OFFICE OF BEHAVIORAL HEALTH, DISABILITY, AND AGING POLICY

Evaluation of the Assisted Outpatient Treatment Grant Program for Individuals with Serious Mental Illness: Outcome Evaluation Report

Prepared for
**the Office of the Assistant Secretary for Planning and Evaluation (ASPE)
at the U.S. Department of Health & Human Services**

by

RTI International

Policy Research Associates, Inc.

Duke University School of Medicine

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Office of the Assistant Secretary for Planning and Evaluation

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EVALUATION OF THE ASSISTED OUTPATIENT TREATMENT GRANT PROGRAM FOR INDIVIDUALS WITH SERIOUS MENTAL ILLNESS:

OUTCOME EVALUATION REPORT

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Although the findings presented in this report are solely our responsibility, we recognize the valuable involvement of our project's U.S. Department of Health and Human Services (HHS) AOT program advisory committee, including Joel Dubenitz, PhD, of the HHS Office of the Assistant Secretary for Planning and Evaluation and Joel Sherrill, PhD, of the National Institute of Mental Health.

EXECUTIVE SUMMARY

ES.1. Introduction

Assisted outpatient treatment (AOT) is a civil court procedure whereby a judge orders an adult with serious mental illness (SMI) to comply with community-based treatment. Developed as a less restrictive alternative to involuntary hospitalization, AOT targets individuals who are at risk of clinical deterioration or rehospitalization because they do not voluntarily comply with prescribed treatment. At present, AOT is authorized in nearly all U.S. states and territories, although statutory variation and uneven implementation of AOT means that no two implementations look exactly alike. In general, however, to be placed under an AOT order, individuals must be at least 18 years of age, be diagnosed with SMI, and be assessed unlikely to be able to live safely in the community. Once an AOT order is finalized by a court, recipients are engaged in a comprehensive community-based treatment plan and procedures for monitoring adherence to the plan.

The purpose of the project carried out by RTI International, in partnership with Duke University and Policy Research Associates, Inc. (PRA), was to conduct an implementation and outcome evaluation of the Substance Abuse and Mental Health Services Administration's (SAMHSA's) AOT Grant Program for Individuals with SMI, a 4-year pilot program that funded AOT grants set forth in the 2014 Protecting Access to Medicare Act. The implementation evaluation, conducted from November 2016 to August 2017, gathered information related to the processes and practices of AOT across six of the 18 SAMHSA-funded AOT sites.

The outcome evaluation, conducted from September 2017 to March 2021, was intended to address research questions (RQs) in the following domains:

- **AOT program outcomes**:
  1. Does AOT affect treatment, clinical functioning, and social functioning outcomes?
  2. Do outcomes differ by AOT duration or scope of services?
  3. Which models of AOT lead to better outcomes?
  4. Which specific intervention components, including the use of evidence-based practices (EBPs), lead to better outcomes?
  5. Do outcomes differ based on the intensity of services offered or intensity of resources available to providers?

- **Client and family perceptions**:
  6. What do clients report about AOT?
  7. Are families satisfied with AOT? With treatment providers? With judicial/legal personnel?

- **AOT resources and costs**:
  8. What resources are available to support AOT?
  9. What costs are associated with implementing AOT?
  10. Are cost savings associated with outcomes attributable to AOT?
  11. How do sites plan to sustain AOT once grant funding ends?

ES.2. Methods

The six case study sites included in the cross-site evaluation were initially selected by the U.S. Department of Health and Human Services (HHS) AOT program advisory committee per several criteria, including geographic diversity, AOT program type, AOT program size, data availability, and suitability for the outcome evaluation to follow. Ultimately, three case study sites were replaced for the outcome evaluation, having been deemed to have insufficient capacity for data collection or too many programmatic limitations.

The resulting case study sites and their locations are: AltaPointe Health Systems, Inc., in Fairhope, Alabama; LifeStream Behavioral Center in Leesburg, Florida; Pine Belt Mental Healthcare Resources in Hattiesburg, Mississippi; Northern Nevada Adult Mental Health Services (NNAMHS) in Sparks, Nevada; Doña Ana County in Las Cruces, New Mexico; and the Oklahoma Department of Mental Health and Substance Abuse Services in Oklahoma, Tulsa, Rogers, Washington, Ottawa, and Delaware Counties, Oklahoma.

An outcome evaluation design and analysis plan was developed following the completion of the implementation evaluation, in consultation with the HHS AOT program advisory committee and an AOT Technical Advisory Group (TAG). The design and analysis plan was further modified over time to account for changes to key elements of the study design. The plan design was ultimately modified to include: (1) a single comparison site with appropriate primary and secondary data collection capacity; and (2) enhanced secondary data collection (e.g., Medicaid/non-Medicaid service encounters, arrest and hospitalization records) to supplement primary data in pre-post and comparison analyses within and across the six sites.

The outcome evaluation used an array of data sources to address research questions, including a set of Office of Management and Budget (OMB)-approved, prospective survey instruments to obtain primary data from the six case study sites and build upon qualitative and administrative data (e.g., grantee applications, reports) provided during the implementation evaluation. Sites were asked to supplement primary data collections with secondary data obtained from county-level or state-level agencies. Finally, primary and secondary data were collected from an intra-county and inter-county non-AOT comparison group at one case study site.

Data analysis leveraged a range of qualitative and quantitative methodologies to address research questions about AOT program outcomes, client and family perceptions, and resources and costs. The outcome evaluation expanded upon the qualitative work first conducted during the implementation evaluation to capture variability in implementation and, when appropriate, model differences in quantitative analyses.

Specifically, program outcomes data were examined using pre-post and comparison group regression analyses, supplemented with Bayesian methods. In addition to measuring changes in key program outcomes, analyses evaluated the extent to which judicial involvement and changes in treatment adherence during and after an AOT order can explain changes in subsequent clinical and social functioning outcomes. Client-level factors identified to be potentially important in prior research or implementation findings were also assessed as moderators.

Client perceptions of AOT were assessed using pre-post and regression analyses to determine how perceptions changed from baseline to follow-up and the extent to which changes may be influenced by the client's understanding of AOT, therapeutic alliance, or judicial status hearings during the order. Family perceptions of AOT were examined using results of family satisfaction surveys.

Descriptions and analysis of resources and associated costs of AOT were developed using interview and cost data from a subset of three case study sites. Potential cost savings were calculated based on changes in utilization and associated reductions in medical care spending. Preliminary sustainability plans were obtained via qualitative interviews with key informants at all six case study sites.

ES.3. Findings

ES.3.1. AOT Program Outcomes

Results showed that AOT is associated with improvements in treatment, clinical functioning, and social functioning outcomes. Appointment and medication adherence both increased from baseline to 6-month and 12-month follow-up periods. Appointment adherence increased by 25.9%, from an average of 67% at baseline to an average of 93% at 6-month follow-up. Medication adherence increased by 17.1% from an average of 72%

at baseline to an average of 89% at 6-month follow-up. The improvement from baseline to 12-month follow-up were similar for both outcomes.

AOT was associated with improvements across all clinical functioning measures. Specifically, changes to symptom index scores showed that AOT clients, on average, experienced emotional distress several times each month at baseline and only once per month at 6-month follow-up. Results were similar when comparing the baseline and 12-month follow-up scores. Clients also reported greater perceptions of mental health and life satisfaction at follow-up than at baseline. On average, clients rated their mental health as between fair and good at baseline (on a four-point Likert scale ranging from poor, fair, good, and excellent). At 6-month follow-up there was a significant improvement, with the average client rating their mental health between good and excellent. Results were similar for 12-month follow-up. Life satisfaction scores also increased over time, illustrating that AOT clients, on average, had mixed feelings about their lives as a whole at baseline and were satisfied with their lives in general at 6-month follow-up. Results were similar but stronger when comparing the 12-month follow-up and baseline life satisfaction.

Therapeutic alliance also improved during and after the AOT order. The goal, task, and bond scales of the working alliance inventory improved by 8.5%-11.5% over time, indicating that clients perceived that they were working more effectively to identify and achieve functioning goals; viewed treatment activities as beneficial; and felt that their therapeutic bond improved. Results from the 12-month follow-up were similar.

Clients were less likely to report any violent behavior and have suicidal thoughts at follow-up than at baseline. The percentage of clients who reported any violent behavior decreased by 19%, from 23.9% at baseline to just 4.9% at 6-month follow-up. The percentage of clients who reported any suicidal thoughts decreased by 24.7%, from 31.4% at baseline to 6.7% at 6-month follow-up. Results for both outcomes were similar at 12-month follow-up.

Between 37% and 44% of the changes observed in clinical functioning outcomes could be attributed to changes in treatment adherence or having at least one status hearing. A greater proportion of changes were attributed to judicial status hearings (21% to 32%) than to treatment adherence (6% to 14%).

AOT was associated with improvements across social functioning outcomes. Psychiatric inpatient utilization decreased significantly, with the percentage of clients with at least one psychiatric inpatient episode during the past 6 months dropping from 61.4% at baseline to 20.4% at 6-month follow-up. These reductions were greater among AOT clients compared to non-AOT participants. The number of nights spent in a psychiatric inpatient setting decreased from an average of 11.8 nights at baseline to 2.1 nights at 6-month follow-up.

While not corroborated by secondary/administrative data, criminal justice involvement also decreased, as the percentage of clients who reported at least one arrest in the past 6 months decreased from 26.0% at baseline to 6.8% at follow-up. The percentage of clients who reported any illicit drug use in the past 6 months decreased from 28.6% at baseline to 14.4% at 6-month follow-up. The percentage of clients who reported any homelessness during the past 6 months decreased from 17.3% at baseline to 5.1% at 6-month follow-up.

Results for all social functioning outcomes were similar at 12-month follow-up save for homelessness, which was not statistically significant. Among social functioning outcomes, 72% of the changes observed in mental health emergency department visits were attributable to both factors. Less than half of the changes observed among the remaining social functioning outcomes were attributed to changes in either factor. Results showed no clear indication of one factor playing a stronger role than the other for any one outcome. Judicial status hearings and changes in treatment adherence accounted for 72% of the changes observed in mental health emergency department visits. Across remaining social functioning outcomes, judicial status hearings and

treatment adherence accounted for less than half of the observed changes in outcomes, with neither factor playing a stronger role for any specific outcome.

Results of moderator analyses showed that the length of the AOT order moderated changes in violence, suicidal ideation, number of psychiatric inpatient nights, and homelessness, such that clients who spent at least 6 months under the AOT order had better outcomes than those with a shorter order. Step-down status was not associated with a statistically significant difference in changes in any outcome. Pre-post reductions in violent behavior and illicit drug use were greater for participants with baseline CJ involvement. Successful order completion moderated improved changes in symptomology, illicit drug use, and homelessness.

ES.3.2. Client and Family Perceptions

Results of pre-post analyses from baseline to follow-up indicated that some client perceptions of AOT remained stable, whereas others changed over time. Specifically, clients reported neutral levels of perceived coercion at baseline and follow-up. Most individuals did not perceive that there is a stigma around AOT, and the proportion of those who did lessened over the course of the order. Clients typically endorsed statements that AOT is effective at improving treatment and medication adherence and reducing likelihood of inpatient hospitalization. Perceived pressures to adhere to treatment grew over the course of the order, but the perceived benefits and fairness of these pressures and overall treatment satisfaction also increased over time.

Family perceptions of AOT--including satisfaction with the civil process and treatment services provided under the order--were largely positive and unaffected by specific role (e.g., individual filing the petition) or level of involvement in the petition process (e.g., attending initial court hearing). Most family members, like AOT clients, believed that AOT is effective at improving treatment and medication adherence and keeping clients out of the hospital.

ES.3.3. AOT Resources and Costs

Cost analyses showed substantial variation in total costs incurred within each AOT site over a 6-month early implementation period ($3,324-$14,182). These costs were driven by labor costs for personnel who participated in planning meetings, such as meetings intended to map out responsibilities across courts and treatment teams. Total mid-adoption costs were calculated on a per client per year basis, and were much more similar across sites, ranging from $12,300-$13,261. Estimates showed that AOT was associated with almost $1,000 in net savings (i.e., savings after netting out mid-adoption costs), which is roughly an 8% return on investment (ROI). These savings reflect significant decreases in psychiatric inpatient and emergency room care.

Despite the cost savings noted above, multiple sites indicated that sustaining their AOT programs after the end of the grant period would involve fundamental changes to implementation, including incorporation of a formal voluntary option or changes to staff composition, as some funded positions would no longer be supported after the grant. In general, sites with state and local government agencies with more favorable views of AOT forecasted being able to fund AOT as is, without the need for modifications around court involvement.

ES.4. Summary

In general, findings of the outcome evaluation align with those of prior research and enhance our understanding of the effectiveness of AOT, including the impact of select client and programmatic characteristics on outcomes. Namely, results revealed significant improvements across a range of client outcomes, including appointment and medication adherence, symptomology, perceived mental health, life satisfaction, and therapeutic alliance during AOT and following the order. AOT clients also demonstrate

reductions in violent behaviors, suicidal thinking, arrests, drug use, and homelessness, as well as number of inpatient hospitalizations and days in the hospital.

Results suggested - no notable differences in effectiveness for those who are referred from the community (i.e., “step-up” entry) versus those referred from inpatient hospitalization or jail stay, (i.e., “step-down” pathway), suggesting that entry criteria in state statutes can be effective for both pre-emptively reducing risk of hospitalization or incarceration and for reducing risk of recidivism. Our between-group findings suggest that AOT is more effective than voluntary treatment in instances of repeated psychiatric hospitalizations. Assertive community treatment (ACT) or other intensive case management without a court order may still be suitable in cases where the client has demonstrated difficulties with adhering to treatment but does not reach the point of requiring hospitalization.

Additionally, individuals with criminal justice involvement at the time of AOT initiation exhibit similar treatment adherence and clinical functioning improvements as those without, and also evince greater reductions in violent behavior and arrests, suggesting that justice-involved individuals are within the scope of AOT’s effectiveness.

AOT characteristics associated with subsequent outcomes include length of time of the order, as spending at least 6 months on an AOT order is associated with a further reduced likelihood of violent behavior; suicidal thoughts; number of psychiatric inpatient nights; and homelessness. Moreover, those who successfully complete their AOT order show greater improvements around symptomology, homelessness, and illicit drug use. Findings also suggest that a sizable proportion of changes observed in clinical and social functioning outcomes can be associated with having at least one judicial status hearing over the course of the order and changes in medication and appointment adherence.

Additionally, this study provides insights around client and family perceptions of AOT to be factored into the ongoing pursuit of balance between respecting individual rights, on one hand, and ensuring public safety and access to community care, on the other. The findings do not raise any pressing concerns about civil liberties from the perspective of the consumer, and most clients and family members surveyed believe that AOT is an effective way to improve treatment and medication adherence and keep clients out of the hospital.

Finally, findings regarding costs and resources indicate that AOT is associated with reductions in psychiatric emergency department and inpatient costs. The observed savings likely represent a conservative estimate, given they do not incorporate other potential cost savings related to public safety outcomes including criminal justice involvement. The initial investment to establish a new AOT program varies widely, in part as a function of staff time, and is larger in cases where the court is involved over the course of the order. Although judicial status hearings are not required to achieve positive client outcomes, our findings suggest that this may be an effective practice at sites with the ability to coordinate and fund the additional judicial contacts during the order.

1. INTRODUCTION

1.1. History and Current Implementation in the United States

Assisted outpatient treatment (AOT) is a civil court procedure whereby a judge orders an adult with serious mental illness (SMI) to comply with community-based treatment. Developed as a less restrictive and less costly alternative to involuntary hospitalization, AOT targets individuals who are at risk of clinical deterioration or rehospitalization because they do not voluntarily comply with prescribed treatment. AOT is meant to circumvent the costly "revolving-door syndrome," which is marked by numerous arrests or inpatient (IP) hospitalizations among adults with SMI, often following disengagement from community care.

To facilitate receipt of treatment supports and services in the community, AOT legally mandates participation in outpatient treatment, which may include routine outpatient services, such as case management; specialty, intensive services like assertive community treatment (ACT); and psychopharmacological services via medication management. When used, these services improve clinical, social, and public health outcomes among individuals with SMI. The American Psychiatric Association issued a position statement asserting that AOT, "if systematically implemented and resourced, can be a useful tool to promote recovery through a program of intensive outpatient services designed to improve treatment adherence, reduce relapse and rehospitalization, and decrease the likelihood of dangerous behavior or severe deterioration among a sub-population of patients with SMI."[1]

At present, AOT is authorized in 47 states; exceptions include Connecticut, Maryland, and Massachusetts. In general, to be eligible for AOT, an individual must be 18 years of age or older, have a diagnosis of SMI, and be assessed to be unlikely to be able to live safely in the community without supervision. In several states, this final criterion is based on, in the past 2-3 years, a history of treatment non-compliance resulting in psychiatric hospitalization or incarceration, or having committed serious acts or threats of violence to self or others. Most statutes also require that the individual be unlikely to voluntarily participate in services and to need AOT to prevent relapse and subsequent violent or suicidal behavior.

However, statutory variation and variability in site-level determinations of AOT both within and across jurisdictions means that no two implementations of AOT in the United States look exactly alike. Rather, sites differ in their application of elements of AOT, including, but not limited to, eligibility criteria and associated target populations; approach to treatment and level of judicial involvement during the order; and renewal or closeout processes. Indeed, even length of time spent on AOT differs in and across program sites. Although all AOT orders are of limited duration, the length of the initial order is subject to state statute and subsequent determinations for renewal and completion are subject to clinical and judicial decision-making.

These differences in implementation underscore a degree of adaptability for AOT, which may be used to meet the needs of the population to be served within each program site. For example, programs may use a preventive, step-up approach for people in the community who are non-compliant with efforts to get them engaged in enhanced voluntary services, or they may use a step-down approach, essentially taking on the form of a conditional release for those in inpatient psychiatric care. Simultaneously, variability in implementation prompts questions about not only the effectiveness of AOT, but also which specific elements of AOT may influence health and social outcomes among recipients.

1.2. Assisted Outpatient Treatment Research and Evaluation History

Previous research on the implementation and effectiveness of AOT has been conducted both in the United States and internationally. Domestic studies, including randomized controlled trials (RCTs) in New York and in North Carolina and non-controlled trials in New York, comprise the bulk of research on AOT.

1.2.1. Client Outcomes

In general, prior studies have shown that AOT programs can be effective at improving key outcomes across treatment engagement and clinical and social functioning (***Table 1-1***). Domestic studies reported increased receipt of medication, reduced hospitalizations, and reduced lengths of stay, all persisting post-AOT. For example, the Duke Mental Health Study in North Carolina examined the effectiveness of AOT compared with that of case management services alone. The RCT found that AOT significantly reduced the monthly risk of hospitalization in some repeated measures multivariate analyses, but found no significant difference in the proportion of participants with any hospitalizations in a year, except for consumers who experienced longer court orders. When compared with those who underwent brief periods of AOT (i.e., 0-179 days), individuals with extended AOT (i.e., 180-365 days) had a lower probability of arrest, fewer inpatient hospitalizations, and improved treatment adherence outcomes, among others. However, these findings have been criticized methodologically by some, as length of court order was not randomized.

TABLE 1.1. Research Summary and Strength of Findings

Area and Finding[a]	United States		International		
	North Carolina[2-8]	New York[9-13]	Other Domestic[14-16]	England & Wales[17-18]	Australia[19-22]
Study Characteristics					
Analytic design	RCT (AOT vs. case management)	Pre-post + RCT (AOT vs. case management)	Pre-post (AOT vs. case management)	RCT (CTO vs. conditional release)	Pre-post (CTO vs. case management)
Sample size(s)[b]	N=331	N=3,576	Ns=19-231	N=333	Ns=1,182-128,427
Data sources	Client interviews, administrative records	Medicaid claims, case manager reports	Medical records, court records	Client interviews, medical records	Medical records
Client Outcomes					
Reduced hospitalization	++	+++	+/-	+/-	+/-
Increased receipt of medication	++	+++	–	+/-	–
Increased receipt of case management	++	+++	–	–	++
Improved functioning	++	++	–	+/-	–
Decreased arrests	++	++	–	–	–
Service Utilization and Outcomes Post-AOT					
Reduced hospitalization	–	+++	–	–	–
Increased receipt of medication	–	+++	–	–	–
Increased receipt of case management	–	+++	+++	–	–
Client Perceptions of AOT					
Improved autonomy	–	+/-	–	+/-	–
Improved treatment satisfaction	–	+/-	–	+/-	–
Increased coercion	+++	+/-	–	+/-	–

NOTES:
a. Key: +++ very strong evidence; ++ moderately strong evidence; + some evidence; +/- equivocal findings; – not tested.
b. Sample size differed across analyses as a function of data availability; here we report the total N for parent studies.

In contrast, the Bellevue Study, an RCT of a pilot AOT program in New York, found no significant differences between AOT and control (e.g., case management) participants in hospital readmission rates and lengths of stay, although the small sample size and a lack of enforcement of the court order in the case of non-compliance have been cited as limitations. However, a subsequent retrospective, quasi-experimental evaluation in New York was conducted following the enactment of a statewide AOT statute known as Kendra's Law. This evaluation showed multiple improved outcomes for AOT recipients, including reduced hospitalizations and lengths of stay, and increased receipt of medicine and intensive case management services. Still, generalizability of findings was hampered by New York's service area, which encompassed locations with ample community health services, and an unfunded mandate where no treatment dollars were associated with AOT.

International evaluations of similar court-ordered treatment programs have typically reported less-favorable results. For example, the Oxford Community Treatment Order Evaluation Trial, an RCT of CTOs in England and Wales, did not find any reduction in hospitalizations or significant changes in clinical and social outcomes. However, some have criticized these findings as lacking a true voluntary comparison group; the control condition was itself a form of conditional release from the hospital, termed Section 17 Leave of Absence--a section under the Mental Health Act 1983 policy that included legal leverage similar to that of the community treatment orders (CTOs) in the experimental condition (e.g., rehospitalization if deemed necessary by their clinician). Data from Australia similarly failed to report improved outcomes, save increased receipt of case management services.

1.2.2. Client Perceptions

Critical to evaluating whether AOT strikes an appropriate balance between respecting individual rights and civil liberties, on one hand, and ensuring public safety and access to community care, on the other, is how AOT is perceived by actual clients. Although most extant research in this area is derived from hospital admissions and inpatient settings, some studies have assessed coercion and stigma in community settings, including AOT (see ***Table 1-1***). The Bellevue Study compared individuals who completed AOT and those receiving outpatient treatment after hospitalization and found no significant differences in perceived coercion and stigma between groups. In contrast, the Duke Mental Health Study found that individuals on AOT reported greater perceived coercion than the comparison group, and additionally showed greater perceived coercion among AOT clients who were Black; were single and not living with someone; and had ongoing substance misuse, poor insight, and severe clinical symptoms and spent a longer time under the order. The Duke Mental Health Study also found that AOT affected participants' subjective quality of life in both positive and negative ways--positive insofar as AOT increased treatment participation resulting in improved symptoms, but negative insofar as AOT also tended to increase perceived coercion, a correlate of poorer quality of life.[7] In this regard, AOT may resemble a beneficial therapy with some adverse side-effects to be weighed in the balance.

Another study evaluated retrospective endorsement of the personal benefits of AOT among clients following their orders. Results indicated that most clients did not personally endorse AOT's benefits at the end of the study, regardless of whether they experienced positive treatment outcomes.[23] In a different study, individuals with schizophrenia were administered a preference assessment to measure strength of preference for avoiding hospitalization versus avoiding the constraints of AOT. In that study, findings showed that the former was a far more important and salient preference.[24]

Another study's findings suggest that potentially coercive aspects of AOT may be moderated by the degree to which judges demonstrate procedural justice via active and respectful interactions with the client. Namely, clients who indicated that they had enough opportunity to communicate with the judge or magistrate; that the judge or magistrate seemed interested in them as a person; and that they were treated respectfully and fairly reported significantly lower levels of perceived coercion.[25]

In sum, prior research on client perceptions of AOT has yielded mixed results. These findings may indirectly convey impacts of implementation of AOT on client perceptions, such that differing court and treatment experiences are associated with varied client perceptions. More information is needed on how perceptions may change over time and on the specific elements of AOT that may be associated with increased or decreased levels of coercion, stigma, and general pressures to adhere to treatment. Furthermore, family perceptions of AOT may inform ongoing discussion regarding the merits and shortcomings of mandated mental health treatment.

1.2.3. Cost

Proponents of AOT suggest that it is a cost-effective, community-based program. However, the costs, and savings, of establishing a new AOT program have not been well documented to date. Findings from New York studies suggest that AOT can reduce service costs for adults with SMI, albeit with substantial initial investment from the state in implementation of the program and availability of intensive community services. Specifically, results showed that there was a marked decline of approximately 50% in treatment costs during the first 2 years after AOT program enrollment. As outpatient service (e.g., case management, ACT, medication refills) utilization increased, inpatient hospitalizations, psychiatric emergencies, and crisis services all decreased.[26] A 7-year study of AOT in Summit County (Akron), Ohio,[27] reached similar conclusions as in New York--aggregated treatment costs per person decreased, both while the AOT order was in effect and after the order lapsed. In the Ohio study, most savings were attributed to a decrease in hospitalizations, individual therapy, crisis services, and medication management assessments and to an increase in group community support and respite services. Three additional studies reached similar conclusions that the decrease in expenditure was largely attributed to a decrease in hospitalization and acute/crisis services.

Taken together, prior research suggests that AOT is more cost effective than traditional mental health treatment utilization during and after AOT commitment. These savings tend to be gained through an overall reduction in more intensive treatment interventions such as inpatient psychiatric hospitalization, crisis services, individual therapy, and physician assessments. Although considered an intensive treatment intervention, AOT programs are delivered as outpatient services, including case management, peer support services, and medication management, all of which are less expensive than acute psychiatric treatment.

Although prior research has suggested that AOT can pay for itself by shifting care from inpatient to outpatient, costs to implement AOT are incurred across a number of domains, ranging from mobilized community resources (e.g., case management, crisis services) to court and clinical teams. Cost savings can be substantial, but new costs for implementation versus cost savings may occur in different domains. Some are new costs or savings, but others are simply a reallocation of resources from one system to another. The cumulative impact of sustained treatment engagement on multiple systems is unmeasured in cost studies of AOT, as is the intrinsic value of clinical and social benefits conveyed to clients via individualized treatment in the community.

1.2.4. Methodological Limitations

Methodological limitations in prior AOT research have left some questions unanswered, and the validity or generalizability of other findings remain unclear. For example, in observational studies of AOT, methodological critiques have included small samples; selection bias vis-à-vis emphasis on clients with the greatest likelihood of success in the community; no or non-equivalent comparison groups; a lack of valid, non-self-report data prior to AOT; retrospective designs; and lack of consistent enforcement of court orders. In RCTs on AOT, limitations have included small sample size, lack of enforcement of court orders, and non-equivalent comparison groups.

Notably, some of these limitations reflect the reality of how, and for whom, AOT is implemented. Because AOT is a complex community intervention intended for a select population of adults with SMI, for example, small samples are expected. Additionally, random assignment of treatment type and duration is not always feasible, nor is the approximation of a true comparison group. In response to these challenges, as well as in recognition that AOT's effectiveness will likely vary depending on the ways in which it is implemented, researchers have advocated for multisite observational studies using an array of data to consider those varying contexts and outcomes. Indeed, single-site studies have been limited in their ability to identify and incorporate potentially important variations in AOT characteristics into statistical models.

1.3. Background for the Present Study

To better understand best practices related to the implementation and effectiveness of AOT, the U.S. Department of Health and Human Services (HHS) Office of the Assistant Secretary for Planning and Evaluation (ASPE), in consultation with the Substance Abuse and Mental Health Services Administration (SAMHSA) and the National Institute of Mental Health (NIMH), supported this important examination. The purpose of the project carried out by RTI International, in partnership with Duke University and Policy Research Associates, Inc. (PRA), was to conduct an implementation and outcome evaluation of SAMHSA's Assisted Outpatient Treatment Grant Program for Individuals with Serious Mental Illness, a 4-year pilot program that funded AOT grants set forth in the 2014 Protecting Access to Medicare Act (PAMA). The in-depth implementation and outcome evaluations focus on six of the 18 SAMHSA-funded AOT sites.

1.3.1. Implementation Evaluation

The implementation evaluation, conducted from November 2016 to August 2017, was intended to gather information related to the processes and practices of AOT across six sites in the following areas of investigation:

- **AOT programs and civil court processes**: Are there differences across the pilot programs, their implementation, and the civil court procedures used?
- **Target populations**: Who did the programs intend to serve and who are they actually serving?
- **Service infrastructures and clinical approaches**: What existing and newly established clinical service infrastructures are supporting AOT program participants?
- **Stakeholder involvement**: What stakeholders were involved in the development and implementation of the AOT program, and have their roles changed over time? What stakeholders are involved in the civil court process, and what are their roles?
- **Person-centered practices and procedural justice**: To what extent do the programs retain due processes and choices for individuals and families?
- **Innovation**: What are some of the innovative practices and arrangements to implementing AOT that have emerged from the pilot grants?
- **Evaluation capacities**: What is the data collection capacity of the program sites? What supports will need to be in place to collect valid and complete data surrounding the nature, intensity, and quality of services and health and social outcomes if the site is also selected for the outcome evaluation?

The first stage of the evaluation began with a review of grant applications and consultations with all grantees to guide the selection of six in-depth sites. These sites, presented in ***Table 1-2***, were selected by the HHS AOT

program advisory committee per several criteria, including geographic diversity, AOT program type, AOT program size, data availability, and suitability for the outcome evaluation.

TABLE 1-2. In-Depth Sites for Implementation Evaluation

Grantee	Implementing Location(s)
AltaPointe Health Systems, Inc.	Baldwin Co, AL
Cook County Health & Hospital System	Chicago, IL
Hinds County Mental Health Commission	Jackson, MS
Doña Ana County	Las Cruces, NM
Alcohol, Drug Addiction & Mental Health Services Board of Cuyahoga County (ADAMHSBCC)	Cleveland, OH
ODMHSAS	Oklahoma, Tulsa, Rogers, Washington, Ottawa, and Delaware Counties, OK

Following recruitment of the sites, site visit protocols were created to facilitate interviews with and observations of various stakeholder groups during visits to each of the six sites. Site visits took place over 2 days and were conducted by three-person teams led by Brian Case of PRA and Richard Van Dorn of RTI, with additional support provided by RTI, PRA, and Duke. Information gathered from the site visits was supplemented by the original grant applications and additional materials provided by the sites. Findings related to the areas of investigation were compiled into site visit summaries, which were reviewed by each site, and a final implementation report.

Overall, findings of the implementation evaluation demonstrated that the development and ongoing implementation of AOT programs was proceeding in a manner consistent with SAMHSA's program expectations. This first stage of the cross-site evaluation provided a rich array of qualitative data to inform the design and execution of the next stage of the project. Namely, the implementation evaluation identified many sources of heterogeneity across and within AOT programs, capturing noted differences in how AOT was being implemented across sites, both in terms of statutory characteristics and site-level determinations.

1.4. Summary

Equivocal findings across existing research have underscored the need for a better understanding of how AOT is developed and implemented. Prior research has demonstrated how select differences in program characteristics, such as duration of AOT, can affect important outcomes. The completed implementation evaluation identified key sources of variability, derived from state and local statutes and site-specific characteristics, within and across sites. Informed by limitations of prior research and findings from the implementation evaluation, the outcome evaluation examines AOT with respect to program outcomes, client and family perceptions, and resources and costs. Findings from this cross-site evaluation will inform development and implementation of effective policies, services, and interventions to improve outcomes for adults with SMI.

2. OBJECTIVES AND METHODOLOGY OF THE OUTCOME EVALUATION

2.1. Research Questions

The outcome evaluation examines which characteristics of AOT influence health and social outcomes for individuals under AOT orders and client and family perceptions of AOT and resources and costs. Specifically, this evaluation addresses research questions (RQs) in the following domains:

- **AOT program outcomes**:
  1. Does AOT affect treatment, clinical functioning, and social functioning outcomes?
  2. Do outcomes differ by AOT duration or scope of services?
  3. Which models of AOT lead to better outcomes?
  4. Which specific intervention components, including the use of evidence-based practices (EBPs), lead to better outcomes?
  5. Do outcomes differ based on the intensity of services offered or intensity of resources available to providers?

- **Client and family perceptions**:
  6. What do clients report about AOT?
  7. Are families satisfied with AOT? With treatment providers? With judicial/legal personnel?

- **AOT resources and costs**:
  8. What resources are available to support AOT?
  9. What costs are associated with the implementation of AOT?
  10. Are cost savings associated with outcomes attributable to AOT?
  11. How do sites plan to sustain AOT once grant funding ends?

2.2. Outcome Evaluation Study Design

An outcome evaluation design and analysis plan was developed following the completion of the implementation evaluation, in consultation with the HHS AOT program advisory committee (ASPE, SAMHSA, and NIMH) and an AOT TAG. Specifically, a meeting to solicit feedback on the preliminary design plan was held on October 5, 2017, in Washington, DC, and included participants from the HHS committee, TAG, and evaluation team. Input and recommendations from meeting attendees were presented according to their feasibility and cost-benefit in a design options memorandum, and subsequent analytic decisions from the project COR and HHS committee were integrated into the preliminary design and analysis plan.

The design and analysis plan was further modified over time to account for changes to key elements of the study design. For example, three case study sites were added to the outcome evaluation by the study team and HHS advisory committee, replacing sites from the implementation evaluation that were deemed to have insufficient capacity for data collection or too many programmatic limitations. Additional changes were made in response to challenges related to identifying appropriate comparison sites for each of the six program sites. The plan design was ultimately modified to include: (1) a single comparison site with appropriate primary and secondary data collection capacity; and (2) enhanced secondary data collection (e.g., Medicaid/non-Medicaid service encounters, arrest and hospitalization records) to supplement primary data in pre-post and comparison analyses within and across the six sites. The final six case study sites used for cross-site data collection and analysis are presented in ***Table 2-1***.

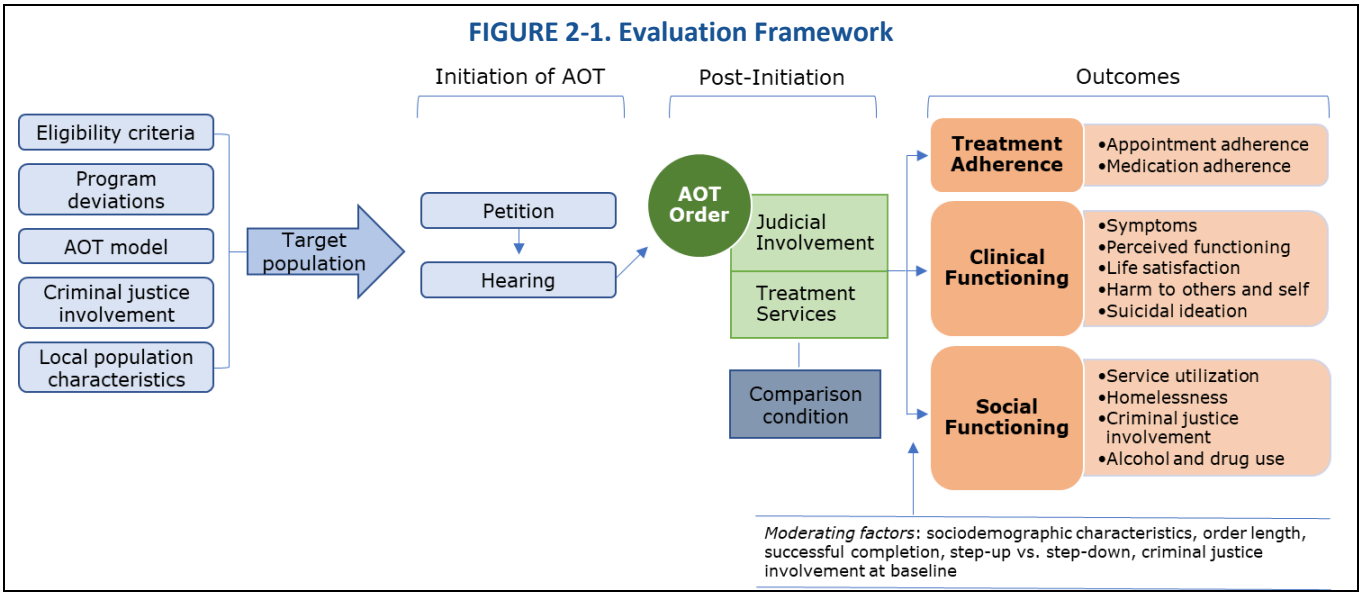
The following sections present an overview of the design and analysis plan used in this multisite outcome evaluation, including the evaluation framework, data sources, and qualitative and quantitative methodologies.

TABLE 2-1. Case Study Sites for Outcome Evaluation	
Grantee	**Implementing Location(s)**
AltaPointe Health Systems, Inc.*	Baldwin Co, AL
LifeStream Behavioral Center	Leesburg, FL
Pine Belt Mental Healthcare Resources	Hattiesburg, MS
NNAMHS	Sparks, NV
Doña Ana County*	Las Cruces, NM
ODMHSAS*	Oklahoma, Tulsa, Rogers, Washington, Ottawa, and Delaware Counties, OK
* Also included as case study site in implementation evaluation.	

2.3. Evaluation Framework

Figure 2-1 presents the evaluation framework used to inform data collection and analysis. The items presented in the far-left side of the figure depict some of the site-level factors that influence the target population that is petitioned and subsequently placed on AOT. The intervention process comprises both: (1) AOT program services, including initiation and post-initiation program implementation (e.g., step-up vs. step-down models, judicial involvement); and (2) treatment services (e.g., medication management, psychosocial interventions) provided to individual consumers. The comparison condition used in select analyses comprised non AOT clients receiving intensive, community-based outpatient services like those provided on AOT but without a court mandate. The right side of the figure outlines outcomes of interest, separated into treatment adherence, clinical functioning, and social functioning outcomes. The framework also supports analyses assessing the relationship between judicial status hearings and treatment adherence and clinical and social functioning, as well as examination of other client-level moderators of AOT effectiveness.

FIGURE 2-1. Evaluation Framework



2.4. Data Sources

The outcome evaluation used an array of data sources to capture the AOT characteristics and outcomes presented in the evaluation framework above and address the research questions outlined in ***Section 2.1***. Namely, the outcome evaluation began with development and OMB approval of a set of prospective survey instruments to obtain primary data from the six case study sites and build upon qualitative and administrative

data (e.g., grantee applications, reports) provided during the implementation evaluation. Sites were additionally asked to supplement primary data collections with secondary data obtained from county-level or state-level agencies. Finally, primary and secondary data were collected from an intra-county and inter-county non-AOT comparison group at one case study site.

This section outlines each data source and its respective role in outcome analyses.

2.4.1. Primary Data

AOT Characteristics Form
- *Client or site-level: Site-level*
- *Collection interval: Once per month*
- *Time to complete: 30 minutes*
- *Timeframe of collection: January 2018 through September 2020*
- *Used in analyses for: RQs 3, 4, 5*

Data instruments and protocols were developed under the guidance of the HHS advisory committee and approved by OMB in August 2018.

AOT characteristics form. The AOT characteristics form was completed by program staff to provide site-level information on target populations, initiation, and post-initiation of AOT. Items were intended to track the civil and legal processes of AOT across sites and over time. The AOT characteristics form is provided in ***Appendix A***.

AOT docket monitoring form. The docket monitoring form was completed by program staff present at AOT hearings. This form collected information on the date of the court hearing, the presiding judge, and the court location, as well as client-level items on hearing type, respondent attendance, hearing representatives, hearing length, verbal interaction between judge and respondent and between judge and treatment team, hearing outcome, warnings or reminders, response to non-compliance, and next hearing date. The docket case-monitoring form is included in ***Appendix B***.

AOT Docket Monitoring Form
- *Client or site-level: Client-level*
- *Collection interval: Each AOT hearing*
- *Time to complete: 6 minutes*
- *Number completed: 765*
- *Used in analyses for: RQs 3, 4, 5*

Structured client interview. The structured client interview was administered to AOT clients by program staff (most frequently, non-primary treating clinicians, though some sites used local evaluators) at baseline and follow-up (e.g., 6-month and 12-month while on AOT, 6-month post-AOT). These interviews gathered information across numerous domains, including housing, perceived functioning and well-being, clinical symptoms, treatment history and service use, medication use, substance use, satisfaction with treatment, perceived coercion to adhere to treatment, general pressures to adhere to treatment, AOT experiences, and criminal justice experiences. The cross-site evaluation did not provide any renumeration or incentive to interview respondents. Some sites elected to use a portion of their own SAMHSA grant funds to compensate clients ($10-$20 per completed interview). Baseline and follow-up versions of the structured client interview instrument are provided in ***Appendix C***.

Structured Client Interview
- *Client or site-level: Client-level*
- *Collection interval: Every 6 months*
- *Time to complete: 60-90 minutes*
- *Number of participants interviewed: 392*
- *Used in analyses for: RQs 1-6*

Family satisfaction survey. The family satisfaction survey was administered to a subsample of AOT clients' family members to gather information related to their perceptions of AOT, involvement in and satisfaction with the civil process, satisfaction with treatment services received under the AOT court order, client behaviors, and family well-being. The family satisfaction survey instrument is provided in ***Appendix D***.

Family Satisfaction Survey
- *Client or site-level: Client-level*
- *Collection interval: Once, approximately 6 months after client's entry into AOT*
- *Time to complete: 15 minutes*
- *Number completed: 46*
- *Used in analyses for: RQ 7*

Cost questionnaire. The cost questionnaire was completed by representatives at each of the six in-depth AOT sites. The focus of the questionnaire was on the labor and non-labor resources used to provide treatment services to AOT participants. For three of the six in-depth sites, we were able to schedule and conduct interviews with one or more representatives from the courts involved with the AOT program. These interviews provided more detailed information on who was involved with the AOT hearings both during the in-person hearings and behind the scenes (e.g., clerks who helped prepare for hearings). We used these data to approximate the labor and non-labor costs associated with the AOT hearings to estimate a total AOT cost. For three program sites, estimates were provided by program informants, rather than court personnel, regarding specific court involvement. Therefore, we present cost results for the three in-depth sites where we have the most-reliable data. A sensitivity analysis that includes the limited data from all six in-depth sites is provided in ***Appendix F***. The cost questionnaire is provided in ***Appendix E***.

Cost Questionnaire
- *Client or site-level: Site-level*
- *Collection interval: Once*
- *Time to complete: 60 minutes*
- *Number completed: 6*
- *Used in analyses for: RQs 8-11*

2.4.2. Secondary Data

Medicaid and non-Medicaid services encounter data. Sites were expected to obtain relevant Medicaid and non-Medicaid treatment services and cost data. These data illustrate patterns in outpatient and inpatient utilization and prescription drug reimbursements. We also received data on the primary diagnoses of individuals when they entered AOT.

Local and state arrest records. Sites were expected to provide criminal justice data (e.g., arrests, incarcerations) at the state or county levels from criminal justice agencies.

Public and private hospitalization data. Sites were asked to obtain hospitalization data from state and county, public and private hospitals for all AOT recipients.

AOT Secondary Data
- *Time period: Spanning up to 2 years before services and 6 months post-services*
- *Number of participants with at least 1 record:*
  - *Medicaid and non-Medicaid services encounter data: 524*
  - *Local and state arrest records: 588*
  - *Public and private hospitalization data: 775*

Each site was able to furnish a subset of the above secondary data types, although very few data elements were provided by all sites. Data elements that were consistently provided were measures of psychiatric inpatient service utilization and demographic data elements. In light of these inconsistencies, we use secondary administrative data in three ways in this report: (1) to fill in missing demographic data elements from the primary structured client interview; (2) to construct indicators for the length of each participant's AOT order and the successful completion of their order based on discharge notes provided by program administrators; and (3) to conduct a set of confirmatory analyses using available data on outcomes comparable to those measured in primary structured client interview. The specific measures included in the confirmatory analysis are as follows:

- Number of outpatient encounters to proxy for appointment adherence.
- Medication possession ratio as an alternative to medication adherence.
- Crisis and psychiatric inpatient encounters as alternatives to self-reported psychiatric emergency room and inpatient encounters.
- Arrests as an alternative to self-reported arrests.

2.4.3. Comparison Data

The AltaPointe comparison group comprised non-AOT ACT and Bridge Team clients in Mobile County, and non AOT ACT clients in Baldwin County, Alabama. Comparison clients were administered an adapted version of the Structured Client Interview at baseline, every 6 months while receiving ACT or Bridge Team services, and again 6 months after discontinuing ACT or Bridge Team services. Clients received $20 for completing the OMB-approved interview at baseline and at follow-up. Secondary data were gathered for all comparison group clients. Secondary data were also collected for non-AOT ACT clients at two additional sites, including demographic, enrollment, and discharge data. For both AOT and comparison group clients, we also collected data on primary diagnosis before enrollment, during participation in the program, and after being discharged; data on routine and crisis services received by clients before enrollment and during treatment; and medication prescription and fill data.

Non-AOT Secondary Data

- *Time period: Spanning up to 2 years before services and 6 months post-services*
- *Number of participants with at least 1 record:*
  - *Medicaid and non-Medicaid services encounter data: 513*
  - *Local and state arrest records: 156*
  - *Public and private hospitalization data: 278*

2.4.4. Data Collection Training and Monitoring

In November 2018, RTI held a live webinar for case study sites to provide an overview of the enhanced data collection protocols. In addition to presenting objectives of the evaluation and the in-depth sites' roles and responsibilities, the evaluation team reviewed data collection activities and introduced the prospective survey instruments. A link to the recorded presentation and tailored packets, including all instruments, were circulated immediately following the webinar, with instructions for AOT staff to review and make any necessary changes to Institutional Review Board agreements.

RTI also created a series of presentations that provided detailed information on data collection instruments and protocol, and on deidentifying and sharing data. AOT programs were asked to have relevant program staff view the recorded presentations prior to a virtual meeting led by a study team member, who reviewed procedures and facilitated a mock structured client interview conducted by site staff. Case study sites were encouraged to start collecting AOT and cost data in January 2019. Administration of the client interview and family satisfaction survey began in March 2019 for case study sites, following completion of the individual meetings with site staff and subsequent mock interview(s).

Presentation Series

- *Collecting Information about the AOT Program (17:35)*
- *Collecting Cost Data (12:06)*
- *Collecting Information from Families (7:53)*
- *Collecting Information on Clients (49:53)*
- *Preparing to Share Data with RTI (15:50)*

Client-level primary data elements captured by the docket monitoring form, structured client interview, and family satisfaction survey were collected by program staff on an ongoing basis per AOT hearings and

enrollment into AOT. Site-level primary and secondary data were collected at pre-determined intervals, deidentified as appropriate, and submitted to a secure FTP site.

The evaluation study team monitored data collected by the sites on an ongoing and quarterly basis, per data type and site-specific needs. For example, monthly submissions were tracked for each site to monitor primary data uploaded and missing for each instrument. Additionally, item-level trackers were continuously updated to identify any missing or incorrect data to be addressed with sites in quarterly calls or more immediate email or phone communications. Secondary data grids were developed and updated to track the collection of Medicaid and non-Medicaid services encounter data, arrest records, and hospitalization records and to facilitate conversations with each site to support attempts to obtain county-level or state-level data.

2.5. Methodological Approach

2.5.1. Data Constructs

Table 2-2 presents the constructs and measures used in addressing different research questions. In most cases, measures were specified from primary data sources; however, these measures were supplemented in analyses by additional data sources, including administrative and secondary data, when feasible.

TABLE 2-2. Constructs and Measures for Outcome Analyses

Construct	Data Source	Measure/Specification
Treatment Adherence Outcomes		
Appointment adherence	Structured Client Interview	• One item rated on a 5-point scale (1=never missed an appointment; 5=avoided keeping appointments altogether). • Individuals rated as "appointment adherent=1" if they were rated as 1 or 2.
Medication adherence	Structured Client Interview	• One item rated on a 6-point scale (1=never missed taking medication; 6=never took medication). • Individuals rated as "appointment adherent=1" if they were rated as 1 or 2.
Medication possession ratio	Secondary Administrative Records	• One indicator derived from medication fill data indicating whether the client filled their medications at least once in 5 out of the past 6 months.
Clinical Functioning Outcomes		
Symptoms	Structured Client Interview	• MCSI. • Mean scores were calculated, with lower scores reflecting more prominent psychiatric symptoms.
Perceived mental health status	Structured Client Interview	• One item rated on a 4-point scale rating self-perceived quality of mental health, where 1 is poor, 2 is fair, 3 is good, and 4 is excellent. Higher scores reflect better mental health.
Perceived functioning	Structured Client Interview	• One item reflecting the count of weekly activities, with a score range 0-5. Activities included: (a) going shopping, to a restaurant, or to a coffee shop; (b) preparing a meal; (c) washing from head to toe 2 or more times; (d) cleaning your room or apartment; and (e) helping with household chores such as dishes, cleaning, or yard work. Higher scores reflect higher functioning.
Life satisfaction	Structured Client Interview	• One item rated on a 7-point scale (1=terrible; 7=delighted). • Mean score was calculated, with higher scores reflecting greater satisfaction.
Therapeutic alliance	Structured Client Interview	• Three items derived from the WAI instrument. Indicates working alliance around 3 specific domains: goals, formation of bonds, and therapeutic tasks.
Violence and victimization	Structured Client Interview	• Semi-structured interview on 12 violent or aggressive behaviors experienced or perpetrated by the respondent, yielding measures of any violence or victimization (Y/N).
Suicidal ideation	Structured Client Interview	• One item indicating whether the client had any suicidal thoughts during the past 6 months.
Social Functioning Outcomes		
Acute psychiatric health care	Structured Client Interview	• Three items: (1) indicator for any psychiatric ED visits during the past 6 months; (2) indicator for any psychiatric IP admissions in the past 6 months; and (3) number of nights spent in a psychiatric IP setting during the past 6 months.

TABLE 2-2 (*continued*)		
Construct	**Data Source**	**Measure/Specification**
Acute psychiatric health care	Secondary Administrative Records	• Count of the number of crisis encounters during the past 6 months. Count of the number of psychiatric IP admissions during the past 6 months.
Arrests	Structured Client Interview	• One item indicating whether the individual was arrested in the past 6 months.
Illicit drug use	Structured Client Interview	• One item indicating whether the individual reported illicit drug use to get high or to change the way they feel in the past 30 days.
Homelessness	Structured Client Interview	• One item indicating whether the individual reported any nights of homelessness.
AOT Model Characteristics		
Target populations (e.g., step-up)	Docket Monitoring Form	• One item indicating whether the client was stepped down from an institutional setting or stepped up from the community.
Use of status hearings	Docket Monitoring Form	• One item indicating whether the client appeared before a judge for a status hearing.
Treatment Intensity		
Appointment adherence	Structured Client Interview	• One item indicating whether the individual rarely missed appointments.
Medication adherence	Structured Client Interview	• One item rated on a 6-point scale (1=never missed taking medication; 6=never took medication). • Individuals were rated as "medication adherent=1" if they were rated as 1 or 2.
Medication possession ratio	Secondary Administrative Records	• Medication prescription fills were assessed by examining Medicaid claims. Only medications appropriate for the individual's psychiatric condition, diagnosed by a psychiatrist or while in an IP hospital stay, were counted. • Individuals were rated as "positive for medication possession=1" if they had a sufficient medication supply for that month, as indicated by duration of prescriptions and defined as ≥80% days of a given month.
Regression Controls		
Demographic characteristics	Structured Client Interview	• Gender, age, race/ethnicity, marital status, children (binary indicator for having children, number of children under age 16, number of children over age 16, total number of children) education level, employment status.
Previous use of mental health services	Structured Client Interview	• Self-report of any lifetime psychiatric IP encounters.
Prior criminal justice involvement	Structured Client Interview	• Single item asking the respondent whether they are currently on parole or probation.
	Criminal Justice Records	• Arrest records were obtained. Individual was rated as positive or negative for arrest (arrest=1, no arrest=0) for a given month, and the data were structured as person-month observations). Arrests included both misdemeanors and felonies.
Patient & Family Perceptions		
AOT understanding	Structured Client Interview	• Eight true/false statements. Example: "When they have an AOT order, people are required to go to mental health treatment appointments that are part of the treatment plan." (True). • Mean scores were calculated, with higher scores reflecting greater understanding.
AOT perceived benefits	Structured Client Interview	• Three yes/no items. Item response positive for benefit=1. Example: "When people are under AOT, do you think they are more likely to keep their mental health or substance abuse appointments?" • Mean scores were calculated, with higher scores reflecting greater perceived benefits.
Perceived AOT stigma	Structured Client Interview	• One yes/no item: "When people are under AOT, do you think that most other people think less of them?" • Individual to be rated as "perceives AOT stigma=1".
Procedural justice	Structured Client Interview	• Six items rated on a 3-point scale (1=not at all, 2=somewhat, 3=definitely). Example: "When you received your court order, did they treat you respectfully?" • Mean scores were calculated, with higher scores reflecting greater procedural justice.
Treatment satisfaction	Structured Client Interview	• Nine items rated on a 5-point scale (1=strongly agree; 5=strongly disagree). Example: "I was able to get all of the services I thought I needed." • Mean scores will be calculated, with lower scores reflecting greater satisfaction.

TABLE 2-2 (*continued*)		
Construct	**Data Source**	**Measure/Specification**
Pressure benefits	Structured Client Interview	• Nine items rated on a 5-point scale (1=strongly agree; 5=strongly disagree). Lower scores reflect greater perceived benefits from pressures to adhere to treatment. Example: "Overall, the pressures or things people have done were for my own good." • Mean scores were calculated, with higher scores reflecting fewer perceived benefits of pressure to adhere to treatment.
Perceived coercion	Structured Client Interview	• Five items rated on a 5-point scale (1=strongly agree; 5=strongly disagree) assessing experiences in the previous 6 months. Example: "It was my idea to get treatment." • Mean scores were calculated, with higher scores reflecting greater perceived coercion.
General pressures to adhere to treatment	Structured Client Interview	• Eight yes/no items assessing experiences in the previous 6 months. Item response positive for pressure=1. Example: "Did anyone tell you that you may lose your housing if you don't follow your treatment plan?" • Mean scores were calculated for the total scale, with higher scores reflecting greater pressure.
Therapeutic alliance and treatment motivation	Structured Client Interview	• Twelve items rated on a 5-point scale (seldom to always), scored using 3 subscales: goals, tasks, and bond. Mean scores were calculated for each subscale, with higher scores reflecting greater therapeutic relationship.
Family Satisfaction		
Perceived value of AOT	Family Satisfaction Survey	• Four items, including 1 item on a 5-point scale (strongly agree to strongly disagree) and 3 yes/no items, assessing the perceived value of AOT in allowing patients to stay well. Example: "When people are under AOT, do you think they are more likely to keep their appointments at the mental health center?"
Satisfaction with civil process	Family Satisfaction Survey	• Four items, including 1 item on a 5-point scale (strongly agree to strongly disagree) and 3 yes/no items, assessing involvement and satisfaction with civil process. Additional 3 yes/no items if AOT hearing is open in the jurisdiction. Example: "Did you feel as though those involved in the petition process care about what you had to say?"
Family well-being	Family Satisfaction Survey	• Nine items, with response formats including yes/no, 4-point scales, multiple choice, and numerical, assessing the cost of AOT for family members and general well-being. Examples: "How many days were you unable to perform your household responsibilities because you were caring for or providing assistance to (client)?" or "In general, how would you rate your mental health?"
AOT Resources and Costs		
AOT costs		
Start-up, program, and judicial costs	Cost Questionnaire and Key Informant Interviews	• Measured the amount of time spent on start-up activities (e.g., planning and coordination meetings, trainings) and approximated labor expenditures. Measured all labor and non-labor costs associated with providing treatment under AOT orders. Interviewed judges/magistrates or court representatives to approximate hearing costs in terms of labor and non-labor resources used to support hearings.
Savings associated with AOT outcomes		
Service utilization	Pre-post results for changes in acute psychiatric care	• Focused on acute psychiatric care for cost savings associated with AOT because these have the most-reliable unit prices available in the literature.
Health care service unit prices	Literature	• Cost per ED visit and per psychiatric IP night.
Plans for sustaining AOT		
Site-level plans	Key Informant Interviews	• Qualitative data describing site-level plans for sustaining AOT after grant funding.

2.5.2. Statistical Power

Our evaluation design prioritizes pre-post analysis (referred to as within-group analysis) that pools together data from all six of the case study AOT sites, and a pre-post analysis with a comparison group (referred to as between-group analysis) that only includes data from AltaPointe and the AltaPointe comparison group. ***Table 2-3*** summarizes the post-hoc power for: (1) within-group analysis of the constructs that derive from the structured client interview (second column); and (2) between-group analysis of these same constructs for AltaPointe and AltaPointe's comparison group (third column).

TABLE 2-3. Post-Hoc Power for Within and Between-Group Analyses		
Measure	**Within-Group**	**Between-Group**
Appointment adherence	✓	✗
Medication adherence	✓	✗
MCSI score	✓	✗
Perceived mental health status	✓	✗
Perceived functioning	✓	⚠
Life satisfaction	✓	✗
Therapeutic alliance	✓	✓
ED and IP psychiatric visits	✓	✓
Violent behavior	✓	✗
Suicidal ideation	✓	✗
Illicit drug use	✓	✗
Homelessness	✓	✗

NOTES:
Within-group power used all sites and no comparison group; between-group used AltaPointe and AltaPointe's comparison group.
✓ post-hoc power >0.80; ⚠ post-hoc power <0.80 but >0.50; ✗ post-hoc power <0.50.

These analyses show that there is adequate power for a within-group analysis for all the included measures, and less than adequate power for a between-group analysis for almost all the included measures. The two exceptions are for therapeutic alliance and emergency department and inpatient (IP) psychiatric visits. Perceived functioning was close to having adequate power but was still less than 0.80. The lack of adequate power for a between-group analysis is primarily driven by the fact that the differences between pre-post changes in outcomes across AltaPointe and the AltaPointe comparison group are small.

Considering the low statistical power for the between-group analyses, and the relatively small sample size included in this evaluation, results presented in the sections that follow rely on a complementary set of Bayesian methods to measure the strength of evidence. Bayesian methods have been recommended as an approach to improve understanding in small N or underpowered studies.

2.5.3. Quantitative and Qualitative Methodologies

Within-group and between-group analysis. We had two analytic goals for this outcome evaluation. The first was to obtain large enough sample sizes to ensure adequate power. The second was to incorporate, to the extent possible, a comparison group condition into the analytic framework. We attempted multiple comparison group approaches and were successful in recruiting a comparison group for enhanced data collection at one case study site. To maximize the utility of the data that we were able to collect across AOT and non-AOT sites, we conducted a set of complementary within-group and between-group regression analyses. The within-group analyses highlight the regression-adjusted changes in key outcomes observed among AOT participants, and the between-group analyses highlight the extent to which these changes may be greater (in absolute value) than changes observed among a voluntary ACT population. Both analyses control for a common set of confounders: gender, age, race/ethnicity, marital status, parenthood status, education, and indicators for in school and employed. Within-group analyses also control for a set of moderators that are tested in subsequent models. The between-group analysis uses propensity-score weights to further control for

confounding. The propensity-score model was a logistic regression predicting the likelihood of being an AOT participant as a function of the same covariates used in both the within-group and the between-group analyses.

The within-group analyses measure changes in the outcome from baseline to 6-month follow-up and from baseline to 12-month follow-up. For most people, the 12-month follow-up interview was a post-discharge interview. To control for differences across individuals with respect to the length of AOT enrollment, we include controls for number of days on an AOT order. The between-group analyses were difference-in-differences specifications and estimated a relative change at the 6-month follow-up interval. Sites did not obtain enough 12-month follow-up interviews to model 12-month outcomes, although we do have follow-up data on these individuals from secondary sources, such as the length of AOT order.

Qualitative Methodologies. We conducted several qualitative analyses during the implementation evaluation, guided by the *integrated*-Promoting Action on Research Implementation in Health Services (i-PARIHS) framework. i-PARIHS is a conceptual framework designed to study the implementation of new interventions in health services settings. Emphasis is placed on the role of innovation and the appropriate adaptation of the evidence-based approaches within the implementation environment. In the outcome evaluation, we extended the qualitative analyses that have already been conducted to identify different AOT practices across sites and to quantitatively assess whether and how these practices influence implementation success. Specifically, qualitative analyses are integrated in at least two meaningful ways. First, qualitative analyses are used to identify varying practices adopted by the sites (e.g., use of judicial status hearings), and these practices are linked to quantitative outcomes in analyses presented in ***Section 4***. Second, after conducting quantitative analyses, we compared quantitative findings with qualitative themes to provide context and enhance the interpretability of our quantitative results.

The role of judicial status hearings and clinical service use in explaining changes in key outcomes. In addition to measuring changes in key outcomes, we also conducted analysis to ascertain the extent to which judicial exposure or changes in treatment adherence during and after an AOT order explain changes in subsequent clinical and social functioning outcomes. These analyses consider three measures: (1) whether an individual ever appeared before a judge during the order; (2) adherence to clinic appointment schedule; and (3) adherence to medication schedule. The analytic approach involves using regression-based techniques to decompose observed variation in changes in clinical and social functioning outcomes into variation that can be explained by these three measures versus variation that cannot be explained by these three measures. Specifically, results when these measures are excluded from the regression specification capture a total change, and results with these measures sequentially added to the regression specification capture the extent to which changes cannot be attributed to these specific measures. As a residual, these two results can be combined to measure the proportion of changes that are attributable to judicial status hearings or changes in treatment adherence.

Moderators. Lastly, we considered four factors that could have moderated changes in key evaluation outcomes. These factors were drawn from our implementation evaluation and further qualitative analyses conducted for the six in-depth sites included in the outcome evaluation. Specifically, these factors included the following:

- Client stepped down from an inpatient setting (Y/N).
- Criminal justice involvement at baseline (Y/N).

- Length of AOT order >6 months (Y/N).

- Successful completion of AOT order (Y/N).

Bayesian methods for small samples/low statistical power. We also conducted secondary analyses using Bayesian methods, which are an alternative to classical statistical analysis. These methods provide a more nuanced interpretation of the data than classical methods by expressing results as probabilities that can fluctuate--like weather reports--rather than true/false answers to traditional hypothesis tests. We used these secondary Bayesian analyses to qualify the strength of evidence under a categorization scheme ranging from "barely worth more than a mention" to "decisive evidence." We then augmented this approach by considering between-group analyses (where powered) and secondary data analyses to capture our confidence in the reliability of all study findings after considering all analyses conducted. More detail and intuition on the use of Bayesian methods is provided in ***Section 4***.

3. DESCRIPTION OF ASSISTED OUTPATIENT TREATMENT

Across AOT programs, the civil court process and scope of services provided under the AOT order may differ widely due to statutory variations and site-level determinations. Our implementation evaluation identified key differences in how AOT was implemented across sites and over time, and directly informed development of prospective instruments (detailed in ***Section 2***) to capture site-level and client-level characteristics in the outcome evaluation. These characteristics are intended to: (1) reflect key elements of AOT before and during the civil court process (e.g., target populations, initiation, post-initiation, judicial involvement); and (2) capture variation in treatment infrastructure (e.g., treatment services, caseload, staff) by site.

This section provides an overview of the statutory and programmatic characteristics of AOT and characteristics of the service area and treatment services infrastructure, in and across case study sites. Select elements are incorporated as client-level variables in the outcome analyses presented in ***Section 4***. The section concludes with a description of COVID-19's impact on AOT court processes, treatment services, and client/provider needs and assesses the impact on data collection and results.

3.1. Target Populations

3.1.1. Assisted Outpatient Treatment Statute Eligibility Criteria and Local Program Deviations

State statutes typically specify AOT program eligibility criteria, but there are often local approaches that guide how the statutes are implemented in practice. There can be variations from the behavioral health (BH) partners in terms of availability of services and from the justice partners in how criteria are ultimately interpreted and applied. ***Table 3-1*** presents a summary of the study states' criteria, illustrating that the only criterion all states have in common is that treatment for an individual can be mandated to prevent deterioration.

TABLE 3-1. AOT Statute Characteristics by States

State	AOT Eligibility Criteria					Ineligible Classes
	Danger to Self/Others[1]	Prevent Future Danger to Self/Others	Unable to Meet Basic Needs	Treatment to Prevent Deterioration	Unwilling or Unlikely to Accept Voluntary Treatment	
Alabama	–	–	–	√	√	Incompetent or meets inpatient criteria
Florida	√	√	√	√	√	None
Mississippi	√	√	√	√	Varies	SUD primary
Nevada	√	√	√	√	–	Incompetent
New Mexico	√	√	√	√	Varies	None
Oklahoma	√	–	√	√	–	SUD primary

NOTE:
1. Danger to self/others is not a required criterion for AOT; rather, eligibility criteria indicate that, in the past 2-3 years, an individual have a history of treatment non-compliance resulting in psychiatric hospitalization or incarceration or have committed serious acts or threats of violence to self or others.

Aside from Alabama, the states were consistent in other aspects of AOT eligibility criteria, namely danger to self or others; prevention of future danger; inability to meet basic needs; and unwillingness/unlikeliness to accept voluntary treatment orders. However, in practice, and with six counties participating in Oklahoma's AOT program, sites varied in how AOT was implemented.

Some AOT laws have specific exclusionary criteria for AOT eligibility, whereas others have implicit criteria. For example, two program sites excluded substance use disorder (SUD) as the primary diagnosis for AOT eligibility,

although co-occurring substance use and mental health disorders were permitted. Additionally, implementation policies might also elaborate on intended target populations for AOT. As shown in ***Table 3-1***, only New Mexico AOT law is silent on explicit or implicit exclusionary criteria. It is not surprising that Alabama's AOT law is the most distinct from the others, as the law excludes anyone who meets involuntary inpatient commitment criteria that commonly include dangerousness and inability to provide self-care. In Alabama, if an individual meets inpatient criteria, they are ineligible for AOT. Thus, the law was conceived as a step-down program from state hospitalization, for when an individual still needed supervised treatment but did not need hospital level of care.

One requirement of many AOT laws is that the individual being referred for an AOT order be unwilling (not unable) to engage in the prescribed treatment plan. In practice, however, some judges did not implement this criterion, even though it is inconsistent with state law. For example, in two of these case study sites, a judge refused to order AOT to any individual who did not sign a voluntary agreement, despite that practice being inconsistent with state law. In another jurisdiction, judges were permitted to enforce this criterion as they wish because the state law is silent on voluntariness. Finally, Florida's Baker Act, which establishes AOT, allows for "voluntary temporary institutionalization [in a psychiatric hospital]."

Another feature of some AOT laws that can cause confusion about the "voluntariness" prong is the exclusion of individuals who are not competent to make treatment decisions from AOT. In other words, individuals must be capable of agreeing and adhering to treatment to qualify for AOT. Voluntary agreements are qualitatively different than involuntary court-ordered treatment; thus, these deviations in practice pose substantial challenges to the evaluation of AOT as written in state statutes.

One final characteristic of AOT implementation that deviates from both the letter and the intention of the law, according to legal advisors who assisted in drafting New Mexico's AOT law, is the assignment of a "treatment guardian" to every person on an AOT court order. The effect of this court order is to assign treatment decisions to an adult other than the individual on AOT. There is no provision for "treatment guardian" in New Mexico's AOT law.

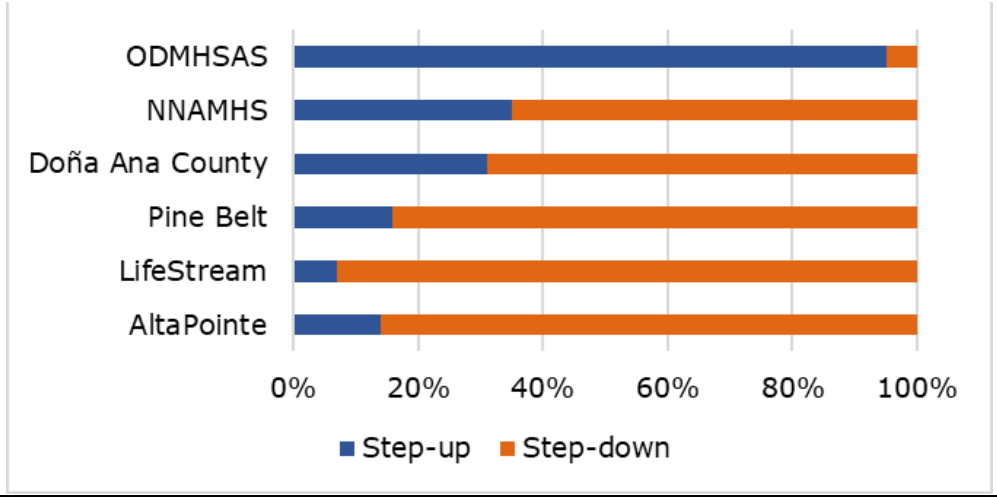
3.1.2. Assisted Outpatient Treatment Models

In addition to the eligibility criteria and ineligible classes set forth by state statute and site-level determinations, target populations are further shaped by each program's utilization of a step-up, step-down, or mixed approach to AOT (***Figure 3-1***). These models dictate whether individuals referred to AOT originate from the community or an inpatient hospitalization or jail stay and can subsequently impact the initiation process in and across sites.

No case study site implemented a strictly step-up or step-down model, although the case mix varied across sites. Most site referrals originated from inpatient settings; five of six sites reported higher rates of step-down cases. In contrast, Oklahoma Department of Mental Health and Substance Abuse Services (ODMHSAS) operated predominantly through community-based referrals. For most sites, this case mix remained steady over the course of implementation. However, AltaPointe Health Systems initially enacted a strictly step-down approach but gradually began to accept referrals from the community. LifeStream was the only site to use voluntary service agreements (VSAs) during the grant period, whether in stepping petitions up from a VSA or referring petitions to a VSA.

> ***Step-up/step-down to AOT*** *is included as a client-level moderator in outcome analyses presented in* **Section 4**.

Figure 3-1. AOT Model Case Mix by Site



3.1.3. Criminal Justice Involvement

Although AOT programs may differ in their inclusion or exclusion of criminal justice-involved individuals, no case study site excluded individuals solely based on ongoing criminal justice involvement. Rather, most sites assessed criminal justice-involved individuals on a case-by-case basis, taking into consideration the circumstances for each individual and the charges involved. All sites considered clients with felony and violent offenses in the assessment process and placed them on AOT if circumstances of the consumer and charges involved were deemed appropriate. AltaPointe Health Systems was the only site to codify exclusions in the event of violent offenses or felony charges that were not the result of diminished capacity related to primary psychiatric diagnoses.

> ***Criminal justice involvement at baseline*** *is included as a client-level moderator in outcome analyses presented in* **Section 4**.

The proportion of criminal justice-involved individuals remained relatively stable at program sites over time.

3.2. Initiation

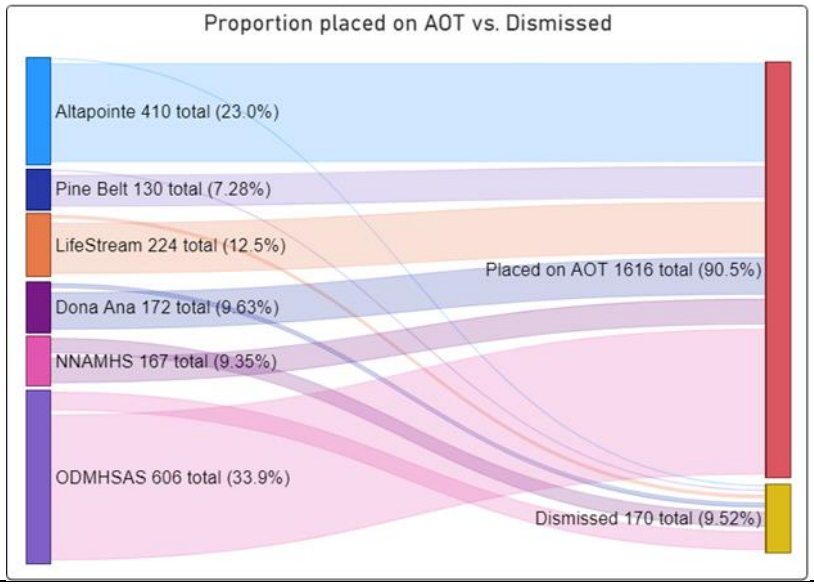
3.2.1. Petition

State statutes define key aspects of the petition process, including who can file a petition, associated fees, and whether the petition goes through a single point of access or is filed directly with the court. However, additional site-level characteristics inform the petition process and efficiency of the initiation procedure. The length of time from petition to commitment, for example, varied from site to site and was largely determined by court scheduling (e.g., whether there was a set docket). For example, in AltaPointe, which did not have a set docket for AOT, the hearing typically took place 1-2 days after the petition is filed. Across sites with regularly scheduled dockets, in contrast, the time between petition and commitment typically ranged from 2 to 6 days. However, the range reported by sites was subject to change due to delays from court scheduling, incomplete paperwork, trouble locating the individual being petitioned, and insufficient staff capacity to perform any necessary assessments.

As shown in ***Figure 3-2***, at half of the sites (AltaPointe, Pine Belt, and LifeStream), the AOT team and judge were well-aligned in terms of individuals deemed fit for AOT, such that all petitions brought to the court were subsequently placed on AOT. At other sites (Doña Ana County, NNAMHS, ODMHSAS), however, a varying proportion of petitions were dismissed for a variety of reasons, including cases in which the judge did not approve of the order despite the treatment team considering it an appropriate course of action; a primary SUD

missed during initial screening at sites where that was considered disqualifying; a lack of clinical capacity; and, in rare instances, client/family refusal to participate, honored by the judge.

Figure 3-2. Petitions Placed on AOT vs. Dismissed



3.2.2. Initial AOT Hearing

The average time spent on each AOT case during the docket differed widely in and across case study sites, dictated by factors such as respondent attendance, treatment plan review, expert testimony, and verbal interactions between the judge and client/family and between the judge and treatment team.

TABLE 3-2. AOT Hearing Characteristics by Site

Program	Average Hearing Length (in minutes)	Respondent Attendance	
		Percentage in Attendance	Percentage Waived
AltaPointe	34	100	0
LifeStream	4	97	3
Pine Belt	18	19	81
Doña Ana County	26	79	21
NNAMHS	4	67	33
ODMHSAS	12	100	0

At half of the sites, respondent attendance was expected but not required. For most hearings at LifeStream, Doña Ana, and NNAMHS, the individuals being petitioned were present; however, attendance was waived in select cases. Respondent attendance was required at AltaPointe and ODMHSAS. At Pine Belt, in contrast, most AOT initiation hearings were held without the client present due to step-down cases in which clients were directly discharged to AOT from inpatient commitment.

The treatment plan was required and reviewed by the judge at three sites, although the degree to which it was discussed during the hearing itself was subject to judicial preference. Some judges used the initial hearing to outline the requirements of the program. These hearings were shorter, as the AOT team would address any

issues with the respondent prior to meeting with the judge. At other sites, most time was dedicated to expert testimony and collateral information. In some instances, judges spent time speaking with clients, family members, or caregivers and the AOT treatment team. For example, the judge at NNAMHS would discuss issues such as housing, food insecurity, medical needs, and transportation.

3.3. Post-Initiation

Once the court order is issued, the AOT treatment team assumes the primary role in facilitating client engagement and adherence to the treatment plan during the order. However, case study sites reported variation in how the court engaged with the client and team over the course of the order, including in the use of status hearings, response to non-compliance, and renewal or closeout processes.

3.3.1. Status Hearings

Status hearings may be used by AOT program sites, at the discretion of the court, to permit additional judicial monitoring of client progress at specified intervals over the course of an order, which may vary from judge to judge or client to client. Periodic status hearings were conducted as part of official proceedings at three of six program sites. More information on the use of status hearings is provided in ***Section 3.4***.

> ***Whether a status hearing was held*** *is included as a client-level moderator in outcome analyses presented in* **Section 4**.

3.3.2. Response to Non-compliance

Across program sites, the AOT team engaged in a range of strategies to improve engagement in instances of non-compliance before formally involving the courts. These strategies include a treatment team or interdisciplinary meeting to address issues with the client, increased clinical monitoring or drug screening, and outreach by a wellness officer. Status hearings were also used at Doña Ana County, NNAMHS, and ODMHSAS as an opportunity for the judge to stress the importance of complying or to issue warnings. At AltaPointe and LifeStream, if all other options were exhausted and non-compliance continued, pick-up orders were issued by the court following notice of material non-compliance, resulting in a revocation hearing and recommitment based on the least-restrictive setting. At Pine Belt, in contrast, response to non-compliance never extended further than the wellness officer.

3.3.3.Renewal or Closeout Processes

Sites differed in their deliberations and procedures to renew or closeout cases after the initial order was complete.

At AltaPointe, the AOT team determined whether a client continued to demonstrate lack of insight as they approached the end of their order. In cases where it was determined that, if not on AOT, the client would disengage in treatment and decompensate, the liaison petitioned the court for a renewal and a new hearing was set. Those who completed AOT were monitored via chart monitoring and biweekly AOT team follow-up for a full year.

> ***Length of AOT Order***
> - *AltaPointe: 150 days*
> - *LifeStream: 90 days*
> - *Doña Ana County: 12 months*
> - *NNAMHS: 6 months*
> - *ODMHSAS: 12 months*
> - *Pine Belt: 12 months*

At LifeStream, in contrast, the site renewed the order when the treatment team or legal stakeholders believed that the person was improving, and thus wanted to continue that trend under the order. This renewal process took place every 90 days, with the decision to renew or closeout the order made jointly by the treatment team and court.

At Doña Ana County, the treatment provider performed assessments with AOT clients on a quarterly basis. If AOT was still considered necessary at the end of the 1-year order, the client would appear in front of the judge to have the order extended for a second year. Once the client was believed to have been successful on AOT, the treatment team would petition for a closeout hearing and the client was stepped down to a lower level of care.

At NNAMHS, the approach toward AOT renewal changed over time. During early implementation, clients were permitted to remain in the program after the initial order, even when successful, as long as they expressed a desire to do so. Over time, the AOT program put more of a focus on successful completion. AOT staff would discuss readiness for completion toward the end of the order, and if clinically-indicated, the client was transitioned to appropriate services.

At ODMHSAS, the client appeared before the judge at the end of the order. The judge would occasionally grant an extension or renewal if needed to maintain client stability, but the determination was typically made to terminate the order in cases where the client is believed to have been successful on AOT.

At Pine Belt, the treatment team reviewed the treatment plan and goals, including medication and treatment adherence, and determined whether clients were a danger to self or others. If the client was considered to have been successful at the end of the order, they were stepped down to a lower level of care. In some instances, the order was renewed even when clients demonstrated compliance with medication and treatment because they were still symptomatic and did not have enough environmental supports to maintain progress.

3.4. Judicial Involvement

AOT program sites reported varied levels of judicial involvement during the initial hearing and over the course of the order. Variability in judicial involvement, including whether the client appears before the judge in a status hearing during the order, is typical among AOT programs across the country. We developed a measure intended to capture the structure and degree of judicial involvement in and across sites, thereby operationalizing what Treatment Advocacy Center has termed the *black robe effect*.[28] This process incorporated qualitative content and thematic analysis of client-level and site-level variables and resulted in a categorization scheme based on a judicial engagement and frequency of judicial contact over the course of the order. At each case study site, the presiding court official(s), including judge, magistrate, or special master, were stratified by high, medium, and limited judicial involvement. In contrast with preceding sections, we have chosen to deidentify case study sites in the description of judicial involvement.

> ***Whether a status hearing was held*** *(client-level) is included as a potential mediator in outcome analyses presented in* **Section 4**.

Judicial engagement was assessed using a judicial rating instrument with items capturing the extent to which the AOT presiding court official engaged in "habits of a highly effective judge" as defined by Brian Stettin of the Treatment Advocacy Center.[29] For each of the six items, the designated site respondent (e.g., AOT staff who regularly attended AOT hearings) rated the judge, magistrate, or special master by how frequently they exhibited each behavior on a three-point scale ranging from zero (not at all) to two (always). Scores were summed for a total rating scale ranging from zero to 12. Frequency of judicial contact was directly informed by use and frequency of status hearings over the course of the order. Across sites, there was a strong correlation between frequency of contact and judicial ratings. More information on the measurement approach used to capture judicial involvement is provided in the issue brief "Assessing Level of Judicial Involvement in Assisted Outpatient Treatment".

As shown in ***Table 3-3***, six presiding officials across three case study sites were categorized as exhibiting high judicial involvement, with judicial rating scores ranging 10-12 and status hearings routinely used. Three individuals across two sites were categorized as having medium judicial involvement, with judicial rating scores ranging between six and seven out of 12. Neither site used status hearings, meaning that judicial contact was generally limited to the initial hearing and any renewal/closeout hearings. Two court officials overseeing separate courts for the same AOT site were categorized as having limited judicial involvement. Although both officials exhibited the behaviors captured by the judicial rating instrument when they met with clients, many of the AOT initiation hearings were held without the client present due to a step-down model in which clients were directly discharged to AOT from inpatient commitment. Accordingly, because of the infrequency with which clients were present for AOT court proceedings, the site indicated low ratings for judicial behaviors. Neither of the courts used status hearings, so judicial contact was minimal throughout the order.

TABLE 3-3. Judicial Ratings and Use of Status Hearings Among AOT Case Study Sites

Site/Court Official	Judicial Rating Score (0-12)	Status Hearings? (Y/N)	Frequency of Status Hearings
High Judicial Involvement			
Site A Court Official	11	Y	Quarterly
Site B Court Official	11	Y	As-needed
Site C Court Official 1	11	Y	Monthly
Site C Court Official 2	12	Y	Monthly
Site C Court Official 3	10	Y	Quarterly
Site C Court Official 4	10	Y	Monthly or bimonthly
Medium Judicial Involvement			
Site D Court Official	7	N	
Site E Court Official 1	6	N	
Site E Court Official 2	6	N	
Limited Judicial Involvement			
Site F Court Official 1	0	N	
Site F Court Official 2	0	N	

3.5. Characteristics of the Service Area

Population characteristics of case study sites are presented in ***Table 3-4***. The six AOT programs in this study are from the south and west regions of the United States. Half of the sites are considered a mix of urban, suburban, and rural; two are rural; and one is urban. The populations of the service areas range in size from 143,000 in Mississippi to 1.7 million in Oklahoma. Half of the AOT programs in this study target just one county, two target two counties, and one--Oklahoma--includes six counties in their service area. In Oklahoma, two counties, Tulsa and Oklahoma, comprise the largest proportion of residents and are largely urban areas, whereas the four counties in the northeastern region of the state are rural. Together, these six counties represent a third of the state's population.

Three programs--AltaPointe, LifeStream, and NNAMHS--drew from a largely White population (87%, 85%, and 85% respectively). The remaining programs' populations were much more diverse, with Pine Belt including 40% who identified as racial and ethnic minorities, primarily Black. In Doña Ana County, New Mexico, 73% of the residents identified as non-White, with the largest proportion being Hispanic. Oklahoma's target population claimed similar proportions of Black and Hispanic residents, with another 5% identifying as American Indian.

TABLE 3-4. In-Depth Site Population Characteristics								
Program	Geographic Location	Geographic Classification	# Site Counties	Combined Site Population	% Female	% Non-White	% Poverty	IP Beds/ 100,000[a]
AltaPointe	Southeast	Rural	1	223,234	52	13	10	29.8
LifeStream	South	Both	2	499,538	52	15	11	34.0
Pine Belt	Southeast	Semi-rural	2	142,995	52	40	22	55.4
NNAMHS	West	Urban	1	460,587	50	15	13	23.5
Doña Ana County	West	Both	1	218,195	51	73	25	38.0
ODMHSAS	Southwest	Both	6	1,687,862	51	27	16	45.3

a. Indicates state-level, not site-level, public and private (2014). Source "Trend in Psychiatric Inpatient Capacity, United States and Each State, 1970-2014." Lutterman, Shaw, Fisher, & Manderscheid, 2017.[30]

A common thread across most of these AOT program sites was that they targeted areas with high levels of poverty. The average poverty rate (estimated 2019, pre-COVID) across the United States was 10.5%. Doña Ana and Pine Belt service areas were in especially impoverished locations. As shown in ***Table 3-4***, only AltaPointe and LifeStream were situated in areas with poverty rates lower than the average for both the United States as a whole and the individual states. A deeper analysis into both AltaPointe and LifeStream, however, showed that their specific AOT target populations had high rates of poverty, despite the county overall having below-average poverty.

Availability of inpatient psychiatric hospital beds is a key element to most AOT programs, whether the program is a step-down program, with the target population being individuals who are discharged from inpatient psychiatric hospitals, or a step-up program that identifies individuals living in the community who need a higher level of care (see ***Section 3.1.2*** for a description of AOT program models). A common concern across the country is the shortage of inpatient or residential psychiatric beds for providing that level of care. Estimates from the National Association of State Mental Health Program Directors[31] reported 33.1 public and private inpatient beds per 100,000 United States residents. As shown in ***Table 3-4***, two site locations, Alabama and northern Nevada, had fewer beds than the national average, whereas the remaining four programs were in states with more inpatient psychiatric beds for the population. State hospitals are currently in short supply in all states, and data show that most state hospital beds are dedicated forensic beds, thus not available for AOT programs, requiring AOT programs to rely on private residential beds.

3.6. Treatment Services

The AOT programs in this evaluation were required to provide access to an array of evidence-based treatments and other support for clients, as shown in ***Table 3-5***.

Most or all sites offered ACT, cognitive behavioral therapy (CBT), motivational interviewing, substance use treatment, individual therapy, supported employment, supported housing, and peer support. Other types of treatment and support available in some AOT programs included person-centered case management, dialectical behavior therapy, and trauma-specific therapies, including Seeking Safety.

However, the type and composition of treatment services received by AOT clients varied in and across sites. For example, treatment providers most often spoke of AOT in relation to ACT, but fidelity to ACT was not always observed or evaluated, and they are intended to be distinct services. Instead, AOT teams shared select features with ACT (e.g., small caseloads, frequent contacts/outreach) but did not always have a dedicated psychiatrist or 24-hour crisis services. Specifically, AOT teams provided treatment and support to a small (~10) caseload of clients. Typically, AOT teams had multiple contacts during the week with each client. Most AOT

teams held regular face-to-face interactions either in the person's residence or in the team's office. Most programs provided medication management as part of AOT, but it was, in practice, often provided by a nurse.

TABLE 3-5. EBPs Offered by Site

EBP/PP/Other Services	AL	FL	MS	NM	NV	OK
ACT/PACT	X		X	X	X	X
Medication management	X	X	X	X	X	X
Illness management & recovery	X	X	X			X
CBT/Cognitive enhancement therapy	X	X	X	X	X	X
Substance use treatment	X	X	X	X	X	X
Motivational interviewing	X	X	X	X		X
Critical time intervention		X				
Mobile crisis/Crisis services		X	X	X	X	
Dialectical behavior therapy	X		X		X	
Peer support	X	X	X	X	X	X
Recovery support services			X	X	X	X
Seeking Safety	X		X			
WRAP			X			
Other trauma-specific therapy				X		X
Family support	X			X		X
Person-centered case management	X	X	X		X	
Supported employment	X	X	X		X	X
Supported housing/Housing First	X		X	X		X
Transportation	X				X	
SOAR	X			X		

As with ACT, treatment provided under AOT relies on frequent, intensive contact with clients. For example, AltaPointe initially had contact with clients during weekdays only and during business hours. Recognizing that engagement with AOT is key to achieving intended outcomes, AltaPointe now has two AOT teams, each of which includes a registered nurse practitioner (NP) for expanded availability and contacts. Similarly, Pine Belt includes two community-based AOT teams, but its prescribers are shared across Pine Belt programs.

Dedicated AOT teams were in place at four of six sites; the remaining two bundled AOT with existing clinical teams. The composition of these AOT teams varied across sites (see ***Table 3-6***).

As required under the SAMHSA grant, all teams were led by a Project Director, and all teams included peer support specialists, case managers or care coordinators, and therapists. Aside from these three positions, the teams varied as to whether they had a full-time (FT) psychiatrist or prescriber and whether justice partners were considered team members. Most shared a prescriber (e.g., physician, nurse practitioner) with other clients the provider served. AOT teams often had full-time clinical staff trained and certified to provide specific clinical treatment interventions such as CBT to AOT clients. These clinicians also often provided group interventions such as Seeking Safety or Dialectical Behavior Therapy.

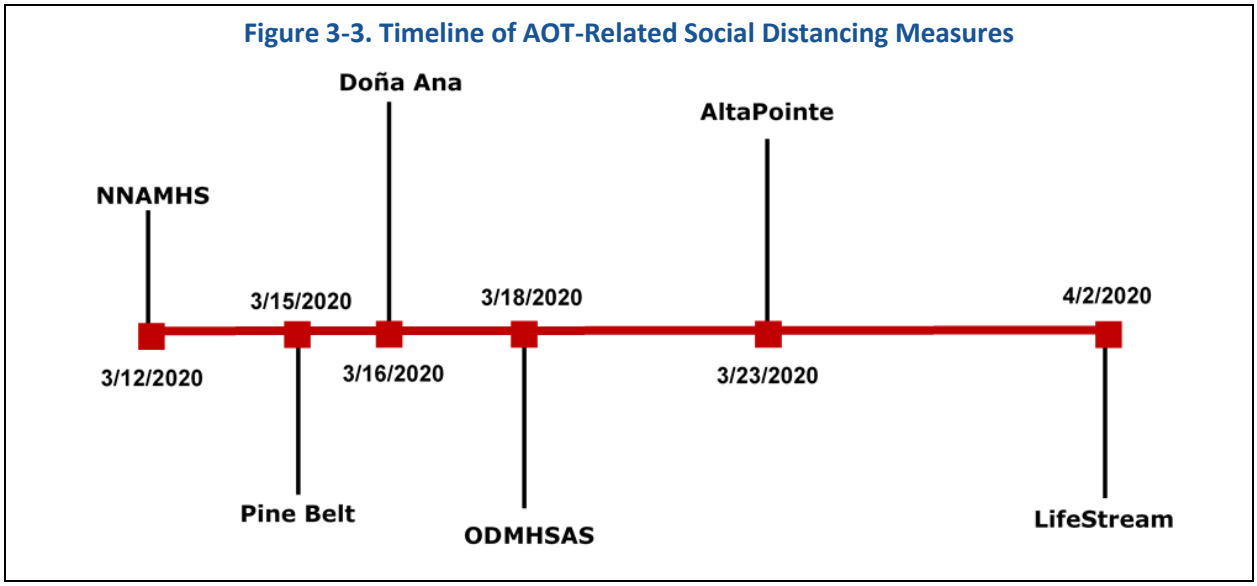
There was some staff turnover during the life of the SAMHSA AOT grant, and that turnover had an impact on which treatment interventions were offered at a particular time. Furthermore, one program reported that, when they lost specifically trained clinicians, they subcontracted with another provider for those services.

TABLE 3-6. AOT Team Composition by Site						
Team Members	Alta Pointe	Life Stream	Pine Belt	Doña Ana County	NNAMHS	ODMHSAS
Project Director	X	X	X	X	X	X
Project Coordinator(s) or Administrator(s)				X		X
Clinical Director						
Psychiatrist/Prescriber	50%	PT	100%		X	X
Court Liaison/Court Staff	X		X			
Justice Professionals--Judge, Prosecutor, Defender				X		
Nurse--NP/LPN/RN	X	FT			X	
Case Manager(s)	X	X			X	X
Care Coordinator(s)		X				
Community Support Specialists			X			
CIT Coordinator/BH Officer				X		X
Peer(s)	X	X	X	X	X	X
Therapist(s)/Clinical Specialist		X	X	X	X	X
Evaluator	X		X	X		X
Supervisor		X				

3.7. COVID-19 Impact

Impacts of the COVID-19 pandemic on implementation of AOT were documented at all case study sites. Specifically, information was gathered on any changes to AOT court processes and procedures, treatment services, and client or provider needs via semi-structured interviews with site directors and evaluators, docket monitoring forms, and AOT characteristics forms. The timing and extent of the impact varied across sites (see ***Figure 3-3***), informed largely by geographic spread of COVID-19 and social distancing measures levied by each state.

Figure 3-3. Timeline of AOT-Related Social Distancing Measures



3.7.1. Court Processes and Procedures

AOT hearings transitioned to take place via video-conference or phone at all but one site location (Baldwin County in AltaPointe, which continued in-person hearings). Some sites reported a decrease or short pause in

petitions/referrals to AOT, but most continued petition and renewal hearings at the same schedule. Status hearings were suspended at one site.

Several AOT staff expressed thoughts, ranging from mild curiosity to outright concern, about potential changes to the black robe effect due to hearings taking place over video or by phone. For example, the one program director reported that their program's judge struggled to connect with clients by phone; similarly, interaction between the court team and clients reportedly decreased across sites.

3.7.2. Treatment Services

Among the biggest impacts on treatment for AOT programs was the discontinuation of group treatment activities and the loss of interpersonal engagement. Medication access was unchanged. Most sites continued with individual treatment via telehealth options, and some still allowed clients to attend one-on-one sessions in person, provided they adhered to specified health measures (e.g., mask and temperature checks prior to admission to the clinic/facility).

In general, sites transitioned to more frequent, albeit shorter, contact with clients. The sudden transition to tele-assisted behavioral health was reported to be challenging on many levels, including technological and interpersonal. Although some programs were able to provide, for example, telephones to clients for support and monitoring, many clients did not have access to Wi-Fi, forcing them to use limited data/minutes for clinical and supervisory activities. Some clients were resistant to using data/minutes for these activities that had previously been conducted in person. AOT program staff also cited their concerns with relying exclusively on telehealth with AOT (and other behavioral health) clients, noting that interpersonal engagement and trust building was hindered by remote communications. One site--Grand Lake, Oklahoma--stood out as having already fully incorporated technology (tablet) into its AOT program--Grand Lake included tablet check-ins from the outset of its AOT program and cited few difficulties caused by the pandemic.

3.7.3. Client and Provider Needs

Sites reported a mix in AOT client responses to the pandemic. AOT staff observed increased anxiety in some clients, and increased paranoia in others (thought to be exacerbated by the pandemic or the transition to phone contacts for treatment). However, overall client needs pertaining to medication access, employment, and transportation were perceived by AOT staff to be largely unaffected by COVID-19. Housing was a noted issue at three of six sites, as their areas experienced housing freezes that prevented placement of new clients.

No sites reported substantial changes to their overall approach to serving clients in light of client needs or reduced capacity. Namely, although there were client-level and site-level transitions (noted in ***Section 3.8.2***) to type (e.g., in-person, video, phone) and frequency of contacts, no sites ascertained a need for concerted suicide prevention or other crisis-oriented efforts. Multiple sites incorporated informal educational discussions (e.g., adhering to social distancing measures) between case managers and clients in early days of the pandemic.

3.7.4. Data Collection Activities

Primary data collection, including administration of structured client interviews, continued with AOT clients at five of six in-depth sites. Most of these sites transitioned to conducting interviews by phone. No sites reported issues with this transition, and some noted improvements in the rates of completion due to increased availability of staff and clients. One site ceased client interviews for the remainder of its grant period.

3.7.5. Sensitivity and Robustness Checks

We assessed effects of COVID-19 and subsequent social distancing measures on data collection activities. Sensitivity and robustness checks were conducted for all models to determine whether the inclusion of COVID-affected data fundamentally altered the conclusions of the pre-COVID impact analysis. These analyses (available in ***Appendix F***) do not show any substantive differences in the results whether we retain post-COVID observations or drop them from the analyses. Accordingly, we present analyses based on all the data collected, regardless of whether it was collected before or after COVID-19 began impacting the AOT communities.

4. ASSISTED OUTPATIENT TREATMENT PROGRAM OUTCOMES

Prior research has demonstrated that AOT programs can be effective at improving key outcomes across treatment engagement, and clinical and social functioning among adults with SMI. However, the strength and significance of findings vary across studies and the respective contexts in which AOT was implemented, leaving questions around the effectiveness of AOT on health and social outcomes. Moreover, the existing evidence base on AOT does not sufficiently account for differences in AOT program elements in relation to client outcomes.

This section addresses the following evaluation questions about AOT program outcomes:

- Does AOT affect treatment, clinical functioning, and social functioning outcomes?
- Do outcomes differ by AOT duration or scope of services?
- Which models of AOT lead to better outcomes?
- Which specific intervention components lead to better outcomes?
- Do outcomes differ based on the intensity of services offered, or intensity of resources available to providers?

Specifically, this section presents quantitative evidence on the client-level outcomes observed among AOT participants, and a limited between-group analysis comparing outcomes across AOT participants from one site with a comparison group drawn from that same site's location. Broadly, these analyses demonstrate that almost all outcomes changed in the expected direction, although we do not always find strong evidence that these changes were different from changes observed in our limited comparison group.

In ***Section 4.1***, we present data on the clients in the AOT study population, and a comparison of the AOT and non-AOT participants that are included in the between-group analysis. In ***Section 4.2***, we address the overarching evaluation question: Does AOT affect treatment adherence, clinical functioning, and social functioning outcomes? In ***Section 4.3***, we address evaluation questions related to the role of judicial status hearings and treatment adherence in explaining outcomes observed (i.e., Do outcomes differ by AOT duration or scope of services? Do outcomes differ based on the intensity of services offered?). Lastly, in ***Section 4.4***, we address questions related to factors that may moderate the associations between AOT and subsequent outcomes (i.e., Which models of AOT lead to better outcomes? Which specific intervention components lead to better outcomes?).

4.1. Assisted Outpatient Treatment Client Characteristics

Table 4-1 shows that about 40% of clients at baseline were female, and the average age was 40. Most clients were White, non-Hispanic (53.4%), followed by Black, non-Hispanic (39.2%) and other/Hispanic race/ethnicity (7.5%). Few clients reported being married at baseline (5.4%); a higher percentage of clients reported having children (42.8%). Approximately 60% of clients reported having completed high school or achieving high school equivalency, and 17.5% of clients reported having at least some college education. Only 5.8% of clients reported being enrolled in school at baseline, and 16% reported being employed. Almost a quarter of clients had some criminal justice involvement reported at baseline, which included any arrests during the 6-months prior to AOT entry or being on parole or probation during this time.

TABLE 4-1. Client-Level Characteristics at Baseline		
Characteristic	**Mean/%**	**SD**
Number of clients	286	
Demographic characteristics		
Female, %	39.3%	
Age in years, M (SD)	40.3	13.3
Black, non-Hispanic, %	39.2%	
White, non-Hispanic, %	53.4%	
Other/Hispanic, %	7.5%	
Married, %	5.4%	
Any children, %	42.8%	
High school graduate, %	58.9%	
Some college, %	17.5%	
Enrolled in school at baseline, %	5.8%	
Employed at baseline, %	13.7%	
CJ involved at baseline, %	24.1%	
AOT order characteristics		
Length of AOT order (days), M (SD)	228.7	142.5
Client stepped-down, %	79.4%	
Client ever had a status hearing, %	21.0%	
Treatment adherence constructs		
Percent deemed appointment adherent, %	68.3%	
Percent deemed medication adherent, %	69.2%	
Clinical functioning constructs		
MCSI score, M (SD)	3.7	0.9
Perceived MH rating, M (SD)	2.6	0.9
Life satisfaction score, M (SD)	4.8	1.3
WAI: goal scale, M (SD)	14.7	4.2
WAI: task scale, M (SD)	14.7	4.5
WAI: bond scale, M (SD)	15.9	4.5
Any violence, %	24.6%	
Any suicidal ideation, %	29.7%	
Social functioning constructs		
Any psychiatric ED visits, %	14.0%	
Any psychiatric IP episodes, %	61.8%	
Number of psychiatric IP nights, M (SD)	12.0	23.0
Any arrests, %	27.6%	
Any illicit drug use, %	28.1%	
Homelessness, %	16.9%	

Data from the structured client interview did not provide information on the primary and/or secondary diagnoses with which clients entered AOT. However, we did collect this information through secondary administrative records. Indicators of secondary SUDs were missing too frequently to report here. However, primary diagnoses were available for about 80% of clients in the secondary administrative data files. These

data showed that 64% of clients had a primary diagnosis of schizophrenia, 26% of clients had a primary diagnosis of bipolar disorder, and 10% of clients had a primary diagnosis of major depressive disorder.

Data from the structured client interview provide multiple relevant constructs for the evaluation of the AOT programs included in this study. However, as with any primary data collection effort, these data are limited to clients who are willing to be interviewed. As with any study, some individuals were lost to follow-up for a variety of reasons. As an attempt to address this potential limitation, we also worked with sites to collect some overlapping data elements from secondary administrative data sources. Because these data do not rely on individuals' willingness to participate in interviews and are less susceptible to attrition, they may provide a more robust assessment of AOT outcomes.

These data may also reveal that some types of clients were more likely to be unwilling/unable to participate in client interviews or lost to follow-up. To assess this, we compared basic demographic characteristics and outcome data across the primary and secondary data sources. This analysis showed some notable differences between the sample that was included in the primary client interview data and the secondary data. Specifically, we saw that clients with secondary data were younger (37.8 vs. 40.3 years of age, $p = 0.005$), less likely to be non-Hispanic Black (28.6% vs. 29.2%, $p = 0.001$), more likely to be other race or Hispanic (15.3% vs. 7.5%, $p < 0.001$), and more likely to have graduated high school (74.9% vs. 58.9%, $p < 0.001$).

Despite these differences, outcomes were remarkably similar where they were equivalently defined. For example, average medication possession ratios exceeded 80% for approximately 70% of the sample, which is very similar to the 68.3% of the primary client interview sample who were medication adherent at baseline. The percentage of people arrested was also similar. The percentage of people with at least one psychiatric inpatient admission was substantially lower in the secondary data sample than in the primary data sample. However, similar changes were observed in the number of psychiatric inpatient admissions (based on secondary data) and in the number of psychiatric inpatient nights (based on primary data).

The average client spent more than 6 months on an AOT order (228.7 days), and 79.4% of clients were stepped-down from an institutional setting. Only 21.0% of clients ever appeared before a judge/magistrate for a status hearing during the order. Self-reported appointment and medication adherence were both around 70% at baseline. Modified Colorado symptom indices were just under four of five, suggesting relatively low symptomology at baseline (lower scores indicate greater symptomology). In contrast, fewer than 15% of clients reported that they perceived their mental health as being very good. Life satisfaction scores were on average just under five of seven (higher scores indicate greater life satisfaction). Working alliance inventory (WAI) scales averaged around 15-16 of 20 (higher scores indicate greater therapeutic alliance). Less than one-fourth of clients reported any violent behaviors at baseline, and 30% reported any suicidal ideation. Around 15% of clients had at least one psychiatric emergency department visit, and 62.4% of clients had at least one psychiatric inpatient episode with an average of 12 nights spent in a psychiatric inpatient setting during the 6 months prior to AOT entry. At baseline, 27.6% of clients reported being arrested, 28.1% of clients reported illicit drug use, and 16.9% of clients reported at least 1 night of homelessness.

4.1.1. Comparison Group

We collected data on a comparison group at one of the six in-depth AOT sites. These data were collected via an adapted version of the structured client interview administered to clients at the six case study AOT sites. ***Table 4-2*** shows that the AltaPointe site had similar client-level characteristics and outcomes at baseline as the overall averages reported in ***Table 4-1***. However, there were some notable differences in the client characteristics of the comparison group. Specifically, the comparison group were less likely to be appointment or medication adherent, were less likely to perceive their mental health as very good, and had lower life satisfaction scores. The comparison group were also more likely to report violent behaviors and have any prior

psychiatric emergency department visits. The comparison group had a similar probability of having at least one psychiatric inpatient episode, but they had fewer average nights spent in a psychiatric inpatient setting. The comparison group was also less likely to have been arrested during the baseline period, but they were more likely to use illicit drugs.

TABLE 4-2. Client Characteristics for the AltaPointe and AltaPointe Comparison Group at Baseline

Characteristic	AOT Participants		Non-AOT Participants		P Value
	Mean/%	SD	Mean/%	SD	
Number of clients	114		103		
Demographic characteristics					
Female, %	36.1%		43.5%		0.218
Age in years, M (SD)	40.7	14.3	41.2	13.5	0.746
Black, non-Hispanic, %	42.7%		50.9%		0.125
White, non-Hispanic, %	55.0%		44.0%		0.068
Other/Hispanic, %	2.3%		5.1%		<0.001
Married, %	6.5%		11.0%		0.139
Any children, %	43.4%		37.0%		0.465
High school graduate, %	62.9%		51.0%		0.078
Some college, %	20.3%		19.3%		0.997
Enrolled in school at baseline, %	8.3%		4.2%		0.154
Employed at baseline, %	12.6%		16.6%		0.638
Treatment adherence constructs					
Percent deemed appointment adherent, %	82.6%		46.6%		<0.001
Percent deemed medication adherent, %	68.5%		42.9%		0.005
Clinical functioning constructs					
MCSI score, M (SD)	3.9	0.8	3.5	0.8	0.004
Perceived MH rating, M (SD)	2.8	0.7	2.4	0.6	0.001
Life satisfaction score, M (SD)	5.0	1.1	4.4	1.0	0.001
WAI: goal scale, M (SD)	11.8	3.4	11.8	4.4	0.994
WAI: task scale, M (SD)	11.8	3.6	11.9	4.6	0.931
WAI: bond scale, M (SD)	13.1	3.4	13.3	4.6	0.922
Any violence, %	15.7%		31.3%		0.017
Any suicidal ideation, %	15.4%		23.0%		0.199
Social functioning constructs					
Any psychiatric ED visits, %	4.5%		10.3%		0.145
Any psychiatric IP episodes, %	71.6%		73.6%		0.772
Number of psychiatric IP nights, M (SD)	15.9	26.6	6.3	7.6	0.001
Any arrests, %	34.9%		18.2%		0.012
Any illicit drug use, %	27.0%		46.0%		0.009
Homelessness, %	9.9%		5.5%		0.268

4.2. Assisted Outpatient Treatment Outcomes

Tables 4-4 through ***4-6*** present results from within-group analyses assessing the impact of AOT on treatment adherence, clinical functioning, and social functioning outcomes. Between-group results are available in ***Appendix F*** and are referenced below. Within-group analyses regressed each outcome onto indicators for the

first and second follow-up interviews. All models control for a common set of sociodemographic characteristics (gender, age, race/ethnicity, marital status, parenthood, education, and indicators for in school or employed). Models also control for multiple characteristics that will be tested as moderators in subsequent analyses (criminal justice involvement at baseline, length of the AOT order, an indicator for whether the client was stepped down from an institutional setting). Binary outcomes were modeled using logistic regression, and continuous outcomes were modeled using ordinary least squares regression. We used cluster-robust standard errors in all analyses, using the AOT site as the clustering variable. This approach accounts for within-site correlations in client-level outcomes.

In the tables that follow, we also provide an illustration of the strength of evidence associated with each outcome. The assessment of the strength of evidence is based on a complementary Bayesian analysis that we conducted. Specifically, we estimated an analogous Bayesian specification for each frequentist regression model (e.g., if we estimated a logistic regression, we also estimated a Bayesian logistic regression model). All Bayesian analyses used uninformative priors for the model parameters. Uninformative priors do not impose assumptions as to the direction or strength of the association. The goal of these analyses was to differentiate between instances where frequentist analyses were marginally insignificant because of low statistical power and instances where frequentist analyses were insignificant because of little evidence of an association between AOT and a particular outcome.

This goal was operationalized by estimating Bayes factors to provide a quantitative assessment of the strength of evidence. Bayes factors provide a structured way of leveraging Bayesian results to assess the strength of evidence in favor of the hypothesized association.[32] Specifically, a Bayes factor compares the posterior odds--a measure of how likely a null hypothesis is to be false based on the data observed--with the prior odds--a subjective measure of how likely a null hypothesis is to be false before observing the data. Thus, larger Bayes factors indicate that the data more strongly support the hypothesized association, whereas smaller Bayes factors indicate that the data less strongly support the hypothesized association. More formally, Kass and Raftery[33] suggest thresholds in ***Table 4-3*** for interpreting Bayes factors.

TABLE 4-3. Interpretation of Bayes Factors

Bayes Factor	Interpretation
0 to 3.2	Evidence is not worth more than a bare mention.
3.2 to 10	Evidence is substantial.
10 to 100	Evidence is strong.
100+	Evidence is decisive.

SOURCE: Kass and Raftery (1995).[33]

For some outcomes, we estimated models using data derived from both structured client interviews and administrative secondary data sources. If the direction and significance of the secondary data analysis results were consistent with the structured client interview results, we increased our assessment of the strength of evidence. For example, if the Bayes factor was between 3.2 and 10, and the secondary data analyses confirmed the direction and significance of the structured client interview results, we indicated that there was strong evidence. In contrast, if the Bayes factor was between 10 and 100, but the significance and direction of the secondary data analysis was inconsistent with the structured client interview results, we indicated that there was substantial evidence. Similarly, for all outcomes, we estimated models using a comparison group for one site. As with the secondary data analyses, if these analyses confirmed the within-group analyses, we indicated a greater strength of evidence.

4.2.1. Treatment Adherence Outcomes

Table 4-4 shows that appointment adherence increased by 25.9 percentage points from baseline to 6-month follow-up (67% to 93%; $p < 0.001$) and by 24.2 percentage points from baseline to 12-month follow-up (67% to 92%; $p = 0.024$). Bayes factors indicated that the evidence was decisive. Between-group analysis showed that the comparison group had similar improvements in appointment adherence, leading to an insignificant relative change with a Bayes factor less than one. Medication adherence also increased: by 17.1 percentage points from baseline to 6-month follow-up (72% to 89%; $p = 0.011$) and by 18.4 percentage points from baseline to 12-month follow-up (72% to 90%; $p < 0.001$). Bayes factors indicated that the evidence was decisive. The between-group analysis showed that the comparison group had similar improvements in medication adherence. Moreover, secondary data analyses did not show a significant change in medication possession ratio. Accordingly, we downgraded the strength of evidence to strong evidence.

TABLE 4-4. Changes in Appointment and Medication Adherence Among AOT Clients

Outcome/Follow-up Period	Change	95% CI	Strength of Evidence
Percent deemed appointment adherent, %[a]			
6-month follow-up	25.9***	(15.9, 35.9)	
12-month follow-up	24.2*	(3.1, 45.2)	
Percent deemed medication adherent, %[a,b]			
6-month follow-up	20.2**	(7.7, 32.8)	
12-month follow-up	21.8***	(10.9, 32.7)	

NOTES:
a. Complementary between-group analyses are available in ***Appendix F***.
b. Complementary secondary data analyses are available in ***Appendix F***.
* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. N = 392.
Both outcomes used a logistic regression to model the probability of being either appointment or medication adherent. Models controlled for the following confounders: gender, age, race/ethnicity, marital status, parenthood, education, indicators for in school or employed, criminal justice involvement at baseline, length of AOT order, and an indicator for whether the client was stepped down from an institutional setting. Marginal effects were calculated so that all estimates are interpreted as the percentage point change in the outcome observed at 6-month or 12-month follow-up.
Bayes factors were calculated using Bayesian analogs to the frequentist regression models using wide normal distributions for priors (i.e., with standard deviations of 100).
Strength of evidence was assessed by reviewing the Bayes factors for each outcome, the between-group analyses, and (if available) any secondary data analyses.
 = strong evidence
 = decisive evidence

4.2.2. Clinical Functioning Outcomes

Table 4-5 shows that AOT was associated with improvements in all eight clinical functioning outcomes. Modified Colorado symptom indices increased by 0.7 points from an average score of 3.7 at baseline to an average score of 4.4 at 6-month follow-up ($p = 0.016$), indicating that AOT clients, on average, experienced emotional distress several times each month at baseline and experienced emotional distress only once per month at 6-month follow-up. Results were similar when comparing the 12-month follow-up and baseline scores. Bayes factors indicate decisive evidence for an improvement in symptomology. Between-group analysis showed that the comparison group had a very similar improvement in modified Colorado Symptom Index (MCSI) scores, and these results were not statistically significant. The Bayes factor was also less than 3.2.

TABLE 4-5. Associations Between AOT and Clinical Functioning Outcomes			
Outcome/Follow-up Period	**Change**	**95% CI**	**Strength of Evidence**
MCSI score[a]			
6-month follow-up	0.7***	(0.3, 1.0)	
12-month follow-up	0.8***	(0.4, 1.2)	
Perceived MH rating[a]			
6-month follow-up	0.5***	(0.2, 0.7)	
12-month follow-up	0.5***	(0.3, 1.0)	
Life satisfaction[a]			
6-month follow-up	0.4**	(0.2, 0.7)	
12-month follow-up	0.8**	(0.3, 1.3)	
Therapeutic alliance, goals[a]			
6-month follow-up	2.3**	(0.9, 3.7)	
12-month follow-up	2.6**	(0.6, 4.5)	
Therapeutic alliance, tasks[a]			
6-month follow-up	2.2**	(0.6, 3.8)	
12-month follow-up	3.0***	(1.5, 4.6)	
Therapeutic alliance, bond[a]			
6-month follow-up	1.7*	(0.3, 3.2)	
12-month follow-up	2.2**	(0.7, 3.6)	
Any violence, %[a]			
6-month follow-up	-19.0**	(-33.4, -4.6)	
12-month follow-up	-22.5**	(-36.6, -8.4)	
Any suicidal ideation, %a			
6-month follow-up	-24.7**	(-40.0, -9.3)	
12-month follow-up	-26.7***	(-41.6, -11.8)	

NOTES:

a. Complementary between-group analyses are available in ***Appendix F***.

* p < 0.05; ** p < 0.01; *** p < 0.001. N = 392.

The following outcomes used a logistic regression to model the probability of the outcome: perceived MH rating is very good, any violence, and suicidal ideation. The remaining models used an ordinary least squares regression functional form. All models controlled for the following confounders: gender, age, race/ethnicity, marital status, parenthood, education, indicators for in school or employed, criminal justice involvement at baseline, length of AOT order, an indicator for whether the client was stepped down from an institutional setting, and an indicator for whether the client ever appeared before the judge/magistrate for a status hearing during their AOT order. Marginal effects were calculated so that all estimates are interpreted as the percentage point change in the outcome observed at 6-month or 12-month follow-up.

Strength of evidence was assessed by reviewing the Bayes factors for each outcome, the between-group analyses, and (if available) any secondary data analyses.

Bayes factors were calculated using Bayesian analogs to the frequentist regression models using wide normal distributions for priors (i.e., with standard deviations of 100).

 = strong evidence

 = decisive evidence

Clients also reported a higher perception of their mental health and greater life satisfaction at follow-up relative to baseline. On average, clients reported their mental health was between fair and good at baseline, and reported that their mental health was between good and excellent at 6-month follow-up (2.6 to 3.1; p <

0.001). Results were similar when comparing the 12-month follow-up and baseline responses. Bayes factors indicate decisive evidence of an improvement in perceived mental health status, and between-group analyses confirmed that there were larger changes in perceived mental health status among AOT participants relative to non-participants. Life satisfaction scores increased by 0.4 points, from an average of 4.7 at baseline to 5.1 at 6-month follow-up, indicating that AOT clients on average had mixed feelings about their life as a whole at baseline and had satisfied feelings about their life as a whole at 6-month follow-up. Results were similar but stronger when comparing the 12-month follow-up and baseline life satisfaction. Bayes factors indicated decisive evidence of an increase in life satisfaction. However, between-group analyses did not show that AOT participants had a larger improvement in life satisfaction relative to non-AOT participants, and these results were not statistically significant. The Bayes factor was also less than 3.2.

Therapeutic alliance also improved during and after the AOT order. Specifically, the average WAI, goal scale increased by 2.3 points from baseline to 6-month follow-up (15.0 to 17.3; $p = 0.002$), indicating that clients more often perceived that they were working effectively with their therapist to identify and achieve functioning goals. The average WAI, task scale also increased by 2.2 points from baseline to 6-month follow-up (14.9 to 17.1; $p = 0.006$), indicating that clients more often perceived as beneficial the treatment activities engaged in during therapy. Lastly, the average WAI, bond scale increased by 1.7 points from baseline to 6-month follow-up (16.2-17.9; $p = 0.019$), indicating that client-therapist bonds improved from baseline to follow-up. Each of these scales have a maximum of 20 points. Therefore, a change of 1.7-2.3 points represents an 8.5%-11.5% improvement in the therapeutic alliance. Results from the 12-month follow-up were similar. Bayes factors indicate decisive evidence for all three of these changes. The WAI goal scale was also statistically significant in the between-group results, indicating that AOT participants had a greater improvement in therapeutic alliance than non-AOT participants.

Table 4-5 also shows that clients were less likely to report any violent behavior and were less likely to have suicidal thoughts at follow-up than at baseline. The percentage of clients who reported any violent behavior decreased by 19.0 percentage points from baseline to 6-month follow-up (23.9% to 4.9%; $p = 0.009$). Additionally, the percentage of clients who reported any suicidal thoughts decreased by 24.7 percentage points from baseline to 6-month follow-up (31.4% to 6.7%; $p = 0.002$). Results were similar at 12-month follow-up. Bayes factors indicated decisive evidence for both outcomes. Between-group analyses showed that AOT participants had a larger decrease in likelihood of reporting any violent behavior relative to non-AOT participants. However, this result was not statistically significant. Changes in suicidal ideation were similar among non-AOT participants.

4.2.3. Social Functioning Outcomes

Table 4-6 shows that AOT was associated with improvements in five of six social functioning outcomes. Psychiatric inpatient utilization decreased significantly. The percentage of clients with at least one psychiatric inpatient episode during the past 6 months decreased by 41.0 percentage points from baseline to 6-month follow-up (61.4% to 20.4%; $p = 0.018$), and the number of nights spent in a psychiatric inpatient setting decreased by 9.6 nights during the past 6 months at 6-month follow-up relative to baseline (11.8 nights to 2.1 nights; $p = 0.019$). Bayes factors indicate decisive evidence for both outcomes, and between-group analyses confirmed these findings. Secondary data analyses also confirmed significantly fewer psychiatric inpatient encounters (7.1 encounters to 1.3 encounters; $p < 0.001$) during the 6 months following an AOT order than during the 6 months before an AOT order.

Criminal justice involvement also decreased among AOT participants. The percentage of clients who reported at least one arrest during the past 6 months decreased by 19.2 percentage points from baseline to 6-month follow-up (26.0% to 6.8%; $p < 0.001$). Results were similar at 12-month follow-up. Bayes factors indicate decisive evidence. However, although secondary data analysis results were in the same direction, they were

not statistically significant. Accordingly, we downgraded the evidence for a change in the number of arrests to strong evidence. Between-group analysis did not show a difference in the change in arrests across AOT and non-AOT participants.

TABLE 4-6. Associations Between AOT and Social Functioning Outcomes

Outcome/Follow-up Period	Change	95% CI	Strength of Evidence
Any psychiatric ED visits, %[a,b]			
6-month follow-up	-12.0	(-38.6, 14.7)	
12-month follow-up	-12.1	(-39.0, 14.9)	
Any psychiatric IP episodes, %[a,b]			
6-month follow-up	-41.0*	(-75.0, -6.9)	
12-month follow-up	-46.9***	(-73.2, -20.7)	
Number of psychiatric IP nights[a,b]			
6-month follow-up	-9.6*	(-17.7, -1.6)	
12-month follow-up	-8.9**	(-15.3, -2.6)	
Any arrests, %[a,b]			
6-month follow-up	-19.2***	(-21.7, -16.6)	
12-month follow-up	-24.0***	(-26.0, -22.1)	
Any drug use, %			
6-month follow-up	-14.2***	(-21.8, -6.6)	
12-month follow-up	-19.6***	(-26.3, -12.9)	
Homelessness, %			
6-month follow-up	-12.2**	(-21.0, -3.4)	
12-month follow-up	-8.7	(-25.8, 8.3)	

NOTES:
a. Complementary between-group analyses are available in Appendix F.
b. Complementary secondary data analyses are available in Appendix F.
* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. N = 392.
The following outcomes used a logistic regression to model the probability of the outcome: any psychiatric ED visits, any psychiatric IP episodes, any arrests, any illicit drug use, and homelessness. The remaining model used an ordinary least squares regression functional form. All models controlled for the following confounders: gender, age, race/ethnicity, marital status, parenthood, education, indicators for in school or employed, criminal justice involvement at baseline, length of the AOT order, an indicator for whether the client was stepped down from an institutional setting, and an indicator for whether the client ever appeared before the judge/magistrate for a status hearing during their AOT order. Marginal effects were calculated so that all estimates are interpreted as the percentage point change in the outcome observed at 6-month or 12-month follow-up.
Strength of evidence was assessed by reviewing the Bayes factors for each outcome, the between-group analyses, and (if available) any secondary data analyses.
Bayes factors were calculated using Bayesian analogs to the frequentist regression models using wide normal distributions for priors (i.e., with standard deviations of 100).
 = strong evidence
 = decisive evidence

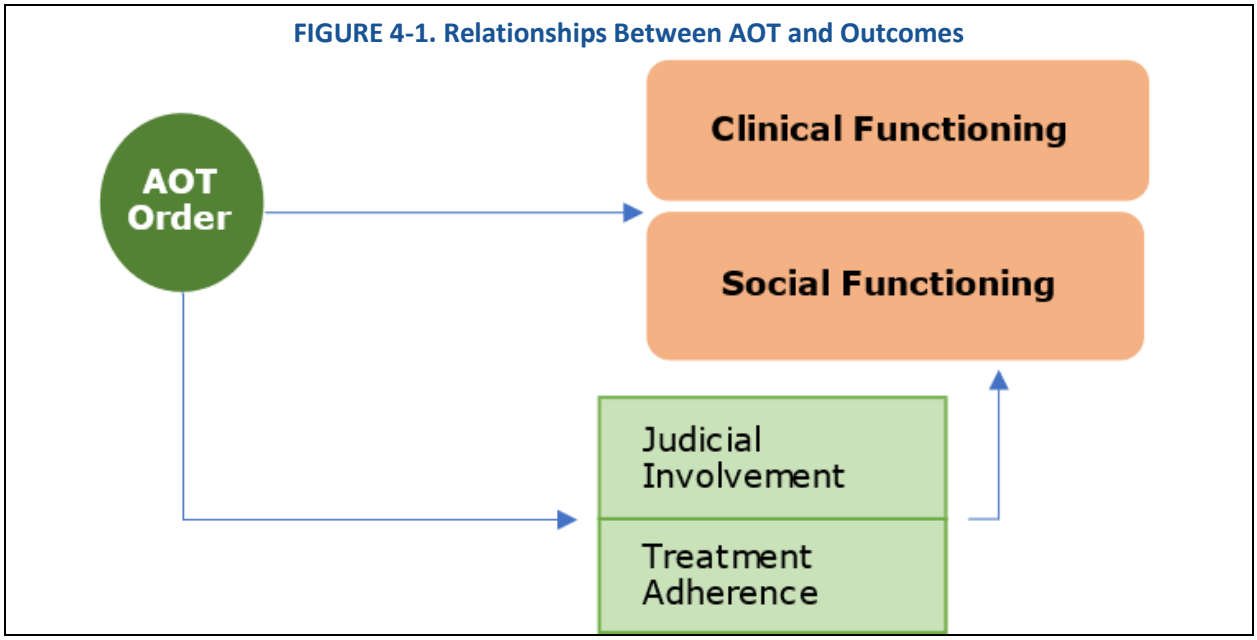
Illicit drug use decreased among AOT participants. The percentage of clients who reported any illicit drug use during the past 6 months decreased by 14.2 percentage points from baseline to 6-month follow-up (28.6% to 14.4%; $p < 0.001$). Results were similar for 12-month follow-up. Bayes factors indicate decisive evidence. Between-group analyses showed that there was a similar improvement in illicit drug use among non-AOT participants.

Lastly, ***Table 4-6*** shows that AOT clients were also less likely to be homeless. The percentage of clients who reported any homelessness during the past 6 months decreased by 12.2 percentage points from baseline to 6-month follow-up (17.3% to 5.1%; p = 0.007). Although the 12-month follow-up result was not statistically significant, Bayes factors indicated substantial evidence of a decrease in homelessness from baseline to 12-month follow-up. Between-group analyses showed a similar improvement in homelessness among non-AOT participants.

4.3. Role of Treatment Adherence and Judicial Status Hearings

The previous section focused on ascertaining whether treatment adherence, clinical functioning, or social functioning outcomes are changing among AOT participants (and relative to a between-group of non-AOT participants). In this section, we focus on clinical and social functioning changes associated with AOT that can be attributed to status hearings over the course of the order, changes in treatment adherence (i.e., appointment or medication adherence), or both. ***Figure 4-1*** illustrates the approach. Specifically, the total change observed in clinical or social functioning measures among people on an AOT order is measured by the analyses presented in the previous section and represents the cumulative impacts across both pathways that AOT has on the outcomes. We cannot easily measure the pathway from judicial status hearings and treatment adherence to these same outcomes. However, we can measure the pathway directly from AOT to the outcomes by controlling for judicial status hearings and treatment adherence. The indirect pathway that travels through judicial status hearings and treatment adherence can then be recovered as a residual: the total change observed in the previous section minus the direct pathway measured after controlling for both factors.

FIGURE 4-1. Relationships Between AOT and Outcomes



The specific measure we include for judicial status hearings is a client-level indicator for whether the client ever appeared before a court official for a status hearing during their AOT order. The specific measures we include for treatment adherence are the appointment and medication adherence measures analyzed in the previous section.

Table 4-7 presents the results of these analyses. Specifically, for a selection of clinical and social functioning outcomes, we present the change attributable to judicial status hearings, the change attributable to treatment adherence, and the change attributable to both factors collectively. For each, we also provide the percentage of the total change observed in the previous section that can be attributed to each factor individually and

collectively. Larger percentages indicate that almost all the association can be attributed, whereas smaller percentages indicate that very little of the association can be attributed. Binary outcomes were modeled with logistic regression and continuous outcomes were modeled using ordinary least squares. We used cluster-robust standard errors in all analyses, using the AOT site as the clustering variable. This accounts for within-site correlations in client-level outcomes.

Table 4-7 shows that between 37% and 44% of the changes observed among AOT participants in clinical functioning outcomes can be attributed to changes in treatment adherence or to having at least one status hearing. Models that separately estimate the extent to which judicial status hearings mediates outcomes versus the extent to which treatment adherence mediates outcomes show that a greater proportion of changes can be explained by judicial status hearings (21% to 32%) than by treatment adherence (6% to 14%). Although the attributable changes are not statistically significant, Bayes factors indicated substantial evidence of a change in each of these outcomes.

Table 4-7 also shows that most of the changes observed among AOT participants in any mental health emergency department visits can be attributed to changes in treatment adherence or judicial status hearings. Less than 50% of the changes observed among AOT participants can be attributed to changes in treatment adherence or judicial status hearings for the remainder of the outcomes. Separately modeling these mediators does not show a clear picture as to whether either factor more strongly mediates outcome changes. Bayes factors indicate that there is substantial evidence for a change in the percentage of clients who were arrested in the past 6 months, the percentage of clients who reported any illicit drug use in the past 6 months, and the percentage of clients who reported any homelessness in the past 6 months.

TABLE 4-7. Treatment Adherence and Judicial Status Hearings as Explanatory Factors for Observed Changes in Clinical and Social Functioning Outcomes

Outcome	Changes Explained by Any Status Hearings			Changes Explained by Treatment Adherence			Changes Explained by Either		
	Change	95% CI	% Attributable	Change	95% CI	% Attributable	Change	95% CI	% Attributable
Clinical Functioning Outcomes									
MCSI score	0.1	(−0.3, 0.6)	21%	0.04	(−0.6, 0.7)	6%	0.24	(−0.4, 0.9)	37%
Any violence, %	−6.2	(−21.7, 9.6)	32%	−2.21	(−22.1, 16.8)	12%	−8.05	(−24.2, 7.8)	42%
Suicidal ideation, %	−6.0	(−23.4, 11.6)	24%	−3.52	(−25.0, 18.4)	14%	−10.90	(−28.5, 6.2)	44%
Social Functioning Outcomes									
Any MH ED, %	−6.9	(−34.6, 21.1)	58%	−3.41	(−35.0, 27.9)	28%	−8.78	(−36.7, 17.9)	72%
Number of psychiatric IP nights	1.6	(−9.2, 12.6)	−17%	−3.47	(−14.0, 6.9)	36%	−2.66	(−13.8, 8.5)	28%
Any arrests, %	−0.3	(−5.2, 4.6)	2%	−3.30	(−7.6, 0.9)	17%	−4.20	(−9.8, 1.6)	22%
Any illicit drug use, %	−0.9	(−10.9, 9.2)	6%	−5.95	(−15.8, 4.1)	42%	−5.69	(−14.7, 3.4)	40%
Any homelessness, %	−3.4	(−14.0, 7.3)	28%	−0.89	(−13.8, 12.0)	7%	−4.23	(−18.6, 10.4)	35%

Notes: The following outcomes used a logistic regression to model the probability of the outcome: any violence, suicidal ideation, any psychiatric ED visits, any arrests, any illicit drug use, and homelessness. The remaining models used an ordinary least squares regression functional form. All models controlled for the following confounders: gender, age, race/ethnicity, marital status, parenthood, education, indicators for in school or employed, criminal justice involvement at baseline, length of AOT order, and an indicator for whether the client was stepped down from an institutional setting. Marginal effects were calculated so that all estimates are interpreted as the percentage point change in the outcome observed at 6-month follow-up. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. N=286.

4.4. Potential Moderators of Changes in Clinical and Social Functioning Outcomes

In this section, we investigate whether the following factors moderate changes observed in clinical and social functioning outcomes: (1) step-down status for each client; (2) having criminal justice involvement at baseline; (3) spending at least 6 months on an AOT order; and (4) successfully completing an AOT order. The analytic approach is to extend the models presented in ***Section 4.2*** by interacting the within-group indicators with each of these factors. This approach measures whether the changes differ at all based on these factors, with statistically significant differences indicating that the factor is a potential moderator.

Table 4-8 shows that the length of the AOT order potentially moderated changes in violent behaviors, suicidal ideation, the number of psychiatric inpatient nights, and homelessness.

The following outcomes used a logistic regression to model the probability of the outcome: any violence, suicidal ideation, any arrests, any illicit drug use, and homelessness. The remaining models used an ordinary least squares regression functional form. All models controlled for the following confounders: gender, age, race/ethnicity, marital status, parenthood, education, indicators for in school or employed, criminal justice involvement at baseline, length of AOT order, and an indicator for whether the client was stepped down from an institutional setting. Marginal effects were calculated so that all estimates are interpreted as the percentage point change in the outcome observed at 6-month follow-up.

Bayes factors were calculated using Bayesian analogs to the frequentist regression models using wide normal distributions for priors (i.e., with standard deviations of 100).

Step-down status was not associated with a statistically significant difference in changes in any outcome. Criminal justice involvement at baseline potentially moderated changes in violent behavior and illicit drug use. Clients who had criminal justice involvement at baseline had a 28.8 percentage point decrease in the likelihood of any violent behavior, whereas clients who did not have criminal justice involvement at baseline had a 14.5 percentage point decrease in the likelihood of any violent behavior. Clients who had criminal justice involvement had a 23.7 percentage point decrease in the likelihood of illicit drug use, whereas clients who did not have criminal justice involvement at baseline had a 9.5 percentage point decrease in the likelihood of illicit drug use.

Among clients who had an AOT order of at least 6 months, we observed a 24.5 percentage point decrease in the likelihood of any violence from baseline to 6-month follow-up, whereas among clients with an AOT order of less than 6 months, we observed a 14.7 percentage point decrease in the likelihood of any violence from baseline to 6-month follow-up. Clients who had an AOT order of at least 6 months had a 27.4 percentage point decrease in the likelihood of suicidal ideation, whereas clients with an AOT order of less than 6 months had a 21.4 percentage point decrease in the likelihood of suicidal ideation. Although the number of psychiatric inpatient nights decreased regardless of whether the AOT order was greater than or less than 6 months, we saw that clients with an AOT order of less than 6 months only had 2.5 nights fewer psychiatric inpatient nights, whereas clients with an AOT order of at least 6 months had 14.5 fewer psychiatric inpatient nights. Lastly, clients with an AOT order of at least 6 months had a 20.5 percentage point decrease in the likelihood of any homelessness, whereas clients with an AOT order less than 6 months had a smaller 8.3 percentage point decrease in the likelihood of any homelessness.

TABLE 4-8. Potential Moderators of Observed Changes in Clinical and Social Functioning Outcomes Among AOT Participants at 6-Month Follow-Up			
Outcome/Moderator	**Difference in Change**	**95% CI**	**Bayes Factor**
Clinical Functioning Outcomes			
MCSI score			
Client was stepped down	0.1	(−0.6, 0.9)	0.3
Criminal justice involvement at baseline	0.3	(−0.1, 0.7)	18.0
AOT order ≥6 months	−0.2	(−0.5, 0.2)	5.3
Successful order completion	0.4**	(0.2, 0.7)	>100
Any violence, %			
Client was stepped down	4.5	(−3.7, 12.8)	0.4
Criminal justice involvement at baseline	−14.3***	(−16.1, −12.6)	48.5
AOT order ≥6 months	−9.8**	(−14.4, −5.1)	15.0
Successful order completion	−2.9	(−6.3, 0.6)	1.1
Suicidal ideation, %			
Client was stepped down	−9.0	(−37.8, 19.7)	3.0
Criminal justice involvement at baseline	9.6	(−6.6, 25.8)	0.2
AOT order ≥6 months	−5.9**	(−9.7, −2.2)	0.2
Successful order completion	4.7	(−2.6, 12.1)	0.3
Social Functioning Outcomes			
Number of psychiatric IP nights			
Client was stepped down	−3.9	(−20.0, 12.3)	0.3
Criminal justice involvement at baseline	5.5	(−0.7, 11.6)	7.9
AOT order ≥6 months	12.0	(5.9, 18.1)	>100
Successful order completion	0.5	(−10.6, 11.6)	1.2
Any arrests, %			
Client was stepped down	−3.9	(−10.0, 2.1)	5.0
Criminal justice involvement at baseline	–	–	–
AOT order ≥6 months	7.5	(−0.5, 15.6)	30.3
Successful order completion	na	na	na
Any illicit drug use, %			
Client was stepped down	−3.9	(−12.8, 5.0)	0.7
Criminal justice involvement at baseline	−14.2***	(−22.0, −6.4)	0.1
AOT order ≥6 months	−0.6	(−19.5, 18.2)	1.4
Successful order completion	7.7	(1.5, 13.9)	2.1
Any homelessness, %			
Client was stepped down	6.8	(−1.4, 15.0)	0.2
Criminal justice involvement at baseline	3.9	(−7.8, 15.5)	0.4
AOT order ≥6 months	−12.2***	(−18.0, −6.4)	18.7
Successful order completion	−7.0*	(−12.9, −1.0)	0.3

NOTES: na = result not available due to lack of convergence.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. N = 392.

The following outcomes used a logistic regression to model the probability of the outcome: any violence, suicidal ideation, any arrests, any illicit drug use, and homelessness. The remaining models used an ordinary least squares regression functional form. All models controlled for the following confounders: gender, age, race/ethnicity, marital status, parenthood, education, indicators for in school or employed, criminal justice involvement at baseline, length of AOT order, and an indicator for whether the client was stepped down from an institutional setting. Marginal effects were calculated so that all estimates are interpreted as the percentage point change in the outcome observed at 6-month follow-up.

Bayes factors were calculated using Bayesian analogs to the frequentist regression models using wide normal distributions for priors (i.e., with standard deviations of 100).

Successful order completion potentially moderated changes in MCSI scores, illicit drug use, and homelessness. Clients who successfully completed an AOT order had a 0.8-point increase in their MCSI scores, whereas clients who did not successfully complete an AOT order had only a 0.3-point increase in their MCSI score. This finding suggests that symptoms improved more strongly among those who successfully completed AOT orders than among those who did not successfully complete AOT orders. Although the likelihood of any illicit drug use decreased regardless of successful completion of an AOT order, clients who successfully completed orders had an 11.0 percentage point decrease in their likelihood of illicit drug use, whereas clients who did not successfully complete orders had a larger 18.7 percentage point decrease in their likelihood of illicit drug use. Lastly, clients who successfully completed AOT orders had a 14.8 percentage point decrease in the likelihood of any homelessness, whereas clients who did not successfully complete AOT orders had a 7.9 percentage point decrease in the likelihood of any homelessness.

5. CLIENT AND FAMILY PERCEPTIONS

Although proponents of AOT assert that it provides access to needed treatment and, in fact, is implemented with those individuals for whom it is the least-restrictive alternative, challengers contend that the practice is inherently coercive. How AOT is perceived by clients is critical to determining AOT's place in relation to individuals' rights and civil liberties and to public safety and access to community care. Furthermore, family perceptions of AOT may inform ongoing discussion regarding the relative merits and shortcomings of mandated mental health treatment.

This section addresses evaluation questions about these client and family perceptions:

- What do clients report about AOT?
- Are families satisfied with AOT? With treatment providers? With judicial/legal personnel?

We first present a range of AOT-related perceptions reported by AOT clients, including stigma, coercion, general pressures to adhere to treatment and associated benefits of those pressures, procedural justice, treatment satisfaction, and effectiveness of AOT. ***Section 5.1*** presents within-group analyses of these client-level measures to assess any changes from baseline (e.g., prior to AOT) to follow-up (e.g., while on the order). ***Section 5.2*** presents a regression analysis to determine the extent to which changes are influenced by AOT understanding, therapeutic alliance, or judicial status hearings. ***Section 5.3*** presents a description of results from family satisfaction surveys, including perceptions of AOT, involvement in and satisfaction with the civil process, satisfaction with treatment services received under the AOT court order, client behaviors, and family well-being.

5.1. Client Perceptions Over Time

Table 5-1 presents results of within-group analyses of client perceptions at baseline and follow-up periods.

TABLE 5-1. Client Perceptions at Baseline and Follow-Up

Client Perceptions	Baseline	Follow-Up	Change (95% CI)	P Value
AOT stigma	0.34	0.20	−0.14 (−0.18, −0.10)	<0.001
AOT coercion	2.65	2.71	0.06 (−0.17, 0.30)	0.608
General pressures to adhere to treatment	0.89	1.94	1.05 (0.35, 1.75)	0.003
Pressure benefits	2.69	2.45	−0.24 (−0.38, −0.10)	<0.001
Procedural justice	2.27	2.29	0.02 (−0.09, 0.13)	0.745
Treatment satisfaction	3.59	3.93	0.34 (0.07, 0.60)	0.013
AOT effectiveness	0.96	0.97	0.01 (−0.03, 0.05)	0.622

Some perceptions of AOT remained stable, whereas others changed over the course of the order. Perceived stigma was measured with a single yes/no question: "When people are under AOT, do you think that most

other people think less of them?" One in three clients endorsed this item at baseline, which decreased to roughly one in five at 6-month follow-up.

Perceived coercion was measured with a five-point standardized scale from "strongly agree" to "strongly disagree," with statements such as "It was my idea to get treatment." Strong disagreement with this and other items indicated higher levels of perceived coercion. Results showed that perceptions of coercion remained neutral (e.g., neither agree nor disagree), on average, from baseline to follow-up.

General pressures to adhere to treatment were assessed with eight yes/no items, including "Did you feel that, if you did not keep your treatment appointments or take your prescribed medication, someone would make you go to the hospital?" Total scores ranged from zero to eight, with higher scores indicating greater pressure exerted. AOT clients reported minimal levels of these pressures in the 6 months preceding AOT, and although perceived pressures increased over the first 6 months of AOT, they remained low, with an average of two items indicated per respondent.

Perceived benefits and fairness of these pressures were measured with a nine-item scale, with item responses ranging from strongly agree to strongly disagree. A sample item included "Overall, the pressures or things people have done were for my own good." Lower scores reflect greater perceived benefits. These perceptions improved over time, with AOT clients reporting greater benefits at follow-up relative to baseline.

Procedural justice under AOT was measured using six items rated on a three-point scale ("not at all" to "definitely"), for example, "When you received your court order, did they treat you respectfully?" Higher scores indicated greater perceptions of procedural justice. AOT clients reported high levels of procedural justice at both baseline and follow-up assessments.

Treatment satisfaction was captured using nine items rated on a five-point standardized scale ("strongly agree" to "strongly disagree"), with examples such as "I was able to get all of the services I thought I needed." Mean scores were calculated, with higher scores reflecting greater satisfaction. Results showed that reported levels of treatment satisfaction significantly improved from baseline to follow-up.

Client perceptions of effectiveness of AOT were assessed using three yes/no items, such as "When people are under AOT, do you think they are more likely to keep their mental health or substance abuse appointments?" Mean scores were calculated, with higher scores reflecting greater perceived benefits. Client scores remained high from baseline to follow-up, with nearly all individuals indicating agreement that AOT improves treatment and medication adherence and reduces likelihood of inpatient hospitalization.

5.2. Moderators of Client Perceptions

Table 5-2 presents results of a regression analysis to determine the extent to which changes are influenced by AOT understanding, therapeutic alliance, or judicial status hearings.

Results showed no significant impacts of AOT understanding or status hearings on perceptions of coercion, stigma, pressure, or benefits at follow-up. Therapeutic alliance tasks were associated with an increase in perceived benefits of pressures to adhere to treatment ($p = 0.045$).

TABLE 5-2. Association of AOT Understanding, Therapeutic Alliance, and Judicial Status Hearings with Clinical and Social Functioning Outcomes								
Measure	AOT Stigma		Pressures		Pressure Benefits		Treatment Satisfaction	
	Coef. (95% CI)	P Value	Coef. (95% CI)	P Value	Coef. (95% CI)	P Value	Coef. (95% CI)	P Value
AOT understanding	−0.13 (−0.69, 0.43)	0.646	1.20 (−8.31, 10.72)	0.795	0.34 (−0.24, 0.93)	0.248	−1.14 (−3.20, 0.92)	0.270
Therapeutic alliance, goals	−0.01 (−0.07, 0.06)	0.791	−1.74 (−4.03, 0.56)	0.130	0.02 (−0.04, 0.07)	0.522	−0.10 (−0.33, 0.13)	0.383
Therapeutic alliance, tasks	0.01 (−0.05, 0.06)	0.774	1.06 (−0.75, 2.87)	0.239	−0.04 (−0.09, 0.00)	0.045	0.09 (−0.13, 0.30)	0.418
Therapeutic alliance, bond	−0.03 (−0.08, 0.03)	0.340	0.79 (−0.48, 2.06)	0.209	−0.004 (−0.05, 0.04)	0.882	0.06 (−0.16, 0.28)	0.565
Any status hearings	0.02 (−0.27, 0.31)	0.904	1.29 (−3.42, 5.99)	0.577	0.03 (−0.25, 0.31)	0.807	0.16 (−0.77, 1.09)	0.734

5.3. Family Perceptions of AOT

Perceptions of AOT. Most family members who were surveyed (91.5%) reported perceptions that AOT help clients stay well. Nearly all family members (91.5%) indicated agreement that people under AOT are more likely to retain their appointments at the mental health center. Most family members (93.6%) reported that clients were more likely to adhere to their medication while under AOT. Additionally, most (89.4%) also believed that clients under AOT were more likely to stay out of the hospital.

Involvement in and satisfaction with the civil process. Of the 47 family members surveyed across all AOT sites, 14 (29.8%) filed the petition for AOT. Roughly half of all family members surveyed (53.2%) reported that they attended the initial court hearing to determine whether the client should be under AOT. In general, most family members (93.6%) reported satisfaction with the petition process regardless of their specific role or level of involvement.

Legal stakeholders at case study sites sought opinions of family members in nearly all instances. Across all reporting sites, nearly one-fourth of family members (23.4%) stated that those involved in the petition process cared about their opinion about the case of treatment plan before the AOT docket. During the AOT docket, almost one-half of family members (44.7%) across all sites reported that those involved in the petition process valued their opinion.

Satisfaction with treatment services received under the AOT court order. At all sites, most family members (74.5%) reported receiving an adequate amount of information about the client's illness from the mental health providers. Similarly, across all sites, nearly all family members surveyed (93.6%) reported being satisfied with both the quantity and quality of their contact with mental health providers.

Family members were equally satisfied with the mental health system's response to their concerns regarding the client's needs while under AOT. Most family members surveyed reported that mental health professionals aided in connecting clients with external resources, such as housing, legal aid, vocational programs, and transportation. At all but one site, family members were satisfied with the connecting services provided to the client.

Client behaviors. Most family members indicated that the services provided under the AOT order helped most clients handle their daily conflicts more effectively (80.9%); enhance their relationships with their family members (89.4%); augment their academic or work performance, if applicable (44.7%); alleviate their symptoms (78.7%); and effectively decrease their encounters with law enforcement (78.7%).

Family well-being. Most family members surveyed (74.5%) reported worrying while a relative was under AOT. Across all sites, most family members surveyed (80.9%) either maintained full-time or part-time (PT) employment or were retired at the time the client was under AOT. Family members across all sites reported missing approximately 10 days of work, on average, because they were caring for the client. Many of the families across all sites reported not being financially burdened by their provisions to the client. Only five of the 47 family members surveyed reported being involved in support groups, such as the National Alliance for the Mentally Ill (NAMI).

6. ASSISTED OUTPATIENT TREATMENT RESOURCES AND COSTS

Current research suggests that AOT may be cost-effective and can create cost savings by reducing the frequency of costly services such as hospitalizations and emergency visits. However, research into AOT costs is limited, and a detailed documentation of AOT costs and savings is needed to help better understand where AOT creates cost savings. Identifying where cost savings occur also informs sustainability decisions and strategies after grant funding ends.

The goal of this section is to address the following evaluation questions:

- What resources are available to support AOT?
- What costs are associated with the implementation of AOT?
- Are cost savings associated with outcomes attributable to AOT?
- How do sites plan to sustain AOT once grant funding ends?

To address these evaluation questions, we start by describing the resources and associated cost of these resources used by three of the six in-depth AOT sites. We focus on these three sites because we were able to interview and collect data directly on the court processes from court representatives for each of these sites. For the remaining in-depth sites, we attempted to collect similar information, but we were only able to interview other program administrators to indirectly obtain information on court processes.

We next present an examination of the potential cost savings associated with AOT. In ***Section 4***, we demonstrate that AOT is associated with reductions in psychiatric emergency department visits and psychiatric inpatient episodes. Drawing from the literature on the cost of these services, we approximate the extent to which these changes in utilization are associated with reductions in medical care spending. Although other cost savings are likely to result from other outcomes observed (e.g., reduced criminal justice involvement as evidenced by lower arrest probabilities), these are the only outcomes that counted the number of visits or days that could be matched to unit costs, so they represent a conservative estimate of cost savings.

We conclude this section with a presentation of preliminary sustainability plans developed by the in-depth AOT sites. These are preliminary in the sense that as of the time we interviewed key informants, sites were still operating under their SAMHSA grant.

6.1. Assisted Outpatient Treatment Resources and Program Costs

We collected program cost data from both clinical and court representatives at three of the in-depth AOT sites. The data collection instrument, modified from the Substance Abuse Cost Analysis Program,[34] asks respondents to report expenses for labor and non-labor inputs and expenses for inputs that indirectly support AOT activities (e.g., planning and coordination meetings). After collecting responses, we conducted follow-up interviews to ensure the quality of these data. To supplement this information, we also conducted a series of interviews with court stakeholders (e.g., judges/magistrates). These interviews focused on the training and planning activities during the 6 months prior to AOT adoption, specific court processes implemented, miscellaneous resources used (e.g., office supplies), and funding sources. Using these data, we estimated early implementation costs (which capture the value of time spent participating in planning meetings, formal/informal training activities, and other coordination activities) and mid-adoption costs (which capture the treatment, ongoing planning and coordination costs, and hearing costs over a 12-month period). To ensure

a common scale across sites, we divide these costs by the number of clients enrolled in each AOT program during the 12-month reference period, so that costs are cost per client.

Table 6-1 shows results from this cost analysis.

TABLE 6-1. Early and Mid-Adoption Costs Incurred by Three AOT Sites

Type of Cost	Site A	Site B	Site C
Early implementation costs			
Total costs incurred during the first 6 months	$8,064	$14,182	$3,341
Mid-adoption costs per client per year			
Average number of AOT orders per year	66	49	42
Total mid-adoption costs	$12,300	$13,261	$13,260
Hearing costs	$1,065	$1,480	$478
Continued planning and coordination costs	$31	$512	$24
Treatment costs	$11,204	$11,270	$12,758

Early implementation costs. During the 6 months prior to full adoption, sites reported resource costs of $3,324-$14,182. This large range reflects underlying differences in the amount of time spent planning for AOT adoption across the three sites. Sites A and C reported 66-74 staff-hours in meetings preparing to implement AOT, whereas Site B reported 258 staff-hours. Although some of these costs may have captured time that staff spent learning and implementing a new treatment model, the overwhelming majority of these costs, as reported in qualitative interviews, were associated with time that staff spent in meetings to discuss procedures for coordinating across courts and treatment teams and identifying roles and responsibilities.

Mid-adoption costs. Sites averaged 42-66 AOT orders during the 12-month observation window. Hearing costs were $478-$1,480 per client, ongoing planning and coordination costs were $24-$523 per client, and treatment costs were $11,204-$12,758 per client. As with early implementation costs, these ranges reflect some important differences in the amount of time staff spend preparing for and participating in hearings. Site C reported minimal preparation and hearing times, no status hearings, and a smaller judicial team than sites A or B. Treatment costs are the largest portion of AOT costs, reflecting that all sites adopted a treatment modality characterized by a diverse treatment team and small client-to-staff ratios.

6.2. Cost Savings Associated with Assisted Outpatient Treatment

To approximate cost savings associated with AOT, we estimate the costs associated with the observed changes in psychiatric emergency department visits and psychiatric inpatient episodes. McCollister et al.[35] report that the average cost of an emergency department visit is $2,996 and that the average cost of one psychiatric inpatient night is $999. We used the Consumer Price Index and inflated these to 2016-dollar values to 2020 dollars, resulting in unit price estimates of $3,230 and $1,077, respectively. We then multiplied the estimated unit prices by the change in psychiatric emergency department visits during the first and second 6-month follow-up periods and the change in psychiatric inpatient nights during the first and second 6-month follow-up periods. To compare cost savings associated with reduced psychiatric emergency department visits and shorter psychiatric inpatient episodes, we compared the average cost savings across the two 6-month follow-up periods to the total 12-month per client AOT cost estimated above. Because of the wide variation in early implementation costs, and because these costs may be viewed as one-time, non-recurring costs, we chose to compare only with the mid-adoption costs presented above. This approach is conservative, as 12 months of AOT treatment and court expenditures are compared with 6 months of psychiatric emergency department and inpatient savings. This approach is also conservative because we only capture cost savings associated with two

AOT outcomes. Other outcomes, such as criminal justice involvement, may be equally as important to consider, but the value of these outcomes was not easily assessed for this study. To estimate uncertainty around these estimates, we used the mean and standard deviation of AOT treatment and court expenditures and acute psychiatric treatment cost to generate 1,000 normally distributed observations, and these data were used to calculate savings and ROI. This process was simulated over 10,000 draws with replacement. For each draw, we calculated a mean and 95% CI.

Table 6-2 shows the results of the cost savings and net benefit analysis.

Acute psychiatric treatment cost savings. We find that AOT is associated with a reduction of about $125 in psychiatric emergency department costs and a reduction of about $14,000 in psychiatric inpatient costs, per client. Collectively, this finding implies a net cost savings (AOT treatment and court costs minus psychiatric treatment costs saved) of almost $1,000. The 95% Confidence Interval (CI) shows that there is substantial variation, and although this result is not statistically significant, 81% of our draws show positive treatment cost savings.

TABLE 6-2. Expenditures and Cost Savings Associated with AOT

Expenditures or Savings Measure	Per Client Cost or Savings (95% CI)
AOT treatment and court expenditures	$12,940 ($12,906-$12,974)
Psychiatric ED savings	$129 ($19-$239)
Psychiatric IP savings	$13,792 ($11,706-$15,878)
Savings net expenditures	$981 (-$1,108-$3,070)
ROI	8% (-8%-24%)

Return on investment. These calculations suggest an ROI of 8%, indicating that acute psychiatric treatment costs fell by 8% more than the amount of treatment and court resources that sites invested. Again, the 95% Confidence Interval shows that there is substantial variation, and although this result is not statistically significant, 82% of our draws show a positive ROI.

6.3. Assisted Outpatient Treatment Program Sustainability

To understand the sustainability of the type of AOT programs developed under the SAMHSA grant, we conducted interviews with each of the in-depth sites to determine whether and which components of their AOT programs they intended to sustain. For those that were intending to sustain their programs, we asked where funding for ongoing implementation would come from.

Almost all sites, with the exclusion of one, indicated that they had a solid plan for continuing to sustain AOT. The one exception site noted that they did not foresee that they would be able to sustain AOT because the state and local budget impacts of COVID-19 were particularly hard in their state and community. Their "sustainability" goals were therefore focused on transitioning existing clients on AOT orders to other treatment modalities and enacting a phase-out plan for their AOT program. For sites that were continuing, respondents overwhelmingly reported that they were looking to state or local municipalities to provide grant

funds to continue supporting AOT personnel. Swartz and Swanson (2013)[2] have provided a case study showing that, in some states, AOT can be implemented without new funding.

More than one site indicated that they had a plan for sustaining their AOT program, but the program would change in fundamental ways. For example, some sites noted that they were having difficulties funding certain key personnel on the treatment team, such as a dedicated psychologist. Sites whose state and local government agencies had more favorable views of AOT were more likely to fund a model that closely resembled the model implemented under the SAMHSA AOT grant. In contrast, in some sites, the state department of mental health had a negative perspective on the court's involvement with treatment for adults with SMI, and this was linked to a need to make changes in the civil court processes associated with their ongoing AOT program.

In interviews with court representatives for the cost analyses, we heard that a key challenge for ongoing funding of AOT was the lack of funds to support the necessary coordination between court personnel and the treatment team. As COVID-19 is expected to impact county and state budgets, these challenges will likely continue. However, most sites indicated that their court officials were expected to continue to be involved with the AOT program and would continue to hear AOT cases, making it even more important to ascertain the role that court personnel play in an AOT program, as different levels of involvement carry different costs.

7. SUMMARY AND CONCLUSIONS

Informed by limitations of prior research and relevant findings from the implementation evaluation, the outcome evaluation addresses questions pertaining to AOT program outcomes, client and family perceptions, and resources and costs. A collection of OMB-approved, prospective data instruments provided in ***Appendices B-F*** was used to gather site-level and client-level data from six AOT case study sites, supplemented by available secondary data obtained by sites, including Medicaid and non-Medicaid service encounters, arrest records, and hospitalization records. Primary and secondary data were collected from an intra/inter-county comparison group at one case study site.

7.1. Limitations

Although the analytic design developed for this evaluation is bolstered by the multiple participating case study sites and mix of data types gathered, the data used to answer evaluation questions remain subject to methodological limitations around missing/incomplete items, client attrition, and sampling.

First, because data collection capacity and engagement differed across sites, site reporting on primary data instruments varied and, in some cases, provided an incomplete picture of client-level outcomes. Our analytic approach incorporated secondary data when possible to fill in gaps left by primary data, including client outcomes (e.g., hospitalizations, arrests) experienced by those who did not complete follow-up interviews following attrition from the AOT order. Additionally, within-group analyses pooled data across sites to assess the effectiveness of AOT and evaluate impact of both site-level and client-level factors on outcomes.

Second, we were only able to derive data from a single comparison group, rather than multiple comparison groups. As a result, between-group analyses had less than adequate power to detect small differences in outcomes across the AOT and non-AOT sites.

Third, although pooled within-group and regression analyses were sufficiently powered for most constructs, sample sizes precluded examination around additional mediators and moderators of potential relevance, such as the client's willingness to engage in the court order. These smaller samples were in part due to fewer total AOT clients than originally expected across sites and instances of missing/incomplete primary data due to program site evaluation capacity and, at one program site in particular, the effects of COVID-19 on data gathering efforts for both primary and secondary data. As a result, we used Bayes factors for both within-group and between-group analyses to provide additional understanding around the relative strength of the evidence.

Finally, although site-level and client-level indicators were used to account for select differences in how AOT was implemented and characteristics of the population being served on key outcomes, other important questions undoubtedly remain about how and for whom AOT works, including the role and impact of other programmatic elements (e.g., additional considerations of judicial engagement) and characteristics of the target population and surrounding populations (e.g., potential for racial disparities in enrollment).[36]

7.2. Description of AOT Programs

The AOT programs included in the outcome evaluation were funded by SAMHSA's *AOT Grant Program for Individuals with Serious Mental Illness*, a 4-year pilot program that funded 18 AOT programs through grants established in the 2014 PAMA. The subset of six case study sites included in this cross-site outcome evaluation were selected by the HHS AOT program advisory committee per several criteria, including, but not limited to, geographic diversity, AOT program type and size, and data availability.

Statutory and programmatic site characteristics of AOT, as well as characteristics of the service area and treatment services infrastructure, differ across the case study sites. No two sites adhere to the same eligibility criteria and accompanying ineligible classes shaping AOT's target population. Notably, this uneven implementation of AOT is affirmed in extant literature, including a national survey on AOT programs in 45 states.[37] Program deviations from the state statute are also not uncommon, including enrolling--or even requiring--voluntary agreements at multiple sites or--in the case of one site--assigning treatment guardians to each AOT client. Target populations are further dictated by program decisions to use a step-up, step-down, or mixed approach to AOT, thus determining whether individuals referred to AOT originate from the community or an inpatient hospitalization or jail stay. Among the case study sites, no site established a strictly step-up or step-down model, although the case mix varies across sites. Overall, five of six sites report a predominantly step-down case mix.

Case study sites vary in the degree to which the court engages with the client and treatment team over the course of the order, including in use of status hearings, response to non-compliance, and renewal or closeout processes. Specifically, periodic status hearings are in place at three of six program sites, which otherwise engage in a range of strategies to improve engagement in cases of non-compliance prior to involving the court. Additionally, the deliberation around renewal or closeout is subject to change. Namely, there is no one justification for renewing or closing out the order; indeed, client success on the order is used as justification for either, depending on the site and clinical capacity.

Beyond use of status hearings, AOT program sites report varied levels of judicial involvement during the initial hearing and over the course of the order. Higher levels of judicial engagement (e.g., extent to which a court official engages in what TAC has labeled *highly effective behaviors* with the AOT client and treatment team) is more common among sites that conduct status hearings.

Case study sites are from the south and west regions of the United States, with catchment areas covering a mix of rural and urban locations. The proportion of female residents remains stable across program sites. Whereas three programs draw from a largely White population, the remaining service areas have greater representation of racial and ethnic minorities. Most target areas with high levels of poverty.

The implementation evaluation report provides a more detailed description of the process behind identifying the site-level and client-level differences in AOT at case study sites. In general, the implementation evaluation found that early development and implementation of AOT program sites was largely based on empirical and theoretically-supported efforts, and that challenges were relatively minor and to be expected. We find the same to be true with the case study sites during most of the outcome evaluation, which spanned the final 3 years of SAMHSA's 4-year pilot program.

The emergence of COVID-19 in the final year of the evaluation marked a clearly unexpected development that prompted changes to the court and treatment processes. Changes to court processes and procedures included a transition to video-conference or phone by all but one site location. Group treatment activities were discontinued at all sites; most sites continued with individual treatment via telehealth options, which led to more frequent, albeit shorter, contacts with clients. Overall client needs pertaining to medication access, employment, and transportation were perceived by AOT staff to be largely unaffected by the pandemic. Housing was a noted issue at three of six sites, as their areas experienced housing freezes, which prevented placement of new clients. No sites reported substantial changes to their overall approach to serving clients in light of client needs or reduced capacity.

7.3. Assisted Outpatient Treatment Program Outcomes

Findings from pooled, within-group analyses show that AOT is associated with improvements in treatment adherence, clinical functioning, and social functioning outcomes from baseline to 6-month and 12-month follow-ups. During and after AOT, clients evince increased appointment and medication adherence. We also found significant improvements in client symptomology, perceived mental health, and life satisfaction. AOT clients report an increase in therapeutic alliance and reductions in violent behaviors and suicidal thinking while on AOT and after the order. There is evidence of a substantial reduction in number of inpatient psychiatric hospitalizations and days in the hospital during and after AOT. We additionally found evidence of improved social functioning associated with AOT, including reductions in arrests, drug use, and homelessness that, apart from homelessness, persist post-AOT. Bayesian analyses were used to supplement the classical analyses and measure the strength of the evidence. These analyses showed that there was decisive evidence of improvements in nearly all of the client-level outcomes we assessed.

Results from comparisons to non-AOT participants offer additional perspective regarding the strength of the evidence regarding AOT's effectiveness; however, it is important to note that these comparisons were generally underpowered. Among sufficiently powered analyses, improvements in perceived mental health status are greater among AOT clients, as is the reduction in psychiatric inpatient encounters. Therapeutic alliance improvements are mixed, with only the WAI showing a greater change among AOT clients relative to non-AOT clients. Other outcomes were underpowered in between-group analyses. Despite this, the point estimates suggested little clinical significance in the relative changes for many of these outcomes. Accordingly, these findings suggest that treatment provided under AOT delivers comparable outcomes to alternate treatment options, such as ACT or similar intensive case management.

Moreover, as AOT does not purport to deliver "better" outcomes, but rather to increase engagement in the treatment needed to obtain such outcomes, the question remains as to whether these AOT clients would have seen the same improvements *without* the court order. Notably, compared with AOT clients at baseline, the clients in the comparison group were less likely to be appointment or medication adherent, had a similar probability of having at least one psychiatric inpatient episode, and had fewer average nights spent in a psychiatric inpatient setting. Although propensity scores were used to adjust for between-group differences, our findings do not provide the same clarity around AOT versus non-AOT outcomes as would be provided in a true experimental study, like an RCT.

Indeed, prior RCTs on AOT have documented struggles with establishing equivalent comparison groups and random assignment of treatment type and duration. Given these challenges, and noted differences in how AOT is implemented in practice, researchers have spoken of the need for multisite observational studies using an array of data to incorporate potentially important variations of AOT into statistical models.

To accomplish this, we conducted a series of regression analyses, to assess the degree to which changes in clinical and social functioning may be attributed to judicial status hearings and treatment adherence, length of time on the order, successful order completion, step-down status, and criminal justice involvement at baseline. Findings from the first set of regression models suggest that nearly half of clinical functioning outcomes, and more than half of social functioning outcomes, are attributable to differences in judicial status hearings or treatment adherence, with the former playing a relatively larger mediating role in clinical functioning outcomes.

Findings about length of time on the order underscore those established in prior studies. Specifically, spending at least 6 months on an AOT order is associated with a reduced likelihood of violent behavior, fewer suicidal thoughts, fewer psychiatric inpatient nights, and a reduced likelihood of homelessness. Those who successfully complete AOT orders show better improvement in symptomology and reduced homelessness, albeit a smaller

decrease in illicit drug use. There are no noted differences in outcomes between those who are referred from the community (step-up) and from inpatient hospitalization or jail stay (step-down). In contrast, criminal justice involvement at time of initiation of the AOT order is associated with subsequently greater reductions in violent behavior and arrests, suggesting that this population is within the scope of AOT's effectiveness.

7.4. Client and Family Perceptions

Prior research assessing client perceptions associated with AOT has been mixed, with equivocal findings around general attitudes toward AOT, including coercion and stigma. Findings from within-group analyses of a range of client-level measures show that some key perceptions of AOT remain stable over time: most clients report neutral attitudes about perceived coercion, and nearly all indicate agreement with perceived effectiveness of AOT (e.g., improved treatment and medication adherence, reduced hospitalization) both at initiation and during the order. Perceptions of procedural justice remain strong over time.

Other perceptions of AOT are subject to change over time. Most individuals do not perceive that there is a stigma around AOT, and the proportion of those who do lessens over the course of the order. Perceived pressures to adhere to treatment grow during the order, although levels ultimately remain low. The perceived benefits and fairness of these pressures also increase over time, suggesting that attempts to engage AOT clients in needed treatment are interpreted positively by clients. Indeed, therapeutic alliance tasks are associated with an increase in benefits of these pressures, signifying that this aspect of the clinical relationship is important for positive client perceptions of AOT. Finally, treatment satisfaction improves during the AOT order.

Family perceptions of AOT--including satisfaction with the civil process and treatment services provided under the order--are largely positive and are unaffected by specific role (e.g., individual filing the petition) or level of involvement in the petition process (e.g., attending initial court hearing). Like AOT clients, most family members believe that AOT is effective at improving treatment and medication adherence and keeping clients out of the hospital. Similarly, family members report observing improvements in client behaviors while on AOT, including the ability to handle daily conflicts, family relationships, school or work performance, and a reduction of clinical symptoms and encounters with law enforcement.

Notably, the family members surveyed across sites represent a small percentage of clients. These findings, although indicating almost uniformly positive perceptions of AOT, are not generalizable to those who are uninvolved in AOT clients' treatment. Even among those who are involved, however, only a handful report engagement in support groups like the NAMI.

7.5. Assisted Outpatient Treatment Resources and Costs

The cost to establish a new AOT program varies widely, often as a function of the amount of staff time used in planning and early adoption periods spanning the first 6 months. Although some of the early adoption costs may include costs incurred in starting up a new treatment modality, qualitative interviews suggest that most estimated costs were attributable to time that staff spent planning meetings to establish procedures and identify roles and responsibilities. Mid-adoption costs similarly reflect differences of staff time spent preparing for and participating in AOT hearings, although treatment costs comprise the bulk of reported costs because of a diverse treatment team and small client-to-staff ratios.

Cost savings associated with AOT are borne out of a reduction in psychiatric emergency department and psychiatric inpatient visits. Findings indicate that AOT is associated with savings of approximately $129 in psychiatric emergency department costs and a $14,000 in psychiatric inpatient costs, per client. These savings were based on within-group assessments showing the reduction in psychiatric emergency department and inpatient nights among AOT clients. After considering the 6-month savings with 12 months of mid-adoption

costs associated with operating an AOT program, we estimated a net cost savings of nearly $1,000 per client in 6 months, or an approximate 8% ROI.

Although this study focused on short-term costs and benefits, there could also be some uncaptured short-term disadvantages and long-term indirect benefits of AOT programs. For example, a 10-year longitudinal analysis of service utilization by SMI clients following the initiation of AOT in New York suggests a tradeoff between two system-level outcomes: (1) a short-term contraction of capacity to serve non-AOT-qualifying SMI clients who could have benefited from intensive services such as ACT and ICM, but who experienced delay in initiating these services or an accelerated termination of services due to "queue-jumping" by prioritized court-ordered clients; and (2) a long-term advantage in terms of increased service capacity that accrued (eventually) to the whole system of care, due to cost savings through better outcomes for AOT clients and the appropriations that accompanied AOT legislation.[38]

Despite the previously noted cost savings, multiple sites indicated that sustaining their AOT program after the end of the grant period would involve fundamental changes to implementation, including incorporation of a formal voluntary AOT option or changes to staff composition, as some funded positions would no longer be supported after the grant. In general, sites with state and local government agencies with more favorable views of AOT are better able to fund AOT as is, without the need for modifications that impact court involvement. Another key challenge for funding AOT is obtaining funds to support coordination between court personnel and the treatment team, particularly in light of COVID-19's adverse impact on county and state budgets.

7.6. Study Implications for Policy and Practice

This section summarizes key takeaways from the outcome evaluation, contextualized by prior research and current policy and practice.

AOT is associated with improvements in treatment adherence, clinical functioning, and social functioning. Previous observational studies[9-12,14-16,19-22] and RCTs[2,3,5,7,8,13,17,18] have generally shown that AOT can be effective at improving client engagement and functioning, although the strength of evidence for each outcome differs across studies. Our findings point to significant improvements across a range of client outcomes, including appointment and medication adherence, symptomology, perceived mental health, life satisfaction, and therapeutic alliance during and after AOT. AOT clients also demonstrate reductions in violent behaviors, suicidal thinking, arrests, drug use, homelessness, and number of inpatient hospitalizations and days in the hospital.

Length of AOT order--and successful completion of the order--moderate client outcomes. The Duke Mental Health Study found that individuals who remained on AOT for at least 6 months had better outcomes than those who were on AOT for shorter periods of time.[3] Our findings underscore the importance of length of order, as spending at least 6 months on an AOT order is associated with a further reduced likelihood of violent behavior, suicidal thoughts, number of psychiatric inpatient nights, and homelessness. Moreover, those who successfully complete AOT orders show greater improvements in symptomology, homelessness, and illicit drug use. These findings are important to consider with respect to state AOT statutes, as typical length of time under the initial order differs across location, from 45 days to 5 years. Programs in states with shorter order lengths (<6 months) may elect to renew clients at the end of the initial order, irrespective of functioning, to achieve these better outcomes.

AOT shows similar levels of effectiveness for step-up and step-down populations. AOT programs vary in their approach to established pathways to enrollment, including preventive and non-preventive step-up (i.e., from the community to an AOT order), step-down (i.e., from an inpatient setting to an AOT order), and mixed

approaches (i.e., a combination of both step-up and step-down approaches). All case study sites' state statutes include eligibility criteria that are preventive in nature, thus allowing for an AOT order in situations where decompensation has not yet occurred but is likely. Our study finds no noted differences in outcomes between those who are referred from the community and those who are referred from inpatient hospitalization or jail stay, suggesting that preventive criteria in state statutes can be as effective as non-preventive criteria in identifying individuals suitable for AOT.

Criminal justice-involved individuals are within the scope of AOT's effectiveness. Adults with SMI are substantially overrepresented in the criminal justice system, resulting in many criminal justice-involved individuals who encounter disruptions in evidence-based treatment as a result of jail stays and insufficient coordination between jails and community care providers upon release.[39,40] Although AOT is intended to intervene in cases of revolving-door syndrome, wherein adults with SMI have numerous arrests or inpatient hospitalizations, in practice, AOT programs differ in their inclusion or exclusion of criminal justice-involved recipients. Our findings show that those with criminal justice involvement at the time of AOT initiation exhibit similar treatment adherence and clinical functioning improvements as those without, and they additionally evince greater reductions in violent behavior and arrests.

Treatment mandated under AOT results in greater reductions in psychiatric inpatient hospitalizations than ACT or similar intensive case management. Psychiatric inpatient hospitalizations decreased in pre-post analyses for both AOT and non-AOT clients, but greater reductions were observed among AOT clients. This is a key consideration in determining individuals for whom AOT would benefit over voluntary community-based treatment. Our findings suggest that AOT is appropriate in instances of repeated psychiatric hospitalizations. ACT or other intensive case management without a court order may still be suitable in cases where the client has demonstrated difficulties with adhering to treatment but does not reach the point of requiring hospitalization. In addition, improvements in perceived mental health status were greater among AOT clients than non-AOT clients. Though other between-group outcomes were not sufficiently powered, the pre-post change in means for AOT clients was significant for these outcomes. Moreover, we observed similar changes in pre-post means across AOT and non-AOT clients for treatment engagement, client symptomology, life satisfaction, violent behavior, suicidal ideation, arrests, drug use, and homelessness, suggesting comparable effectiveness across AOT and non-AOT programs.

Judicial status hearings and treatment adherence may augment clinical and social functioning outcomes. A recurring debate about AOT research and practice centers on the mechanism by which AOT works--namely, whether it is the court order or the services provided under the order. Our analyses are not poised to suitably answer this ongoing question, but rather to assess the extent to which the changes observed in clinical and social functioning outcomes may be attributed to two specific, client-level factors: (1) having at least one judicial status hearing over the course of the order; and (2) changes in medication and appointment adherence. Findings suggest that a sizable proportion of changes observed in clinical and social functioning outcomes can be attributed to these factors, with judicial status hearings playing a greater role in changes to clinical functioning. Notably, the changes attributable to both factors were frequently greater than the sum of their individual impacts, suggesting some degree of interaction. All told, findings suggest that, although judicial status hearings are not required to achieve positive client outcomes, they may be an effective practice at sites with the ability to coordinate and fund the additional judicial contacts during the order.

Client and family perceptions of AOT do not pose pressing concerns about civil liberties. Prior research assessing client perceptions associated with AOT has been mixed, with equivocal findings as to whether individuals on AOT report greater perceptions of coercion or stigma compared to individuals receiving voluntary case management services. To our knowledge, no research has examined how client perceptions of AOT change over time. Our findings show that clients record neutral responses to measures of perceived coercion at baseline and follow-up. Most individuals do not perceive that there is a stigma around AOT, and

the proportion of those who do lessens during the order. Clients typically endorse statements that AOT is effective at improving treatment and medication adherence and reducing likelihood of inpatient hospitalization, and although perceived pressures to adhere to treatment grow over the course of the order, the perceived benefits and fairness of pressures also increase over time, as does treatment satisfaction. Family perceptions of AOT--including satisfaction with the civil process and treatment services provided under the order--are largely positive and are unaffected by specific role (e.g., individual filing the petition) or level of involvement in the petition process (e.g., attending initial court hearing). Like AOT clients, most family members believe that AOT is effective at improving treatment and medication adherence and keeping clients out of the hospital.

AOT cost savings reflect a shift in service utilization, largely driven by reductions in costly psychiatric emergency department and inpatient visits. Prior research has suggested that AOT may be cost-effective, although the costs--and savings--of establishing a new AOT program have not been well documented to date.[2,26,27] Our findings indicate that AOT is associated with savings of approximately $129 in psychiatric emergency department costs and a $14,000 in psychiatric inpatient costs, per client. Given treatment and court costs in implementation, this finding implies a net cost savings of nearly $1,000 per client and an 8% ROI. These estimates are conservative, as they do not incorporate cost savings of public safety outcomes like criminal justice involvement. However, it is important for prospective sites to consider that the initial investment to establish a new AOT program varies widely, often as a function of the amount of staff time used in planning and early adoption periods spanning the first 6 months. The level of investment is largely reflective of efforts needed to coordinate courts and treatment providers and is lessened in cases where the court is not involved over the course of the order.

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ACRONYMS

ACT	Assertive Community Treatment
ADAMHSBCC	Alcohol, Drug Addiction and Mental Health Services Board of Cuyahoga County
AHRF	Area Health Resources File
AOT	Assisted Outpatient Treatment
ASPE	HHS Office of the Assistant Secretary for Planning and Evaluation
BH	Behavioral Health
CBT	Cognitive Behavioral Therapy
CI	Confidence Interval
CJ	Criminal Justice
CMHS	Community Mental Health Services
COVID-19	Novel Coronavirus
CTO	Community Treatment Order
EBP	Evidence-Based Practice
ED	Emergency Department
EHR	Electronic Health Record
FT	Full-Time
HHS	U.S. Department of Health and Human Services
i-PARIHS	integrated-Promoting Action of Research Implementation in Health Services
ICD	International Classification of Diseases
ICM	Intensive Care Management
IP	Inpatient
LPN	Licensed Practical Nurse
M	Mean
MCSI	Modified Colorado Symptom Index
MH	Mental Health
NAMI	National Alliance on Mental Illness
NIMH	HHS National Institute of Mental Health
NNAMHS	Northern Nevada Adult Mental Health Services
NOMS	National Outcome Measures
NP	Nurse Practitioner
NSDUH	National Survey on Drug Use and Health
ODMHSAS	Oklahoma Department of Mental Health and Substance Abuse Services
OMB	Office of Management and Budget
PAMA	Protecting Access to Medicare Act
PRA	Policy Research Associates, Inc.
PT	Part-Time

QCA	Qualitative Comparative Analysis
RCT	Randomized Controlled Trial
RN	Registered Nurse
ROI	Return on Investment
RQ	Research Question
SAMHSA	HHS Substance Abuse and Mental Health Services Administration
SD	Standard Deviation
SMI	Serious Mental Illness
SOAR	SSI/SSDI Outreach, Access, and Recovery
SUD	Substance Use Disorder
TAC	Treatment Advocacy Center
TAG	Technical Advisory Group
TAY	Transition-Age Youth
UCR	Uniform Crime Reporting
VSA	Voluntary Service Agreement
WAI	Working Alliance Inventory

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