New York/New York III Supportive Housing Evaluation

Interim Utilization and Cost Analysis

A report from the New York City Department of Health and Mental Hygiene in collaboration with the New York City Human Resources Administration and the New York State Office of Mental Health

NYC

Contents

Executive Summary

The New York/New York III (NY/NY III) Supportive Housing Agreement is a commitment by State and City governments to create 9,000 new supportive housing units serving nine populations in New York City (NYC). This interim report on the NY/NY III evaluation compares the cost and utilization of government-subsidized health care, social services, and jail among eligible applicants who were placed to those among eligible applicants who were not placed in NY/NY III supportive housing from 2007 through 2009. Savings were found in a number of areas, but the results presented here are of an interim nature since the program continues to be implemented and additional analyses are planned. All 9,000 units will not be fully operational until at least 2016, and this analysis includes eligible tenants only from the first three years of the program, and with only one year of follow-up time.

Populations served by NY/NY III include individuals and heads of families who are chronically homeless or at risk of homelessness, and who have serious mental illness, substance use disorders, disabling medical conditions, or HIV/AIDS, or who are aging out of foster care. Applicants apply to the New York City Human Resources Administration for placement in housing, and eligible applicants are placed in housing through a process overseen by government agencies and housing providers.

The results in this report are expressed as the difference in costs and utilization between NY/NY III tenants and unplaced eligible applicants during the year after moving into NY/NY III housing or becoming eligible for the program, respectively. Statistical matching helped to control for differences between the placed tenants and the comparison groups at baseline.

- *Days in Institutions*: Placed NY/NY III tenants spent fewer days in jail and homeless shelters than unplaced eligible applicants across almost all of the populations targeted by the program. Placed tenants who had been in New York State-operated psychiatric facilities; who were chronically homeless single adults with serious mental illness (SMI) or who were dually diagnosed with mental illness and a substance use disorder (SUD); and who were young adults aging out of foster care spent fewer days in State-operated psychiatric inpatient facilities than unplaced eligible applicants. When NY/NY III populations were combined, placed tenants spent fewer days in jails, shelters, and State-operated psychiatric facilities than unplaced eligible applicants.
- *Shelter Costs*: There were savings in the cost of shelter use for chronically homeless single adults with SMI or who were dually diagnosed with a mental illness and an SUD ($9,916 less for placed versus unplaced); heads of families with an SUD, a disabling medical condition, or HIV/AIDS ($18,193); heads of families with SMI or who were dually diagnosed with mental illness and an SUD ($18,280); single adults with an SUD ($8,576) or with an SUD and had received substance use treatment ($4,174); and young adults aging out of foster care ($626). When NY/NY III populations were combined, there were savings in the cost of shelters for single adults ($5,427) and shelters for families ($1,492).
- *Jail Costs*: There were savings in jail costs for chronically homeless single adults with SMI or who were dually diagnosed with mental illness and an SUD ($1,776); single adults who had been in State-operated psychiatric facilities ($1,048); heads of families with an SUD, a disabling medical condition,

or HIV/AIDS ($1,576); single adults with an SUD ($1,348) or with an SUD and had received substance use treatment ($1,784); and young adults aging out of foster care ($878). When NY/NY III populations were combined, there were savings in the cost of jail ($1,298).

- *Cash Assistance*: There were savings in cash assistance costs for heads of families with an SUD, a disabling medical condition, or HIV/AIDS ($7,061) and heads of families with SMI or who were dually diagnosed with mental illness and an SUD ($10,111).
- *Health Care Utilization and Costs*:
  - NY/NY III tenants in combined populations were less likely to have medical services reimbursed by Medicaid for several types of avoidable health care events compared with unplaced eligible applicants, including inpatient hospitalization and emergency department visits related to injury, psychiatric treatment, and substance use.
  - There were overall Medicaid savings for single adults with an SUD ($8,710), and young adults aging out of foster care ($4,628).
  - There were Medicaid savings among combined NY/NY III populations for inpatient and emergency department services, as well as in three populations for inpatient services and four populations for emergency department services.
  - There were Medicaid savings in five populations for physical illness services, in three populations for mental illness services, and in one population for substance use services.
  - There were large savings in the use of State-operated inpatient psychiatric facilities among single adults with serious mental illness who had been patients in State-operated psychiatric facilities ($105,987). There were also savings in the use of State-operated psychiatric facilities among chronically homeless single adults with serious mental illness or mental illness and an SUD ($1,424) and among young adults aging out of foster care ($4,694).
- *Net Costs*: When NY/NY III service and operating costs were included, there were net savings for single adults coming from State-operated psychiatric facilities ($77,425). In four other populations, the cost of the program was offset by savings in services and benefits not used by NY/NY III tenants. In two populations, net costs were greater for placed than unplaced individuals. When NY/NY III populations were combined, there were net savings of $10,100.

Limitations and strengths

These cost analyses do not include effects on health and social outcomes that are not easily measured or monetized, such as improved health status, employment, or housing stability. In addition, this interim report presents findings from only one year of follow-up time and in some NY/NY III populations for small numbers of tenants. Also, medical services not

NY/NY III populations described in this report

Population A	Homeless and with serious mental illness (SMI) or mental illness and a substance use disorder (SUD)
Population B	Had been in State-operated psychiatric facilities and at risk of homelessness
Population E	Homeless and have an SUD
Population F	Homeless and treated for an SUD
Population D	Heads of family have SMI or mental illness and an SUD
Population G	Heads of family have an SUD, disabling medical condition, or HIV/AIDS
Population I	Young adults leaving foster care and at risk of homelessness

reimbursed by Medicaid are not included in the analysis, nor are service types or service-specific costs for services covered by Medicaid managed care. Nevertheless, this analysis covers several important areas of services, benefits, and incarceration, providing a broad picture of public costs incurred by program applicants who applied for and were served by NY/NY III in the early years of the program. In addition, rigorous methodology was used to control for differences between placed and unplaced NY/NY III applicants and to account for time trends and the regression-to-the-mean phenomenon. Finally, the evaluation includes several populations that have seldom been included in supportive housing, which expands our understanding of the usefulness of this type of solution to homelessness.

Conclusions

During the early years of the NY/NY III program, tenants had savings in jail, shelter, State psychiatric facilities, and Medicaid utilization and costs relative to people eligible but not placed in the program. When NY/NY III service and operating costs were included, there were net savings. Specific populations varied in the types of public services for which they had savings, as well as their net costs. Multiple populations of tenants had utilization and cost savings in jail and shelter, and family populations had savings in cash assistance costs. Tenants in some populations also had Medicaid and State psychiatric center savings. When NY/NY III service and operating costs were included, there were net savings for one population. In four other populations, the cost of the program was offset by savings in services and benefits not used by NY/NY III tenants. In two populations, net costs were greater for placed than unplaced individuals. Following this interim report showing savings across multiple domains, future reports will include longer follow-up time and greater numbers of NY/NY III tenants, as well as analyses of housing stability, health care utilization (incorporating data from hospital and emergency department utilization from events not covered by Medicaid), and high utilizers of Medicaid.

Background

The NY/NY III Supportive Housing Agreement is a commitment by State and City governments to create 9,000 new supportive housing units serving nine populations in NYC (see Appendix A for details). From February 2007 through December 2010, 3,993 individuals were placed in NY/NY III housing.[1] Additional units of supportive housing will continue to be made available until at least 2016, and, therefore, the results in this report are considered to be of an interim nature while the program continues to be implemented.

An evaluation of the NY/NY III program was included in the NY/NY III agreement. The evaluation has entailed linking administrative data across multiple services and benefits domains, reflecting a range of possible program effects, including on housing stability, social welfare, incarceration, and health. This report synthesizes findings from the cost analysis of the initial years of the program.

1 HRA Customized Assistance Services NY/NY III Agreement Quarterly Progress Report through December 31, 2010, February 2011.

Methodology Overview

This report focuses on seven populations housed in NY/NY III as of December 2009: individuals with SMI or mental illness and an SUD; individuals who had been in State-operated psychiatric facilities; individuals who had an SUD; individuals who had been treated for an SUD; heads of families who had SMI or mental illness and an SUD; heads of families who had an SUD, a disabling medical condition, or HIV/AIDS; and young adults leaving foster care and at risk of homelessness. Applicants apply for NY/NY III housing through the NYC Human Resources Administration. Several government agencies provide lists of eligible applicants to housing providers, who then select tenants. Eligible applicants remain eligible for six months after applying, and if not housed, must re-apply.

Table 1 summarizes the number of individuals in each population with at least one year of follow-up time that was included in the evaluation cohort.[2] Table 11 in Appendix D illustrates some differences between placed and unplaced eligible applicants.

Criteria for inclusion in the evaluation cohort were:

- "Placed" individuals must have lived in NY/NY III housing for at least 365 days to be included in the analysis of individuals with one year of follow-up time.
- "Unplaced" individuals were those who were not placed in NY/NY III for more than seven days and did not reside for more than seven days in any other government subsidized housing tracked by the evaluation after they became eligible for NY/NY III, including housing operated by the NYC Department of Health and Mental Hygiene (DOHMH) and the NYC Department of Homeless Services (DHS), HIV/AIDS Services Administration (HASA) housing, Housing Opportunities for Persons with AIDS (HOPWA), and New York State (NYS) Office of Mental Health (OMH) housing. Individuals residing in homeless shelters were not removed from the comparison group. The comparison group excluded people who died during the one-year follow-up period (mortality data were available only through 2009).

Table 1: Number of NY/NY III placed and unplaced eligible applicants who had at least one year of follow-up time (eligible or placed in NY/NY III 2007-2009)

	Population A Homeless & with SMI or mental illness & an SUD	**Population B** Had been in State-operated psychiatric facilities & at risk of homelessness	**Population E** Homeless & have an SUD	**Population F** Homeless & treated for an SUD	**Population D** Heads of family have SMI or mental illness & an SUD	**Population G** Heads of family have an SUD, disabling medical condition, or HIV/AIDS	**Population I** Young adults leaving foster care & at risk of homeless-ness	**Combined NY/NY III Populations** (A, B, E, F, D, G, and I)	**Population H** Have HIV/AIDS & SMI or an SUD*	**Population B** Transitional†
Placed	431	26	456	509	41	113	122	1,695	320	136
Unplaced	1,366	906	335	782	111	131	299	3,700	341	906

* *In Population H placed individuals were included in analysis if they had 7 days of NY/NY III housing or more. Unplaced individuals were included in analyses even if they were housed in non-NY/NY III housing, since very few individuals in Population H did not get housed during the follow-up period.*

† *"Transitional" tenants were initially considered eligible for Population B housing, but rather than being placed in NY/NY III units, were placed in community care/ transitional housing residences.*

Data sources: NYC Department of Homeless Services (DHS), NYC Department of Correction (DOC), NYC Department of Health and Mental Hygiene (DOHMH), NYC Human Resources Administration (HRA), and New York State (NYS) Office of Mental Health (OMH).

2 See Appendix A Table 9 for the number of individuals who were placed in NY/NY III but did not spend 12 uninterrupted months in NY/NY III.

Nearly all individuals in the population with HIV/AIDS and SMI or an SUD were placed in some housing tracked by the evaluation, whether it was NY/NY III or other housing.[3] Therefore, for this population we compared individuals with at least 7 days of NY/NY III housing to those who were not housed in NY/NY III, but who may have been housed elsewhere. Findings for this population can be found in Appendix B.

Population B "transitional tenants" were individuals who had been in State-operated psychiatric facilities and were considered eligible for NY/NY III housing but rather than being placed in NY/NY III units were placed in community care or transitional housing residences. The same comparison group of unplaced Population B eligible applicants was used for both Population B placed groups. Findings for the transitional B population can be found in Appendix C.

Finally, although NY/NY III currently houses young adults who have SMI being treated in State psychiatric facilities and who are at risk of homelessness, housing for this population was not available at the time the data for this report were analyzed.

For those who were placed in NY/NY III housing, data were analyzed for the two years prior to the earliest placement and one year after placement. For those who were eligible but not placed, data were analyzed for two years before and one year after the earliest NY/NY III eligibility determination. This analysis includes those who moved into housing or first became eligible from 2007 through 2009. Future reports, when more time has elapsed, will present additional data on individuals with at least two years of follow-up time.

Data sources included Medicaid, food stamps, and cash assistance usage; days in inpatient NYS-operated psychiatric facilities, NYC jails, NYC DHS family shelters, and NYC DHS single adult shelters; and other government-sponsored non-NY/NY III housing.

NY/NY III housing services and operating costs were estimated by using the Requests for Proposals submitted by the State and City governments to housing providers (see Appendix A for details), and then adjusted for inflation to 2011 dollars. Costs of Medicaid, food stamps, and cash assistance were the exact dollar amounts spent by government in claims and benefits, adjusted to 2011 dollars. State psychiatric facility costs were calculated by using an estimated daily cost for an inpatient stay and adjusting it to 2011 dollars. Jail costs were derived from the average cost per inmate reported in the Mayor's Management Reports[4] and by estimates by DOHMH of the cost of medical, mental health, transitional, and discharge planning services, and adjusted to 2011 dollars. Shelter costs were estimated from the average per-day per-person cost in the Mayor's Management Reports, adjusted to 2011 dollars.

Propensity score matching, a standard approach for comparing those exposed to a treatment and those who were not, was used to account for differences in baseline characteristics between individuals placed and not placed in NY/NY III housing, thus making comparisons between the two groups more meaningful. Propensity scores were created using variables in the NY/NY III application, as well as utilization of jails and services before NY/NY III move-in or eligibility. Optimal Full Matching was then used to construct sets of individuals who, based on their propensity scores, had similar likelihoods of being placed versus not placed in NY/NY III. Individuals were placed in a set together only if their NY/NY III earliest eligibility or move-in dates were within six months.

3 Local Law #49 stipulates that individuals who are living with AIDS or have a diagnosis of symptomatic HIV illness and meet the criteria for public assistance defined by HRA are eligible for an enhanced shelter allowance. In addition, individuals living with AIDS or who have a diagnosis of symptomatic HIV and who are homeless are eligible to be immediately placed in transitional or emergency housing, and an application for NY/NY III and other housing is filed. Therefore, all NY/NY III eligible applicants in the population with HIV/AIDS and mental illness or substance use also applied for other housing and had accessibility to other housing or an enhanced shelter allowance.

4 Mayor's Management Reports. Mayor's Office of Operations web site. http://www.nyc.gov/html/ops/html/data/mmr_archives.shtml (accessed 5/14/2012).

See Appendix D for an illustration of differences between placed and unplaced individuals before versus after propensity score matching.

Once sets of individuals with similar likelihoods of being placed in housing were established, the average costs and health care utilization for NY/NY III tenants were compared with those for individuals who were eligible but not placed. The costs were calculated by computing the mean within each matched set of placed and unplaced NY/NY III eligible applicants, followed by computing the weighted mean, which takes into account the size of each set relative to the whole group of individuals in the analytic cohort. Bootstrapping, which helps to account for skewed cost data, was used to create 95% confidence intervals that enabled the assessment of statistically significant differences between weighted means. Mantel-Haenszel odds ratios were used to compute some of the health care utilization measures, incorporating the matched sets from propensity score matching. See Appendix D for more details.

Only statistically significant differences are discussed in this report. Sometimes differences of greater magnitude are not statistically significant, while differences of smaller magnitude are. Differences of greater magnitude that are not statistically significant likely have greater individual-level variability than differences of smaller magnitude that are statistically significant.

Health Care Utilization

We measured health care utilization by distinguishing between preventive and avoidable health care events covered by Medicaid. Preventive utilization of medical care aims to avert declining health, which can result in a rise in health care utilization in the future. Preventive medical care is high-quality outpatient care that, guided by best practices, can reduce the likelihood of avoidable health care utilization. Avoidable health care events are those that could have been avoided had the patient had high-quality outpatient care (see Appendix D for details).[5] NY/NY III tenants[6] were less likely than unplaced eligible applicants to have had several types of avoidable health care events (Table 2). For example, NY/NY III placement decreased the odds of having at least one hospitalization (odds ratio [OR] = 0.66). NY/NY III placement was also associated with lower odds of having at least one emergency department

What is an odds ratio?

An odds ratio compares the odds of one group experiencing something versus another. In this report, odds ratios less than one indicate that the likelihood of experiencing something is smaller for placed individuals than for unplaced individuals. Odds ratios greater than one indicate that the likelihood of experiencing something is greater for placed individuals than for unplaced individuals. The confidence intervals surrounding each odds ratio represent the likelihood that the difference between placed and unplaced NY/NY III applicants is not due to chance. Confidence intervals that include one indicate that the difference between placed and unplaced individuals represented by the odds ratio may be due to chance. Confidence intervals that do not include one indicate that there is a probability of only 5% that the difference between placed and unplaced individuals is due to chance.

5 Kruzikas DT, Jiang HJ, Remus D, Barrett ML, Coffey RM, Andrews R. *Preventable Hospitalizations: A Window Into Primary and Preventative Care, 2000.* Agency for Healthcare Research and Quality, 2004. HCUP Fact Book No. 5; AHRQ Publication No. 04-0056.

6 When this report refers to NY/NY III populations combined, the analysis excludes Population H (single adults with HIV/AIDS and SMI or an SUD) and Population B Transitional (individuals eligible for NY/NY III and placed in community care or transitional housing). See the Methodology Overview (page 5) for an explanation of why those populations are excluded in the analysis.

Table 2: Measures of avoidable health care utilization among NY/NY III tenants compared with eligible unplaced applicants during one year after NY/NY III move-in or eligibility

Health care measures	Adjusted odds ratio (95% Confidence interval)†
Any hospitalization	0.66* (0.56,0.77)
Ambulatory Care Sensitive (ACS, also called "preventable") hospitalization	0.75 (0.56, 1.00)
Injury-related hospitalization	0.69 (0.46, 1.02)
Psychiatric hospitalization	0.59* (0.44, 0.79)
Substance use-related hospitalization	0.62* (0.50, 0.78)
Any emergency department (ED) visit	0.68* (0.58, 0.79)
ACS ED visit	0.76* (0.60, 0.95)
Injury-related ED visit	0.58* (0.45, 0.74)
Psychiatric ED visit	0.68* (0.51, 0.91)
Substance use-related ED visit	0.52* (0.38, 0.70)

Data sources: DHS, DOC, DOHMH, HRA, OMH
** Statistically significant*
† Mantel-Haenszel odds ratio (conditional odds ratio) was used to account for propensity score matched sets.

visit (OR = 0.68). In addition, among placed and unplaced individuals who were hospitalized at least once, placed individuals tended to have shorter lengths of stay in the population of single adults with an SUD (16 fewer days) and the population of single adults who had substance use treatment (10 fewer days) (data not shown).

In the receipt of preventive health care, placed tenants did not significantly differ from unplaced, except that the odds of having an evaluation and management visit were lower (OR = 0.86, Table 3), as well as the odds of having a dental visit (OR=0.84). Since the data did not include outpatient events for patients who had Medicaid managed care, and since a

Table 3: Measures of preventive health care utilization among NY/NY III tenants compared with eligible unplaced applicants during one year after NY/NY III move-in or eligibility

Health care measures	Adjusted odds ratio (95% Confidence interval)†
Any "evaluation and management visit"	0.86* (0.75, 0.99)
Individuals with diabetes at baseline who received an HbA1c test during follow-up year	0.78 (0.49, 1.23)
Individuals with schizophrenia at baseline who received schizophrenia medication during follow-up year	1.19 (0.94, 1.51)
Any dental visit	0.84* (0.72, 0.98)
Discovery of diabetes	0.94 (0.67, 1.31)
Discovery of hypertension	0.80 (0.58, 1.10)
Discovery of asthma	0.68 (0.44, 1.04)
Discovery of lung disease	0.82 (0.55, 1.22)

Data sources: DHS, DOC, DOHMH, HRA, OMH
** Statistically significant*
† Mantel-Haenszel odds ratio (conditional odds ratio) was used to account for propensity score matched sets.

greater portion of placed tenants had Medicaid managed care than unplaced, it is unclear whether this result is due to missing data.

Among individuals who were identified in their NY/NY III application as having a mental illness, the odds of placed tenants having at least one hospitalization for psychiatric care was 0.68 that of unplaced applicants. Among individuals who had experienced an inpatient hospitalization for mental illness, the odds of having a follow-up visit to an outpatient clinic for mental illness within 30 days after release were 2.43 greater than that of unplaced applicants. The odds were 3.61 greater of having two or more visits to an outpatient clinic during six months after an inpatient hospitalization for mental illness. For placed tenants who had experienced an outpatient visit for mental illness treatment, the odds of not having another outpatient visit for mental illness treatment within 90 days were 0.56 that of unplaced applicants (Table 4).

Table 4: Measures of mental health care utilization among NY/NY III tenants compared with eligible unplaced applicants during one year after NY/NY III move-in or eligibility

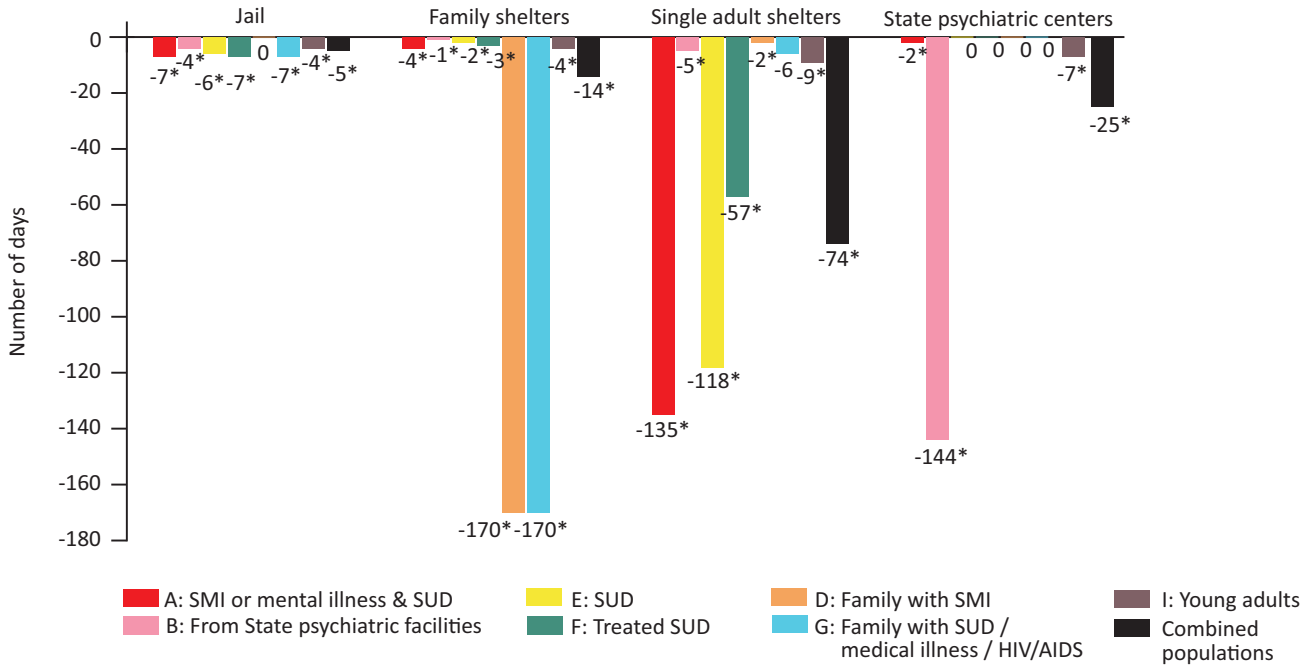
Health care measures	Adjusted odds ratio (95% Confidence interval)†
Follow-up visits to outpatient clinic for mental illness treatment within 30 days after inpatient hospitalization for mental illness	2.43* (1.21-4.95)
Follow-up visits to outpatient clinic for mental illness treatment within 7 days after inpatient hospitalization for mental illness	1.75 (0.77-3.93)
Any psychiatric hospitalization among individuals with mental illness (mental illness is defined through the NY/NY III application)	0.68* (0.50-0.91)
Any psychiatric ED visit among individuals with mental illness (mental illness is defined through the NY/NY III application)	0.77 (0.57-1.03)
2+ visits to outpatient clinic for mental illness treatment during 6 months after inpatient hospitalization for mental illness	3.61* (1.27, 11.21)
Monthly visit to outpatient clinic for mental illness treatment during 6 months after inpatient hospitalization for mental illness	5.01 (0.95, 23.50)
No outpatient visit for mental illness treatment within 90 days after outpatient visit for mental illness treatment	0.56* (0.33-0.91)
Readmission to the hospital within 7 to 30 days after inpatient hospitalization for mental illness	0.58 (0.23-1.32)

Data sources: DHS, DOC, DOHMH, HRA, OMH
** Statistically significant*
† Mantel-Haenszel odds ratio (conditional odds ratio) was used to account for propensity score matched sets.

Days of Institutional Utilization

We measured the days spent in jails, shelters, and State-operated inpatient psychiatric facilities. Placed NY/NY III tenants spent fewer days in jail than unplaced eligible applicants across almost all populations, and among NY/NY III eligible applicants when the populations were combined. Heads of families placed in NY/NY III spent fewer days in family shelters than those not placed, and almost all populations spent fewer days in single adult shelters. Fewer State-operated psychiatric facility days were spent post-placement for individuals who had been in those facilities pre-placement. Chronically homeless individuals with SMI or who were dually diagnosed with mental illness and an SUD, and young adults aging out of foster care also spent fewer days in State-operated psychiatric facilities though the difference was much smaller.

Figure 1: Differences in average numbers of days of institutional use per person one year post NY/NY III



** Statistically significant*

Data sources: DHS, DOC, DOHMH, HRA, OMH. See Appendix E for details of the number of days spent by placed tenants versus unplaced eligible applicants.

Cost analysis: explanation and example

In order to calculate expenditures among NY/NY III tenants vs. unplaced eligible applicants, post-NY/NY III move-in and eligibility costs were adjusted for differences between placed and unplaced individuals at baseline, using pre-NY/NY III move-in and eligibility costs and other variables. The difference between placed and unplaced individuals in their adjusted post-NY/NY III costs was then calculated. The numbers below are for illustration only.

	Costs in the pre-placement/eligibility period	Costs in the post-placement/eligibility period	Cost difference between placed and unplaced groups in the post period
Actual costs			
Placed	$10,000	$5,000	-$5,000
Unplaced	$12,000	$10,000	
Adjusted costs			
Placed		**$6,000**	**-$3,000**
Unplaced		**$9,000**	

For this report, we focus on the adjusted cost differences, not actual cost differences, since the adjusted costs account for baseline differences between placed and unplaced individuals.

Costs in the year following placement were measured for both placed and unplaced groups.

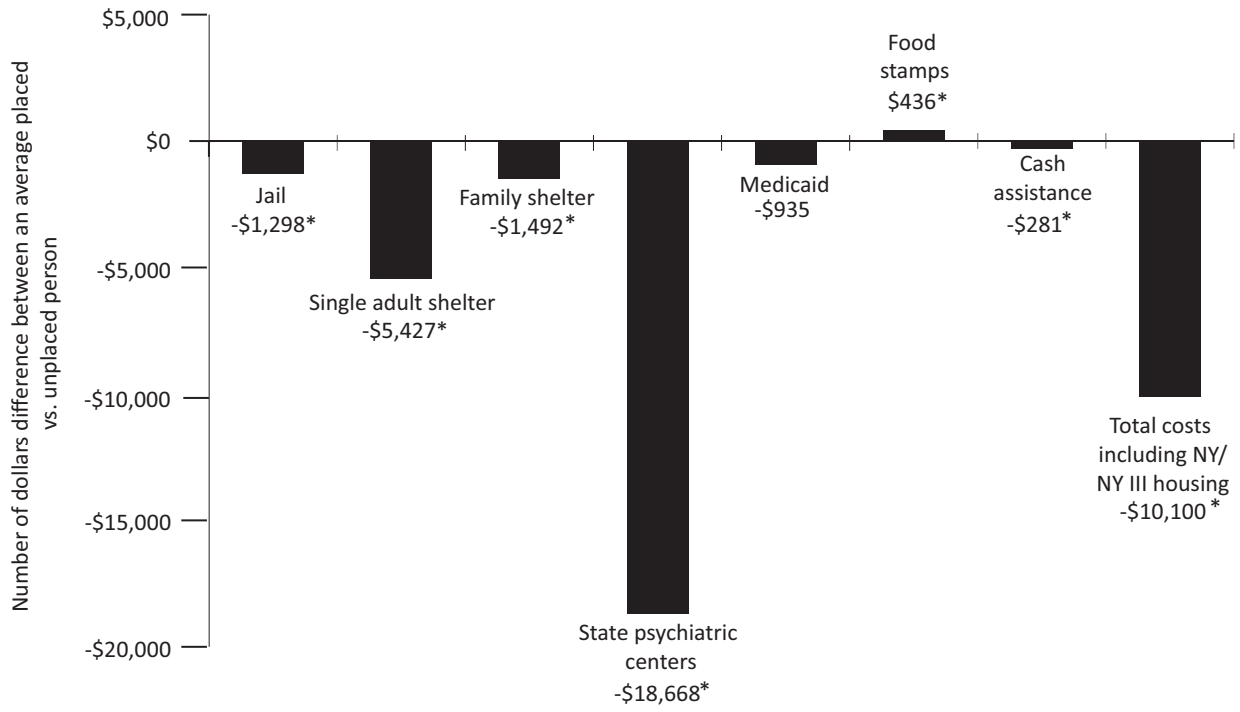
The control group of unplaced individuals often differed from placed individuals in terms of their healthcare and other service cost differences. We used statistical methods to adjust the costs of the groups to make them comparable and make any differences observed between them attributable to the program, not to those underlying differences.

The main result of the analysis is the difference in cost between the placed and unplaced group in the post period (after adjusting for baseline differences between the groups). This represents the best estimate of the program's impact on cost.

NY/NY III populations combined

Among NY/NY III eligible applicants on average per-person, when multiple populations were combined,[7] placed tenants incurred fewer costs than unplaced applicants in jail utilization, single and family shelter utilization, state psychiatric facility utilization, and cash assistance. They incurred greater costs for food stamps. Jail costs were $1,298 less per person for individuals with at least one year of NY/NY III housing compared with unplaced individuals, single adult shelter costs were $5,427 less, family shelter costs were $1,492 less, and state-operated inpatient psychiatric facility costs were $18,668 less (Figure 2). Individuals with at least one year of NY/NY III housing had $436 greater costs for food stamps and $281 lesser costs for cash assistance than did unplaced individuals. Overall, with NY/NY III service and operating costs taken into consideration, costs for NY/NY III tenants were $10,100 less than those for

Figure 2: Combined NY/NY III eligible applicants with one year of follow-up time: Differences in average cost per person – NY/NY III tenants (N = 1,695) vs. unplaced eligible applicants (N = 3,700)



** Statistically significant*
Data sources: DHS, DOC, DOHMH, HRA, OMH

7 The populations that were combined included individuals who were homeless with SMI or mental illness and an SUD, individuals who had been in State-operated psychiatric facilities and were at risk of homelessness, individuals who were homeless and had an SUD, individuals who were homeless and had been treated for an SUD, heads of families who had SMI or mental illness and an SUD, heads of families who had an SUD, a disabling medical condition, or HIV/AIDS, and young adults leaving foster care and at risk of homelessness. Single adults with HIV/AIDS and SMI or an SUD and Population B Transitional (individuals eligible for NY/NY III and placed in community care or transitional housing) were not included. See the Methodology Overview (page 5) for an explanation of why those populations are excluded in the analysis.

unplaced individuals for all services, benefits, and jail use tracked by the evaluation. Since the different NY/NY III populations vary greatly in their utilization of each type of public service and benefit, it is very important to note the population-specific findings in the pages that follow.

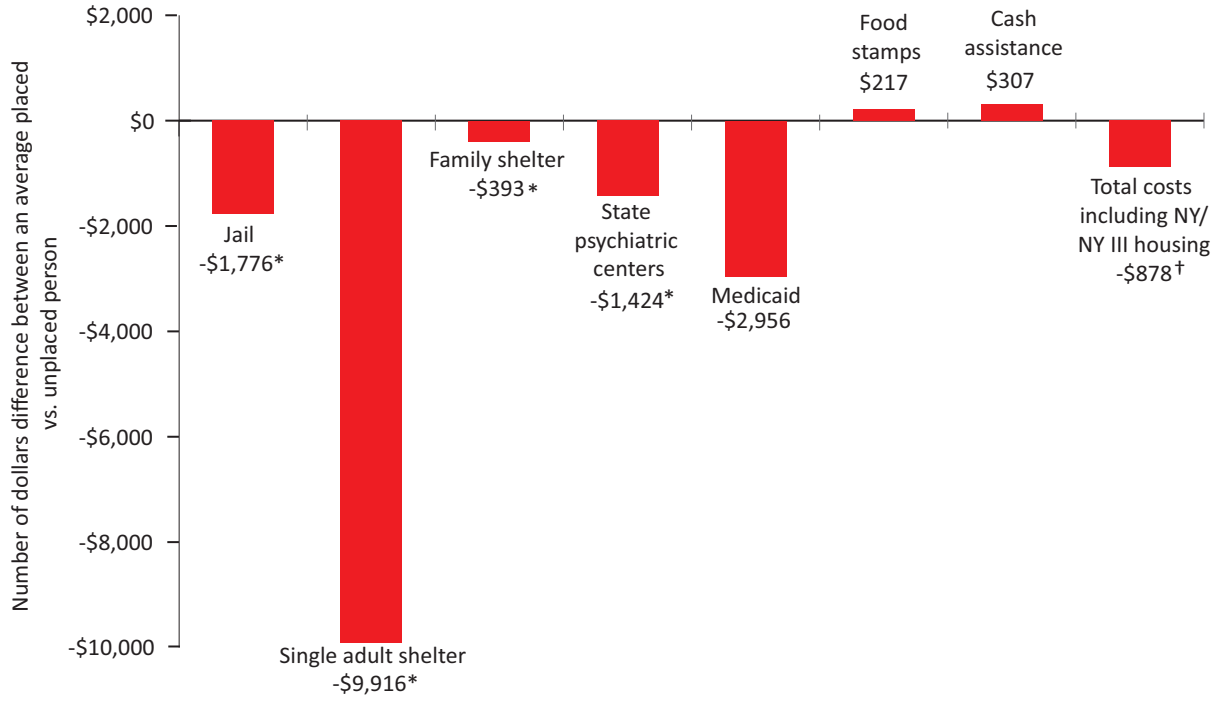
Cost category	Adjusted costs for placed applicants	Adjusted costs for unplaced applicants
Jail	$410	$1,708
Single adult shelter	$164	$5,591
Family shelter	$10	$1,502
State psychiatric	$750	$19,418
Medicaid	$18,134	$19,069
Food stamps	$1,793	$1,357
Cash assistance	$2,094	$2,375
Institutional/Benefit total costs	$23,355	$51,020
NY/NY III cost	$17,566	$0*
Total	$40,921	$51,021

** Among the 3,700 NY/NY III applicants considered "unplaced" in NY/NY III, a small number were placed in NY/NY III housing for 7 days or fewer. These applicants incurred a small amount of NY/NY III housing costs that are included in the total cost calculation, and therefore the Institutional/Benefit Total Costs and the Total Cost are slightly different.*

Population A: Homeless single adults with SMI or who were dually diagnosed with mental illness and an SUD

Jail costs were $1,776 less per person for individuals with at least one year of NY/NY III housing compared with unplaced individuals, single adult shelter costs were $9,916 less, family shelter costs were $393 less, and State-operated inpatient psychiatric facility costs were $1,424 less (Figure 3). When NY/NY III service and operating costs were included, there was no statistically significant difference in total costs between placed and unplaced individuals.

Figure 3: Population A (homeless and had SMI or were dually diagnosed with mental illness and an SUD) with one year of follow-up time: Differences in average cost per person – NY/NY III tenants (N = 431) vs. unplaced eligible applicants (N = 1,366)



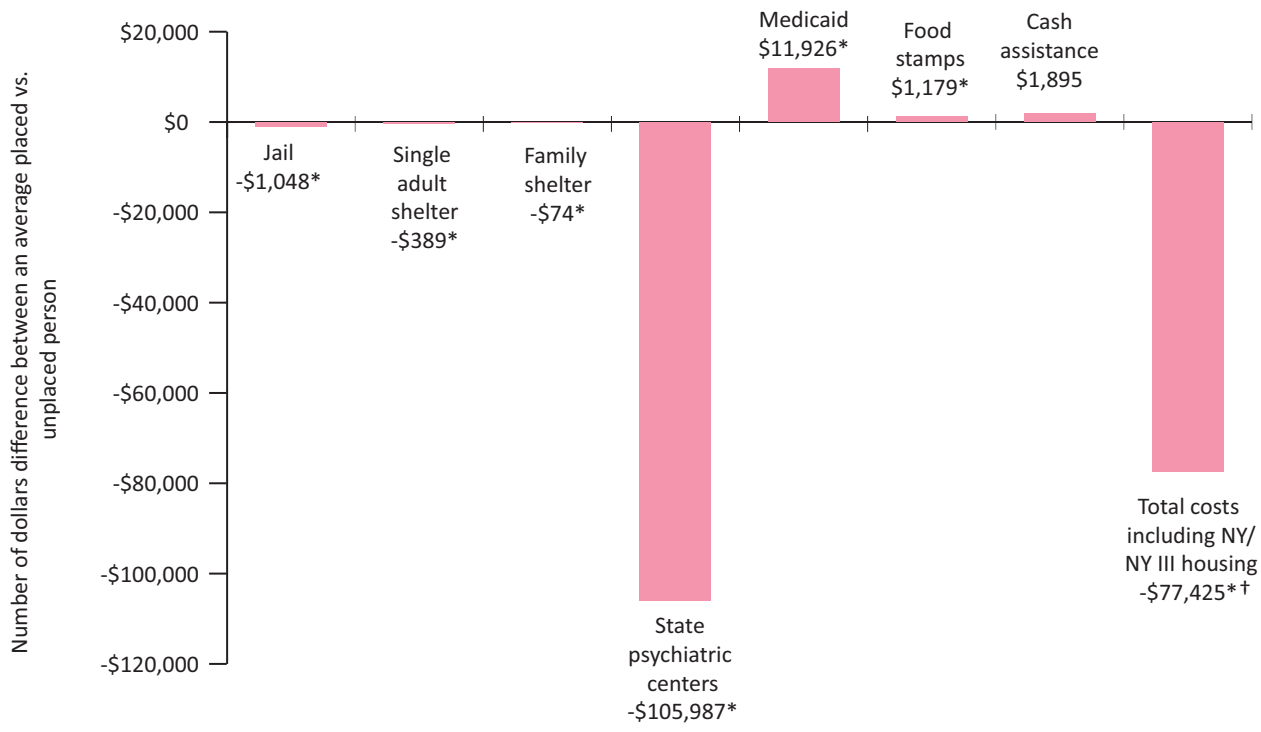
** Statistically significant*
† See appendix A for NY/NY III costs
Data sources: DHS, DOC, DOHMH, HRA, OMH

Cost category	Adjusted costs for placed applicants	Adjusted costs for unplaced applicants
Jail	$239	$2,015
Single adult shelter	$416	$10,332
Family shelter	$2	$396
State psychiatric	$202	$1,626
Medicaid	$19,918	$22,873
Food stamps	$1,475	$1,258
Cash assistance	$1,399	$1,092
Institutional/Benefit total costs	$23,650	$39,592
NY/NY III cost	$15,064	$0
Total	$38,714	$39,592

Population B: Previously in State-operated psychiatric facilities and at risk of homelessness

Jail costs were $1,048 less per person for individuals with at least one year of NY/NY III housing compared with unplaced individuals, single adult shelter costs were $389 less, family shelter costs were $74 less, and State-operated inpatient psychiatric facilities costs were $105,987 less (Figure 4). Individuals with at least one year of NY/NY III housing had $11,926 greater costs for Medicaid and $1,179 greater costs for food stamps than unplaced individuals. Overall, with NY/NY III service and operating costs taken into consideration, costs for NY/NY III tenants were $77,425 less than those for unplaced individuals for all services, benefits, and jail use tracked by the evaluation.

Figure 4: Population B (had been in State-operated psychiatric facilities and at risk of homelessness) with one year of follow-up time: Differences in average cost per person – NY/NY III tenants (N = 26) vs. unplaced eligible applicants (N = 906)



** Statistically significant*
† See appendix A for NY/NY III costs
Data sources: DHS, DOC, DOHMH, HRA, OMH

Cost category	Adjusted costs for placed applicants	Adjusted costs for unplaced applicants
Jail	$0	$1,048
Single adult shelter	$0	$389
Family shelter	$0	$74
State psychiatric	$4,934	$110,921
Medicaid	$35,346	$23,421
Food stamps	$1,454	$275
Cash assistance	$2,077	$182
Institutional/Benefit total costs	$43,811	$136,309
NY/NY III cost	$15,074	$0*
Total	$58,885	$136,310

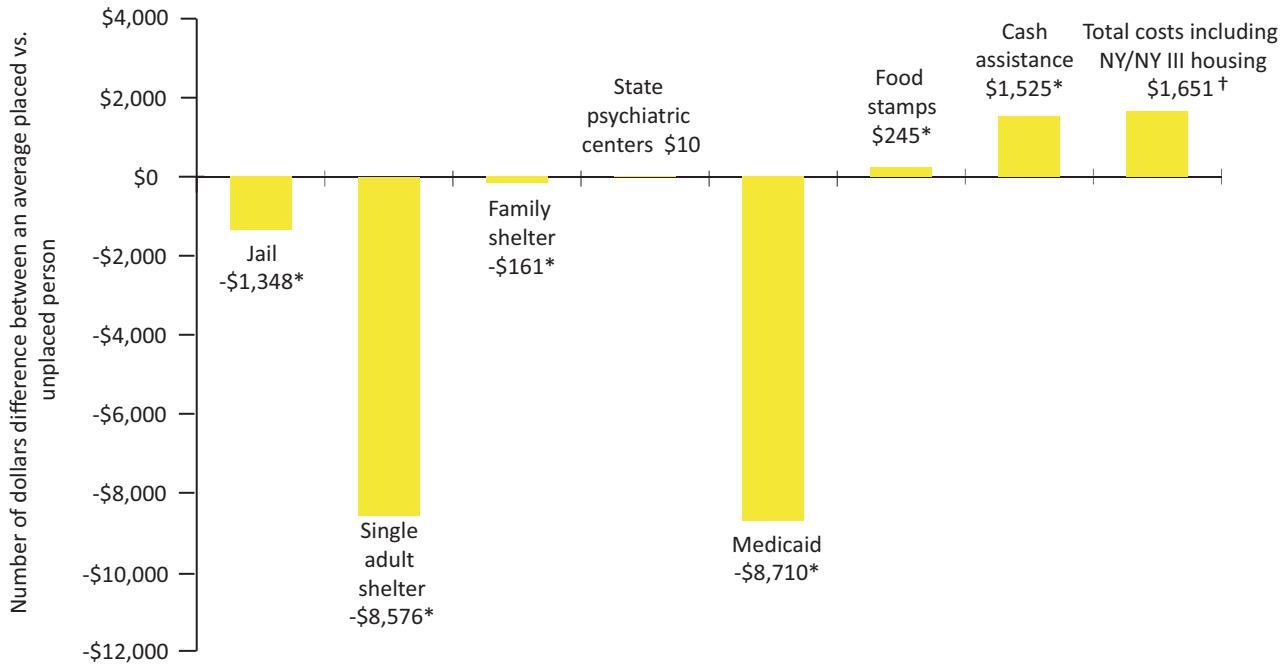
** A small number of "unplaced" applicants were placed in NY/NY III housing for 7 days or fewer. These applicants incurred a small amount of NY/NY III housing costs that are included in the total cost calculation, and therefore the Institutional/Benefit Total Costs and the Total cost are slightly different.*

Population E: Homeless and had an SUD

Jail costs were $1,348 less per person for individuals with at least one year of NY/NY III housing compared with unplaced individuals, single adult shelter costs were $8,576 less, family shelter costs were $161 less, and Medicaid costs were $8,710 less (Figure 5).

Individuals with at least one year of NY/NY III housing had $245 greater costs for food stamps and $1,525 greater costs for cash assistance than unplaced individuals. When NY/NY III service and operating costs were included, there was no statistically significant difference in total costs between placed and unplaced individuals.

Figure 5: Population E (homeless and had an SUD) with one year of follow-up time: Differences in average cost per person – NY/NY III tenants (N = 456) vs. unplaced eligible applicants (N = 332)



** Statistically significant*
† See appendix A for NY/NY III costs
Data sources: DHS, DOC, DOHMH, HRA, OMH

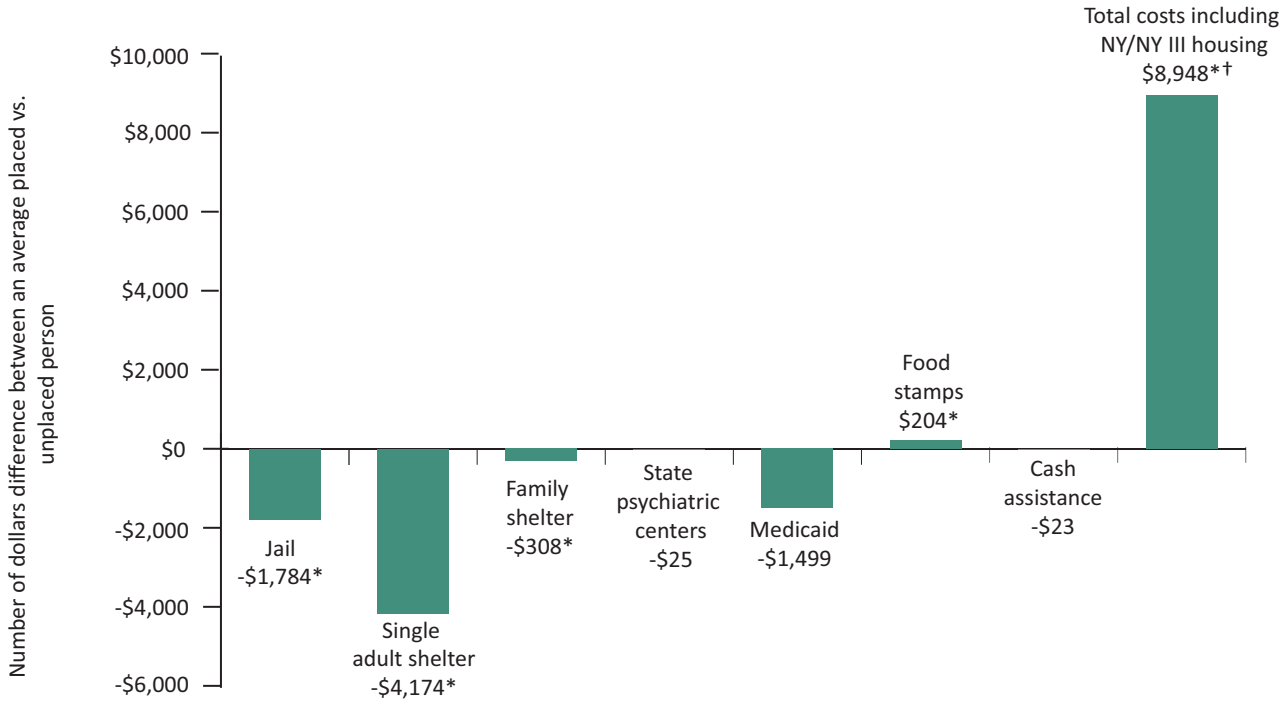
Cost category	Adjusted costs for placed applicants	Adjusted costs for unplaced applicants
Jail	$443	$1,791
Single adult shelter	$51	$8,627
Family shelter	$0	$161
State psychiatric	$10	$0
Medicaid	$11,150	$19,860
Food stamps	$1,806	$1,561
Cash assistance	$2,597	$1,072
Institutional/Benefit total costs	$16,056	$33,070
NY/NY III cost	$18,667	$0*
Total	$34,723	$33,073

** A small number of "unplaced" applicants were placed in NY/NY III housing for 7 days or fewer. These applicants incurred a small amount of NY/NY III housing costs that are included in the total cost calculation, and therefore the Institutional/Benefit Total Costs and the Total Cost are slightly different.*

Population F: Homeless with an SUD and had received substance use treatment

Jail costs were $1,784 less per person for individuals with at least one year of NY/NY III housing compared with unplaced individuals, single adult shelter costs were $4,174 less, and family shelter costs were $308 less. Individuals with at least one year of NY/NY III housing had $204 greater costs for food stamps than unplaced individuals (Figure 6). Overall, with NY/NY III service and operating costs taken into consideration, costs for NY/NY III tenants were $8,948 greater than those for unplaced individuals for all services, benefits, and jail use tracked by the evaluation.

Figure 6: Population F (homeless and treated for an SUD) with one year of follow-up time: Differences in average cost per person – NY/NY III tenants (N=509) vs. unplaced eligible applicants (N = 763)



** Statistically significant*
† See appendix A for NY/NY III costs
Data sources: DHS, DOC, DOHMH, HRA, OMH

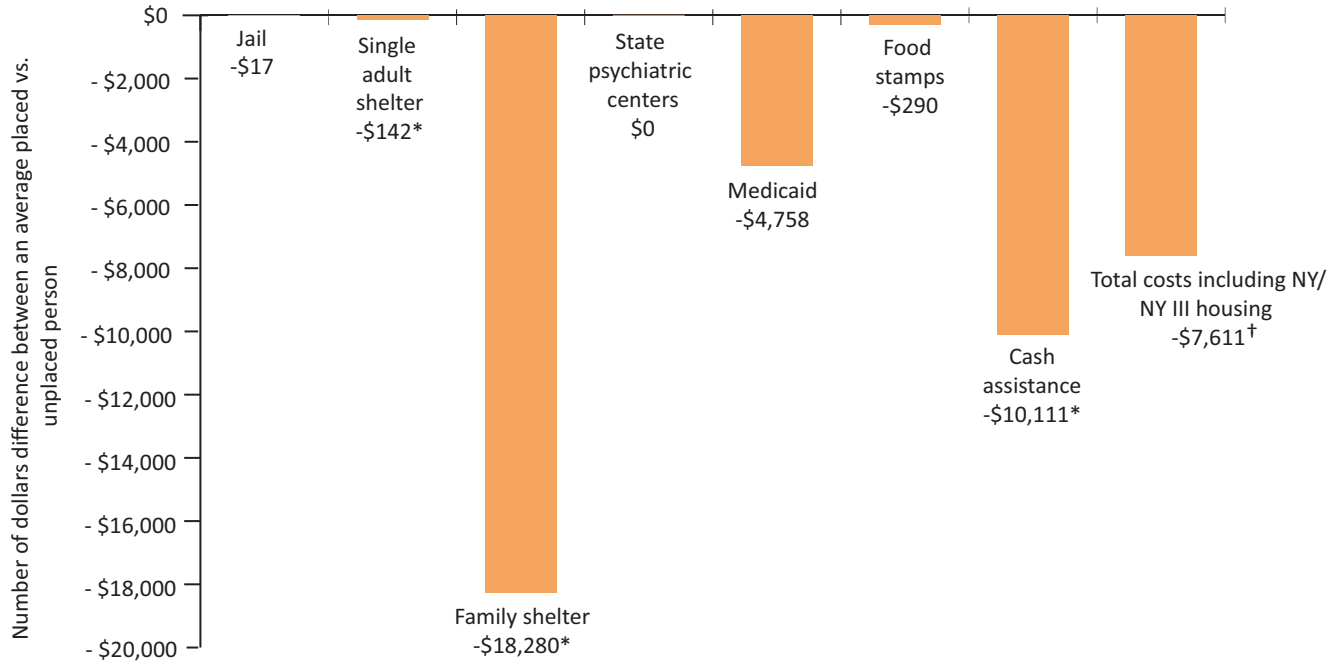
Cost category	Adjusted costs for placed applicants	Adjusted costs for unplaced applicants
Jail	$286	$2,070
Single adult shelter	$35	$4,209
Family shelter	$10	$318
State psychiatric	$0	$25
Medicaid	$14,861	$16,359
Food stamps	$1,883	$1,679
Cash assistance	$3,168	$3,191
Institutional/Benefit total costs	$20,244	$27,852
NY/NY III cost	$16,557	$0*
Total	$36,801	$27,853

** A small number of "unplaced" applicants were placed in NY/NY III housing for 7 days or fewer. These applicants incurred a small amount of NY/NY III housing costs that are included in the total cost calculation, and therefore the Institutional/Benefit Total Costs and the Total cost are slightly different.*

Population D: Heads of family with SMI or dually diagnosed with mental illness and an SUD

Single adult shelter costs were $142 less per person for individuals with at least one year of NY/NY III housing compared with unplaced individuals, family shelter costs were $18,280 less, and cash assistance costs were $10,111 less (Figure 7). When NY/NY III service and operating costs were included, there was no statistically significant difference in total costs between placed and unplaced individuals.

Figure 7: Population D (heads of family with SMI or dually diagnosed with mental illness and an SUD) with one-year of follow-up time: Differences in average cost per person – NY/NY III tenants (N = 41) vs. unplaced eligible applicants (N = 111)



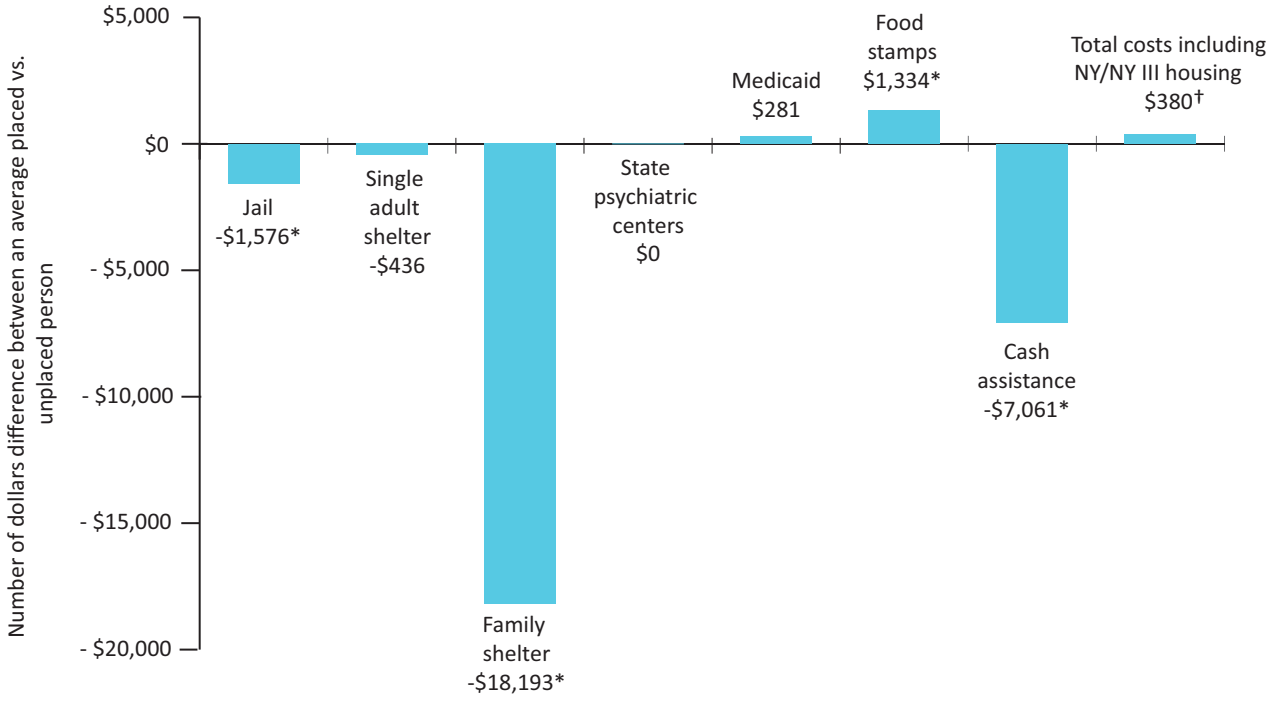
** Statistically significant*
† See appendix A for NY/NY III costs
Data sources: DHS, DOC, DOHMH, HRA, OMH

Cost category	Adjusted costs for placed applicants	Adjusted costs for unplaced applicants
Jail	$0	$17
Single adult shelter	$0	$142
Family shelter	$94	$18,374
State psychiatric	$0	$0
Medicaid	$10,122	$14,879
Food stamps	$2,837	$3,127
Cash assistance	$3,331	$13,443
Institutional/Benefit total costs	$16,385	$49,983
NY/NY III cost	$25,987	0
Total	$42,372	$49,983

Population G: Heads of family with an SUD, disabling medical condition, or HIV/AIDS

Jail costs were $1,576 less per person for individuals with one year of NY/NY III housing compared with unplaced individuals, family shelter costs were $18,193 less, and cash assistance costs were $7,061 less (Figure 8). Individuals with at least one year of NY/NY III housing had $1,334 greater costs for food stamps than unplaced individuals. When NY/NY III service and operating costs were included, there was no statistically significant difference in total costs between placed and unplaced individuals.

Figure 8: Population G (heads of family with an SUD, disabling medical condition, or HIV/AIDS) with one year of follow-up time: Differences in average cost per person – NY/NY III tenants N = 113 vs. unplaced eligible applicants N = 131



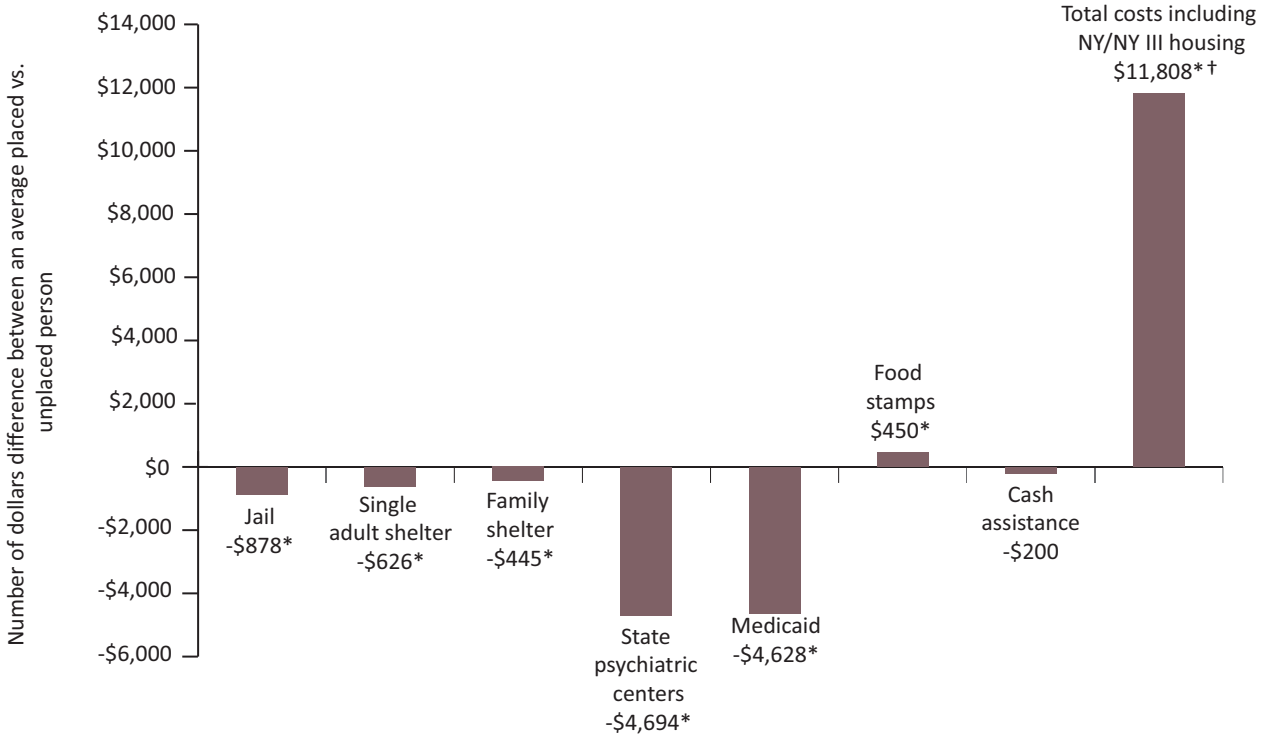
** Statistically significant*
† See appendix A for NY/NY III costs
Data sources: DHS, DOC, DOHMH, HRA, OMH

Cost category	Adjusted costs for placed applicants	Adjusted costs for unplaced applicants
Jail	$270	$1,846
Single adult shelter	$0	$436
Family shelter	$140	$18,333
State psychiatric	$0	$0
Medicaid	$16,342	$16,062
Food stamps	$4,159	$2,825
Cash assistance	$5,548	$12,609
Institutional/Benefit total costs	$26,459	$52,109
NY/NY III cost	$26,030	0
Total	$52,489	$52,109

Population I: Young adults leaving foster care and at risk of homelessness

Jail costs were $878 less per person for individuals with at least one year of NY/NY III housing compared with unplaced individuals, single adult shelter costs were $626 less, family shelter costs were $445 less, State-operated inpatient psychiatric facility costs were $4,694 less, and Medicaid costs were $4,628 less (Figure 9). Individuals with at least one year of NY/NY III housing had $450 greater costs for food stamps than unplaced individuals. Overall, with NY/NY III service and operating costs taken into consideration, costs were $11,808 greater for placed tenants than those for unplaced individuals for all services, benefits, and jail use tracked by the evaluation.

Figure 9: Population I (young adults leaving foster care and at risk of homelessness) with one year of follow-up time: Differences in average cost per person – NY/NY III tenants (N = 122) vs. unplaced eligible applicants (N = 288)



** Statistically significant*
† See appendix A for NY/NY III costs
Data sources: DHS, DOC, DOHMH, HRA, OMH

Cost category	Adjusted costs for placed applicants	Adjusted costs for unplaced applicants
Jail	$2	$880
Single adult shelter	$43	$669
Family shelter	$0	$445
State psychiatric	$0	$4,694
Medicaid	$1,819	$6,447
Food stamps	$1,459	$1,009
Cash assistance	$474	$674
Institutional/Benefit total costs	$3,797	$14,818
NY/NY III cost	$22,828	$0
Total	$26,625	$14,818

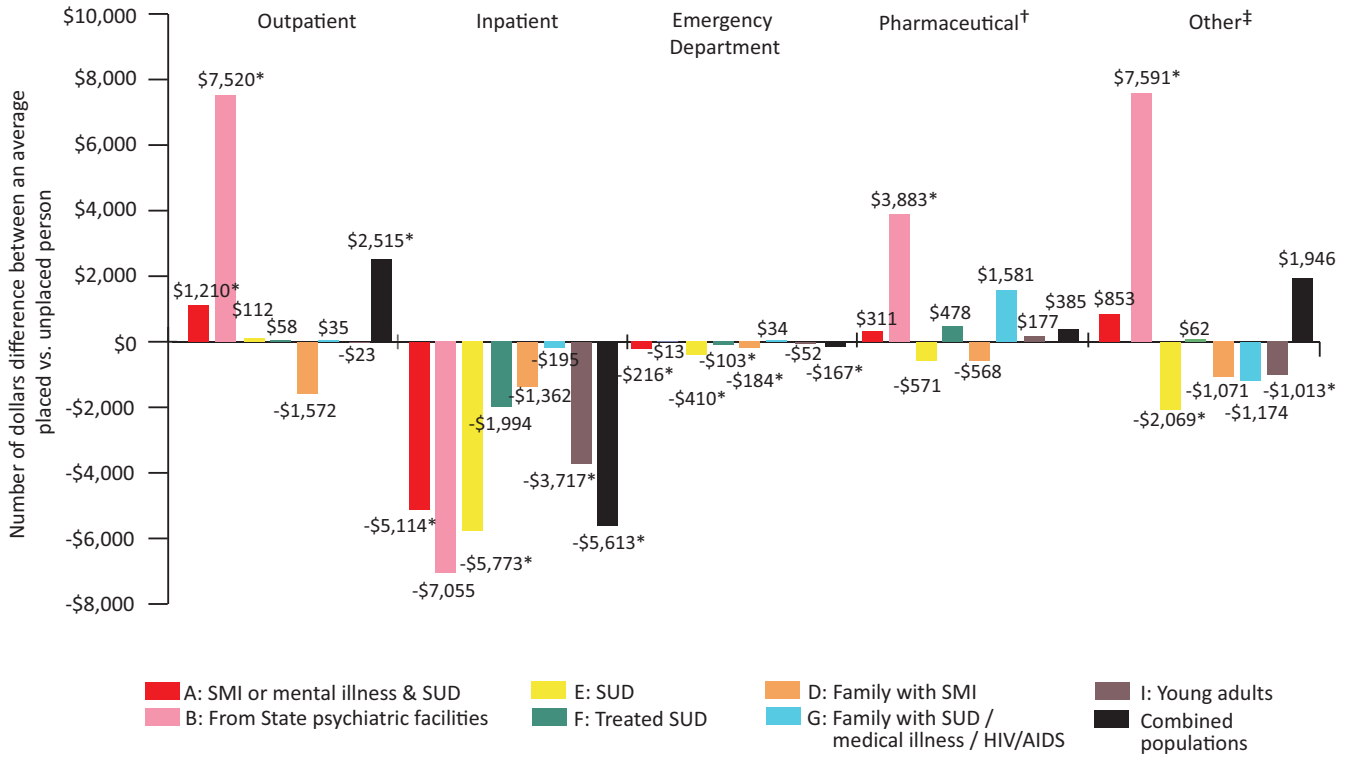
Medicaid Cost Sub-analyses

Categories of Medicaid Costs

Medicaid costs cover a broad spectrum of care. In an effort to detect differences in types of costs between placed and unplaced NY/NY III eligible applicants, we disaggregated Medicaid costs into categories of expenditures. Several patterns emerged (Figure 10):

- Inpatient costs were lower for placed than unplaced individuals among chronically homeless single adults with SMI or who were dually diagnosed with mental illness and an SUD, single adults with an SUD, youth aging out of foster care, and NY/NY III populations combined.
- Emergency department costs were lower for placed than unplaced individuals among chronically homeless single adults with SMI or who were dually diagnosed with mental illness and an SUD, single adults with an SUD or a treated SUD, heads of families with SMI or who were dually diagnosed with mental illness and an SUD, and NY/NY III populations combined.
- Pharmaceutical costs were higher for placed than unplaced individuals among single adults coming from State-operated psychiatric facilities.
- Outpatient costs were higher for placed than unplaced individuals among chronically homeless single adults with SMI or who were dually diagnosed with mental illness and an SUD, single adults coming from State-operated psychiatric facilities, and NY/NY III populations combined.

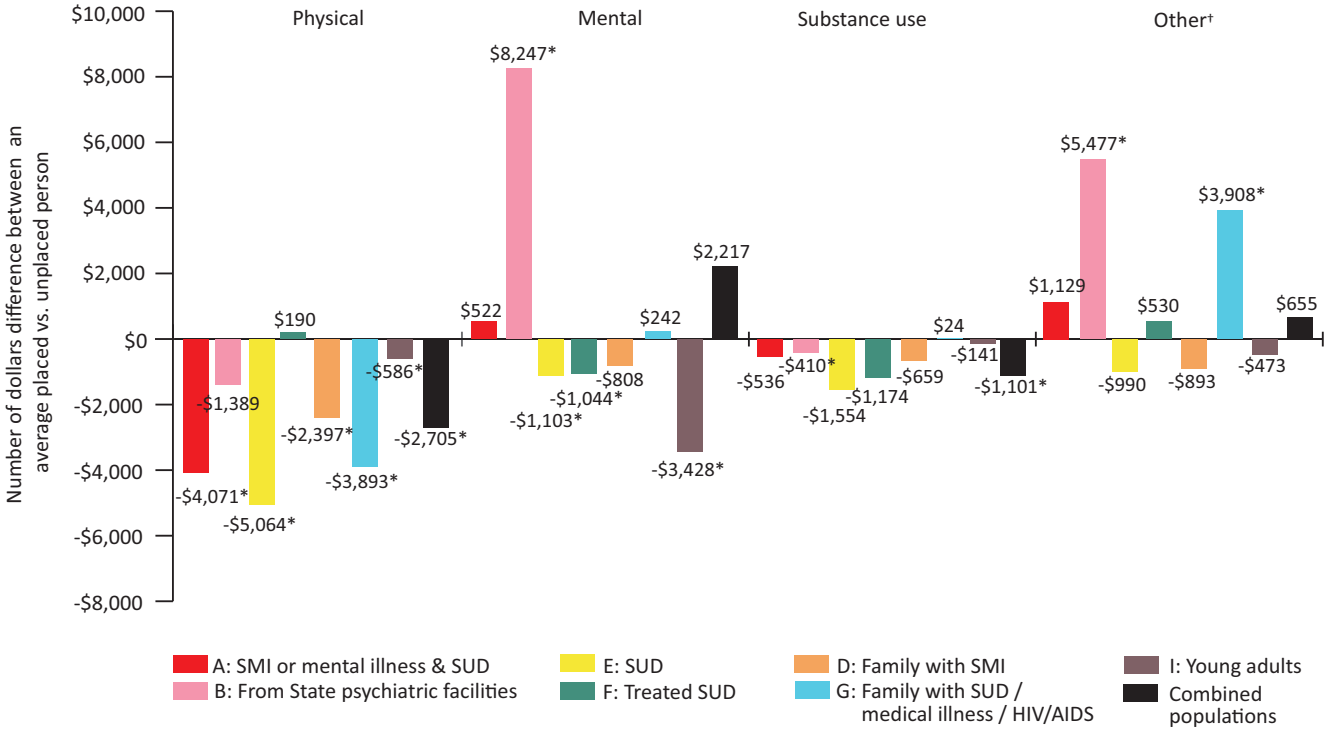
Figure 10: Outpatient, Inpatient, Emergency Department, Pharmaceutical, and Other Medicaid utilization for individuals with one year of follow-up time



* *Statistically significant*
† *"Pharmaceutical" refers to Medicaid-covered pharmaceutical costs.*
‡ *"Other" refers to home health agencies and personal care (35% of "other" costs), managed care capitation (28%), residential care (21%), and other costs. Managed care may include outpatient, inpatient, emergency department, and pharmaceutical encounters.*
Data sources: DHS, DOC, DOHMH, HRA, OMH. See Appendix F for details of the costs incurred by placed tenants versus unplaced eligible applicants.

Another way to examine Medicaid costs is to categorize them into physical illness, mental illness, substance use, or other needs. Chronically homeless single adults with SMI or who were dually diagnosed with mental illness and an SUD, single adults with an SUD, heads of families, young adults aging out of foster care, and NY/NY III populations combined who lived in NY/NY III housing for one year, incurred fewer Medicaid costs for physical illness than unplaced individuals (Figure 11). Placed single adults with an SUD or treatment for an SUD and young adults aging out of foster care had lower Medicaid costs for mental illness than unplaced individuals. Placed single adults who had been in State-operated psychiatric facilities had higher Medicaid costs for mental illness than unplaced individuals. Placed single adults coming from State-operated psychiatric facilities, and NY/NY III populations combined had lower Medicaid costs for substance use than unplaced individuals.

Figure 11: Physical Illness, Mental Illness, Substance Use, and Other Medicaid utilization for individuals with one year of follow-up time



* *Statistically significant*

† *"Other" includes prescriptions, dental services, monthly capitation costs for managed care, etc. Managed care capitations may include care for physical illness, mental illness, and substance use.*

Data sources: DHS, DOC, DOHMH, HRA, OMH. See Appendix F for details of the costs incurred by placed tenants versus unplaced eligible applicants.

Medicaid Coverage and Medicaid Managed Care

Among individuals who lived in NY/NY III for one year, the percent of individuals who had one full year of Medicaid coverage during that time was higher than among individuals who did not live in NY/NY III for most populations (Table 5). Unlike in the previous sections of the report, this section examines only individuals who had one full year of Medicaid coverage. Among individuals with continuous Medicaid coverage for one full year, there were no statistically significant differences in overall Medicaid utilization in Populations A, F and G (Table 6). Placed individuals in Population E, the population with an SUD, incurred $10,796 fewer Medicaid expenditures than unplaced individuals in that population. Placed individuals in Population D (families in which the head of household had SMI or was dually diagnosed with mental illness and an SUD) incurred $11,925 greater Medicaid expenditures than unplaced individuals. Populations B and I had 10 placed individuals or fewer with 12 full months of Medicaid coverage, so they were not analyzed. Placed and unplaced individuals also differed in the extent to which they had Medicaid managed care. Among placed tenants, 34% had at least six months of Medicaid managed care during their first year in NY/NY III housing, compared with 22% among unplaced applicants during their first year after applying to NY/NY III and not being placed.

Table 5: Percent of placed versus unplaced NY/NY III eligible applicants who had one full year of Medicaid coverage post-NY/NY III eligibility or move-in

	Population A Homeless & with SMI or mental illness & an SUD	Population B Had been in State-operated psychiatric facilities & at risk of homelessness	Population E Homeless & have an SUD	Population F Homeless & treated for an SUD	Population D Heads of family have SMI or mental illness & an SUD	Population G Heads of family have an SUD, disabling medical condition, or HIV/AIDS	Population I Young adults leaving foster care & at risk of homeless-ness	Combined Populations
Placed	55%	27%	41%	38%	61%	50%	8%	42%
Unplaced	43%	23%	41%	26%	43%	48%	15%	33%

Data sources: DHS, DOC, DOHMH, HRA, OMH

Table 6: Adjusted Medicaid utilization one-year post-NY/NY III for placed versus unplaced NY/NY III eligible applicants who had one full year of Medicaid coverage post-NY/NY III eligibility or move-in

Population†	Medicaid costs among placed tenants	Medicaid costs among unplaced applicants	Difference between placed versus unplaced applicants
A: SMI or mental illness & SUD (236 placed; 587 unplaced)	$26,060	$29,885	-$3,825
E: SUD (186 placed; 136 unplaced)	$16,190	$26,986	-$10,796*
F: Treated SUD (191 placed; 199 unplaced)	$19,832	$20,414	-$582
D: Family with SMI (25 placed; 36 unplaced)	$28,551	$16,626	$11,925*
G: Family with SUD/ medical illness/ HIV/AIDS (57 placed; 63 unplaced)	$21,693	$13,450	$8,243
Combined populations (711 placed; 1207 placed)	$23,278	$24,927	-$1,649

* Statistically significant.

† Populations B and I had 10 or fewer placed individuals with 12 full months of Medicaid coverage, so they were not analyzed.

Data sources: DHS, DOC, DOHMH, HRA, OMH

Limitations, Strengths, Conclusions, and Next Steps

Limitations and Strengths

A limitation in this interim report is that analyses are restricted to one year of follow-up time because the available data included small numbers of NY/NY III applicants with two years of follow-up time. Interpreting results from a single year of follow-up time is difficult given that the long-term benefits of stable housing on health and other outcomes are unlikely to fully accrue in 12 months. Delivery of supportive services would be expected to improve over time as housing providers gain experience with the populations they are serving and with the settings in which the services are delivered. Additionally, health care costs may increase in the early months post-placement when those recently housed receive treatment for previously undiagnosed or untreated illnesses. Also, because this report covers only the early years of NY/NY III housing when most of the available units were in scattered-site housing, the results cannot be generalized to individuals living in single-site housing, nor can comparisons be made between the two housing types.

There are also limitations in our ability to determine if someone was housed in non-NY/NY III government subsidized housing. Some of the individuals who were considered "unplaced" in the analysis may have been in New York City Housing Authority (NYCHA), Section 8, or other housing not included in the data for this evaluation. Analyses of the population of chronically homeless adults with HIV/AIDS (Population H) are especially complicated because members of this population who were eligible for NY/NY III were nearly all placed in housing, even if they were not placed in NY/NY III; this makes a comparison group difficult to construct. In Appendix B we compare individuals placed in NY/NY III Population H housing for at least 7 days to individuals not placed in NY/NY III housing, irrespective of whether they were placed in other housing. This approach differs from that which we used for the other populations, in which we were able to compare individuals placed in NY/NY III to individuals not placed in other housing that we track.

Another limitation is that although individuals placed in NY/NY III for a full 12 months are not likely to have left New York City and State for extended periods of time, individuals not placed in NY/NY III may have done so and incurred public expenses in other localities that were not captured by this evaluation. Similar to the missed out-of-state costs, some public services, benefits, and incarceration costs were not available for this report. For example, data were not included on the utilization of prisons, and individuals who applied to NY/NY III but were not placed may have spent time in prisons, where costs of services and benefits included in this analysis would not have been incurred. Among unplaced individuals, 93 were in NYC jails and released to prison during their first year after applying to NY/NY III, representing between zero and three percent of each of the NY/NY III populations of unplaced individuals. Other data not included were substance use services funded by the New York State Office of Alcoholism and Substance Abuse Services (OASAS) (for example, residential treatment), and hospitalizations and emergency department visits not covered by Medicaid.

There are also several potential biases that may result from the methodology used. First, the date that defined the post-treatment period was the move-in date for placed individuals, and the earliest NY/NY III eligibility date for unplaced applicants. We tried to

limit the bias that could result from this difference by including individuals in matched sets only if their move-in date and eligibility date were in the same six-month window. However, the follow-up period for unplaced individuals began at their earliest eligibility date, and service utilization during the period between eligibility and move-in might differ from service utilization after move-in, thereby introducing a bias in the follow-up periods being compared. Across NY/NY III populations the average gap between NY/NY III eligibility and move-in ranged from 69 to 150 days. A second potential methodological limitation is that the propensity score matching used only information from the NY/NY III application and available administrative data, and unmeasured characteristics may have been important. Finally, NY/NY III applicants may have applied to multiple programs simultaneously, and were subsequently connected to care and services in a way that non-applicants were not. Therefore, services and benefits utilization by applicants who were not housed in NY/NY III may reflect positive outcomes of those other programs. Differences between NY/NY III tenants and the comparison group may not represent differences between NY/NY III tenants and individuals who did not apply.

There are two key limitations in the analysis of health care utilization, as measured by Medicaid data. First, for patients who had Medicaid managed care, their monthly capitation costs were included in the Medicaid data used by this evaluation, but their encounters covered under managed care were not included. Therefore, the analysis of types of health care received by placed versus unplaced NY/NY III eligible applicants does not include events that were not billed as Medicaid fee-for-service claims. A second limitation is that health care that was not billed to Medicaid was excluded from the analysis. For example, patients could have had inpatient hospitalizations while they were not enrolled in Medicaid. Future reports will capture these hospitalizations through the New York State Department of Health hospitalization database.

This evaluation has several strengths. First, data cover important areas of services, benefits, and incarceration, therefore providing a broad picture of public costs incurred by program applicants. Second, the methodology used to control for differences between individuals placed in the program versus individuals not placed in the program is rigorous. Third, supportive housing is evaluated for some populations that have seldom been included in supportive housing (e.g. young adults aging out of foster care and heads of families), thereby providing an opportunity to conduct analysis on non-traditional groups. Finally, because 9,000 units will ultimately become available for this supportive housing project, the NY/NY III evaluation will have the largest population size of any supportive housing evaluation published to date.

Conclusions

During the early years of the NY/NY III program, tenants had savings in jail, shelter, State psychiatric facilities, and Medicaid utilization and costs relative to people eligible but not placed in the program. When NY/NY III service and operating costs were included, there were net savings. Specific populations varied in the types of public services for which they had savings, as well as their net costs. Multiple populations of tenants had utilization and cost savings in jail and shelter, and family populations had savings in cash assistance costs. Tenants in some populations also had Medicaid and State psychiatric center savings. When NY/NY III service and operating costs were included, there were net savings for one population. In four other populations, the cost of the program was offset by savings in services and benefits not used by NY/NY III tenants. In two populations, net costs were greater

for placed than unplaced individuals. These interim findings showing savings across multiple domains will be followed by additional future reports, which are the next steps in this evaluation.

Next Steps

Additional results from more follow-up time. We will conduct a new data linkage, incorporating 2011 and 2012 data into our analysis. This will enable us to analyze two years of follow-up time for the cohort that had only one year of follow-up time. In addition, it will enable us to analyze an expanded group of individuals who were placed after 2009 and had one year of follow-up time, thereby reducing analytic challenges associated with small numbers for some populations.

Analysis of high utilizers of Medicaid and other services. We will analyze whether NY/NY III tenants predicted to become high utilizers of Medicaid used less Medicaid after moving into NY/NY III housing than similar tenants who did not move into NY/NY III housing. In addition, we will identify characteristics of individuals who were high utilizers of services overall and who reduced their utilization after moving into NY/NY III housing.

Additional details on outcomes and costs not captured in the current analysis. Shelter, jail, and Medicaid cost outcomes are only some of the outcomes that could be impacted by moving from housing instability and homelessness into permanent supportive housing. A more nuanced understanding is needed of "care transitions" from episodic, acute care in hospitals and emergency departments to continuous care in outpatient settings with access to medications. Particularly challenging to measure, though no less important, are "recovery" outcomes expected to be associated with stable housing such as employment, overall well-being, and family and community relationships. Another outcome that will be analyzed is housing stability, and the characteristics of longer-term tenants will be compared with those of tenants who move out more quickly.

In summary, over the next several years our evaluation of NY/NY III supportive housing will expand its assessment of the impacts of housing using rigorous analytic methods.

Appendix A

NY/NY III Housing populations and costs

NY/NY III supportive housing offers subsidized housing along with support services to individuals who meet one of nine different eligibility criteria (Table 7). Services mentioned in Requests for Proposals (RFPs) for housing providers include "case management, medication management, rehabilitation, personal assistance that emphasizes learning daily living skills," "financial management," "assistance in gaining access to appropriate public benefits and services, peer support," 24-hour/seven-day-a-week on-call staffing, and help in establishing the household. Additional services include "linkages/referrals to appropriate providers located nearby or that are readily accessible through public transportation" to "address clients' physical and mental health needs in the areas of primary medical, mental health, and dental care, substance abuse counseling and treatment, domestic violence counseling and HIV/STD prevention services, treatment and support services (including access to condoms and rapid HIV/AIDS testing)."[8] Operating costs include rent stipends, utilities, and building maintenance, among others. Some NY/NY III housing is in scattered-site units, where apartments in conventional buildings are rented. Other housing is in

Table 7: NY/NY III population descriptions

Mental illness	Population A	Chronically homeless single adults with SMI or who are dually diagnosed with a mental illness and an SUD.
	Population B	Single adults who were living in NYS-operated psychiatric centers or NYS-operated transitional residences and who could live independently in the community if provided with supportive housing and who would be at risk of street or sheltered homelessness if discharged without supportive housing.
SUD	Population E	Chronically homeless single adults who have an SUD that is a primary barrier to independent living. Effective April 13, 2009, there were two changes in eligibility criteria: (1) individuals who have been homeless 6 of the past 12 months are considered eligible; (2) clients are no longer required to have a disabling clinical condition.
	Population F	Homeless single adults who have completed a course of treatment or are successfully participating in treatment for an SUD and are at risk of street homelessness or sheltered homelessness and who need transitional supportive housing (that may include half-way houses) to sustain sobriety and achieve independent living.
Family	Population D	Chronically homeless families, or families at serious risk of becoming chronically homeless, in which the head of the household has SMI or is dually diagnosed with mental illness and an SUD.
	Population G	Chronically homeless families, or families at serious risk of becoming chronically homeless, in which the head of household has an SUD, a disabling medical condition or HIV/AIDS.
HIV/AIDS	Population H	Chronically homeless single adults who are persons living with HIV/AIDS (who are clients of the HIV/AIDS Services Administration [HASA], or who have symptomatic HIV and are receiving cash assistance from the City) and who have a co-occurring SMI, an SUD, or a dual diagnosis of mental illness and an SUD.
Young adult	Population C	Young adults, aged 18 to 24, who have SMI being treated in NYS licensed residential treatment facilities, State psychiatric facilities or leaving or having recently left foster care and who could live independently in the community if provided with supportive housing and who would be at risk of street or sheltered homelessness if discharged without supportive housing. (This report does not include this population because no Population C tenants had been placed in NY/NY III housing by 12/31/2010.)
	Population I	Young adults (aged 25 years or younger) leaving or having recently left foster care or who had been in foster care for more than a year after their sixteenth birthday and who are at risk of street homelessness or sheltered homelessness.

8 The City of New York Department of Health and Mental Hygiene. New York/New York III Scattered-Site Supportive Housing Programs, Addendum #2 to the Request for Proposals, 2007.

single-site buildings that are dedicated to supportive or other specialized housing. Since most of the units in the early years of the program were scattered-site, the analysis in this report largely reflects the scattered-site experience.

The housing cost estimates used in this analysis include service and operating costs and exclude capital costs. Aggregate total service and operating costs were obtained from contract RFPs. Costs vary across population groups and by scattered-site versus single-site housing. The dollar amounts specified in the NY/NY III RFPs are in Table 8. The amount of funding received by housing providers can vary depending on whether the housing providers have additional Shelter Plus Care funding. Those with Shelter Plus Care funding receive a lower amount of NY/NY III funds. For the purposes of the NY/NY III evaluation, we used the aggregated funding amount, without differentiating whether it is entirely from the NY/NY III funding stream, or a combination of NY/NY III and Shelter Plus Care.

Some individuals who were eligible for NY/NY III but not placed in the program were placed in other housing at some point during the one year follow-up period. These individuals, with the exception of the Population H analysis, were excluded from analysis. Table 9 shows the number of individuals not placed in NY/NY III but placed in other housing tracked by the NY/NY III evaluation for at least 7 days.

Table 8: Operating Costs for NY/NY III Supportive Housing*

	NY/NY III Population	RFP amount per bed per year	Source of RFP amount
Populations with mental illness	Population A scattered site	$14,197	OMH 2008 Scattered Site RFP, pg. 7
	Population A congregate	$14,888†	OMH 2006 Congregate RFP, pg. 7; DOHMH 2007 Rolling Congregate RFP, pg. 6
	Population B scattered site	$14,197	OMH 2008 Scattered Site RFP, pg. 7
	Population B congregate	$14,888‡	OMH 2006 Congregate RFP, pg. 7
Populations with an SUD	Population E scattered site	$18,000	DOHMH 2007 Scattered Site RFP, pg. 6
	Population E congregate	$18,000	DOHMH 2007 Rolling Congregate RFP, pg. 6
	Population F scattered site	$16,000	DOHMH 2007 Scattered Site RFP, pg. 6
	Population F congregate	$16,000	DOHMH 2007 Rolling Congregate RFP, pg. 6
Family populations	Population D congregate	$25,000	DOHMH 2007 Rolling Congregate RFP, pg. 6
	Population G congregate	$25,000	DOHMH 2007 Rolling Congregate RFP, pg. 6
Population with HIV	Population H scattered site	$24,000	HASA 2007 SS RFP, pg. 7
	Population H congregate	$25,444	HASA 2007 Congregate RFP, pg. 4
Young adults aging out of foster care	Population I scattered site	$22,000	DOHMH 2007 Scattered Site RFP, p. 6
	Population I congregate	$22,000	DOHMH 2007 Rolling Congregate RFP, pg. 6

* *DOHMH, HASA, OMH, and the Supportive Housing Network of New York (SHNNY) provided information about operating costs.*

† *Two additional Population A Congregate RFP's state different dollar amounts. The OMH 2006 Congregate RFP (page 7) states $13,673, and the OMH 2011 Service and Operations Only RFP (page 14) states $16,009. For the evaluation cohort housed from 2007 through 2009, we used $14,888 because few beds from the 2006 contract opened until 2009, and no beds from the 2011 contract were open yet.*

‡ *The Population B Congregate RFP lists two different dollar amounts: $13,673 (Community Residence/Single Room Occupancy [CR/SRO]) and $14,888 (Supported/Single Room Occupancy [SP/SRO]). We used the more conservative dollar amount ($14,888). In addition, we estimated that the cost of Population B Transitional housing was $14,888, which was the same as the cost of Population B Congregate housing.*

Table 9: Number of individuals with one year of follow-up time who were placed in NY/NY III, not placed in any housing tracked by the evaluation, or placed in non-NY/NY III housing

	Population	Placed in NY/NY III for at least 1 year	Placed in NY/NY III for <1 year*	Not placed in any housing tracked by the evaluation	Not placed in NY/NY III but placed in some other housing for >7 days
Populations with mental illness	A	431	42	1,366	1,113
	B	26	15	906	1,420
	B transitional	136	56	906	1,420
Populations with an SUD	E	456	70	335	62
	F	509	117	782	140
Family populations	D and G	154	5	242	8
Population with HIV	H	240	80	18†	323
Young adults aging out of foster care	I	122	57	299	64

* *Moved into NY/NY III prior to 12/31/2009 and remained housed for less than 12 continuous months.*

† *In Population H, 18 individuals were not placed in housing, but they plus 323 who were placed in non-NY/NY III housing were analyzed in the evaluation as "unplaced" people.*

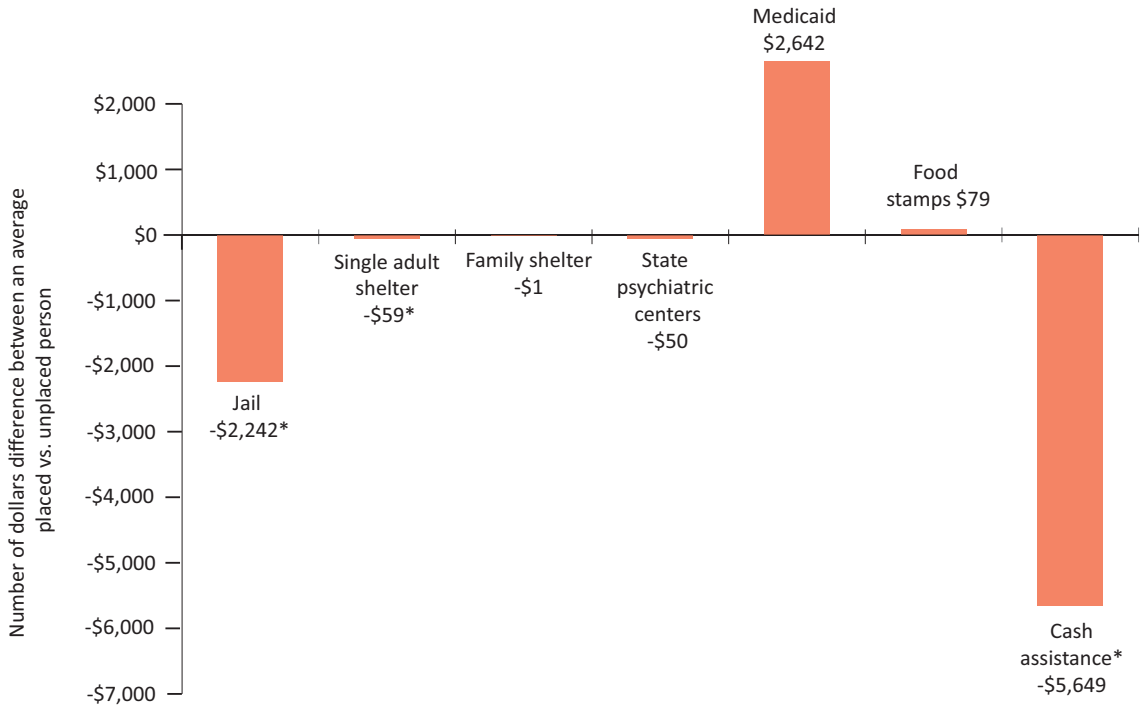
Data sources: DHS, DOC, DOHMH, HRA, OMH

Appendix B

Population H: Single adults with HIV/AIDS and SMI or an SUD

Placed individuals in Population H were compared with individuals eligible for Population H and not placed in NY/NY III housing, irrespective of whether they were placed in other housing. In contrast to other populations, all but 18 Population H eligible applicants were placed in other government-subsidized housing tracked by the evaluation. We did not calculate the total cost including NY/NY III housing because almost everyone in the comparison group was housed in non-NY/NY III housing.

Figure 12: Population H (Single adults with HIV/AIDS and SMI or an SUD with one year of follow-up time): Differences in average cost per person – NY/NY III tenants (N=320) vs. eligible applicants not placed in NY/NY III but could have been placed elsewhere (N=341)



** Statistically significant*
Data sources: DHS, DOC, DOHMH, HRA, OMH

Cost category	Adjusted costs for placed applicants	Adjusted costs for unplaced applicants
Jail	$1,385	$3,627
Single adult shelter	$15	$74
Family shelter	$0	$1
State psychiatric	$67	$118
Medicaid	$66,563	$63,921
Food stamps	$1,937	$1,858
Cash assistance	$11,198	$16,848
Institutional/Benefit total costs	$81,166	$86,447

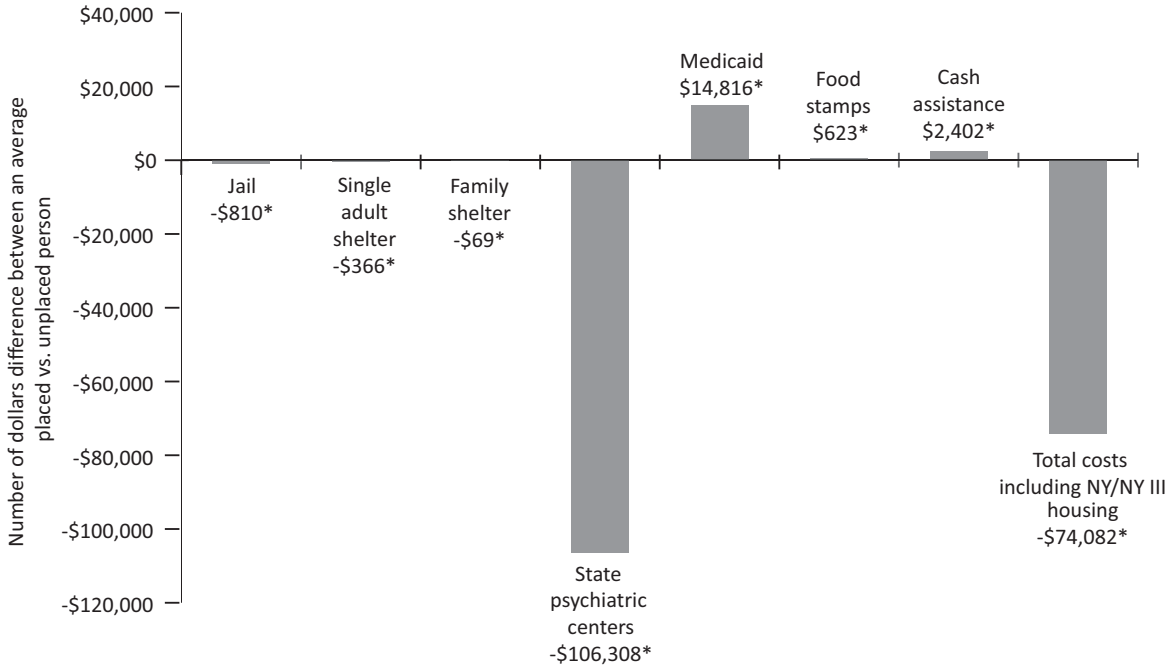
Appendix C

Population B Transitional: Individuals eligible for NY/NY III and placed in community care or transitional housing

Figures 13 and 14 show cost differences between single adults who had been in State-operated inpatient psychiatric facilities and were eligible for NY/NY III but were placed in community care or transitional housing versus people who met those same population criteria but were not placed in any housing tracked by the evaluation.

Jail costs were $810 less per person for individuals with at least one year of community care or transitional housing compared with unplaced

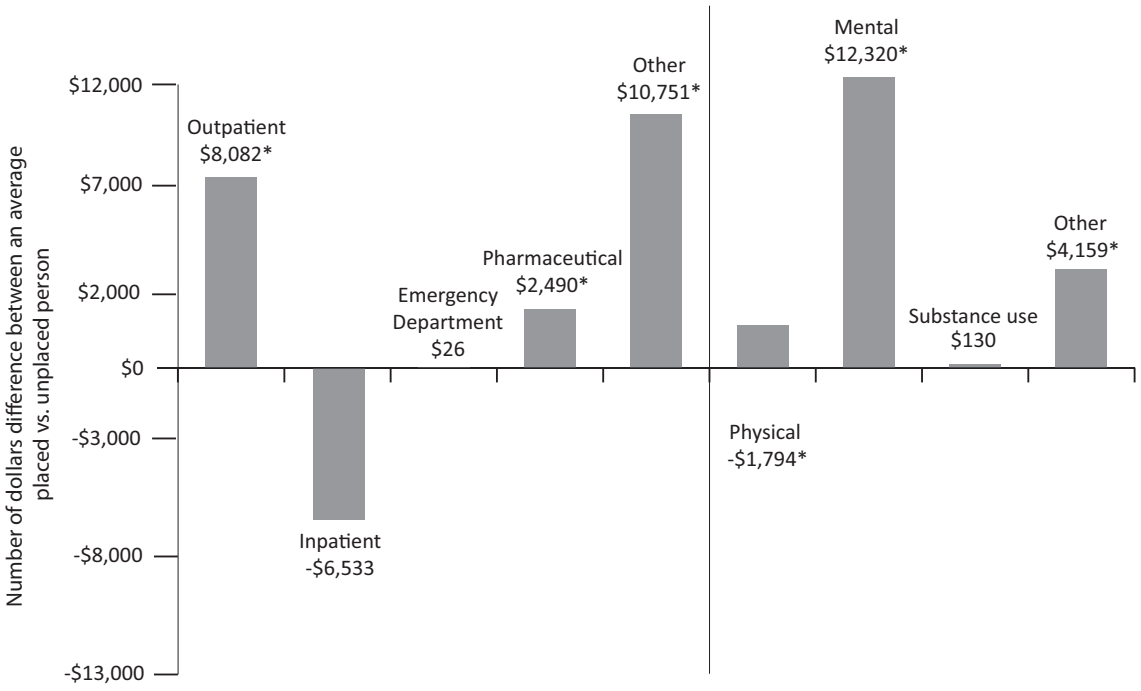
Figure 13: Population B transitionally housed with one year of follow-up time: Differences in average cost per person – NY/NY III tenants (N=136) vs. unplaced eligible applicants (N=906)



** Statistically significant*
Data sources: DHS, DOC, DOHMH, HRA, OMH

Cost category	Adjusted costs for placed applicants	Adjusted costs for unplaced applicants
Jail	$228	$1,038
Single adult shelter	$3	$369
Family shelter	$0	$69
State psychiatric	$4,193	$110,501
Medicaid	$37,931	$23,116
Food stamps	$900	$278
Cash assistance	$2,593	$191
Institutional/Benefit total costs	$45,849	$135,562
NY/NY III cost	$15,631	0
Total	$61,480	$135,562

Figure 14: Transitional population with one year of follow-up time: Differences in average Medicaid costs per person – NY/NY III tenants vs. unplaced eligible applicants



** Statistically significant*
Data sources: DHS, DOC, DOHMH, HRA, OMH

individuals, single shelter costs were $366 less, family shelter costs were $69 less, and State-operated psychiatric facility costs were $106,308 less (Figure 13). Individuals with at least one year of community care or transitional housing had $14,816 greater costs for Medicaid, $623 greater costs for food stamps, and $2,402 greater costs for cash assistance than unplaced individuals. Greater Medicaid costs were in large part due to outpatient care and mental health care (Figure 14). Overall, with NY/NY III service and operating costs taken into consideration, costs for tenants in community care or transitional housing were $74,082 less than those for unplaced individuals for all services, benefits, and jail use tracked by the evaluation.

Appendix D

Methodological approach

This appendix describes the propensity score matching and data analysis techniques used to determine differences in service and jail utilization between individuals placed in NY/NY III compared with those eligible but not placed. SAS software version 9.2 (SAS Institute INC, Cary, NYC) and R software version 2.14.2 (R Foundation for Statistical Computing) were used to conduct analyses.

Propensity score matching

Propensity score matching was used to account for differences in baseline characteristics between individuals placed and not placed in NY/NY III housing. This section of the appendix describes the theoretical and empirical framework that led us to select a specific propensity score matching option, optimal full matching with a time restriction, in the NY/NY III evaluation.

Variable selection for the propensity model

Step One

All applicants to NY/NY III completed an application for housing, which served as a primary source of baseline data. We identified variables in the NY/NY III application that were associated with use of benefits, services, and jail post-move-in or post-eligibility. The services, benefits, and jail data included the number of days in NYC jails, the number of days in NYC DHS single adult and family shelters, the number of days in NYS OMH inpatient facilities, cash assistance dollars, food stamp dollars, and Medicaid dollars. Medicaid outpatient, inpatient, pharmaceutical, and other usage costs were included as separate indicators. We ran a negative binomial regression for each variable in the NY/NY III application data and each type of service or benefit with statistical significance set at $p<.05$. Use of services or benefits was the dependent variable and the application variable was the independent variable. These regressions were run for each NY/NY III population separately. We also evaluated whether the difference between the placed and unplaced individuals in the application variables was statistically associated with placement status, using a chi-square test.

Step Two

Next, the statistically significant predictors of benefits, services, jail and placement in NY/NY III were included in a set of logistic regression models in which the dependent variable was placement in NY/NY III. The independent variables included the list of all statistically significant variables selected in the process described above. We removed variables with large standard errors that could introduce multicollinearity and that would prevent us from producing the correct parameter estimates. In addition, we used missing data indicators to address missing data in the selected covariates.

Step Three

We ran a final regression model to generate the parameter estimates that were then used to create the propensity scores. We used individuals' application and benefits/services data in conjunction with the coefficients from the parameter estimates to create a propensity score for each person.

Regression model:

$$\ln(p/1-p) \sim \beta\mathbf{X}$$

where p = probability of being placed in NY/NY III housing.

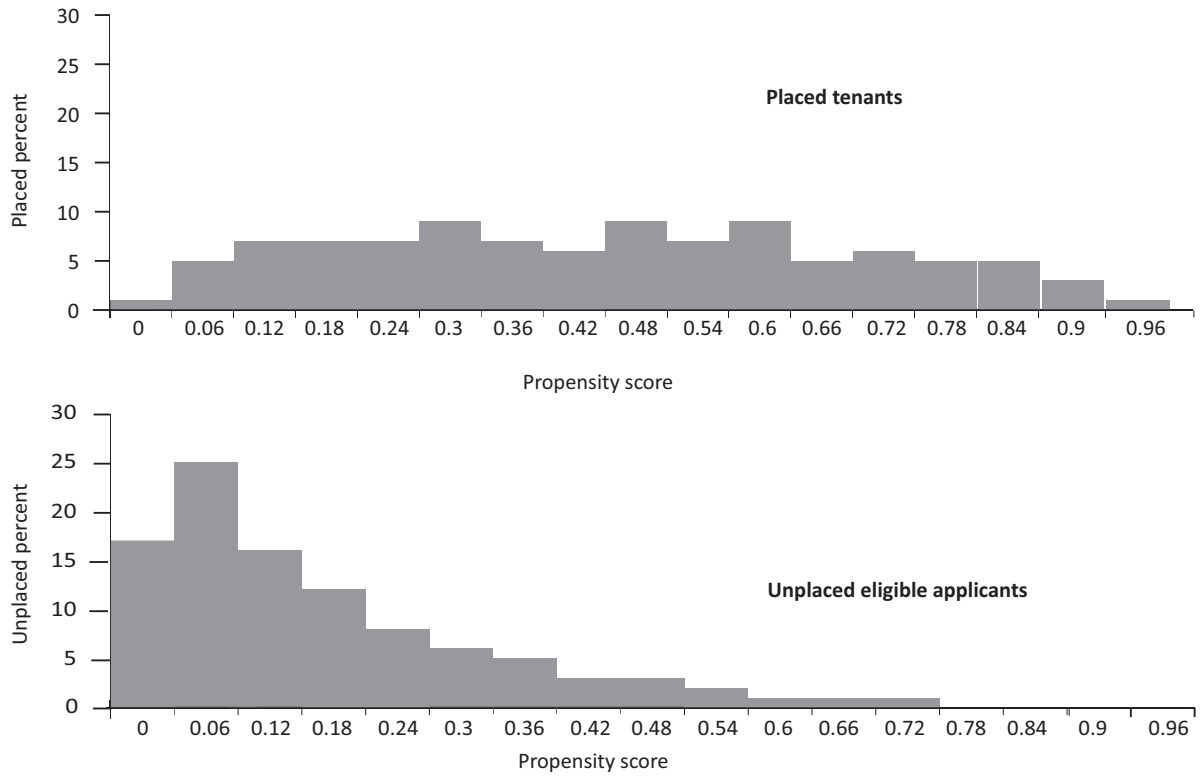
Covariates for the regression model (X) (variables remaining in the model after Steps One and Two were complete):

- Demographic characteristics
- Substance use
- Benefits received (reported in the NY/NY III application)
- Homeless and institutional experience
- Clinical diagnoses
- Historical and current indicators of mental illness
- Historical and current indicators of violence
- Recommendations for services
- Pre-treatment services, benefits, and jail use expressed as binary categories or tertiles (jail, single adult shelter, family shelter, OMH inpatient facilities, Medicaid, cash assistance, and food stamps, and quintile-based categories of total service/benefit costs.[9]

Results of the propensity model

For illustration purposes, in Figure 15 we included the distribution of predicted propensity scores by placement status (top: placed tenants; bottom: unplaced applicants) for Population A (chronically homeless individuals with SMI or dually diagnosed with mental illness and an SUD) with at least one year of follow-up time. We also grouped placed and unplaced individuals by quintiles of their propensity scores, which is useful for providing a general

Figure 15: Distribution of propensity scores by NY/NY III placement status among homeless single adults with SMI or who were dually diagnosed with mental illness and an SUD with one year of follow-up time (top: placed tenants; bottom: placed eligible applicants)



Data sources: DHS, DOC, DOHMH, HRA, OMH

9 We tried to capture some differences in cost distribution between placed and unplaced individuals, rather than just a linear trend associated with the likelihood of placement. To do this, we included quintile categories of total costs in the model. Categorized costs did not create a multicollinearity problem and were weakly associated with the dependent variable.

understanding of characteristics of those with low or high probability of being placed (data not shown).

Matching individuals by propensity scores

Matching options

We explored several matching options that used propensity scores to balance the covariates in the treatment and control groups.

1. **Subclassification:** Treatment and control groups were stratified based on quintiles of propensity scores.
2. **One-to-one greedy matching:** Treatment and control groups were first randomly sorted by propensity scores. Then a placed person was matched to an unplaced person based on the absolute value of the difference in propensity scores between two individuals. The unplaced person with the smallest difference was selected as a match. Once a pair of a placed and an unplaced person was created, the same procedure was performed for the next placed person. This iteration stopped when matching for the last placed person was performed. We conducted one-to-one greedy matching without replacement and with replacement.
3. **Optimal full matching:** Optimal full matching allowed each placed person to match to one or more unplaced individuals, and also allowed each unplaced person to match to one or more placed individuals. Matching was performed as an optimal solution to minimize the total sample distance of propensity scores, which resulted in non-overlapping matched sets of placed and unplaced individuals. Mathematically, matched sets were created to minimize

$$\Delta = \sum_{s=1}^{S} \varpi\left(|A_s|,|B_s|\right)\delta(A_s,B_s),$$

where $\varpi\left(|A_s|,|B_s|\right)$ was a weight function and δ was the difference in propensity scores between placed and unplaced individuals.[10]

Using R software,[11] we conducted optimal full matching with and without the constraint that controls should be found among those who first became eligible for NY/NY III during the same six-month period when NY/NY III tenants were first placed. The six-month periods were fixed (January – June 2007, July – December 2007, etc.). The purpose of imposing this constraint was to make pre- and post-intervention points closely overlap between placed and unplaced individuals who belonged to the same matched sets. Additionally, matching was performed separately with and without a propensity score caliper (i.e. with a caliper the difference in propensity score between treatment and control had to be <0.20).

Evaluation of the match

The absolute difference in covariates between placed and unplaced individuals for the variables used in each population model was calculated to evaluate the performance of matching options. Table 10 presents the average absolute difference divided by the overall standard deviation (absolute standardized difference) in covariates by matching options. Smaller numbers indicate a better match.

10 Grinstein-Weiss M, Charles P, Guo S, Manturuk K, Key C. The effect of marital status on home ownership among low-income households. *Social Service Review*. 2011;85(3)475-503.

11 Hansen's optmatch package was used with the following syntax to perform full matching with a time constraint (Hansen BB and Klopfer SO. Optimal full matching and related designs via network flows. *Journal of Computational and Graphical Statistics.* 2006;15(3): 609-627). Due to a technical error at the time the analysis was conducted we combined approximately 0-10% of the program participants, with variation across the populations, into strata with which they should not have been combined. A re-analysis of key findings indicated that the results did not change substantially, and therefore the original numbers have been preserved.

```
scalardiffs <-function(trtvar,data,scalarname)
{sclr<-data[names(trtvar),scalarname]
names(sclr)<-names(trtvar)
abs(outer(sclr[trtvar],sclr[!trtvar], '-'))}
psd2<-makedist(interven1~startdt, a, scalardiffs, "prob")
result<-fullmatch(psd2)
```

Table 10: Average absolute standardized difference in covariates between placed and unplaced individuals with one year of follow-up time across propensity score matching options

Matching options	A	B	E	F	D	G	I
No matching	0.14	0.40	0.18	0.09	0.17	0.23	0.34
Subclassification	0.06	0.34	0.04	0.01	0.16	0.10	0.20
One-to-one greedy matching without replacement	0.04	0.19	0.18	0.03	0.14	0.19	0.10
One-to-one greedy matching with replacement	0.06	0.26	0.09	0.05	0.21	0.12	0.08
Full matching without time restriction (without caliper)	0.03	0.08	0.02	0.02	0.08	0.05	0.06
Full matching with time restriction (without caliper)	0.03	0.09	0.05	0.03	0.08	0.06	0.05
Full matching with time restriction & upper limit (within caliper 0.2)	0.03	0.08	0.04	0.03	0.08	0.06	0.05

Data sources: DHS, DOC, DOHMH, HRA, OMH

We concluded that the full matching approach without a caliper minimum threshold, in which matches were limited to individuals who moved into NY/NY III or first became eligible within the same six-month period, was the best approach to use, both theoretically and for the data in the NY/NY III evaluation, for the following reasons:

- Optimal full matching with a time restriction controls for secular trends since we could perform matching of individuals placed and not placed in NY/NY III within the same six-month period.
- Unlike in one-to-one greedy matching, in optimal full matching most individuals were retained, while in greedy matching an equal number of placed and unplaced individuals were matched and the rest were dropped from analysis. For example, Population E with one year of follow-up time had 121 individuals dropped out of 791 eligible applicants after greedy matching. Population F with one year of follow-up time had 273 individuals dropped out of 1,291 after greedy matching, and Population I with one year of follow-up time had 177 individuals dropped out of 421.
  - In optimal full matching, a small number of unplaced individuals whose propensity scores were very different from those of placed individuals within the same six-month placement/eligibility period were unable to be matched in Population E (3 out of 791 placed and unplaced individuals), Population F (19 out of 1,291 placed and unplaced individuals), and population I (11 out of 421 placed and unplaced individuals).
- One-to-one greedy matching cannot perform matching if propensity scores do not overlap between treatment and control groups. This causes problems for some populations that have non-overlapping propensity scores between treatment and control groups. In contrast, the full matching algorithm is able to perform matching for treatment and control groups from non-overlapping regions because it does not focus on resolving local imbalance. Rather, it creates matched sets with the objective of minimizing global differences between two groups.[12]
- Full matching with the time restriction worked better for the NY/NY III data than one-to-one greedy matching and stratification for five out of seven populations. Table 11 illustrates some differences between placed and unplaced eligible NY/NY III applicants before versus after propensity score matching.

We decided not to use a caliper minimum threshold in the full matching approach since that would eliminate individuals from analysis. Full matching based on a full study cohort enabled us to answer the evaluation

12 Hansen BB and Klopfer SO. Optimal full matching and related design via network flows. *Journal of Computational and Graphical Statistics.* 2006;15(3):609-627.

Table 11: Differences at the time of application to NY/NY III between placed and unplaced individuals before versus after propensity score matching in the population of homeless single adults with SMI or who were dually diagnosed with mental illness and an SUD with one-year of follow-up time

	Before propensity score matching			After propensity score matching		
	Placed	Unplaced	Absolute difference	Placed	Unplaced	Absolute difference
Substance Use						
Past substance use pattern						
Never	21%	25%	4%	24%	25%	1%
Less than weekly	6%	6%	0%	6%	5%	1%
Once a week	6%	5%	1%	7%	6%	1%
Several times per week	27%	23%	4%	26%	26%	0%
Daily	28%	25%	4%	27%	27%	0%
Currently participating in a substance use treatment course	26%	22%	5%	24%	23%	1%
Successful completion or participation in a course of substance use treatment	19%	12%	7%	17%	16%	1%
Hospitalization						
Currently incarcerated, hospitalized, in foster care or in some other type of institution	2%	5%	3%	2%	2%	0%
Estimated number of psychiatric hospitalizations in past 3 years						
0	21%	20%	1%	22%	23%	1%
1+	27%	36%	9%	29%	30%	1%
Missing	52%	44%	8%	49%	47%	2%
Currently hospitalized	2%	4%	2%	2%	3%	1%
Activities of Daily Living						
# of areas of assistance required for ADL						
0	79%	71%	8%	78%	79%	1%
1	12%	16%	3%	12%	11%	1%
2-3	8%	10%	2%	9%	9%	0%
4+	1%	3%	2%	2%	2%	0%
Recommendations for type of housing and services						
Eligible for scatter-site program	63%	40%	23%	56%	57%	1%
Recommendation – review for Assisted Outpatient Treatment	1%	9%	8%	2%	2%	0%
Recommendation – medication management	40%	56%	16%	44%	43%	1%
Recommendation – 24 hour supervision	2%	15%	13%	3%	3%	0%
Recommendation – Mental Illness and Chemical Addiction treatment program	13%	25%	11%	15%	14%	1%
Recommendation – case management	77%	84%	7%	77%	76%	1%

Table 11 continued on page 37

Table 11 Continued

	Before propensity score matching			After propensity score matching		
	Placed	Unplaced	Absolute difference	Placed	Unplaced	Absolute difference
Costs two years pre-NY/NY III placement or eligibility						
Medicaid inpatient						
Low ($0)	51%	41%	10%	49%	50%	1%
Medium ($197-$15,416)	22%	23%	2%	21%	20%	1%
High ($15,453-$460,645)	27%	35%	8%	30%	30%	0%
Medicaid outpatient						
Low ($0-$582)	23%	37%	14%	26%	28%	2%
Medium ($591-$6,432)	36%	32%	4%	36%	37%	1%
High ($6,434-$103,784)	41%	31%	10%	38%	36%	2%
Medicaid emergency department						
Low ($0)	37%	37%	0%	37%	39%	2%
Medium ($16-$560)	31%	29%	2%	32%	31%	1%
High ($563-13,579)	32%	34%	2%	31%	30%	1%
Medicaid pharmaceutical						
Low ($0-$389)	26%	36%	10%	28%	30%	2%
Medium ($391-$4,811)	32%	34%	2%	32%	32%	0%
High ($4,813-$102,991)	42%	30%	12%	40%	38%	2%
Medicaid other						
Low ($0-$1,298)	29%	35%	5%	31%	32%	1%
Medium ($1,304-$4,733)	35%	33%	3%	36%	35%	1%
High ($4,737-$193,740)	35%	33%	3%	33%	33%	0%
Food stamps						
Low ($0-$1,029)	23%	37%	13%	27%	28%	1%
Medium ($1,030-$2,827)	30%	34%	4%	33%	32%	1%
High ($2,830-$11,582)	47%	29%	17%	40%	40%	0%
Cash assistance						
Low ($0)	29%	44%	15%	34%	36%	2%
Medium ($12-$884)	27%	26%	1%	26%	26%	0%
High ($895-$55,707)	45%	30%	15%	40%	39%	1%
Days in single-adult shelters						
Low (0 - 124 days)	32%	34%	1%	32%	34%	2%
Medium (125 days - 453 days)	25%	36%	11%	29%	27%	2%
High (454 days - 730 days)	42%	30%	12%	39%	38%	1%
Days in jail						
Low (0 day)	86%	81%	5%	85%	85%	0%
High (1 day - 418 days)	14%	19%	5%	15%	15%	0%
Days in family shelter						
Low (0 day)	95%	95%	0%	96%	94%	2%
High (3 days - 729 days)	5%	5%	0%	4%	6%	2%
Days in NYS-operated psychiatric facilities						
Low (0 day)	100%	97%	2%	100%	99%	1%
High (4 days - 730 days)	0%	3%	2%	0%	1%	1%
Total cost						
Quintile 1 ($0-$30,994)	18%	21%	3%	18%	19%	1%
Quintile 2 ($31,143-$51,803)	18%	21%	3%	19%	20%	1%
Quintile 3 ($51,866-$70,950)	24%	19%	5%	24%	25%	1%
Quintile 4 ($70,951-$105,024)	25%	19%	6%	21%	19%	2%
Quintile 5 ($105,078-$572,634)	16%	21%	5%	17%	17%	0%

Data sources: DHS, DOC, DOHMH, HRA, OMH

questions with more validity, which outweighed the benefits in shrinking the difference in the size of covariates between placed and unplaced individuals.

Statistical analysis

The null hypothesis was that costs from public service/benefits use post-intervention were not different between placed tenants and unplaced applicants. Characteristics of the data posed unique analytic challenges that needed to be addressed in the hypothesis testing. There were two major constraints.

Constraint 1: Stratification as a result of propensity score matching

Propensity score matching produced sets where placed individuals were matched with unplaced individuals who shared similar baseline characteristics and public service/benefit use prior to the intervention. Accounting for this stratification by matching allowed us to balance observed differences at baseline between placed and unplaced individuals. However, having multiple individuals within matched sets made it difficult to conduct conventional types of regression analyses. We did attempt conditional regression analysis, but it included only records whose cost for placed tenants was different than the cost for unplaced applicants and, therefore, did not produce estimated cost differences between placed and unplaced eligible applicants.

Constraint 2: Skewed distribution of the outcome

The outcomes of the NY/NY III evaluation were aggregate counts of public service/benefit use. These included the cost of days spent in facilities and dollar-costs incurred from other services/benefits. Because count data is greater than or equal to zero and many individuals used zero quantities of some of these services/benefits, the data were right-skewed. We explored several statistical options to account for the skewed distribution, and evaluated pros and cons of each option to determine the best statistical method.

OPTION 1: Mixed Modeling

Mixed modeling is a popular analytic method when individual-level outcomes are assumed to be correlated within a group (in our case, in a matched-set).[13] It can also address a skewed distribution problem by specifying a Poisson or negative binomial link function. In this approach, an effect of NY/NY III housing could be modeled as an exponentiation of the regression coefficient for the placement indicator. A p-value associated with this coefficient would represent the statistical significance of the effect. However, a preliminary run of mixed modeling showed that between-matched-set variance of the outcome in mixed modeling was almost zero, implying that heterogeneity of the outcome at the matched-set-level may not be a realistic assumption. This led us to conclude that clustering by propensity score matching (i.e., dependency of the outcome by matched-sets) was highly unlikely, and the predicted means from mixed modeling were almost identical with the raw means, which further verified this conclusion.

OPTION 2: Negative binomial regression model

We could directly account for stratification by including dummy variables of strata as independent variables in a regression model. Alternatively we could achieve the same goal by including all covariates used to predict propensity scores in the regression model, instead of including propensity-score-matching strata. In this model-based approach, a count model such as a negative binomial model is more appropriate than an Ordinary Least Square (OLS) regression model because it has been shown to produce a more valid estimate of over-dispersed count data.[14] Similar to

13 Gardiner JC, Luo Z, Roman LA. Fixed effects, random effects and GEE: what are the differences? *Statistics in Medicine*. 2009;28(2):221-239.

14 King, Gary. Statistical Models for Political Science Event Counts: Bias in Conventional Procedures and Evidence for the Exponential Poisson Regression Model. *American Journal of Political Science* 32 (1988): 838-863.

Option 1, an effect of NY/NY III housing and its statistical significance is an exponentiation of the regression coefficient of a placement indicator and its p-value. However, including a large number of independent variables could lead to overfitting the data. The results, characterized by overestimates, cannot be generalized beyond the data.

OPTION 3: Hodges-Lehmann Aligned Rank Test

The Wilcoxon signed-rank test is a common method to test the treatment effect if a placed person is paired with an unplaced person.[15] The Hodges-Lehmann (H-L) test is conceptually similar to this method, but is able to account for matched sets. The H-L test could also address the second constraint in the NY/NY III evaluation data – skewed distribution of the outcomes – because it does not assume any parametric assumption. It has been found to be more efficient than tests based on a normality assumption (e.g., t-test). We tried conducting the H-L test using the following steps:[15]

1. Center each matched set by subtracting a set-mean outcome from each outcome.
2. For all of the sets, rank these outcomes that have been centered.
3. Compute the H-L mean by subtracting an expected sum of ranking for the placed individuals from the sum of the ranking for the placed individuals

   $= (= \sum_{i=1}^{b} \sum_{j=1}^{n_{it}} R_{ij} - \sum_{i=1}^{b} n_i \bar{R}_i)$

   where R_{ijt} = ranking of response for *t (treatment) = 1, 2* and *j (response within placed or unplaced individuals) = 1, 2, …,*n_{it} in i[th] matched set.
4. Compute H-L variance by using the following formula: $\sum_{i=1}^{b} \frac{n_i \times m_i}{N_i (N_i - 1)} (R_i - \bar{R}_i)^2$
5. Compute the z score by dividing the H-L mean by the H-L standard error. The p-value is obtained via the normal approximation of this z score.

To present the magnitude of the effect of NY/NY III housing, along with the p-value from the H-L test, we inverted the H-L test with the null hypothesis of an additive effect using the following steps:[16–18]

1. Since additive effects are not known, we pre-determined an amount of dollars or days of service/benefit use as an estimate of the difference in the outcome between placed and unplaced individuals (denoted as *t*).
2. We then subtracted that pre-determined amount from each individual's actual dollar amount or days of service/benefit used only among placed individuals (Y_1-*t*).
3. After adjusting Y_1 by *t*, we ran the H-L test of the null hypothesis that Y_1-*t* =Y_2. An additive effect (*t*) that yielded a two-sided p-value of 1.0 from the H-L test was the point estimate of difference (known as the Hodges-Lehmann point estimate). Likewise, an additive effect that yielded a one-sided p-value 0.025 was either a low or an upper end of the 95% confidence interval.
4. If a pre-determined t failed to produce a two-sided p-value of 1.0, steps 1-3 were repeated using a new value (an incremental change of a greater or smaller pre-determined amount). We also repeated this iterative process to calculate the confidence intervals.
5. The whole process was iterated until an additive effect with a desired p-value was identified.

15 Haviland A, Nagin DS, Rosenbaum PR. Combining propensity score matching and group-based trajectory analysis in an observational study. *Psychological Methods*. 2007;12(3):247-267.

16 Rosenbaum PR. *Design of Observational Studies*. New York, NY: Springer, 2010.

17 Hodges JL, Lehmann EL. Estimates of location based on rank tests. *Annals of Mathematical Statistics*. 1963;34(2):598-611.

18 Hodges JL, Lehmann EL. Rank methods for combination of independent experiments in analysis of variance. *The Annals of Mathematical Statistics*. 1962;33(2):482-497.

For the outcomes with a large proportion of zero's, such as days in jails, homeless shelters, and State psychiatric inpatient facilities, we could report the average public service use over one year after intervention for both the placed and unplaced groups as a mean of a weighted average.

The average public service use over one year after intervention for placed individuals:

$$\sum_{i=1}^{b} \frac{n_i + m_i}{N} \overline{Y}_{1i},$$

The average public service use over 1 year after intervention for unplaced individuals:

$$\sum_{i=1}^{b} \frac{n_i + m_i}{N} \overline{Y}_{0i}$$

However, we found that a drawback of the H-L approach was that results were difficult to interpret because sub-components of costs did not add up to the whole cost. Therefore, we considered, and finally chose, an alternative approach: weighted means.

SELECTED OPTION: Weighted means

Ultimately we decided to use weighted means. First we computed the mean outcome per each stratum. Then, weighting by the relative size of the strata, we computed a weighted mean of the stratum-specific means. An alternative weight could have been the relative size of only the placed individuals in each stratum, as opposed to both placed and unplaced individuals combined, but we decided to use the combined weight because of our interest in accounting for matching structures that make baseline differences between placed and unplaced individuals balanced. Table 12 illustrates this computation process.

The advantage of this approach is that the mean summed cost is always identical to the sum of mean cost components. However, since mean cost is very sensitive to outliers, it is not guaranteed that the estimate represents a central tendency of the data. A statistical test of mean difference could be carried out via t-test, but given the skewness of the data, the t-test is likely to violate the normality assumption. Outliers tend to increase variance estimates, which in turn decrease the power of rejecting the null hypothesis. Transformation may be considered to be a fix of skewness, but it is not effective if the sample sizes are small.

Given the skewness of the data, we decided to use bootstrapping to test for statistical significance. Bootstrapping is a method used to derive the sampling distribution of an estimator by sampling the original data with replacement when parametric inference is not attainable due to a violation of major assumptions, such as normality or the complex formula for the standard errors.[19] The heavy-tailed distribution of NY/NY III cost outcomes and use of weighted means provide the rationale for employing bootstrapping to estimate valid 95% confidence intervals (CI). In this analysis, we created 10,000 bootstrap datasets that contained the propensity score for each placed and unplaced individual, placement status, and the cost outcome of the specific analysis being conducted. We used "PROC SURVEYSELECT" in SAS to generate 10,000 randomly-sampled datasets with replacement. In each of these datasets every individual had the same likelihood of being selected, but the number of times that each individual appeared in the dataset varied across datasets because we chose the starting seed number and made it increase by 1 in each run of selection. Because the composition of each of the 10,000 samples was different each time, we ran propensity score matching for each of the 10,000 samples, and computed the weighted mean cost difference for each sample. We then created a dataset with the 10,000 weighted means. In order to determine the lower and upper bounds of a 95% CI, we selected the 250th and 9,750th weighted means within that dataset.

19 Efron B,Tibshirani RJ. *An Introduction to the Bootstrap*. Boca Raton, FL: Chapman & Hall/CRC. 1993.

Table 12: Illustration of weighted mean approach

ID	Strata (= matched sets)	Size of strata	Weights	Placement	Costs	Stratum-average
1	1	3	3/12	1	$1,000	$1,500
2	1			1	$2,000	
3	1			0	$1,000	$1,000
4	2	3	3/12	1	$5,000	$5,000
5	2			0	$3,000	$3,500
6	2			0	$4,000	
7	3	4	4/12	1	$2,000	$3,500
8	3			1	$5,000	
9	3			0	$6,000	$3,350
10	3			0	$700	
11	4	2	2/12	1	$8,000	$8,000
12	4			0	$4,000	$4,000

$$\text{Weighted mean} = \sum_{h=1}^{H} \frac{N_h}{N} \overline{Y}_h = 3/12*(1{,}500-1{,}000) + 3/12*(5{,}000-3{,}500) + 4/12*(3{,}500-3{,}350) + 2/12*(8{,}000-4{,}000) = 1{,}217$$

In order to conduct data checking, two analysts ran the bootstrapping using different random seeds. In the rare cases when two results did not yield the same determination of statistical significance, meaning that the upper and lower bounds in one analysis crossed or included zero and in the other one did not, analysts repeated this procedure using 50,000 bootstrap datasets since greater replications make the bootstrap distribution much closer to the original one. If after repeating the procedure using 50,000 bootstrap datasets and two different seeds, the results were still different, we considered the difference in weighted means to be not statistically significant. The results of the bootstrapping are reflected in this report in the asterisks indicating statistical significance.

Bootstrapping may have two limitations in producing correct CIs even after random replications. First, bootstrap estimates could be biased to the estimate from the original data. Second, the standard error of each bootstrap estimate could vary against the true value.[19] To address these problems, we calculated bias as the proportion of the weighted means created from the 10,000 bootstrap results that are smaller than the point-estimate weighted means. This enabled us to account for the central tendency of the bootstrap results.[20] Using the estimated bias, we then corrected the bootstrap distributions and obtained two percentile values associated with the true lower and upper bounds of the CIs. Corresponding bootstrap means of these percentiles were considered accelerated bias corrected 95% CI. We determined that the difference between placed and unplaced individuals was statistically significant if the null value (i.e., cost difference between placed and unplaced individuals = 0) was not contained in the 95% CI. In bootstrapping, a conventional p-value is derived by two times the one-sided test ($P(T \geq T_0 | H_0)$), which may not be applied to NY/NY III data because equal-tailed two-sided intervals are violated.[19,21]

In sum, after weighing the benefits and drawbacks of each approach, we decided to use adjusted means, with bootstrapping to test for statistical significance.

20 Ideally, we would also calculate an acceleration statistic as a degree of how much each bootstrap mean influences the overall mean of the bootstrap by using jackknife replications (Efron and Tibshirani, 1993). However, we found that it took many days of running our computer programs in order to generate this statistic, and decided not to proceed with that additional step.

21 Boos DD. Introduction to the bootstrap world. *Statistical Science.* 2003;18(2):168-174.

Health care utilization measures

Health care utilization measures were constructed in the following ways:

- Ambulatory Care Sensitive (ACS) hospitalizations were identified as those where the primary diagnosis had in the first four digits of ICD-9 codes: 7803, 4721, 2501, 2502, 2503, 2508, 2509, 2500, 2512, 5589, 5990, 5999, 2765, 2680, 2681, 4660, 4822, 4823, 4829, 5184, 4010, 4019, 4111, 4118, 3200, 2801, 2808, 2809, 7834, 7070, 7071, 7078, or 7079. Alternatively, the first five digits were: 40201, 40211, 40291, 40210, 40290, or 40200. ACS categorization was informed by Billings J, Parikh N, Mijanovich T. Emergency Department Use in New York City: A Substitute for Primary Care? New York, NY:The Commonwealth Fund Issue Brief; November 2000.
- Injury-related hospitalizations and emergency department visits were identified as those where the first digit of ICD-9 codes in the primary diagnosis field was 8 or 9.
- Evaluation and management visit was defined by the following procedure codes: 99201-99205, 99211-99215, 99241-99245.
- Diabetes was defined as any diagnosis field including ICD-9 codes in which the first three digits were 250 or 790, the first four digits were 7915, 7916, or 2500, or codes 25000, 25001, V6546, V5391, or V4585.
- Schizophrenia was defined as any diagnosis field of ICD-9 code in which the first three digits were 295. Schizophrenia medication was defined by drug therapeutic code 20250.
- Hypertension was defined as any diagnosis field including the following ICD-9 codes in which the first three digits were 401, 402, 403, 404, or 405, or the first four digits were 4010 or 4372.
- Asthma was defined as any diagnosis field including ICD-9 codes in which the first three digits were 493.
- Lung disease was defined as any diagnosis field including the following ICD-9 codes in which the first three digits were 490, 491, 492, 494, 496, 500, 501, 502, 503, 504, 506, 515, 516, or 517 or the first four digits were 5078.
- "Discovery" of diabetes and other chronic disease was defined as a diagnosis of the disease among individuals who did not have a diagnosis of that disease during the two years prior to NY/NY III move-in or eligibility. Chronic conditions were identified if there was at least one inpatient claim or at least two non-inpatient claims related to the condition. This approach was informed by two sources:
  - Quam L, Ellis LBM, Venus P, et al. Using claims data for epidemiologic research: The concordance of claims-based criteria with the medical record and patient survey for identifying a hypertensive population. *Medical Care* 1993; 31(6):498-507.
  - Fowles JB, Lawthers AG, Weiner JP, et al. Agreement between physicians' office records and Medicare Part B Claims Data. *Health Care Financing Review* 1995; 16(4):189-199.
- Many of the preventive and avoidable health care measures were informed by several sources:
  - The 2010 Healthcare Effectiveness Data and Information Set (HEDIS) measures (Volume 2, technical specifications) published by the National Committee for Quality Assurance (NCQA).
  - Billings J. Findings from small area analysis of ambulatory care sensitive (ACS) conditions, Hudson-Bergen counties, 1989-1990, Local advisory board II, Hacksensack, NJ: Fairleigh Dickinson University; 1993.
  - Dr. Tod Mijanovich, New York University.

- Mental health care measures were informed by two sources:
  - Hermann RC. *Improving Mental Healthcare: A Guide to Measurement-Based Quality Improvement*. Arlington, VA:American Psychiatric Publishing, Incorporated; 2005.
  - Hermann RC, Mattke S, Somekh D et al. Quality indicators for international benchmarking of mental health care. *International Journal for Quality Health Care.* 2006; 18(Suppl 1):31-38.

Table 13: Unadjusted measures of avoidable health care utilization during one year after NY/NY III move-in or eligibility, without taking into account differences between placed and unplaced NY/NY III eligible applicants

Health care measures	Number of individuals in the denominator*	Overall (raw %)	Placed (raw %)	Unplaced (raw %)
Hospitalization	5,395	31%	24%	35%
Ambulatory Care Sensitive (ACS, also called "preventable") hospitalization	5,395	7%	6%	7%
Injury-related hospitalization	5,395	3%	3%	4%
Psychiatric hospitalization	5,395	12%	5%	16%
Substance use-related hospitalization	5,395	12%	10%	12%
Emergency department (ED) visit	5,395	36%	32%	38%
ACS ED visit	5,395	11%	10%	12%
Injury-related ED visit	5,395	9%	7%	10%
Psychiatric ED visit	5,395	9%	5%	11%
Substance use-related ED visit	5,395	7%	5%	8%

** Denominators include all placed and unplaced individuals.*
Data sources: DHS, DOC, DOHMH, HRA, OMH

Table 14: Unadjusted measures of preventive health care utilization during one year after NY/NY III move-in or eligibility, without taking into account differences between placed and unplaced NY/NY III eligible applicants

Health care measures	Number of individuals in the denominator*	Overall (raw %)	Placed (raw %)	Unplaced (raw %)
Any "evaluation and management visit"	5,395	50%	54%	49%
Individuals with diabetes at baseline who received an HbA1c test during follow-up year	910	19%	19%	19%
Individuals with schizophrenia at baseline who received schizophrenia medication during follow-up year	2,315	49%	54%	47%
Any dental visit	5,395	32%	34%	30%
Discovery of diabetes	4,485	7%	5%	7%
Discovery of hypertension	3,898	9%	7%	10%
Discovery of asthma	4,463	4%	3%	5%
Discovery of lung disease	4,869	4%	3%	4%

** Denominators include all placed and unplaced individuals.*
Data sources: DHS, DOC, DOHMH, HRA, OMH

Table 15: Unadjusted measures of mental health care utilization during one year after NY/NY III move-in or eligibility, without taking into account differences between placed and unplaced NY/NY III eligible applicants

Health care measures	Number of individuals in the denominator*	Overall (raw %)	Placed (raw %)	Unplaced (raw %)
Follow-up visit to outpatient clinic for mental illness treatment within 30 days after inpatient hospitalization for mental illness	597	27%	43%	25%
Follow-up visit to outpatient clinic for mental illness treatment within 7 days after inpatient hospitalization for mental illness	597	17%	22%	16%
Any psychiatric hospitalization among individuals with mental illness (Mental illness is defined through the NY/NY III application)	4,940	13%	5%	17%
Any psychiatric ED visit among individuals with mental illness (Mental illness is defined through the NY/NY III application)	4,940	10%	6%	12%
2+ visits to outpatient clinic for mental illness treatment during 6 months after inpatient hospitalization for mental illness	344	28%	56%	25%
Monthly visit to outpatient clinic for mental illness treatment during 6 months after inpatient hospitalization for mental illness	344	7%	16%	6%
No outpatient visit for mental illness treatment within 90 days after outpatient visit for mental illness treatment	1,346	10%	9%	11%
Readmission to the hospital within 7 to 30 days after inpatient hospitalization for mental illness	597	30%	16%	32%

** Denominators include all placed and unplaced individuals.*
Data sources: DHS, DOC, DOHMH, HRA, OMH

Appendix E

Adjusted number of days of institutional use after NY/NY III eligibility or placement

Table 16: Differences between NY/NY III tenants and unplaced applicants in adjusted average number of days of institutional use per person one year post NY/NY III

	Cost category	Adjusted days for placed applicants	Adjusted days for unplaced applicants
A: SMI or mental illness & SUD	Jail	1	8
	Family adult shelter	0	4
	Single shelter	6	141
	State psychiatric centers	0	2
B: From State psychiatric facilities	Jail	0	4
	Family adult shelter	0	1
	Single shelter	0	5
	State psychiatric centers	6	151
E: SUD	Jail	2	7
	Family adult shelter	0	2
	Single shelter	1	119
	State psychiatric centers	0	0
F: Treated SUD	Jail	1	9
	Family adult shelter	0	3
	Single shelter	1	58
	State psychiatric centers	0	0
D: Family with SMI	Jail	0	0
	Family adult shelter	1	171
	Single shelter	0	2
	State psychiatric centers	0	0
G: Family with SUD/ medical illness/ HIV/AIDS	Jail	1	8
	Family adult shelter	1	171
	Single shelter	0	6
	State psychiatric centers	0	0
I: Young adults	Jail	0	4
	Family adult shelter	0	4
	Single shelter	1	9
	State psychiatric centers	0	7
Combined populations	Jail	2	7
	Family adult shelter	0	14
	Single shelter	2	77
	State psychiatric centers	1	26

Data sources: DHS, DOC, DOHMH, HRA, OMH

Appendix F

Adjusted Medicaid costs after NY/NY III eligibility or placement

Table 17: Differences between NY/NY III tenants and unplaced applicants in adjusted outpatient, inpatient, emergency department, pharmaceutical, and other Medicaid utilization per person one year post NY/NY III

	Cost category	Adjusted costs for placed applicants	Adjusted costs for unplaced applicants
A: SMI or mental illness & SUD	Outpatient	$4,279	$3,069
	Inpatient	$6,689	$11,803
	Emergency Department	$205	$421
	Pharmaceutical	$3,063	$2,751
	Other	$5,682	$4,829
B: From State psychiatric facilities	Outpatient	$9,573	$2,053
	Inpatient	$8,584	$15,639
	Emergency Department	$194	$206
	Pharmaceutical	$5,095	$1,212
	Other	$11,901	$4,310
E: SUD	Outpatient	$3,093	$2,981
	Inpatient	$4,625	$10,398
	Emergency Department	$278	$688
	Pharmaceutical	$1,026	$1,596
	Other	$2,129	$4,198
F: Treated SUD	Outpatient	$5,764	$5,706
	Inpatient	$3,427	$5,421
	Emergency Department	$173	$275
	Pharmaceutical	$3,310	$2,832
	Other	$2,187	$2,125
D: Family with SMI	Outpatient	$3,122	$4,694
	Inpatient	$1,063	$2,425
	Emergency Department	$44	$228
	Pharmaceutical	$3,625	$4,193
	Other	$2,268	$3,339
G: Family with SUD/ medical illness/ HIV/AIDS	Outpatient	$4,890	$4,854
	Inpatient	$2,924	$3,120
	Emergency Department	$254	$220
	Pharmaceutical	$3,467	$1,886
	Other	$4,808	$5,982
I: Young adults	Outpatient	$451	$474
	Inpatient	$187	$3,904
	Emergency Department	$93	$145
	Pharmaceutical	$411	$233
	Other	$678	$1,691
Combined populations	Outpatient	$5,997	$3,482
	Inpatient	$3,686	$9,300
	Emergency Department	$183	$350
	Pharmaceutical	$2,626	$2,241
	Other	$5,643	$3,696

Data sources: DHS, DOC, DOHMH, HRA, OMH

Table 18: Differences between NY/NY III tenants and unplaced applicants in adjusted Medicaid utilization for physical illness, mental illness, substance use, and other needs per person one year post NY/NY III

	Cost category	Adjusted costs for placed applicants	Adjusted costs for unplaced applicants
A: SMI or mental illness & SUD	Physical	$3,654	$7,724
	Mental	$7,625	$7,103
	Substance use	$2,473	$3,009
	Other	$6,165	$5,037
B: From State psychiatric facilities	Physical	$1,953	$3,342
	Mental	$24,955	$16,708
	Substance use	$99	$509
	Other	$8,339	$2,862
E: SUD	Physical	$4,641	$9,706
	Mental	$200	$1,302
	Substance use	$3,485	$5,039
	Other	$2,823	$3,813
F: Treated SUD	Physical	$4,038	$3,848
	Mental	$544	$1,589
	Substance use	$5,139	$6,313
	Other	$5,140	$4,610
D: Family with SMI	Physical	$940	$3,338
	Mental	$1,819	$2,628
	Substance use	$1,556	$2,215
	Other	$5,806	$6,699
G: Family with SUD/ medical illness/ HIV/AIDS	Physical	$4,469	$8,362
	Mental	$573	$332
	Substance use	$3,969	$3,945
	Other	$7,330	$3,423
I: Young adults	Physical	$518	$1,103
	Mental	$241	$3,669
	Substance use	$38	$179
	Other	$1,022	$1,496
Combined populations	Physical	$2,770	$5,476
	Mental	$8,096	$5,879
	Substance use	$2,395	$3,497
	Other	$4,872	$4,217

Data sources: DHS, DOC, DOHMH, HRA, OMH

Appendix G

Raw service utilization of NY/NY III eligible applicants prior to NY/NY III eligibility or placement

Table 19: Average per-person raw service utilization of NY/NY III eligible applicants with one year of follow-up time prior to NY/NY III eligibility or move-in, placed and unplaced applicants combined

	Individuals with SMI		Individuals with an SUD		Families		Young adults	Combined populations	Individuals with HIV/AIDS	Transitional housing
	A	B	E	F	D	G	I	A,B,E,F,D,G,I	H	Transitional B
Costs during one year before eligibility or placement										
Jail	$1,075	$1,122	$1,716	$1,318	$47	$181	$581	$1,064	$2,966	$1,101
Single shelter	$13,985	$484	$10,058	$5,896	$392	$96	$554	$7,382	$165	$428
Family shelter	$224	$102	$230	$102	$27,823	$31,110	$167	$2,301	$43	$92
Psychiatric center	$1,640	$138,282	$0	$176	$0	$0	$4,742	$24,032	$258	$140,772
Medicaid cost	$21,608	$37,538	$17,232	$21,650	$14,926	$16,521	$3,985	$21,662	$62,223	$36,845
Food stamps	$1,121	$240	$1,245	$1,426	$2,796	$2,749	$450	$1,127	$1,696	$253
Cash assistance	$804	$118	$954	$4,043	$10,479	$9,778	$181	$2,062	$18,202	$116
Days during one year before eligibility or placement										
Jail	4	5	7	5	0	1	2	4	12	5
Single shelter	193	7	135	79	5	1	7	101	2	6
Family shelter	2	1	2	1	262	294	2	22	0	1
Psychiatric center	2	184	0	0	0	0	6	32	0	187
Number of inpatient visits	1	1	2	1	0	1	0	1	3	1
Number of ED visits	2	1	3	1	1	1	0	1	2	1

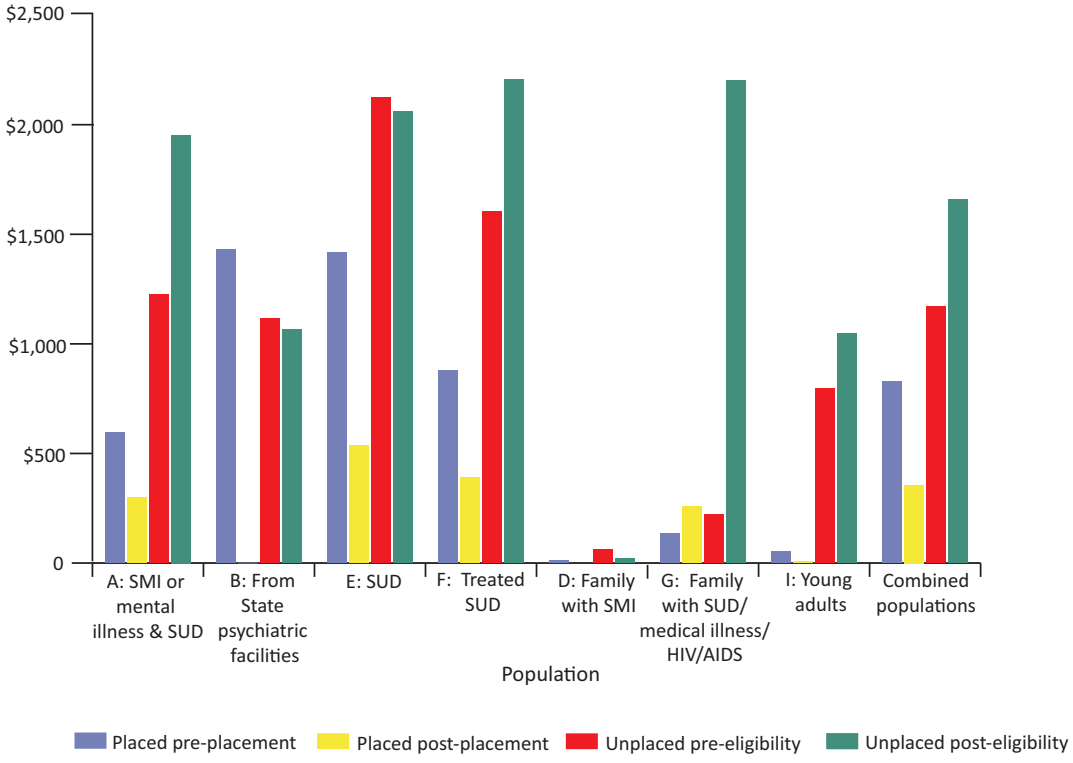
Data sources: DHS, DOC, DOHMH, HRA, OMH

Appendix H

Raw costs of placed and unplaced NY/NY III eligible applicants without controlling for differences between them

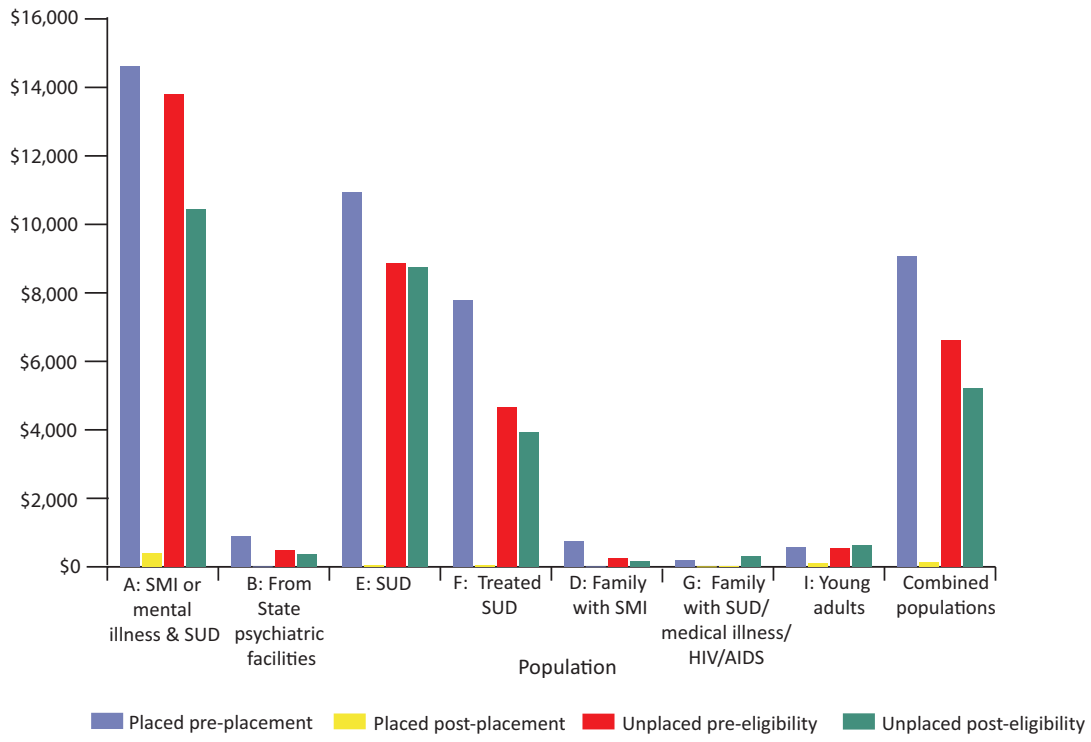
As background to the costs of services and jail used by NY/NY III placed and unplaced eligible applicants taking into account differences between them at baseline using propensity score matching, we show the raw amount of utilization before versus after NY/NY III move-in or eligibility, taking into account only inflation. These numbers do not allow for conclusions to be drawn about cost savings since they do not control for baseline differences between individuals placed in the program versus unplaced. Nevertheless, they are a useful indicator of the magnitude of services and jail being used.

Figure 16: Raw jail costs for NY/NY III eligible applicants one year before and one year after NY/NY III move-in or eligibility, without controlling for differences between placed and unplaced individuals



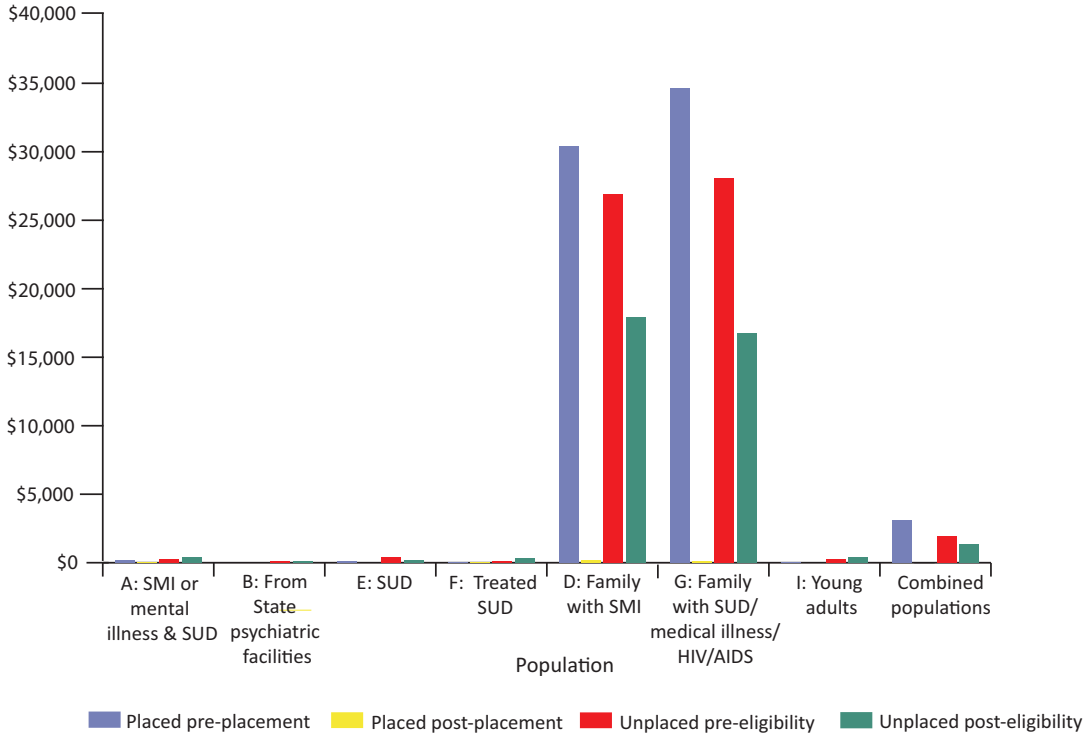
Data sources: DHS, DOC, DOHMH, HRA, OMH

Figure 17: Raw single adult shelter costs for NY/NY III eligible applicants one year before and one year after NY/NY III move-in or eligibility, without controlling for differences between placed and unplaced individuals



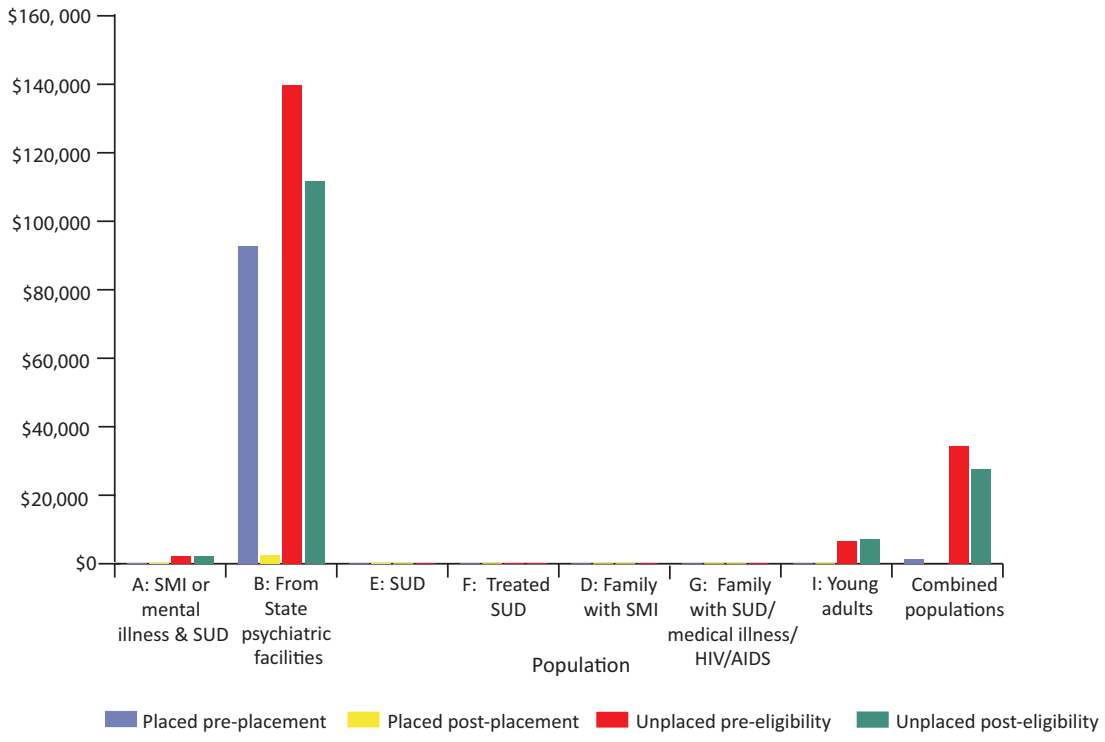
Data sources: DHS, DOC, DOHMH, HRA, OMH

Figure 18: Raw family shelter costs for NY/NY III eligible applicants one year before and one year after NY/NY III move-in or eligibility, without controlling for differences between placed and unplaced individuals



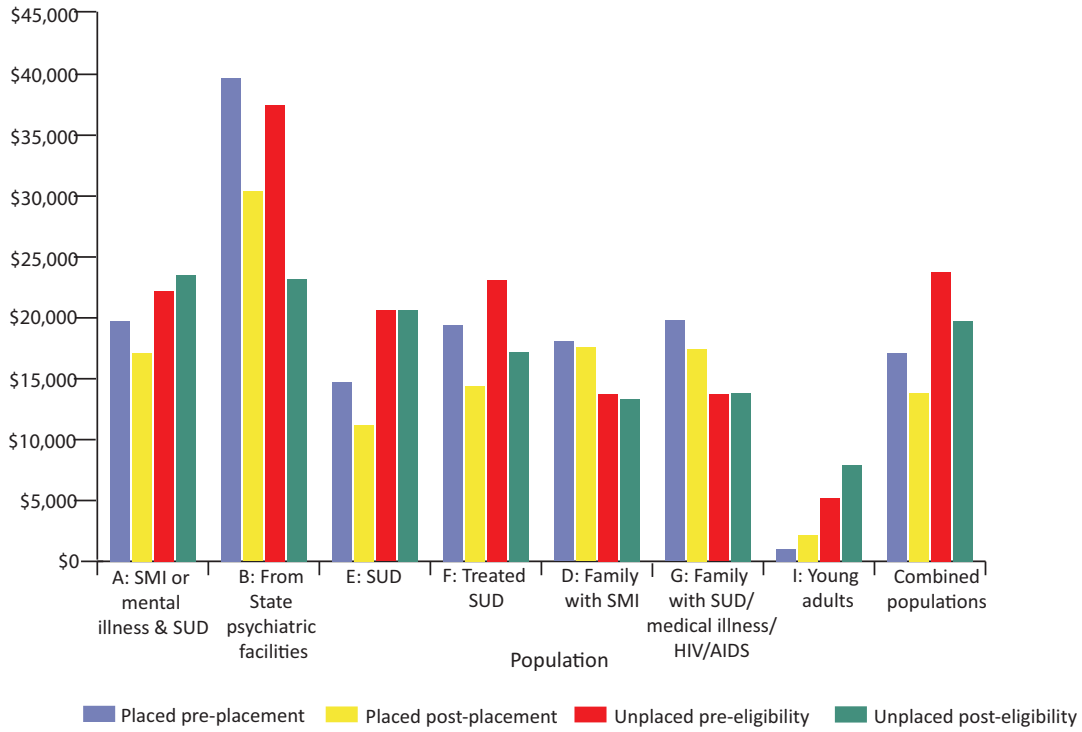
Data sources: DHS, DOC, DOHMH, HRA, OMH

Figure 19: Raw State psychiatric center cost for NY/NY III eligible applicants one year before and one year after NY/NY III move-in or eligibility, without controlling for differences between placed and unplaced individuals



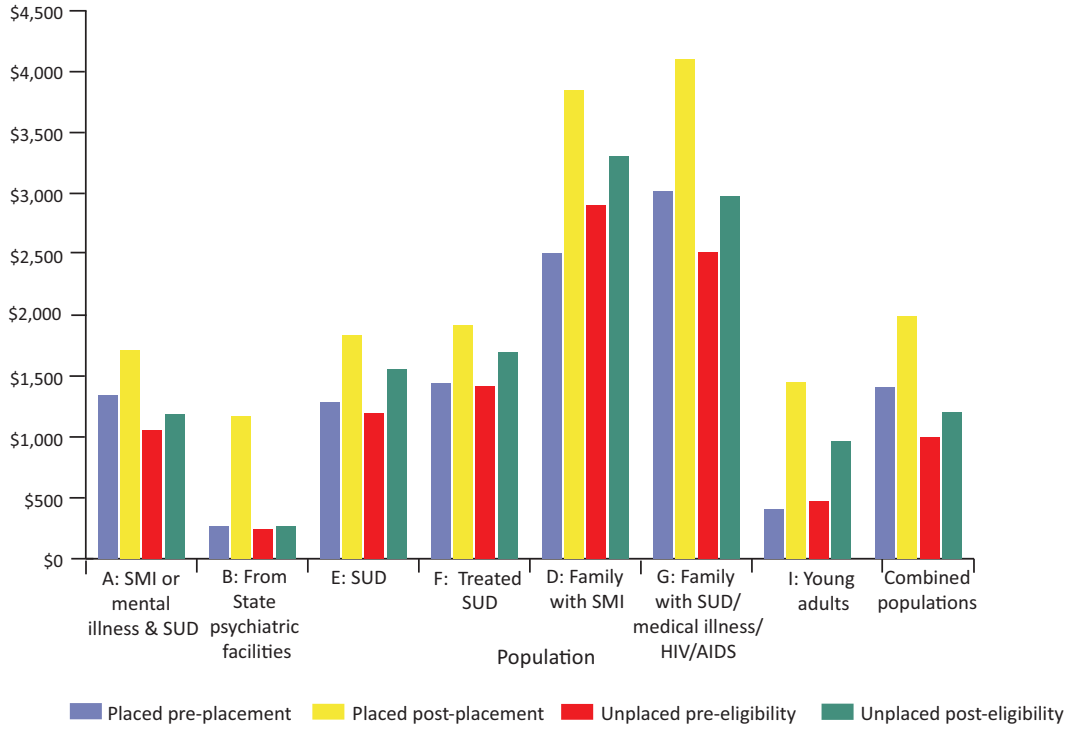
Data sources: DHS, DOC, DOHMH, HRA, OMH

Figure 20: Raw Medicaid cost for NY/NY III eligible applicants one year before and one year after NY/NY III move-in or eligibility, without controlling for differences between placed and unplaced individuals



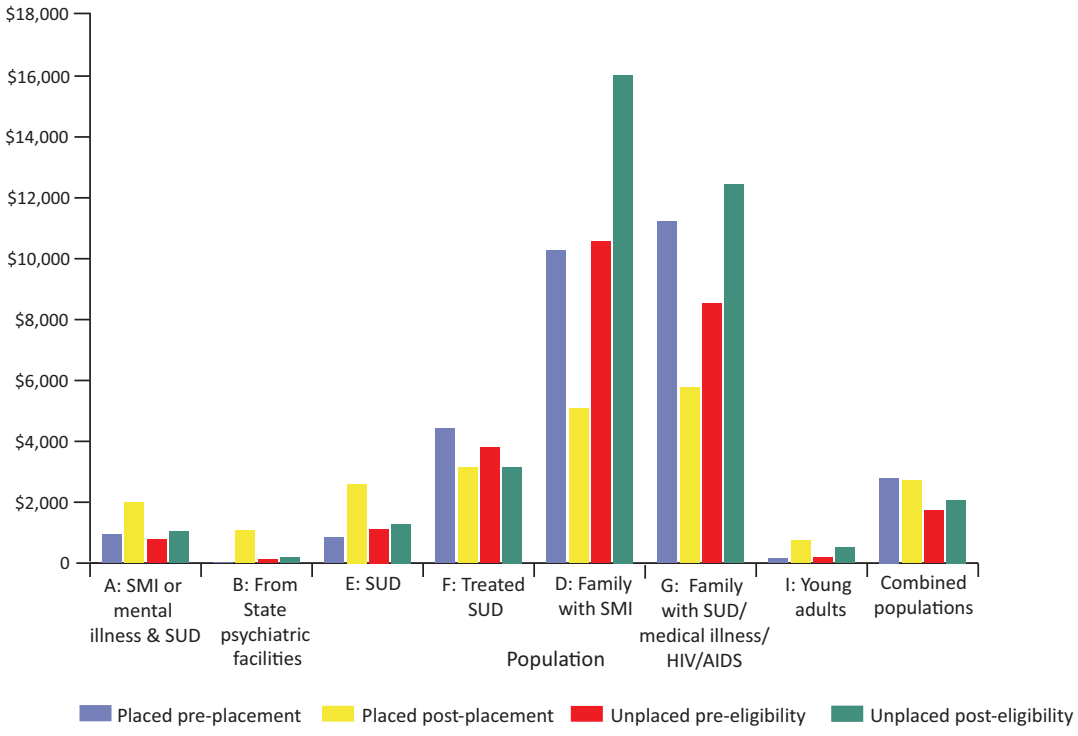
Data sources: DHS, DOC, DOHMH, HRA, OMH

Figure 21: Raw food stamps costs for NY/NY III eligible applicants one year before and one year after NY/NY III move-in or eligibility, without controlling for differences between placed and unplaced individuals



Data sources: DHS, DOC, DOHMH, HRA, OMH

Figure 22: Raw cash assistance costs for NY/NY III eligible applicants one year before and one year after NY/NY III move-in or eligibility, without controlling for differences between placed and unplaced individuals



Data sources: DHS, DOC, DOHMH, HRA, OMH

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