

The Cost of Assisted Outpatient Treatment: Can It Save States Money?

Jeffrey W. Swanson, Ph.D.
 Richard A. Van Dorn, Ph.D.
 Marvin S. Swartz, M.D.
 Pamela Clark Robbins, B.A.
 Henry J. Steadman, Ph.D.
 Thomas G. McGuire, Ph.D.
 John Monahan, Ph.D.

Objective: The authors assessed a state's net costs for assisted outpatient treatment, a controversial court-ordered program of community-based mental health services designed to improve outcomes for persons with serious mental illness and a history of repeated hospitalizations attributable to nonadherence with outpatient treatment.

Method: A comprehensive cost analysis was conducted using 36 months of observational data for 634 assisted outpatient treatment participants and 255 voluntary recipients of intensive community-based treatment in New York City and in five counties elsewhere in New York State. Administrative, budgetary, and service claims data were used to calculate and summarize costs for program administration, legal and court services, mental health and other medical treatment, and criminal justice involvement. Adjusted effects of assisted outpatient treatment and voluntary intensive services on total service costs were examined using multivariate time-series regression analysis.

Results: In the New York City sample, net costs declined 50% in the first year after

assisted outpatient treatment began and an additional 13% in the second year. In the five-county sample, costs declined 62% in the first year and an additional 27% in the second year. Psychotropic drug costs increased during the first year after initiation of assisted outpatient treatment, by 40% and 44% in the city and five-county samples, respectively. Regression analyses revealed significant declines in costs associated with both assisted outpatient treatment and voluntary participation in intensive services, although the cost declines associated with assisted outpatient treatment were about twice as large as those seen for voluntary services.

Conclusions: Assisted outpatient treatment requires a substantial investment of state resources but can reduce overall service costs for persons with serious mental illness. For those who do not qualify for assisted outpatient treatment, voluntary participation in intensive community-based services may also reduce overall service costs over time, depending on characteristics of the target population and local service system.

Am J Psychiatry Swanson et al.; AIA:1-10

In 1999, joining 41 other states with outpatient commitment statutes, the New York State legislature enacted Kendra's Law, which authorized assisted outpatient treatment for persons with serious mental illness who were deemed at risk of failing to live safely in the community (1). Assisted outpatient treatment, as codified in New York, mandates the provision of an array of community-based services; research suggests that these services can be effective in reducing poor outcomes associated with a pattern of revolving-door hospitalization (2-5). Still, assisted outpatient treatment remains controversial and largely unimplemented in most states because of a range of barriers and stakeholder resistance (6, 7).

Concerns about assisted outpatient treatment range from consumer advocates' objections to its putatively coercive nature to clinicians' liability worries in discharging "dangerous" patients into the community to the perception in many quarters that assisted outpatient treatment is a toothless order to comply with treatment (8). At worst, assisted outpatient treatment is thought to

waste scarce public funds and divert resources from would-be voluntary service recipients to those who may not benefit from forced treatment (9).

Research has shown positive results from assisted outpatient treatment, but these results depend on adequate appropriation of public funding for community-based mental health services (10). However, in times of extreme strain on states' human services budgets, policy makers are reluctant to fund new programs and benefits, especially in the face of strident opposition from vocal consumer advocates. Precise information about public costs and potential cost savings related to assisted outpatient treatment is thus needed to enlighten debate and inform difficult policy decisions.

In this article, we present a comprehensive analysis of net costs of assisted outpatient treatment, using data from a recent legislatively mandated evaluation of New York's assisted outpatient treatment program (5). Because the assisted outpatient treatment program operates much differently in New York City than it does in the rest of the

state, we conducted separate analyses on 520 assisted outpatient treatment participants from New York City and 114 from five counties elsewhere in New York State. We have summarized costs incurred for assisted outpatient treatment administration and legal services, mental health and medical treatment, and criminal justice involvement for assisted outpatient treatment participants. We compared these costs over three periods of observation: 12 months before assisted outpatient treatment was initiated upon discharge from an index psychiatric hospitalization and two subsequent 12-month periods following initiation of assisted outpatient treatment.

To be eligible for assisted outpatient treatment in New York State, a person must be 18 years of age or older, diagnosed with a mental illness, assessed to be unlikely to be able to live safely in the community without supervision, have a history of treatment noncompliance resulting in psychiatric hospitalization or incarceration at least twice in the past 36 months, or have committed serious acts of violence or threatened violence toward self or others in the past 48 months (1). These persons also are deemed to be unlikely to participate voluntarily in effective services but likely to benefit from assisted outpatient treatment, both clinically and in terms of preventing illness relapse and subsequent violent or suicidal behavior. Once an individual meets these criteria, court orders for initial assisted outpatient treatment are generally issued for 6 months and can be renewed.

The 2005 reauthorization of Kendra's Law required an independent evaluation of the effectiveness of assisted outpatient treatment. The investigators found that assisted outpatient treatment reduced psychiatric hospital admissions and lengths of stay, reduced arrests, increased utilization of case management services, and improved consistent possession of appropriate prescribed medications (5, 10–13). In the present analysis, we used a subset of the evaluation data to examine the net costs involved in achieving those outcomes.

Method

Sampling and Data Sources

Data were assembled to measure administrative, legal, and court-related costs of assisted outpatient treatment programs, inpatient and outpatient mental health services utilization, medical treatment, and criminal justice system involvement for 634 individuals who started an assisted outpatient treatment order within 30 days of discharge from an index hospitalization between January 2004 and December 2005. As mentioned above, the data were examined for the year before and 2 years following initiation of assisted outpatient treatment.

We examined one sample of assisted outpatient treatment participants in New York City and a second sample drawn from Albany, Erie, Monroe, Nassau, and Rensselaer counties (14). Selection criteria were as follows: 1) an index hospitalization of any length between January 2004 and December 2005; 2) no assisted outpatient treatment order 12 months before discharge from the index hospitalization; and 3) an assisted outpatient

treatment court order that went into effect no more than 30 days after discharge from the index hospitalization. The vast majority of assisted outpatient treatment orders originate around hospitalizations (5). Any eligible persons who met these criteria were included, which produced a sample of 520 persons from New York City and 114 persons from the five counties, for a total of 20,003 person-month observations. The process of selection identified new court orders and represented approximately one-third of all active cases.

Data were collected from state psychiatric hospital admission files, the Tracking for Assisted Outpatient Treatment Cases and Treatments database, and Medicaid service claims. (The Medicaid cost analysis includes all Medicaid payments; thus, references to state costs should be understood to include the federal contribution to the state Medicaid program.) Participating Mental Hygiene Legal Service departments and individual assisted outpatient treatment programs provided budgetary information on program administrative, legal, and court-related costs associated with assisted outpatient treatment. Matching records of arrests and jail and prison stays were obtained from local sheriffs' offices, the New York State Division of Criminal Justice Services, and the New York State Department of Corrections and Community Supervision.

Assisted outpatient treatment programs assist individuals in obtaining Medicaid, and the large majority of assisted outpatient treatment recipients (about 87%) are enrolled in Medicaid. All of the sampled participants in this study were Medicaid enrollees. Medicaid covers a wide range of services in New York State, including outpatient, partial, and inpatient care and pharmacy costs. Additional utilization and per diem cost information was obtained for inpatient psychiatric treatment at psychiatric hospitals licensed by the New York State Office of Mental Health.

To compare cost effects that may be associated with assisted outpatient treatment with those that may result from voluntary participation in intensive community-based mental health services, we also estimated the net effect of receiving assertive community treatment or intensive case management among individuals who did not qualify for assisted outpatient treatment and who resided in the same regions described above (N=255; 14,182 person-month observations). In this analysis, we used equivalent data (i.e., received assertive community treatment or intensive case management within the first 30 days after discharge from an index hospitalization and no assertive community treatment or intensive case management in the 12 months before the index hospitalization) for persons who did not receive assisted outpatient treatment orders but otherwise had the same psychiatric diagnoses and were in the same systems of care during the same years as the two assisted outpatient treatment samples.

This project was approved by the institutional review boards of Duke University Medical Center, Policy Research Associates, the New York State Office of Mental Health, and the Biomedical Research Alliance of New York.

Measures

Assisted outpatient treatment program costs for New York City and the five counties were obtained from program administrators. The average cost per case of assisted outpatient treatment was calculated from each program's assisted outpatient treatment budget, reported expenditures on cases, and the number of participants served. The case-rate administrative expense was prorated to an average monthly charge for months when assisted outpatient treatment was active. A similar approach was used to calculate Mental Hygiene Legal Service and court costs, which were prorated across active assisted outpatient treatment months. Mental Hygiene Legal Service costs for activities not associated with assisted outpatient treatment, such as involuntary inpatient proceedings or litigation, were excluded.

Mental health services costs were obtained for the following categories: New York State Office of Mental Health facility hospitalization; Medicaid-paid hospitalization; psychiatric emergency department visits or crisis services; outpatient programs including assertive community treatment and continuing day treatment; case management (including intensive, blended, and supportive types); outpatient prescription medication; clinician visits (including billed encounters with psychiatrists, psychologists, and clinical social workers); chemical dependency treatment; transportation to treatment; and partial hospitalization. Except for hospitalization in New York State Office of Mental Health facilities, costs for mental health treatment were paid by Medicaid. Costs for New York State Office of Mental Health hospitalization stays were calculated as the product of the length of stay and the state average cost per bed day. Hospitalizations paid by private insurance were uncommon and were not included in these analyses. Other medical costs covered by Medicaid were included for nonpsychiatric hospitalizations, emergency department visits, outpatient treatment visits, and outpatient prescription medications.

Criminal justice cost information was obtained for arrests and jail and prison days. Arrest costs were based on inflation-adjusted published estimates described by Clark et al. (15). These estimates included costs for police, booking, court, attorney services, and transportation. Jail costs per day were obtained from individual county jail cost of operation worksheets, which are completed by jails on an annual basis and submitted to the state. All completed worksheets were for the fiscal year 2008–2009. We also included costs for medications prescribed in jail. This cost information was obtained from interviews with key jail personnel. Prison costs per day were based on information obtained from the chief fiscal officer of the New York State Department of Corrections and Community Supervision for the fiscal year 2005–2006.

Current legal status was obtained from the New York State Office of Mental Health Tracking for Assisted Outpatient Treatment Cases and Treatments database. Start and end dates for court-ordered treatment were used to classify each month as being before, during, or after assisted outpatient treatment. This classification was used in a person-month regression analysis to estimate the adjusted effect of assisted outpatient treatment status on total cost. In addition, a person-level analysis was conducted to summarize and compare utilization and costs for the 12-month period before assisted outpatient treatment began with the subsequent two 12-month periods after treatment began.

Medication possession ratio, a commonly used proxy for medication adherence, was constructed using Medicaid pharmacy fill records (13–18). We calculated the number of days in a given month in which an individual had a supply of a prescribed psychotropic medication that was clinically appropriate for his or her current diagnosis, as determined by a psychiatrist blind to participants' identity. Consistent with previous research, the months in which the filled supply of medication was enough to cover 80% of days were considered high-possession months, compared with low-possession months when the filled supply covered less than 80% of days. (Depot injectable medication claims were coded as a complete fill for the given month.)

Data on race/ethnicity, sex, and age were obtained from the New York State Office of Mental Health. In the regression analysis, participants of Hispanic ethnicity and African Americans, Asians, and persons from other racial/ethnic backgrounds were compared with non-Hispanic whites. Men were compared with women, and individuals older than the median age were compared with those younger than the median age.

Psychiatric diagnosis and information on monthly receipt of assertive community treatment and intensive case management were obtained from Medicaid claims. Primary diagnoses were

obtained from these claims and grouped into four categories: schizophrenia spectrum disorder, bipolar disorder, major depressive disorder, and other. We counted the number of claims with each diagnosis; the most frequent diagnosis type over the study period was then used to classify the participant. For the five-county analysis, costs for persons residing in Albany, Erie, Monroe, and Rensselaer counties were compared with costs for persons residing in Nassau County as the reference category.

Data Analysis

We first calculated rates of services utilization and the mean cost per person for each type of service used in three time periods: 1) the 12 months before discharge from the index hospitalization when assisted outpatient treatment was initiated; 2) the first 12 months after discharge from the index hospitalization; and 3) the second 12 months (i.e., the period from 13 to 24 months after discharge from the index hospitalization). Because assisted outpatient treatment orders varied in length, these subsequent 12-month periods represented costs incurred after assisted outpatient treatment was initiated, whether or not an assisted outpatient treatment order remained in place; this resembles an intent-to-treat analysis. Mean costs are presented in two ways: first as the average cost among those using the service (i.e., with nonusers removed from the denominator) and second as the average cost per person in assisted outpatient treatment (i.e., with all sample participants in the denominator.)

We also conducted a longitudinal multivariate regression analysis to assess the adjusted effect of assisted outpatient treatment status on total and mental health costs. The unit of analysis for these regression models was the person-month, reflecting multiple repeated observations for each participant. Assisted outpatient treatment status was coded as a time-varying descriptor for each monthly observation in the analysis. Monthly costs were regressed on dummy variables associated with monthly assisted outpatient treatment status (i.e., current or postassisted outpatient treatment compared with pre-assisted outpatient treatment).

A negative binomial model was estimated to accommodate dispersion in the cost data (19). We examined the negative binomial dispersion parameter to confirm that the negative binomial model was a better-fitting model than the Poisson model. We estimated robust standard errors to account for the nonindependence of observations. All analyses were conducted with SAS, version 9.2 (SAS Institute, Cary, N.C.). Separate analyses were conducted for samples from New York City and the five counties for both the assisted outpatient treatment group and the samples of individuals who did not qualify for assisted outpatient treatment. To examine the effect of missing data, we used several approaches to impute missing data and found that no approach appreciably affected the cost estimates.

Results

The demographic and clinical characteristics of the two samples are summarized in Table 1. The mean age of participants was 40 years in the New York City sample and 42 years in the five-county sample. The majority of participants in both samples were men. Substantially more of the participants in the New York City sample were African American compared with the five-county sample. Four-fifths of those in the New York City sample (82%) and three-fourths of those in the five-county sample (75%) had a diagnosis of a schizophrenia spectrum disorder. More

TABLE 1. Demographic and Clinical Characteristics of Assisted Outpatient Treatment Participants in New York City and Five New York Counties

Characteristic	New York City Sample (N=520)		Five-County Sample (N=114)	
	Mean	SD	Mean	SD
Age at index hospitalization (years)	40.19	10.97	42.22	10.10
	N	%	N	%
Sex				
Male	340	65.38	69	60.53
Female	180	34.62	45	39.47
Race/ethnicity				
White, not Hispanic	108	20.77	60	52.63
Black, not Hispanic	240	46.15	46	40.35
Hispanic	118	22.69	4	3.51
Asian/Pacific Islander	28	5.38	2	1.75
Other race/ethnicity	25	4.81	2	1.75
Diagnosis				
Schizophrenia spectrum disorder	442	85.00	86	75.44
Major depression	46	8.85	14	12.28
Bipolar disorder	18	3.46	12	10.53
Other	14	2.69	2	1.75
County				
Albany			22	19.30
Erie			17	14.91
Monroe			17	14.91
Nassau			40	35.09
Rensselaer			18	15.79

than one-third of the five-county sample resided in Nassau County; the remainder of these participants were distributed fairly evenly among the other four counties.

The average rates of services utilization per person for the three 12-month periods, by sample, are presented in Table 2. For each category of service, we report the number and percent of the sample with any utilization during the period (i.e., at least one Medicaid claim for the type of service listed, at least one hospital admission in the case of New York State Office of Mental Health inpatient treatment, or at least one arrest, jail day, or prison day in the case of criminal justice involvement).

The main finding is that hospitalization declined markedly during the first 12 months after assisted outpatient treatment was initiated, while increases were seen in utilization of case management, assertive community treatment, other outpatient services, and psychotropic medication fills. In the second 12-month period, additional modest declines were observed for hospitalization rates, while case management and outpatient program participation also declined but remained above preassisted outpatient treatment levels. Declines were also seen in use of psychiatric emergency and crisis services, clinician visits, and criminal justice involvement. It is notable that, for the most part, increases in outpatient utilization rates were sustained into the third 12-month period of observation,

during which many assisted outpatient treatment participants were no longer subject to court-ordered treatment. These observed patterns were similar in both the New York City and five-county samples.

The summary costs per person with any utilization in each category for the three periods, by sample, are presented in Table 3. In the New York City sample, the average annual cost of New York State Office of Mental Health inpatient treatment per person hospitalized declined from about \$142,000 to about \$84,000 from the preassisted outpatient treatment period to the first 12 months after assisted outpatient treatment was initiated, and then it increased to about \$119,000 per person hospitalized in the second 12 months after assisted outpatient treatment. A similar pattern was observed among New York State Office of Mental Health-hospitalized participants in the five-county sample, except the second year trend reversal was proportionally smaller than it was in the New York City sample.

Considering Medicaid-paid hospitalization, consistent declines in cost per person hospitalized were seen in both periods following initiation of assisted outpatient treatment, and in both samples, but with a proportionately greater second-year decline in the five-county sample. In the New York City sample, Medicaid inpatient costs declined from about \$66,000 to about \$46,000 per person hospitalized (i.e., comparing the year before assisted outpatient treatment began to the second year after assisted outpatient treatment was initiated). In the five-county sample, a comparable total decline was observed, from about \$47,000 to about \$18,000 annually per person hospitalized.

These patterns are consistent with a pattern of fewer hospitalizations per person, reduced length of stay, or both, moving from before to after initiation of assisted outpatient treatment. At the same time, while hospitalization costs declined, average annual costs for outpatient (or noninpatient) treatment increased, from about \$6,000 per person served in the year before assisted outpatient treatment to about \$14,000–\$18,000 per person served after assisted outpatient treatment years began.

Overall, cost trends in the five-county sample resembled those observed in the New York City sample, with a few notable differences. The baseline annual cost per person served for all Medicaid-paid services was higher in the New York City sample, with about \$60,000 per person served, compared with about \$47,000 per person served in the five-county sample. However, both samples exhibited comparable proportional declines in per-person Medicaid costs across the three periods of observation: a 40% decline in the New York City sample and a 48% decline in the five-county sample from the year before initiation of assisted outpatient treatment to the second 12-month period after initiation of assisted outpatient treatment.

Average annual criminal justice costs (per person with any arrests or jail or prison days) revealed no clear pattern

TABLE 2. Prevalence of Service Utilization by Assisted Outpatient Treatment (AOT) Period and Sample

Type of Service	New York City Sample (N=520)						Five-County Sample (N=114)					
	12-Month Period Before Discharge to AOT		First 12-Month Period After Discharge to AOT		Second 12-Month Period After Discharge to AOT		12-Month Period Before Discharge to AOT		First 12-Month Period After Discharge to AOT		Second 12-Month Period After Discharge to AOT	
	N	%	N	%	N	%	N	%	N	%	N	%
Mental health services												
Inpatient treatment												
New York State Office of Mental Health hospitalization	180	34.6	70	13.9	60	11.6	47	40.5	20	18.5	15	13.2
Medicaid hospitalization	373	71.6	245	48.7	181	35.1	95	81.9	50	46.3	47	41.2
Noninpatient treatment (Medicaid)												
Case management (intensive, blended, supportive)	136	26.1	318	63.2	237	45.9	43	37.1	63	58.3	60	52.6
Assertive community treatment, day treatment, other outpatient programs	367	70.4	446	88.7	400	77.5	91	78.4	105	97.2	106	93.0
Clinician visits	218	41.8	167	33.2	117	22.7	56	48.3	36	33.3	32	28.1
Outpatient prescription medication fills	341	65.5	440	87.5	375	72.7	96	82.8	105	97.2	94	82.5
Chemical dependency treatment	43	8.3	37	7.4	40	7.8	14	12.1	11	10.2	7	6.1
Transportation to treatment	84	16.1	99	19.7	91	17.6	38	32.8	22	20.4	30	26.3
Psychiatric emergency and crisis services	184	35.3	152	30.2	121	23.5	46	39.7	40	37.0	33	28.9
Partial hospitalization	39	7.5	64	12.7	26	5.0	20	17.2	20	18.5	4	3.5
Medical treatment (Medicaid)												
Hospitalization	63	12.1	64	12.7	62	12.0	17	14.7	15	13.9	14	12.3
Medical emergency department visits	146	28.0	134	26.6	131	25.4	36	31.0	41	38.0	44	38.6
Outpatient treatment	329	63.2	387	76.9	348	67.4	72	62.1	89	82.4	84	73.7
Outpatient prescription medication	261	50.1	365	72.6	317	61.4	74	63.8	90	83.3	82	71.9
Criminal justice services												
Arrests	35	6.7	22	4.4	23	4.5	6	5.2	2	1.9	3	2.6
Jail days	33	6.3	22	4.4	23	4.5	11	9.5	7	6.5	13	11.4
Prison days	6	1.2	1	0.2	4	0.8	0	0.0	0	0.0	1	0.9

but mostly increased in both samples across the three periods. Thus, while there were fewer individuals involved with the criminal justice system during the periods after assisted outpatient treatment was initiated (as shown in Table 2), those who were arrested or spent time incarcerated incurred approximately the same or higher costs over the three study periods.

In summary, combining all costs, the average annual cost per person declined substantially and consistently across the three periods of observation, in both samples. In the New York City sample, average costs declined 50%, from about \$105,000 to about \$53,000 per person, and in the five-county sample, average costs declined 62%, from about \$104,000 to about \$39,000 per person. Most of the decline was seen in the first year after assisted outpatient treatment was initiated, with a larger incremental second-year decline in the five-county sample than in the New York City sample.

Costs by period and sample are presented in Figure 1, in which the total assisted outpatient treatment sample is used as the denominator (in contrast to the average costs presented in Table 3); this way of presenting the data

spreads the costs across the entire assisted outpatient treatment group rather than only among those utilizing a particular service. In summary, both samples exhibited substantial shifts in service costs, apparently driven by an increase in outpatient treatment costs and a corresponding decrease in psychiatric hospitalization costs. The legal and administrative costs of the assisted outpatient treatment program were small in comparison to the large costs, and apparent shifts in cost, associated with inpatient and outpatient mental health services utilization.

Finally, results of longitudinal multivariate regression analyses conducted to assess net effects of assisted outpatient treatment participation on service costs over time, controlling for demographic and clinical covariates, are presented in Table 4. Assisted outpatient treatment cost effects are presented in comparison to the analogous effects of voluntary participation in intensive community-based services (assertive community treatment or intensive case management) for the samples of persons with serious mental illness who did not qualify for assisted outpatient treatment in New York City and in the five counties. In these voluntary outpatient treatment comparison groups,

COST OF ASSISTED OUTPATIENT TREATMENT

TABLE 3. Average Costs for Services Before and After Hospital Discharge Initiating Assisted Outpatient Treatment (AOT), By Sample^a

Type of Service	Mean Cost Per Person					
	New York City Sample (N=520)			Five-County Sample (N=114)		
	12-Month Period Before Discharge to AOT	First 12-Month Period After Discharge to AOT	Second 12-Month Period After Discharge to AOT	12-Month Period Before Discharge to AOT	First 12-Month Period After Discharge to AOT	Second 12-Month Period After Discharge to AOT
AOT legal assistance and program administration						
Mental Hygiene Legal Service	\$0	\$425	\$312	\$0	\$371	\$312
AOT program administration	\$0	\$4,546	\$3,329	\$0	\$4,735	\$3,977
Group average for AOT legal assistance and program administration	\$0	\$4,971	\$3,641	\$0	\$5,106	\$4,289
Mental health treatment						
Inpatient treatment						
New York State Office of Mental Health index hospitalization	\$41,844			\$53,885		
New York State Office of Mental Health non-index hospitalization	\$7,356			\$18,013		
Group average for New York State Office of Mental Health hospitalization	\$142,401	\$83,592	\$119,322	\$139,619	\$73,823	\$79,733
Medicaid index hospitalization	\$36,489			\$36,380		
Medicaid non-index hospitalization	\$43,306			\$21,104		
Group average for Medicaid hospitalization	\$65,740	\$46,918	\$45,418	\$47,265	\$30,631	\$18,262
Noninpatient treatment						
Case management (intensive, blended, supportive)	\$3,192	\$4,864	\$5,507	\$2,775	\$5,260	\$5,134
Assertive community treatment, day treatment, other outpatient programs	\$2,216	\$7,999	\$8,089	\$2,413	\$9,237	\$7,226
Clinician visits	\$349	\$258	\$288	\$550	\$316	\$241
Outpatient prescription medication fills	\$2,452	\$4,021	\$4,133	\$2,706	\$4,822	\$3,872
Chemical dependency treatment	\$2,878	\$4,379	\$2,977	\$1,127	\$1,394	\$1,528
Transportation to treatment	\$108	\$150	\$173	\$175	\$103	\$207
Psychiatric emergency department and crisis services	\$499	\$495	\$752	\$696	\$372	\$398
Partial hospitalization	\$4,575	\$6,303	\$4,815	\$1,043	\$1,625	\$1,915
Group average for noninpatient mental health treatment	\$5,946	\$15,760	\$14,784	\$6,306	\$17,365	\$13,651
Group average for Medicaid-paid mental health treatment	\$58,225	\$38,817	\$32,383	\$45,708	\$31,678	\$21,472
Medical treatment						
Hospitalization	\$16,377	\$28,971	\$21,182	\$3,937	\$6,334	\$11,336
Medical emergency department visits	\$288	\$276	\$250	\$334	\$370	\$340
Outpatient treatment	\$375	\$668	\$697	\$270	\$426	\$482
Outpatient prescription medication	\$764	\$1,077	\$767	\$994	\$1,511	\$1,245
Group average for medical treatment	\$4,131	\$6,174	\$4,991	\$1,901	\$3,012	\$3,425
Criminal justice services						
Arrests	\$3,511	\$3,420	\$5,016	\$2,926	\$2,508	\$2,508
Jail	\$5,841	\$7,102	\$12,248	\$16,650	\$12,606	\$13,308
Prison	\$5,461	\$11,352	\$17,953	\$0	\$0	\$10,664
Group average for criminal justice services	\$9,169	\$9,997	\$17,820	\$16,726	\$11,657	\$15,203
Group average for Medicaid-paid services	\$60,201	\$43,959	\$36,129	\$47,205	\$34,408	\$24,422
Group average for New York State Office of Mental Health and Medicaid-paid services	\$104,084	\$55,448	\$50,546	\$102,554	\$48,207	\$35,170
Group average for all costs	\$104,753	\$59,924	\$52,386	\$104,284	\$53,683	\$39,142

^a Costs are per-person averages for subgroups with any utilization in each category of service and do not sum to the total costs for the sample.

average per-person costs for the New York City and five-county samples were \$7,056 and \$4,420, respectively, in the preintensive service 12-month period, and they declined to \$4,549 and \$3,457, respectively, in the first year and to \$3,764 and \$3,379, respectively, in the second year.

Significant cost-reducing effects associated with assisted outpatient treatment were found for mental health treatment costs and total state costs in both the New York City and five-county samples. Medication adherence also was associated independently with lower service costs in these samples. Regression analyses for the voluntary treatment sample from New York City revealed significant declines in costs associated with voluntary participation in intensive services, although these declines were smaller and of less significance, about half as large as the declines related to assisted outpatient treatment. In the five-county analyses, in contrast to assisted outpatient treatment, voluntary participation in intensive services was not significantly associated with declines in mental health costs or total state costs.

Discussion

Assisted outpatient treatment remains controversial despite evidence of its effectiveness. Forty-five states now permit outpatient commitment in some form, yet the practice has been implemented only sporadically, if at all (20). Several factors may explain the low penetration of assisted outpatient treatment (7, 21–23). Vocal mental health consumer advocates oppose it, and some mental health clinicians and administrators raise liability and operational concerns. Furthermore, some view outpatient commitment as diverting resources from voluntary service recipients, a claim that might be refuted if assisted outpatient treatment reduces overall treatment costs (24–26).

The question of cost comes into play in policy arguments for and against assisted outpatient treatment. If assisted outpatient treatment is a net drain on resources or precipitates “queue jumping” in a zero-sum game for public resources, then it may be difficult to justify this type of program even if it “works” for a small number of people. However, if assisted outpatient treatment offsets other medical costs, such as reducing hospitalizations for state-supported clients, then policy makers may be on firmer ground in arguing in favor of funding it. In the end, assisted outpatient treatment may benefit not only the people who receive court-ordered treatment but also those who will be served in a more efficient public behavioral health care system, a system with greater capacity that produces better outcomes for a broader population in need (27).

Our analyses for New York State suggest that assisted outpatient treatment reduces total state costs for those it serves, mainly by shifting patterns of service provision from repeated inpatient episodes to regular outpatient

care and improved receipt of appropriate psychotropic medications. In the New York City sample, total combined costs for the assisted outpatient treatment program, mental health and medical treatment, and criminal justice services declined 50% in the first year after assisted outpatient treatment began and an additional 13% in the second year. In the five-county sample, these declines were even greater: 62% in the first year after treatment initiation and an additional 27% in the second year. However, these results from New York may not generalize to other states, where this type of program may operate differently and where the public system may be less generously funded; even in New York, the gains may not be sustainable if treatment resources are substantially reduced. Our analyses estimate net treatment and programmatic costs, and we did not attempt to estimate a host of other costs and savings that may result from reduced family or caregiver burden or other costs to society.

Parallel analyses for a sample of voluntary participants in intensive community-based services produced mixed results. In the New York City comparison sample, voluntary participation in assertive community treatment or intensive case management was associated with significant net declines in mental health service costs and total state costs, although the relative declines were not as dramatic as the declines related to assisted outpatient treatment. However, in the five-county comparison sample, no significant declines in costs were associated with voluntary community-based service participation.

The nonrandomized comparison of assisted outpatient treatment with voluntary treatment effects is limited; the fact that one group qualified for assisted outpatient treatment and the other group did not means that the groups differed in ways that could not be observed and controlled for. However, the before-and-after adjusted time-series comparison for the assisted outpatient treatment group is a quasi-experimental design capable of accounting for time-invariant differences across groups. Furthermore, our comparison uses the large number of person-period observations that are available for the periods before, as well as during and after, assisted outpatient treatment. Because of this relatively long period of observation before the start of the court-ordered treatment, these results are unlikely to be a result of regression to the mean, and because the program has been in place for several years, these results are also unlikely to be a transient response to programmatic change.

In short, these cost estimates provide crucial information to help public policy makers decide whether assisted outpatient treatment is warranted from both fiscal and clinical perspectives. Results of this study reveal significantly reduced overall costs under New York’s assisted outpatient treatment program, attributable mainly to a marked shift in patterns of mental health services provision from inpatient to outpatient care settings. For a

FIGURE 1. Summary Costs by Category, Assisted Outpatient Treatment (AOT) Period, and Sample

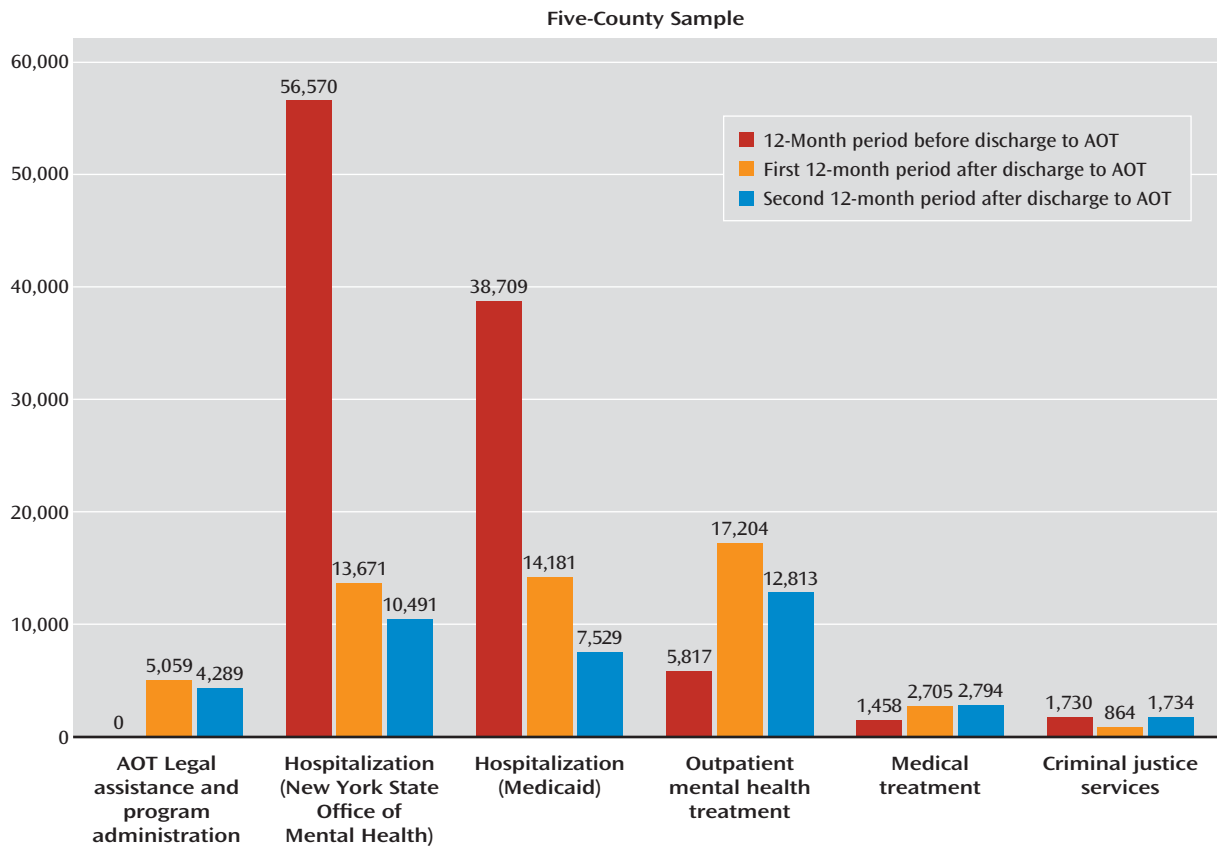
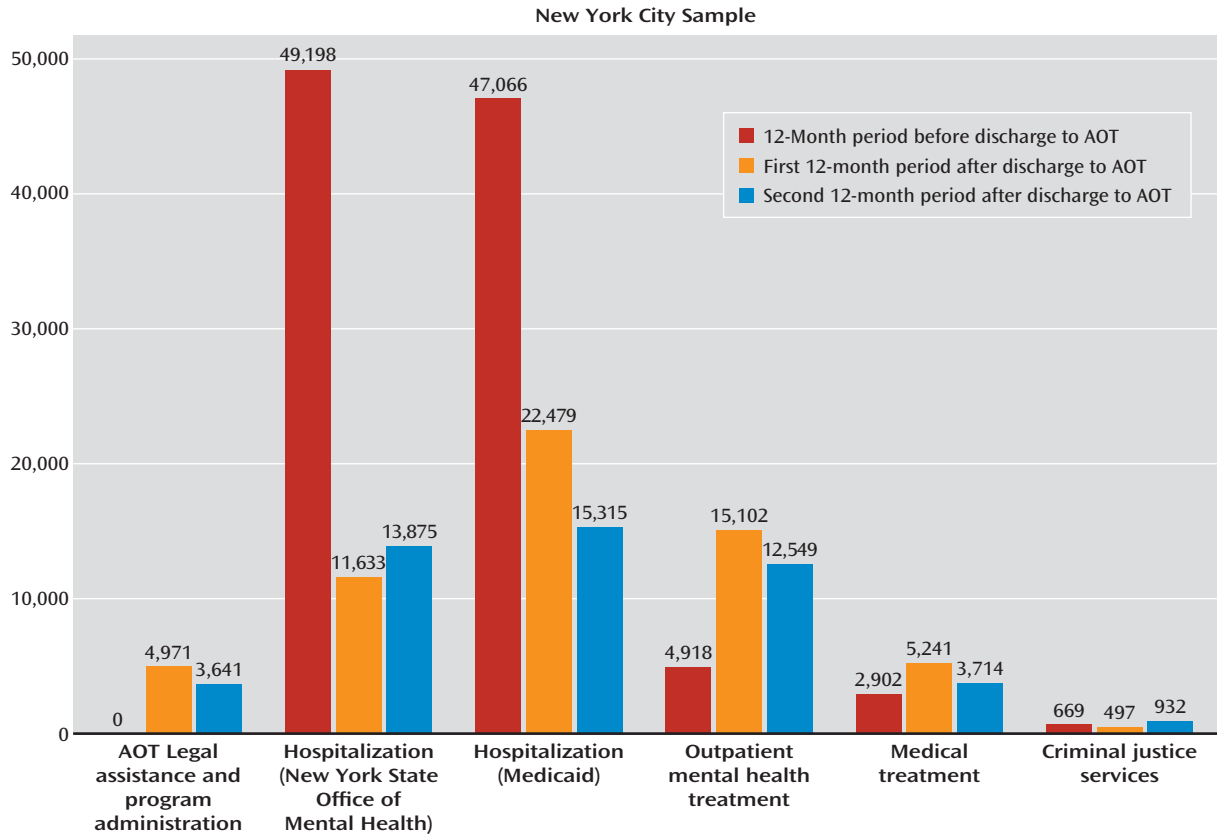


TABLE 4. Regression-Adjusted Effects of Assisted Outpatient Treatment (AOT) and Non-AOT Intensive Services on Mental Health and Total State Costs (By Sample)^a

Effect	New York City Sample				Five-County Sample			
	AOT Sample (N=16,284 Person-Month Observations)		Non-AOT Sample (N=11,541 Person-Month Observations)		AOT Sample (N=3,719 Person-Month Observations)		Non-AOT Sample (N=2,641 Person-Month Observations)	
	B	SE	B	SE	B	SE	B	SE
Effects on mental health treatment costs								
Intervention (AOT or non-AOT intensive services)								
Twelve months before start of intervention (reference category)								
Actively receiving intervention	-0.62***	0.07	-0.27**	0.09	-0.39*	0.18	0.16	0.18
Postintervention period	-0.86***	0.11	-0.39**	0.14	-1.00***	0.24	0.14	0.29
Medication adherence								
Prescriptions filled to cover >80% of days needed	-0.54***	0.05	-0.17*	0.07	-0.46***	0.12	-0.07	0.11
Effects on total state costs								
Intervention (AOT or non-AOT intensive services)								
Twelve months before start of intervention (reference category)								
Actively receiving intervention	-0.56***	0.06	-0.28**	0.09	-0.37*	0.16	0.27	0.16
Postintervention period	-0.77***	0.10	-0.39**	0.13	-0.96***	0.22	0.31	0.25
Medication adherence								
Prescriptions filled to cover >80% of days needed	-0.52***	0.05	-0.15*	0.06	-0.43***	0.11	-0.12	0.10

^a Models are adjusted for study month, participants' demographic characteristics (age, sex, and race/ethnicity), psychiatric diagnosis, and county of residence.

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

large proportion of baseline services, costs were associated with lengthy hospitalizations preceding assisted outpatient treatment, which suggests that averting extended inpatient treatment could yield significant savings. However, while assisted outpatient treatment programs typically start after inpatient admissions, this is not a program requirement. Assisted outpatient treatment programs that are not preceded by a hospitalization may not result in as significant a savings. Finally, for persons with serious mental illnesses who do not legally qualify for assisted outpatient treatment, voluntary participation in intensive community-based services may also reduce overall service costs over time, at least in a population and mental health system resembling that of New York City.

Received Sept. 3, 2012; revision received Jan. 22, 2013; accepted March 25, 2013 (doi: 10.1176/appi.ajp.2013.12091152). From the Department of Psychiatry and Behavioral Sciences, Duke University School of Medicine, Durham, N.C.; Research Triangle Institute, Durham; Policy Research Associates, Delmar, N.Y.; Department of Health Care Policy, Harvard Medical School, Boston; and University of Virginia School of Law, Charlottesville. Address correspondence to Dr. Swanson (jeffrey.swanson@duke.edu).

Dr. Swanson has received research support from Eli Lilly, the National Science Foundation, the Robert Wood Johnson Foundation Program on Public Health Law Research, the Stanley Medical Research Foundation, and the U.S. Department of Education National Institute on Disability and Rehabilitation Research; he has received speaking fees from the University of North Carolina-Chapel Hill with support from Pfizer; and he has received consulting fees from Novartis. All other authors report no financial relationships with commercial interests.

Supported by the John D. and Catherine T. MacArthur Foundation Research Network on Mandated Community Treatment and by the New York State Office of Mental Health.

References

1. New York Mental Hygiene Law Section 9.60: Assisted Outpatient Treatment. http://law.onecle.com/new-york/mental-hygiene/MHY09.60_9.60.html
2. Swartz MS, Swanson JW: Involuntary outpatient commitment, community treatment orders, and assisted outpatient treatment: what's in the data? *Can J Psychiatry* 2004; 49:585–591
3. Swartz MS, Swanson JW: Outpatient commitment: when it improves patient outcomes. *Curr Psychiatry* 2008; 7:25–35
4. Swartz MS, Swanson JW, Hiday VA, Wagner HR, Burns BJ, Borum R: A randomized controlled trial of outpatient commitment in North Carolina. *Psychiatr Serv* 2001; 52:330–336
5. Swartz MS, Swanson JW, Steadman HJ, Robbins PC, Monahan J: New York State Assisted Outpatient Treatment Program Evaluation. Durham, NC, Duke University School of Medicine, 2009. www.omh.state.ny.us/omhweb/resources/publications/aot_program_evaluation
6. Pettila J, Ridgely MS, Borum R: Debating Outpatient Commitment: Controversy, Trends, and Empirical Data. *Crime Delinq* 2003; 49:157–172
7. Geller JL: The evolution of outpatient commitment in the USA: from conundrum to quagmire. *Int J Law Psychiatry* 2006; 29: 234–248
8. Appelbaum PS: Thinking carefully about outpatient commitment. *Psychiatr Serv* 2001; 52:347–350
9. Swartz MS, Swanson JW: Involuntary outpatient commitment in the United States: practice and controversy, in *Care for the Mentally Disordered Offender in the Community*. Edited by Buchanan A. Oxford, United Kingdom, Oxford University Press, 2002

10. Swartz MS, Wilder CM, Swanson JW, Van Dorn RA, Robbins PC, Steadman HJ, Moser LL, Gilbert AR, Monahan J: Assessing outcomes for consumers in New York's assisted outpatient treatment program. *Psychiatr Serv* 2010; 61:976–981
11. Gilbert AR, Moser LL, Van Dorn RA, Swanson JW, Wilder CM, Robbins PC, Keator KJ, Steadman HJ, Swartz MS: Reductions in arrest under assisted outpatient treatment in New York. *Psychiatr Serv* 2010; 61:996–999
12. Van Dorn RA, Swanson JW, Swartz MS, Wilder CM, Moser LL, Gilbert AR, Cislo AM, Robbins PC: Continuing medication and hospitalization outcomes after assisted outpatient treatment in New York. *Psychiatr Serv* 2010; 61:982–987
13. Busch AB, Wilder CM, Van Dorn RA, Swartz MS, Swanson JW: Changes in guideline-recommended medication possession after implementing Kendra's law in New York. *Psychiatr Serv* 2010; 61:1000–1005
14. Robbins PC, Keator KJ, Steadman HJ, Swanson JW, Wilder CM, Swartz MS: Assisted outpatient treatment in New York: regional differences in New York's assisted outpatient treatment program. *Psychiatr Serv* 2010; 61:970–975
15. Clark RE, Ricketts SK, McHugo GJ: Legal system involvement and costs for persons in treatment for severe mental illness and substance use disorders. *Psychiatr Serv* 1999; 50:641–647
16. Valenstein M, Copeland LA, Blow FC, McCarthy JF, Zeber JE, Gillon L, Bingham CR, Stavenger T: Pharmacy data identify poorly adherent patients with schizophrenia at increased risk for admission. *Med Care* 2002; 40:630–639
17. Svarstad BL, Shireman TI, Sweeney JK: Using drug claims data to assess the relationship of medication adherence with hospitalization and costs. *Psychiatr Serv* 2001; 52:805–811
18. Karve S, Cleves MA, Helm M, Hudson TJ, West DS, Martin BC: Prospective validation of eight different adherence measures for use with administrative claims data among patients with schizophrenia. *Value Health* 2009; 12:989–995
19. Hardin J, Hilbe J: *Generalized Estimating Equations*. Boca Raton, Chapman & Hall, 2001
20. Swartz MS, Swanson J, Kim M, Petrla J: Use of involuntary outpatient commitment or related civil court treatment orders in five United States communities. *Psychiatr Serv* 2006; 57:343–349
21. Appelbaum PS: Ambivalence codified: California's new outpatient commitment statute. *Psychiatr Serv* 2003; 54:26–28
22. Petrla J, Christy A: Florida's outpatient commitment law: a lesson in failed reform? *Psychiatr Serv* 2008; 59:21–23
23. Christy A, Petrla J, McCranie M, Lotts V: Involuntary outpatient commitment in Florida: case information and provider experience and opinions. *Int J Foren Ment Health Services* 2009; 8: 122–130
24. Gomes C, McGuire TG, Foster MF, Donahue SA, Felton CJ, Essock SM: Did Project Liberty displace community based Medicaid recipients in New York? *Psychiatr Serv* 2006; 57:1309–1312
25. Rosenheck R: Cost-effectiveness of services for mentally ill homeless people: the application of research to policy and practice. *Am J Psychiatry* 2000; 157:1563–1570
26. Swanson JW, Van Dorn RA, Swartz MS, Cislo AM, Wilder CM, Moser LL, Gilbert AR, McGuire TG: Robbing Peter to pay Paul: did New York State's outpatient commitment program crowd out voluntary service recipients? *Psychiatr Serv* 2010; 61:988–995
27. Sinaiko AD, McGuire TG: Patient inducement, provider priorities, and resource allocation in public mental health systems. *J Health Polit Policy Law* 2006; 31:1075–1106