Psychosocial disability and functional impairments frequently accumulate throughout the course of serious and persistent mental illnesses, all too often culminating in homelessness, incarceration, and repeated hospitalization. Yet, in many healthcare settings—including the southeast region of Georgia where the Opening Doors to Recovery intervention was and is provided—very limited or no recovery- oriented case management services are available."
Michael T. Compton, Lead Researcher for ODR Project.

When NAMI-Georgia convened a Adult Mental Health Summit in Savannah made up of groups of professionals and lay mental health advocates and consumers in the early winter of 2009, a decision was made by them to design a Model System of Care the 34 counties in Region 5 in the southeast corner of Georgia that would reduce recidivism for adults with Serious Mental Illnesses who end up more than once in a year in the state hospital, jails, prisons and/or homeless. Four Battle Groups were organized to 1) study issues related to Information Systems, 2) study Services Delivery, 3) study Housing access and availability, and 4) develop a family/peer/self-case management and case coordination tool. Full report: http://www.namiga.org/Region5/Region_5_Summit_Report_09-04-2009.pdf

Phase 1 (2010-2013) for the project, funded by the Bristol-Myers Squibb Foundation, DBHDD, CSX, DOL, Gateway/Unison/Pineland CSBs was a validation study for Battle 4: Develop a family/peer/self-case management and case coordination tool. These case managers are called Community Navigation Specialist (CNS). The study provided initial effectiveness testing of a highly innovative approach to delivering tailored, recovery-oriented case management services to 100 volunteers who were people with serious and persistent mental illnesses with an established history of recidivism. The study was grounded in an extensive research base that documents health care disparities affecting access and quality of care, while embracing a recovery approach to mental health services. The target population was those with serious and persistent mental illness who have recidivated and who, as

outlined in other documents, have repeated patterns of homelessness, incarceration, and/or hospitalization ("The Deep End" described by NAMI-Georgia).

   The intervention approach was developed by NAMI-Georgia through extensive consultations, as outlined in Response to the Crisis Report. The intervention was an innovation in case management that has not been tried before and is in need of an evidence base. This study was the initial step in establishing such an evidence base. Findings from the study provided a clear sense of the adjustments that are needed for broader implementation in other "deep end" settings, like jails and prisons.

   The Project developed and implemented a DBHDD approved innovative curriculum to train the CNS (three people on a team-a professional, a two peers consisting of a family member with the lived experience and a peer with the lived experience).   The ODR certified CNS then trained and supported the 100 in the study to move toward Recovery. All stakeholders agreed that four areas of focus were needed for the participants to recover and become contributing members of their communities. The ODR pillars of recovery are: Adequate treatment, Safe Housing, Meaningful Day, and Technology all wrapped around a personal and community "Circle of Support."

   NAMI-Georgia begun the ODR Project in 2010, and hosted the Region 3 (Metro) and Region 1 Adult Mental Health Summits to move those regions toward a similar collaboration. It was hoped that concepts and lessons learned from Region 5 would catapult to other Regions so that they could begin synchronizing all systems to support those with serious and persistent mental illnesses who are recidivating in the deep end and put an end to unacceptable, wasteful, expensive, painful outcomes. This project is about collaboration— bringing stakeholders to the table to work together and support their citizens who have been failed miserably by an under funded, fragmented mental health system. ODR is about systems and communities coming together, measuring it up, and finding solutions.

Research results from ODR Phase 1

Opening Doors to Recovery in Southeast Georgia: Results from the Initial Demonstration Project Involving 100 Individuals with Serious Mental Illnesses and a History of Psychiatric Inpatient Recidivism

Michael T. Compton, M.D., M.P.H., Beth Broussard, M.P.H., C.H.E.S., Kelly Cito, Alicia Moore, Thomas Reed, Mary E. Kelley, Ph.D., Benjamin G. Druss, M.D., M.P.H.

This document is an overview of the research results from the initial study of Opening Doors to Recovery (ODR). The partnerships that went into designing and implementing ODR have been described previously in the peer-reviewed mental health services research journal, Psychiatric Services (attached). Here, we focus on summarizing our research findings rather than describing the ODR model. Our study included a number of objectives, summarized below:

Objective 1 was an evaluation of the 2–3 week Community Navigation Specialist (CNS) training curriculum, in terms of overall feedback as well as specific improvements in knowledge and self-efficacy for working in a community navigation role. Results from this straightforward pre-training/post-training evaluation were positive, and have been published in Community Mental Health Journal (attached).

Objective 2 was a qualitative program evaluation in which randomly selected ODR participants, CNSs, and key stakeholders were interviewed about the strengths and challenges of ODR. This interview-based evaluation is currently under review by the journal Psychiatric Quarterly.

Objective 3 was a study relying on State of Georgia administrative data, in which we tested the hypotheses that: (1) patients enrolled in ODR would have fewer hospitalizations and fewer days hospitalized during the one year while receiving ODR services than they had during the one year prior to ODR, and (2) patients enrolled in ODR would have fewer arrests during the one year while receiving ODR services than they had during the one year prior to ODR. Our methods and results are presented in this document.

Objective 4 was a study in which we examined a whole host of trajectories of recovery outcomes during the year of ODR. We hypothesized that patients receiving ODR services would have longitudinal improvements in recovery measures. We considered how outcome measures changed over time since baseline, and how such changes differed by the intensity of involvement with the CNSs. Our methods and results, presented in this document, pertain to 12 primary measures of recovery (six using data collected by the research team at baseline, 4-months, 8-months, and 12-months, and six using data collected by the CNSs at 4-months, 8-months, and 12-months), as well as four secondary measures of health status and symptom severity.

Objective 3 and 4 findings, described herein, are now being prepared for a manuscript to be submitted to the peer-reviewed mental health services research journal, Psychiatric Services. We are currently conducting two qualitative studies of two particularly innovative aspects of ODR, the "meaningful day" concept as a key recovery outcome and the Family CNS position. We are collecting and will analyze audio-recorded individual interviews with 30 participants.

Eligibility Criteria for Participation in the Main Study (Objective 3 and 4)

Our inclusion and exclusion criteria are given below.

Inclusion criteria:
1. 18–65 years of age
2. English-speaking
3. A clinical diagnosis of a psychotic disorder or a mood disorder
4. Being discharged from Georgia Regional Hospital at Savannah (GRHS) or one of three Crisis Stabilization Units (CSUs) after a stay of ≥2 nights
5. In addition to that hospitalization or CSU admission, having had a prior stay of ≥2 nights within the past 6 months, (thus, they have psychiatric inpatient "recidivism")
6. Able and willing to provide written informed consent for research participation
7. Being discharged to reside within the catchment area of one of the three CSBs

Exclusion criteria:
1. Known or suspected developmental or intellectual disability, or dementia
2. Presence of a serious medical condition that would interfere with research participation

Sociodemographic Characteristics of the Study Sample

Sociodemographic characteristics of the overall study sample (n=100) are given in Table 1. The average age was 37.3 years, and the average years of education was 10.8. Roughly half the sample was male, about half was Caucasian and half African American, and about half had less than a 12th-grade education. Furthermore, half were single/never married and 85% were unemployed before hospitalization. Other sociodemographic characteristics are given in Table 1.

Table 1. Sociodemographic Characteristics of the Study Sample (n=100)		
Characteristic	mean	SD
Age, years (range, 18–65)	37.3	13.0
Years of education completed (range, 4–18)	10.8	2.1
Characteristic	n	%
Gender		
Male	53	53.0%
Female	47	47.0%
Race		
White/Caucasian	52	52.0%
Black/African American	46	46.0%
Other	2	2.0%
Highest educational level		
Less than or equal to 11th grade	49	49.0%
GED	11	11.0%
High School Graduate	21	21.0%
Greater than 12 years	19	19.0%
Marital status		
Single, never married	50	50.0%
Separated/divorced or widowed	41	41.0%
Married or living with a partner	9	9.0%
Who patient lived with prior to hospitalization?		
Family members	42	42.0%
Alone	25	25.0%
With	10	10.0%
boyfriend/girlfriend/spouse/partner	10	10.0%
With friends	8	8.0%
Homeless	5	5.0%
Other		
Does the participant have children?		
Yes	54	54.0%
No	46	46.0%
Employed prior to hospitalization?		
No	85	85.0%
Yes	15	15.0%

Does the participant have a driver's license?		
Yes	51	51.0%
No	49	49.0%

Clinical Characteristics of the Study Sample

Clinical characteristics of the overall sample are given in Table 2. Most participants (70%) were enrolled from GRHS; the remaining 30% were drawn from the Brunswick, Saint Illa, and John's Place CSUs. The 100 participants, enrolled within about 1–3 days prior to discharge, were divided across the four CNS teams as follows: 29 in the Savannah-Gateway team, 27 in the Pineland team, 25 in the Brunswick-Gateway team, and 19 in the Satilla/Unison team. Diagnoses and the presence of a substance use disorder are shown below, based on the MINI International Neuropsychiatric Interview (MINI) conducted at 4-months (or 8- or 12-months if necessary) (n=75), or, if a researcher-conducted MINI was not available, based on the clinical diagnosis at baseline, which was hospital/CSU discharge (n=25). Regarding "intensity of ODR involvement" shown in the table and used in the main analyses, patients were classified by the research team as "heavily involved" versus "less involved" in ODR using the following criteria. "Heavily involved in ODR" meant that the patient both: (1) had ODR CNS involvement throughout the year, based on the research team's knowledge and all available information from the CNSs, and (2) had consistent contact with at least one of the three CNSs throughout the year based on the available CNS data collection packets (collected at 4-, 8-, and 12-months). If the patient met both of these criteria, he/she was classified as "heavily involved in ODR," and if the patient met only one or neither, he/she was classified as "less involved in ODR."

Table 2. Basic Clinical Characteristics of the Study Sample (n=100)		
Characteristic	mean	SD
Length of inpatient stay prior to enrollment (n=98)	19.6	33.1
Characteristic	n	%
Site of enrollment		
Georgia Regional Hospital at Savannah	70	70.0%
Brunswick CSU	12	12.0%
Saint Illa CSU	11	11.0%
John's Place CSU	7	7.0%
Legal status at enrollment (n=79)		
Voluntary	42	53.2%
Involuntary	37	46.8%
CNS team		
Savannah	29	29.0%
Pineland	27	27.0%
Brunswick	25	25.0%
Satilla	19	19.0%
Primary Diagnosis		
Psychotic disorder (e.g., schizophrenia)	46	46.0%
Major depression or bipolar disorder	54	54.0%

Substance Abuse Diagnosis			
Substance abuse or dependence diagnosis		38	38.0%
Absence of a substance use disorder		62	62.0%
Intensity of ODR Involvement			
Heavily involved in ODR		58	58.0%
Less involved in ODR		42	42.0%

Comparison of the 100 Participants with Those Referred but Who Declined or Were Ineligible

Of note, while enrolling these 100 participants, 22 other patients initially referred to ODR were screened and excluded from the study. Specifically, four met study inclusion criteria but declined to take part in the study, three met study criteria but did not enroll into the ODR program, and one met study criteria but was deemed to not have capacity to give informed consent for the study. The remaining 14 were screened out due to not meeting one or more study eligibility criteria (e.g., four did not meet the study's definition of psychiatric recidivism and two were excluded due to known or suspected intellectual disability). Although we obviously have very limited data on those who declined or were excluded, as shown in Table 3, the 22 referred patients who were not enrolled did not differ significantly from the 100 enrolled and assessed participants in terms of age, gender, race (Caucasian versus African American), referral source (GRHS versus one of the three CSUs), or clinical diagnosis at discharge from the inpatient unit (psychotic disorder versus mood disorder). These findings suggest that there were no obvious selection/enrollment biases at play, at least in terms of the five variables that we could examine.

Table 3. Comparisons between the 100 Enrolled Participants and 22 Who Declined or Were Excluded from Study Participation			
	Enrolled/ Assessed n=100	Declined/ Excluded n=22	Test Statistics
Age, years	37.3±13.0	41.9±11.4	t=1.42, df=115, p=0.16
Gender, male	53%	67%	χ^2=1.40, df=1, p=0.24
Race, Caucasian	52%	47%	χ^2=0.21, df=1, p=0.64
Referral source, GRHS	70%	59%	χ^2=0.82, df=1, p=0.37
Diagnosis, psychotic disorder	46%	37%	χ^2=0.33, df=1, p=0.57

Comparison of the 72 Involved in the Main Analyses with Those Who Were Excluded

To test Objective 3 hypotheses on hospitalizations and arrests, we first restricted the sample from n=100 to n=72 because we wanted to include only those who had an adequate level of exposure to ODR and who were actually "eligible" to be re-hospitalized or arrested in Georgia. Specific reasons for excluding 28 patients from these analyses were as follows: 13 dropped out of ODR within the first six months after enrolling in ODR, five relocated to another state (Florida, South Carolina, Tennessee, Indiana, and California) within the first four months of enrolling in ODR, five were incarcerated for most of the year after initially enrolling in ODR, two died during the year after enrolling in ODR, one was transferred to Assertive Community Treatment (ACT) within the first four months after enrolling in ODR, one sustained injuries from a motor vehicle accident within about four months after enrolling in ODR, and one never enrolled in ODR after the research team's baseline assessment and thus never received ODR services. These reasons for exclusion demonstrate the very high level of risk and instability of the population targeted for service provided by ODR and other intensive community-based mental health services. As we discuss at the end of this document, analyses for a truly experimental design would have included these individuals using an "intention-to-treat" analysis, but we excluded them due to concern that including them all could bias findings away from the null hypothesis in our quasi-experimental design (see below).

As shown in Table 4 below, comparing the 28 participants excluded from the main analyses with the 72 who were included revealed no significant differences in terms of age, gender, race, baseline symptom severity, or baseline global functioning. These findings suggest that there were no obvious selection biases at play when we restricted the sample.

Table 4. Comparisons between the 72 Participants Included in and 28 Excluded from the Main Analyses			
	Included in the Analysis n=72	Excluded from the Analysis n=28	Test Statistics
Age	38.7±12.9	33.5±12.6	t=1.80, df=97, p=0.08
Gender, male	57.1%	51.4%	χ^2=0.14, df=1, p=0.71
Race, Caucasian	51.4%	55.6%	χ^2=0.82, df=1, p=0.66
Positive symptom severity (n=96)	19.6±5.2	18.3±5.5	t=1.00, df=94, p=0.32
Negative symptom severity	19.0±5.2	20.1±5.2	t=0.87, df=92,

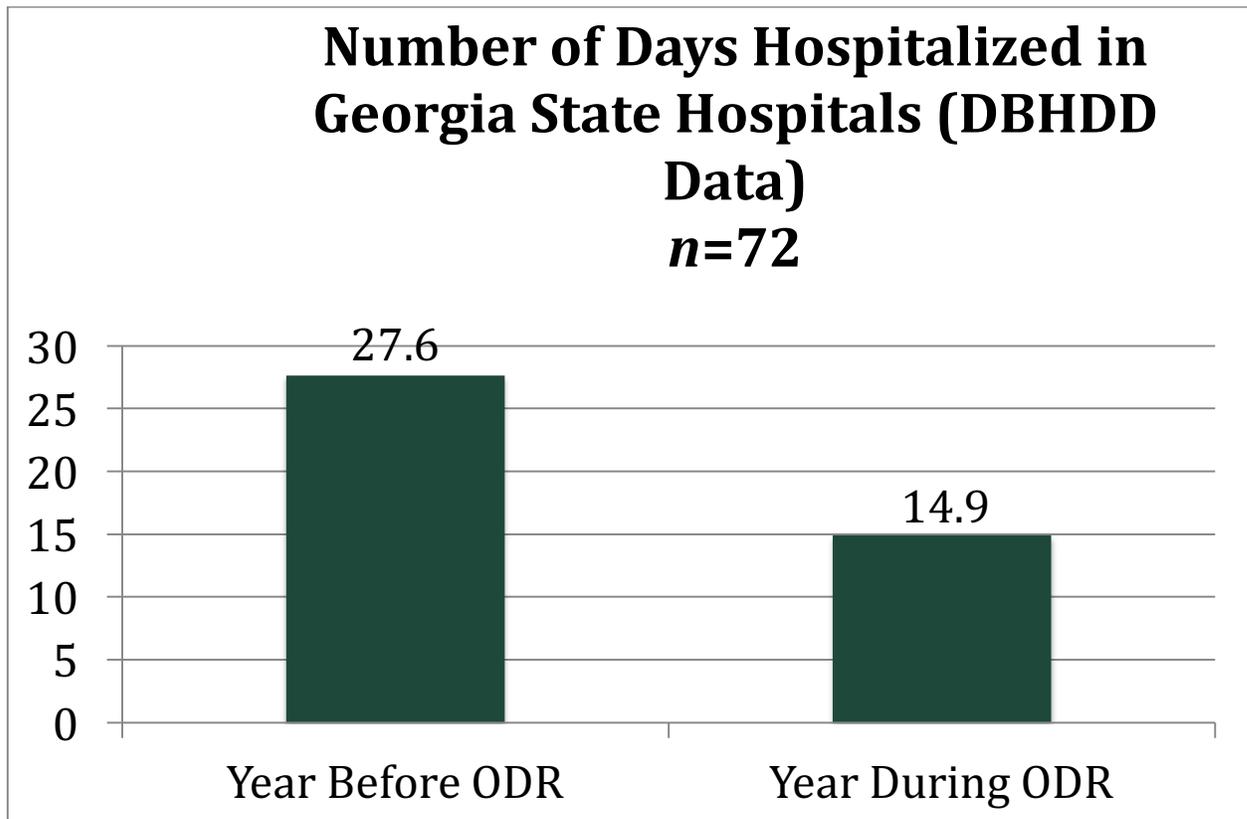|			
(n=94)			p=0.38
Manic symptom severity (n=92)	12.8±7.7	12.8±8.5	t=0.02, df=90, p=0.99
Depressive symptom severity (n=98)	22.1±7.0	20.1±6.0	t=1.32, df=96, p=0.19
Global functioning (n=88)	39.3±11.6	39.3±14.6	t=0.00, df=86, p=1.00

Hospitalizations and Hospital Days in the Year Before and the Year During ODR

Data on (1) the number of hospitalizations and (2) the number of days hospitalized were made available by the Georgia Department of Behavioral Health and Developmental Disabilities. These data pertain only to hospitalizations in Georgia's state psychiatric hospitals. Hospitalizations that may have occurred in other facilities, such as private psychiatric hospitals or general medical hospitals—or admissions to a CSU—are not included in this data. We hypothesized that patients receiving ODR would have fewer hospitalizations and fewer days hospitalized during the one year while receiving ODR services than they had during the one year prior to ODR. Differences between the two time periods (with research participants serving as their own historical controls) were examined by modeling counts with repeated-measures Poisson regression, which is a generalized linear mixed model (GLMM) with Poisson distribution and random intercept.

The first test assessed the number of hospitalizations in the year before ODR and the year of ODR. The number of hospitalizations in the year before ODR differed significantly from the number of hospitalizations in the year of ODR (p<0.0005), with means of 1.9±1.6 (range, 0–8) in the year before ODR and 0.6±0.9 (range, 0–4) in the year of ODR.

Number of Hospitalizations in Georgia State Hospitals (DBHDD Data)
n=72

	Year Before ODR	Year During ODR
	1.9	0.6
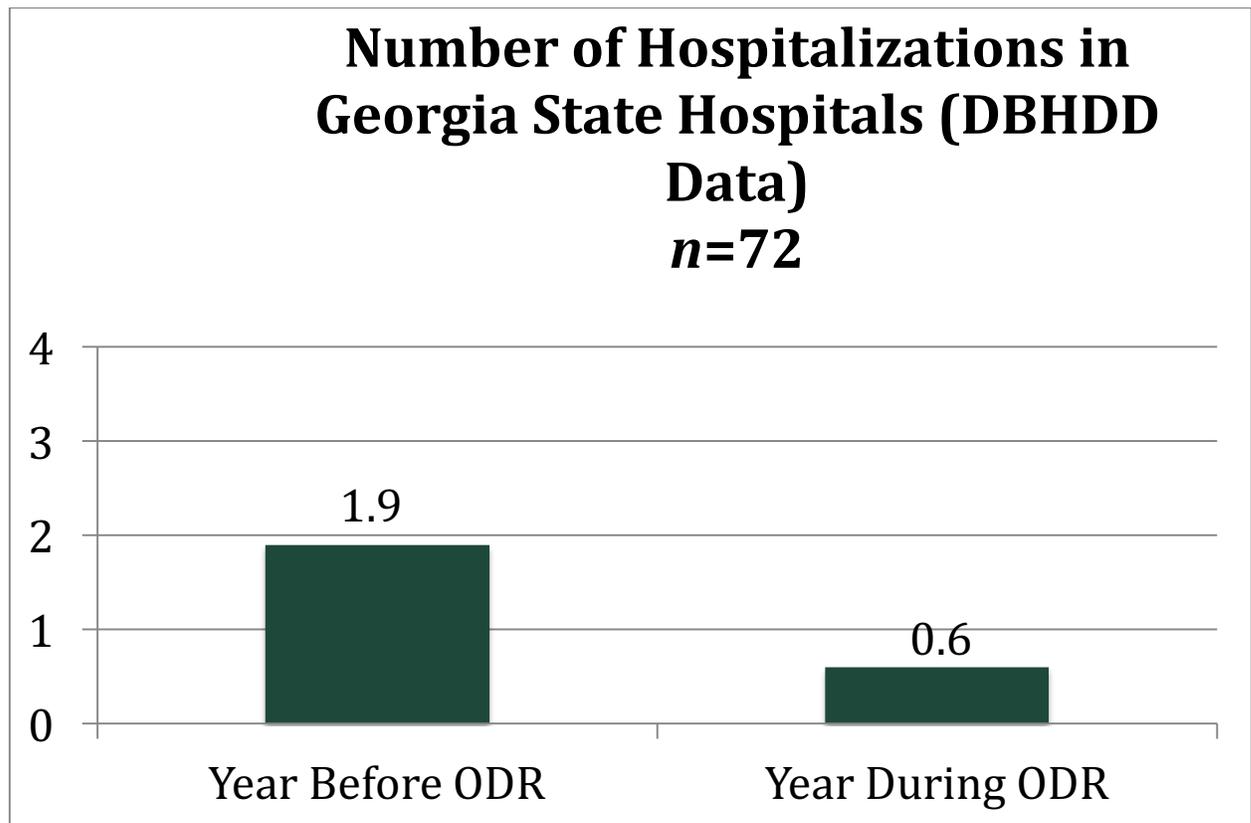
The second test examined the number of days hospitalized in the year before ODR and the year of ODR. The number of days hospitalized in the year before ODR differed significantly from the number of days hospitalized in the year of ODR (again, p<0.0005), with means of 27.6±36.4 (range, 0–202; median, 18) in the year before ODR and 14.9±41.3 (range, 0–228; median, 0) in the year of ODR.

Number of Days Hospitalized in Georgia State Hospitals (DBHDD Data)
***n*=72**

A bar chart showing two bars. "Year Before ODR" = 27.6, "Year During ODR" = 14.9. Y-axis ranges from 0 to 30 in increments of 5.

Of note, the number of hospitalizations was moderately correlated with the number of hospital days (r=0.61 for the year before ODR and r=0.55 for the year of ODR). Thus, these two findings are somewhat, though not completely, redundant results. Despite their being partly overlapping, they provide two different ways of understanding the data on hospitalizations.

Aside from being enrolled in ODR, several other factors might drive the number of hospitalizations and number of hospital days. Although our sample size is too small to formally test for "interaction effects," baseline symptom severity (total Positive and Negative Syndrome Scale (PANSS) score) was modestly related to the number of hospitalizations averaged across the two time-points (r=0.15, p=0.08) and the number of days hospitalized averaged across the two time-points (r=0.16, p=0.07). Age, gender, diagnosis (psychotic disorder versus mood disorder), and substance abuse (presence versus absence of a substance use disorder diagnosis) were unrelated to number of hospitalizations and number of days hospitalized. Importantly, the extent of the patient's involvement in ODR (classified as heavily involved or less involved) was marginally statistically significantly associated with

the number of hospitalizations in the year of ODR (0.5±0.8 and 0.9±1.2, respectively, p=0.096) and was statistically significantly associated with the number of days hospitalized in the year of ODR (9.0±23.4 and 35.5±74.1, respectively, p=0.02). This suggests a potential "dose-response" effect of the ODR intervention.

Arrests in the Year Before and the Year During ODR

Data on the number of arrests were made available by the Georgia Crime Information Center (GCIC). At 12-months after enrolling in ODR, GCIC provided a record of arrests and prosecutions (rap) sheet for each participant, which allowed us to tabulate arrests in the prior two years. These data pertain only to "fingerprintable" arrests that occurred in the State of Georgia. Furthermore, these arrest counts include arrests that may have been associated with charges that were ultimately dismissed, deferred, or acquitted. Arrests that may have occurred in other states could not be included in analyses. Although a prior history of arrest was not an inclusion criterion for study participation, the 100 participants had a mean of 6.1±9.3 lifetime arrests (range, 0–60; median, 2.0; mode, 0), and the 72 participants included in this analysis had a mean of 5.6±9.2 lifetime arrests (range, 0–60; median, 2.0; mode, 0).

We hypothesized that patients receiving ODR would have fewer arrests during the one year while receiving ODR than they had during the one year prior to ODR. Differences between the two time periods (with research participants serving as their own historical controls) were again examined by modeling counts with repeated measures Poisson regression.

The number of arrests in the year before ODR differed numerically, though not statistically significantly (p=0.71), from the number of arrests in the year of ODR, with means of 0.49±1.06 (range, 0–5) in the year before ODR and 0.44±0.98 (range, 0–4) in the year of ODR.

Number of Arrests for Fingerprintable Charges in Georgia (GCIC Data)
$n=72$

	Year Before ODR	Year During ODR
Value	0.49	0.44
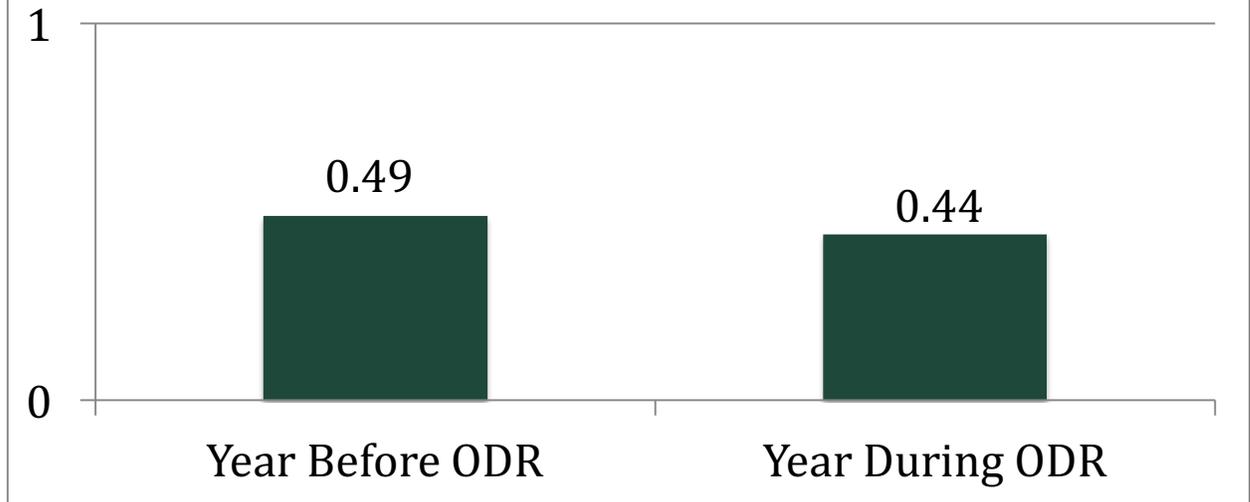
In terms of the nature of arrests, we classified arrests as misdemeanor charges (e.g., disorderly conduct, criminal trespass, driving without a valid license, failure to appear, theft by shoplifting) or felony charges (e.g., parole violation, criminal damage to property, aggravated assault, cruelty to children, terroristic threats). In the event that any given arrest was associated with multiple charges, if any felony charge was present, we classified the arrest as a felony arrest, and if all of the multiple charges were misdemeanors, we classified the arrest as a misdemeanor arrest. In the year before ODR, the mean number of misdemeanors and felonies were: 0.39±0.90 (range, 0–5) and 0.14±0.42 (range, 0–2), respectively. In the year of ODR, the mean number of misdemeanors and felonies were: 0.39±0.96 (range, 0–4) and 0.06±0.23 (range, 0–1), respectively. Thus, it appears that it was felony, rather than misdemeanor arrests that decreased numerically (though not statistically significantly).

Because some patients were periodically "ineligible" to be arrested because they were in the hospital rather than in the community, we double-checked our main result (misdemeanor and felony arrests combined) by computing the number of days "eligible" to be arrested (otherwise, there might appear to be equal/more arrests in the year of ODR simply because patients were out of the hospital more). The arrest rate (number of arrests per eligible, non-hospitalized days in the year) in the year before ODR differed numerically, though not significantly (p=0.62), from the arrest rate in the year of ODR, with means of 0.00139±0.00302 in the year before ODR and 0.00127±0.00280 in the year of ODR.

Aside from being enrolled in ODR, several other factors might drive the number of arrests. As above, although our sample size is too small to formally test for interaction effects, gender and substance abuse (presence versus absence of a substance use disorder diagnosis) appear to be related to the number of arrests averaged across the two time-points (0.24±0.71 for females, compared to 0.68±1.21 for males, p=0.009; and 0.35±0.91 for those without substance abuse, compared to 0.67±1.17 for those with substance abuse, p=0.09). On the other hand, baseline symptom severity (total PANSS score), age, and diagnosis (psychotic disorder versus mood disorder) were unrelated to number of arrests averaged across the two time-points. Furthermore, the extent of the patient's involvement in ODR (classified as heavily involved or less involved) was unrelated to the number of arrests in the year of ODR.

Trajectories of Recovery Outcomes during the Year of ODR

For Objective 4 analyses, data were collected from two different sources. First, two thoroughly trained Research Associates interviewed participants at baseline, 4-months, 8-months, and 12-months. These interviews took approximately 1.5 hours with the study participant at each time-point (the first done at hospital or CSU discharge, and all others done in the patient's home or in community settings). For some patients, we do not have data for all measures. For example, 68% were assessed at 4-months. Comparing the 32 who could not be interviewed at 4-months with the 68 who were interviewed (Table 5) revealed no significant differences in terms of age, gender, race, baseline symptom severity, or baseline global functioning. These findings suggest that there were no obvious retention biases at play, and we can assume that missing data are missing largely at random. The number of assessments across the four time-points was 100 at baseline, 68 at 4-months, 60 at 8-months, and 62 at 12-months. For our second data source, the participants' Professional CNS provided data on recovery and functioning at 4-months, 8-months, and 12-months (but not at baseline since the CNSs would have just met and begun working with participants at that point). For Objective 4 analyses, we used all available data from the n=72 included in Objective 3 analyses.

Table 5. Comparisons between the 68 Participants Interviewed at 4-Months and 32 Who Could Not be Followed-Up at 4-Months			
	Assessed at 4-Months n=68	Not Assessed at 4-Months n=32	Test Statistics
Age	36.7±12.8	38.8±13.5	t=0.75, df=97, p=0.45
Gender, male	52.9%	53.1%	χ^2=0.00, df=1, p=0.24
Race, Caucasian	52.9%	51.6%	χ^2=0.33, df=1, p=0.85
Positive symptom severity (n=96)	19.3±5.9	19.0±5.5	t=0.26, df=94, p=0.79
Negative symptom severity (n=94)	19.5±5.3	19.5±4.9	t=0.04, df=92, p=0.97
Manic symptom severity (n=92)	12.5±7.7	13.6±8.2	t=0.61, df=90, p=0.54
Depressive symptom severity (n=98)	21.7±7.1	21.0±6.2	t=0.53, df=96, p=0.60
Global functioning (n=88)	39.3±11.6	39.3±14.4	t=0.01, df=86, p=0.99

We first examined six recovery measures using self-report data collected by the research team:
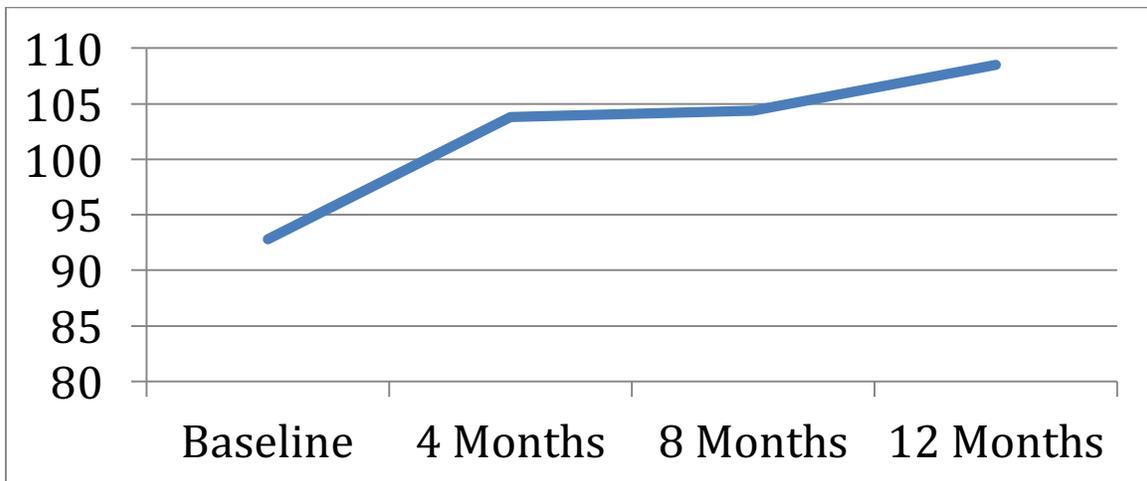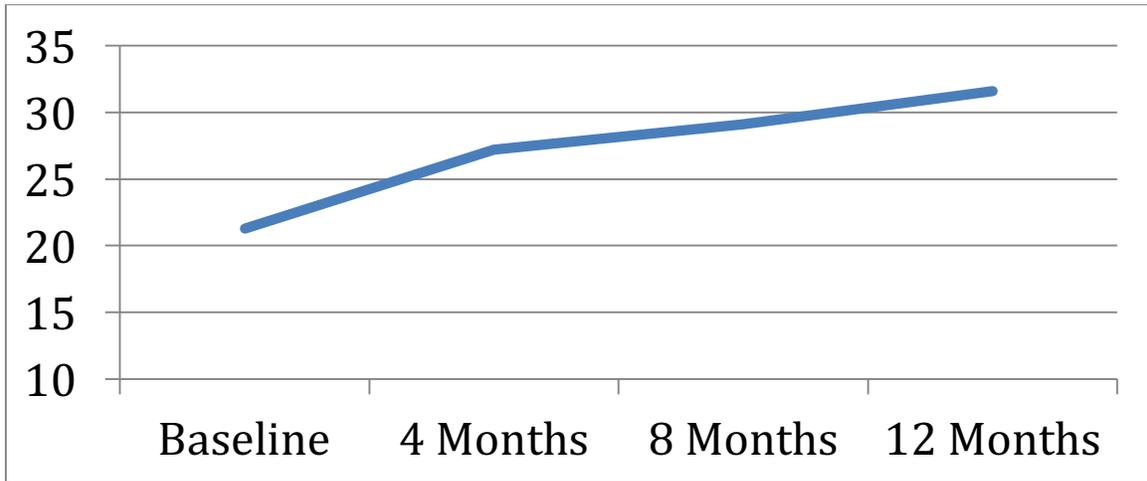
(1) Community functioning was measured with the 22-item Multnomah Community Adjustment Scale–Patient Version (MCAS-P). Internal consistency reliabilities at baseline, 4-months, 8-months, and 12-months, measured with Cronbach's α coefficient, were 0.78, 0.87, 0.85, and 0.87, indicating acceptable internal consistency. The possible range is 22 to 110, with higher scores indicating better community adjustment.

(2) Mental health recovery was measured with the 30-item Mental Health Recovery Measure (MHRM). Cronbach's α coefficients were 0.93, 0.94, 0.93, and 0.95. The possible range is 0 to 120, with higher scores indicating better mental health recovery.

(3) Quality of life was measured with the 32-item Quality of Life Inventory (QOLI). Cronbach's α coefficients (computed for the 16 satisfaction items, excluding the 16 importance items used to weight the satisfaction items) were 0.85, 0.85, 0.82, and 0.85. The possible range is -96 to +96, with higher scores indicating better quality of life.

(4) Meaningful days were rated using a single item that we developed in which participants use a thermometer-like visual scale (0–100) to rate "how meaningful an average day has been for you during the past month."

(5) Meaningful days rated in response to the question "How many days in the past month, 0–30, do you feel were meaningful days?"

(6) Community navigation competencies (CNC) were measured with a 21-item scale that we developed. Cronbach's α coefficients were 0.88, 0.87, 0.82, and 0.86. The possible range is 21 to 147, with higher scores indicating better community living skills.

Results are shown in Table 6. Statistically significant linear trends were evident for all six measures. For example, mean scores on the MCAS-P across the four time-points were: 74.6±11.6 at baseline, 78.9±13.6 at 4-months (which is significantly different from baseline, p=0.009), 78.8±12.8 at 8-months (which is significantly different from baseline, p=0.009), and 81.1±13.4 at 12-months (which is significantly different from baseline, p<0.0005); the linear trend was strongly statistically significant (p<0.0005).

Table 6. Trajectories of Recovery Outcomes across One Year after Enrolling in ODR								
	Mean Scores (Standard Deviations)				Statistical Test Significance			
Measure	Baseline	4 Months	8 Months	12 Months	B – 4	B – 8	B - 12	Linear Trend
MCAS-P	74.6 (11.6)	78.9 (13.6)	78.8 (12.8)	81.1 (13.4)	0.009	0.008	<0.0005	<0.0005
MHRM	79.8 (17.5)	83.5 (16.9)	83.1 (15.8)	85.5 (19.4)	0.078	0.231	0.009	0.026
QOLI	21.3 (31.5)	27.2 (27.7)	29.1 (27.1)	31.6 (27.6)	0.141	0.129	0.008	0.013
MD	54.7	63.9	69.4 (26.6)	70.8 (26.2)	0.021	0.001	<0.000	<0.000

Therm	(30.0)	(28.0)					5	5
MD – 30	17.0 (9.0)	18.9 (8.7)	19.5 (8.5)	20.6 (8.6)	0.228	0.110	0.021	0.021
CNC	92.8 (24.0)	103.8 (22.9)	104.4 (17.9)	108.5 (18.2)	<0.0005	<0.0005	<0.0005	<0.0005

These results are shown graphically below for just two of the measures, the QOLI (quality of life) and the CNC (community navigation competencies).

We next examined six recovery measures using data provided by the participants' CNSs. That is, the patient's professional CNS provided us with collateral data at 4-months, 8-months, and 12-months, at the same time as each of our researcher-administered assessments. The total number of CNS assessments provided across the three time-points was 63 at 4-months, 63 at 8-months, and 65 at 12-months. CNS-recorded data included the following six measures:

(1) Community functioning from the CNSs' perspective was measured with the 22-item Multnomah Community Adjustment Scale–Clinician Version (MCAS-C). Internal consistency reliabilities at 4-months, 8-months, and 12-months, measured with Cronbach's α coefficient, were 0.93, 0.93, and 0.91. The possible range is 22 to 110, with higher scores indicating better community adjustment.

(2) Functioning was also measured with the 20-item Daily Living Activities (DLA) scale. Cronbach's α coefficients were 0.96, 0.97, 0.93, and 0.96. The possible range is 20 to 140, with higher scores indicating better daily living skills.

(3) The ODR "adequate treatment" construct was rated with ODR's scale ranging 1 to 5.

(4) The ODR "meaningful days" construct was rated with ODR's scale ranging 1 to 5.

(5) The ODR "safe housing" construct was rated with ODR's scale ranging 1 to 5.

(6) The ODR "use of technology" construct was rated with ODR's scale ranging 1 to 5.

Results are shown in Table 7. Statistically significant linear trends were evident for all measures except use of technology. For example, scores on the MCAS-C across the three time-points were: 72.9 ± 14.9 at 4-months, 76.0 ± 15.8 at 8-months (which was not statistically significantly different from baseline, p=0.161), and 78.8 ± 12.5 at 12-months (which was significantly different from baseline, p=0.009; the latter p-value is equivalent to the linear trend test for three time-points.

Table 7. Trajectories of Recovery Outcomes across One Year after Enrolling in ODR					
	Mean Scores (Standard Deviations)			Statistical Test Significance	
Measure	4 Months	8 Months	12 Months	4 – 8	8 – 12
MCAS-C	72.9 (14.9)	76.0 (15.8)	78.8 (12.5)	0.161	0.009
DLA	89.8 (24.4)	96.5 (26.5)	99.7 (22.5)	0.082	0.009
Adequate treatment	2.7 (1.0)	3.1 (1.2)	3.4 (1.1)	0.262	0.004
Meaningful day	2.6 (1.2)	2.7 (1.2)	2.9 (1.1)	0.380	0.047
Safe housing	3.3 (1.1)	3.7 (1.2)	4.0 (1.0)	0.097	0.001
Use of technology	2.7 (1.0)	3.0 (1.3)	2.9 (1.4)	0.048	0.095

These results are shown graphically below for just two of the measures, the MCAS-C (community adjustment) and engagement in adequate treatment.
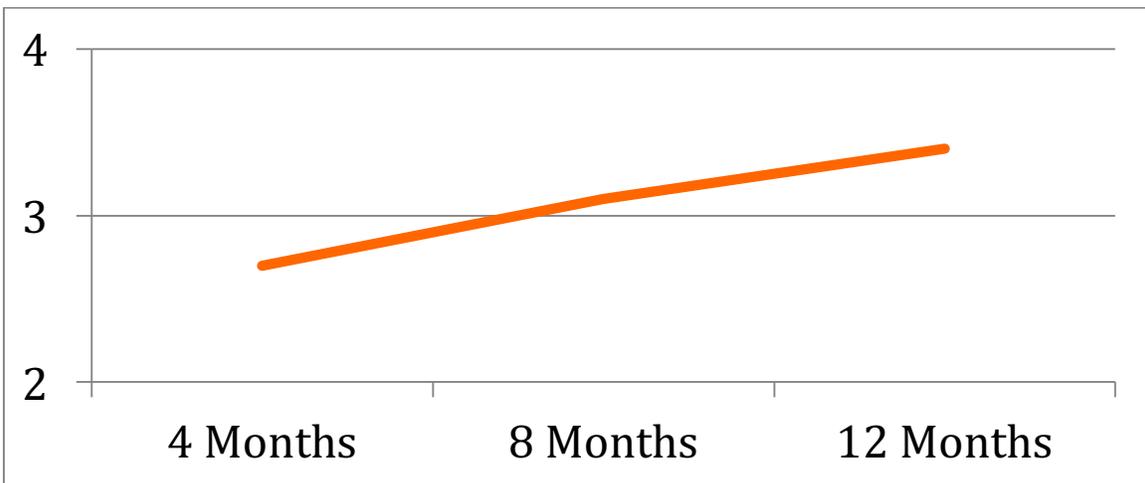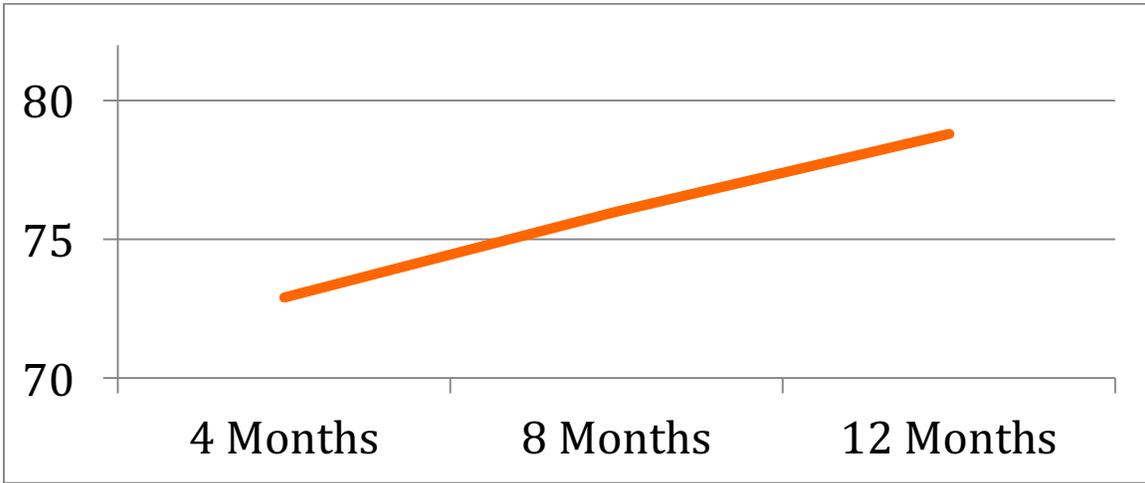
Of note, results pertaining to the six self-report and six CNS-rated recovery measures are somewhat, though not completely, redundant findings. For example, the MCAS-P is substantially correlated with the MHRM (r=.749) and the CNC (r=.813). On the other hand, the meaningful day thermometer score is not overly correlated with meaningful days in the past 30 days (r=.205); the correlation between the MCAS-P and the MCAS-C is only r=.131; and the inter-correlations between the ODR measures of adequate treatment, meaningful day, safe housing, and use of technology range from r=.368 to r=.617. Despite their being partly overlapping, they provide diverse perspectives for understanding the data on recovery outcomes. Inter-correlations among the 12 measures at 4-months are given in Table 8 below.

Table 8. Inter-Correlations among Six Patient-Rated and Six CNS-Rated Recovery Measures at the 4-Month Assessment											
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. MCAS-P											
2. MHRM	.749										
3. QOLI	.621	.699									
4. MD Therm	.579	.521	.508								
5. MD – 30	.153	.098	.116	.205							
6. CNC	.813	.740	.659	.533	.160						
7. MCAS-C	.131	-.05	.046	.100	-.05	.012					
8. DLA	.097	-.00	.068	.089	-.04	-.04	.918				
9. Adequate treatment	.156	-.13	-.09	.295	.231	.024	.582	.590			
10. Meaningful day	.323	.122	.130	.436	.173	.282	.662	.667	.617		
11. Safe housing	.124	-.10	-.08	-.04	.052	.085	.309	.355	.421	.447	
12. Use of technology	.258	.272	.149	.331	.043	.192	.580	.609	.385	.509	.368

Trajectories of Other Outcomes during the Year of ODR: Health Status and Symptom Severity

Although we did not have a priori hypotheses concerning these measures, the research team also collected data on a number of measures of health status and symptom severity, including the following:

1. Self-reported physical health status was measured with the Short Form (36) Health Survey (SF-36). The possible range is 0 to 100, with higher scores indicating better perceived physical health status.
2. Self-reported mental health status was also measured with the SF-36. The possible range is 0 to 100, with higher scores indicating better perceived mental health status.
3. Total positive, negative, and general psychopathology symptom severity was measured with the researcher-rated 30-item Positive and Negative Syndrome Scale (PANSS). The possible range is 30 to 210, with higher scores indicating greater symptom severity. To assess inter-rater reliability of the PANSS subscale scores (because this is a complex instrument requiring extensive clinical sophistication and ample research training), intraclass correlation coefficients (ICCs) were calculated using a two-way mixed (judges fixed) effects analysis of variance (ANOVA) model in which the two Research Associates were the fixed effect while 12–14 target ratings were the random effect (Shrout and Fleiss, 1979). ICCs in the first year of the study (two assessors and 12 patients) were: 0.98 for the positive subscale, 0.94 for the negative subscale, 0.87 for the general psychopathology subscale, and .95 for the total score. In the second year of the study, ICCs (two assessors and 14 patients) were: 0.97 for the positive subscale, 0.79 for the negative subscale, 0.75 for the general psychopathology subscale, and .87 for the total score. These findings demonstrate excellent inter-rater reliability.
4. Depressive symptom severity was measured with the 9-item self-report Patient Health Questionnaire (PHQ-9). Internal consistency reliabilities at baseline, 4-months, 8-months, and 12-months, measured with Cronbach's α coefficient, were 0.85, 0.81, 0.86, and 0.891. The possible range is 9 to 36, with higher scores indicating greater depressive symptom severity.

Results are shown in Table 9. Statistically significant linear trends were evident for all measures.

Table 9. Trajectories of Health Status and Symptom Severity Outcomes across One Year after Enrolling in ODR								
	Mean Scores (Standard Deviations)				Statistical Test Significance			
Measure	Baseline	4 Months	8 Months	12 Months	B–4	B–8	B–12	Linear Trend
SF-36 (PH)	42.7 (12.1)	44.7(13.4)	45.3 (14.8)	45.9 (12.9)	0.188	0.042	0.036	0.028

SF-36 (MH)	35.4 (9.7)	36.7 (8.8)	39.8 (8.7)	39.6 (9.0)	0.210	0.004	0.002	0.001
PANSS	81.1 (16.4)	75.7 (15.3)	74.0 (15.9)	70.6 (13.8)	0.004	<0.0005	<0.0005	<0.0005
PHQ-9	22.1 (7.0)	18.9 (6.5)	17.9 (6.8)	17.6 (6.7)	0.001	<0.0005	<0.0005	<0.0005

In order to show how changes in recovery measures are associated with symptomatic improvement over time, we computed Pearson correlation coefficients for change-scores in recovery measures (by subtracting the baseline value for the measure at each time-point) and similar change-scores in researcher-rated PANSS total scores. More importantly, we examined how changes in recovery measures are associated with the intensity of involvement with CNSs, by comparing change-scores in those less involved with CNSs and those heavily involved.

Table 10 shows these findings. Changes in most recovery measures (MCAS-P, MHRM, QOLI, and CNC) were significantly, though modestly ($r=.212$–.356), correlated with PANSS change-scores. Importantly, changes in all but one recovery measure (meaningful days in the past 30 days) were significantly related to the intensity of involvement with CNSs. For example, among 16 patients less involved with the CNSs, the mean change in quality of life was
-6.46±27.25, compared to a change of +12.31±33.39 among 56 patients heavily involved with the CNSs (p=.011). As another example, the mean change in the meaningful day thermometer was -0.17±34.81 among 16 patients less involved with the CNSs, compared to a change of +18.89±33.75 among 56 patients heavily involved with the CNSs (p=.012).

Table 10. Associations between Changes in Recovery Measures and: (1) Changes in Symptom Severity, and (2) Intensity of Involvement with CNSs						
	Correlation with PANSS Change-Scores		Association with Intensity of Involvement with CNSs			
	r	p	Mean Change in those Less Involved (n=16)	Mean Change in those Heavily Involved (n=56)	t	p
MCAS-P	-.297	<.001	1.27±7.81	6.29±14.79	2.39	.021
MHRM	-.356	<.001	-0.65±10.36	6.72±21.19	2.65	.010
QOLI	-.229	.006	-6.46±27.25	12.31±33.39	2.59	.011
MD Therm	-.053	.530	-0.17±34.81	18.89±33.75	2.54	.012
MD – 30	-.159	.059	0.56±12.76	2.87±12.97	0.81	.421
CNC	-.212	.010	3.20±24.18	14.69±24.27	2.17	.031

"Take-Home" Summaries of Our Key Findings

1. The Opening Doors to Recovery model can be successfully implemented in community mental health agencies and can successfully enroll and follow patients with serious mental illnesses, serious impairments in functioning, and an established history of psychiatric (and criminal justice) recidivism.
2. Conducting rigorous, university-based research on the ODR model and the clients it serves—using qualitative and quantitative data sources (the latter including administrative data from the State, researcher-collected data, self-report data, and CNS-reported data)—is entirely feasible and successful.
3. Among the 72 participants included in the main analyses, we observed a substantial and strongly statistically significant reduction in the number of hospitalizations when comparing the year before ODR (average of 1.9 hospitalizations in State hospitals) with the year of ODR (average of 0.6 hospitalizations). Perhaps more importantly from a cost-savings perspective, we observed a substantial, clinically meaningful, and strongly statistically significant reduction in the number of days hospitalized when comparing the year before ODR (average of 27.6 days) with the year of ODR (average of 14.9 days). Furthermore, the extent of the participant's involvement in ODR was statistically significantly associated with the number of days hospitalized in the year of ODR, with those heavily involved with the CNSs having an average of 9.0 days in the hospital, compared to 35.5 among those less involved.
4. Among these 72 participants, we observed a numerical (but not statistically significant) reduction in the number of arrests when comparing the year before ODR (average of 0.49 arrests) with the year of ODR (average of 0.44 arrests). A larger sample size would be required to show this to be a statistically significant difference.
5. A whole host of recovery measures statistically significantly and clinically meaningfully improve over time as participants take part in ODR. These recovery measures pertain to domains ranging from community functioning, to mental health recovery, to quality of life, to meaningful days. As might be expected, improvements in recovery measures are partly related to reductions in symptom severity; however, they are also clearly related to the extent of the participant's involvement in ODR.

Methodological Limitations

Several methodological limitations, tied to our quasi-experimental (pre-/post-) research design (in which participants served as their own historical controls rather than having an actual randomized control group) are noteworthy. First, we had planned to do an "intention-to-treat" analysis based on the initial treatment assignment rather than on the treatment actually received; that is, using all data available from all participants, regardless of how long they remained engaged in ODR services. However, we opted against an intention-to-treat analysis because not excluding some participants' data from the analysis could have actually biased the results away from the null hypothesis. That is, because some participants moved out of the state, died, or were chronically hospitalized or chronically incarcerated during the year after enrolling in ODR, they were thus "ineligible" for hospitalizations or arrests. Yet, we had data on hospitalizations and arrests since we used administrative State data; thus, if we had used all 100 participants in the analysis (in an intention-to-treat analysis), it might have appeared that there was a stronger, more positive effect for hospitalizations and arrests than there really was. An intention-to-treat analysis would clearly be appropriate in the context of a randomized, controlled trial. Second, without a control group, it is difficult to fully attribute positive findings to ODR itself, as some portion of the effects might have derived from other factors. One such factor is the phenomenon of "regression to the mean"—it is likely that participants would have improved over time simply due to the fact that they were having a particularly difficult year in the year they were enrolled (e.g., having had at least two hospitalizations). We attempted to partly address this issue by examining whether the "dose" or intensity of CNS involvement was a predictor of positive response, and it clearly was. Nonetheless, the problem of regression to the mean can only be adequately dealt with by a true experimental approach (a randomized, controlled trial).

Next Steps for Proving the ODR Model of Reducing Recidivism and Promoting Recovery

Despite the inherent limitations tied to the design of our initial demonstration project, our very promising, extensive initial results suggest a need for (1) a randomized, controlled trial of ODR, and (2) a demonstration of ODR in criminal justice settings (e.g., re-entry after a prison stay) in addition to psychiatric inpatient settings. These next studies would more clearly demonstrate that the above improvements are indeed causally tied to the intervention itself, and that the model can be generalized to other pertinent settings. Finally, those next studies will move us toward establishing ODR as a Georgia-born evidence-based mental health service.

From 2010-2014 Research ODR Published

Opening Doors to Recovery Research

Articles/Manuscripts to Date, 24 October 2013

Michael T. Compton, M.D., M.P.H.

1. Compton MT, Hankerson-Dyson D, Broussard B, Druss BG, Haynes N, Strode P, Grimes C, Li C, DiPolito JA, Thomas GV (2011) Opening Doors to Recovery: A novel community navigation service for people with serious mental illnesses. *Psychiatric Services*, 62:1270–1272.

2. Reed TA, Broussard B, Moore A, Cito KJ, Compton MT (2013) Community navigation to reduce institutional recidivism: Qualitative evaluation of a new recovery-oriented program. *Psychiatric Quarterly* (in press).

3. Compton MT, Reed T, Broussard B, Powell I, Thomas GV, Moore A, Cito K, Haynes N (2013) Development, implementation, and evaluation of a recovery-based curriculum for community navigation specialists working with individuals with serious mental illnesses. *Community Mental Health Journal* (in press).

4. Compton MT, Kelley ME, Druss BG, Moore A, Smith K, Broussard B, Reed T, Bonati F, Brown A, DiPolito JA, Li C, O'Neal M, Quesenberry J, Ringling C, Haynes N (2013) Community navigation for persons with serious mental illnesses and repeated hospitalizations: I. Initial effects on recidivism. Submitted to *Psychiatric Services*.

5. Compton MT, Kelley ME, Druss BG, Moore A, Smith K, Broussard B, Reed T, Bonati F, Brown A, DiPolito JA, Li C, Ringling C, Haynes N (2013) Community navigation for persons with serious mental illnesses and repeated hospitalizations: II. Initial effects on recovery. Submitted to *Psychiatric Services*.

6. Myers NL, Smith K, Moore A, Broussard B, Alolayan Y, Haynes N, Compton MT. Embracing and measuring the recovery concept of "a meaningful day" in community mental health services for individuals with serious mental illnesses. In progress for submission to *Social Science and Medicine*.

7. Myers NL, Alolayan Y, Smith K, Moore A, Broussard B, Haynes N, Compton MT. Family community navigator specialists as positive additions to community mental health teams: A qualitative study. In progress for submission to *Psychiatric Services.*

Phase 2 ODR (two parts)—A. Funded by NIMH, and B. Funded by GA DOC , Region 5 CSBs and DBHDD

A. Part I Phase 2 ODR Randomized Control Trial of ODR

Letter from Researcher Dr. Michael T. Compton:

Dear Colleagues,

I am THRILLED to announce that I have just received a new NIH R01 grant. This 5-year grant will support a very complex randomized, controlled trial of a new form of recovery-oriented "community navigation" services (called "Opening Doors to Recovery") for persons with serious mental illnesses and a history of repeated admissions to the state psychiatric hospital. Although the grant is housed here in New York (at the NSLIJ / Feinstein Institute for Medical Research), the project will be based in Savannah, Georgia (at Gateway Behavioral Health Services). I have attached a 2-page summary of the project so that you can see what it's about. This federal grant will allow us to conduct a randomized, controlled trial of the ODR model, which is needed in light of the very promising findings from our initial n=100 demonstration project funded by the Bristol-Myers Squibb Foundation in 2011-2013.

I want to especially thank several of my many partners: (1) Nora Haynes, who is the "mother" of ODR; (2) NAMI-Georgia and NAMI-Savannah for developing (with their multitude of diverse partners) this remarkable recovery-oriented service model that I have the privilege of studying; (3) Catharine Grimes and the Bristol-Myers Squibb Foundation, who supported us every step of the way during the past four years; (4) the CSBs in southeast Georgia, which successfully implemented the n=100 demonstration project; (5) the Savannah-Chatham Metropolitan Police Department and many other law enforcement agencies; (6) Marsha O'Neal and the GBI GCIC; (7) the Georgia DBHDD, at the state and regional level; (8) my Emory Co-Investigators (Drs. Kelley and Druss) and my Columbia/NYSPI Co-Investigator (Dr. Lisa Dixon);

(9) the CNSs from the initial demonstration project; (10) the 100 patients who allowed us to work with them and administer endless rating scales as part of the initial BMS Foundation-funded demonstration project; and (11) the NIMH, which has boldly funded this very, very real-world psychosocial intervention trial. The research will be based in Savannah (at Gateway, which will house the CNS team and most of the research team), and I will be going back and forth to Savannah periodically.

Given the current funding environment, I feel very fortunate to have received this grant, which I will carry out alongside an existing two-year R21 and an existing two-year R34.

Michael Compton

A. Research Design (2014-2019) NIMH Grant (Phase 2)

A Trial of "Opening Doors to Recovery" for Persons with Serious Mental Illnesses

National Institute of Mental Health, R01 MH101307

Principal Investigator: Michael T. Compton, MD, MPH

Co-Investigators: Ben Druss, MD, MPH; Mary Kelley, PhD; Frank Bonati, DrPH; Lisa Dixon, MD, MPH

Individuals with serious mental illnesses and a history of repeated inpatient hospitalizations often do not have the needed community-based support to successfully reintegrate into their communities and embrace recovery; rather, they often find themselves struggling with repeated hospitalizations, arrests/incarcerations, and even homelessness. Public mental health systems need new, innovative approaches to addressing these problems. The "Opening Doors to Recovery" model—which we propose to study in a randomized, controlled trial—was designed as a fresh new approach to help persons with serious mental illnesses stay out of hospitals and jails/prisons, have better housing outcomes, and embrace the tenets of recovery, including hope, empowerment, peer support, shared goal-setting, and developing a meaningful day.

Many persons with serious mental illnesses (SMI) and a history of psychiatric hospitalizations are struggling with a cycle of institutional recidivism (repeated hospitalizations, incarcerations, and homelessness) and a lack of

personal recovery. These problems are in part driven by fragmented, inaccessible community services; unengaged local stakeholders who could be partners in community support after hospitalization; frequent police contacts and poor communication between mental health and the police; and limited recovery support. For many, the promise of modern conceptualizations of recovery remains an unrealized promise. The Opening Doors to Recovery (ODR) model was developed to help such persons reduce institutional recidivism and engage in recovery. It does this by providing the participant with community support from a team of three Community Navigation Specialists (CNSs): a licensed social worker (the "Professional CNS"), a peer specialist with lived experience (the "Peer CNS"), and a family member of someone with SMI who has experience with the stress imposed on family members by the SMI and a complex, fragmented mental health system (the "Family CNS"). This team provides community navigation (mapping of all available community resources) and is embedded within the local community. They also provide ongoing recovery support by focusing on: (1) ensuring adequate treatment, (2) maintaining safe housing, (3) developing a meaningful day, and (4) using technology to support recovery. At least two other features of ODR distinguish it from other community-based services: a group of collaborative local partners is committed to supporting ODR and the work of the CNSs, and a novel linkage system with the police allows CNSs to respond immediately when one of their clients has an encounter with local law enforcement. All of these components of ODR work together to reduce institutional recidivism and promote recovery. Through a large-scale pilot/demonstration project involving 100 participants, we have demonstrated all aspects of feasibility, thoroughly established acceptability from diverse stakeholders, and shown promising effects in terms of reduced hospital stays and enhanced recovery. ODR is now ready for a more definitive randomized, controlled trial, and the research team is ideally suited and highly experienced to carry out such a trial. We will randomize 240 persons with SMI and a history of ≥2 inpatient stays in the past 6 months to ODR (n=120, followed for 12 months, with a maximum CNS caseload of 40) versus the existing Community Support Team (CST) model (n=120). Assessments will be conducted at baseline (at hospital discharge), and at 4, 8, 12, and 18 months. Our hypotheses center on ODR participants having fewer days of hospitalization, fewer arrests, better housing outcomes, and greater recovery, the latter measured with a diverse set of recovery measures (e.g., community adjustment, mental health recovery, community navigation competencies, meaningful day activities, hope, and empowerment). If our hypotheses are proven, we will have the needed evidence to move forward with dissemination activities for this new service model.

Part 2 Phase 2 Partnership with the Georgia Department of Corrections 2014. A demonstration project designed to study the effectiveness with recycling serious and persistently mentally ill in probations or on parole.

Insufficient community-based support after inpatient discharge for persons with serious mental illnesses (SMI) may lead to re-hospitalization, excessive criminal justice involvement, homelessness, and an inability to embrace recovery. In fact, many of these especially vulnerable persons find themselves in a cycle of repeated hospital stays, arrests, and even homelessness, with little support for recovery. Public mental health systems are struggling to address these problems. Evidence-based, comparatively inexpensive, time-limited community support models are needed to reduce institutional recidivism and facilitate recovery. The Georgia chapter of the National Alliance on Mental Illness (NAMI-GA) developed Opening Doors to Recovery (ODR), and we have collected extensive preliminary data on it. ODR is now poised for a randomized controlled trial (RCT).

The primary goals of ODR are to prevent institutional recidivism and to promote recovery. The ODR intervention is comprised of several components that work together to address barriers to successful integration into the community among individuals with SMI and repeated inpatient hospitalizations. A team of 3 specially trained "Community Navigation Specialists" (CNSs)—consisting of a licensed social worker, a family member of someone with SMI who has experienced the complexities of navigating services and understands how SMI affects the family, and a certified peer specialist—provide intensive, mobile, community support to persons with SMI with a defined history of inpatient recidivism. They provide recovery support through a constant focus on 4 areas grounded in recent definitions of recovery: ensuring adequate treatment, identifying safe housing, helping participants develop a meaningful day, and using technology to facilitate recovery. Their process of community navigation is a broader function than traditional case management as it includes mapping out and connecting clients to all available local resources by being embedded in the community. ODR is not just community-based, it is community-engaged, and the work of the CNSs benefits from commitments of diverse collaborative ODR partners (e.g., local treatment providers, local law enforcement, local employers, local housing programs) who meet bimonthly. Additionally, a novel electronic linkage between local police officers and CNSs was designed as part of ODR to reduce the risk of arrest when appropriate, in the event of an encounter between an ODR participant and the police.

We have carried out a demonstration/pilot study involving 100 participants, which allowed us to develop an intervention manual and demonstrate feasibility, acceptability, and promising outcomes including reduced recidivism and improvements in a number of recovery measures. Our findings now indicate a need for a RCT. The research team has extensive expertise in intervention research and a close working partnership with local mental health agencies in southeast Georgia.

We propose to implement a fully powered trial of ODR in an 8-county catchment area in southeast Georgia, which is an ideal real-world location to

carry out the study. During the 5-year study period, we will randomize 240 persons with SMI and a history of ≥2 inpatient stays in the past 6 months to ODR (n=120, followed for 12 months, with a maximum CNS caseload of 40) versus community care with a Community Support Team (CST, n=120). Assessments will be conducted at baseline (at hospital discharge), and at 4, 8, 12, and 18 months. Aim A and B hypotheses make use of highly accurate State administrative data.

Aim A. Test the impact of ODR on hospital recidivism. Hypothesis A1: ODR participants will have fewer total days in inpatient psychiatric settings during a 12-month period compared to participants in CST. Hypothesis A2: Effects on recidivism will persist at 18 months (6 months after being transitioned out of ODR).

Aim B. Test the impact of ODR on arrests. Hypothesis B1: ODR participants will have fewer arrests during a 12-month period compared to participants in CST. Hypothesis B2: Effects on arrests will persist at 18 months.

Aim C. Test the impact of ODR on homelessness/housing stability/housing satisfaction. Hypothesis C1: ODR participants will have: (1) a lower likelihood of homelessness, (2) lesser housing instability, and (3) greater housing satisfaction during a 12-month period compared to participants in CST. Hypothesis C2: Effects on homelessness/housing stability/housing satisfaction will persist at 18 months.

Aim D. Test the impact of ODR on recovery. Hypothesis D1: ODR participants will have greater recovery, based on 7 scales of community adjustment, mental health recovery, community navigation competencies, meaningful day activities, hope, and empowerment, during a 12-month period compared to participants in CST. Hypothesis D2: Effects on recovery will persist at 18 months.

    If this study is funded and hypotheses proven, it will provide a new evidence-based intervention that holds promise for substantial public health impact. Reducing rehospitalization, incarceration, and homelessness, while advancing recovery among persons with SMI and a history of inpatient psychiatric recidivism would benefit persons with these disabling conditions and the community mental health systems that serve them.

 The NIMH ODR Project has one team located at Gateway CSB. They are randomizing patients to ODR or Intensive Case Management/Case Management. If the project has positive results, ODR will become an Evidence Based Practice.

B. ODR Phase 2 Department of Corrections

Phase 2 (prison released participants): Georgia Department of Corrections (GDC) committed to place 3 ODR Teams in Region 5 (Gateway, Pineland and Middle Georgia CSB) to further study the ODR innovation with 100 spmi participants who have been recycling in and out of **incarceration**. The Family and Professional CNS will work for GDC and the Peer will work for the CSB, however they will function as a team. Phase 2 will began in early Fall, 2014, however in July of 2015 Probation moved into another agency—the Department of Community Supervision. The ODR Project was suspended and should re-start in Fall, 2015.

Opening Doors to Recovery *in Corrections/Re-Entry*

Research Design

Michael T. Compton, M.D., M.P.H.

Draft Date: 18 August 2014

OVERVIEW

Psychological and social disability frequently accumulate throughout the course of serious mental illnesses, all too often culminating in repeated hospitalizations, homelessness, and *multiple arrests and incarcerations in local jails and state prisons*. Yet, in many settings, including many areas of Georgia, very limited or no recovery-oriented community support services are available. There is a grave need for recovery-oriented community support services for persons with mental illnesses *who are being released from state prisons or who are enrolled in probation/parole programs*. Such persons are at high risk for costly and frustrating recidivism in both the mental health *and* criminal justice systems. They need intensive, community-based support to reduce their risk of hospitalization, homelessness, and re-incarceration. Applying Opening Doors to Recovery (ODR) to the corrections/re-entry setting is one potential solution that is deserving of a demonstration project with rigorous research/evaluation.

The Opening Doors to Recovery (ODR) model was developed by NAMI-Georgia through extensive cross-disciplinary and multi-agency partnerships (see our 2011 introductory article in *Psychiatric Services*). ODR is an innovation in community support that had not been tried before. We demonstrated its effectiveness for persons with serious mental illnesses coming out of the hospital who had had repeated hospitalizations. It might also work in the corrections/re-entry setting, but we need a research evidence base in order to know whether or not it works in this setting. The study described here is a crucial step in establishing such an evidence base. Findings from the study will provide a clear sense of the adjustments that are needed before broader implementation. Just as the original ODR research study (involving persons with serious mental illnesses coming out of the hospital) is positioned to make ODR a national exemplary program through ongoing research, an ODR research study involving persons with mental illnesses coming out of state prisons or enrolled in probation/parole

could also establish "ODR in Corrections/Re-entry" as a national model, designed here in southeast Georgia.

The proposed research project will provide rigorous, academic evaluation of a highly innovative approach to delivering tailored, recovery-oriented community navigation services to persons with mental illnesses who are being, or have recently been, released from state prisons in Georgia. Because the research project is an extension of a prior successful study with 100 individuals with serious mental illnesses with a history of repeated hospitalizations, we are highly experienced and ready to carry out all aspects of the study's complex protocols and procedures. The research, led by a highly qualified, nationally recognized psychiatric researcher with very strong ties in Georgia, will evaluate the effectiveness of the "ODR in Corrections/Re-entry" community navigation service. We expect that the study will result in at least two major empirical articles in peer-reviewed psychiatric or criminal justice research journals, which will serve to establish the validity of this innovative program for further implementation and research. This research, and the publications that result from it, will highlight Georgia's leadership in innovating in the crucial area of re-entry among persons with mental illnesses, as well as Georgia's dedication to reducing criminal justice recidivism in this population.

SPECIFIC AIMS AND HYPOTHESES

AIM 1: Examine Reductions in Re-Arrest and Re-Incarceration.

We hypothesize that 100 participants receiving the innovative ODR community navigation approach (approximately 33 followed by each of three teams of Navigators) will have: (1) fewer arrests and (2) fewer days in detention over the course of one year while receiving ODR services than they had during the one year prior to enrollment. Differences between the two time periods (with participants thus serving as their own historical controls) will be examined by modeling counts with repeated-measures Poisson regression, a generalized linear mixed model with Poisson distribution and random intercept.

AIM 2: Estimate Cost Savings of Reductions in Re-Incarceration.

We will estimate the costs of implementing the innovative ODR approach to community navigation and the potential cost savings to the criminal justice system based on reductions in re-incarceration in the 12 months post-release (using data from Aim 1). State data on incarceration costs will be used as multipliers when considering the number of days detained in order to estimate detention costs.

AIM 3: Assess Improvements in Diverse Domains of Mental Health Recovery.

We hypothesize that 100 individuals with mental illnesses who are released from state prisons and receive the innovative ODR approach to community navigation will show consistently improving recovery outcomes in the 12-month follow-up period. The recovery outcomes of interest, measured at baseline (prison release or initial participant enrollment) and at 4-, 8-, and 12-months will include: community functioning, recovery, community navigation competence, meaningful days, hope, and empowerment. Linear mixed models will be fit with time as a factor; thus, comparisons to baseline and linear trends will be assessed using customized hypothesis tests of the model coefficients.

We will also measure symptoms of psychosis, depression, and mania; overall functioning; alcohol and drug abuse; number of hospitalizations and number of days hospitalized in State facilities; and homelessness and housing status/satisfaction. Some of these will be used as covariates in the above analyses (e.g., symptom severity), and others will allow us to conduct secondary analyses (e.g., on days hospitalized and housing outcomes).

STUDY TIMELINE

The overall study (and its three Specific Aims) will be accomplished in a 3-year period. We propose a start-date of September 1, 2014. During the first 4 months, start-up activities including ethics committee (Institutional Review Board) approvals, database development, research assessment packet assembly, and training of the Community Navigation Specialists and the Research Assistant will be completed. We expect to recruit the 100 research participants during the subsequent 16 months. We will then follow all participants for a full 12 months. The final 4 months of the study period will be committed to data analyses, testing of all hypotheses outlined above, and writing research articles for publication in peer-reviewed journals. We hope that the results of this demonstration project / pilot study will set the stage for larger-scale research.

PARTICIPANT ELIGIBILITY, RECRUITMENT, AND BASELINE ASSESSMENTS

The determining of study eligibility and the recruiting/enrolling of research participants will be conducted by the Research Assistant, in conjunction with one of the CNSs. Eligibility criteria will include:

1. 18–65 years of age
2. English-speaking
3. A clinical diagnosis of one of the following mental illnesses; self-report or clinician-report initially, which will then be confirmed with the *Structured Clinical Interview for DSM-IV Axis I Diagnoses* (SCID) before enrolling the participant into the study:
    - Schizophrenia or another psychotic disorder
    - Bipolar disorder
    - Major depressive disorder
    - Posttraumatic stress disorder or another anxiety disorder
4. No known or suspected mental retardation, developmental or intellectual disability, or dementia
5. Currently being released from a Georgia prison, currently being released from an integrated treatment program within the Department of Corrections, or currently in an existing mental health caseload within the Department of Corrections
6. Currently residing in, or being released to reside in, the catchment area of one of three participating Community Service Boards (Gateway in the Savannah/Brunswick area, Pineland in the Statesboro area, and Middle Georgia in the Dublin area)
7. The absence of serious medical conditions that would interfere with research participation
8. Able and willing to provide written informed consent for research participation

Research assessments will not proceed until written informed consent is obtained, using NSLIJ- and Georgia DPH-approved consent forms and HIPAA consent documents. The Research Assistant will conduct the baseline assessment that will determine research diagnoses. The baseline assessment will also measure demographics, psychiatric symptoms, global functioning, housing status, and recovery from diverse perspectives. See below for details of the baseline assessment. This baseline assessment will require approximately four hours with the participant. Participants will be remunerated $80 for their time and effort for the in-depth baseline assessment.

LONGITUDINAL ASSESSMENTS

Longitudinal assessments will be conducted at 4-month intervals over the course of the year following the baseline assessment. To enhance the likelihood that participants will take part in the research assessment every 4 months, the Research Assistant will call the participant by phone every 5–6 weeks after study enrollment (twice during each 4-month inter-assessment interval). This phone call will entail a brief "check in" to: (1) say hello from the research team, and (2) encourage the participant to return for the study's longitudinal assessments. They will be reminded of the date and time of the next interview. For participants who do not have their own personal phone, we will aim to make telephone contact through family members. Communication between the Research Assistant and the Community Navigation Specialists will facilitate participants' engagement in the longitudinal assessments. Each of the three follow-up assessments will take approximately three hours. We will escalate the reimbursement rate to compensate participants for sticking with the study for 12 months. We will reimburse $80 for the baseline assessment, $90 at 4 months, $100 at 8 months, and $120 at 12 months. Other methods will be developed by the research team to maximize cohort retention. Yet, despite our best efforts, some attrition will undoubtedly occur. We project that among 100 participants initially enrolled, there will be a 35% study attrition (*n*~65) by the end of the year of longitudinal assessment.

Longitudinal research assessments will be conducted at a location convenient to the participant, such as: (1) in a quiet conference room at a Georgia Department of Corrections facility, (2) in a quiet room at a Community Service Board facility where the participant is receiving outpatient care, or (3) at the participant's home/residence. All assessments will be done by the Research Assistant with a Community Navigation Specialist present.

ADMINISTRATIVE DATA

Participants will give consent for administrative data collection as part of the informed consent process. After 12 months, lifetime arrest data (which, most importantly, include data on past-two-year number of arrests) will be provided by the Georgia Crime Information Center, a division of the Georgia Bureau of Investigation. These data pertain only to fingerprintable arrests that occurred in the State of Georgia. Furthermore, these arrest counts include arrests for charges that ultimately may have been dismissed, deferred, or acquitted. Arrests occurring in other states are not included. We will also work with the Georgia Department of Corrections to collect data on days detained. Also at 12 months, data on past-two-year number of hospitalizations and number of days hospitalized will be gathered from the Georgia Department of Behavioral Health and Developmental Disabilities. These data pertain only to hospitalizations in Georgia's state psychiatric hospitals or crisis stabilization units. Hospitalizations that may have occurred in other facilities, such as private psychiatric hospitals or general medical hospitals—or admissions to a crisis stabilization unit—are not included.

MEASURES AND RATING SCALES

Measure	Construct	Baseline	4-mo	8-mo	12-mo	Notes
Baseline Measures						
Screening Form	Eligibility	✓				Background variables
Demographics	Demographics	✓				
SCID	Research diagnoses	✓				
Level of CNS Contact and Treatment	Intensity of CNS Contact, Types of Mental Health Care		✓	✓	✓	Allows us to assess whether their "dose" of ODR has an effect
Aim 1 Measures (arrests, days detained)						
# arrest	Arrests in past 2 yr				✓	Administrative data from GBI/GCIC
# days detained	Days detained in past 2 yr				✓	Administrative data from Department of Corrections
Aim 3 Measures (recovery)						
MCAS	Community functioning	✓	✓	✓	✓	Recovery measures
MARS	Recovery	✓	✓	✓	✓	
CNC	Community navigation	✓	✓	✓	✓	
MD-Therm	Meaningful days	✓	✓	✓	✓	
EMAS	Meaningful activities	✓	✓	✓	✓	
HHS	Hope	✓	✓	✓	✓	
ES	Empowerment	✓	✓	✓	✓	
Additional Measures						
BSI	Psychiatric symptoms	✓	✓	✓	✓	Self-report of diverse symptoms
PANSS	Symptoms of schizophrenia	✓	✓	✓	✓	Requires extensive training of the RA
YMRS	Manic symptoms	✓	✓	✓	✓	Symptom measures
PHQ-9	Depressive symptoms	✓	✓	✓	✓	
GAF/SOFAS	Functioning	✓	✓	✓	✓	Overall functioning
MAST	Alcohol use	✓	✓	✓	✓	Alcohol/drug use measures
DAST	Drug use	✓	✓	✓	✓	
# days hospitalized	Days in State Hospitals in past 2 yr				✓	Administrative data from DBHDD
Homelessness	Homelessness	✓	✓	✓	✓	

Housing Stability Index	Housing stability	✓	✓	✓	✓	Housing measures
Housing Satisfaction Scale	Housing satisfaction	✓	✓	✓	✓	

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