseded by later versions which included more programs and a larger client population.

The final complement of reports is described below.



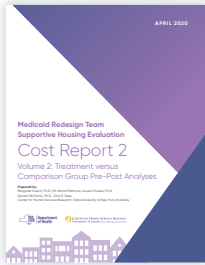
Cost Report II, Volume 1: Pre-Post Analyses

This report, which will be noted throughout as Cost Report Vol. 1, details Medicaid spending changes associated with enrollment in MRT-SH programs. The report includes a summary of the MRT-SH projects and the Medicaid spending characteristics of the people enrolled.

For each included MRT-SH program, Medicaid cost data are presented from one year before participants' enrollment through the first or second year post-enrollment. The goal of the analysis is to include an updated description of the costs before and after program enrollment.

All analyses presented in this report are limited to the 23 programs, pilots, and capital projects that began enrolling participants prior to October 2016. Participants were included for analysis provided that they were enrolled prior to October 2016, and that they had full, continuous Medicaid coverage for the period spanning from one year prior to program enrollment to one year after enrollment. Of the 5,088 clients enrolled by October 2016, 3,649 met these criteria for full, continuous Medicaid coverage.

Medicaid spending for these clients was then analyzed over the twelve months prior to and twelve months after program enrollment. A second post-enrollment year was also analyzed for programs where a sufficient number of clients met full coverage criteria for the additional year. Participants were included in the analysis according to an intent-to-treat methodology, such that participants were kept for pre-post cost analysis whether or not they remained enrolled in supportive housing for the post-period. For programs that began enrolling participants prior to October 2016 but did not have at least 25 eligible participants, descriptive statistics are presented, but inferential statistics (i.e., significance tests) were not performed.



Cost Report II, Volume 2: Treatment versus Comparison

This report, which will be noted throughout as Cost Report, Vol. 2, details Medicaid spending changes associated with enrollment in MRT-SH programs, including a summary of these projects and the Medicaid spending characteristics of the people enrolled (Treatment) versus a comparison group of Medicaid clients who were similar to MRT-SH clients but were not enrolled (Comparison). For the Treatment clients, Medicaid cost data are presented from one year before participant enrollment through the first year post-enrollment; for Comparison clients, Medicaid cost data are presented for a similar two-year timespan. The goal of the analysis is to present a comparison between spending changes before and after MRT-SH program enrollment for the Treatment versus Comparison groups.

MRT-SH Treatment participants were included for analysis provided that they were enrolled prior to October 2016 in a program determined to be appropriate for a comparison group approach, and that for the period spanning from one year prior to program enrollment to one year after enrollment, they had full, continuous Medicaid coverage. Participants were included in the analysis according to an intent-to-treat methodology, so that participants were kept for pre-post cost analysis whether or not they remained enrolled in supportive housing for the post-period. Additionally, all clients were required to have at least one claim in one of the four major diagnostic categories (i.e., with a primary diagnosis of a serious mental illness (SMI), substance use disorder (SUD), HIV, or another chronic condition) during their pre-period year.

Comparison group participants were selected from a random sample of New York State Medicaid clients who met these same coverage criteria and who had at least one claim in one of the four major diagnostic categories during their pre-period year between 2011 and 2017. All Treatment and Comparison clients were required to have some Medicaid spending in their pre-period year.

A matched set of comparison clients was then selected from this sample using a propensity score matching approach; see *Comparison Group report* for more detail. These procedures resulted in 2,037 pairs of unique Treatment and matched Comparison clients available for analysis. Pre- and post-period spending was then computed and compared between the Treatment and Comparison groups.



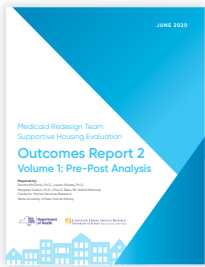
Cost Report Year 3: Treatment versus Comparison Group, Investments versus Savings Analyses

This report details public spending changes (Medicaid and non-Medicaid) associated with enrollment in MRT-SH programs, contrasting the cost profile of the people enrolled (Treatment) versus a comparison group of people who were similar to MRT-SH clients but were not enrolled (Comparison). For each Treatment participant, cost data are presented from one year before participant enrollment (defined here as the pre-period) through the first year post-enrollment (the post-period); for each included Comparison participant, cost data are presented for a similar two-year timespan. The MRT-SH Treatment and Comparison participants examined here were the same groups used in *Cost Report, Vol. 2*. All costs were adjusted for inflation to 2015 dollars.

Cost data include Medicaid claim spending, investments into MRT-SH supportive housing (both MRT and non-MRT development costs, and program service and operating costs), and other cross-sector spending (e.g., utilization of inpatient psychiatric centers, Office of Mental Health (OMH) residential settings, and homeless shelters). The goal of the analysis is to present a comparison between overall spending before and after MRT-SH program enrollment for enrolled clients versus similar but not enrolled Medicaid users. Additionally, pre-post analyses are presented for participants in Office of People with Developmental Disabilities (OPWDD) Rental Assistance and Olmstead Housing Subsidy programs using an extended two-year post-period, where available.

Medicaid Data Warehouse (MDW) fee-for-service claims and managed care plan reported (encounter) data were used to calculate pre- and post-period Medicaid claim costs. Investments into supportive housing were determined by examination of disbursement records provided by the New York State Department of Health, including monthly budgets and annual program submissions through 2017. Cross-sector costs were calculated by determining the number of days each participant spent in inpatient psychiatric hospital, OMH residential facility, and homeless shelter settings in their pre- or post-period, then multiplying that number by an appropriate daily rate.

Pre- and post-period spending was then computed and compared between the Treatment and Comparison group participants, using repeated measures ANOVAs to determine whether the Treatment group showed a greater mean spending decrease (i.e., greater savings) than the Comparison group. These analyses were performed for the full Treatment versus Comparison groups, and within each Medicaid claim spending decile. Simple pre-post comparisons were also conducted for eligible participants in OPWDD Rental Assistance and Olmstead Housing Subsidy programs.

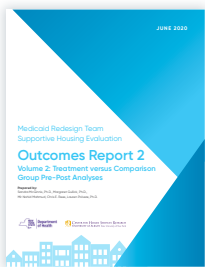


Outcomes Report II, Volume 1: Pre-Post Analyses

This report, which will be noted throughout as *Outcomes Report, Vol. 1*, examines changes in some of the clinical and other outcomes for enrollees in MRT-SH programs. The report focuses on clients' health care utilization over the 12 months prior to and after program enrollment, as well as program attrition, quality of life, and housing stability. Utilization of inpatient and emergency services are also analyzed for the second year post-enrollment when sample size permits. For programs that did not have at least 25 eligible participants, descriptive statistics are presented, but inferential statistics (i.e., significance tests) are not performed.

Analyses of Medicaid claims include all clients who were enrolled in supportive housing at least one year prior to September 30, 2017 and had continuous Medicaid coverage³⁵ during the year before and after their supportive housing start (n=3,649). All analyses presented below are for those programs that began enrolling participants prior to October 2016 and had a sufficient number of eligible participants (i.e., 25 or more). Participants were included for analysis provided that they were enrolled prior to October 2016, and provided that, for the period spanning from one year prior to program enrollment to one year after enrollment, they met the criteria for full and continuous Medicaid coverage. Of the 5,088 clients enrolled by October 2016, 3,649 met these criteria.

Participants were included in the analysis according to an intent-to-treat methodology, such that participants were kept for pre-post cost analysis whether or not they remained enrolled in supportive housing for the post-period.



Outcomes Report II, Volume 2: Treatment versus Comparison

This report details selected outcomes for Treatment participants (i.e., clients enrolled in MRT-SH) versus a Comparison group of people similar to MRT-SH clients but who were not enrolled. For each included MRT-SH participant, outcomes data are presented from one year before participant enrollment through the first year post-enrollment; for each included comparison participant, outcomes data are presented for a similar two-year timespan. The goal of the analysis is to present a comparison between changes in outcomes before and after MRT-SH program enrollment for enrolled clients versus similar but not enrolled Medicaid users.

These outcomes include overall inpatient utilization (both as a binary yes/no variable, as well as number of days utilized), overall emergency department (ED) utilization (again as a binary yes/no variable as well as number of visits), inpatient and ED use for certain conditions of interest (e.g., behavioral health conditions, housing-sensitive conditions), and potentially preventable ED use. Other outcomes of interest are nursing home utilization, homeless shelter stays, and recorded mortality.

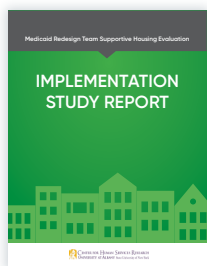
MRT-SH Treatment participants were included for analysis provided that they were enrolled prior to October 2016 in one of the included programs and that they had full, continuous Medicaid coverage for the period spanning from one year prior to program enrollment to one year after enrollment. Participants were included in the analysis according to an intent-to-treat methodology, such that participants were retained for analysis whether or not they remained enrolled in supportive

³⁵ Continuous 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.

housing for the post-period. Potential comparison group clients were selected from a random sample of New York State Medicaid clients who met the same coverage criteria. Additionally, all clients were required to have at least one claim in one of the four major diagnostic categories (i.e., with a primary diagnosis of a serious mental illness (SMI), substance use disorder (SUD), HIV, or another chronic condition) during their pre-period year, and to have some Medicaid spending in their pre-period year. A matched set of comparison clients was then selected from the sample described using a Propensity Score Matching approach; see Comparison Group report for more details.

These procedures resulted in 2,037 pairs of unique Treatment and matched Comparison clients available for analysis. Pre- and post-period outcomes were then compared between the Treatment and Comparison group participants to determine whether the Treatment group showed better outcomes than the Comparison group.

It should be noted that the propensity score modeling and subsequent matching procedure were optimized around Medicaid costs, not service utilization. As such, matched pairs of clients have similar levels of pre-period Medicaid spending, but are not necessarily similar in their pre-period utilization of services. Pre-period differences in utilization-based outcomes require a difference-in-differences approach to assessing treatment effects, which is less ideal than using a propensity score model specifically optimized for these outcomes.



Implementation Report

The MRT-SH programs serve individuals who were previously homeless, at risk of becoming homeless, or are institutionalized. Drawing from qualitative interview and focus group data, this report describes how several MRT-SH programs are being implemented, based on administrative, staff, and participant perspectives. We describe the overall program context and key components, then present staff and administrative perspectives regarding program targeting and eligibility determinations, program changes or innovations since receiving MRT-SH funding, the nature of housing and services offered, strategies for decreasing Medicaid costs, perceptions of participants' progress, and staff and administrative views of program strengths and weaknesses.

Participant perspectives are also presented, which highlight the participants' housing status and lived experience prior to entering the program, their perceptions of housing and services, any changes they may have experienced since entering the program, and their views of program strengths and weaknesses.

Data sources for the report consist of semi-structured interviews with program administrators, as well as focus groups with program staff and participants, which were conducted separately. The specific provider sites selected for qualitative data collection were chosen to ensure representation of the various agencies and programs that receive MRT-SH funding.

The main objectives of this report are: 1) To highlight specific and contextualized information about how the programs are being implemented, including the extent to which they are being implemented as expected or designed; 2) To synthesize stakeholder perspectives regarding factors that are facilitating or impeding successful program implementation; 3) To examine how participants are experiencing supportive housing, including how the program may be impacting their daily lives, health, service utilization, and perceived quality of life; and 4) To provide recommendations regarding program implementation, with the goal of informing policy and practice.



Final Targeting Report

This report examines client characteristics, their relationships to one another and their relationship to cost savings relative to a Comparison group in order to determine how NYSDOH might tailor its targeting practices to optimize future cost savings and benefits to participants. Currently, MRT-SH programs are encouraged to use the following prioritization criteria in targeting their services: 2 or more hospital inpatient stays; 5 or more emergency department (ED) visits; 1 inpatient stay and 4 ED visits; top 20% of Medicaid spending; health home enrollment or outreach; or nursing home stay

Part I of the report uses descriptive statistics based on the MRT-SH client sample and a random sample of adult Medicaid users to address the following questions:

1. whether there are ways to simplify the prioritization menu by eliminating redundant criteria; and

2. whether or not certain criteria are more salient to particular populations using descriptive statistics based on the MRT-SH client sample and a random sample of adult Medicaid users.

The analyses in Part I are based on all MRT-SH clients without imposing any continuous coverage restrictions. Participants were included for analysis provided that they were enrolled prior to October 2016. Characteristics of clients meeting these criteria were analyzed over the twelve months prior to program enrollment (the pre-period). There were 6,189 MRT-SH clients examined for the Part I analyses.

These clients were compared with and contrasted to Medicaid clients from a random sample of 49,912 New York State Medicaid users who had claims during the same period. The clients in this random sample constitute a pool from which MRT-SH participants are potentially drawn. Some analyses are further focused on Medicaid clients who appear in the homeless shelter population, as this is a key population to which MRT-SH programs are targeted. This includes an analysis of how the composition of different MRT-SH programs would change with modifications to the prioritization criteria.

Part II looks at how pre-post changes in spending vary between the Treatment group and a Comparison group and how this in turn would vary based on different prioritization criteria. The Part II analyses are based on the propensity score-matched Treatment and Comparison group samples used for the Cost 2 and Outcomes 2 Volume 2 reports. Part II investigates the following:

1. determine which prioritization criteria best predict supportive housing effectiveness, and whether this varies by client population;
2. describe the perspectives offered by program administrators and staff regarding participant subgroups who are benefitting most from supportive housing, as well as those who are most challenging to serve;
3. summarize the barriers to serving subgroups identified as challenging (e.g., level of need, gaps within the supports currently available, etc.); and
4. provide policy and practice recommendations on ways to tailor targeting practices to capture those who appear to be benefitting the most.

The first approach to predicting supportive housing effectiveness uses linear regression to model the effects of various characteristics on pre-post spending changes among MRT-SH clients. The second approach takes the form of a series of regression decompositions. Regression decomposition separates the effect of differential means from the effect of differential parameters for each predictor variable in a regression equation that is run for both groups, and also provides a breakdown of the total effects of different group characteristics versus different relationships between the independent and dependent variables between the two groups. Finally, Part II concludes with an examination of how treatment effects in the form of pre-post cost savings would vary depending on the implementation of different prioritization criteria.

The purpose of the Part III analyses is to synthesize stakeholder feedback to inform targeting practices. Qualitative data from the implementation study are analyzed to determine provider perspectives on groups who are benefitting the most from supportive housing.

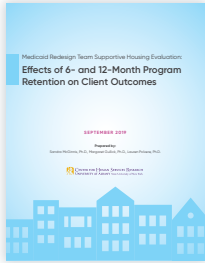


Access Report II

This report represents a first step in understanding the scope of unmet need regarding MRT-SH for homeless individuals across New York State. We highlight demographic information and shelter utilization trends regarding homeless individuals within Homeless Management Information System (HMIS) reporting shelters in selected regions of Upstate New York and New York City. We also describe the Medicaid utilization and spending of this group, to better understand the pool of homeless individuals who would be eligible for MRT-SH programs.

As such, this work is a preliminary component of the eventual creation of an MRT-SH comparison group. For this process, we must both characterize the shelter use patterns of MRT-SH enrolled “treatment” clients, then identify a matched set of similarly-eligible individuals not enrolled in MRT-SH, but who have a similar history of shelter use, among other factors. An understanding of the patterns of shelter use and Medicaid utilization for both treatment and non-treatment clients is thus a critical phase in this process. MRT-SH programs serve individuals who are homeless, at risk of becoming homeless, or are institutionalized. This report focuses exclusively on the homeless population. Data sources

for the report include a literature review; Housing and Urban Development (HUD) Point-in-Time count data; Homeless Management Information System (HMIS) data, which is an administrative data set that stores demographic information about shelter users in New York State; Medicaid Data Warehouse (MDW) data; and Statewide Planning and Research Cooperative System (SPARCS) data.



Effects of 6- and 12-Month Program Retention on Client Outcomes

This report, which will be noted throughout as the Retention Report, presents findings on the effect of participant retention on outcomes in the Medicaid Redesign Team Supportive Housing (MRT-SH) program, with implications for provider practice and policy. It is intended to put findings from preceding pre-post cost and outcomes reports in context. Previous analyses may underestimate the effects of MRT-SH because they use an “intent to treat” methodology, which includes people who only received services for a short time. This examination explicitly separates out effects for those who received a certain minimum duration of services (6 or 12 months) versus those who did not. To the extent that longer retention is associated with improved outcomes, this research may also encourage

a policy focus on improved retention within programs.

The report describes how different levels of “dosage,” or number of months enrolled in an MRT-SH program, impacted participant outcomes, such as inpatient hospitalization, ED usage, primary care usage, and overall Medicaid spending, as well as housing stability. Additionally, the relationship between pre-period and post-period resource use was accounted for to determine whether the associations between retention and outcomes were the result of lower resource-use clients being retained longer (i.e. a selection effect).

These effects were examined for participants retained 1 to 6 months, 6 to 12 months, and 12 or more months, and for high, medium, and low resource users. High utilizers or spenders were defined as the top quintile for all MRT-SH clients, medium utilizers or spenders were defined as the 3rd and 4th quintiles, and low utilizers as the 1st and 2nd quintiles¹. The report also examines these patterns across programs by participant diagnosis and demographic characteristics, and within certain programs; the latter two are included as appendices.

Data sources for this report include scholarly literature on supportive housing; Medicaid Data Warehouse (MDW) data; and provider-level documentation related to participant enrollment and discharge. Participants in MRT-SH were included if they enrolled prior to September 30, 2016 and if they had full Medicaid coverage throughout the 12 months prior to and following enrollment (with no gaps in coverage greater than 60 days).



Comparison Group Report

This report differs from the others in that it is a technical and methodological reference document rather than a report of findings. The report details selection of the Treatment clients and the creation of the matched Comparison group for use in upcoming MRT-SH Evaluation reports. A propensity score matching approach was applied, wherein appropriate matches were determined for each eligible MRT-SH client based on demographic, clinical, and utilization criteria from a random sample of New York State Medicaid users who met certain coverage, diagnosis, and spending criteria.

This report also includes an evaluation of the quality of the data matches and discussion of the appropriate use of the matched data.

Part I: Cross-Cutting Key Themes

When looking at the evaluation across the numerous detailed reports, there are five primary messages that have emerged repeatedly:

1. Enrollment in MRT-SH is associated with improvement in several key outcomes compared to a group of matched Medicaid clients who did not enroll in MRT-SH.
2. Treatment effects for spending are greater among the highest-cost clients.
3. Treatment effects are greater for those who stay in the program longer. If you simply get clients enrolled, you see a 4% cost savings, 16% reduction in ER visits, and 21% reduction in inpatient days. If you keep them for at least 12 months, you see a 19% savings, 29% reduction in ER visits, and 48% reduction in inpatient days.
4. Primary care use does not increase even as inpatient and ED utilization decrease. It is possible that not only do MRT-SH clients require fewer visits because they are healthier, but that they also see their physicians earlier when something is wrong, resulting in fewer visits in the long-term (as well as less use of more intensive services such as ED and inpatient).
5. Success looks different depending on the population. For example, HIV is a condition that must be intensively managed, and appropriate HIV care is costly. It is not always reasonable or appropriate to look for cost savings among this group of clients.

1. ENROLLMENT IN MRT-SH IS ASSOCIATED WITH IMPROVEMENT IN SEVERAL KEY OUTCOMES COMPARED TO A GROUP OF MATCHED MEDICAID CLIENTS WHO DID NOT ENROLL IN MRT-SH.

Early analyses showed promising reductions in Medicaid spending and intensive forms of health care utilization among MRT-SH enrollees (*Cost Report 2, Vol. 1; Outcomes Report 2, Vol. 1*). Without the use of an appropriate comparison group, however, it was impossible to discern whether these improvements in outcomes were truly due to the effects of treatment. There are two reasons that substantial drops in pre-post spending might be observed in the absence of a genuine treatment effect. First, the MRT-SH program exists in the context of a larger New York State health care reform initiative. MRT-SH is one program in a suite of programs aimed at reducing health care costs and improving health outcomes statewide. Thus, it is not only possible that high-cost Medicaid clients who are at risk of poor health outcomes would be experiencing improvements regardless of whether they were enrolled in an MRT-SH program, but it is an outcome consistent with many other macro-level state health initiatives.

The second reason is that these clients were targeted for intervention in part because they were or were expected to become intensive users of health care resources. Most of the MRT-SH programs prioritize clients with serious medical conditions, including serious behavioral health conditions, as well as high spending and high rates of utilization. It is not only expected but desired that the MRT-SH clients represent a particularly acute and resource-intensive subset of Medicaid clients. This suggests that the pre-post statistics for this group could be particularly vulnerable to a phenomenon known as "regression to the mean".

"Regression to the mean" refers to the well-established tendency of more extreme values to moderate over time. Without matching the MRT-SH clients to a group of Medicaid clients with an equal likelihood of being selected into the intervention (i.e., a similar "propensity score"), it is difficult to discern whether the drop in extreme values is due to the effects of the intervention or due to regression to the mean.

To create a Comparison group, a propensity score matching approach was applied, wherein appropriate matches were determined for each eligible MRT-SH client based on demographic, clinical, and utilization criteria from a random sample of New York State Medicaid users who met certain coverage, diagnosis, and spending criteria. While the original MRT-SH and Random Sample groups were quite different on most of the modeled criteria, the final Treatment and Comparison clients were not significantly different in most of their key characteristics (more detail on the propensity score model and the matching methodology are available in the *Comparison Group report*).

The Comparison group participants displayed similar changes on some of the same metrics as the Treatment group. There were, however, key areas in which true treatment effects emerged for the MRT-SH population. Compared to the matched sample of non-treated Medicaid clients, the MRT-SH Treatment group had reduced Medicaid spending, reduced use of EDs (in particular for visits deemed potentially preventable), and reduced nursing home use. They were also less likely than the Comparison group to spend time in homeless shelters or OMH residential settings. Perhaps the most essential measure of personal well-being among these high risk clients is mortality, and the Treatment clients had significantly lower levels of mortality than their Comparison group counterparts.

More qualitative measures of well-being also showed positive effects, although there was no comparison group for these findings. MRT-SH clients scored significantly higher on measures of physical and social well-being following their enrollment in the program (*Outcomes Report 2, Vol. 1*), and reported positive effects on their physical and mental health and health behaviors, their feelings of safety and comfort, their orientation towards the future, and often – but not always – improvements in their family relationships (*Implementation Report*).

Reduced Medicaid spending. One of the primary goals of the Medicaid Redesign Team in New York is to decrease Medicaid spending. Spending was measured for both the Treatment and Comparison groups over a 12-month pre-period (for the Treatment clients this was the 12 months prior to their MRT-SH enrollment; for the Comparison clients this was a comparable 12-month period matched to a similar Treatment client) and a 12-month post-period. All costs reported on Medicaid claims with the exception of capitation payments were included in this measure. All numbers were standardized to 2015 dollars. As discussed in the *Comparison Group report and Cost 2, Vol. 2*, Treatment and Comparison clients were matched within the same decile of pre-period spending.

Treatment participants demonstrated average savings of about \$6,800, which was significantly more than the \$3,700 average savings for Comparison participants. As such, enrollment in MRT-SH programs resulted in greater cost savings in Medicaid claims than “treatment as usual”.

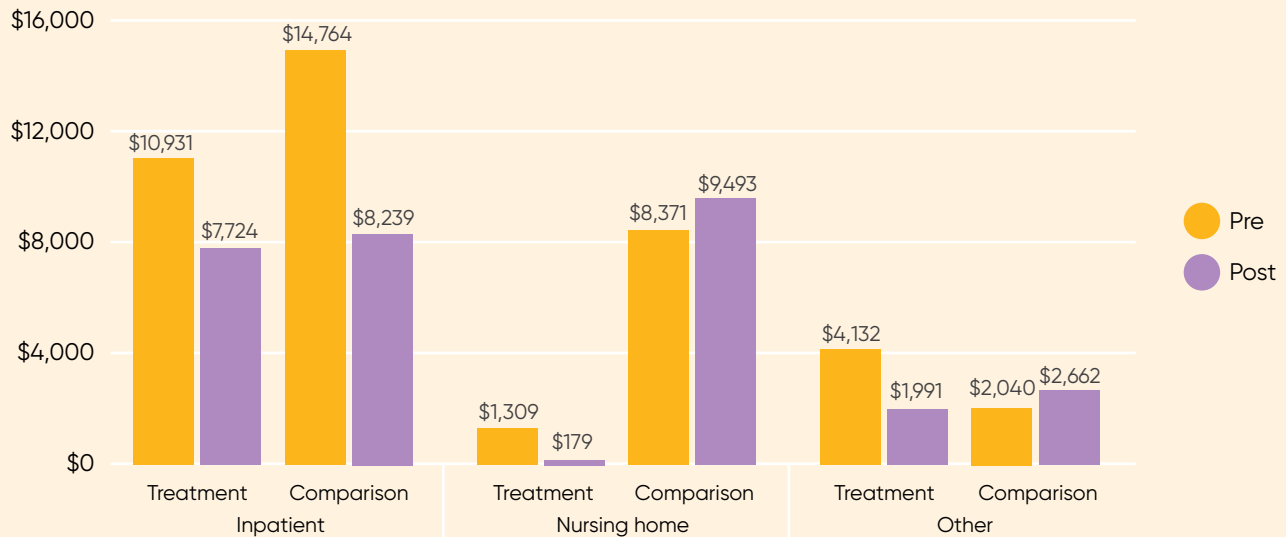
Table 1. Spending treatment effects for full group

Group	N	Mean Pre-Period Spending	Mean Post-Period Spending	Main Effect of Group	Mean Pre-Post Difference
Treatment	2,037	\$34,173	\$27,350	0.002	-\$6,822
Comparison	2,037	\$35,828	\$32,130		-\$3,699
Main Effect of Time		<0.001		Interaction 0.008	

These savings likely stemmed from decreased spending in three service categories – hospital inpatient spending, nursing home spending, and “other”. It should be noted, however, that the propensity score matching approach used was optimized for overall spending, not for any spending subcategory. As such, these comparisons can point to potential overall cost drivers, but conclusions must be limited.

It should also be noted that, while the Treatment group experienced a significant decrease in hospital inpatient spending, the Comparison group experienced an even larger decrease in hospital spending, so the inpatient cost savings is a substantial portion of the cost savings for the Treatment group, but is not found to result from the effects of the intervention.

Figure 1. Pre-Post Changes in Inpatient, Nursing Home, and “Other” Spending, Treatment vs. Comparison



When costs other than Medicaid claims (MRT-SH program investments and the costs of housing clients in alternative settings not covered by Medicaid) were included, Treatment participants demonstrated greater overall decreases in spending than did Comparison, for a relative savings of about \$7,000,000, or about \$3,500 per person more than the Comparison group clients.

These full-group savings appear to be driven particularly by decreased usage of other settings (e.g., inpatient psychiatric centers, OMH residential facilities, and homeless shelters) in the post-period for Treatment clients. While days in these settings remained steady or increased for Comparison clients, they decreased for Treatment clients, resulting in huge cost savings sufficient, when coupled with the observed Medicaid claim savings, to overcome the program investment.

Table 2. Treatment versus Comparison Group Cross-Sector Spending Analysis

Cost Categories:	Treatment Group		Comparison Group		Total Spending Difference	Per-Person Difference
	Pre-Period	Post-Period	Pre-Period	Post-Period		
Investments:						
Total Program Service & Operating costs, Development Costs	\$0	\$31,019,705	\$0	\$0	\$31,019,705	\$15,228
Outcomes:						
Medicaid Claims	\$69,609,598	\$55,712,469	\$72,981,851	\$65,447,946	-\$6,363,224	-\$3,124
Inpatient Psychiatric stays	\$2,093,518	\$1,145,641	\$5,481,653	\$4,602,602	-\$68,826	-\$34
OMH Residential stays	\$24,648,016	\$6,002,159	\$10,384,053	\$14,383,689	-\$22,645,494	-\$11,117
Homeless Shelter stays	\$11,393,300	\$1,864,100	\$5,440,300	\$4,919,900	-\$9,008,800	-\$4,423
Total Costs:	\$107,744,432	\$95,744,074	\$94,287,858	\$89,354,138	-\$7,066,638	-\$3,469

When Medicaid program costs versus Medicaid claim costs alone were examined for Treatment clients, the claim costs declined by about \$6,800 per person, which was insufficient to balance out the high costs of providing MRT-SH housing and services (about \$15,000 per person). This highlights the importance of considering cross-sector costs (those not paid for by Medicaid) when determining the final cost-benefit balance, as care in these settings is quite costly.

Reduced ED use. ED use is not a major cost driver relative to hospital inpatient and nursing home care, but is a much more expensive setting than primary care. There has been much policy concern about preventable ED use – that is, the use of EDs to address complaints that could have been handled in a primary care office (or for emergent conditions that could have been prevented by appropriate primary care). Not only is it costly to treat preventable conditions in the ED, but frequent ED visits are likely to reflect less-than-optimal quality of life for the clients who resort to them.

A significant treatment effect was found for the average number of ED visits overall (although not for the percentage of clients with any ED visits, which decreased slightly, but significantly, more for Comparison group clients).

When specific types of preventable ED use were examined, there were also significant treatment effects found for many types of visits. This included ED visits with a behavioral health diagnosis (i.e., an SMI or SUD) and ED visits for housing-sensitive conditions (i.e., those to which unstably housed individuals are particularly vulnerable; for example, infectious diseases that are widespread among the homeless population, or environmental injuries such as frost bite or heat stroke).

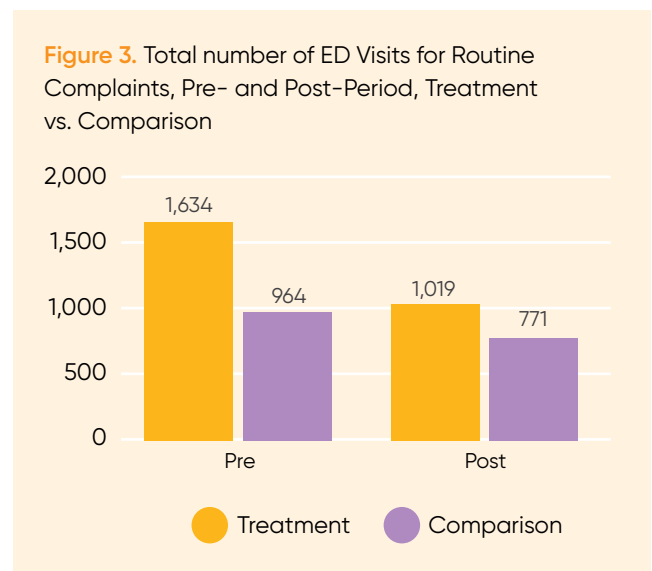
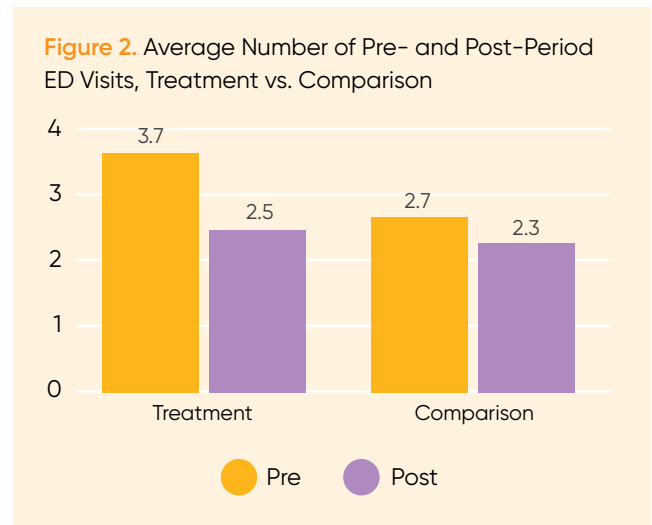
The Treatment group had significantly greater pre-post reductions in ED use for SUD and for housing-sensitive conditions compared to the Comparison group. The percent of Treatment clients with any ED visit for a primary diagnosis of SUD dropped from 15% to 11% (a 27% decrease), while the percent of Comparison clients with any ED visit for this type of diagnosis dropped from 14% to 11% (a 21% decrease). While this difference between the Treatment and Comparison group was small, it was statistically significant. A more substantial difference was found between the average number of ED visits for a primary diagnosis of SUD – Treatment clients dropped from 0.56 visits to 0.31 (a decrease of 45%), while Comparison clients dropped from 0.44 to 0.41 (a decrease of only 7%). This treatment effect was also statistically significant.

The Treatment group started out with significantly more ED use for housing-sensitive conditions relative to the Comparison group. Despite the fact that they continued to have significantly more of these ED visits in the post-period, they had nonetheless experienced a significantly larger decrease than the Comparison group (-31% versus -25%).

Other researchers have done specific work around classifications of preventable ED visits. There are several different approaches to examining preventable ED use. The table below shows 11 categories of conditions identified by Excellus Health³⁶ as constituting a high percentage of emergency department use for non-emergency conditions.

The Treatment group had significantly more such ED visits than the Comparison group in both the pre-period and in the post-period. Both groups experienced statistically significant pre-post decreases, but the decrease for the Treatment group (38%) was significantly larger than that for the Comparison group (20%).

Another approach, used by researchers at NYU³⁷, aims to categorize diagnoses according to the estimated percentage of ED visits for that condition that could have been avoided



³⁶ <http://brand.excellusbcbcs.com/infographics/er.php>

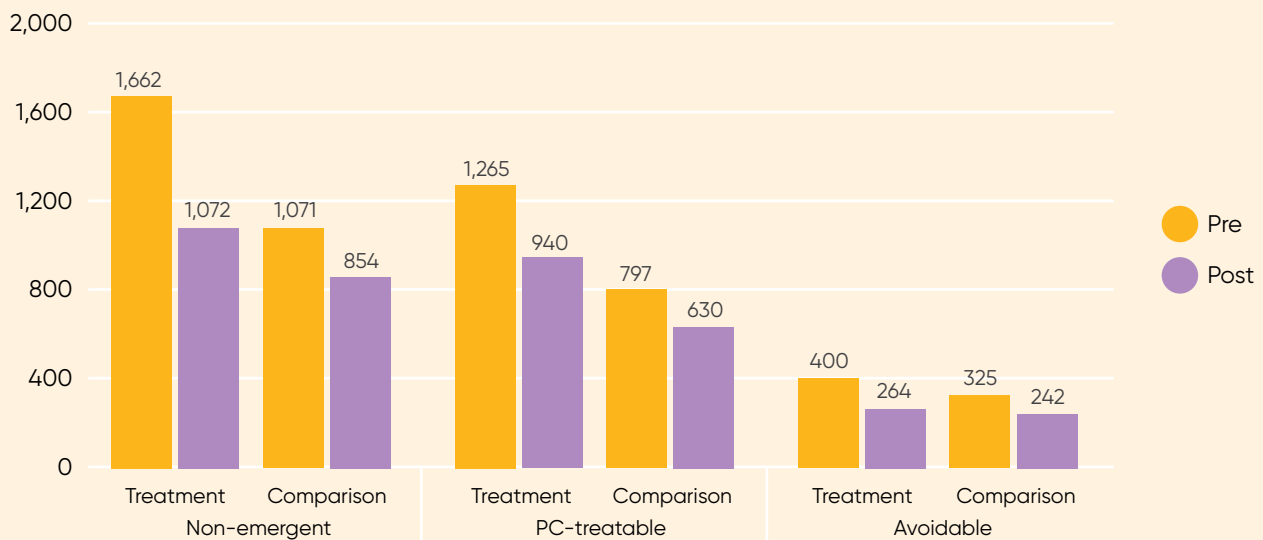
³⁷ <http://www.ajmc.com/journals/issue/2014/2014-vol20-n4/emergency-department-visit-classification-using-the-nyu-algorithm>

either because they were non-emergent, because they could have been treated by a primary care doctor, or because they were avoidable if the patient had received adequate preventive care. The NYU team later created categories for ED visits that were potentially preventable on the basis of being related to drug or alcohol use, a mental health crisis, or an injury.

The analysis below assigns a condition to a particular category if the original research estimated it fell into that category at least 51% of the time. It is important to understand that not all of the ED visits in the “non-emergent” category, for example, were necessarily non-emergent, but were for conditions that are non-emergent more than half the time (e.g. pharyngitis, low back pain, nausea).

Figure 4 shows that the Treatment group experienced significantly greater reductions than the Comparison group in ED visits for non-emergent conditions (-35% versus -20%), emergent but primary care treatable conditions (-26% for Treatment versus -21%), and for avoidable conditions (-34% versus -26%). The Treatment group also experienced significantly greater reductions in ED visits for alcohol-related conditions (not shown) from 857 to 469 (-45%) compared to 638 to 619 (-3%).

Figure 4. Total Number of Potentially Preventable ED Visits by Type, Pre- and Post-Period, Treatment vs. Comparison



The qualitative findings provide some context for these reductions in ED use, particularly for those clients who had been previously homeless. Some focus group participants noted that they are using hospitals and psychiatric facilities less since receiving housing, in part because their lives are now less chaotic and they are experiencing reduced levels of stress. In particular, the participants noted a decreased reliance on emergency services. For example, participants who had been homeless reported going to the emergency department to get out of the cold, to have a safe place to stay for a while, or because they were tired or feeling unwell due to walking around all day with nowhere to go. Some participants indicated that while homeless, the hospital felt safer than living on the streets.

“Since I got my place it has been less...the hospital, psych wards... for me cause when I was homeless, people say ‘yeah you stay with me, pay me this much money,’ then they come and say, ‘my landlord say you have to go’ but I say, but I paid for the whole month. Now, I don’t have to worry about none of that.”

-AIDS Institute Services and Subsidies Program, Evergreen Health Services, Western New York

“I used to lock myself in the hospital because there were times that I just felt safe there. Because I’ve been in the street, you understand? And just being homeless, period. I have not seen a hospital since I moved in here. And that’s real. And I have my primary doctor and I get my medication, and I’m good.”

-Capital project, Norwood Terrace, New York City

"I definitely know I'd be in a shelter; because of my condition, I've been in the hospital a lot...Let's say I've been in the shelter for a year, I've been in the hospital at least, out of that year, five to six times. Since I've been in my apartment, I've gone like once a year."

-OASAS Rental Subsidies, Bridging Access to Care, New York City

"You've been in an environment where you got to go out on the streets... so you would feel safer saying, "I'm sick already, I'm going to go to the hospital." Instead of being on the streets and getting in trouble or something like that, end up in the hospital. But now, I have an apartment. You learn to adjust and deal with certain things that normally you might not do in a shelter."

-OASAS Rental Subsidies, Bridging Access to Care, New York City

Reduced nursing home use. Nursing homes are an extremely expensive care setting, and one which most people want very much to avoid. Even high-quality nursing homes, by their very nature as strictly controlled environments, confer a loss of independence and personal agency for their residents. Only two of the MRT-SH programs included in the final analyses are targeted to nursing home residents³⁸, so this is not a widely-used care setting among the MRT-SH sample overall, but the high costs give it an outsized importance to the mission of the greater Medicaid Redesign initiative.

There were robust treatment effects found for nursing home use, with Treatment clients experiencing a reduction in the percent with nursing home stays and the average number of nursing home days, while Comparison clients experienced an increase in nursing home days. This is consistent with the treatment effect found for nursing home spending in *Cost Report 2, Volume 2*.

It should be noted that pre-period nursing home use was not well-balanced between the two groups, so this finding merits further study with a model optimized for this purpose. It should also be noted that there is no way to know whether Comparison group clients with nursing home stays would have been appropriate candidates for an MRT-SH program, so the pre-period nursing home population in these two groups may have had very different levels of acuity. However, findings indicate that some clients can be successfully transitioned from nursing homes into supportive housing, and that this successful transition is very high-impact in terms of costs (see Figure 1) and presumably also quality of life.

Table 3. Percent with any Nursing Home Days and Average Number of Nursing Home Days: Treatment vs. Comparison Group, Pre- and Post-Enrollment

	Pre	Post	Raw	% of pre	Sig.
Any nursing home days					
Treatment	2.3%	0.8%	-1.5%	-65%	***
Comparison	14.4%	13.5%	-0.9%	-6%	*
T - C Difference (raw)	-12.1%	-12.7%			
p-value (T-C)	***	***			***
Total number nursing home days					
Treatment	8,493	1,177	7,316	-86%	***
Comparison	62,116	69,555	-7,439	+12%	***
T - C Difference	-53,623	-68,378			
p-value (T-C)	***	***			***

The qualitative interviews with program staff and participants offer some insights on the type of nursing home residents who may be the most appropriate clients for such programs. Those who described enrolling in a program from a nursing home noted that chronic conditions led to their placement in the nursing home from previous accommodations:

³⁸ East 99th Street and Nursing Home to Independent Living (transition clients only)

"I was in rehab nursing home because I took sick and lost the apartment that I was living in, because I had a heart attack and a stroke."

-Capital project, East 99th Street, New York City

The clients in the focus groups clearly described the improvements they perceived in their quality of life after transitioning into MRT-SH from nursing home care. When describing changes in their typical days, the participants indicated experiencing fewer boundaries and more freedom to live as they choose, in contrast to life in a nursing home. They widely described the dignity associated with having their own apartment to call home. Some participants indicated that they have more frequent connections with family, and improved family relationships, including seeing their children more frequently. Others, however, noted that a sense of isolation continues to be a struggle.

Reduced use of other housing. Most of the MRT-SH programs are targeted to those who are homeless or unstably housed. Many of these individuals have stays in a homeless shelter that reports to New York's Homeless Management Information System (HMIS), although it is important to acknowledge that not all individuals experiencing homelessness stay in shelters and not all shelters report to the HMIS.

Shelter data were available for this report from the HMIS in the following regions of the state: New York City, Hudson Valley, Capital District, Adirondacks, Long Island, and Central New York. However, the quality of data points used in matching was sometimes inconsistent, such that even within those regions a client with no match to the shelter data may have in fact spent time in the shelter system, due to it being listed under incorrect identifiers. In other words, clients identified with shelter stays are likely to have actually experienced shelter stays, but clients not identified with shelter stays may still have experienced shelter stays.

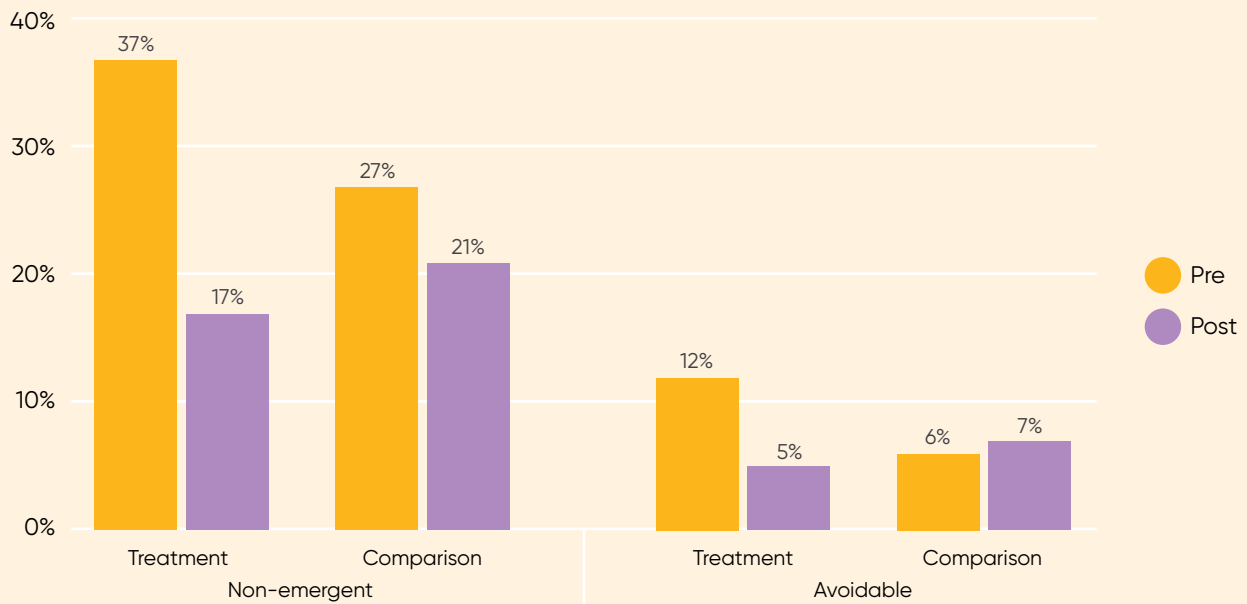
Furthermore, shelter data were only available through 2016, so in order to look at a full post-year of data, clients could only be included if they had enrolled in MRT-SH prior to the beginning of 2016. With these geographical and temporal limitations, the final sample size for this analysis was 1,268 matched pairs of clients.

Many MRT-SH programs – including, but not limited to, those operated by NYS Office of Mental Health OMH) – are targeted to those with SMI. Some of these individuals had been housed in congregate living or other supervised residences by OMH. These include apartment/treatment, congregate/support, congregate/treatment, single-room occupancy (SRO) community residence, and supported SRO. Supported housing community services, which include some of the MRT-SH programs and other supportive housing, were removed from this metric.

While use of these two settings was incorporated into the modeling of propensity scores, the final Treatment group had higher utilization of both types of settings in the pre-period relative to the final Comparison group (i.e., the final groups were not well-matched on these characteristics). This was true whether utilization was measured as any stay in these settings or as the average number of days in these settings.

The Treatment group had significantly greater decreases in the use of homeless shelters and OMH residential settings than the Comparison group. In both cases, while the percent with any stays started out higher for the Treatment group it ended lower in the post-period (Figure 5). Furthermore, the Treatment group dropped from an average of 85.5 days in shelter to 8.6 (a decrease of 90%), compared to the Comparison group, which dropped from 38.3 days to 33.3 days (a decrease of only 5%). Stays in OMH residential settings dropped from 33.6 to 8.2 for the Treatment group (a decrease of 76%) but increased from 14.1 to 19.6 for the Comparison group (an increase of 39%).

Figure 5. Percent with Any Shelter Stay or OMH Residential Stay, Pre- and Post-Period, Treatment vs. Comparison



It is not surprising that providing people with housing would reduce their use of alternate housing, but it is also not necessarily a given that people in the MRT-SH program would not find themselves back in these settings within a year after enrollment, as a substantial percentage of the Treatment group (27%) did not stay in the program for a full year. These findings therefore are not groundbreaking, but support the findings in Table 2 that costs in these settings are substantially reduced by MRT-SH programs as well as the premise that MRT-SH programs result in a higher quality of life for their clients.

Not only are individuals with homelessness or SMI key target populations for MRT-SH, but these two types of settings – homeless shelters and OMH residential settings – are expensive ways to house people. The New York Medicaid program does not pay for these types of settings, but they are funded through the state via other mechanisms.

These settings are also not necessarily the optimal settings for clients who would be able to live independently with supportive services. OMH residences may impose various levels of restrictiveness on their clients depending upon the type of housing. In the qualitative work, a recurring theme found among clients was the challenges they had experienced living in homeless shelters:

“I’d either be in the shelter or in jail. In the shelter, if someone was bothering me, I’d just snap” [others agreed].”

–Capital projects, CAMBA Gardens II, New York City

“I get to bring my daughter and two boys over here...I wasn’t really able to do that in the shelter.”

–Capital projects, CAMBA Gardens II, New York City

“In my case, I had to wait for a little while because I was staying with friends. And if you don’t be persistent at living in a shelter, they take advantage that you don’t really need no housing because you got somewhere else to stay. So if you’re running back and forth to your friend’s house...and you can’t hold a bed in the shelter that puts you at the end of the list. They say, “What is he here for? He don’t need us, really,” but I really did need them. But I just found it hard living in the shelter because it reminded me of the prison, the penitentiary housing I was in before.”

–OASAS Rental Subsidies, Bridging Access to Care, New York City

"When you're in the shelter system...you have to get up and get out. So no matter how you feel, you have to be on your feet. It's no hanging out there all day long; you have to stay in the street until about 4:30, 5 o'clock."

-OASAS Rental Subsidies, Bridging Access to Care, New York City

"If you're in the shelter, you got to get up in the morning and you got to get out. Now, you can plan your day. I'm going to do this, I'm going to exercise, I'm going to the gym, I'm going to do that, take a walk. You're not stuck to a curfew. You can actually go out and enjoy yourself...If you go out you ain't got to worry about, "Oh, I got to get there, I got to get back.""

-OASAS Rental Subsidies, Bridging Access to Care, New York City

"Because of my dialysis I'm on a renal diet. In the shelter you got what they served you, which was not good for me at all."

-OASAS Rental Subsidies, Bridging Access to Care, New York City

"I was living in one of the motels, the homeless shelter-type motels. Not a good place to be – a lot of things that can really challenge my recovery. And prior to that I've been in jail a few times and in multiple rehabs, admitted to the hospital many times for health-related reasons."

-OASAS Rental Subsidies, Champlain Valley

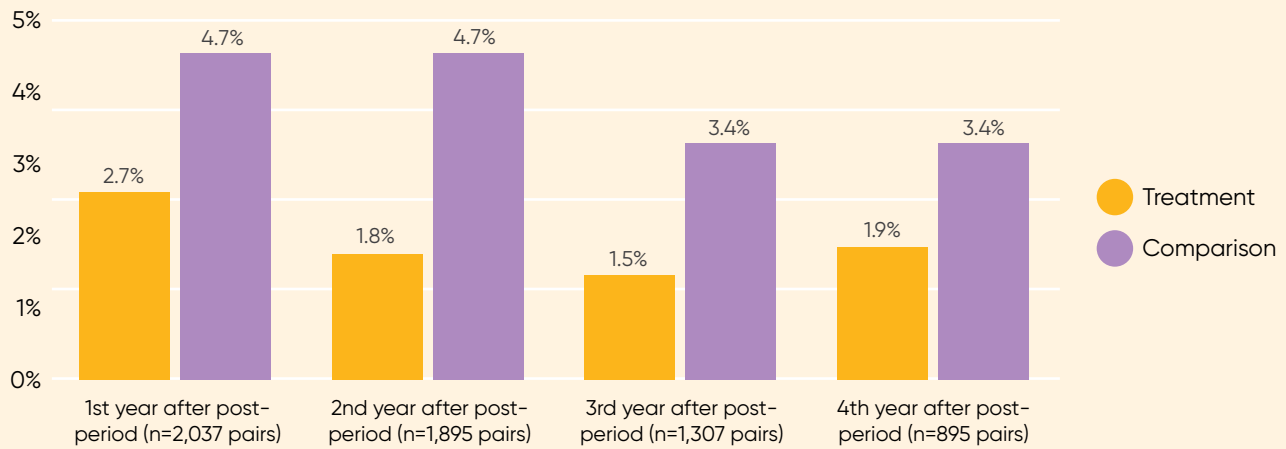
Reduced mortality. An essential aspect of quality of life is life itself, and the Treatment clients in the MRT-SH program (and their matched Comparison clients) tend to have multiple serious health conditions and a high degree of acuity, which put them at a high risk of premature mortality. Mortality during the immediate 12-month post-period cannot be observed as the client sample was limited to those with continuous Medicaid coverage throughout that period (by definition excluding those who have left the Medicaid rolls due to death), but the client population is one that tends to have multiple risk factors for premature mortality.

Mortality as measured by a date of death in the Medicaid record was subsequently examined in the years following the 12-month post-period. Due to the enrollment of clients in different years, some clients had more observable years of data after the post-period than others, but client pairs were matched on enrollment year so that the two groups were balanced on the number of years they were observed.

As predicted, these clients did experience high rates of mortality. However, mortality after the end of the post-period is greatly and significantly lower for Treatment clients. By March 2020, 8% of the Treatment clients and 15% of the Comparison clients were reported as being deceased. Given that the two groups were also matched on Medicaid spending decile and well-balanced on age and comorbidities, this result is very striking. A McNemar test indicated a p-value <0.001.

A subsequent analysis looked at the persistence of this effect over time. Mortality was observed for those client pairs in which both the Treatment and Comparison client had observable data for a given period of time after their post-period (i.e. both were alive at the start of the period). The significantly lower mortality for Treatment clients was found to persist for up to three years after the end of the post-period year (and the findings in the fourth year trended in the right direction but were not statistically significant).

Figure 6. Mortality by Year Following Post-Period, Treatment vs. Comparison



Increased quality of life. Many of the findings above suggest improved quality of life for MRT-SH treatment clients. Clients are likely to be happier and more satisfied with lives in which they spend less time in the ED and are housed in settings that allow for more independence than nursing homes or OMH residences, and more security than homeless shelters. There are limited direct measures of quality of life available for these clients, however, and no measure is available for all clients.

The FACT-GP scale is a quality of life measure used to assess various dimensions of well-being among those enrolled in Health Homes, with higher scores indicating better health within that dimension. A limited number of MRT-SH clients (n=231) had FACT-GPs taken during the 12 months before their MRT-SH enrollment and between six and 12 months after enrollment³⁹. This was a small fraction of the overall MRT-SH clients that had usable data, and the analysis was not repeated with a comparison group.

As shown below, these clients experienced significant increases in both their physical and social well-being between the two assessments. There were also very slight increases in emotional and functional well-being, which were not statistically significant. The increase in the overall score was also not statistically significant.

While the limitations of the FACT-GP data (chiefly the small sample for which it is available and the broad timeframes in which it was administered) are a discouragement to placing too much emphasis on these results in and of themselves, the findings provide support to other findings suggesting improvements in quality of life.

Table 4. FACT-GP scores, Pre- and Post-Enrollment (n=231)

FACT-GP scores	Pre	6-12 months post	% change in average score	Sig.
Physical well-being	16.1	17.2	+6.8%	**
Social well-being	9.3	10.1	+8.6%	*
Emotional well-being	10.4	10.8	+3.8%	n.s.
Functional well-being	11.1	11.5	+3.6%	n.s.
Overall	47.3	50.0	+5.7%	*

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

³⁹ There was also a smaller group of people (n=129) who had FACT-GPs taken during the 12 months before their MRT-SH enrollment and within 6 months after enrollment. This group showed a similar trend in their overall score (from 47.0 to 48.6) but the difference was not statistically significant, possibly due to the smaller sample size.

Client-reported outcomes. Another indication of client quality-of-life outcomes can be taken from the qualitative focus group interviews carried out with clients in a broad variety of programs, as well as similar interviews with program staff and administrators. As with the FACT-GP, only a limited number of clients provided data, and no comparison group was used, but the interviews are an invaluable way to solicit human perspectives within a health and social services system that is all too often reduced to quantitative measurements.

Administrators, staff, and especially participants, described the critical role of housing in facilitating health and well-being. In addition to less use of hospital and emergency services, clients reported numerous less-quantifiable benefits – housing allowed them to reclaim a positive sense of identity, experience peace and stability, become independent, and address health and recovery needs. The participants highlighted how housing provides them with a sense of peace, dignity, and personal safety. Most described sincere gratitude and a sense of luck or grace for the opportunity to enroll in the MRT-SH programs, contrasting the sense of comfort and security they currently experience in the programs with the trauma associated with being precariously housed, homeless, or institutionalized.

Changes in health and health behaviors. The participants widely described improved physical and mental health, which they attributed to housing and case management received through the program. They commonly described how having a place of one's own reduces stress that exacerbates their chronic conditions, mental health problems, and/or substance abuse. Having a safe place to stay and relax positively impacts their well-being and improves their conditions. Changes included recovery from depression, initiating more exercise (e.g., getting out and walking), improved sleep, and improvement in their overall physical condition. One participant indicated that her health has not improved, but it is now easier to see primary care doctors who can help her. Many noted that they are able to cook healthy food at home and to begin establishing other healthy routines. The stability provided by housing also allows participants to establish and follow through with primary care and preventative appointments, and they are better able to adhere to medication regimens. Clients in some programs reported that their case managers in particular are helpful in terms of connecting them with primary care and other needed health services.

As participants described:

“Yes, [health changes have been] positive. My health got better. I was able to stabilize it. I was able to put in place and keep it. Like in the mornings before I take my meds, I gotta eat. I gotta eat what I want to eat. Then after that I gotta take my meds. Sometimes side effects from the meds keep you home. You wanna lay down. Now if you living with somebody else, that won't be easy because people coming around. You might not want to be bothered by nobody. Because of the pain and aches that you have going.”

-AIDS Institute Services and Subsidies Program, ACR Health, Syracuse

“Yes [my health] improved! I suffer from depression but since I moved in here, everything is different. I continue to go to therapy...now I walk much better and sleep much better. I had a mini stroke before moving here and herniated disk and a stent in my heart too...where I was before, I was always wheezing and coughing... from time I move here my doctor and specialist said 'there is some changes in your walk and bulging in your disk.' I say, 'Yeah I'm comfortable, I am happy. That makes a difference.' I don't need a counselor about how I find myself crying anymore. I used to be hurting and since I came into the building, I get to share my life with people. I feel proud and happy.”

-Capital project, East 99th Street, New York City

Changes in relationships with family. Though the results were mixed, some participants described how housing allowed them to strengthen relationships with family and loved ones. Some were able to reunite with families, since they can now invite relatives to their apartments. The participants described being able to see their children, with some working to regain custody.

“My daughters come over, spending nights...Got a little bit more closer to them, 'cause before I wasn't able to do that either. So it brought us a little closer, I got a better understanding of them.”

-Health Homes Supportive Housing Program, BronxWorks, New York City

Hope for the future and goal-setting. Many participants described looking to the future since enrolling in the program and developing goals. Several would like to find a job, continue to focus on their health, or help others with similar life experiences. As one participant explained:

"I think goal-setting depends on the person...the only difference now is you have the privacy, the space, and the resources available to be able to move closer towards those goals...it was just about when I was about to give up that CAMBA thankfully came through and it all worked out."

-*Capital projects, CAMBA Gardens II, New York City*

"I wanna show other people that they can improve their life the way I improved mine. And those people that have my condition (HIV positive) and cervical cancer, and who would like to lose weight. I would like them to know they can do it. They can get strength the way those guys give me strength."

-*AIDS Institute Services and Subsidies Program, ACR Health, Syracuse*

Some participants noted that the privacy and resources provided by the program allow them to pursue their goals. Several participants described how staff are supporting them as they work toward personal goals. For instance, those who are interested in education noted that staff help with paperwork and provide information about programs. They also noted a long-term goal of continued recovery.

2. TREATMENT EFFECTS FOR SPENDING ARE GREATER AMONG THE HIGHEST-COST CLIENTS

It was important for several reasons to look at how treatment effects, especially for spending, varied by the level of pre-period Medicaid costs. First, most of the MRT-SH program are in theory targeted to clients who are intensive users of health care resources and are associated with a disproportionate share of health care spending. But this assumes that the programs are at least as effective, if not more so, for these high-cost clients than for those clients with more moderate health care spending.

Second, earlier analyses (e.g. in the *Retention report*) have suggested that more resource-intensive clients experience larger pre-post decrease in spending and utilization, but in the absence of a comparison group it is impossible to tell whether this is due to regression to the mean⁴⁰. Regression to the mean has the potential to exaggerate the pre-post effects for high spenders (i.e. high-cost clients receiving the treatment experience a significant cost decrease, while in fact equally high-cost clients not receiving the treatment may experience a comparable cost decrease). There is also the potential to mask a pre-post effect for low spenders (i.e. low-cost clients receiving the treatment experience a significant increase in costs, but equally low-cost clients not receiving the treatment may experience an even greater increase).

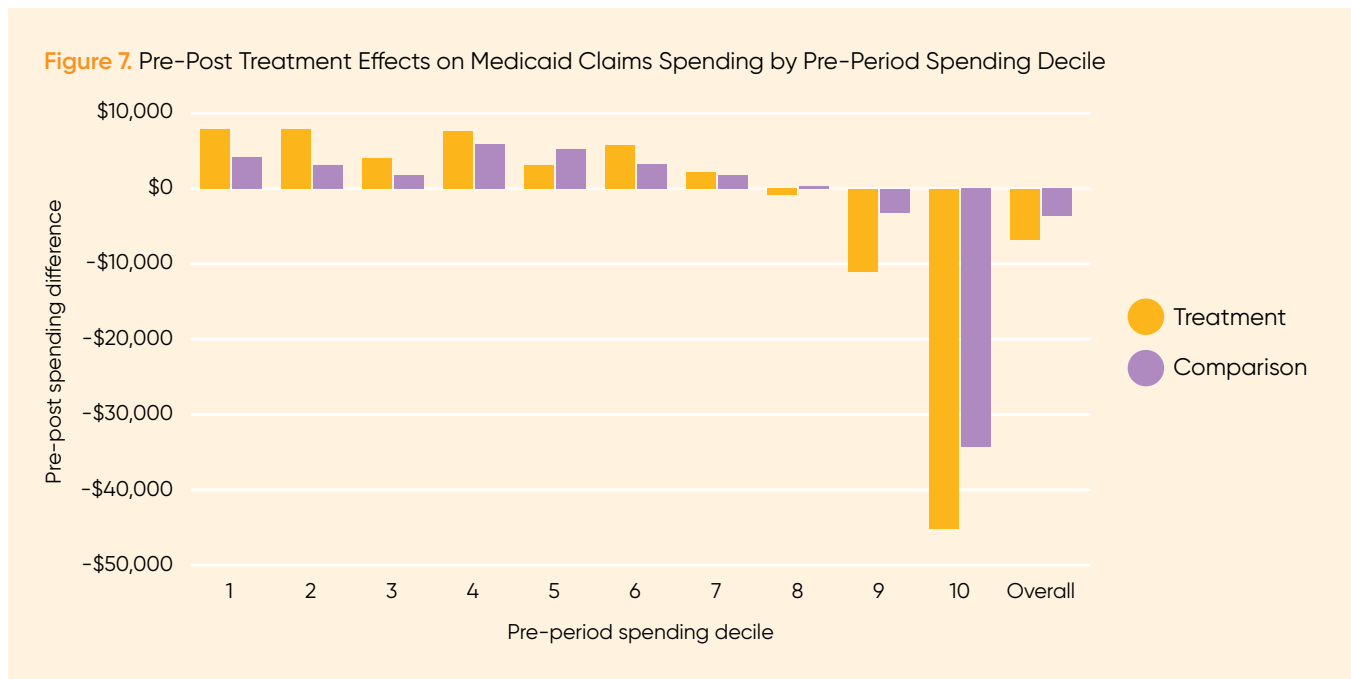
The treatment effects observed for costs (*Cost 2, Vol. 2*) were likely driven by the Treatment clients in the highest decile of pre-period spending. While both Treatment and Comparison group participants in the lower spending deciles tended to demonstrate increased spending in the post-period, those in the top two spending deciles demonstrated significant cost savings, with greater savings for Treatment than Comparison clients.

Both Treatment and Comparison participants in the lower deciles tended to show statistically significant increases in spending from the pre- to the post-periods that were similar between groups (i.e., a main effect of time). These increases may reflect a simple "nowhere to go but up" regression to the mean, but given the sometimes significantly greater increases seen for Treatment, may also demonstrate improved access to needed services after program enrollment. In most cases, these increases were typically a few hundred to a few thousand dollars.

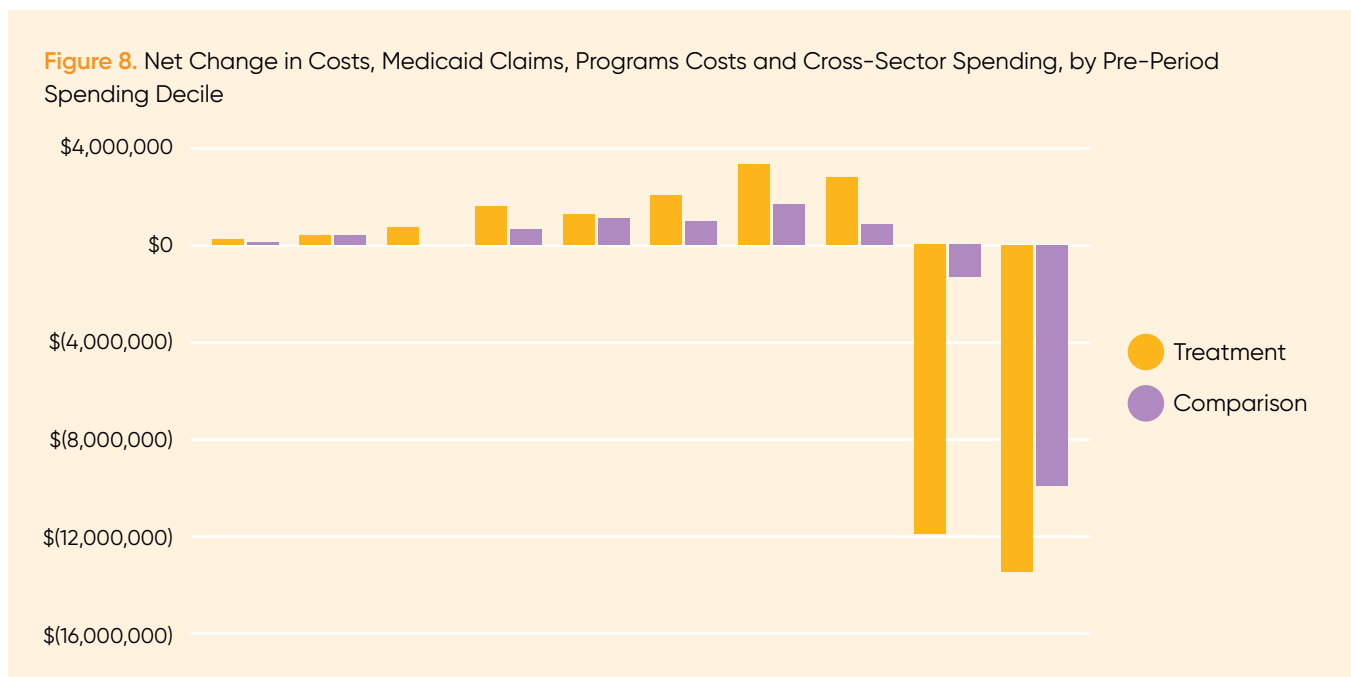
However, participants whose pre-period spending ranked them in the top two deciles demonstrated significant decreases in spending across the interval; and importantly, in both cases, these decreases were greater for Treatment than Comparison clients. The decreases seen for Comparison clients may reflect the fact that with pre-period spending so

⁴⁰ A well-established statistical phenomenon by which extreme values at any given time point are likely to have moved closer to the mean at a subsequent time point. Thus, both the highest- and lowest-spending clients during the pre-period are likely to experience a moderation of their medical costs in the post-period (the highest-spending clients experiencing decreases and the lowest-spending clients experiencing increases).

high, there was more “room” to show improvement over the post-period; however, the fact that savings were significantly greater for Treatment clients indicates that the decreases found can be attributed to the program itself and not simply to regression to the mean.



This was also the case when cross-sector costs and MRT program investments are considered. Treatment clients in the two highest pre-period spending declines showed greater decreases than did their Comparison counterparts, demonstrating that the overall treatment effect is likely driven by these pre-period high spenders. Those Treatment clients in lower deciles, by contrast, showed greater increases than the Comparison clients (but the difference was only statistically significant in the 3rd, 4th, and 7th deciles).



When MRT program investments were considered without factoring in cross-sector costs, it was *only* Treatment clients in the highest pre-period spending decile who showed a significant spending decrease net of program costs. Although

the Comparison clients in this spending decile experienced a similar spending decrease, the Treatment clients achieved this decrease inclusive of the costs of housing and supportive service – in other words, while similar amounts of money were spent pre- and post-period for the Treatment and Comparison groups, the Treatment group got more services and supports without incurring significantly more spending than their peers in the Comparison group. This is key because it demonstrates that it is possible for the program to be fully self-supporting without relying on cost offsets in non-Medicaid settings *if* the programs are targeted to the very highest-spending clients.

Since a key goal of the MRT-SH programs is to reduce Medicaid costs, the programs could greatly benefit from standardization of guidance about how to operationalize and validate high Medicaid utilization. Drawing from the evaluation findings (e.g., upcoming cost and targeting findings), guidance can be provided regarding how to target and prioritize participants for all MRTs program who are the highest utilizers. DOH might also consider ways to provide program staff with streamlined access to Medicaid data to confirm high utilization. While this is done with DOH MRT programs it could be scaled to all agency MRT programs.

As noted previously, nursing home care is a substantial driver of both pre-period costs and of savings resulting from treatment effects (see Figure 1). This suggests that nursing home clients who have the potential to live independently with the help of supportive services might be a particularly important group to target for supportive housing in order to maximize the cost savings of the program.

3. TREATMENT EFFECTS ARE GREATER FOR THOSE WHO STAY IN THE PROGRAM LONGER

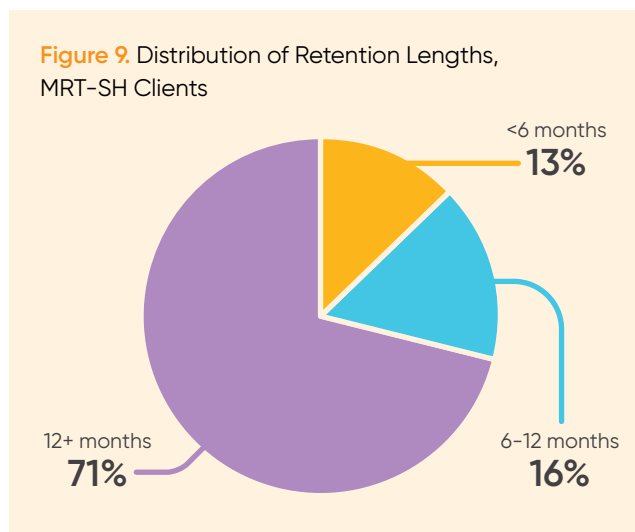
Most of the analyses throughout this evaluation, including the final analyses with the matched Comparison group, have taken an “intent-to-treat” approach, wherein MRT-SH clients were included in the analyses without regard to whether they remained in the program for the full 12-month post-period. This is to reflect the “real life” effects of the program, acknowledging that even in a best-case scenario, clients who are as medically and behaviorally complex as the target clients will be difficult to retain.

The majority (71%) of clients who had full, continuous Medicaid coverage from one year before enrollment through one year after were retained in MRT-SH for at least one year. Thirteen percent were retained for less than 6 months, and 16% were retained for at least 6 but less than 12 months.

Overall Retention Effects. Generally, clients who were retained longer in the MRT-SH programs showed greater post-period decreases in utilization and spending. These effects were typically strongest for participants retained at least 12 months, versus those retained between 1 and 6, or 6 and 12, months. Recipients who enrolled in MRT-SH had an average Medicaid savings of \$5,522, or 15% of pre-period costs. However, for individuals who stayed enrolled for 12 months or more (two thirds of enrollees), average savings were \$6,773, or 19% of pre-period costs.

MRT-SH enrollees overall experienced a reduction of 0.7 emergency room visits (23%) and 3.7 inpatient days (38%) overall. But clients retained at least 12 months had 0.8 fewer emergency room visits (29%) and 4.2 fewer inpatient days (48%). Comparing the clients retained less than six months to those retained for 12 or more, one could summarize the results as follows:

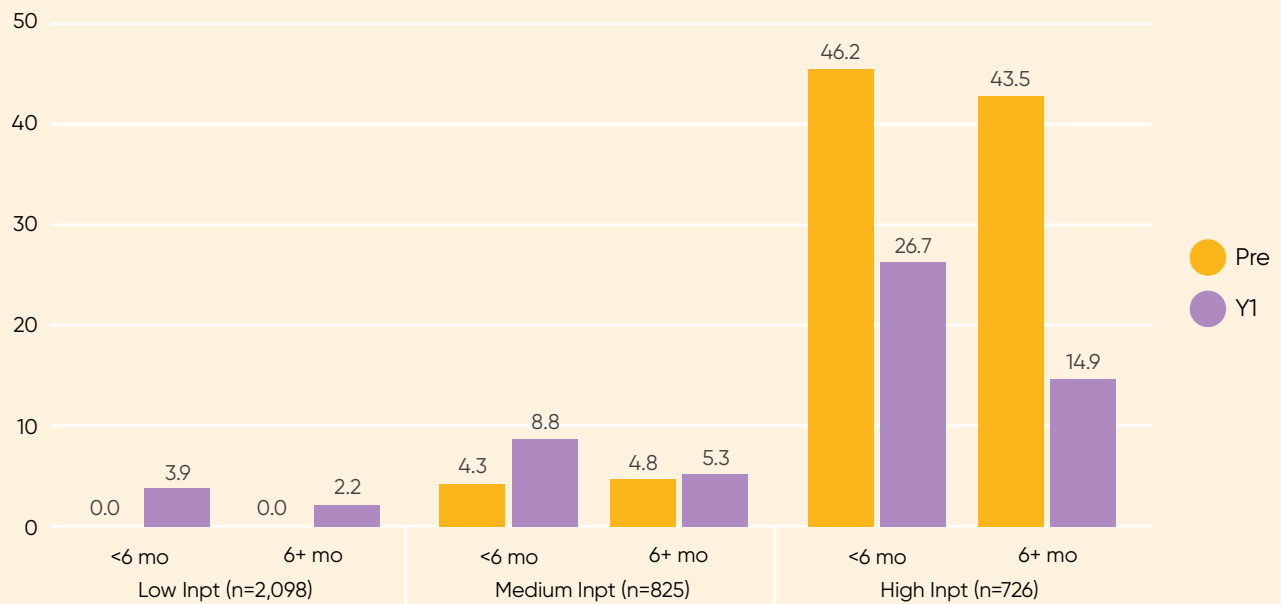
If you simply get clients enrolled, you see a 4% cost savings, 16% reduction in ER visits, and 21% reduction in inpatient days. If you keep them for at least 12 months, you see a 19% savings, 29% reduction in ER visits, and 48% reduction in inpatient days.



There was both a 6-month and 12-month (not shown) retention effect on inpatient days among clients across all levels of pre-period resource use, where longer retention was associated with fewer days. For example, the chart below shows that

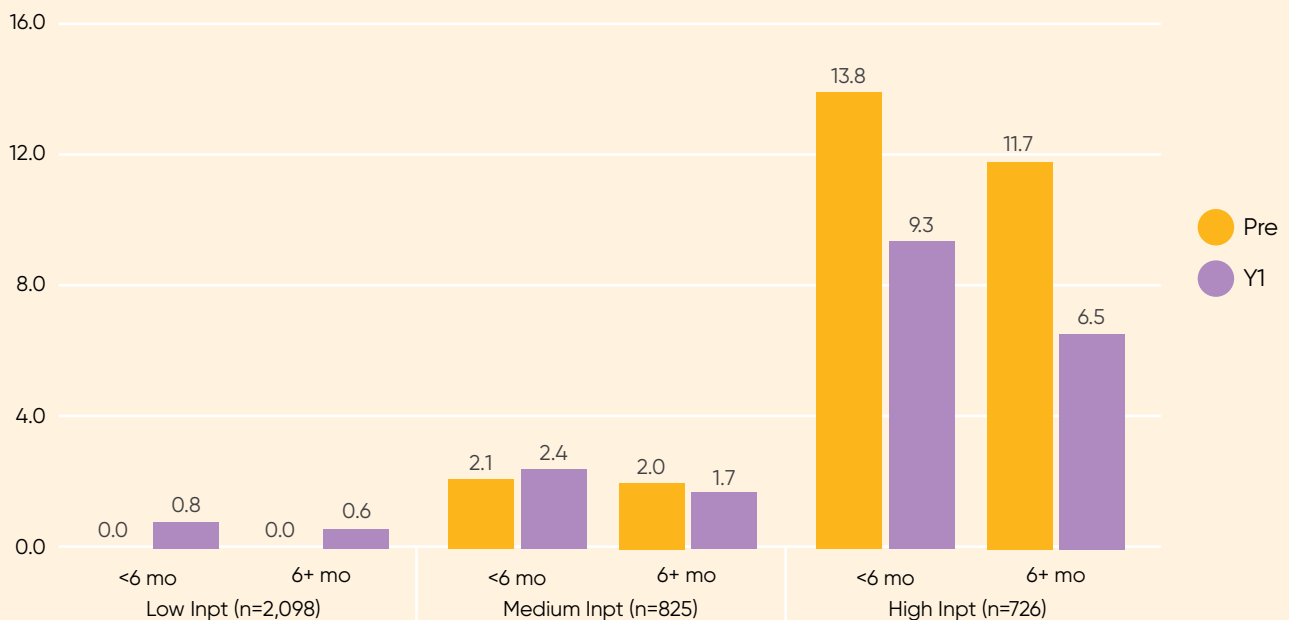
within the high pre-period inpatient utilizers, those retained for at least 6 months started off with 3 fewer inpatient days than those not retained (a selection effect), but in the first year post-enrollment they experienced 12 fewer inpatient days than those not retained (a result that goes far beyond the selection effect). **Although these high pre-period utilizers are at greater risk of attrition, they benefit the most from being retained.**

Figure 10. Average Year 1 Inpatient Days by Pre-Period Inpatient Use and 6-month Retention



There was also a 6-month retention effect on decreased ED visits for all levels of pre-period utilization, and a 12-month retention effect (not shown) among clients with medium and high pre-period levels of ED use. Again, the largest effects of retention were found among those with the highest pre-period utilization.

Figure 11. Average Year 1 ED Visits by Pre-Period ED Use and 6-month Retention



A key conundrum faced by MRT-SH programs is that the same clients who seem to derive the most benefit from retention (i.e., those with higher levels of pre-period resource use) are also those clients who are at greatest risk of attrition. The qualitative work in the *Implementation Report* highlights some of the challenges programs face in working with populations with such complex issues. While supportive housing positively impacts health and quality of life for most participants, many individuals continue to struggle with mental health issues, chronic conditions, and addictions; others contend with social isolation and strained relationships. The participants described trauma and significant adversity prior to entering supportive housing, which is likely compounded by structural injustices, such as poverty, discrimination, racism, and marginalization. Thus, the complex needs they are experiencing when entering MRT-SH programs are unlikely to be fully ameliorated by supportive housing.

While this presents a challenge for program management, it also highlights the tremendous potential for improving program outcomes by increasing retention. For example, an average program would have to retain almost 43 low-cost clients for 12 months to realize the same cost savings as retaining a single high-cost client (i.e., the 12-month net retention effect for a high-cost client in dollars [-\$22,128] is nearly 43 times the 12-month net⁴¹ retention effect for a low-cost client [-\$516]).

The *Implementation Report* suggests that programs should work to anticipate early adjustment challenges as individuals first enter the program. Many participants struggle to pay rent on time, maintain their apartments, remember and follow through with medical appointments, and navigate their new communities. Social isolation and loneliness were commonly reported by participants when first entering supportive housing. It is especially important for programs to provide intensive services at this stage, and to continually assess the specific supports each participant requires in order to retain their housing.

Although the primary drivers of client retention may be beyond the ability of programs to influence, the presence of retention effects suggests that providers should track client retention and pilot strategies to reduce attrition, especially among clients at the highest risk of leaving the program.

4. PRIMARY CARE USE DOES NOT INCREASE EVEN AS INPATIENT AND ED UTILIZATION DECREASE

It was initially expected that a mechanism through which MRT-SH programs would reduce preventable ED use and inpatient hospitalizations would be by improving access to primary care. Once housed and connected with case management services, clients would be more likely to receive recommended preventive treatment and screenings, would receive regular monitoring and clinical management of their chronic conditions, and be less likely to resort to the ED for routine complaints.

Although robust treatment effects were indeed found for reduced ED use, especially for routine conditions and other preventable reasons, the expected increase in the use of primary care services in general and preventive services in particular did not materialize. Primary care and preventive care were measured in multiple ways⁴², but the definitions used did not change this fundamental result.

For the analyses below, primary care is measured using the definition decided upon through conversations with physicians affiliated with the DOH, who consulted with the evaluation team on the optimal way to identify primary care from Medicaid claims data. After extensive consultation with these advisors, the definition used for primary care in the final reports was 1) an evaluation and management (E&M) visit 2) to a primary care provider (general medicine, internal medicine, family practice, nurse practitioner, obstetrics and gynecology, primary care clinic, general practice, general preventive medicine, public health – preventive medicine) 3) in an outpatient setting (physician group, multi-type group service, diagnostic and treatment center, hospital-based outpatient service, physician services, or nurse practitioner).

Using this definition, it was found that 52% of clients had at least one primary care visit, while this fell to 46% in the first year following MRT-SH enrollment. The average number of primary care visits dropped significantly, from 3.1 to 2.7 (*Outcomes*

⁴¹ After pre-period differences (i.e. selection effects)

⁴² Different measures of primary care were based on rate codes, provider type, settings, and measures of selected preventive screenings (e.g. colorectal cancer screenings for those > 50) and chronic disease management (e.g. medication adherence for those with asthma).

Report 2, Vol. 1). This was true regardless of patient diagnostic category or health coverage characteristics. Additionally, selected routine conditions that – despite being typically primary care-treatable – are together estimated to account for 10% of ED visits⁴³. Other analyses showed that ED visits for these conditions did decline significantly, but primary care visits for several of these conditions (headaches, sinus infections, sore throats, back and neck problems, and abdominal pain) also declined significantly. This suggests that MRT-SH clients may be using less primary care as well as less emergency services because they are in fact experiencing fewer symptoms that rise to the level of requiring medical evaluation and management.

When a Comparison group was matched with the Treatment group and incorporated into the analysis (Outcomes Report 2, Vol. 2), both groups experienced significant decreases in the percent having at least one primary care visit and in the average number of primary care visits. Although the Treatment group started out more likely to have at least one primary care visit (73% versus 61% of the Comparison group), the magnitude of the reduction was statistically similar for both groups. In the average number of primary care visits, however, the Treatment group experienced a significantly larger decrease (from 4.8 to 3.6, or -25%) than the Comparison group (from 3.4 to 2.8, or -18%). In other words, **there was a treatment effect on the average number of primary care visits, but it took the form of a reduction rather than an increase in visits.**

Interestingly, there was not a treatment effect on visits for those routine conditions described above, with both groups experiencing statistically similar pre-post decreases.

In the focus group interviews (Implementation Report), some program participants reported using primary care services more since entering the program, consistent with the initial hypothesis, indicating that their access to health care services had improved. Some reported that they continue to see the same doctor but on a more regular basis. At the same time, however, they reported improvement in their health and health behaviors. For example, participants discussed having better eating and sleeping patterns, losing weight, and requiring less medication for sleep or blood pressure. As several participants explained:

“I sleep and I eat better...because I have blood pressure issues.”

“I have been eating healthier because I have been able to cook food that is readily available.”

“I lost pretty much 50-pound by living here and got off my blood pressure medication.”

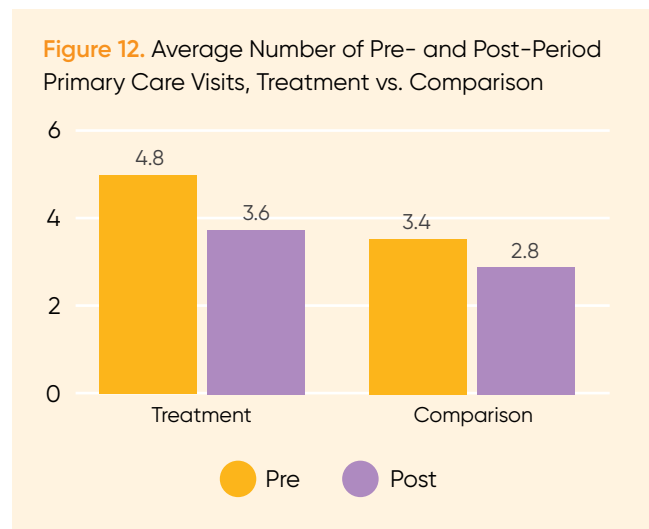
-All from Capital projects, CAMBA Gardens II, New York City

Consequently, some described needing to see health professionals less, due to improvements in their health condition and stress reduction:

“Mine are stretched out a little longer...don’t have to see the doctor as often. Has to do with the stress factor and health wise.”

“I see my primary doctor every 4 months instead of every month or 6 weeks. So that is great! I don’t wheeze anymore.”

-Both from Capital project, East 99th Street, New York City



⁴³ <http://brand.excellusbcbcs.com/infographics/er.php>

It is possible that not only do MRT-SH clients require fewer visits because they are healthier, but that they also see their physicians earlier when something is wrong, resulting in fewer visits in the long-term (as well as less use of more intensive services such as ED and inpatient).

“By me being diabetic and my other illness – amputations on my toes, on my feet – it was kind of hard on me. So, every now and then I would get kind of sick and I would have to stay in the hospital. For March sometimes, Christmas, New Years, Thanksgiving, Halloween, my birthday, all of that – hospital. But now that I’ve got a stable place I’m able to take care of it more better, and manage it more better, and make my appointments – they help me with that too, help me make my appointments, keep my appointments up – and I’m much better now.”

-Health Homes Supportive Housing Program, BronxWorks, New York City

5. SUCCESS LOOKS DIFFERENT DEPENDING ON THE POPULATION. FOR EXAMPLE, HIV IS A CONDITION THAT MUST BE INTENSIVELY MANAGED, AND APPROPRIATE HIV CARE IS COSTLY. IT IS NOT ALWAYS REASONABLE OR APPROPRIATE TO LOOK FOR COST SAVINGS AMONG THIS GROUP OF CLIENTS.

Twenty-four percent of the MRT-SH clients in the pre-post analyses have HIV, often along with other conditions such as SMI, SUD, or other chronic medical conditions. They are mostly enrolled in the three AIDS Institute (AI) programs. Two of these three programs serve New York City residents. In the comparison group analyses, there is a much more limited population of HIV-positive clients (5%), because these analyses only include programs that provide both housing and services. The largest AI program, based in New York City, is a services-only program.

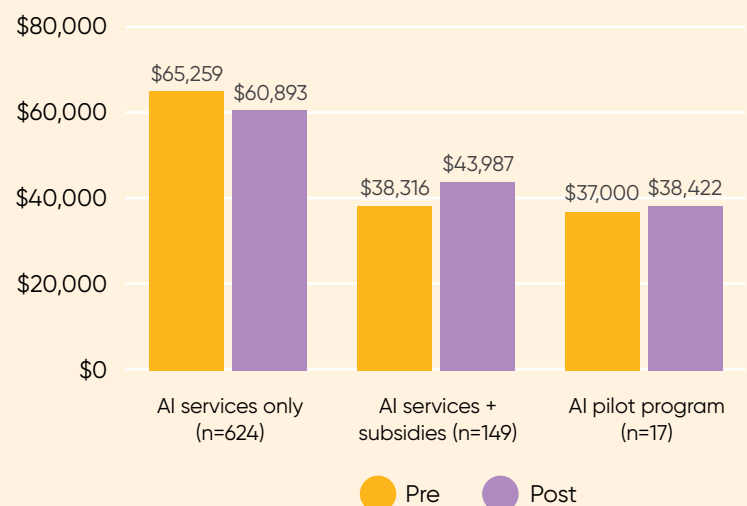
Pre-post findings. When pre-post outcomes are examined among MRT-SH clients only (*Outcomes Report Vol. 1; Cost Report II Vol. 1*), there are marked differences in the findings for the HIV+ clients by program. Most of the pre-post effects were observed in the AI Services-Only program (n=624), which has been discontinued. Clients in this program experienced significant pre-post reductions in:

- Average number of inpatient days, percent with any ED visits, and average number of ED visits
- Percent with any Inpatient stays for HIV
- ED visits for routine and non-emergent conditions
- Shelter use
- Overall Medicaid spending decreased by \$4,366 per person

The results for clients in the AIDS Institute – Services and Subsidies program, which served communities outside of New York City, were less striking. These clients experienced a significant pre-post decrease in shelter use, but only in the second year after MRT-SH enrollment. Overall Medicaid spending increased by an average of \$5,672 per person. This was a smaller program (n=149) than the Services-Only program, however, meaning that statistically significant results were more difficult to obtain.

Similarly, clients in the AIDS Institute – Pilot Program experienced reductions in the likelihood of inpatient care and ED care, but the sample size was too small (n=17) for significance testing. Overall Medicaid spending increased by an average of \$1,422.

Figure 13. Average Medicaid Claims Spending for AI Program Clients, Pre- and Post-Period



Treatment versus Comparison. The picture is complicated when the Comparison Group is introduced to these analyses (*Outcomes Report Vol. 2; Cost Report II Vol. 2*). First of all, only clients from programs that met a stricter definition of supportive housing (i.e. providing both housing and services) were included in the propensity score model. Thus, clients from the AIDS Institute Services-Only program, which was the largest program – and the most successful based on the pre-post analyses – were not included in the propensity score-matched sample.

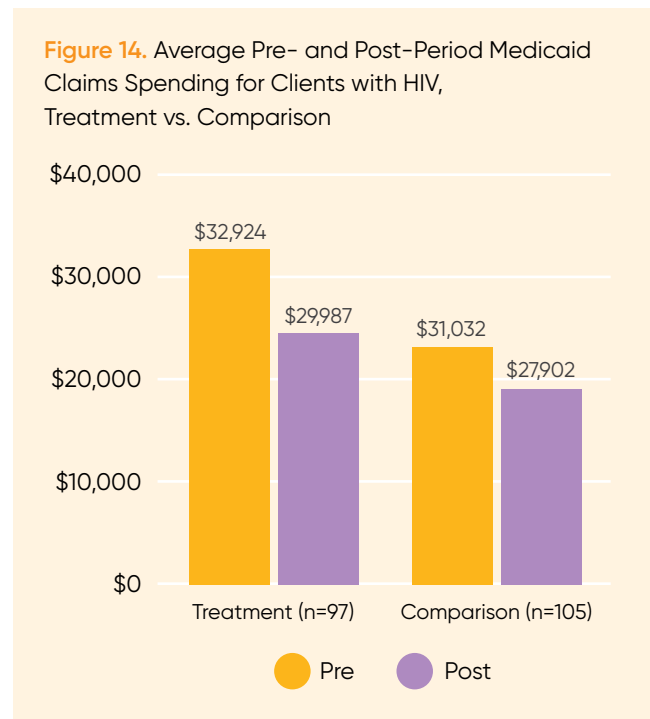
Second, the modeling methodology demanded that the Treatment and Comparison groups be matched and analyzed overall and not by program. An attempt was made to break out groups by diagnosis for some post-hoc analyses, but these analyses can only be characterized as “exploratory” as the model was not optimized to compare clients within diagnostic groups.

Subsequently, in the Treatment vs. Comparison group analysis, there was neither a significant difference in pre-period spending between the two groups of clients with HIV, nor a significant change in post-period spending for either group. The two groups started and remained statistically indistinguishable in their levels of spending (Figure 14). Other outcomes used in the Treatment vs. Comparison analyses took the form of binary or count variables and the statistical tests selected for those data were based on differences between matched pairs rather than differences between groups overall. There were too few matched pairs in which both the Treatment and Comparison client had HIV to analyze.

These findings leave a muddy picture of the effects of MRT-SH on clients with HIV. There are positive pre-post findings from the Services-Only program, but without a comparison group it is impossible to discern whether these findings are based on regression to the mean (these clients were also the most costly to begin with compared to the other two AI programs). On the other hand, higher-cost clients have been found to have the greatest treatment effects, as well, so the Services-Only program may genuinely have been more effective than the other programs *because* of its high-spending client profile. There may also have been regional differences that set the Services-Only program apart. While the Pilot program is also a NYC program, it is a very small program. The Services-and-Subsidies clients were all outside of NYC.

There is also the possibility that because housing subsidies were provided outside of the Service-Only program, the clients who signed up were those who were inherently more motivated to make use of supportive services. It was reported to be harder to fill programs slots when clients learned that housing was not included, which suggests that the clients who did enroll were different in some way from those who rejected the program. The findings in the Retention report that selection effects are more important to post-period results than retention effects for the HIV-positive population (i.e. that the clients with longer retention have lower post-period resource use because they started out with lower resource use) supports the premise that characteristics of these clients before the intervention may carry more weight than any effects of the intervention itself. (Clients with HIV were the only of the four diagnostic subgroups for which this was true.)

Regardless, the Services-Only program has been discontinued, and the two other AI programs seem to have very limited impact as measured by spending or utilization-based outcomes. This raises the question of whether these are necessarily the best measures of positive outcomes for clients with HIV, or whether other more disease-specific measures such as viral load or adherence to antiviral medication regimens might reveal that higher spending and/or utilization actually results in better health for these clients. In particular, the significantly increased transportation costs found for clients in the Services-



and-Subsidies program implies that clients have improved access to care and services following MRT-SH enrollment, and the greatly increased pharmacy costs for clients in the Pilot program implies that they may have improved medication adherence.

The premise that more use of health care services among the HIV population is a positive rather than negative outcome is also supported by *Targeting report* findings which suggest that many of the same client characteristics associated with spending decreases for the Treatment group among other client populations are associated with spending *increases* for the HIV population and vice-versa. For example, a co-occurring SMI was associated with higher spending for Treatment clients with HIV, but lower spending for Treatment clients with SUD or other chronic medical conditions. Similarly, having had at least one pre-period ED visit or at least one inpatient stay were both associated with spending decreases for Treatment clients with HIV, but associated with spending increases for the other three groups. However, the regression model from which the HIV results come is based on only 97 Treatment clients with HIV, and these coefficients were not statistically significant within this group.

Some deeper investigation of HIV-specific outcomes were carried out in *Outcomes Report 2, Vol. 1*, but the findings do not support a clear conclusion. An examination of HIV+ MRT-SH clients for whom Healthcare Effectiveness Data and Information Set (HEDIS) quality data were available found that the percentage engaged in viral load monitoring increased after MRT-SH enrollment (from 63% to 72%), but this was a relatively small sample of clients and the results did not quite reach the level of statistical significance ($p > 0.05$ & $p < 0.10$). A detailed analysis of medication use found that most of the increased spending on pharmacy for MRT-SH clients with HIV is due to increases in drug prices (even accounting for combination products) rather than to greater adherence to ARV regimens.

Overall, the takeaway from all of this is that MRT-SH programs may affect Medicaid spending and use of other health care services differently for people with HIV than those with other types of conditions, and that the patterns observed for other groups may not apply to this group. The reason for this is not clear, although the analyses done for the various reports have generated some hypotheses. Perhaps the best way to approach these questions would be to use propensity score modeling to identify a comparison group that is *explicitly matched to those Treatment clients with HIV* for a deeper dive into the spending patterns among the two groups.

Part II: Key Findings and Conclusions from Executive Summaries

This section of the report consists of a collection of the key findings and conclusions from the Executive Summaries of each of the reports in the evaluation series. The purpose and methodology for each report are described in the Report Overview section near the beginning of this document.

COST REPORT II, VOLUME 1: PRE-POST ANALYSES

Key Findings

- Across all included MRT-SH programs, there were statistically significant overall Medicaid cost savings for the pre-period versus the first and second years post enrollment. The mean cost savings were about \$5,500 per person from the pre-period to the first post-period year, and about \$5,600 to the second post-period year.

Table 5. Summary Pre- versus 1 Year Post Cost Table for MRT-SH Programs

All Programs	N	Pre-Period Total Cost	Post-Period Total Cost	Total Cost Difference	Mean Cost Difference	Median Cost Diff	Sign Test
Pre vs. 1 Year Post (all)	3,649	\$136,109,947	\$115,954,670	-\$20,155,277	-\$5,524	-\$1,569	$p < 0.001$

- These comparisons were also significant for about half of the individual programs.
 - The AIDS Institute: Services Only program, East 99th Street, Norwood Terrace, HHAP Capital projects, OMH Rental Subsidies of Brooklyn and Rental Subsidies Statewide, OASAS Rental Subsidies and Supports, OPWDD Expansion of Existing Rental Services, and OHIP Health Homes Supportive Housing Pilot and the Nursing Home to Independent Living (transitions clients) programs all showed significant cost decreases from pre-period to post-period.
 - Median cost decreases ranged from about \$4,300 to \$50,300.
 - Only the AIDS: Institute Subsidies & Services program demonstrated notable mean cost increases (approximately \$5,600 per person), likely due to increasing pharmacy costs.
 - The Eviction Prevention for Vulnerable Adults program and Senior Supportive Housing Program were both focused on preventive actions and were not expected to demonstrate significant spending changes. No major spending changes were seen, meaning that these programs may have effectively prevented higher Medicaid spending in the time after client enrollment.
 - The remaining programs (Third Avenue mean increase \$695, Boston Road mean cost increase \$3,674, HSDPP mean increase \$3,014) showed non-significant cost increases.
- Additionally, many of these same programs showed significant decreases in the second post-enrollment year. Medicaid spending may thus continue to decrease after the first post-enrollment year, or at least maintain the decreased level of spending. The availability of supportive housing may thus stabilize health care expenditures.
- When Medicaid spending changes are examined by category of service, there are statistically significant overall Medicaid cost savings across programs for almost all categories from the pre- to the post-periods examined.
 - Hospital inpatient (mean cost savings of \$2,143), nursing home (\$1,575), physician service (\$532), clinic (\$335), hospital outpatient (\$277), emergency department (\$157), lab (\$59), Durable Medical Equipment (DME; \$20), and other costs (\$2,297) all decreased over this interval. Many then showed additional decreases in the second post-enrollment year, indicating continued spending decreases in the longer term.

- Health Home/Care Management spending showed a significant increase (mean increase of \$415). Health Homes enrollment also increased by 5% across all eligible clients in this period. This increase may thus reflect an increased number of clients using these services, or simply changes in programmatic billing over the analysis period.
- Non-institutional long-term care costs showed a significant increase of about \$500 per person. The programs showing increases in this category tended to focus on serving elderly or disabled clients, or had an especially high rate of clients with other chronic conditions. This change may reflect that while institutional care decreased, long-term care was still needed.
- Pharmacy costs significantly increased by about \$800 per person. These changes may demonstrate increased medication adherence, pharmaceutical price increases, changes in disease stage, or additional prescriptions per individual after MRT-SH enrollment across programs. Program-level analyses demonstrate that this shift may be driven by increased pharmacy costs for the AIDS Institute programs.

Conclusions

Overall, participants in MRT-SH supportive housing programs are demonstrating significant Medicaid savings, with several programs (such as HHAP Capital Projects; OMH Rental Subsidies Brooklyn; OASAS Rental Subsidies & Supports; OPWDD Rental Subsidies & Supports; and OHIP Nursing Home to Independent Living (transition clients)) showing especially pronounced savings. Savings were also seen by specific categories of service, most prominently emergency department, hospital inpatient and outpatient, and nursing home costs, as well as expensive program-specific waivers and rehabilitative services, indicating less need for high-cost, high-demand medical services. As such, participation in a supportive environment, combined with enrollment in Health Homes or Medicaid managed care, may lead to a more efficient use of health care resources.

COST REPORT II, VOLUME 2: TREATMENT VERSUS COMPARISON

Key Findings

- Overall, a significant treatment effect was found: while pre-period spending was similar (as expected after the matching process), Treatment participants demonstrated average savings of about \$6,800, which was significantly more than the \$3,700 average savings for Comparison participants. As such, enrollment in MRT-SH programs resulted in greater cost savings in Medicaid claims than “treatment as usual.”

Table 6. Spending Treatment Effects for Full Group

Group	N	Mean Pre-Period Spending	Mean Post-Period Spending	Main Effect of Group	Mean Pre-Post Difference
Treatment	2,037	\$34,173	\$27,350	0.002	-\$6,822
Comparison	2,037	\$35,828	\$32,130		-\$3,699
Main Effect of Time			<0.001	Interaction 0.008	

- These treatment effects were likely driven by the Treatment clients in the highest deciles of pre-period spending. While both Treatment and Comparison participants in the lower spending deciles tended to demonstrate increased spending in the post-period, those in the top two *spending* deciles demonstrated significant cost savings, with greater savings for Treatment than Comparison clients.

Most MRT-SH programs used pre-period Medicaid spending as a targeting criterion, with the aim of enrolling particularly high-cost users. These results demonstrate that such a strategy is appropriate, as these initially high-spending clients are the ones most likely to show significant cost savings after enrollment.

- Further, these savings likely stemmed from decreased spending in three service categories.
 - Hospital inpatient spending showed significant decreases in the post-period, though these decreases were greater for Comparison than Treatment clients.
 - Nursing home and “other” spending showed significant savings for Treatment clients, while Comparison clients tended to show increases.
 - It should be noted, however, that the propensity score matching approach used was optimized for overall spending, not for any spending subcategory. As such, these comparisons can point to potential overall cost drivers, but conclusions must be limited.

Directions for Future Research

- Some comparisons were also made between Treatment and Comparison clients who met the same diagnostic criteria or had the same prior housing histories. These analyses are more limited, as the compared subgroups were not selected to necessarily match each other (and thus the results seen could be attributable to other demographic or clinical differences). Significant treatment effects, where cost savings were significantly greater for Treatment than Comparison clients, were seen for clients with an SMI, SUD, or other chronic condition, and for those with a history of nursing home or homeless shelter stays in the pre-period. Future work should examine these patterns more closely through propensity score models specifically optimized for these comparisons.

Conclusions

The overall treatment effects found represent a promising result of MRT-SH interventions: Treatment clients demonstrate greater cost savings in the first year after MRT-SH enrollment than do their matched Comparison counterparts. These decreases are likely driven by clients who were particularly high utilizers before enrollment, and likely stem from decreases in inpatient, nursing home, and “other” service category spending. Treatment clients with an SMI, SUD, or other chronic condition, or with a history of OMH residential facility or nursing home stays, may especially benefit from MRT-SH programs, but further work is needed to better establish these subgroup-based patterns. As such, participation in a supportive environment, combined with enrollment in Health Homes or Medicaid managed care, may lead to a more efficient use of health care resources.

COST REPORT YEAR 3: TREATMENT VERSUS COMPARISON GROUP, INVESTMENTS VERSUS SAVINGS ANALYSES

- When non-Medicaid cross-sector costs (non-MRT program investments, and alternative setting utilization costs) were included, Treatment participants demonstrated greater overall spending decreases than did Comparison, for a relative savings of about \$7,000,000, or about \$3,500 per person.
- These full-group savings appear to be driven particularly by decreased usage of other settings in the post-period for Treatment clients. While days in setting remained steady or increased for Comparison clients, days decreased for Treatment clients, resulting in huge cost savings sufficient, when coupled with the Medicaid claim savings seen, to overcome the sizeable program investment.

Further, Treatment clients in the two highest pre-period spending deciles showed greater decreases than did their Comparison counterparts, demonstrating that the overall treatment effect seen is likely driven by these pre-period high spenders.

Table 7. Treatment versus Comparison Group Cross-Sector Spending Analysis

Cost Categories:	Treatment Group		Comparison Group		Total Spending Difference	Per-Person Difference
	Pre-Period	Post-Period	Pre-Period	Post-Period		
Investments:						
Total Program Service & Operating costs, Development Costs	\$0	\$31,019,705	\$0	\$0	\$31,019,705	\$15,228
Outcomes:						
Medicaid Claims	\$69,609,598	\$55,712,469	\$72,981,851	\$65,447,946	-\$6,363,224	-\$3,124
Inpatient Psychiatric stays	\$2,093,518	\$1,145,641	\$5,481,653	\$4,602,602	-\$68,826	-\$34
OMH Residential stays	\$24,648,016	\$6,002,159	\$10,384,053	\$14,383,689	-\$22,645,494	-\$11,117
Homeless Shelter stays	\$11,393,300	\$1,864,100	\$5,440,300	\$4,919,900	-\$9,008,800	-\$4,423
Total Costs:	\$107,744,432	\$95,744,074	\$94,287,858	\$89,354,138	-\$7,066,638	-\$3,469

However, when Medicaid program costs versus Medicaid claim costs alone were first examined for Treatment clients, the claim costs declined by about \$6,800 per person, which was insufficient to balance out the high costs of providing MRT-SH housing and services (about \$15,000 per person). This resulted in a significant spending increase if only Medicaid costs and savings are considered, highlighting the importance of examining cross-sector costs as well.

- Treatment clients in the highest pre-period spending decile did show a significant spending decrease, likely due to their high Medicaid claim cost savings, though no other deciles demonstrated such a result.
- The pre- and post-period differences in total Medicaid spending within the Treatment group were then compared to the differences for the Comparison group, to determine whether the Medicaid cost of the MRT-SH programs was significantly less than the cost of “treatment as usual.” While Treatment clients demonstrated a greater Medicaid claim spending decrease than did Comparison clients, once program costs were included, Medicaid-related spending still significantly increased for the Treatment group but decreased for the Comparison.
- Both the Olmstead Housing Subsidy program and OPWDD Rental Assistance program demonstrated significant Medicaid claim cost savings one and two years after enrollment. In both cases, savings were particularly driven by decreases in “other” service spending; OPWDD also showed notable decreases in nursing home-related spending.

The overall treatment effects seen represent a promising result of MRT-SH interventions: Treatment clients demonstrate greater cross-sector cost savings in the first year after MRT-SH enrollment than do their matched Comparison counterparts. Consistent with previous reports, Treatment clients demonstrated greater Medicaid claim spending decreases than did Comparison clients. But as MRT-SH programs represent costly interventions, with high annual service and operating costs and sizeable development investments, examination of Medicaid spending changes alone

is insufficient to overcome this spending. But when non-Medicaid cross-sector costs were also examined, Treatment participants demonstrated greater overall spending decreases than did Comparison participants, for a relative savings of about \$7 million, or about \$3,500 per person.

These decreases are likely driven by clients who were particularly high utilizers before enrollment, and likely stem from decreases in Medicaid inpatient, nursing home, and other service category spending, and decreases in utilization of other settings (inpatient psychiatric centers, OMH residential facilities, and homeless shelters, all of which are quite costly).

As such, participation in a supportive environment, combined with enrollment in Health Homes or Medicaid managed care, may lead to a more efficient use of health care resources, as well as societal resources in general.

OUTCOMES REPORT II, VOLUME 1: PRE-POST ANALYSES

Key Findings

- The MRT-SH programs are serving a seriously ill population who experience high rates of comorbidities. Sixty percent have an active diagnosis of a Serious Mental Illness (SMI), 41% have a Substance Use Disorder (SUD), 24% are HIV+, and 52% 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, 42% percent had at least one inpatient admission and 61% had at least one emergency department visit in the pre-period. The mean number of inpatient days was 9.8, and the mean number of emergency department visits was 3.0.
- Following 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, and emergency department visits (including those for mental health and substance abuse, and particularly visits that were potentially preventable).
- In the geographic areas from which data were available on homeless shelter stays, shelter use decreased from 25% of clients in the pre-period to 3% in the year following MRT-SH enrollment. This decrease was largely maintained through the second year following MRT-SH enrollment, even though many clients were discharged from MRT-SH before or during this period.
- 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.

AIDS Institute (AI) programs

Clients in the AIDS Institute – Services Only program experienced significant reductions in:

- Average number of inpatient days, percent with any ED visits, and average number of ED visits
- Percent with any Inpatient stays for HIV
- ED visits for routine and non-emergent conditions
- Shelter use

Clients in the AIDS Institute – Services and Subsidies program experienced significant decreases in shelter use. Clients in the AIDS Institute – Pilot Program experienced reductions in the likelihood of inpatient care and ED care, but the sample size was too small for significance testing.

Housing and Community Renewal (HCR) programs

- Clients in the East 99th capital project experienced significant reductions in ED visits for emergent but PC treatable conditions and in shelter use

- Clients in the HCR behavioral health projects overall experienced significant reductions in:
 - The average number of ED visits overall
 - The likelihood of ED visits for SUD
 - ED visits for routine complaints, non-emergent conditions, avoidable conditions, injuries, and drug- and alcohol-related conditions.
 - Shelter use
 - Clients in the Boston Road capital project experienced a decrease in the average number of ED visits for injuries
 - Clients in the Third Avenue capital project experienced a decrease in the average number of ED visits overall, and ED visits for routine conditions
 - Clients in the Norwood Terrace capital project experienced a decrease in the percent with any inpatient care and the average number of inpatient days

Office of Temporary and Disability Services (OTDA) programs

Clients in EPVA experienced:

- A reduction in the percentage with at least one ED visit
- A reduction in ED visits for routine and non-emergent conditions
- A reduction in shelter use

Clients in the HHAP capital projects experienced:

- A reduction in the percent with any inpatient and ED use and in the average number of inpatient days and ED visits overall
- A reduction in ED visits for routine complaints and emergent but PC treatable conditions

Clients in the Homeless Senior and Disabled Placement Pilot experienced:

- A reduction in the percent with any ED use, but only in the second year post-enrollment
- A reduction in ED visits for routine complaints
- A reduction in shelter use

Office for Mental Health (OMH) programs

Clients in RSB experienced:

- A reduction in the average number of inpatient days and ED visits overall
- A reduction in ED visits for emergent but PC treatable conditions
- A reduction in shelter use

Clients in RSS experienced:

- A reduction in the percent with any inpatient or ED and in the average number of inpatient days and ED visits (the latter only statistically significant among those with at least two years of post-enrollment data)
- A reduction in the percent with any inpatient use and any ED use for SMI
- A reduction in the percent with any inpatient care for SUD
- A reduction in ED visits for routine complaints and non-emergent conditions, and for psychiatric-related visits and injuries
- A reduction in shelter use

Clients in OASAS experienced:

- A decrease in the percent with any inpatient use or ED use and the average number of inpatient days and ED visits
- A reduction in ED visits for routine complaints, and nearly all types of potentially avoidable ED visits (except injury)
- A reduction in the percent with any inpatient or ED use for SMI
- A reduction in the percent with any inpatient or ED use for SUD
- A reduction in shelter use

Clients in OPWDD experienced:

- A reduction the average number of ED visits, but only in the second year following MRT-SH enrollment
- An increase in non-emergent ED visits and ED visits for injuries

Clients in HHSP experienced:

- A reduction in the percent with any ED and inpatient use overall and in the average number of inpatient days and ED visits
- A reduction in the percent with any inpatient and ED use for SMI
- A reduction in the percent with any inpatient care for SUD overall
- A reduction in ED visits for routine complaints, non-emergent conditions, and injuries, as well as for alcohol-related, drug-related, or psychiatric-related ED visits
- A reduction in shelter use

Clients in the NHIL transition program experienced:

- A reduction in the percentage with at least one inpatient stay

Clients in the SSHP program experienced:

- An increase in the percent with any inpatient use and the average number of inpatient days
- Decreased shelter use in the first year post-enrollment

Conclusion

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. 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.

Additional research is needed to better understand which program participants benefit most from supportive housing.

OUTCOMES REPORT II, VOLUME 2: TREATMENT VERSUS COMPARISON

Key Findings

- The Comparison group clients unexpectedly had higher pre-period utilization of inpatient services than the Treatment clients. This may have been an artifact of the matching procedure, which prioritized matches on Medicaid spending. The Comparison group also showed significantly larger decreases in post-period inpatient utilization than the Treatment group.
 - These findings should be revisited with a model that is optimized for inpatient utilization rather than spending (i.e. pre-period inpatient utilization should be fixed in the matching process).
- Overall, a significant treatment effect was found for the average number of ED visits (although no effect was found for the percentage of clients with ED visits).
- There was a significant treatment effect on the average number of primary care visits, but not on whether or not they

had any primary care use. This took the form of a reduction rather than an increase in primary care visits, which may reflect a lower incidence of minor medical complaints requiring primary care evaluation and management.

- Utilization related to behavioral health and housing-sensitive conditions followed the pattern of utilization overall – the Comparison group had significantly larger decreases in inpatient use for all of these conditions, while the Treatment group had significantly larger decreases in ED use for SUD and housing-sensitive conditions (but not for SMI).
- The most robust treatment effects were found for reductions in potentially preventable ED use.
 - The Treatment group experienced significantly greater pre-post reductions in ED visits for routine complaints, for non-emergent conditions, for emergent but primary care treatable conditions, for avoidable conditions, and for alcohol-related conditions.
- There were robust treatment effects found for nursing home use, with Treatment clients experiencing a reduction in the percent with nursing home stays and the total number of (non-nursing home) inpatient days, while Comparison clients experienced an increase in inpatient days.
 - It should be noted that pre-period nursing home use was not well-balanced between the two groups, so this finding merits further study with a model optimized for this purpose.
- The Treatment group had significantly greater decreases in the use of homeless shelters and Office of Mental Health (OMH) residential settings than the Comparison group.
 - This is not surprising as MRT-SH programs are designed to replace these settings, but highlights the positive impact of MRT-SH programs in helping clients avoid these settings, and thus improve quality of life.
- Mortality after the end of the post-period is much lower for Treatment clients. This effect persists for up to three years after the end of the post-period year (and the findings in the fourth year trended in the right direction but were not statistically significant).

Directions for Future Research

- Some comparisons were also made between pairs of Treatment and Comparison clients who met the same diagnostic criteria or had the same prior housing histories.
 - There were not enough matched pairs of clients with HIV or with either type of OMH housing history to analyze.
- These analyses are more limited, as the compared subgroups were not selected to necessarily match each other (and thus the results seen could be attributable to other demographic or clinical differences).
- The same patterns of inpatient and ED use were generally found for all diagnostic groups as for the sample overall, except that a treatment effect was not found for number of ED visits among client pairs with chronic medical conditions or with three or more types of conditions.
- The same patterns of inpatient and ED use were found among shelter users as for the sample overall, except that a treatment effect was not found for number of ED visits.
- Future work should examine these patterns more in-depth through models specifically optimized for these comparisons.

Conclusions

MRT-SH appears to have a robust effect on number of ED visits, both overall and for various types of conditions. This seems to be particularly true of potentially preventable ED visits. While ED visits are not one of the major drivers of costs for this population, as established in the Cost 2 report, this is a promising indication of improvements in client well-being as a result of MRT-SH.

MRT-SH programs also show promise in keeping clients out of high-cost residential settings. Significant treatment effects were observed for reductions in the use of nursing homes, homeless shelters, and OMH residential settings. Not only are these settings expensive, but likely less conducive to client psychological well-being.

Finally, the MRT-SH program is associated with fewer client deaths after the post-period. (Clients who died during the post-period would have been excluded from the study sample.) This effect appeared to persist for up to four years after MRT-SH enrollment (i.e. up to three years after the post-period end).

These promising findings are balanced against the consistent finding that the Comparison group clients have greater reductions in inpatient use than the Treatment clients. This unexpected result was statistically significant for many types of inpatient use, and for all the subgroups examined. It is not clear why this would be the case, but is possible that it is related to the matching procedure, which was optimized for matching on cost and may have resulted in artificially greater imbalance on pre-period inpatient use as a result.

Despite the unexpected results for inpatient use, however, the MRT-SH program shows promise in improving several aspects of client well-being, even compared to a matched Comparison group of similar clients.

IMPLEMENTATION REPORT

Key Findings

- The analysis underscored how critical housing is in the lives of individuals who had been unstably housed or homeless, as well as those who were institutionalized. Housing allows many to reclaim a positive sense of identity, experience peace and stability, become independent, and address health and recovery needs. Support services, such as case management, are essential to fostering the skills needed for participants to become independent and to retain their housing. Case management is also critical to facilitating linkages to physical and mental health providers and other support systems.
- While supportive housing is positively impacting health and quality of life for most participants, it is not a panacea. Many individuals continue to struggle with mental health issues, chronic conditions, and addictions; others contend with social isolation and strained relationships. The participants described trauma and significant adversity prior to entering supportive housing, which is likely compounded by structural injustices, such as poverty, discrimination, racism, and marginalization. Thus, the complex needs they are experiencing when entering MRT-SH programs are unlikely to be fully ameliorated by supportive housing.
- The analysis underscored how programs should anticipate early adjustment challenges as individuals first enter the program. Many participants struggle to pay rent on time, maintain their apartments, remember and follow through with medical appointments, and navigate their new communities. Social isolation and loneliness were commonly reported by participants when first entering supportive housing. It is especially important for programs to provide intensive services at this stage, and to continually assess the specific supports each participant requires in order to retain their housing.
- A complex picture emerged in terms of the benefits and drawbacks of congregate and scattered-site supportive housing models. The analysis suggests that the characteristics, needs, and goals of the participants might suggest a better fit with a certain model. For instance, participants with acute mental health needs who experience significant anxiety in an apartment environment might be best served by a congregate program with on-site staff. Those who can acclimate into the community and who wish to reclaim their lives with identities that are less stigmatized might prefer and be successful in a scattered-site program.
- Perspectives on the Housing First approach emerged as complex and nuanced. While the benefits of the model were widely described by administrators, staff, and service recipients, limitations and challenges were highlighted as well. Participants across the stakeholder groups endorsed the low-barrier approach to housing, indicating that housing is a human right and/or a basic need that needs to be met before service recipients can address other health concerns. However, program staff often struggled to address the addictions of individuals residing in the programs, which often complicate landlord relationships. Participants were sometimes hesitant to endorse harm reduction, as they indicated the possibility of becoming destabilized when surrounded by other individuals who are using. To address these challenges, it is important to have intensive supports in place for those with complex

needs, such as addictions. Further, programs may benefit from promoting a respectful and safe environment for all residents, such that those who may be using are encouraged to do so privately, and in a manner less obtrusive and risky to others.

- Since a key goal of the MRT-SH programs is to reduce Medicaid costs, the programs reported a need for additional guidance about how to operationalize and validate high Medicaid utilization. The findings also highlighted the need to address bureaucratic hurdles to the extent possible, in order to expedite the process of enrolling participants into the programs. Administrators and staff of the programs described burdensome application processes and requirements (e.g., proving homeless status) that create hurdles to rapidly housing those who are most vulnerable. Often these hurdles resulted from the requirements of other funders outside of MRT. Further, some program staff requested greater flexibility within the budget to address the needs of participants, such as offsetting the cost of transportation and providing amenities that allow individuals to feel more comfortable and less anxious in their apartments (e.g., air conditioners, radios or DVD players, funding for an occasional movie outing, etc.).
- The analysis suggests that providers are eager for opportunities to interact and obtain feedback from one another, as well as from NYSDOH. One approach to achieve this would be to develop a learning community for the providers, consisting of virtual and in-person meetings to share ideas about innovative approaches. Learning communities can also be a forum for discussing challenges that the providers are experiencing, so staff can share ideas about approaches that others have found successful.

FINAL TARGETING REPORT

Key Findings

Part I: Salience and Overlap of Prioritization Criteria

- None of these prioritization criteria are a good substitute for any other single criterion, either among clients in the MRT-SH program or in the Medicaid population at large. However, nearly all of the clients who meet the inpatient criteria are captured by at least one other criteria, so that the inclusion of inpatient utilization as a prioritization criteria adds relatively few clients
- People who qualify only because of their health home enrollment are not high-cost or high-utilizing clients. If high-cost, high-utilizing clients are the target group for MRT-SH, this criterion is not effective in capturing them.
- A failure to include clients who only meet the ED criterion under the prioritization menu will bias MRT-SH clients to be more male, more non-Hispanic white, and older. Those captured under the ED criterion only appear to represent a distinct group of high utilizers who meet the definition of a high utilizer but have a different demographic profile from those meeting other criteria and who would not otherwise be captured by the MRT-SH programs.
- Dropping both the health home and inpatient criteria and basing the prioritization menu only on costs and ED visits would not dramatically change the character of the clients currently being served by MRT-SH. This simplified prioritization menu would be a more streamlined way to capture largely the same type of clients, while at the same time trimming out some of those who are less intensive users of resources.
- Using a criteria based on top 20% of spending in the specific population or five or more ED visits would result in substantially smaller percentages eligible for services, but would also result in more acute populations, with higher rates of comorbidities, more inpatient and ED use, and more pre-period spending.
- None of the prioritization criteria analyzed, when applied to the random sample, would produce a sample of potential clients that is comparable to actual MRT-SH clients in average level of costs. This would seem to suggest that programs are either targeting their services to a higher-cost population than the top 20%, or are using other – perhaps more subjective – indicators of need that are correlated in practice with higher spending.

Part II: Variation in Cost Savings Based on Prioritization Criteria

- Many of the items that are part of the current prioritization menu are not significantly associated with more favorable outcomes within any of the diagnostic subgroups or for clients with pre-period shelter stays. Having ED visits or inpatient stays in the pre-period was not associated with a greater decrease in pre-post spending for any group.

Nor was Health Home enrollment. Having a pre-period nursing home stay was associated with a significantly greater decrease in pre-post spending only among clients with a serious mental illness.

- Pre-period costs were significantly associated with decreases in pre-post spending in all groups. The greater decrease in pre-post spending associated with higher pre-period spending for those who received the treatment implies that high-spending clients will benefit more from receiving the program, and that by enrolling more high-spending clients, the program can maximize cost savings.
- Certain client characteristics are associated with greater cost savings for the Treatment group relative to the Comparison group within different client populations.
- In sum, for all subgroups of clients, except those with HIV, the largest cost savings in raw dollars between the Treatment versus the Comparison group would be realized by using the most restrictive prioritization criteria (clients who are either in the top 20% of population-specific costs or have 5 or more ED visits).

Part III: Stakeholder Feedback

- Findings from the qualitative analysis highlight participant characteristics that providers associate with success in supportive housing. Most providers indicated that there is no one “profile” of individuals who succeed in housing; rather, they noted that it is critical for the supports provided to match the needs of the individual participant, viewing this as essential to success. However, the providers also commonly reported that participants who are most motivated or engaged tend to do best in the program.
- The providers reported that participants who are less motivated or willing to engage in services are the most challenging to serve, and seem to be benefitting the least. Several providers described serious mental illness, active substance abuse, and co-morbid conditions as characteristics that create challenges to effective delivery of supportive housing.

Conclusions

The implications of these findings for policy depend in large part upon the program priorities. Rather than indicating a clear policy direction, the results of this report suggest some policy questions for further consideration.

- The program leadership should consider the desired balance between exclusivity and inclusivity. More restrictive prioritization criteria will result in a substantially smaller percentage of the Medicaid population with program-specific diagnoses being prioritized for services. However, the clients who are prioritized under the strictest criteria (that involving population-specific cost cutoffs), will result in a higher-spending profile of clients, and these clients tend to experience the greatest cost savings in raw dollars compared to a Comparison group with the same spending profile.
- Health Home enrollment is one of the current prioritization criteria that could be considered for elimination.
- Inpatient use is another current prioritization criteria that could be considered for elimination. Nearly all of the clients who would be prioritized based on inpatient use are captured by other criteria.
- Using a population-specific cost cutoff results in a smaller population of more resource-intensive clients. However, the implementation of such a population-specific cost criterion requires consideration of how to treat that majority of cases where clients belong to more than one diagnostic population.
- The patterns for the HIV-positive population are substantially different than those for other diagnostic populations, and seem to imply that MRT-SH enrollment results in higher, rather than lower, levels of spending for these clients. Because the recommended therapies for HIV/AIDS are cost-intensive, this may represent a more appropriate level of service utilization for their condition rather than increased morbidity or unnecessary use of services.

ACCESS REPORT II

Key Findings

Section 1: Literature Review

- Homelessness is a significant social problem in the United States, and in New York State particularly. Housing and Urban Development (HUD) data highlight New York State as one of two states with the largest number of homeless individuals (HUD, 2017).
- According to HUD Point-in-Time count data, on a single night in the United States in 2017, roughly 553,742 individuals experienced homelessness. Of this count, 65% of individuals were residing in emergency shelters or transitional housing programs, and 35% were in unsheltered locations (HUD, 2017).
- The HUD 2017 data on New York State counted 89,503 individuals as homeless. This source estimated 37,390 homeless unaccompanied individuals, 2,829 unaccompanied homeless youth, and 52,113 homeless individuals in families including children; 1,244 homeless individuals were veterans, and 5,087 were chronically homeless (HUD, 2017).
- New York State experienced a 3.6% increase in the homeless count between 2016–2017, and a 43% increase between 2007–2017. This increase of 43% within the last ten years was the largest absolute increase in the country, while the increase between 2016–2017 represented the second largest increase in the country, after California (HUD, 2017).
- New York City experienced the second largest city-based increase in homelessness between 2016–2017, surpassed only by Los Angeles. One quarter of all families homeless in the U.S. are located in New York City (HUD, 2017).
- Point-in-Time (PIT) counts, the approach used by HUD to quantify homelessness, are believed to greatly underestimate the scope of the problem, due to a lack of reliability, validity, and “ability to capture an accurate numerical count” of the overall homeless population (Schneider et al., 2016). PIT counts in different states and communities tend to use varying methodologies, with some more comprehensive than others (Burnes & DiLeo, 2016; Schneider et al., 2016). Thus, the PIT count data presented in this report is very likely to underestimate the scope of homelessness in New York State.
- Homelessness was once characterized as “a single, white man’s issue”, but it is now clear that a number of groups are impacted, including single men and women, families, youth, GLBTQ individuals, veterans, individuals fleeing domestic violence, and other groups (Henwood et al., 2015; Schnieder et al., 2016). Homelessness is a social problem that disproportionately impacts African-Americans, as well as individuals with disabilities, including mental illness (Henwood et al., 2015). Recent research suggests a growing cohort effect in terms of the homeless population, with adults over the age of 55 and youth between 18–25 experiencing increases (Culhane & Byrne, 2013).
- Youth homelessness is a significant issue in the United States, despite the fact that data on the scope of homelessness among young people is limited, and likely underestimates the problem (Anthony & Fischer, 2016). Likewise, family homelessness is often underestimated in homeless counts, as families are often “out of sight,” doubling up in housing with others or living in similarly precarious accommodations (Biele, Gilhuly, Wilcox, & Jacobstein, 2014; Brush, Gultekin, & Grim, 2016).

Section 2: Homelessness in New York State: Scope, Demographics of Shelter Users, and Medicaid Service Utilization

- Based on the 2016 HUD Point-in-Time (PIT) counts, about 0.10% of the adult population in Upstate New York (including the Capital, Hudson Valley, and Adirondack regions) and 0.70% of the population in New York City may be in need of housing. This rate encompasses adults living in emergency shelters and temporary housing, and those who are unsheltered on an individual night. Per the literature, PIT counts are known to underestimate the scope homelessness, particular among certain subgroups (e.g., families, precariously housed individuals, those experiencing short-term homelessness).

- Clients in HMIS-reporting shelters in New York City and selected regions of Upstate New York are similar in age (mean about 38 years, median 36) and gender (about 55% male). Upstate clients are more likely to be white (54%, versus 18% in NYC) and are more likely to report being disabled (28.5%, versus 17.5% in NYC).
- Under the length of stay criteria used in the study, about 6% of upstate HMIS-reporting shelter users are likely to be chronically homeless. In contrast, the rate of chronic homelessness in New York City is 40%.
- Upstate New York HMIS-reporting shelters show less seasonal variation in shelter utilization compared with New York City HMIS-reporting shelters.
- The homeless population in New York State has high rates of serious mental illness, substance use disorders, HIV, and other chronic medical conditions. Almost three-quarters of the homeless upstate (74%) and two-thirds of those in New York City (67%) are estimated to have a diagnosis in at least one of these categories.
- An estimated one-half (50%) of the homeless population with full, continuous Medicaid coverage in New York City and a higher percentage upstate (57%) meet at least one of the eligibility criteria generally used for MRT-SH programs. Many of these people in New York City are also chronically homeless (45% of the eligible homeless), while a much lower percentage of the eligible upstate are chronically homeless (7.5%).
- To generate the estimates in Section 2 of this report, an assumption of equal healthcare utilization rates between those with and without continuous Medicaid coverage was used.
- Overall, it is estimated that roughly 29,221 homeless individuals in New York are MRT-SH eligible, and 11,537 of these are also chronically homeless. Eighty-three percent of the MRT-SH eligible homeless population is in New York City, 13% are upstate, and roughly 4% live on Long Island. Ninety-five percent of those who are both MRT-SH eligible and chronically homeless live in New York City.
- Among the Upstate New York regions where HMIS data were available, the largest percentage of eligible homeless live in the Hudson Valley (34%), and the smallest percentage live in the Adirondacks (7%). No data were available on the homeless population in the Mohawk Valley.

Section 3: MRT-SH eligibility among individuals without 12 months of continuous Medicaid coverage

- Many homeless individuals experience significant gaps in Medicaid coverage. Twenty-eight percent of the New York City sample and 33% of the upstate sample had less than full coverage, or gaps in coverage exceeding 60 days. Additionally, a large number of homeless individuals had no Medicaid Data Warehouse match (12% of those upstate and 7% in New York City). It is unclear how many of these individuals had no Medicaid records, and how many had data entry errors in their HMIS records that prevented a match. Overall, in New York City, 66% of the homeless individuals sampled had a record of full, continuous Medicaid coverage. Upstate, 55% had a record of full, continuous Medicaid coverage.
- The estimates derived from both the MDW and SPARCS data consistently indicate that clients without full and continuous Medicaid coverage have, in fact, substantially lower utilization of inpatient and ED services than clients who are consistently covered by Medicaid. They also have lower rates of Health Home enrollment and HARP or SNP enrollment, and are less likely to be in the top quintile of Medicaid spenders.
- While any underestimation of inpatient utilization using the MDW relative to SPARCS is minor, substantial numbers of ED visits not billed to Medicaid occur among this population. Data provided by the SPARCS team indicate that 20% of ED visits for this group of shelter clients are self-pay, and another 4% are paid by private insurance. Therefore, while MDW data may provide a reasonable proxy for eligibility based on inpatient stays, it is not a reliable source of data for eligibility based on ED visits.
- Clients without full, continuous Medicaid are a substantially different population than those who are continuously covered by Medicaid, with different patterns of health care utilization and therefore different rates of MRT Supportive Housing eligibility. Assuming that the rates of eligibility found among continuously covered shelter

users apply equally to those not continuously covered may result in sizeable overestimates of the MRT-eligible population (by roughly 21% among NYC clients and 38% among upstate clients).

- There is enough uncertainty inherent in the data on clients without continuous Medicaid enrollment that it is not recommended that estimates of MRT-eligibility presented in Section 2 be directly adjusted. Rather, users should acknowledge the strong probability that these estimates are biased upwards by the methodology used.

EFFECTS OF 6- AND 12-MONTH PROGRAM RETENTION ON CLIENT OUTCOMES

Key Findings

The majority (71%) of clients who had full, continuous Medicaid coverage from one year before enrollment through one year after were retained in MRT-SH for at least one year. Thirteen percent were retained for less than 6 months, and 16% were retained for at least 6 but less than 12 months.

Overall Retention Effects

Generally, clients who were retained longer in the MRT-SH programs showed greater post-period decreases in utilization and spending. These effects were typically strongest for participants retained at least 12 months, versus those retained between 1 and 6, or 6 and 12, months.

On an intent-to-treat basis, the forthcoming Cost Report 2 will show a Medicaid savings of \$5,522, or 15% of pre-period costs, for recipients who enrolled in MRT Supportive Housing. However, for individuals who stayed enrolled for 12 months or more (two thirds of enrollees), average savings were \$6,773, or 19% of pre-period costs.

Similarly, Outcomes Report 2 will show a reduction of 0.7 emergency room visits (23%) and 3.7 inpatient days (38%) overall. But clients retained at least 12 months had 0.8 fewer emergency room visits (29%) and 4.2 fewer inpatient days (48%). Comparing the clients retained less than six months to those retained for 12 or more, one could summarize the results as follows: ***If you simply get clients enrolled, you see a 4% savings, 16% reduction in ER visits, and 21% reduction in inpatient days. If you keep them for at least 12 months, you see a 19% savings, 29% reduction in ER visits, and 48% reduction in inpatient days.*** These retention findings should be taken to supplement the findings from the overall outcomes and cost reports and help put those decreases in context.

Although the primary drivers of client retention may be beyond the ability of programs to influence, the presence of retention effects suggests that **providers should track client retention and pilot strategies to reduce attrition, especially among clients at the highest risk of leaving the program.** Further, participants who were high pre-period utilizers or spenders tended to demonstrate the greatest drops in utilization or costs in the post-period. However, **there is a strong, consistent correlation (across demographics, programs, diagnoses, and coverage characteristics) between higher pre-period resource use and earlier discharge (see Table 6 of the original Effects of 6- and 12-Month Program Retention on Client Outcomes report).** The exception was that among those discharged to a less restrictive setting, higher pre-period utilization correlated with a longer stay. **Overall, this pattern seems to indicate that the most vulnerable clients are those also at the highest risk of attrition.**

Retention Effects Controlling for Pre-Period Utilization

Within the high-utilizer group (and sometimes in the medium-utilizer group), clients who were retained longer often demonstrated lower post-period utilization. **Although these high pre-period utilizers are at greater risk of attrition, their retention effects were usually more pronounced.** Evidence of such effects were found across programs for inpatient utilization, ED visits, Medicaid spending, and housing stability. Further effects were also seen across utilization levels.

There was both a 6-month and 12-month retention effect on inpatient days among clients across all levels of pre-period resource use, where longer retention was associated with fewer days. For example, the chart below shows that within the high pre-period inpatient utilizers, those retained for at least 6 months started off with 3 fewer inpatient days than those not retained (a selection effect), but in the first year post-enrollment they experienced 12 fewer inpatient days than those not retained (a result that goes far beyond the selection effect).

Table 8 breaks down the selection and retention effects on inpatient days associated with both 6-month and 12-month retention.

There was also evidence of a 12-month retention effect on decreased ED visits among clients with medium and high pre-period levels of ED use, and a 6-month retention effect for all levels of pre-period utilization. Results for different categories of potentially preventable ED visits are given in Appendix A of the original *Retention report*.

Figure 15. Average Year 1 inpatient days by pre-period inpatient use and 6-month retention

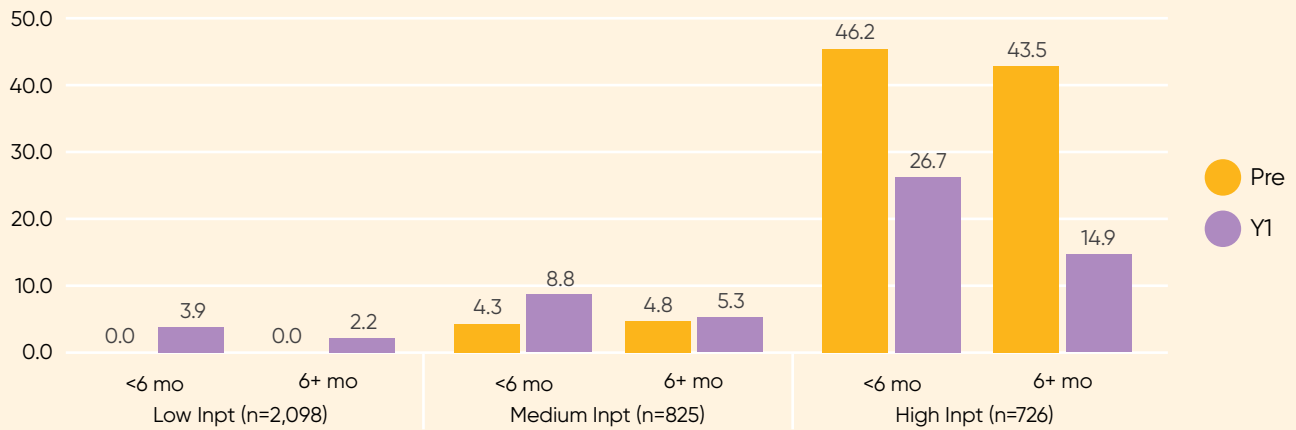


Table 8. Retention and selection effects on average Year 1 and Year 2 inpatient days, all clients

6-month retention	Y1 Retention benefit	Pre-period selection effect	Net retention effect	Base pre-period value	Proportional retention effect
Low inpt (n=2,098)	-1.7*	0.0	-1.7*	0.0	--
Med inpt (n=825)	-3.5**	+0.5	-4.0**	4.8	-83%
High inpt (n=726)	-11.8***	-2.7	-9.1**	44.0	-21%
12-month retention	Y2 Retention benefit	Pre-period selection effect	Net retention effect	Base pre-period value	Proportional retention effect
Low inpt (n=1,430)	-1.3*	0.0	-1.3*	0.0	--
Med inpt (n=557)	-5.7***	0.0	-5.7**	4.7	-121%
High inpt (n=491)	-8.5***	+0.7	-7.8†	42.9	-18%

Figure 16. Average Year 1 ED visits by pre-period ED use and 6-month retention

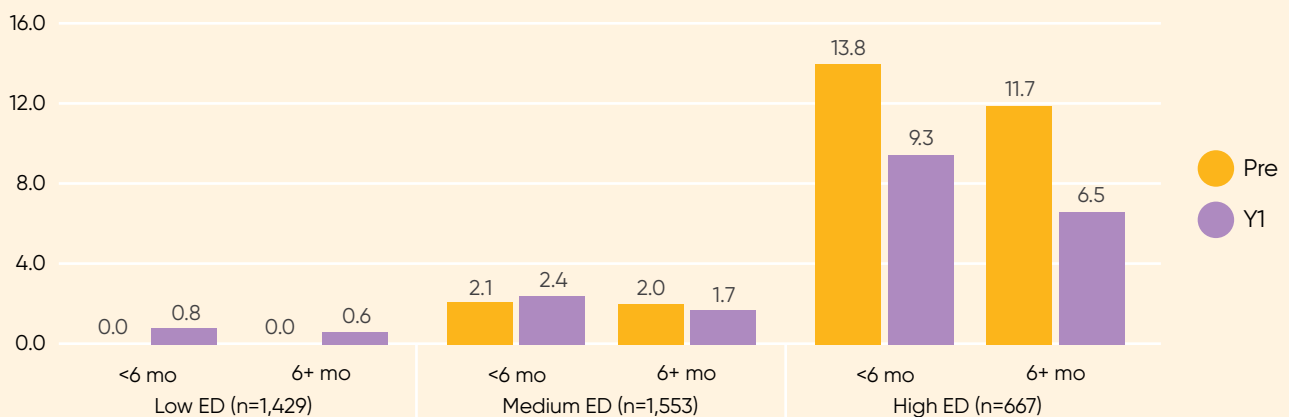


Table 9 breaks down the selection and retention effects on ED visits associated with both 6-month and 12-month retention.

Table 9. Retention and selection effects on average Year 1 and Year 2 ED visits, all clients

6-month retention	Y1 Retention benefit	Pre-period selection effect	Net retention effect	Base pre-period value	Proportional retention effect
Low ED (n=1,429)	-0.2*	0.0	-0.2*	0.0	--
Med ED (n=1,553)	-0.7 ***	-0.1	-0.6***	2.0	-30%
High ED (n=667)	-2.8 ***	-2.1	-0.7**	12.0	-6%
12-month retention	Y2 Retention benefit	Pre-period selection effect	Net retention effect	Base pre-period value	Proportional retention effect
Low ED (n=949)	-0.2	0.0	-0.2	0.0	--
Med ED (n=1,071)	-0.5 ***	0.0	-0.5***	2.0	-25%
High ED (n=458)	-2.2 **	+0.2	-2.0**	11.0	-18%

There was a clear selection effect for Medicaid spending, wherein clients with higher pre-period spending tended to remain in the program for less time than their peers. However, there were still significant 6- and 12-month retention effects related to spending for both medium- and high-cost clients. The chart below shows that within the pre-period high-cost clients, those retained for at least 6 months started off with \$3,876 less in costs than those not retained (a selection effect), but in the first year post-enrollment they experienced \$21,181 less in costs than those not retained (for a net result, beyond selection, of \$17,305).

Figure 17. Average Year 1 Medicaid spending by pre-period spending and 6-month retention

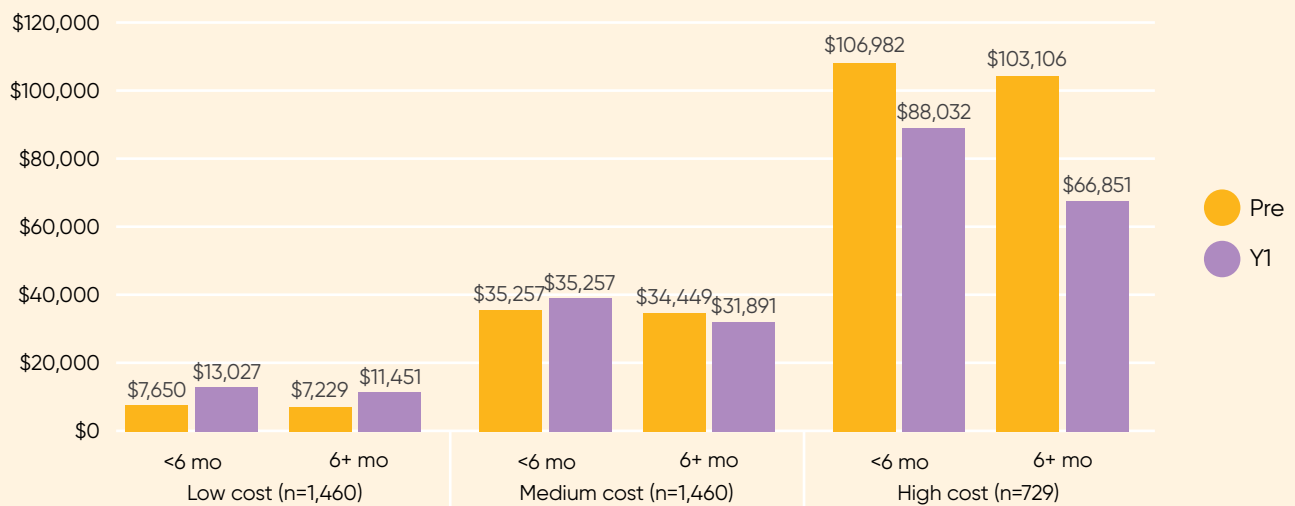


Table 10 breaks down the selection and retention effects on Medicaid spending associated with both 6-month and 12-month retention.

Table 10. Retention and selection effects on average Year 1 and Year 2 Medicaid spending, all clients

6-month retention	Y1 Retention benefit	Pre-period selection effect	Net retention effect	Base pre-period value	Proportional retention effect
Low cost (n=1,460)	-\$1,576†	+\$421	-\$1,155	\$7,268	-16%
Med cost (n=1,460)	-\$6,799***	+\$808	-\$5,991***	\$34,569	-17%
High cost (n=729)	-\$21,181***	+\$3,876	-\$17,305***	\$103,796	-17%
12-month retention	Y2 Retention benefit	Pre-period selection effect	Net retention effect	Base pre-period value	Proportional retention effect
Low cost (n=937)	-\$918	+\$402***	-\$516	\$7,432	-7%
Med cost (n=1,026)	-\$11,178***	+\$178	-\$11,000***	\$34,989	-31%
High cost (n=515)	-\$30,332***	+\$8,204	-\$22,128***	\$101,845	-22%

In sum, after selection effects were accounted for among the high pre-period utilizers, those retained at least 6 months had 9 fewer inpatient days and 0.7 fewer ED visits in their first year post-enrollment than those not retained. Among high pre-period spenders, those retained for at least 6 months experienced \$17,305 less in costs than those not retained.

Among the smaller group of clients who had two years of post-period data, those high pre-period utilizers retained for at least 12 months had 8 fewer inpatient days and 2 fewer ED visits in their second year post-enrollment than those not retained. Among high pre-period spenders, those retained for at least 12 months experienced \$22,126 less in costs during their second post-enrollment year than those not retained.

Other Outcomes

Generally, there was a pre-post decrease in primary care visits; this change only varied by retention in that clients with low levels of pre-period primary care use had significantly fewer Year 2 primary care visits if they were retained for at least 12 months. Outcomes with little or no evidence of retention effects beyond the impact of selection included primary care visits, housing-sensitive conditions, and various types of potentially preventable ED visits (the latter two included in the appendix of the original *Retention report*).

The lack of a significant retention effect should not be taken to indicate that supportive housing does not improve that outcome if a pre-post effect is observed in the overall outcomes report (true of potentially preventable ED visits and housing-sensitive conditions). Rather, even a short tenure in the program may confer benefits for participants. Also, it is more difficult to attain statistical significance with the smaller sample sizes within the different duration groups than for MRT-SH clients overall. Again, the results shown in this report should be taken to provide additional context for the overall outcomes and cost reports, but not supplant them.

Retention Effects by Program Type

While most MRT-SH programs provided housing and supportive services, some offered services only (to individuals who were already housed) or housing only. There was substantial variation by program type in the retention effects found for MRT-SH clients; however, these findings are difficult to interpret given the variation in sample size, location, and primary diagnoses between program types.

- There were a number of robust retention effects, net of selection, among clients in services and subsidies programs, especially those who were medium or high resource users in the pre-period. Medium- and high-using clients had significantly fewer Year 1 inpatient days if retained for 6 months, and significantly fewer ED visits and lower spending associated with both 6-month and 12-month retention. Among the low-utilizing clients, there was a nearly significant effect of both 6-month and 12-month retention on inpatient days, and a significant 6-month retention effect on ED visits.

- In contrast, retention effects for clients in services-only programs existed only among medium-utilizing clients for inpatient days (a nearly significant effect for 6-month retention and a significant effect for 12-month retention) and for spending (a significant effect for 12-month retention only).
- There were no significant retention effects for clients in housing-only programs, for whom only 12-month retention could be analyzed due to the very small numbers retained for less than 6 months. While the net retention effects on ED visits and spending for this group were very small, there was a sizable effect on inpatient days which may have been statistically non-significant primarily due to the relatively small size of this sample.

Retention Effects by Diagnosis Category

Retention appears to matter for all diagnostic categories, although the size of the retention effects varied by type of diagnosis.

- For the behavioral health population (those with severe mental illness and/or substance abuse disorders), 6- and/or 12-month retention effects were evident for inpatient days, ED visits, and overall Medicaid spending. This pattern was most pronounced among the high and medium utilizers.
- For the HIV-positive population, more of the results were accounted for by selection effects. Although there were several effects approaching statistical significance, the only significant results were fewer Year 2 inpatient days for medium-cost clients, and higher Year 2 costs for low-cost clients retained for 12 months. One hypothesis regarding the higher spending for retained low-cost clients is that these clients are receiving more antiretroviral medications, which would represent a positive outcome.
- For clients with other selected chronic medical conditions, dosage effects were found for inpatient days, ED visits (especially in Year 2), and costs, but primarily among clients with medium and high baseline levels of these metrics. These effects persisted even after accounting for selection effects.

Retention Effects by Reason for Discharge

Program discharge reasons were classified as positive (such as discharges to a lower level of care), as negative (e.g., discharges to a higher level of care), or as reflecting personal instability, but some of these groupings were too small to allow breakouts by pre-period utilization. Regardless of reasons for discharge, longer retention in the program was clearly related to lower post-period utilization and spending. The size of the effects, however, varied by both outcome and reason for discharge.

- After selection effects, clients discharged to a lower level of care had significantly fewer inpatient days if they had been retained for 6 months (the effect for 12-month retention was not quite significant).
- All three discharge groups had significantly fewer ED visits if retained for 6 months (but no significant results for 12 months).
- Clients discharged to a higher level of care had significantly lower Year 1 spending if retained for 6 months (and there was a nearly significant effect for clients discharged to a lower level of care); clients discharged for reasons related to personal instability had significantly lower Year 2 spending if retained for at least 12 months.

Policy Implications

- Across all programs and clients, maximum program benefit is associated with retention for at least one year post-enrollment, although net of selection effects the results vary by pre-period resource use.
- Discharge before 6 months – while associated with much less pre-post change than being retained for at least 12 months – is nonetheless associated with some level of pre-post decrease for inpatient and ED use, implying that any amount of time spent in MRT-SH confers at least some benefit on clients compared to their pre-enrollment use of care.

- Programs should plan to track retention, particularly 12-month retention, among their clients, and attempt to determine risk factors associated with avoidable or undesirable client attrition (as opposed to clients being discharged because they no longer need services). This data can facilitate a longer-term goal of identifying potentially preventable discharges – often, but not exclusively, those due to reasons of personal instability – and introducing programmatic changes that target clients' unmet needs before discharge occurs.
- A key conundrum faced by MRT-SH programs is that the same clients who seem to derive the most benefit from retention (i.e., those with higher levels of pre-period resource use) are also those clients who are at greatest risk of attrition. While this confound presents a challenge for program management, it also highlights the tremendous potential for improving program outcomes by increasing retention. For example, an average program would have to retain almost 43 low-cost clients for 12 months to realize the same cost savings as retaining a single high-cost client (i.e., the 12-month net retention effect for a high-cost client in dollars [-\$22,128] is nearly 43 times the 12-month net retention effect for a low-cost client [-\$516]).

Conclusions

In sum, retention is related to stronger pre-post program effects, though these effects vary for different outcomes and between different groups of clients. When clients are retained for less than 6 months, they experience 4% savings, 16% reduction in ER visits, and 21% reduction in inpatient days. If they are retained for at least 12 months, they experience a 19% savings, 29% reduction in ER visits, and 48% reduction in inpatient days.

The findings also suggest that clients with the highest resource use in the 12 months prior to MRT-SH enrollment are those who benefit the most from retention, but these clients are also the most difficult to retain, presenting an important challenge for programs. The presence of retention effects suggests that providers should track client retention and pilot strategies to reduce avoidable or undesirable attrition (as opposed to clients who no longer need services), especially among clients at the highest risk of leaving the program.

COMPARISON GROUP REPORT

While the original MRT-SH and Random Sample groups were quite different on most of the modeled criteria, the final Treatment and Comparison clients were not significantly different in most of their key characteristics, indicating improvements in sample balance after modeling. However, dual eligibility and inpatient utilization remained significantly different between groups even after modeling, demonstrating that while this process was able to select Comparison clients who were generally similar to the Treatment population, this Treatment group still represents a very particular, acute, and complex clientele for whom appropriate matches are likely limited. Because MRT-SH aims to target, enroll, and serve a particularly acute and complex client population, this uniqueness is not unexpected.

This model was optimized for matching by overall Medicaid spending, as this was considered the most potentially important outcome variable. As such, this appears to be a robust model for comparing differences in overall spending. Use of the matched groups to assess other outcomes, or to make comparisons using subgroups of the matched sample (e.g., within diagnostic groups) should be considered exploratory. This is because the fixing by cost decile will artificially increase imbalance on other variables. For this reason, future research should confirm those findings with additional models optimized for those specific comparisons.

Appendix A:

MRT-SH Program Descriptions

AIDS INSTITUTE: SUPPORTIVE SERVICES.

- **Program Description:** This program provides housing retention services to individuals living with HIV/AIDS in New York City; the majority of these participants were receiving a rental subsidy via other funding sources.
- **Population Served:** HIV-positive adults.
- **Program Start Date:** July 2012
- **Enrollment:** 624 included in analysis; 529 had data from two years post-enrollment available.
- **Comorbidities:** In addition to HIV-positive diagnoses, large percentages of enrollees have a serious mental illness (SMI), substance use disorder (SUD), or another major chronic condition; almost half of enrollees have 3 or more chronic illnesses
- **Duration in MRT-SH:** Almost one-third of the participants were enrolled for less than six months, and one-third between six and twelve months. A small group of participants had been enrolled more than 24 months.
- **Care Coordination:** The distribution of types of care coordination remained essentially the same for the pre- and post-periods. There was some decrease in Health Homes enrollment in the second post-enrollment period for the clients who have two years of post-enrollment data available.

AIDS INSTITUTE: RENTAL SUBSIDIES AND SERVICE SUPPORTS.

- **Program Description:** This program provides rental subsidies and housing retention services to individuals living with HIV/AIDS outside of New York City.
- **Population Served:** HIV-positive adults, often referred by Health Homes
- **Program Start Date:** October 2012
- **Enrollment:** 149 included in analysis; 84 had data from two years post-enrollment available.
- **Comorbidities:** In addition to HIV-positive diagnoses, large percentages of enrollees have a serious mental illness (SMI), substance use disorder (SUD), or another chronic condition; almost half of enrollees have 3 or more chronic illnesses.
- **Duration in MRT-SH:** Most enrollees have been in the programs for 12 or more months.
- **Care Coordination:** Care coordination enrollment remained consistent between the pre- and post-periods for all categories, with Medicaid Managed Care and Health Homes enrollment remaining high.

AIDS INSTITUTE: PILOT PROGRAM.

- **Program Description:** The pilot offered rental assistance to homeless and unstably housed Health Home-eligible individuals in New York City who were diagnosed with HIV but medically ineligible for the existing HIV-specific enhanced rental assistance program for New Yorkers with AIDS or advanced HIV illness. The pilot was phased out after the 2016 expansion of New York City's enhanced rental assistance program to all individuals with HIV infection.
- **Population Served:** HIV-positive adults.
- **Program Start Date:** December 2014
- **Enrollment:** 17 included in analysis; 11 had data from two years post-enrollment available. Given this small group, inferential statistics were not performed.
- **Comorbidities:** In addition to HIV-positive diagnoses, large percentages of enrollees have a serious mental illness (SMI), substance use disorder (SUD), or another chronic condition; almost half of enrollees have 3 or more chronic illnesses.
- **Duration in MRT-SH:** About one-quarter of participants had been enrolled for less than six months, and one-quarter between six and twelve months. About half of the participants had been enrolled between 13 and 18 months
- **Care Coordination:** Almost all clients were enrolled in Medicaid Managed Care and Health Homes in both the pre- and post-periods. No clients had dual eligibility.

HCR CAPITAL PROJECTS: EAST 99TH STREET.

- **Program Description:** East 99th Street includes 175 MRT units in Manhattan built during the 2013 decommissioning of the Goldwater Hospital on Roosevelt Island as a housing option for physically disabled adults who did not qualify for existing New York City SH programs.
- **Population Served:** This program serves elderly or disabled adults referred from the former Coler-Goldwater facility and other nursing homes and hospitals owned by New York City Health + Hospitals.
- **Earliest MRT-SH Enrollment Date:** November 2014
- **Enrollment:** 150 included in analysis; 130 had data from two years post enrollment available.
- **Comorbidities:** Enrollees are most likely to have a serious mental illness (SMI) or another chronic condition.
- **Duration in MRT-SH:** Almost all enrollees have been in the programs for 24 months or more.
- **Care Coordination:** While the distribution of dually eligible enrollees stayed the same between periods, there was a significant increase in Medicaid Managed Care enrollment in the post-period for those enrollees analyzed.

HCR CAPITAL PROJECTS: 3361 THIRD AVENUE.

- **Program Description:** This is an HCR project supporting 38 units of permanent supportive housing in the Bronx, NY.
- **Population Served:** This program serves chronically homeless single adults who suffer from a serious and persistent mental illness or who are diagnosed as mentally ill and chemically addicted.
- **Earliest MRT-SH Enrollment Date:** September 2015
- **Enrollment:** 34 included in analysis; only 5 clients had data from two years post enrollment available, and so these analyses were not performed.
- **Comorbidities:** Enrollees are most likely to have a serious mental illness (SMI) or another chronic condition.
- **Duration in MRT-SH:** All participants had been enrolled between 19 and 24 months.
- **Care Coordination:** The distribution of types of care coordination was similar in the pre-period and first post-period year.

HCR CAPITAL PROJECTS: BOSTON ROAD.

- **Program Description:** This is a HCR project supporting 94 units of permanent supportive housing in the Bronx, NY.
- **Population Served:** This program serves chronically homeless single adults who suffer from a serious and persistent mental illness or who are diagnosed as mentally ill and chemically addicted.
- **Earliest MRT-SH Enrollment Date:** January 2016
- **Enrollment:** 77 included in analysis; none had data from two years post enrollment available.
- **Comorbidities:** Enrollees are most likely to have a serious mental illness (SMI), substance use disorder (SUD), or another chronic condition.
- **Duration in MRT-SH:** Almost all participants had been enrolled for at least one year.
- **Care Coordination:** Almost all participants were enrolled in Medicaid Managed Care in the pre- and post-periods. Health Homes enrollment increased in the post-period.

HCR CAPITAL PROJECTS: NORWOOD TERRACE.

- **Program Description:** This is a HCR project supporting 58 units of permanent supportive housing in the Bronx, NY.
- **Population Served:** This program serves chronically homeless single adults who suffer from a serious and persistent mental illness or who are diagnosed as mentally ill and chemically addicted.
- **Earliest MRT-SH Enrollment Date:** August 2016
- **Enrollment:** 29 included in analysis; none had data from two years post enrollment available.
- **Comorbidities:** Enrollees are most likely to have a serious mental illness (SMI), substance use disorder (SUD), or another chronic condition. Almost half of enrollees had claims from the past year with primary diagnoses of at least three of the four conditions, and 14% had all four.
- **Duration in MRT-SH:** All participants had been enrolled between six and eighteen months.
- **Care Coordination:** Enrollment in Medicaid Managed Care enrollment increased so that almost all participants were enrolled in the post-period. Health Home enrollment stayed relatively high in both periods.

HCR CAPITAL PROJECTS: VOA CRESTON AVENUE.

- **Program Description:** This is an HCR project supporting 21 units of permanent supportive housing in the Bronx, NY.
- **Population Served:** This program serves chronically homeless single adults who suffer from a serious and persistent mental illness or who are diagnosed as mentally ill and chemically addicted.
- **Earliest MRT-SH Enrollment Date:** December 2014
- **Enrollment:** 19 included in analysis; 18 had data from two years post enrollment available. Given this small group, inferential statistics were not performed.
- **Comorbidities:** Enrollees are most likely to have a serious mental illness (SMI), substance use disorder (SUD), or another chronic condition.
- **Duration in MRT-SH:** Almost all participants have been enrolled for at least two years.
- **Care Coordination:** Enrollment rates were similar in the pre- and post-periods. Almost all clients were enrolled in Medicaid Managed Care in all timeframes examined.

HCR OTHER PROJECTS: ACCESS TO HOME PROGRAM.

- **Program Description:** The Access to Home program provides grants to eligible applicants to make accessibility modifications to existing owner-occupied or rental dwelling units occupied by persons with disabilities that also receive Medicaid assistance.
- **Population Served:** This program serves persons who are on Medicaid and are physically disabled or have substantial difficulty with activities of daily living (ADLs).
- **Earliest MRT-SH Enrollment Date:** February 2016
- **Enrollment:** 21 included in analysis; none had data from two years post enrollment available. Given this small group, inferential statistics were not performed.
- **Comorbidities:** Enrollees were most likely to have another chronic condition.
- **Care Coordination:** Almost half of participants were enrolled in Medicaid Managed Care; no participants were enrolled in Health Homes in the pre- or post-periods.

HOMELESS HOUSING AND ASSISTANCE PROGRAM (HHAP) CAPITAL PROJECTS.

Program Descriptions:

- Opportunities for Broome's 86 Carroll St. is a capital project supporting 22 units of permanent SH in Binghamton, NY.
- Providence Housing Development's Son House is a capital project supporting 21 units of permanent SH in Rochester, NY.
- Finger Lakes United Cerebral Palsy's Happiness House is a capital project supporting a 20-unit building in Geneva, NY (Ontario County) which includes 7 MRT units.
- The Polish Community Center's Hope Gardens is a capital project supporting 20 units of permanent SH in Buffalo, NY.
- Evergreen Loft Apartments is a capital project supporting 28 units of permanent SH in Buffalo, NY.

Populations Served:

- Opportunities for Broome serves chronically homeless single adults who are recovering from drug and/or alcohol abuse or have a mental illness or other disability.
- Providence Housing Development's Son House serves chronically homeless single adults who have a documented disability.
- Finger Lakes United Cerebral Palsy's Happiness House serves single individuals with developmental disabilities, physical disabilities, or traumatic brain injury who would otherwise be homeless or placed in a nursing home.
- The Polish Community Center's Hope Gardens serves chronically homeless single women with special needs such as mental illness, drug and alcohol abuse, or a history of domestic violence or physical or sexual assault.
- Evergreen Loft Apartments serves homeless adults who are living with HIV/AIDS, have a disabling health condition, and/or are physically disabled.

Earliest MRT-SH Enrollment Dates:

- Opportunities for Broome's 86 Carroll St. – December 2014
- Providence Housing Development's Son House – December 2013

- Finger Lakes United Cerebral Palsy's Happiness House – September 2014
- The Polish Community Center's Hope Gardens – December 2015
- Evergreen Loft Apartments – August 2016
- **Enrollment:** 86 included in analysis; 49 had data from two years post enrollment available.
- **Comorbidities:** Enrollees are most likely to have a serious mental illness (SMI), substance use disorder (SUD), or another chronic condition. About one-quarter of enrollees had claims from the past year with primary diagnoses of at least three of the four conditions.
- **Duration in MRT-SH:** Most participants had been enrolled for at least one year; only a small group had been enrolled for twelve or fewer months.
- **Care Coordination:** The distribution of enrollees in Medicaid Managed Care enrollment stayed the same between periods. For the clients who have two years of post-enrollment data available, there was a large decrease in Health Home enrollment in the second post-enrollment period.

OFFICE OF TEMPORARY AND DISABILITY ASSISTANCE – NYC DISABILITY HOUSING SUBSIDY PROGRAM/EVICTION PREVENTION FOR VULNERABLE ADULTS (EPVA).

- **Program Description:** The program provides rental subsidies for elderly or disabled individuals who are homeless or at risk of eviction. It was created to maintain the housing of formerly homeless recipients of New York City's Advantage Rental Subsidy program when the Advantage program ended. Many recipients were already housed during the pre-period; the program's goal was to prevent a return to homelessness.
- **Population Served:** Recipients of SSI or Social Security retirement or disability benefits who are part of a household with no other employable adults, and are homeless or at risk of homelessness.
- **Earliest MRT-SH Enrollment Date:** August 2013
- **Enrollment:** 213 included in analysis; 188 had data from two years post enrollment available.
- **Comorbidities:** Enrollees are most likely to have a serious mental illness (SMI) or another chronic condition.
- **Duration in MRT-SH:** About three-quarters of participants had been in the program for more than 24 months; only a small group of participants had short enrollment periods.
- **Care Coordination:** The rates of care coordination enrollment remained essentially the same for enrollees in the pre- and post-periods, with a very slight increase in Health Home enrollment in the second post-enrollment period for clients with two years of post-enrollment data available.

OFFICE OF TEMPORARY AND DISABILITY ASSISTANCE – HOMELESS SENIOR AND DISABLED PLACEMENT PILOT (HSDPP).

- **Program Description:** The Homeless Senior and Disabled Placement Pilot provides rental subsidies for Health Home-eligible SSI recipients living in New York City homeless shelters.
- **Population Served:** Participants are Health Home-eligible SSI recipients living in New York City homeless shelters.
- **Earliest MRT-SH Enrollment Date:** May 2014
- **Enrollment:** 199 included in analysis; 65 had data available from two years post enrollment.
- **Comorbidities:** Enrollees are most likely to have at least one "other" major chronic condition.
- **Duration in MRT-SH:** Almost all participants have been in the program for at least one year.
- **Care Coordination:** The distribution of types of care coordination remained essentially the same for enrollees in Medicaid Managed Care and with dual eligibility in the pre- and post-periods, but Health Homes enrollment decreased in the post-period.

OFFICE OF MENTAL HEALTH – RENTAL SUBSIDIES: BROOKLYN (RSB).

- **Program Description:** The program funds rental subsidies and housing case management in scattered-site SH for Brooklyn residents diagnosed with a serious mental illness.
- **Population Served:** Single, Health Home eligible adults with a serious mental illness who either live in Brooklyn, are referred by a Brooklyn-based Health Home, reside in the New York State Kingsborough Psychiatric Center or an OMH-operated residential program, or are discharged from a Brooklyn Article 28 or Article 31 hospital. Individuals must also

be unstably housed or be individuals for whom housing would assist in a hospital diversion.

- **Program Start Date:** February 2013
- **Enrollment:** 366 included in analysis; 292 had data available for two years post enrollment.
- **Comorbidities:** In addition to having an SMI, many enrollees analyzed have an “other” chronic condition.
- **Duration in MRT-SH:** Three-quarters of participants have been in the program for at least two years.
- **Care Coordination:** While Medicaid Managed Care enrollment and dual eligibility stayed the same between periods, Health Home enrollment rose in the post-period.

OFFICE OF MENTAL HEALTH – RENTAL SUBSIDIES: STATEWIDE (RSS).

- **Program Description:** The program funds rental subsidies and housing case management in scattered-site SH for individuals diagnosed with serious mental illness.
- **Population Served:** Single, Health Home-eligible adults with a serious mental illness who are either referred by a Health Home, are a resident in a NYS OMH Psychiatric Center or OMH-operated residential program, or are discharged from an Article 28 or Article 31 hospital. Individuals must also be unstably housed or be individuals for whom housing would assist in a hospital diversion.
- **Program Start Date:** January 2013
- **Enrollment:** 467 included in analysis; 362 had data from two years post enrollment available.
- **Comorbidities:** In addition to SMI, a large proportion of those enrollees analyzed have a substance use disorder (SUD) or an “other” chronic medical condition.
- **Duration in MRT-SH:** A majority of enrollees analyzed have been in the program for 12 months or more, with a substantial group enrolled for at least two years.
- **Care Coordination:** While Medicaid Managed Care enrollment and dual eligibility stayed the same between periods, Health Home enrollment rose in the post-period.

OFFICE OF ALCOHOL AND SUBSTANCE ABUSE SERVICES – RENTAL SUBSIDIES AND SUPPORTS.

- **Program Description:** The program provides rental subsidies on a Housing First basis, intensive case management, and job development and counseling services, and also funds clinical supervision of direct service staff.
- **Population Served:** Single adults with a substance use disorder who are homeless, unstably housed, or at risk of homelessness; who are Medicaid eligible; and who meet frequent utilizer criteria (had at least two inpatient hospitalizations, five emergency room visits, or one inpatient hospitalization and four emergency room visits in the previous 12 months).
- **Program Start Date:** April 2013
- **Enrollment:** 442 included in analysis; 313 had data from two years post enrollment available.
- **Comorbidities:** Most of the enrollees analyzed have Medicaid claims reflecting an SUD, with large percentages having an SMI or an “other” chronic condition. Over one-third of enrollees have diagnoses in 3 or more of the categories analyzed. While a history of SUD was a requirement for eligibility in this program, not all participants had a claim in their pre-period year with SUD as a primary diagnosis; as such, the incidence does not quite reach 100%.
- **Duration in MRT-SH:** A majority of enrollees analyzed have been in the program for 12 months or more, with a substantial group enrolled for at least two years.
- **Care Coordination:** While Medicaid Managed Care enrollment and dual eligibility were similar between periods, Health Homes enrollment increased in the post-period.

OFFICE FOR PEOPLE WITH DEVELOPMENTAL DISABILITIES: EXPANSION OF EXISTING RENTAL/SERVICES (OPWDD).

- **Program Description:** The program provides rental subsidies and services to individuals with intellectual or developmental disabilities who move from certified residential settings with continuous supervision (supervised model residences) to more independent, less restrictive housing (supportive model certified residences or uncertified private apartments with support services such as community habilitation and personal care). A subset of program participants individually tailors their service structures through OPWDD’s Self-Direction program. The OPWDD Expansion of Existing Rental/Services is intended to help the state achieve its Americans with Disabilities Act (ADA)/

Olmstead Implementation Plan goals in addition to reducing Medicaid spending.

- **Population Served:** Individuals with developmental disabilities who expressed interest in more independent living or who were referred by family or provider agencies.
- **Program Start Date:** May 2013
- **Enrollment:** 59 included in analysis; 49 had data from two years post enrollment available.
- **Comorbidities:** Enrollees are most likely to have a serious mental illness (SMI) or some other chronic condition.
- **Duration in MRT-SH:** Over 80% of clients have been enrolled at least a year and a half.
- **Care Coordination:** Care coordination enrollment was similar in the pre- and post-periods examined. Medicaid Managed Care and Health Home enrollment were consistently low; over half of clients had dual eligibility.

OHIP: HEALTH HOMES SUPPORTIVE HOUSING PILOT (HHSHP).

- **Program Description:** This program offers rental subsidies and services to homeless or unstably housed Medicaid members enrolled in New York State's Health Home program.
- **Population Served:** Homeless or unstably housed Health Home members.
- **Program Start Date:** December 2014
- **Enrollment:** 319 included in analysis; 149 had data from two years post enrollment available.
- **Comorbidities:** A majority of the enrollees analyzed have a serious mental illness (SMI), substance use disorder (SUD), or an "other" chronic condition. Over one-quarter of clients have claims for at least three of these diagnosis categories in the past year.
- **Duration in MRT-SH:** Over half of enrollees have been in the program for more than 12 months; about one-third have been enrolled for between six and twelve months.
- **Care Coordination:** Almost all participants were enrolled in Medicaid Managed Care and Health Homes in both the pre- and post-periods. Few enrollees were dually eligible in either period.

OFFICE OF HEALTH INSURANCE PROGRAMS – NURSING HOME TO INDEPENDENT LIVING (TRANSITIONS).

- **Program Description:** The Nursing Home to Independent Living (NHIL) program provides an array of services intended to establish independence, wellness, and self-management, including rental subsidies, community transition services, environmental modifications, tenancy sustaining services, and preventive health services.
- **Population Served:** Participants are elderly or physically disabled; in a nursing home or eligible for a nursing facility level of care; and homeless or unstably housed. The 33 participants included in this analysis transitioned out of a nursing home with program assistance.
- **Program Start Date:** January 2015
- **Enrollment:** 33 included in analysis; only 4 had data from two years post enrollment available, and so analyses on second-year data were not performed.
- **Comorbidities:** Enrollees are most likely to have a serious mental illness (SMI) or an "other" chronic condition.
- **Duration in MRT-SH:** The majority of enrollees have been in the program for more than one year.
- **Care Coordination:** Medicaid Managed Care enrollment increased notably in the post-period to include almost all participants. Dual eligibility remained high in both periods, encompassing over half the group. In contrast, Health Home enrollment remained low in both periods examined.

OFFICE OF HEALTH INSURANCE PROGRAMS – SENIOR SUPPORTIVE HOUSING SERVICES (SSHS).

- **Program Description:** Senior Supportive Housing Services (SSHS) provided capital assistance and supportive services within existing senior housing communities. Capital funding was used to increase accessibility features within existing units. Supportive services were intended to sustain the residents' ability to live independently in the community, and to avoid unwanted institutional care.
- **Population Served:** Providers performed in-reach within existing HUD as well as other senior housing communities to identify current residents who were Medicaid eligible and at risk of nursing home placement. They also performed outreach to identify low-income, Medicaid eligible seniors who were homeless and at risk of nursing home placement, and individuals transitioning out of nursing homes into senior housing.

- **Program Start Date:** December 2014
- **Enrollment:** 377 included in analysis; 230 had data from two years post enrollment available.
- **Comorbidities:** Enrollees were most likely to have an “other” chronic condition.
- **Duration in MRT-SH:** Over half of participants had been enrolled at least one year.
- **Care Coordination:** While the Health Home enrollment and dual eligibility stayed the same between periods, there was some increase in Medicaid Managed Care enrollment in the post-period for those enrollees analyzed.

OLMSTEAD HOUSING SUBSIDY PROGRAM.

Olmstead had previously been excluded from such pre-post analyses as they did not have any clients enrolled by September 2016; however, given the extended timeline of the project, a sufficient client population with a lengthy enough post-period was available at this point for further analyses. However, as no further client rosters were available, descriptions of enrollment duration could not be calculated.

- **Program Description:** Olmstead Housing Subsidy is a statewide rental subsidy and transitional housing support service program for Medicaid members who reside in a skilled nursing facility and have the ability to live safely in the community. The program helps address the needs of eligible Medicaid members in transitioning from skilled nursing facilities and obtaining housing in the community.
- **Population Served:** Individuals who are enrolled in Medicaid and have spent one hundred and twenty (120) consecutive days in a skilled nursing facility.
- **Program Start Date:** December 2016.
- **Enrollment:** 88 included in analysis; 68 had data from two years post enrollment available.
- **Comorbidities:** Included participants were most likely to have an “other” chronic condition or a serious mental illness.
- **Care Coordination:** Care Coordination enrollment was relatively high among Olmstead clients: over half were enrolled in Medicaid Managed Care in the pre-period (a rate which rose in the first post-period year); about a quarter were enrolled in Health Homes; and almost half were dual Medicaid-Medicare eligible.

Appendix B: Summary Characteristics of MRT Supportive Housing Projects Included in Pre-Post Analyses, with Enrollees to Date

Program	Earliest Enrollment Date	Number of Projects	Number of People Served, to date	Number of People included in Pre / Post Year 1 Post Analysis ⁴⁴	Number of People included in Pre / Post Year 2 Post Analysis ⁴⁵	# with 1 or more month in Medicaid Managed Care in Pre / Post Year 1 Period	# with 1 more month in Health Home in Pre / Post Year 1 Period
All Programs⁴⁶		144	6,187	3,649	2,478	2,573/2,673	2,015/2,209
Department Of Health – AIDS Institute							
AIDS Institute Services Only [†]	July 2012	11	881	624	529	597/632	576/604
AIDS Institute Services & Subsidies	October 2012	13	439	149	84	300/267	282/197
AIDS Institute Pilot [†]	December 2014	1	35	17	11	30/35	35/34
Homes and Community Renewal (HCR): Capital							
East 99th Street	November 2014	1	192	150	130	105/128	47/53
3361 Third Ave	September 2015	1	38	34	5	32/30	28/27
Boston Road	January 2016	1	97	76	0	83/83	37/45
Norwood Terrace	August 2016	1	59	29	0	43/46	38/33
VOA Creston Ave	December 2014	1	22	19	18	22/22	6/4
Expand the Access to Home Program	February 2016	10	94	21	0	44/33	7/1
Office of Temporary and Disability Assistance (Homeless Housing and Assistance Program Capital)							
All HHAP Capital Projs	December 2013 – August 2016	5	145	86	49	101/112	51/51
Office of Temporary and Disability Assistance (Other)							
Eviction Prevention for Vulnerable Adults	August 2013	1	283	213	188	197/193	42/37
Homeless Senior and Disabled Placement Program	May 2014	1	234	199	65	157/161	150/100

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⁴⁴ Full cohort, pre-enrollment year versus first year post-enrollment

⁴⁵ Subgroup, pre-enrollment year versus second year post-enrollment, for those participants a second year of post-enrollment data available

⁴⁶ † = Program has ended

Program	Earliest Enrollment Date	Number of Projects	Number of People Served, to date	Number of People included in Pre / Post Year 1 Post Analysis	Number of People included in Pre / Post Year 2 Post Analysis	# with 1 or more month in Medicaid Managed Care in Pre / Post Year 1 Period	# with 1 more month in Health Home in Pre / Post Year 1 Period
Office of Mental Health							
Rental Subsidies - Brooklyn	February 2013	8	472	336	292	318/315	297/352
Rental Subsidies - Statewide	January 2013	38	768	467	362	492/497	479/507
Office of Alcoholism and Substance Abuse Services							
OASAS Rental Subsidies Statewide	April 2013	18	690	441	313	561/585	294/375
Office for People With Developmental Disabilities							
OPWDD Rental Subsidies Statewide	May 2013	11	72	59	49	0/4	0/0
Department Of Health – Office of Health Insurance Programs							
Health Homes Supportive Housing Program	December 2014	11	566	319	149	424/437	402/379
Nursing Home to Independent Living (Transitions)	January 2015	2	347	33	4	19/30	6/4
Senior Supportive Housing Services ¹	December 2014	9	634	377	230	178/240	44/51

Appendix C:

Summary Characteristics of MRT Supportive Housing Projects Included in Treatment vs. Comparison Analyses

Program	Population Served	Number of People included in Pre-Post Analyses	Number of People included in Treatment vs. Comparison Analyses
All Potential Clients at Included MRT-SH Programs		2,348⁴⁷	2,037
Department Of Health – AIDS Institute			
AIDS Institute Services & Subsidies	HIV-positive adults living outside NYC, often referred by Health Homes	149	117
AIDS Institute Pilot	Homeless and unstably housed Health Home-eligible individuals in New York City who were diagnosed with HIV but did not qualify for other existing programs	17	13
Homes and Community Renewal (HCR): Capital			
East 99th Street	Physically disabled adults who did not qualify for existing New York City SH programs	150	107
3361 Third Ave		34	27
Boston Road	Chronically homeless single adults who suffer from a serious and persistent mental illness or who are diagnosed as mentally ill and chemically addicted	76	58
Norwood Terrace		29	28
VOA Creston Avenue		19	17
Office of Temporary and Disability Assistance (Homeless Housing and Assistance Program Capital)			
Opportunities for Broome	Chronically homeless single adults who are recovering from drug and/or alcohol abuse or have a mental illness or other disability	14	9
Son House	Chronically homeless single adults who have a documented disability	26	23
Hope Gardens	Chronically homeless single women with special needs such as mental illness, drug and alcohol abuse, or a history of domestic violence or physical or sexual assault	17	13
Evergreen Loft Apartments	Homeless adults who are living with HIV/AIDS, have a disabling health condition, and/or are physically disabled	22	12
Office of Temporary and Disability Assistance (Other)			
Homeless Senior and Disabled Placement Program	Health Home-eligible SSI recipients living in New York City homeless shelters	199	146

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⁴⁷ Cost 2 Volume 1 report also included individuals at several programs excluded from comparison group analyses: AIDS Institute–Services Only; HCR Capital–Expand the Access to Homes program; HHAP Capital–Happiness House; OTDA–Eviction Prevention for Vulnerable Adults; OPWDD–Rental Subsidies Statewide; and OHIP–Senior Supportive Housing Services; for a total of 3,649 clients.

Program	Population Served	Number of People included in Pre-Post Analyses	Number of People included in Treatment vs. Comparison Analyses
Office of Mental Health			
Rental Subsidies - Brooklyn	Single, Health Home eligible adults with a serious mental illness who either live in Brooklyn, are referred by a Brooklyn-based Health Home, reside in an OMH-operated residential program, or are discharged from an Article 28 or Article 31 hospital. Individuals must also be unstably housed or be individuals for whom housing would assist in a hospital diversion	336	290
Rental Subsidies - Statewide	Single, Health Home-eligible adults with a serious mental illness who are either referred by a Health Home, reside in an OMH Psychiatric Center or OMH-operated residential program, or are discharged from an Article 28 or Article 31 hospital. Individuals must also be unstably housed or be individuals for whom housing would assist in a hospital diversion	467	415
Office of Alcoholism and Substance Abuse Services			
OASAS Rental Subsidies Statewide	Single adults with a substance use disorder who are homeless, unstably housed, or at risk of homelessness; are Medicaid eligible; and meet frequent utilizer criteria	441	436
Department Of Health – Office of Health Insurance Programs			
Health Homes Supportive Housing Program	Homeless or unstably housed Health Home members	319	294
Nursing Home to Independent Living (Transitions)	Individuals who are elderly or physically disabled, homeless or unstably housed, and have transitioned out of a nursing home with program assistance	33	32
Comparison Clients			
No MRT-SH Enrollment	See Comparison Group report for client selection methodology, client characteristics.	0	2,037

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