



FINDINGS FROM THE

**RECOVERY CENTER  
OUTCOME STUDY**

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2014 REPORT

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# EXECUTIVE SUMMARY

## Reductions in Substance Use

90%

Reduction in illegal drug use from the 12 months before entering the recovery center to the 6 months before follow-up

83%

Reduction in alcohol use from the 12 months before entering the recovery center to the 6 months before follow-up

90%

Reduction in alcohol intoxication from the 12 months before entering the recovery center to the 6 months before follow-up

This report summarizes outcome study findings for the Recovery Kentucky Program. The goal of the Recovery Center Outcome Study (RCOS) is to examine client satisfaction, recovery support, and outcomes for several specific targeted factors including: (1) substance use; (2) mental and physical health; (3) education; (4) employment; (5) homelessness and living situation; and (6) criminal justice involvement. In addition, this report provides estimates of cost savings from Recovery Kentucky services.

In particular, this report describes outcomes for 283 men and women who participated in a Recovery Kentucky Program, and who completed an intake interview at entry to Phase 1 and a follow-up telephone interview about 12 months after the intake survey was submitted to UK CDAR.

**Results show that program clients are overwhelmingly satisfied with the Recovery Kentucky services they received**

Results show that program clients are overwhelmingly satisfied with the Recovery Kentucky services they received. In particular, clients reported they had improved mental health and felt better about themselves, had experienced many positive life changes, and had significantly reduced substance abuse and mental health symptoms as a direct result of their participation in the recovery center program. Further, clients reported a significant increase in perceived social standing from before the recovery center program to follow-up.

Specifically, at follow-up, there were significant reductions in drug use, alcohol use, alcohol use to intoxication, and binge drinking as well as self-reported substance abuse severity.



## Improvements in Mental Health

72%

Reduction in clients meeting criteria for depression from the 12 months before entering the recovery center to the 6 months before follow-up

61%

Reduction in clients meeting criteria for anxiety from the 12 months before entering the recovery center to the 6 months before follow-up

71%

Reduction in stress symptoms from the 12 months before entering the recovery center to the 6 months before follow-up

Mental health of clients who participated in the Recovery Kentucky Program was vastly improved at follow-up including depression, anxiety, and co-occurring depression and anxiety. Clients also reported decreased stress-related consequences at follow-up compared to intake, although women reported higher stress-related consequences at both intake and follow-up.

Overall education level improved significantly from intake to follow-up. Further, more clients reported employment at follow-up than intake. Men were more likely to be employed at intake but by follow-up, the number of women who reported being employed at least one month increased by 86% so there was no difference by gender at follow-up. Also, the percentage of clients who considered themselves currently homeless decreased significantly.

### More clients reported employment after Recovery Kentucky

Significantly fewer clients were involved in the criminal justice system at follow-up compared to the 12 months before entering the Recovery Kentucky Program. Specifically, fewer clients were arrested, incarcerated, and on criminal justice supervision during the 6-month period before follow-up compared to the 12-month period at intake.

A little less than half of the clients with follow-up interviews were referred by the Department of Corrections (DOC), slightly more than half were not DOC-referred, and only 3 clients did not have information provided about DOC-referral.<sup>1</sup> A multivariate analysis shows that DOC-referral status and length of service were associated with the odds of using alcohol or drugs at follow-up and the average number of months clients were employed.

At follow-up, there was a significant increase in the number of clients reporting they had

<sup>1</sup> DOC-referral status is not official, only self-reported status by the client.



## Improvements in Living Situation and Involvement with Criminal Justice

83%

Reduction in clients reporting homelessness from intake to follow-up

80%

Clients living in their own home or someone else's home at follow-up

91%

Reduction in clients reporting any arrest from the 12 months before entering the recovery center to follow-up

88%

Reduction in clients spending at least one night in jail from the 12 months before entering the recovery center to the 6 months before follow-up

gone to mutual help recovery group meetings in the past 30 days, and the average number of meetings attended increased from intake to follow-up. Also, more clients reported increased interactions with friends and family who were supportive of their recovery and having more people they could count on for support at follow-up compared to intake.

Examining the total costs of drug and alcohol abuse to society in relation to expenditures on recovery services, estimates suggest that for every dollar spent on Recovery Kentucky programs there was a \$3.59 return in avoided

**Estimates suggest that for every dollar spent on Recovery Kentucky programs, there was a \$3.59 return in avoided costs.**

costs or costs that would have been expected given the costs associated with drug and alcohol use before participation in Recovery Kentucky programs.

Overall, evaluation results indicate that Recovery Kentucky programs have been successful in facilitating positive changes in clients in a variety of areas including decreased substance use, mental health symptoms and stress-related consequences, and criminal justice system involvement as well as improved employment and living situations. Results also suggest clients appreciate their experiences in the recovery centers and have more support for their recovery after participation. Further, the Recovery Kentucky Program saves Kentucky taxpayers' money in avoided costs that ongoing substance abuse would have cost.

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## FINDINGS FROM THE RECOVERY CENTER OUTCOME STUDY 2014 REPORT

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# INTRODUCTION

Recovery Kentucky is a program which helps individuals with substance use and dependency by providing supportive housing, recovery services, peer support and skills training to simultaneously reduce both the state's substance use and homeless issues. It encourages personal responsibility with an emphasis on the Twelve Step Program and long term recovery. Established under the joint effort of the Department for Local Government, the Department of Corrections, and Kentucky Housing Corporation, the program currently has 14 centers across the state.

The goal of the Recovery Center Outcome Study (RCOS) is to provide an annual outcome evaluation for the Recovery Kentucky Program in partnership with the Behavioral Health Outcome Study team at the University of Kentucky Center on Drug and Alcohol Research (UK CDAR). The objectives for the RCOS are to: (1) provide highly credible data with ethical standards to support the Recovery Kentucky Program through collaborative evaluation practices; and (2) translate the research findings to practitioners, community members, politicians, and other key stakeholders. Results are presented in six main sections including:

**Section 1: Overview and Description of Recovery Kentucky Program Clients.** Section 1 describes the Recovery Kentucky program and how it benefits the state. Section 1 also describes the clients who entered the program in FY 2012 as well as clients who were included in the follow-up outcome sample.

**Section 2: Client Satisfaction with Recovery Kentucky Program.** This section describes three aspects of client satisfaction: (1) overall client satisfaction; (2) client ratings of program experiences; and (3) quality of life rating changes.

**Section 3: Substance Use.** Section 3 examines change in substance use (illegal drugs, alcohol and tobacco) at 12 months prior to program entry compared to the 6 month follow-up period for clients who were not incarcerated all 365 days before entering the recovery center. Past 30-day substance use is examined for two groups: (1) clients who were not in a controlled environment all 30 days before entering the recovery center (n = 135); and (2) those who were in a controlled environment all 30 days before entering the recovery center (n = 148). In addition, self-reported severity of alcohol and drug use based on the ASI alcohol and drug use composite scores are compared at intake and follow-up.

**Section 4: Other Targeted Factors.** Section 4 examines change in targeted factors including mental health symptoms, education and employment, homelessness, and involvement with the criminal justice system from intake to follow-up for the overall sample.

**Section 5: Recovery Supports.** Section 5 focuses on three main changes in recovery supports: (1) percentage of clients attending mutual help recovery group meetings; (2) recovery supportive interactions with family/friends in the past 30 days; and (3) the number of people the participant said they could count on for recovery support.

**Section 6: Cost and Implications for Kentucky.** Section 6 examines cost reductions or avoided costs to society after Recovery Kentucky Program participation.

## SECTION 1

# OVERVIEW AND DESCRIPTION OF RECOVERY KENTUCKY PROGRAM CLIENTS

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This section briefly describes the Recovery Kentucky Program as well as how clients are selected into the outcome evaluation. In addition, this section describes characteristics of clients who participated in the Recovery Kentucky program and RCOS between July 1, 2011 and June 30, 2012 as well as clients who completed a RCOS follow-up.

## RECOVERY KENTUCKY PROGRAM

Recovery Kentucky began the recovery centers initiative to help vulnerable Kentuckians with substance abuse and the overlapping problem of chronic homelessness. Recovery centers are not treatment facilities. They are housing environments in which individuals can pursue active use of self-help supports in gaining and maintaining recovery from alcohol and drug dependence. The basic structure of the recovery centers includes five stages of residential status:

1. Safe-Off-The-Streets, or SOS, which is an initial housing safety/shelter arrangement;
2. Motivational Track I where individuals start to examine their commitment to begin work on serious recovery living;
3. Motivational Track II where individuals learn the language of self-help and more seriously apply themselves toward committing to begin a recovery lifestyle;
4. Phase I where individuals spend an average of 6 months practicing recovery living in the recovery center; and
5. Phase II where individuals graduate into more independent living with jobs outside the facility and duties as peer mentors within the facility.

Kentucky also stands to benefit from the reduced cost of incarceration through use of Recovery Kentucky services for DOC clients. The Kentucky Department of Corrections (DOC) contracts with Recovery Kentucky for about half of the centers' beds for DOC-referred individuals. The program forms a key component in providing a midway alternative between prison and unsupervised living in the community. By providing this level of supervised recovery-oriented living, the goals for reduced incarceration might be met more safely for Kentucky citizens and for the individuals involved.

# 14

The Recovery Kentucky Program currently has 14 centers across the state.

- ⊠ Healing Place – Women’s Program
- ⊠ Women’s Addiction Recovery Manor
- ⊠ Cumberland Hope Community Center for Women
- ⊠ Hope Center for Women
- ⊠ Brighton Center for Women
- ⊠ Liberty Place Recovery Center for Women
- ⊠ Trilogy Center for Women



- ⊠ Owensboro Regional Recovery Center for Men
- ⊠ The Healing Place for Men – Louisville
- ⊠ The Transitions Grateful Life Center for Men
- ⊠ Morehead Inspiration Center for Men
- ⊠ The Healing Place of Campbellsville
- ⊠ George Privett Recovery Center
- ⊠ CenterPoint Recovery Center for Men

The goal of the Recovery Center Outcome Study (RCOS) is to provide an annual outcome evaluation for the Recovery Kentucky Program in partnership with the Behavioral Health Outcome Study team at the University of Kentucky Center on Drug and Alcohol Research (UK CDAR). Specifically, the outcome evaluation examines client satisfaction, recovery support, and outcomes for several specific targeted



factors including: (1) substance use; (2) mental and physical health; (3) education; (4) employment; (5) homelessness and living situation; and (6) criminal justice involvement. In addition, estimates show the avoided costs to society in relation to the cost of recovery services. This report describes outcomes for 283 men and women who completed an intake interview at entry to Phase 1 at a recovery center and a follow-up telephone interview about 12 months after the intake survey was submitted to UK CDAR.

## RCOS CLIENTS AT INTAKE

RCOS includes a face-to-face Phase 1 intake interview by program staff to assess targeted factors such as substance use, mental health symptoms, education, employment status, living situation, and criminal justice involvement prior to entering the recovery center (submitted to UK CDAR from July 1, 2011 through June 30, 2012). Before completing the intake clients are told about the RCOS follow-up telephone interview by program staff and asked if they are interested in participating. Client participation in RCOS is completely voluntary. If clients do not agree to participate in the RCOS follow-up component of the study they do not fill out the RCOS intake. In FY12, 1,361 individuals agreed to the follow-up interview and completed an intake survey.<sup>2</sup>

### DESCRIPTION OF RCOS CLIENTS AT PROGRAM INTAKE

Table 1.1 shows that the majority of clients with an intake survey submitted in FY 2012 were male (57.4%), White (88.0%), and reported they were currently homeless (50.8%). One in ten clients reported they were African American/Black and 1.5% reported they were multiracial, American Indian, Asian, or Hispanic. Clients were on average 33.7 years old, ranging from 18 to 65 years old. The majority of clients were not married (78.8%). In particular, 41.8% reported they were never married and 37.0% reported they were separated or divorced. A minority of clients reported they were married or cohabiting with a partner (18.8%) when they entered the recovery center.

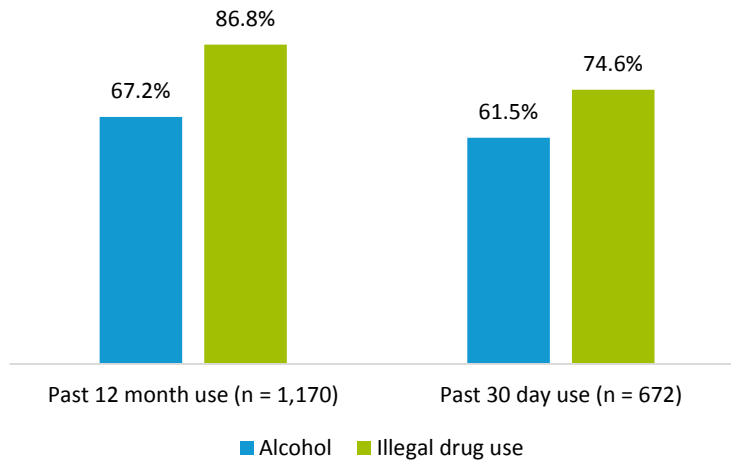
TABLE 1.1. DEMOGRAPHICS FOR ALL RECOVERY KENTUCKY CLIENTS AT INTAKE (n = 1,361)

AGE	33.7 years (range of 18-65)
GENDER	
Male	57.4%
Female	42.6%
RACE	
White	88.0%
African American	10.0%
Other or multiracial	1.5%
MARITAL STATUS	
Never married	41.8%
Married or cohabiting	18.8%
Separated or divorced	37.0%
Widowed	2.4%
HOMELESS	50.8%

<sup>2</sup> When a client had more than one intake survey in FY 2012, the survey with the earliest submission date was kept in the data file and the other intake surveys were deleted so that each client was represented once in the data set.

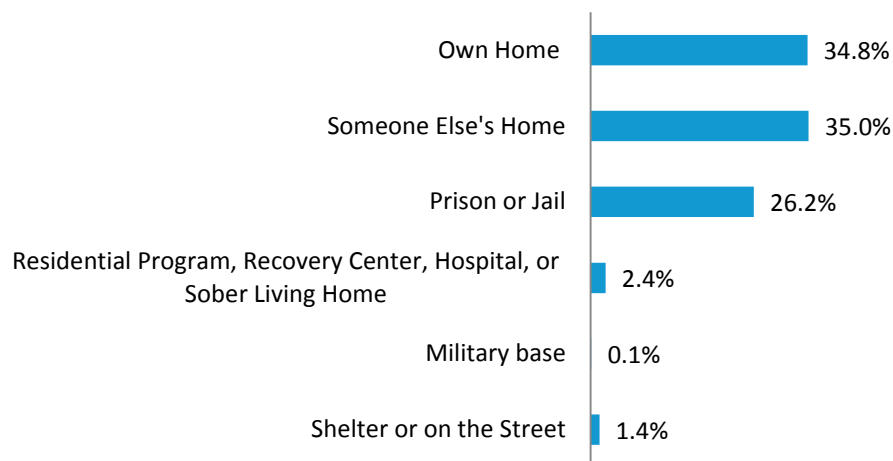
Of the 1361 clients, 14.0% (n = 191) reported they were incarcerated all 365 days before entering the program. Of the 1361 clients, 50.6% were in a controlled environment all 30 days before entering the program. Of the 1,170 clients who were not in a controlled environment all 365 days before entering the program, 67.2% used alcohol and 86.8% used illegal drugs in the 12 months before entering the recovery center (see Figure 1.1). Of the 672 clients who were not in a controlled environment all 30 days, 61.5% used alcohol and 74.6% used illegal drugs in the 30 days before entering the recovery center.

FIGURE 1.1 ALCOHOL AND DRUG USE AMONG CLIENTS NOT IN A CONTROLLED ENVIRONMENT ALL 365 DAYS (N = 1,170) OR 30 DAYS (N = 672) BEFORE PROGRAM ENTRY



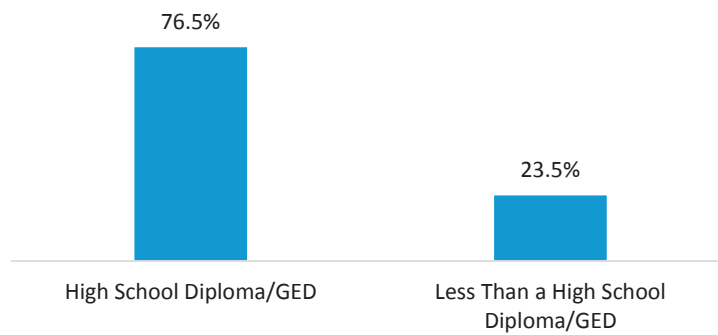
Of the 1,361 clients with an intake survey submitted in FY 2012, 50.8% reported they were currently homeless. The majority (69.8%) reported that their usual living situation in the past 12 months was in a private residence, either their own home/apartment (34.8%) or someone else’s home/apartment (35.0%). A little more than one quarter (26.2%) stated their usual living situation was in a prison or jail. Small percentages mentioned other usual living situations: residential program or recovery center (1.8%), in a shelter or on the street (1.4%), sober living home (0.5%), in a hospital (0.1%), or on a military base (0.1%).

FIGURE 1.2 USUAL LIVING ARRANGEMENT IN THE PAST 12 MONTHS AT INTAKE (N = 1,361)



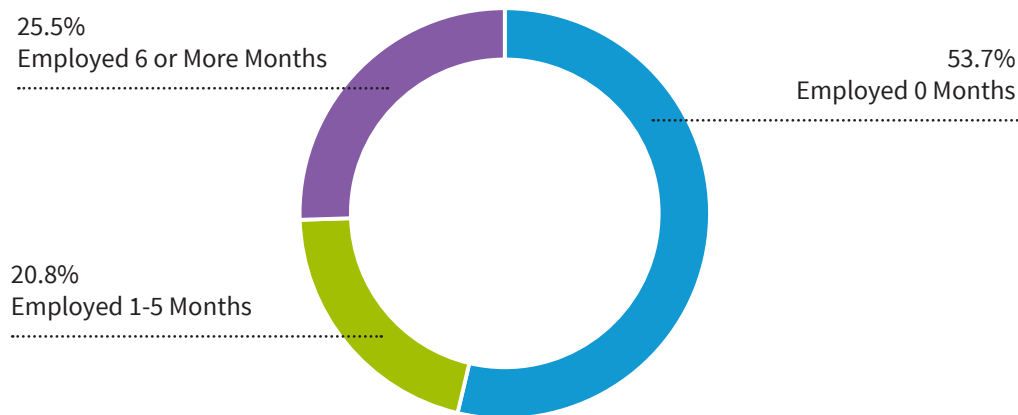
The majority of clients (76.5%) reported they had a high school diploma/GED or higher level of education at intake, with 23.5% reporting less than a high school diploma/GED.

FIGURE 1.3 HIGHEST LEVEL OF EDUCATION COMPLETED AT INTAKE (N = 1,361)



A little more than half of clients reported they had been employed 0 months, 20.8% reported they had been employed 1 to 5 months, and 25.5% reported they had been employed 6 or more months in the 12 months before entering the program (see Figure 1.4).

FIGURE 1.4 NUMBER OF MONTHS EMPLOYED IN THE PAST 12 MONTHS AT INTAKE (N = 1,361)



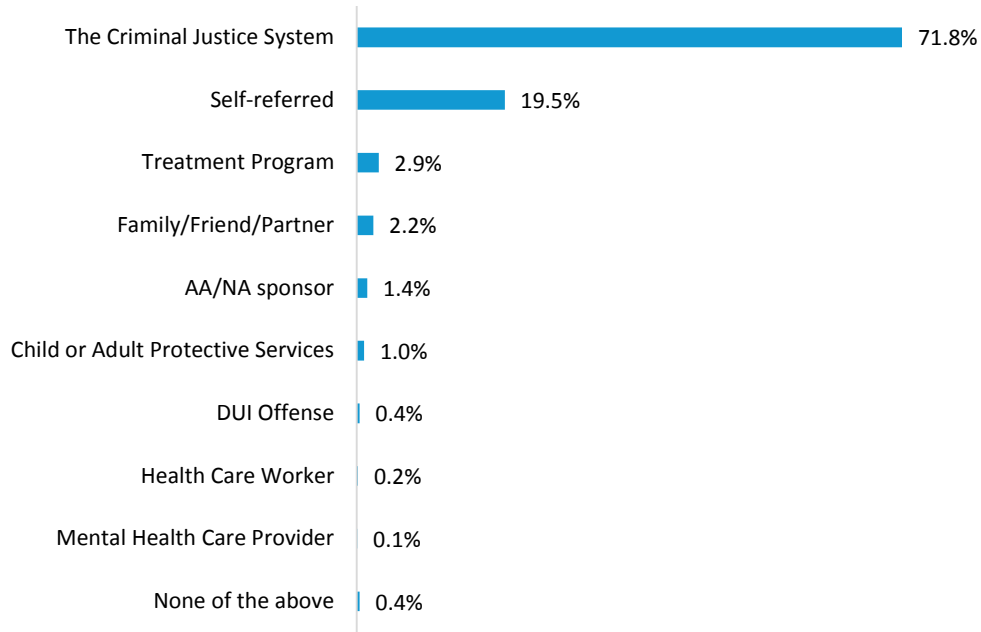
Of the 1,361 clients, 66.1% were arrested 80.8% were incarcerated in the 12 months before entering the program. The majority of clients (71.8%) reported they were referred to Recovery Kentucky by the court (e.g., judge, probation officer), and nearly 1 in 5 (19.5%) reported they had decided on their own to contact the recovery center.<sup>3</sup> The other referral categories were: referred by a treatment program (2.9%), family/friend/partner (2.2%), an AA/NA sponsor (1.4%), child or adult protective services (1.0%), based on DUI offense (0.4%), health care worker (0.2%), mental health care provider (0.1%), and none of the above (0.4%).

**CLIENT QUOTE**

“This place has given me back my life. It has shown me a sober life. It has given me something to look forward to in life.”

<sup>3</sup> DOC-referral status is not official, only self-reported status by the client .

FIGURE 1.5 METHOD OF REFERRAL INTO RECOVERY KENTUCKY PROGRAM (N = 1,361)



A minority of clients (37.3%) reported they had attended a mutual help recovery meeting in the 30 days before entering the program. The majority of clients stated they had contact with family or friends who were supportive of their recovery in the 30 days before entering the recovery center. The average number of people clients reported they could count on for recovery support was 22.7.

### RCOS FOLLOW-UP SAMPLE

A 6-month follow-up interview is conducted with a selected sample of clients about 12 months after the intake survey is completed. Funding constraints limit the number of follow-up interviews that can be completed each year. The target number of completed follow-up surveys was limited to 280. A randomly selected sample of individuals, stratified by DOC-referral status (i.e., DOC-referred and non-DOC-referred) and gender (i.e., male and female) are included in the sample of individuals to be followed up.

The follow-up interviews are conducted over the telephone by an interviewer at UK CDAR. Client responses to the follow-up interviews are kept confidential to help facilitate the honest evaluation of client outcomes and satisfaction with program services. The professionalism of the outcome study is reflected in low refusal rates for follow-up participation at 0.8%, and in the high follow-up rates (78.2%). This means that 21.0% of clients were not contacted for the follow-up telephone interviews.<sup>4</sup> These elements all indicate RCOS is a solid, dependable research study for the Recovery Kentucky Program.

This report describes outcomes for 283 men and women who participated in a Recovery Kentucky program and who completed an intake interview at entry to Phase 1 and a follow-up telephone interview about 12 months (average of 378.3 days) after the intake survey was submitted to UK CDAR.<sup>5</sup>

<sup>4</sup> Clients are not contacted for a variety of reasons including follow-up staff are not able to find a working address or phone number or to contact any friends or family members of the client.

<sup>5</sup> The actual date the intake interview was completed is not known. Some sites do the intake interviews on paper and submit them to UK CDAR through the website at a later date. Although UK CDAR requests the intake information be submitted within 7 days it is not clear whether or not that is the case.

Detailed information about the methods and follow-up efforts can be found in Appendix A.

*DESCRIPTION OF RCOS CLIENTS IN FOLLOW-UP SAMPLE AT INTAKE*

Of the 283 individuals who completed a follow-up survey, 9.5% (n = 27) were still in the recovery center at follow-up, which was targeted to be about 12 months after the intake survey was completed.<sup>6</sup> (Intakes are done close to entry to Phase 1.) For those clients who were still at the recovery center at the time of the follow-up, all 27 individuals were in Phase 2. Clients were in the Recovery Kentucky Program an average of 255 days.

Of the 283 clients included in this report, 52.7% were female and 47.3% male (see Figure 1.6). See Appendix B for detailed information about clients. Clients with completed follow-up surveys were mostly White (85.9%) or African American (13.4%) and were an average of 34 years old at the time of the intake interview.

FIGURE 1.6. GENDER AND RACE OF RCOS FOLLOW-UP CLIENTS AT INTAKE (N = 283)

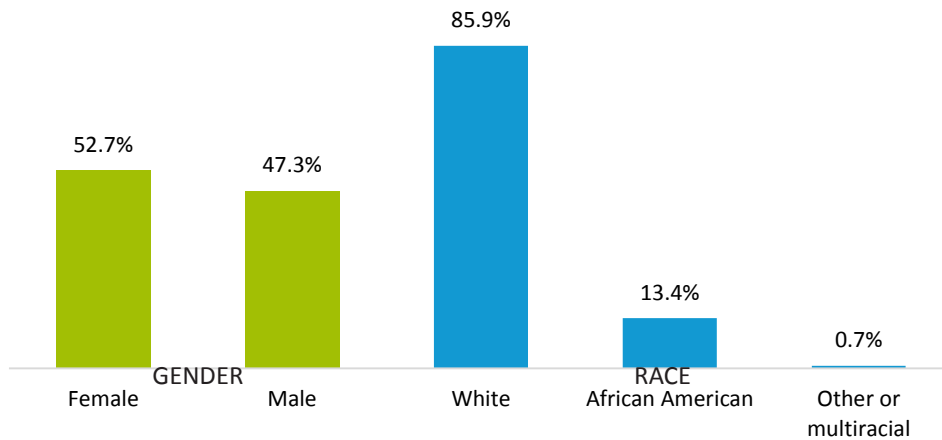
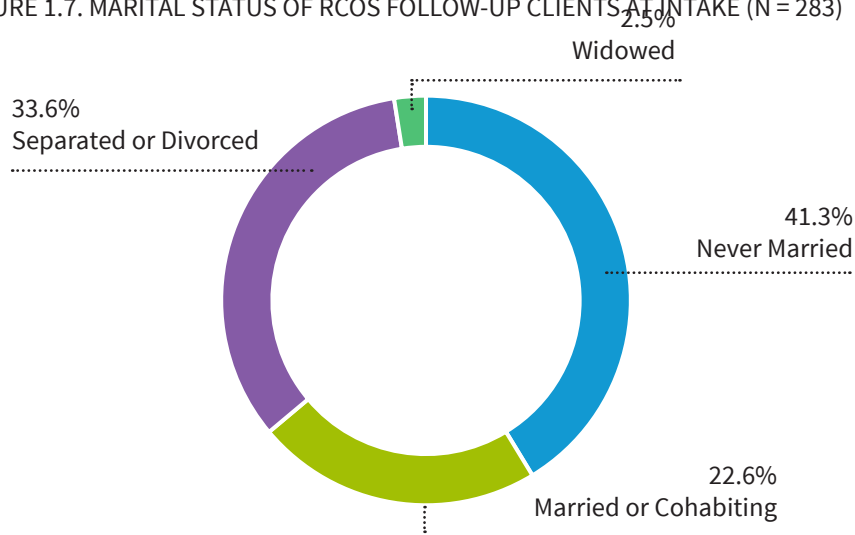


Figure 1.7 shows that, overall at intake, clients in the follow-up sample reported they were separated/divorced (33.6%) or were married or cohabiting (22.6%). About two-fifths of clients indicated they had never been married (41.3%) and were not currently cohabiting.

FIGURE 1.7. MARITAL STATUS OF RCOS FOLLOW-UP CLIENTS AT INTAKE (N = 283)



<sup>6</sup> The average time between intake and follow-up was 378.3 days.

When those with a follow-up interview were compared with those who did not have a follow-up interview on intake variables, there were no significant differences for demographics, socio-economic status indicators (education, employment, living situation), substance abuse, mental health, criminal justice involvement, and treatment history. See Appendix B for comparisons on demographics, substance use and other targeted factors.

Thirty-nine follow-up clients were incarcerated all 365 days before entering the recovery center and 148 clients were incarcerated all 30 days before entering the recovery center.

Also, of the 283 clients with follow-up interviews, 46.3% (n=131) were referred by the Department of Corrections (DOC), 52.7% (n=149) were not DOC-referred, and 1.1% (n = 3) did not have information provided about DOC-referral<sup>7</sup>. In general, the analysis shows that DOC-referral status and length of service were associated with the odds of using alcohol or drugs at follow-up and the average number of months clients were employed. Appendix D provides detail about how DOC-referral status and length of service may be related to one another and with program outcomes.

**In general, the analysis shows that DOC-referral status and length of service were associated with the odds of using alcohol or drugs at follow-up and the average number of months clients were employed.**

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<sup>7</sup> DOC-referral status is not official, only self-reported status by the client.

## SECTION 2

# CLIENT SATISFACTION WITH RECOVERY KENTUCKY PROGRAM

---

One of the important outcomes assessed during the follow-up interview is the client's perception of the Recovery Kentucky Program experience. This section describes three aspects of client satisfaction: (1) overall client satisfaction; (2) client ratings of program experiences; and (3) clients' perceptions of their social standing in society before and after involvement in the program.

## OVERALL CLIENT SATISFACTION

The majority of individuals (74.6%) gave a highly positive rating between 8 and 10 of their experience in the Recovery Kentucky program, where 10 represented the best possible experience. Overall, the average rating was 8.3 indicating a very positive experience.

## CLIENT RATINGS OF PROGRAM EXPERIENCES

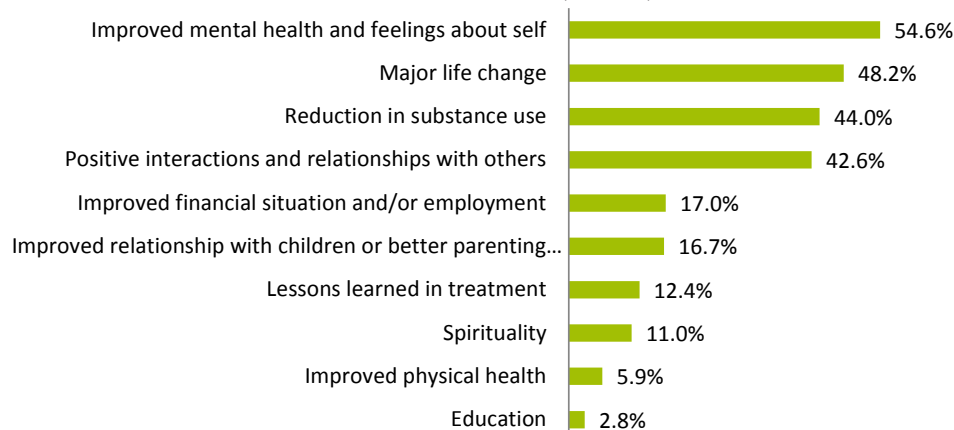
When asked about specific aspects of the program, the majority of clients reported they either agreed or strongly agreed with each aspect of the Recovery Kentucky program assessed (see Figure 2.1). Clients overwhelmingly reported getting the services needed to get better, feeling better about themselves, understanding what was expected of them in the program and their rights as a client, and feeling they were treated with respect.

FIGURE 2.1. PERCENTAGE OF INDIVIDUALS WHO AGREED/STRONGLY AGREED WITH THE FOLLOWING STATEMENTS ABOUT THE RECOVERY KENTUCKY PROGRAM AT FOLLOW-UP (n = 283)



At the beginning of the follow-up survey, individuals were also asked about the most positive outcomes from their Recovery Kentucky Program experience (see Figure 2.2). The most commonly self-reported positive outcomes of the program included improved mental health and feelings about themselves, major life changes (e.g., better quality of life, better able to function, having a “normal” life, greater control over life), reductions in substance use, and positive interactions and relationships with other people.

FIGURE 2.2. CLIENTS REPORTED POSITIVE OUTCOMES OF THEIR RECOVERY KENTUCKY PROGRAM EXPERIENCE AT FOLLOW-UP (n = 282)<sup>a</sup>



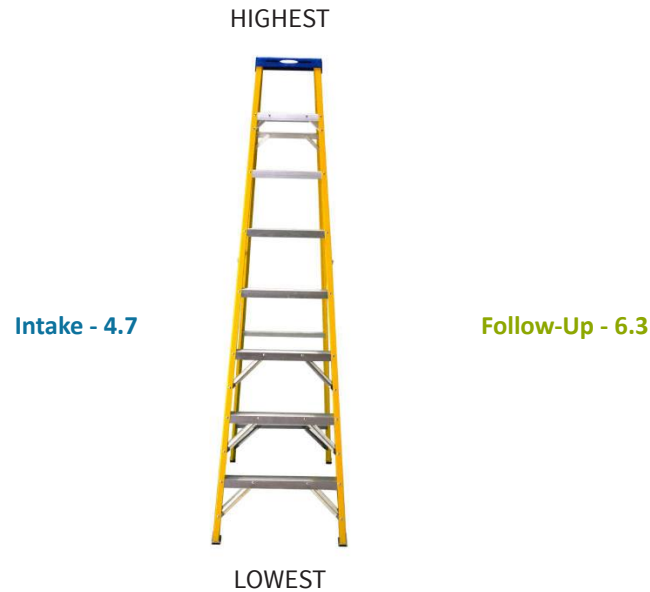
a—One client refused to answer these items.



## SOCIAL STANDING

At intake and follow-up individuals’ perceptions of their social standing in society were assessed. Individuals were asked to place themselves on a ladder, representing their perception of their standing in society (Adler e al., 2000). The bottom rung, 1, represents “people who are the worst off, those who have the least money, least education, and worst jobs or no jobs” and the top rung, 10, represents “people who are the best off, those who have the most money, most education, and best jobs.” Overall, clients rated themselves as a 4.7 on average, (just below the middle of the ladder) at intake, and a 6.3 (above the middle) at follow-up, which was a significant increase (see Figure 2.3).

FIGURE 2.3 RATING OF HOW CLIENTS SEE THEMSELVES IN SOCIETY AT INTAKE AND FOLLOW-UP (n = 282)<sup>a</sup>

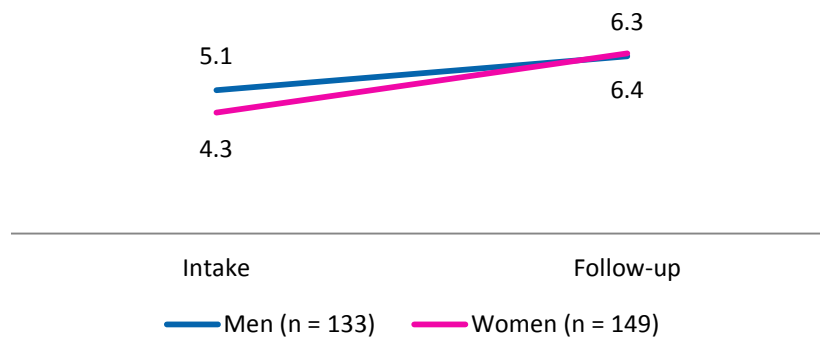


a—One client refused to answer these items.

## GENDER DIFFERENCES IN SOCIAL STANDING

There was a statistically significant difference in subjective social standing by gender at intake (5.1 for men vs. 4.3 for women), but at follow-up, there was no difference in men’s and women’s ratings of their social standing (6.3 vs. 6.4 for men and women respectively; see Figure 2.4).

FIGURE 2.4. GENDER DIFFERENCES IN HOW CLIENTS SEE THEMSELVES IN SOCIETY<sup>a</sup>



a—Significant difference by gender at intake; p < .001.

## SECTION 3

# SUBSTANCE USE

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This section describes pre-program compared to post-program change on illegal drug, alcohol<sup>8</sup>, and tobacco use for clients who were not incarcerated all 365 days before entering the recovery center. Past 30-day substance use is examined separately for a) clients who were not in a controlled environment all 30 days before entering the recovery center (n = 135), and b) clients who were in a controlled environment all 30 days before entering the recovery center (n = 148). Results for each substance are presented for the overall sample and by gender when there were significant gender differences. A trend alert shows how the past 12 month use of opioids and heroin have changed at intake from FY10 to FY12 for clients entering the recovery centers.

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<sup>8</sup> Alcohol use was asked three main ways: (1) how many months/days did you drink any alcohol (alcohol use); (2) how many months/days did you drink alcohol to intoxication (alcohol to intoxication); and (3) how many months/days did you have 5 or more (4 if female) alcoholic drinks in a period of about 2 hours (i.e., binge drinking).

Section 3A includes results presented for each substance in 4 main subsections for clients not in a controlled environment:

1. **Change in 12-month/6-month substance use from intake to follow-up for clients not in a controlled environment.**<sup>9</sup> Comparisons of use of substances (any illegal drug use, alcohol use, and tobacco use) in the 12 months before the client entered the program and use of substances during the 6 month follow-up period (n=244) are presented.<sup>10,11</sup> Significant gender differences are highlighted. Appendix C provides change over time on specific substances for men and women.
2. **Average number of months individuals used substances.** For those who used any of the substances, the average number of months used before program entry (out of a 12 month period) and during the follow-up period (out of a projected 12-month period) are reported.<sup>12</sup>
3. **Change in 30-day substance use from intake to follow-up for clients not in a controlled environment.** Comparisons of any use in the 30 days before program entry and the 30 days before the follow-up interview for any illegal drugs, alcohol, and tobacco for clients who were not in a controlled environment all 30 days before entering the recovery center (n=135) are presented. Significant gender differences are highlighted. Appendix C provides change over time on specific substances for men and women.
4. **Change in self-reported alcohol and drug severity composite scores for clients not in a controlled environment.** The Addiction Severity Index (ASI) composite score based on self-reported severity of drug or alcohol problems are also examined for change over time for illegal drugs (n=97), alcohol (n=82) and those with both alcohol and illegal drug use (n = 113). The alcohol and drug severity composite scores assess addiction severity even among those reporting no substance use in the past 30 days. The alcohol and drug severity composite scores are computed from items about 30 day alcohol (or drug) use as well as the impact of substance use on an individual's life such as money spent on alcohol, number of days they used multiple substances (for drug composite score), number of days individuals had alcohol (or drug) problems, how troubled or bothered individuals were by their alcohol (or drug) problems, and how important the program was to them.

Section 3B includes results presented for each substance in two main subsections for clients who were in a controlled environment all 30 days before entering the program:

1. **Change in 30-day substance use from intake to follow-up for clients who were in a controlled environment all 30 days before entering the recovery center.** Comparisons of any use in the 30 days before program entry and the 30 days before the follow-up interview for any illegal drugs, alcohol, and tobacco for clients who were in a controlled environment all 30 days before entering

<sup>9</sup> Individuals who were incarcerated all 365 days before entering the recovery center were not included in the analysis examining change in substance use from the 12 months before entering the recovery center to the 6 months before follow-up. No clients reported being incarcerated all 182 days before the follow-up.

<sup>10</sup> z test for proportion was used for significance testing of substance use; Chi-square test of independence was used to test for significant differences for gender at intake and then at follow-up.

<sup>11</sup> If the client progresses through the phases of the Recovery Kentucky Program in a typical manner, the follow-up interview should occur about 6 months after they are discharged from Phase I. However, because clients progress through phases at their own pace and many factors can affect when they are discharged from Phase 1, the follow-up timing varies by client. For example, some individuals may not complete Phase 1 and may be discharged before the approximate 6 months it should take to complete Phase 1.

<sup>12</sup> Because the reference period before Recovery Kentucky Program entry was 12 months and the reference period at follow-up was 6 months, the proportion of months in each period individuals reported using particular substances (e.g., any illegal drugs, alcohol, tobacco) was calculated. Then, that proportion was applied to a projected 12-month period at follow-up to facilitate comparisons. For example, if a client reported using tobacco all 6 months in the 6 months before follow-up, then the percent of months of use was 100%, and when this percent was applied to a 12-month period, the value was 12 for the projected follow-up period.

the recovery center (n=148) are presented.<sup>13</sup>

2. **Change in self-reported alcohol and drug severity composite scores for clients who were in a controlled environment all 30 days before entering the recovery center.** Results of the alcohol and drug severity composite scores are also examined for change over time for clients who reported drug use in the past 30 days (n=48) and for clients who reported alcohol use in the past 30 days (n=25) at intake and follow-up.

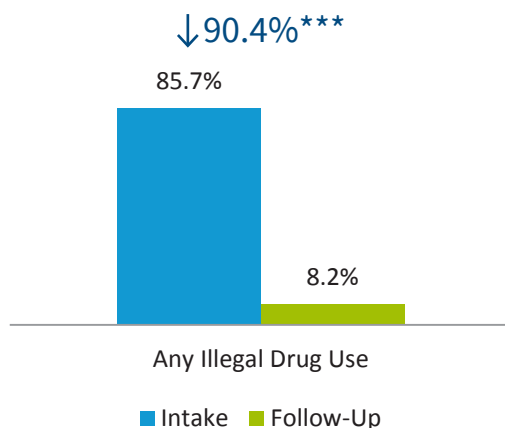
### 3A. SUBSTANCE USE FOR CLIENTS WHO WERE NOT IN A CONTROLLED ENVIRONMENT

#### ANY ILLEGAL DRUG USE

##### ANY ILLEGAL DRUG USE, PAST 12-MONTH/6-MONTH

At intake, 85.7% of clients reported using any illegal drugs (including prescription drug misuse and other illegal drugs) in the 12 months before entering the recovery center. At follow-up, only 8.2% of clients reported using illegal drugs in the 6 months before follow-up (a significant decrease of 90.4%; see Figure 3A.1).

FIGURE 3A.1. ANY ILLEGAL DRUG USE AT INTAKE AND FOLLOW-UP (n = 244)



\*p < .05, \*\*p < .01, \*\*\*p < .001.

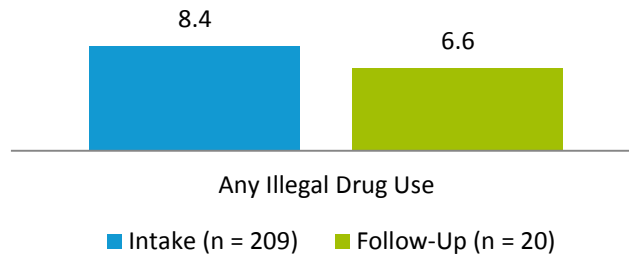
##### AVERAGE NUMBER OF MONTHS USED ANY ILLEGAL DRUGS

Among clients who reported illegal drug use in the 12 months before entering the program (n = 209), they reported using drugs an average of 8.4 months (see Figure 3A.2). Among individuals who reported using illegal drugs at follow-up (n = 20), they reported using an average of 6.6 of the projected follow-up months.



<sup>13</sup> Because many individuals enter the Recovery Kentucky program after leaving jail or prison, substance use in the 30 days before entering the program was examined separately for individuals who were in a controlled environment all 30 days from individuals who were not in a controlled environment all 30 days. The assumption for this divided analysis is that being in a controlled environment inhibits opportunities for alcohol and drug use.

FIGURE 3A.2. AMONG CLIENTS WHO USED ANY ILLEGAL DRUGS, THE AVERAGE NUMBER OF MONTHS INDIVIDUALS USED ILLEGAL DRUGS

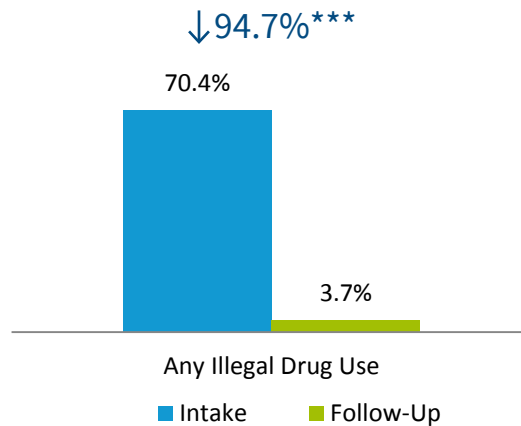


ANY ILLEGAL DRUGS, PAST 30 DAYS

Seven in ten individuals (70.4%) who were not in a controlled environment all 30 days reported they had used illegal drugs (including prescription misuse and other illegal drugs) in the 30 days before entering the recovery center (see Figure 3A.3). At follow-up, only 3.7% of individuals reported they had used illegal drugs in the past 30 days—a significant decrease by 94.7%.

The number of individuals who reported using illegal drugs in the past 30 days decreased by 95%

FIGURE 3A.3. PAST 30-DAY USE OF ANY ILLEGAL DRUGS AT INTAKE AND FOLLOW-UP (n = 135)

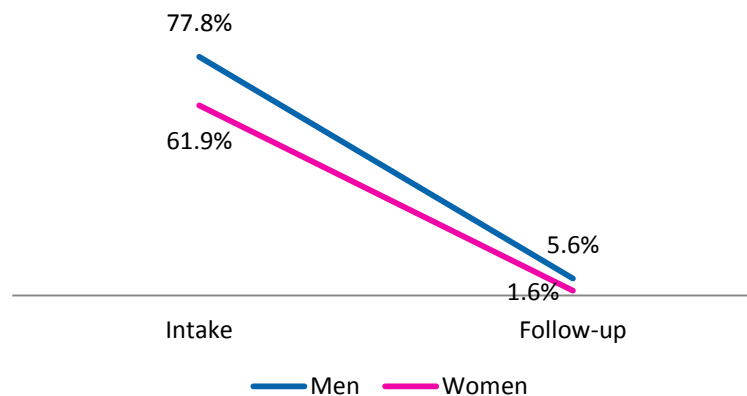


\*p < .05, \*\*p < .01, \*\*\*p < .001.

GENDER DIFFERENCES IN ILLEGAL DRUG USE, PAST 30 DAYS

Significantly more men than women reported using illegal drugs in the 30 days before intake (see Figure 3A.4). However, by follow-up there was no significant difference in past-30-day use of illegal drugs by gender.

FIGURE 3A.4. GENDER DIFFERENCES IN ILLEGAL DRUG USE AT INTAKE AND FOLLOW-UP<sup>a</sup>



a—Significant difference by gender at follow-up, p < .05.

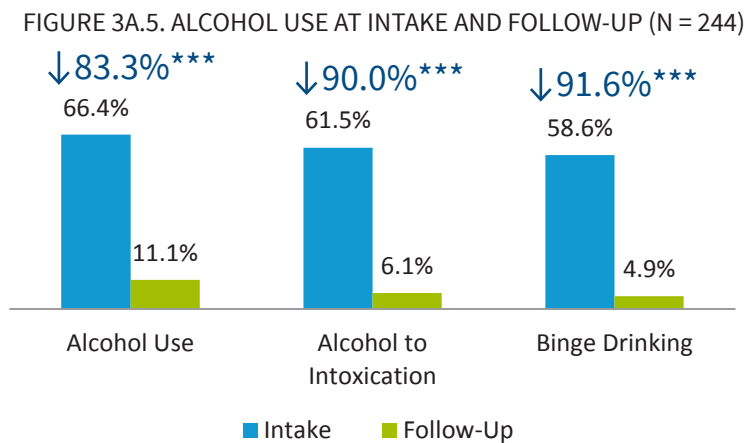
## ALCOHOL

### ALCOHOL USE, PAST 12-MONTH/6-MONTH

Alcohol use was asked three main ways: (1) how many months/days did you drink any alcohol (i.e., alcohol use); (2) how many months/days did you drink alcohol to intoxication (i.e., alcohol to intoxication); and (3) how many months/days did you have 5 or more (4 or more if female) alcoholic drinks in a period of about 2 hours (i.e., binge drinking; National Institute on Alcohol Abuse and Alcoholism, 2004).

When examining all clients, the majority of individuals (66.4%) reported using alcohol in the 12 months before entering the recovery center while 11.1% of clients reported alcohol use in the 6 months before follow-up. There was an 83.3% decrease in the number of individuals reporting alcohol use (see Figure 3A.5). Overall, 61.5% of individuals reported using alcohol to intoxication in the 12 months before entering the recovery center and 6.1% reported using alcohol to intoxication at follow-up—a 90.0% decline. Also, 58.6% of individuals reported binge drinking in the 12 months before program entry and only 4.9% reported binge drinking in the follow-up period—a 91.6% decrease.

The number of clients reporting alcohol use decreased 83%



\*p < .05, \*\*p < .01, \*\*\*p < .001.

### GENDER DIFFERENCES IN ALCOHOL USE TO INTOXICATION, PAST 12-MONTH/6-MONTH

Significantly more men reported alcohol use to intoxication at intake and follow-up compared to women



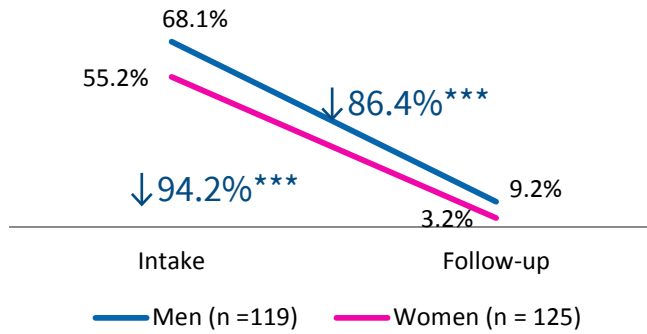
Significantly more men than women reported using alcohol to intoxication at intake (68.1% vs. 55.2%) and at follow-up (9.2% vs. 3.2%). The number of men and women who reported alcohol use to intoxication significantly decreased by

86.4% and 94.2% respectively from intake to follow-up (see Figure 3A.6).

**CLIENT QUOTE**

“They gave me really good tools to face reality.”

FIGURE 3A.6. GENDER DIFFERENCES IN ALCOHOL USE TO INTOXICATION AT INTAKE AND FOLLOW-UP<sup>a</sup>



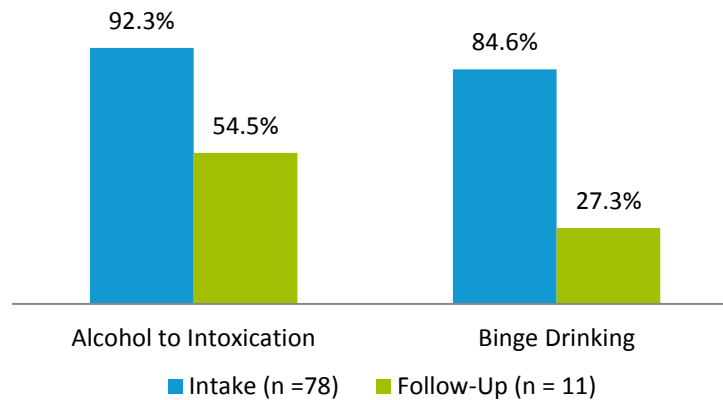
\*p < .05, \*\*p < .01, \*\*\*p < .001.

a—Significant difference by gender at intake and follow-up, p < .05.

### ALCOHOL INTOXICATION AND BINGE DRINKING AMONG THOSE WHO USED ALCOHOL, PAST 12-MONTH/6-MONTH

Of the individuals who used alcohol in the 12 months before entering the recovery center (n = 162), 92.6% used alcohol to intoxication in the 12 months before intake (see Figure 3A.7). Of the individuals who used alcohol in the 6 months before follow-up (n = 27), 55.6% of clients reported alcohol to intoxication. Of the 162 individuals who used alcohol in the 12 months before intake, 88.3% reported binge drinking in the 12 months before entering the recovery center. At follow-up, of those reporting alcohol use (n = 27), 44.4% reported binge drinking.

FIGURE 3A.7. ALCOHOL TO INTOXICATION AND BINGE DRINKING AT INTAKE AND FOLLOW-UP, AMONG THOSE REPORTING ALCOHOL USE AT EACH POINT

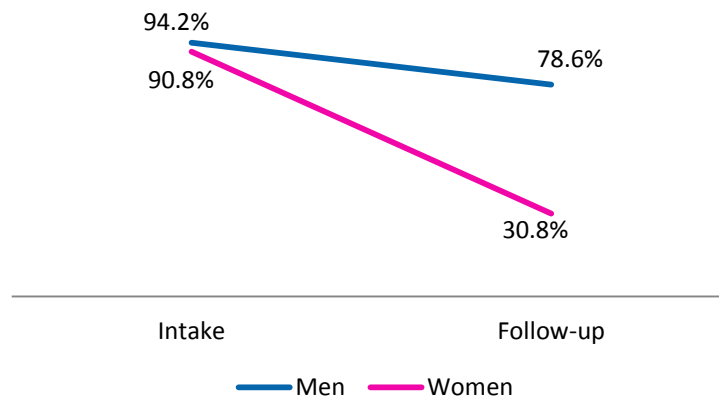


### GENDER DIFFERENCES IN ALCOHOL USE TO INTOXICATION AMONG THOSE REPORTING ALCOHOL USE

Among individuals who used alcohol at intake (n = 162), there was no gender difference in alcohol use to intoxication at intake (see Figure 3A.8). However, of the individuals who used alcohol in the 6 months before follow-up (n = 27), significantly more men reported using alcohol to intoxication compared to women (78.6% vs. 30.8%).



FIGURE 3A.8. GENDER DIFFERENCES IN ALCOHOL USE TO INTOXICATION AT INTAKE AND FOLLOW-UP, AMONG THOSE REPORTING ALCOHOL USE AT EACH POINT<sup>a</sup>

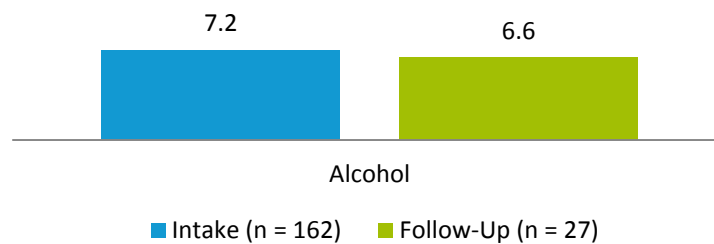


a—Significant difference by gender at follow-up,  $p < .05$ .

### AVERAGE NUMBER OF MONTHS USED ALCOHOL

Figure 3A.9 shows the number of months of alcohol use for those who reported using any alcohol at intake and any alcohol at follow-up. Among the individuals who reported using alcohol in the 12 months before entering the program ( $n = 162$ ), they used an average of 7.2 months. Among individuals who reported using alcohol at follow-up ( $n = 27$ ), they used an average of 6.6 projected months.

FIGURE 3A.9. AVERAGE NUMBER OF MONTHS OF ALCOHOL USE

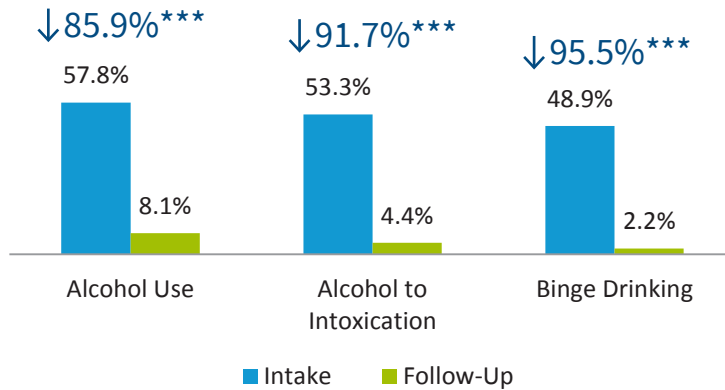


### ALCOHOL, PAST 30-DAY USE

There was a decrease in the percentage of individuals who reported using alcohol in the past 30 days from intake (57.8%) to follow-up (8.1%). This means that the number of RCOS clients reporting alcohol use decreased 85.9% from intake to follow-up. Decreases in the number of individuals who reported using alcohol to intoxication were also significant for the sample overall (by 91.7%). There were similar significant decreases in the number of individuals who reported binge drinking at follow-up compared to the 30 days before entering the recovery center (see Figure 3A.10).



FIGURE 3A.10. PAST 30-DAY ALCOHOL USE AT INTAKE AND FOLLOW-UP (n = 135)



\*p < .05, \*\*p < .01, \*\*\*p < .001.

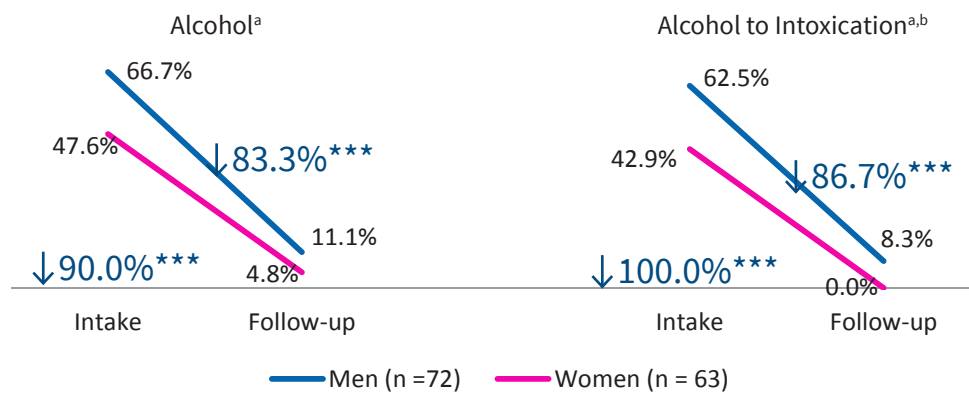
**GENDER DIFFERENCES IN ALCOHOL USE IN THE PAST 30 DAYS**

Figure 3A.11 shows that two-thirds of men reported using alcohol in the 30 days before entering the recovery center, and by follow-up, only 11.1% reported alcohol use, representing an 83.3% significant decrease. Significantly more men than women reported using alcohol and alcohol to intoxication in the 30 days before entering the program. By follow-up, however, the difference between men and women was no longer evident for alcohol. Yet significantly more men used alcohol to intoxication compared to women at follow-up. Decreases in the number of individuals who reported using alcohol to intoxication were significant for men (86.7%) and women (100.0%).



*Significantly more men than women reported using alcohol and alcohol to intoxication in the 30 days before entering the program*

FIGURE 3A.11. GENDER DIFFERENCES PAST 30-DAY ALCOHOL USE AND ALCOHOL TO INTOXICATION AT INTAKE AND FOLLOW-UP



\*p < .05, \*\*p < .01, \*\*\*p < .001.

a—Significant difference by gender at intake, p < .05.

b—Significant difference by gender at follow-up, p < .05.

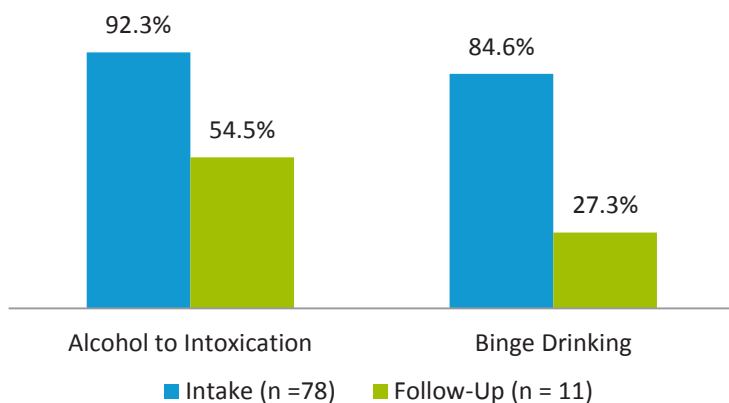
**ALCOHOL INTOXICATION AND BINGE DRINKING AMONG THOSE WHO USED ALCOHOL IN THE PAST 30 DAYS**

Of the 78 individuals who used alcohol in the 30 days before entering the recovery center, 92.3% used alcohol to intoxication in the 30 days before entering the program (see Figure 3A.12). Of the 11 individuals who reported using alcohol in the 30 days before follow-up, 54.5% reported alcohol use to

intoxication.<sup>14</sup>

Of the 78 individuals who used alcohol in the 30 days before entering the recovery center, 84.6% reported binge drinking in the 30 days before entering the recovery center. Of the 11 individuals who used alcohol in the 30 days before follow-up, 27.3% reported binge drinking.

FIGURE 3A.12. PAST 30-DAY ALCOHOL TO INTOXICATION AND BINGE DRINKING AT INTAKE AND FOLLOW-UP, AMONG THOSE REPORTING ALCOHOL USE AT EACH POINT



\*p < .05, \*\*p < .01, \*\*\*p < .001.

### CHANGE IN SELF-REPORTED ALCOHOL AND DRUG SEVERITY FOR CLIENTS NOT IN A CONTROLLED ENVIRONMENT

One way to examine overall change in degree of severity of substance use disorder is to use the Addiction Severity Index (ASI) composite scores for alcohol and drug use. These composite scores are computed based on self-reported severity, taking into consideration a number of issues including number of days of alcohol (or drug) use, money spent on alcohol, the number of days individuals used multiple drugs (for drug use composite score), the number of days individuals experienced problems related to their alcohol (or drug) use, how troubled or bothered they are by their alcohol (or drug) use, and how important the recovery program is to them (see sidebar). Change in the average ASI composite score for alcohol and drugs was examined for individuals who were not in a controlled environment all 30 days before entering the

## ASI DRUG COMPOSITE SCORES AND SUBSTANCE DEPENDENCE

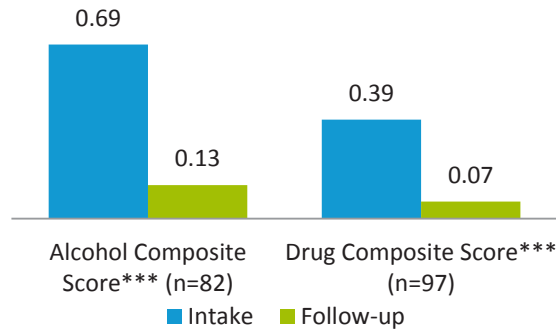
Rikoon et al. (2006) conducted two studies to determine the relationship between the ASI alcohol and drug use composite scores and DSM-IV substance dependence diagnoses. They identified alcohol and drug use composite score cutoffs that had 85% sensitivity and 80% specificity with regard to identifying DSM-IV substance dependence diagnoses: .17 for alcohol composite score and .16 for drug composite score. These composite score cutoffs can be used to estimate the number of individuals who are likely to meet criteria for active alcohol or drug dependence and to show average reductions in severity scores.

<sup>14</sup> It was not possible to conduct a chi square test to examine difference in the percentage of men and women who used alcohol to intoxication and binge drank in the 30 days before follow-up among those who used alcohol (n = 11) because of the small number of individuals who reported using alcohol in the 30 days before follow-up.

recovery center. Individuals who reported abstaining from alcohol or drugs at intake and follow-up were not included in the analysis of change for each composite score.

Figure 3A.13 displays the change in average scores.<sup>15</sup> The average value for the alcohol composite score significantly decreased from 0.69 at intake to 0.13 at follow-up. The average for the drug composite score significantly decreased from 0.39 at intake to 0.07 at follow-up.

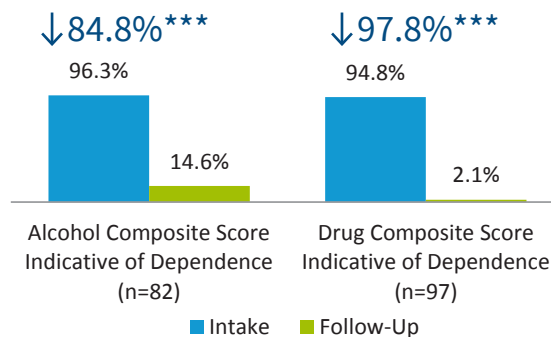
FIGURE 3A.13. AVERAGE ASI ALCOHOL AND DRUG COMPOSITE SCORES AT INTAKE AND FOLLOW-UP



\*p < .05, \*\*p < .01, \*\*\*p < .001.

Among the individuals who were not in a controlled environment all 30 days before entering the recovery center and who did not report abstaining from the substance (alcohol, drugs) both at intake and follow-up, the percentage of individuals who had ASI composite scores that met the cutoff for dependence decreased significantly from intake to follow-up (see Figure 3A.14). The vast majority of individuals had alcohol and drug composite scores that met the cutoff for dependence at intake (96.3% and 94.8% respectively), while the percentages of individuals with alcohol and drug composite scores that met the cutoff for dependence decreased significantly at follow-up. Only 14.6% of individuals had an alcohol composite score that met the cutoff for dependence at follow-up, and only 2.1% had a drug composite score that met the cutoff for dependence at follow-up. Thus, the number of individuals who had an alcohol composite score that met the cutoff for dependence decreased significantly by 84.8% and the number of individuals who had a drug composite score that met the cutoff for dependence at follow-up decreased significantly by 97.8%.

FIGURE 3A.14. INDIVIDUALS WITH ASI COMPOSITE SCORES MEETING THE CUTOFF FOR ALCOHOL OR DRUG DEPENDENCE AT INTAKE AND FOLLOW-UP

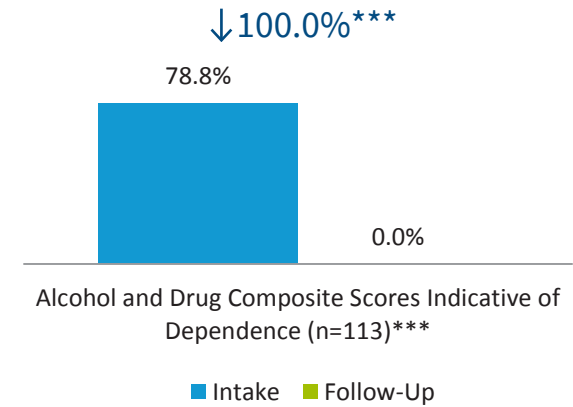


\*p < .05, \*\*p < .01, \*\*\*p < .001.

<sup>15</sup> The following numbers of cases were not included in the analysis of change in the composite scores because 53 individuals reported abstaining from alcohol and 38 individuals reported abstaining from drugs at intake and follow-up.

Among the individuals who were not in a controlled environment all 30 days before entering the recovery center and who reported using alcohol and/or drugs at intake or follow-up, the percentage of individuals who had composite scores that met the cutoff for dependence for both alcohol and drugs also decreased significantly from intake to follow-up (see Figure 3A.15). More than three-fourths of clients (78.8%) had composite scores that met the cutoff for dependence for alcohol and drugs at intake. The percentage of clients who had composite scores that met the cutoff for dependence for alcohol and drugs decreased significantly to 0.0% at follow-up.

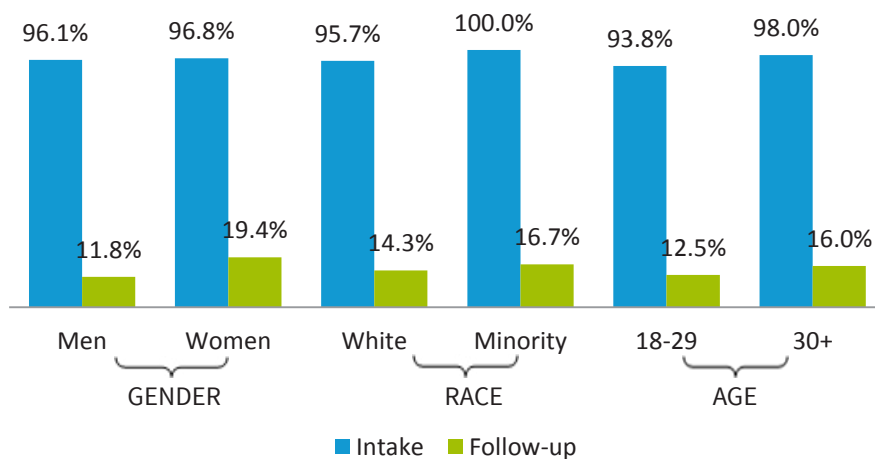
FIGURE 3A.15. INDIVIDUALS WITH ASI COMPOSITE SCORES MEETING THE CUTOFF FOR BOTH ALCOHOL AND DRUG DEPENDENCE AT INTAKE AND FOLLOW-UP



\*p < .05, \*\*p < .01, \*\*\*p < .001.

The data were examined to determine whether individuals who had alcohol composite scores indicative of dependence at intake and follow-up differed by gender, race/ethnicity, or age (see Figure 3A.16). No statistically significant differences were found. In other words, at intake and follow-up, the percentage of individuals with an alcohol composite score indicative of dependence did not differ between men and women, White and racial minority clients, or older and younger clients.

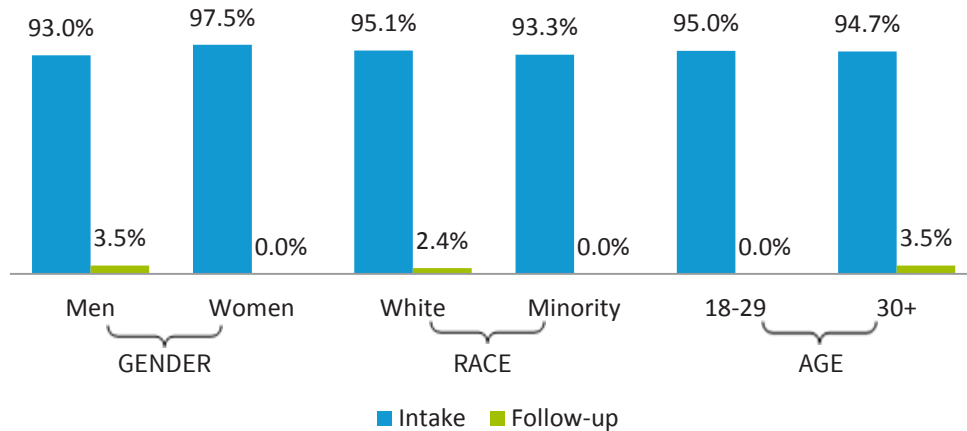
FIGURE 3A.16. ALCOHOL-USING INDIVIDUALS WITH AN ALCOHOL COMPOSITE SCORE INDICATIVE OF DEPENDENCE AT INTAKE AND FOLLOW-UP BY DEMOGRAPHIC FACTORS (n = 82)



Analysis was also conducted to determine if individuals who had a drug composite score indicative of dependence at intake and follow-up differed by gender, race/ethnicity, or age (see Figure 3A.17). There were no significant differences in the percentage of individuals who had a drug composite score indicative of dependence at intake or follow-up by gender, race or age group. In other words, at

intake and follow-up, men and women did not differ on the percentage of individuals who had a drug composite score indicative of dependence. Similarly, White and racial minority clients did not differ on the percentage of individuals who had a drug composite score indicative of dependence at intake or follow-up. Younger and older clients did not differ on the percentage of individuals who met criteria for drug dependence at either intake or follow-up.

FIGURE 3A.17. DRUG-USING INDIVIDUALS WITH A DRUG COMPOSITE SCORE INDICATIVE OF DEPENDENCE AT INTAKE AND FOLLOW-UP BY DEMOGRAPHIC FACTORS (n = 97)

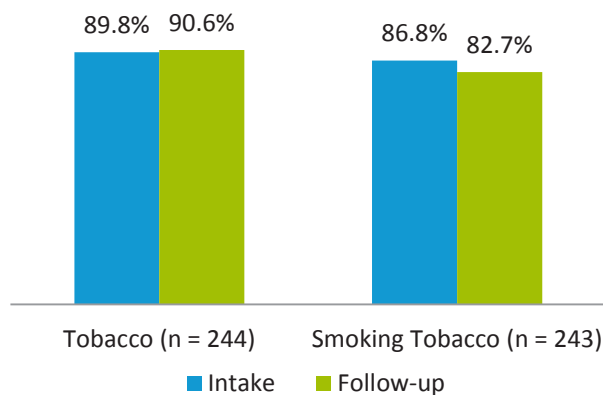


### TOBACCO USE AND SMOKING

#### TOBACCO USE AND SMOKING, PAST 12-MONTH/6-MONTH

Overall, there was no change in tobacco use from intake to follow-up (see Figure 3A.18). Most individuals reported using tobacco in the 12 months before entering the recovery center (89.8%) and in the 6 months before follow-up (90.6%), with no significant change from intake to follow-up. Similarly, the majority of individuals (86.8%) reported smoking tobacco<sup>16</sup> in the 12 months before entering the recovery center, with a non-significant decrease at follow-up (82.7%).

FIGURE 3A.18. TOBACCO USE AT INTAKE AND FOLLOW-UP



#### GENDER DIFFERENCES IN SMOKING TOBACCO, PAST 12-MONTH/6-MONTH

At intake there were no gender differences in the percentage of clients reporting smoking tobacco in the past 12 months (see Figure 3A.19).

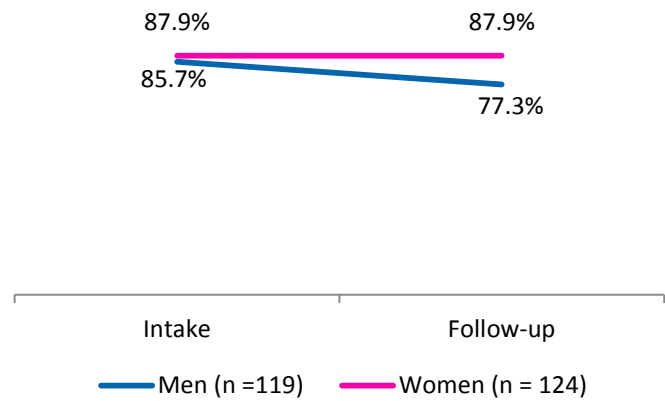


*Significantly more women reported smoking tobacco at follow-up compared to men*

<sup>16</sup> Missing data on smoking tobacco at follow-up for 1 case.

The majority of men and women reported smoking tobacco at intake and follow-up, with a slight but non-significant decrease for men. At follow-up, significantly more women than men reported smoking tobacco (87.9% vs. 77.3%).

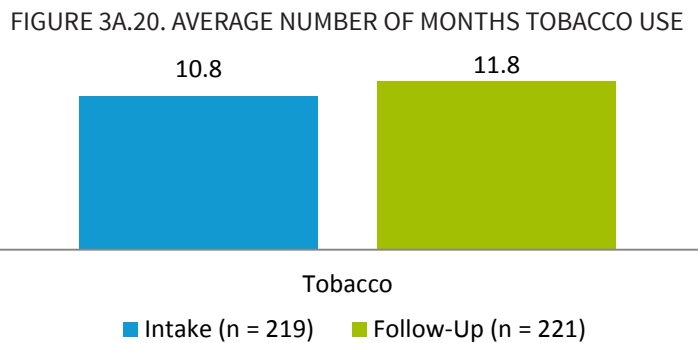
FIGURE 3A.19. GENDER DIFFERENCES IN SMOKING TOBACCO AT INTAKE AND FOLLOW-UP<sup>a</sup>



a—Significant difference by gender at follow-up,  $p < .05$ .

### AVERAGE NUMBER OF MONTHS USED TOBACCO

Figure 3A.20 shows, among tobacco users, the number of months clients reported using tobacco at intake and for the projected follow-up. Among the individuals who reported using tobacco in the 12 months before entering the program (n = 219), they reported using tobacco, on average, 10.8 months. Among individuals who reported using tobacco at follow-up (n = 221), they reported using, on average, 11.8 of the projected follow-up months.

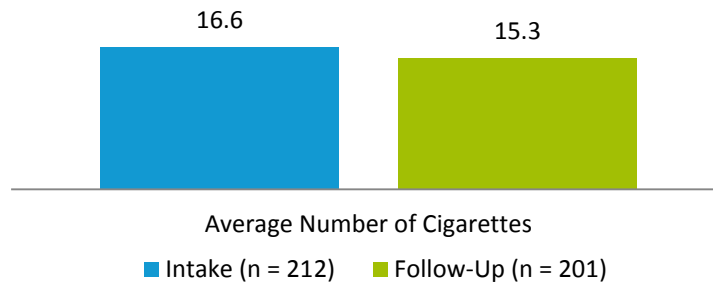


### AVERAGE NUMBER OF CIGARETTES SMOKED PER DAY

Figure 3A.21 shows, among individuals who smoked tobacco, the average number of cigarettes smoked per day. Among the individuals who reported smoking tobacco in the 12 months before entering the program (n = 212), they reported smoking, on average, 16.6 cigarettes per day. Among individuals who reported smoking tobacco at follow-up (n = 201), they reported smoking, on average, 15.3 cigarettes per day.

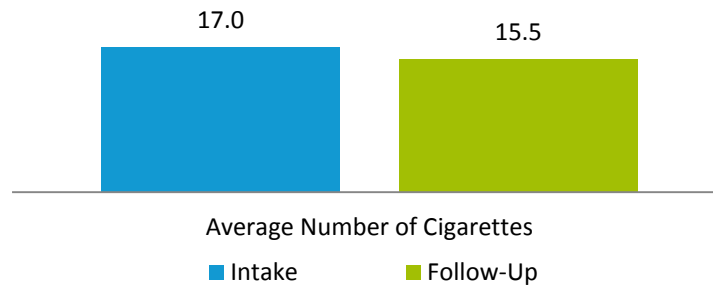


FIGURE 3A.21. AVERAGE NUMBER OF CIGARETTES SMOKED PER DAY AT INTAKE AND FOLLOW-UP, AMONG THOSE WHO SMOKED



Among the individuals who reported smoking tobacco in the 12 months before intake and the 6 months before follow-up (n = 192), the average number of cigarettes they smoked per day decreased significantly from 17.0 at intake to 15.5 at follow-up (see Figure 3A.22).

FIGURE 3A.22. AMONG INDIVIDUALS WHO SMOKED CIGARETTES AT INTAKE AND FOLLOW UP (N = 192), THE AVERAGE NUMBER OF CIGARETTES SMOKED PER DAY\*

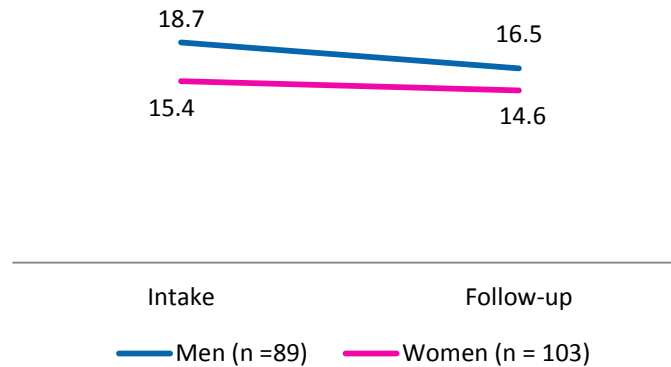


\*p < .05, \*\*p < .01, \*\*\*p < .001.

*GENDER DIFFERENCES IN NUMBER OF CIGARETTES SMOKED PER DAY, PAST 12-MONTH/6-MONTH*

Among the 192 individuals who reported smoking tobacco at intake and follow-up, men reported smoking significantly more cigarettes per day at intake and follow-up compared to women (see Figure 3A.23).

FIGURE 3A.23. GENDER DIFFERENCE IN AVERAGE NUMBER OF CIGARETTES SMOKED PER DAY AT INTAKE AND FOLLOW-UP<sup>a</sup>

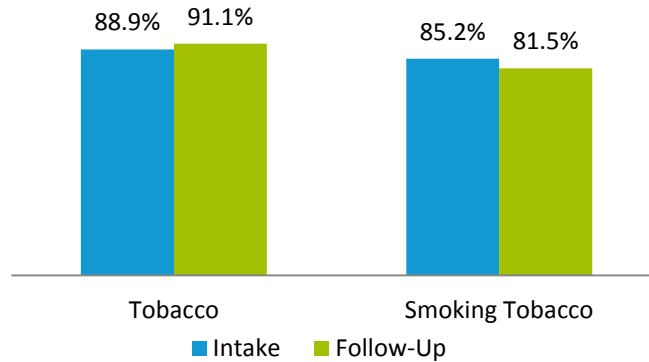


a—Significant difference by gender at intake (p < .01) and follow-up (p < .05).

### TOBACCO USE AND SMOKING, PAST 30-DAY USE

The majority of individuals reported using tobacco in the 30 days before entering the recovery center (88.9%) and at follow-up (91.1%). There was no change in tobacco use from intake to follow-up (see Figure 3A.24). Additionally, there was no significant change in smoking tobacco.

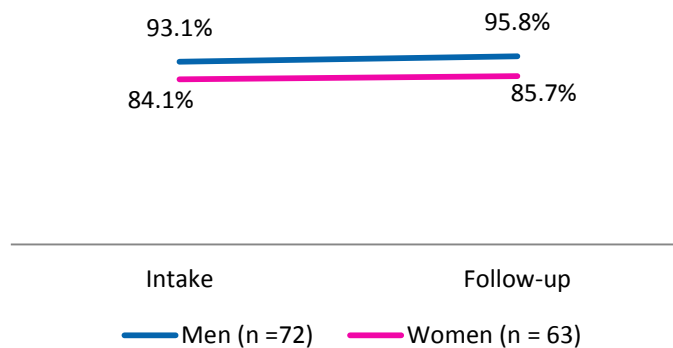
FIGURE 3A.24. PAST 30-DAY TOBACCO USE AT INTAKE AND FOLLOW-UP (n = 135)



### GENDER DIFFERENCES IN TOBACCO USE IN THE PAST 30 DAYS

The vast majority of men and women reported using tobacco in the 30 days before intake, with no difference by gender (see Figure 3A.25). However, by follow-up, significantly more men than women reported using tobacco in the past 30 days. There was no significant change in the number of men and women reporting tobacco use from intake to follow-up.

FIGURE 3A.25. GENDER DIFFERENCE IN PAST 30-DAY TOBACCO USE AT INTAKE AND FOLLOW-UP<sup>a</sup>



<sup>a</sup>—Significant difference by gender at follow-up,  $p < .05$ .

## 3B. SUBSTANCE USE FOR CLIENTS IN A CONTROLLED ENVIRONMENT

Changes in drug and alcohol use from intake to follow-up were analyzed separately for individuals who were in a controlled environment (e.g., prison, jail, other drug-free residential facility) all 30 days before entering the recovery center (n = 148) because being in a controlled environment reduces opportunities for alcohol and drug use.

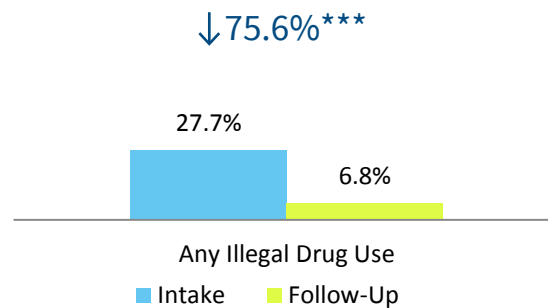
### ANY ILLEGAL DRUGS, PAST 30-DAY USE

Of the individuals who were in a controlled environment all 30 days, 27.7% reported they used illegal drugs (including marijuana, cocaine, heroin, methadone, hallucinogens, barbiturates, inhalants, and non-prescribed use of prescription opiates, sedatives and amphetamines) in the 30 days before they



entered the recovery center (see Figure 3B.1). In the 30 days before follow-up, 6.8% of clients reported illegal drug use which is a 75.6% significant decrease from intake to follow-up.

FIGURE 3B.1. PAST 30-DAY ILLEGAL DRUG USE AT INTAKE AND FOLLOW-UP FOR CLIENTS IN A CONTROLLED ENVIRONMENT (n = 148)

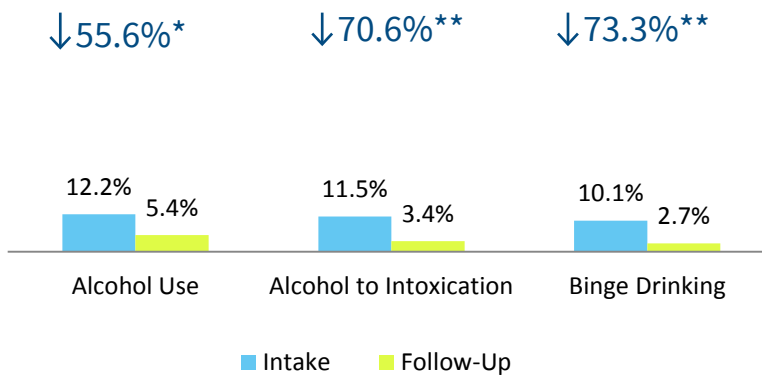


\*p < .05, \*\*p < .01, \*\*\*p < .001.

### ALCOHOL, PAST 30 DAY USE

As expected, given their confinement to a controlled environment in the 30 days before entering the recovery center, only a minority of individuals reported they had used alcohol in those 30 days (see Figure 3B.2). The percentage of individuals who reported alcohol use at follow-up decreased to 5.4% (a significant decrease of 55.6%). At follow-up, 3.4% reported they used alcohol to intoxication, and 2.7% reported they had engaged in binge drinking. Thus, there were significant decreases in alcohol use, alcohol use to intoxication, and binge drinking for individuals who were in a controlled environment all 30 days.

FIGURE 3B.2. PAST 30-DAY ALCOHOL USE AT INTAKE AND FOLLOW-UP FOR CLIENTS IN A CONTROLLED ENVIRONMENT (n = 148)



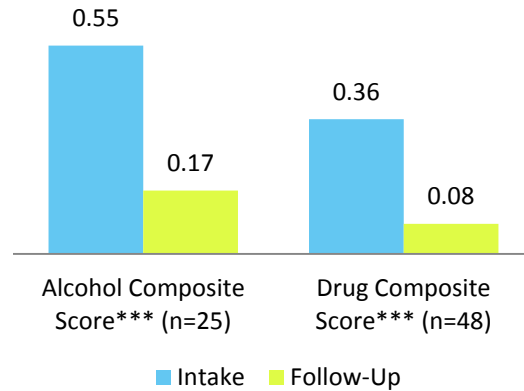
\*p < .05, \*\*p < .01, \*\*\*p < .001.

### CHANGE IN SELF-REPORTED ALCOHOL AND DRUG COMPOSITE SCORES FOR CLIENTS IN A CONTROLLED ENVIRONMENT

Among the individuals who were in a controlled environment all 30 days before entering the program and who did not report abstaining from the substance (alcohol, drugs) at intake and follow-up, the average ASI composite scores (see side bar on page 26) for alcohol and drugs decreased significantly from intake to follow-up (see Figure 3B.3).<sup>17</sup>

<sup>17</sup> Of the 148 cases where the individual was in a controlled environment all 30 days before entering the recovery center, 25 individuals used alcohol and 48 individuals used drugs in the 30 days before entering the recovery center, follow-up or both periods.

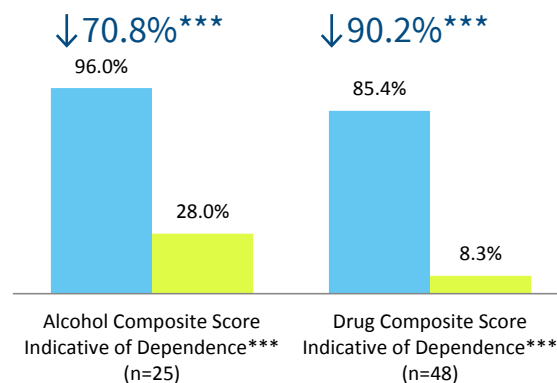
FIGURE 3B.3. AVERAGE ASI ALCOHOL AND DRUG COMPOSITE SCORES AT INTAKE AND FOLLOW-UP



\*p < .05, \*\*p < .01, \*\*\*p < .001.

Among the individuals who were in a controlled environment all 30 days before entering the program and who did not report abstaining from the substance, the majority had an alcohol and drug composite score that met the cutoff for dependence at intake (96.0% and 85.4% respectively), while the percentages of individuals with alcohol and drug composite scores that met the cutoff for dependence decreased significantly at follow-up (see Figure 3B.4). A minority of individuals (28.0%) had an alcohol composite score that met the cutoff for dependence at follow-up, and only 8.3% had a drug composite score that met the cutoff for dependence at follow-up. Thus, for the group of individuals who were in a controlled environment all 30 days before entering the program and who used alcohol or drugs at intake, follow-up, or both, the number of individuals with an alcohol composite score that met cutoff for dependence decreased significantly by 70.8% and the number of individuals with a drug composite score that met cutoff for dependence decreased significantly by 90.2%.

FIGURE 3B.4. ASI COMPOSITE SCORES MEETING THE CUTOFF FOR DEPENDENCE AT INTAKE AND FOLLOW-UP

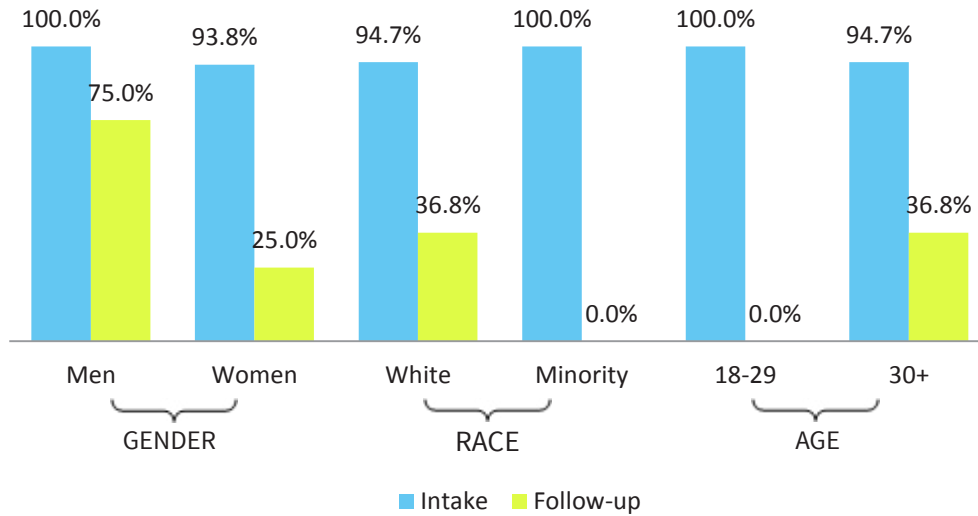


\*p < .05, \*\*p < .01, \*\*\*p < .001.

Analyses were also conducted to examine differences between individuals who had an alcohol composite score indicative of dependence at intake and follow-up by gender, race/ethnicity, or age<sup>18</sup> (see Figure 3B.5). No demographic differences were found at intake or follow-up for the percentage of individuals who had an alcohol composite score indicative of dependence.

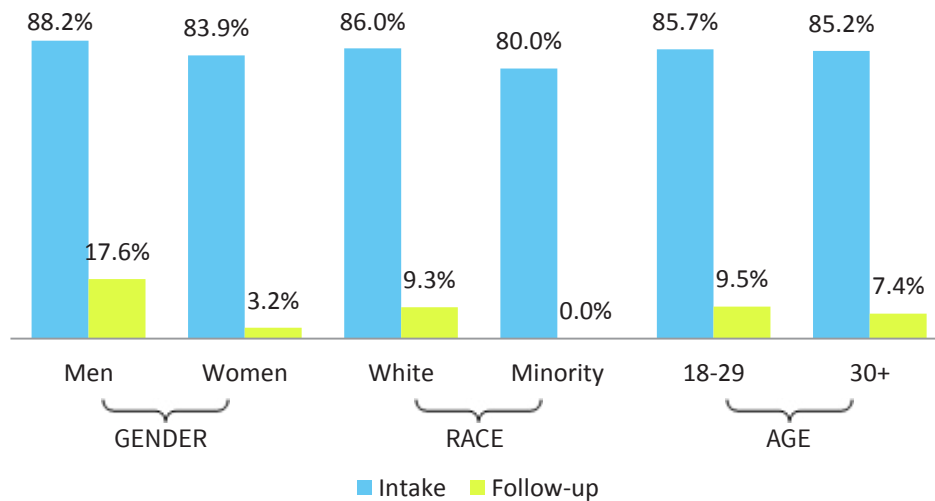
<sup>18</sup> Chi square tests could not be conducted to examine differences by gender because more than 25.0% of the cells had an expected count less than 5.

FIGURE 3B.5. ALCOHOL-USING INDIVIDUALS WITH AN ALCOHOL COMPOSITE SCORE INDICATIVE OF DEPENDENCE AT INTAKE AND FOLLOW-UP BY DEMOGRAPHIC FACTORS (n = 25)



Data were analyzed to examine whether individuals who had a drug composite score indicative of dependence at intake and follow-up differed by gender, race/ethnicity, or age (see Figure 3B.6). No statistically significant differences were found at intake or follow-up. Not finding statistically significant differences may be in part explained by the small number of individuals included in these analyses (n = 48).

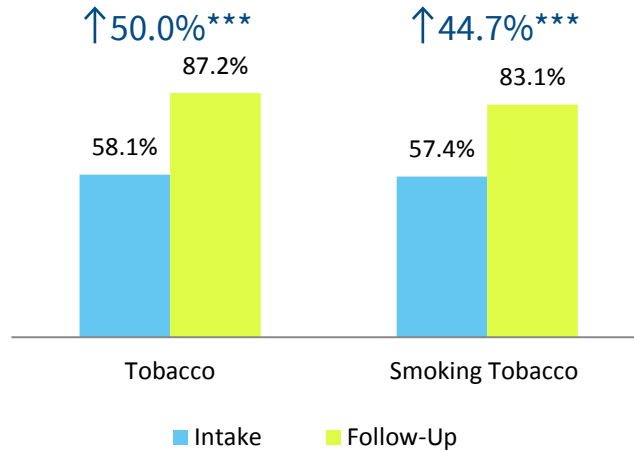
FIGURE 3B.6. DRUG-USING INDIVIDUALS WITH A DRUG COMPOSITE SCORE INDICATIVE OF DEPENDENCE AT INTAKE AND FOLLOW-UP BY DEMOGRAPHIC FACTORS (n = 48)



### TOBACCO, PAST 30 DAY USE

Among individuals who were in a controlled environment all 30 days before they entered the recovery center, 58.1% reported they had used tobacco in those 30 days (see Figure 3B.7). Unlike alcohol and illegal drug use, which decreased from intake to follow-up, the number of clients who reported tobacco use at follow-up increased by 50.0% from intake to 87.2% of clients. Similarly, 57.4% of clients reported smoking tobacco in the past 30 days at intake with a significant increase of 44.7% to 83.1% reporting smoking tobacco in the 30 days before follow-up.

FIGURE 3B.7. PAST 30-DAY TOBACCO USE AT INTAKE AND FOLLOW-UP FOR CLIENTS IN A CONTROLLED ENVIRONMENT

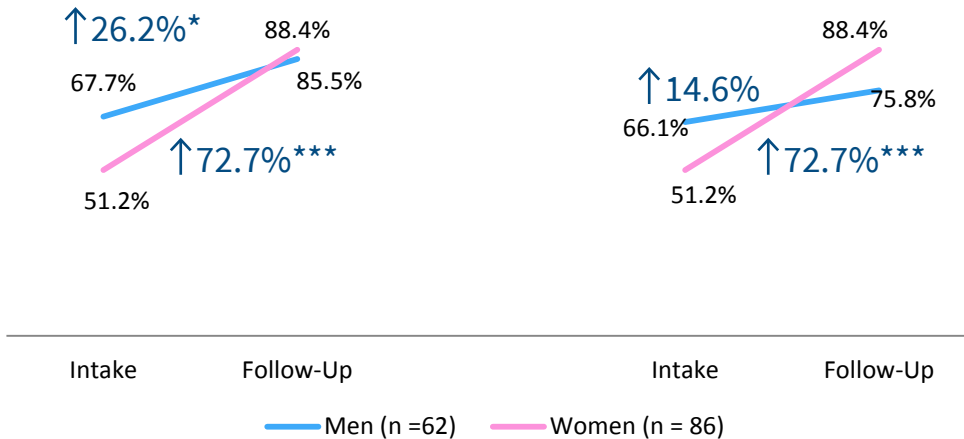


\*p < .05, \*\*p < .01, \*\*\*p < .001.

*GENDER DIFFERENCES IN TOBACCO AND SMOKING TOBACCO USE IN THE PAST 30 DAYS*

Among the individuals in a controlled environment all 30 days before intake, the vast majority of men and women reported using tobacco at intake, with significantly more men reporting tobacco use compared to women (see Figure 3B.8). However, by follow-up, there was no difference in tobacco use by gender. At intake, the percentage of men and women reporting smoking tobacco was not significantly different, but at follow-up, significantly more women reported smoking tobacco compared to men.

FIGURE 3B.8. GENDER DIFFERENCE IN 30-DAY TOBACCO USE AT INTAKE AND FOLLOW-UP



\*p < .05, \*\*p < .01, \*\*\*p < .001.

a—Significant difference by gender at intake, p < .05.

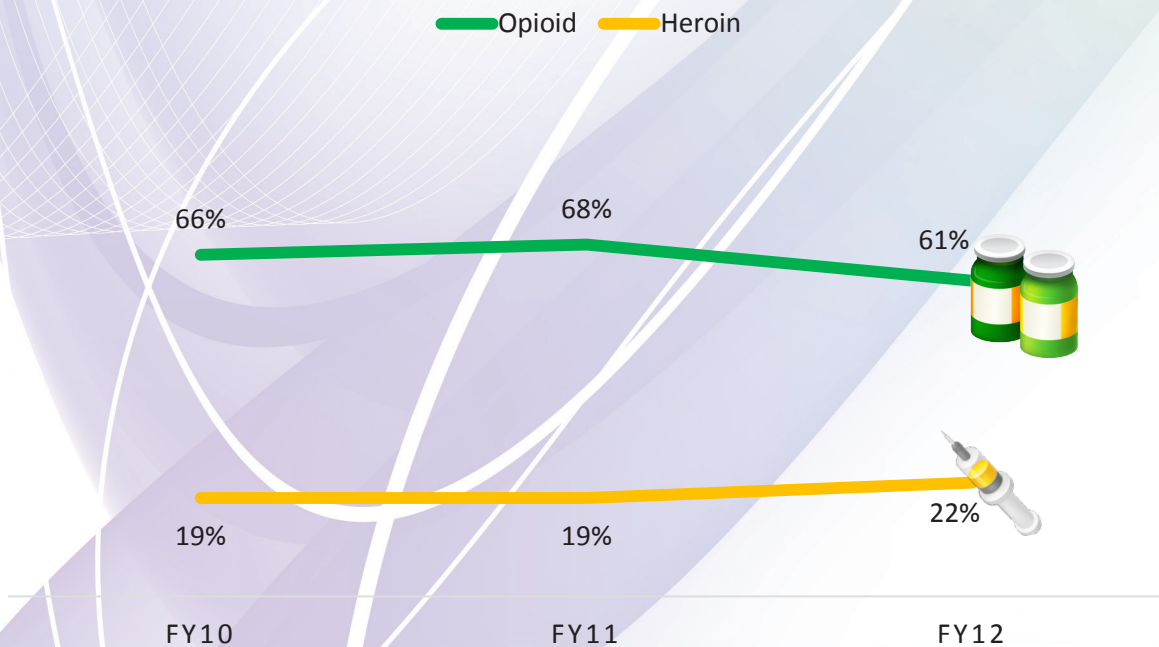
b—Significant difference by gender at follow-up, p < .05.

# TREND ALERT



## How much has opioid and heroin use changed over time?

To examine opioid and heroin use over time the figure below examines RCOS clients at intake 12 months before entering the program on rates of opioid use and heroin use from FY10 to FY12.<sup>19</sup> As the figure shows, the use of opioids has remained fairly steady with two-thirds of clients reporting opioid use in FY10 and 61% reporting opioid use in FY12. In FY10, 19% of clients reported heroin use 12 months before entering the recovery center and while this remained unchanged in FY11, the percent of clients reporting heroin use increased slightly to 22% in FY12.



<sup>19</sup> On average, there were 1,300 intakes per year.

## SECTION 4

# OTHER TARGETED FACTORS

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This section describes pre-program compared to post-program change on five primary targeted factors including: (1) mental and physical health, (2) education, (3) employment, (4) housing/homelessness, and (5) criminal justice system involvement. Results for each targeted factor are presented for the overall sample and separately by gender when there were significant differences.

## 4A. MENTAL HEALTH PROBLEMS

*This subsection examines changes in mental health and stress symptoms from intake to follow-up. Specifically, this subsection examines: (1) depression and/or anxiety symptoms; (2) suicide ideation and attempts; (3) stress symptoms; and (4) perceptions of physical and mental health status. The mental health and stress questions in the RCOS intake and follow-up surveys were self-report measures of mental health symptoms and stress symptoms.<sup>20</sup>*

### DEPRESSION AND/OR ANXIETY SYMPTOMS

To assess depression, participants were first asked two screening questions:

1. “Did you have a two-week period when you were consistently depressed or down, most of the day, nearly every day?” and
2. “Did you have a two-week period when you were much less interested in most things or much less able to enjoy the things you used to enjoy most of the time?”

If participants answered “yes” to at least one of these two screening questions, they were then asked seven additional questions about symptoms of depression (e.g., sleep problems, weight loss or gain, feelings of hopelessness or worthlessness). To meet the study criteria for depression, individuals had to say “yes” to at least one of the two screening questions and at least 4 of the other symptoms.

About 3 in 5 individuals (60.8%) met study criteria for depression in the 12 months before they entered the recovery center (see Figure 4A.1). By follow-up, only 17.0% met criteria for depression, representing a 72.1% significant decrease.

The percentage of clients meeting criteria for depression decreased 72% at follow-up

To assess for generalized anxiety, participants were first asked:

1. “In the 12 months before you entered this recovery center, did you have a period lasting 3 months or longer where you worried excessively or were anxious about multiple things on more days than not (like family, health, finances, school, or work difficulties)?”

Participants who answered “yes” were then asked 6 additional questions about anxiety symptoms (e.g., felt restless, keyed up or on edge, have difficulty concentrating, feel irritable). To meet criteria for generalized anxiety, individuals had to answer “yes” to the screening question and to at least 3 of the symptom items.

The percentage of clients meeting criteria for generalized anxiety decreased 61% at follow-up

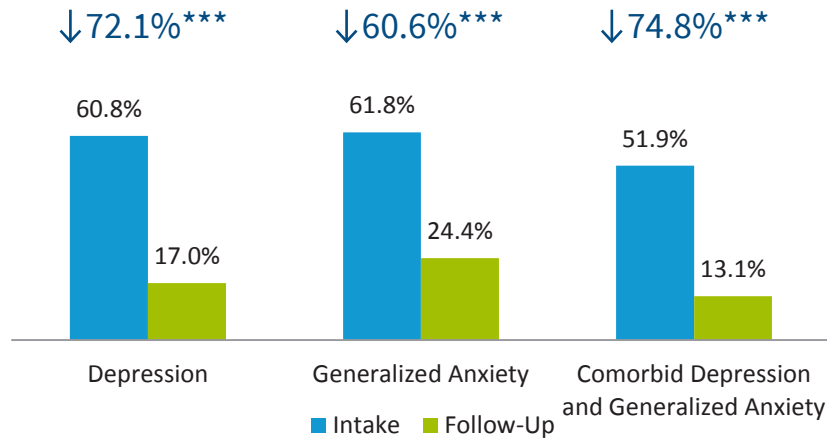
In the 12 months before entering the recovery center, 6 in 10 individuals (61.8%) reported symptoms that met the study criteria for generalized anxiety and 24.4% reported symptoms at follow-up. This indicates there was a 60.6% significant decrease in the number of clients meeting the study criteria for generalized anxiety.

At intake, half of the clients (51.9%) met criteria for both depression and generalized anxiety and at follow-up only 13.1% met criteria for both. There was a 74.8% significant reduction in the number of individuals who reported symptoms that met the criteria for both depression and Generalized Anxiety at follow-up.

The percentage of clients meeting criteria for both depression and generalized anxiety decreased 75% at follow-up

<sup>20</sup> Results are presented as change in the percentage of clients meeting criteria for mental health problems in the 12 months before entering the recovery center to the 6 months before follow-up.

FIGURE 4A.1. CLIENTS MEETING STUDY CRITERIA FOR DEPRESSION, GENERALIZED ANXIETY, AND COMORBID DEPRESSION AND GENERALIZED ANXIETY AT INTAKE AND FOLLOW-UP (n = 283)



\*p < .05, \*\*p < .01, \*\*\*p < .001.

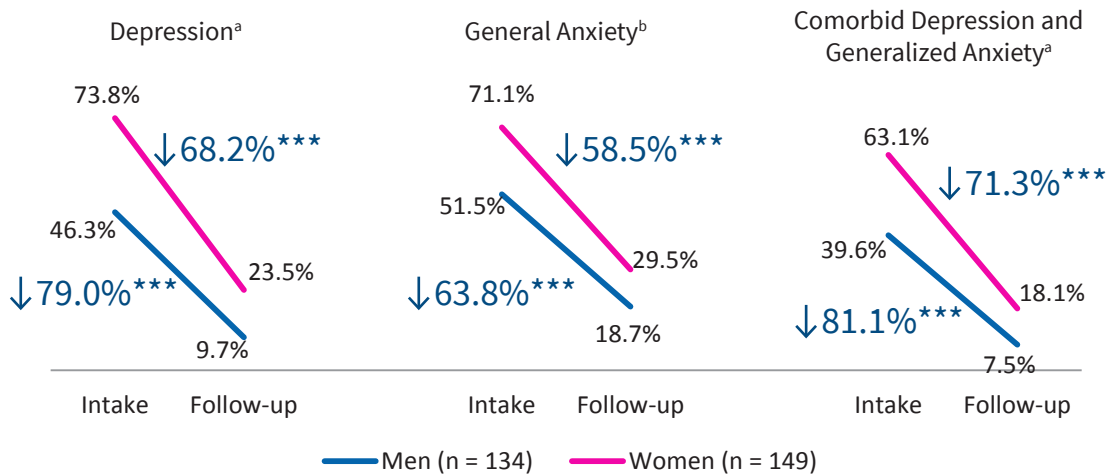
### GENDER DIFFERENCES IN DEPRESSION AND/OR GENERALIZED ANXIETY

Significantly more women met criteria for depression at intake compared to men (73.8% vs. 46.3%). By follow-up, only 9.7% of men and 23.5% of women met criteria for depression, which represents a 79.0% significant decrease in depression for men and a 68.2% significant decrease for women. At follow-up significantly more women than men met criteria for depression. Similarly, significantly more women than men met criteria for generalized anxiety at intake (71.1% vs. 51.5%) and follow-up (29.5% vs. 18.7%). There were significant decreases from intake to follow-up in the number of women and men who met criteria for generalized anxiety. Significantly more women than men met criteria for comorbid depression and generalized anxiety at intake (63.1% vs. 39.6%) and follow-up (18.1% vs. 7.5%).



*Significantly more women met criteria for depression and generalized anxiety at intake and follow-up compared to men*

FIGURE 4A.2. GENDER DIFFERENCES IN CLIENTS MEETING CRITERIA FOR DEPRESSION AND GENERALIZED ANXIETY AT INTAKE AND FOLLOW-UP<sup>a,b</sup>



\*p < .05, \*\*p < .01, \*\*\*p < .001.

a—Statistical difference by gender at intake (p < .001) and follow-up (p < .01).

b—Statistical difference by gender at intake (p < .01) and follow-up (p < .05).

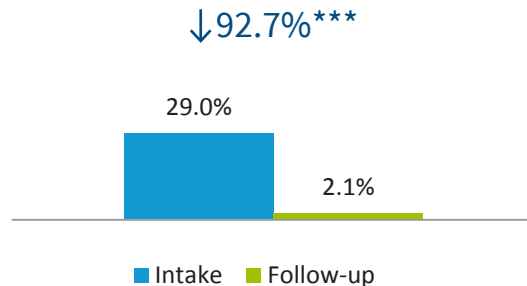


### CHANGE IN PERCENTAGE OF CLIENTS REPORTING SUICIDE IDEATION AND/OR ATTEMPTS

Suicide ideation and attempts were measured with questions about thoughts of suicide and attempts to commit suicide. Nearly 3 in 10 (29.0%) individuals reported thoughts of suicide or attempted suicide in the 12 months before entering the program. At follow-up, only 2.1% of individuals reported thoughts of suicide or attempted suicide in the 6 months before follow-up. There was a 92.7% decrease in suicidal ideation and attempts from intake to follow-up (see Figure 4A.3).

The percentage of clients reporting suicidal ideation and/or attempts decreased 93% at follow-up

FIGURE 4A.3. CLIENTS REPORTING SUICIDAL IDEATION AND/OR ATTEMPTS AT INTAKE AND FOLLOW-UP (n = 283)

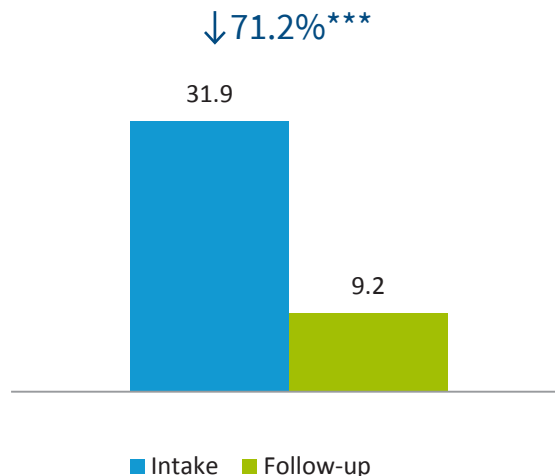


\*p < .05, \*\*p < .01, \*\*\*p < .001.

### AVERAGE STRESS SYMPTOMS

Clients were also asked about their physiological symptoms often associated with higher stress called the Stress Index.<sup>21</sup> The index contains 15 symptoms; the client indicates how often they have experienced each symptom in the past 7 days (e.g., experienced unexplained aches and pains, slept poorly, experienced an increased heart rate). Higher scores on the Stress Index indicate higher stress and greater physiological indicators of stress. For the overall sample, scores on the Stress Index decreased significantly from 31.9 at intake to 9.2 at follow-up (with a range of scores from 0 to 75), representing a decrease of 71.2% (see Figure 4A.4).

FIGURE 4A.4. AVERAGE SCORES ON THE STRESS INDEX AT INTAKE AND FOLLOW-UP (N = 280)<sup>a,b</sup>



a—Significance tested with paired t-test; \*p < .05, \*\*p < .01, \*\*\*p < .001.  
 b—Three cases had missing values on the scale sum at follow-up.

<sup>21</sup> Measure created by Logan, TK and Walker, R. Stress and Allostatic Load.

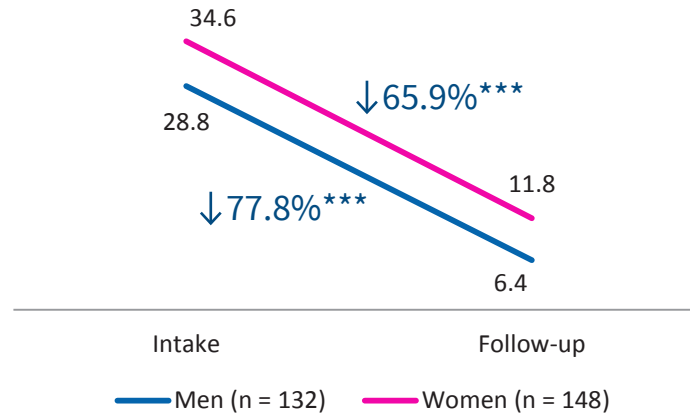
GENDER DIFFERENCES IN STRESS SYMPTOMS

Figure 4A.5 shows that women’s scores on the Stress Index were significantly higher than men’s scores at intake and follow-up. Both men’s and women’s scores decreased significantly from intake to follow-up.



*At intake and follow-up, women’s Stress Index scores were significantly higher than men’s scores*

FIGURE 4A.5. GENDER DIFFERENCES IN AVERAGE SCORES ON THE STRESS INDEX AT INTAKE AND FOLLOW-UP<sup>a</sup>



\*p < .05, \*\*p < .01, \*\*\*p < .001.

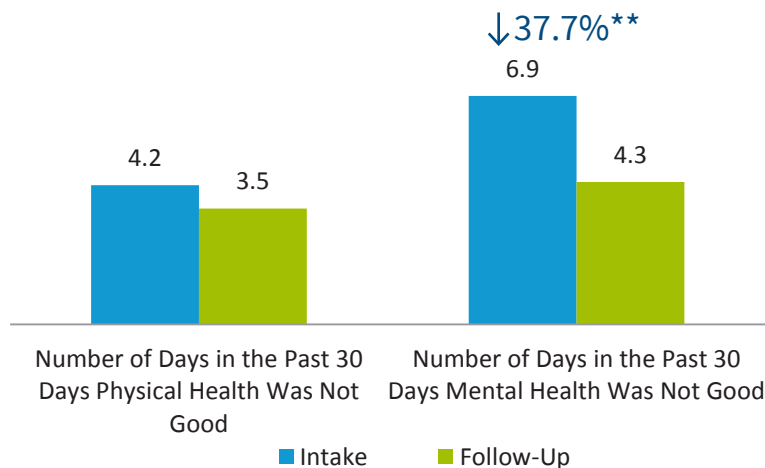
a—Statistical difference by gender at intake (p < .05) and follow-up (p < .001).

PHYSICAL AND MENTAL HEALTH STATUS

Individuals were asked how many days in the past 30 days their physical and mental health were not good, at intake and follow-up (see Figure 4A.6). The number of days individuals reported their physical health was not good slightly decreased from intake to follow-up, but this decrease was not significant. Overall, the number of days mental health was not good decreased significantly, by 37.7%, from intake to follow-up.

**The number of days mental health was not good decreased significantly**

FIGURE 4A.6. PERCEPTIONS OF POOR PHYSICAL AND MENTAL HEALTH IN THE PAST 30 DAYS AT INTAKE AND FOLLOW-UP (n = 283)<sup>a,b</sup>

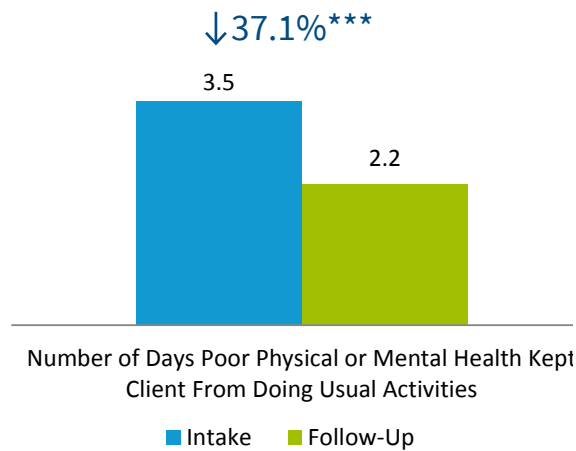


a—Statistical significance tested by paired t-test; \*p < .05, \*\*p < .01, \*\*\*p < .001.

b—One case had a missing value for number of days in the past 30 days mental health was not good at follow-up.

Individuals were also asked to report the number of days in the past 30 days poor physical or mental health had kept them from doing their usual activities (see Figure 4A.7). The number of days clients reported their physical or mental health kept them from doing their usual activities decreased significantly from intake to follow-up (3.5 vs. 2.2).

FIGURE 4A.7. PERCEPTIONS OF POOR PHYSICAL AND MENTAL HEALTH IN THE PAST 30 DAYS (n = 283)

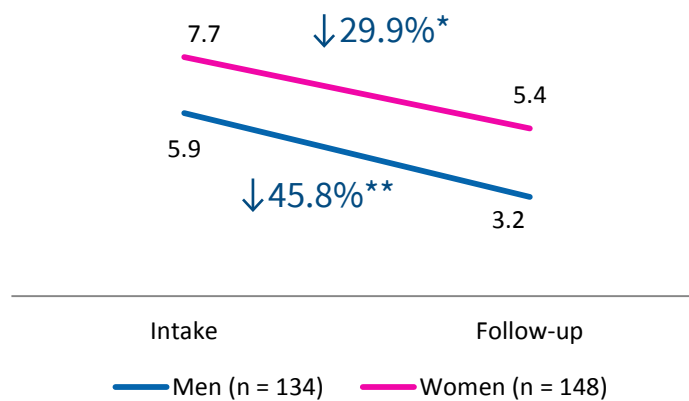


a—Statistical significance tested by paired t-test; \*p < .05, \*\*p < .01, \*\*\*p < .001.

#### GENDER DIFFERENCES IN PERCEPTIONS OF MENTAL HEALTH

Both men’s and women’s reported number of days their mental health was not good decreased significantly from intake to follow-up (see Figure 4A.8). Men’s self-reported number of days their mental health was not good decreased more than women’s, such that men’s average number of days was significantly lower than women’s at follow-up (3.2 vs. 5.4).

FIGURE 4A.8. GENDER DIFFERENCES IN NUMBER OF DAYS IN THE PAST 30 DAYS MENTAL HEALTH WAS NOT GOOD<sup>a</sup>



\*p < .05, \*\*p < .01, \*\*\*p < .001.

a—Statistical difference by gender at follow-up; p < .05.

## 4B. EDUCATION AND EMPLOYMENT

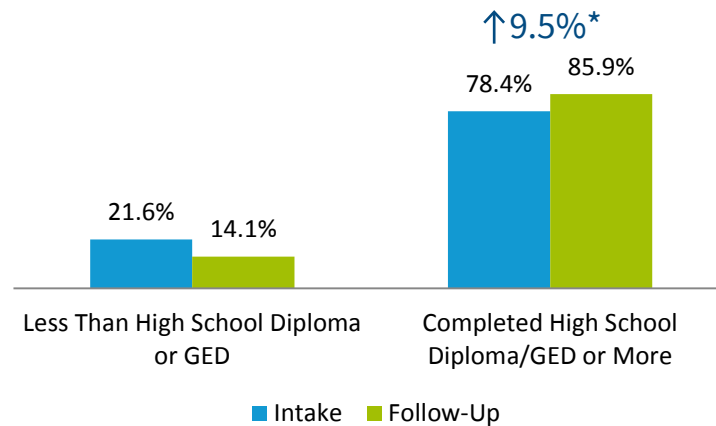
This subsection examines changes in education and employment from intake to follow-up. Specifically, this subsection examines: (1) highest level of education completed; (2) the percentage of clients who worked full-time or part-time, (3) the number of months clients were employed full-time or part-time, among those who were employed the year prior to program entry; and (4) expectations to be employed in the next 12 months.

### EDUCATION

Overall, the highest number of years of education completed increased significantly from 12.2 at intake to 12.4 at follow-up.<sup>22</sup>

Another way to examine change in education was to categorize individuals into one of two categories, based on their highest level of education completed: (1) less than a high school diploma or General Educational Development (GED), or (2) a high school diploma or GED, or higher (see Figure 4B.1). At intake, 21.6% of the follow-up sample reported that they had less than a high school diploma or GED. At follow-up, 14.1% reported that they had completed less than a high school diploma or GED. At intake, 78.4% of the follow-up sample had a high school diploma or GED or had attended school beyond a high school diploma or GED and at follow-up the percentage had increased significantly by 9.5% to 85.9%.

FIGURE 4B.1. HIGHEST LEVEL OF EDUCATION COMPLETED AT INTAKE AND FOLLOW-UP (n = 283)



\*p < .05, \*\*p < .01, \*\*\*p < .001.

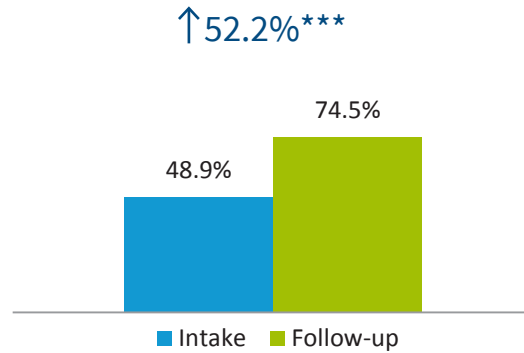
### EMPLOYMENT

Clients were asked in the intake survey to report the number of months they were employed full-time or part-time in the 12 months before they entered the recovery center. At follow-up they were asked to report the number of months they were employed full-time or part-time in the 6 months before the follow-up survey. Of the 282 individuals who indicated the number of months they were employed at intake and follow-up<sup>23</sup>, 48.9% worked part-time or full-time at least one month in the 12 months before entering the recovery center. At follow-up, 74.5% reported working part-time or full-time at least one month in the 6 months before follow-up, which was a significant increase of 52.2%.

<sup>22</sup> Number of years of education was recoded for analysis so that 12 years of education and GED were equal to 12.

<sup>23</sup> 1 case had missing data for the number of months employed at follow-up.

FIGURE 4B.2. EMPLOYMENT AT INTAKE AND FOLLOW-UP (n = 282)



\*p < .05, \*\*p < .01, \*\*\*p < .001.

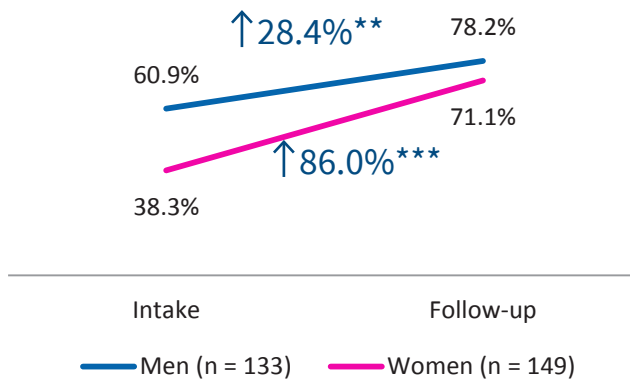
### GENDER DIFFERENCES IN EMPLOYMENT

Significantly more men than women were employed part-time or full-time at least one month in the 12 months before entering the program (see Figure 4B.3). The number of men and women who reported being employed at least one month in the follow-up period increased significantly by 28.4% and 86.0% respectively. Thus, at follow-up, there was no significant difference in the number of men and women who reported they were employed at least one month in the past 6 months.



*The number of women employed at least one month increased significantly by 86%*

FIGURE 4B.3 GENDER DIFFERENCES IN EMPLOYMENT AT INTAKE AND FOLLOW-UP (n = 282)<sup>a</sup>



\*p < .05, \*\*p < .01, \*\*\*p < .001.

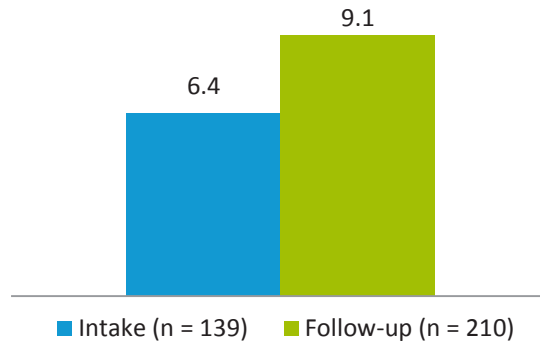
a—Significant difference in the percentage of individuals who were employed part-time or full-time in at least one month at intake by gender; p < .001.

### AVERAGE NUMBER OF MONTHS EMPLOYED

As seen in Figure 4B.4, among individuals who reported being employed part-time or full-time at all in the 12 months before entering the program (n = 139), the average number of months worked was 6.4.<sup>24</sup> Among the 210 individuals who worked at all at follow-up, the projected number of months they worked was 9.1.

<sup>24</sup> Because the reference period was not the same at intake (i.e., 12 months) and follow-up (i.e., 6 months) the proportion of months the client reported working full-time or part-time for each period was computed to allow for comparison of employment at intake and follow-up. The change in proportion was analyzed to determine if the change was statistically significant. To facilitate interpretation of the results, the average proportion found for the follow-up was projected to a 12-month period and presented. Figure 4B.4 shows the number of months clients reported working in 12 months before entering the recovery center and the projected number of months clients worked in the projected 12-month follow-up.

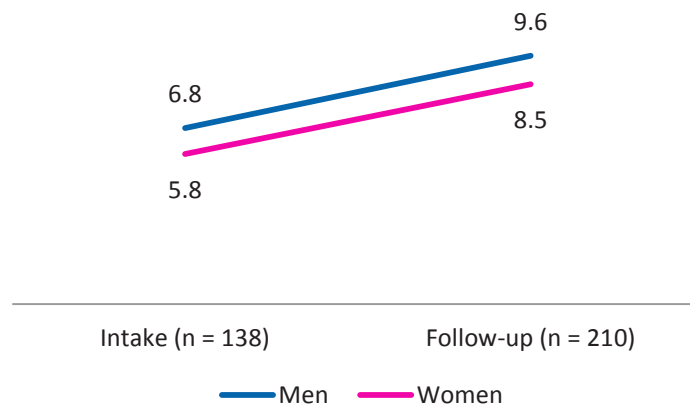
FIGURE 4B.4. AVERAGE NUMBER OF MONTHS EMPLOYED AT INTAKE AND FOLLOW-UP, AMONG THOSE WHO REPORTED EMPLOYMENT



*GENDER DIFFERENCES IN THE AVERAGE NUMBER OF MONTHS EMPLOYED*

Among those individuals who reported any employment at intake and follow-up, there were no differences at intake in the number of months employed by gender. However, at follow-up, men reported more months of employment compared to women (see Figure 4B.5).

FIGURE 4B.5 GENDER DIFFERENCES IN NUMBER OF MONTHS EMPLOYED AT INTAKE AND FOLLOW-UP, AMONG THOSE WHO REPORTED EMPLOYMENT<sup>a</sup>



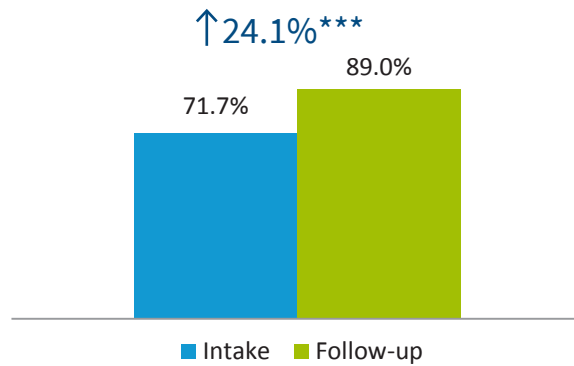
\*p < .05, \*\*p < .01, \*\*\*p < .001.  
 a—Significant difference in proportion of months worked at follow-up by gender; p < .05.

**EXPECTATIONS OF FUTURE EMPLOYMENT**

Clients were asked at intake if they expected to be employed in the next 12 months and at follow-up if they expected to be employed in the next 6 months (see Figure 4B.6). When entering the recovery center, 71.7% of clients expected to be employed in the next 12 months. At follow-up, 89.0% of clients expected to be employed in the next 6 months, which is a 24.1% significant increase.

**At follow-up, nearly 9 in 10 clients expected to be employed in the next 6 months**

FIGURE 4B.6. EXPECTATIONS TO BE EMPLOYED IN THE NEXT 12 (OR 6) MONTHS (n = 283)

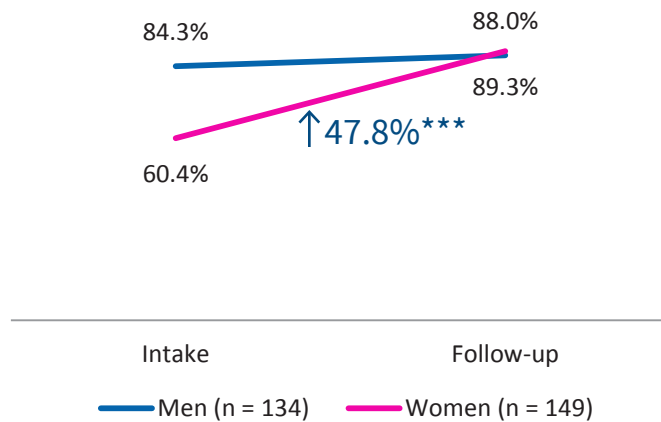


\*p < .05, \*\*p < .01, \*\*\*p < .001.

*GENDER DIFFERENCES IN EXPECTATIONS OF FUTURE EMPLOYMENT*

When entering the recovery center significantly more men than women said they expected to be employed in the next 12 months (84.3% vs. 60.4%). There was no significant change in the number of men who reported they expected to be employed in the next 6 months at follow-up. However, there was a significant increase by 47.8% in the number of women who said at follow-up they expected to be employed in the next 6 months.

FIGURE 4B.7. GENDER DIFFERENCES IN EXPECTATIONS TO BE EMPLOYED IN THE NEXT 12 (OR 6) MONTHS (n = 283)<sup>a</sup>



\*p < .05, \*\*p < .01, \*\*\*p < .001.

a—Significant difference in expectation to be employed at intake by gender; p < .001.

**CLIENT QUOTE**

“First time I’d ever been in recovery and maintained sobriety.”

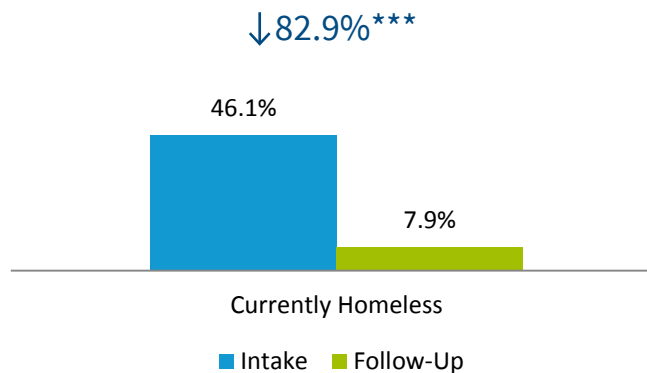
## 4C. HOMELESSNESS AND LIVING SITUATION

*This subsection of target factors examines the clients' living situation at both intake and follow-up. Specifically, clients are asked at both points: (1) if they consider themselves currently homeless; and (2) in what type of situation (i.e., own home or someone else's home, residential program, shelter) they have lived for most of the period.*

### HOMELESSNESS

Clients were asked if they considered themselves currently homeless at intake and at follow-up. A sizable minority of clients (46.1%) reported being homeless when they entered the recovery center, and 7.9% reported being homeless at follow-up.<sup>25</sup> This is a significant decrease of 82.9% in the number of clients who reported they were currently homeless (see Figure 4C.1).

FIGURE 4C.1. CURRENT HOMELESSNESS AT INTAKE AND FOLLOW-UP (n=280)



\*p < .05, \*\*p < .01, \*\*\*p < .001.

### LIVING SITUATION

Change in living situation from intake to follow-up was examined for the RCOS follow-up sample (see Figure 4C.2).<sup>26</sup> At intake, individuals were asked about where they lived for the majority of the time in the 12 months before entering the recovery center, and at follow-up, individuals were asked where they lived for the majority of the time in the 6 months before follow-up.

The majority of individuals reported living in their own home or someone else's home for most of the period at intake and follow-up, with no significant change from intake to follow-up. The number of clients who reported their usual living situation was incarceration in jail or prison decreased significantly by 97.0% from intake (23.5%) to (0.7%) at follow-up.

Even though individuals were targeted for the follow-up survey 12 months after they completed their intake survey and entry into Phase 1, 18.5% reported that their usual living situation in the 6 months before follow-up was in a recovery center, residential program, or sober living home. Thus, the change in number of individuals in a recovery center, residential program, or sober living home increased significantly by 550.0%.

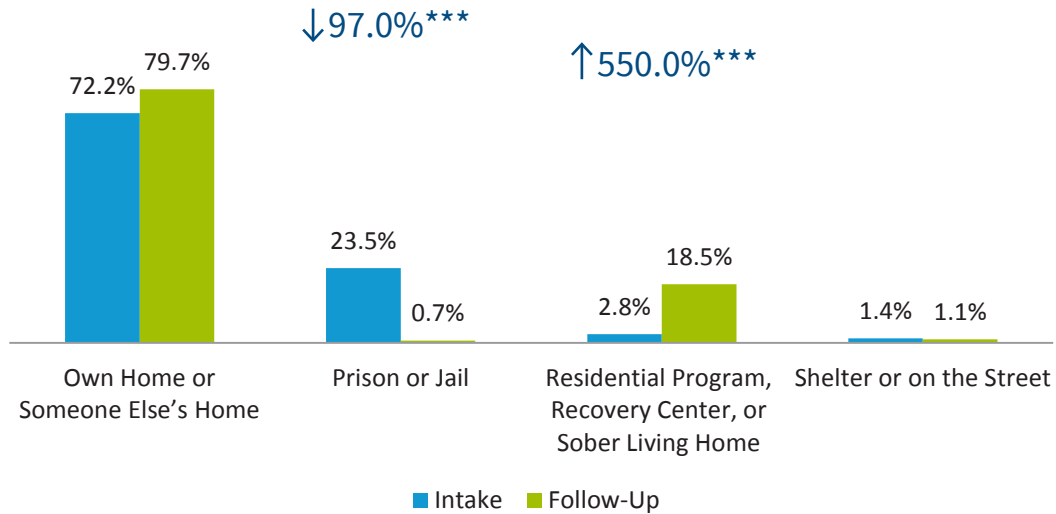
<sup>25</sup> 3 cases had missing values for the question about current homelessness at follow-up.

<sup>26</sup> 2 cases had missing information on usual living situation in the 6 months before follow-up.



Only a small number of individuals reported living in a shelter or on the street at intake (1.4%) and follow-up (1.1%), with no change from intake to follow-up.

FIGURE 4C.2. USUAL LIVING SITUATION AT INTAKE AND FOLLOW-UP (n=281)



\*p < .05, \*\*p < .01, \*\*\*p < .001.

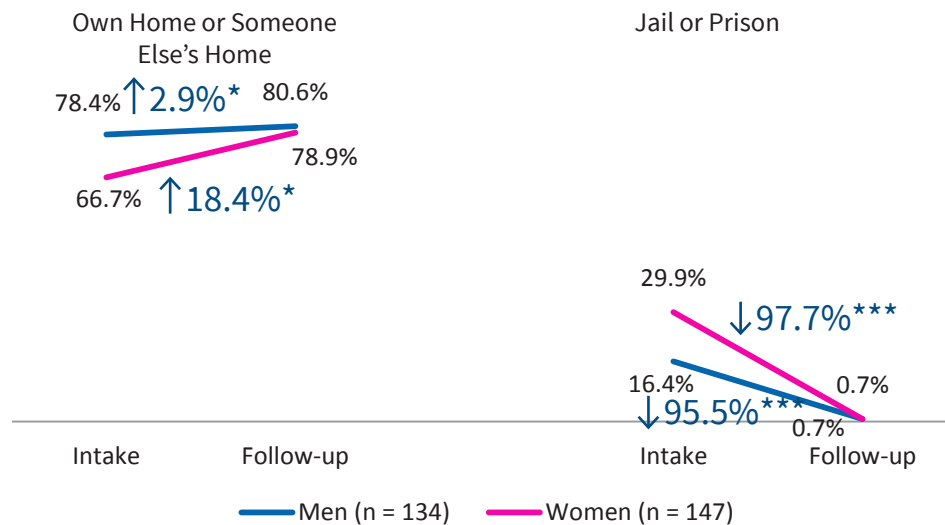
### GENDER DIFFERENCES IN USUAL LIVING SITUATION

Figure 4C.3 shows significantly more men than women reported their usual living situation in the 12 months before entering the program was living in their own home or someone else's home, whereas significantly more women than men reported their usual living situation in the 12 months before intake was in a jail or prison (29.9% compared to 16.4% for men). At follow-up, there was no difference in the percentage of men and women who reported living in their own or someone else's home, or jail or prison.



Significantly more women than men reported their usual living situation at intake was in a jail or prison

FIGURE 4C.3. GENDER DIFFERENCES IN USUAL LIVING SITUATION AS IN THEIR OWN HOME OR SOMEONE ELSE'S HOME, OR IN A JAIL/PRISON AT INTAKE AND FOLLOW-UP (n = 281)<sup>a</sup>



\*p < .05, \*\*p < .01, \*\*\*p < .001.

a— Significant difference by gender at intake; p < .01.

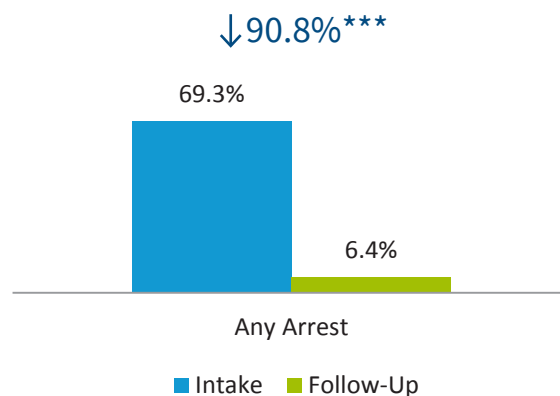
## 4D. INVOLVEMENT IN THE CRIMINAL JUSTICE SYSTEM

This subsection describes change in client involvement with the criminal justice system from intake to follow-up.<sup>27</sup> Specifically, information about: (1) arrests; (2) incarceration; and (3) criminal justice supervision at intake and at follow-up are presented below.

### ARRESTS

At intake individuals were asked about their arrests in the 12 months before they entered the recovery center. At follow-up the period shifted to focus on the months between Phase 1 discharge and follow-up; thus individuals were asked about their arrests in the past 6 months. The majority of individuals (69.3%) reported an arrest in the 12 months before entering the recovery center (see Figure 4D.1). At follow-up, this percentage had decreased significantly by 90.8% to 6.4%.

FIGURE 4D.1. CLIENTS ARRESTED AT INTAKE AND FOLLOW-UP (n = 283)



\*p < .05, \*\*p < .01, \*\*\*p < .001.

### GENDER DIFFERENCES IN ARRESTS

*Significantly more men than women reported being arrested at follow-up*



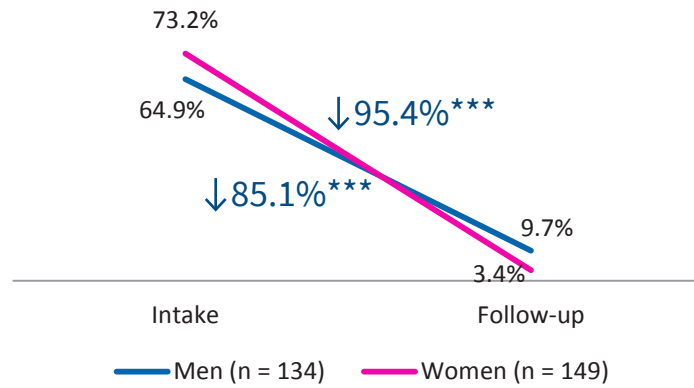
Figure 4D.2 shows no significant difference in the number of men and women who reported being arrested at intake (64.9% vs. 73.2%, respectively). However, at follow-up, significantly more men than women reported being arrested in the past 6 months (9.7% vs. 3.4%).

### CLIENT QUOTE

“First time I’d ever been in recovery and maintained sobriety.”

<sup>27</sup> The period examined at intake was 12 months and at follow-up it was 6 months which means there was a greater opportunity for more arrests and more days of incarceration at intake.

FIGURE 4D.2. GENDER DIFFERENCES IN CLIENTS ARRESTED AT INTAKE AND FOLLOW-UP (n = 283)<sup>a</sup>



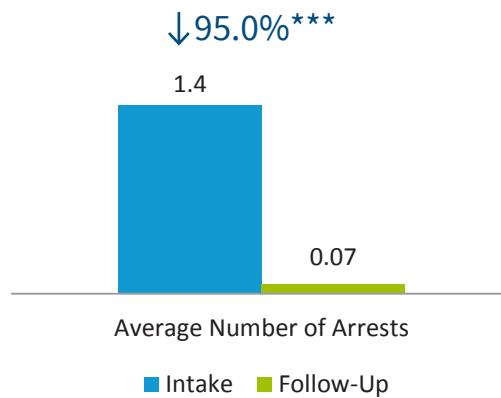
\*p < .05, \*\*p < .01, \*\*\*p < .001.

a— Significant difference by gender at follow-up; p < .05.

### AVERAGE NUMBER OF ARRESTS

At intake, the average number of times individuals reported being arrested in the past 12 months was 1.4 (See Figure 4D.3). In the 6 months before follow-up, the average number of times arrested was 0.07, which was a statistically significant decrease.

FIGURE 4D.3. AVERAGE NUMBER OF ARRESTS AT INTAKE AND FOLLOW-UP (N = 283)<sup>a</sup>



a—Statistical significance tested with paired t-test; \*p < .05, \*\*p < .01, \*\*\*p < .001.

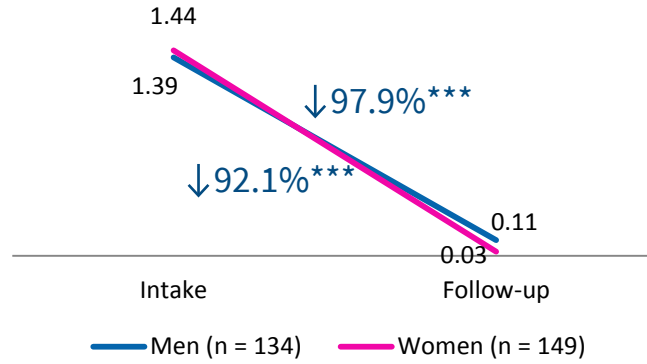
### GENDER DIFFERENCES IN AVERAGE NUMBER OF ARRESTS

Figure 4D.4 shows no significant difference in the average number of arrests at intake by gender. However, at follow-up, men had a significantly higher average number of arrests in the past 6 months compared to women (0.11 vs. 0.03).



*Men reported significantly more arrests at follow-up compared to women*

FIGURE 4D.4. GENDER DIFFERENCES IN AVERAGE NUMBER OF ARRESTS AT INTAKE AND FOLLOW-UP (n = 283)<sup>a</sup>

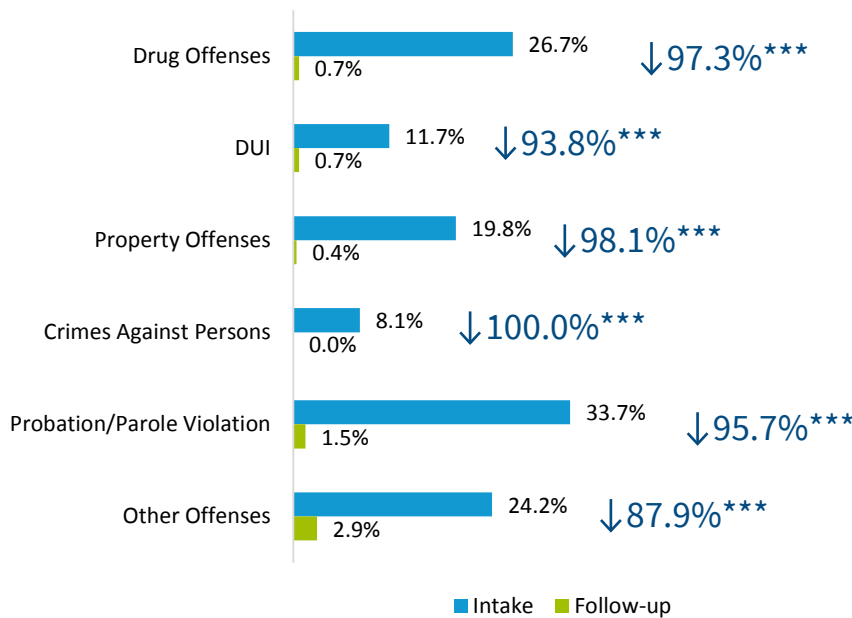


\*p < .05, \*\*p < .01, \*\*\*p < .001.  
 a— Significant difference by gender at follow-up; p < .05.

### ARRESTS BY OFFENSE TYPE

As shown in Figure 4D.5, the percentage of individuals who reported having been arrested for drug offenses decreased by 97.3% from 26.7% at intake to 0.7% at follow-up.<sup>28</sup> The percentage of individuals who reported an arrest for a driving under the influence (DUI) offense decreased by 93.8% from 11.7% at intake to 0.7% at follow-up. Individuals reporting arrests for property offenses decreased by 98.1%, from 19.8% at intake to 0.4% at follow-up. There was a decrease by 100.0% in the number of individuals arrested for crimes against persons from 8.1% at intake to 0.0% at follow-up. The number of individuals reporting an arrest for a probation/parole violation decreased by 95.7%, from 33.7% at intake to 1.5% at follow-up. The number of individuals arrested for other offenses decreased from 24.2% at intake to 2.9% at follow-up, which was a decrease by 87.9%. The decreases in number of individuals reporting arrests for all the categories of criminal offenses were statistically significant.

FIGURE 4D.5. ARRESTS FOR SPECIFIC TYPES OF CRIMINAL OFFENSES IN THE 12 MONTHS BEFORE ENTERING THE RECOVERY CENTER AND THE 6 MONTHS BEFORE FOLLOW-UP (N = 273)



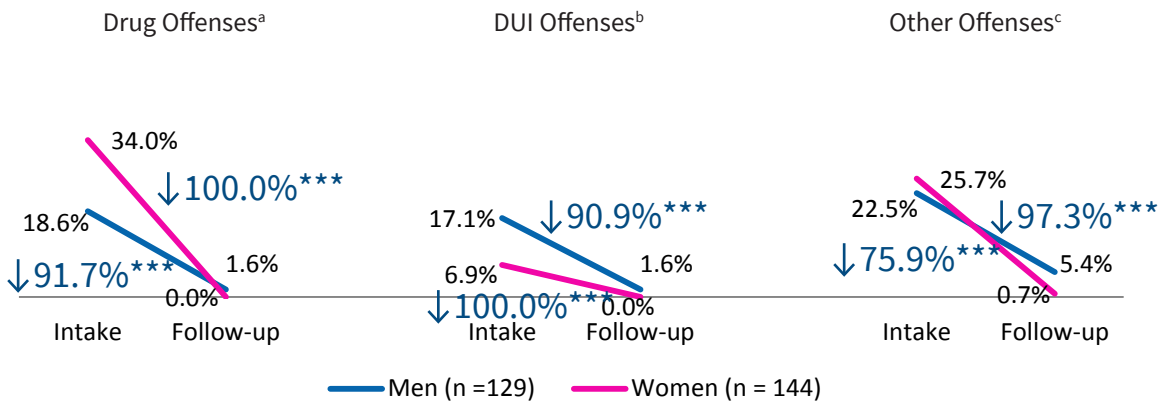
\*p < .05, \*\*p < .01, \*\*\*p < .001.

<sup>28</sup> Eight cases had missing data on arrests for specific types of offenses at intake and two cases had missing data on arrests for specific types of offenses at follow-up.

**GENDER DIFFERENCES IN ARRESTS BY OFFENSE TYPE**

Significantly more women than men (34.0% vs. 18.6%) reported arrests for drug offenses in the 12 months before entering the recovery center (see Figure 4D.6). In addition, more men than women reported arrests for DUI offenses in the 12 months before entering the recovery center. At intake, there was no difference in the number of men and women who reported arrests for other offenses; however, at follow-up, significantly more men than women reported being arrested for other criminal offenses (5.4% vs. 0.7%).

FIGURE 4D.6. GENDER DIFFERENCES IN ARRESTS BY OFFENSE TYPE AT INTAKE AND FOLLOW-UP



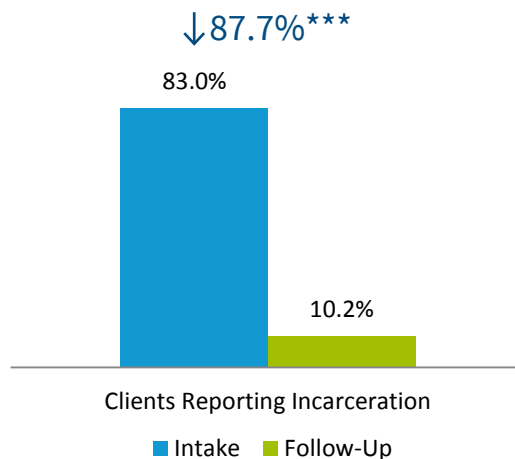
\*p < .05, \*\*p < .01, \*\*\*p < .001.  
 a—Significant difference by gender at intake, p < .01.  
 b—Significant difference by gender at intake, p < .05.  
 c—Significant difference by gender at follow-up, p < .05.

**INCARCERATION**

About 8 in 10 individuals (83.0%) reported spending at least one day in jail or prison in the 12 months prior to entering the recovery center (See Figure 4D.7). At follow-up, only 1 in 10 individuals (10.2%) reported spending at least one day incarcerated in the past 6 months; a significant decrease of 87.7%.

Only  
**1 in 10**  
 Clients reported spending at least one day incarcerated at follow-up

FIGURE 4D.7. CLIENTS REPORTING INCARCERATION AT INTAKE AND FOLLOW-UP (n = 283)



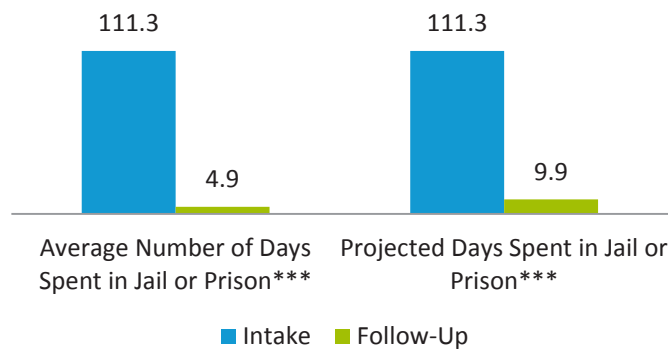
\*p < .05, \*\*p < .01, \*\*\*p < .001.

### AVERAGE NUMBER OF DAYS SPENT INCARCERATED

There was a significant decrease in the average number of days spent in jail or prison from 111.3 days at intake to 4.9 days at follow-up (see Figure 4D.8).

To take into account the different periods measured at intake (i.e., 12 months) and follow-up (i.e., 6 months) the proportion of days in each period clients reported being incarcerated in jail or prison was calculated. Comparisons of those proportions showed significant decreases from intake to follow-up. Overall, individuals spent 0.30 of their time in the 12 months before entering the recovery center incarcerated, whereas they spent only 0.03 of their time in the 6 months before follow-up incarcerated. To make interpretation easier, these proportions were applied to a 12 month period (e.g., the 12 month period before entering the recovery center and the projected 12-month period for follow-up; see Figure 4D.8).

FIGURE 4D.8. AVERAGE NUMBER OF DAYS INCARCERATED IN THE 12 MONTHS BEFORE INTAKE AND 6 MONTHS BEFORE FOLLOW-UP (n = 283)

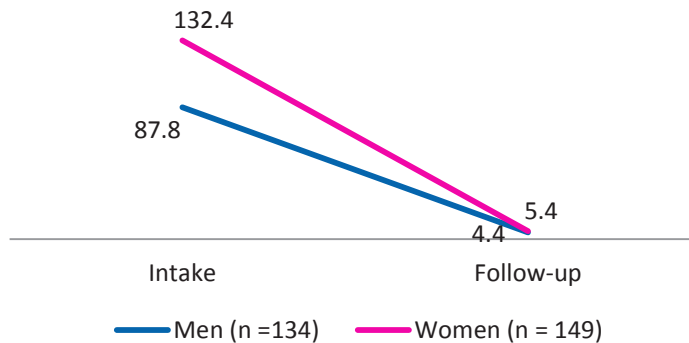


\*p < .05, \*\*p < .01, \*\*\*p < .001.

### GENDER DIFFERENCES IN AVERAGE NUMBER OF DAYS INCARCERATED

Women reported spending significantly more days incarcerated in the 12 months before entering the recovery center compared to men (see Figure 4D.9). However, at follow-up, there was no significant difference in the average number of days men and women were incarcerated.

FIGURE 4D.9. GENDER DIFFERENCES IN AVERAGE NUMBER OF DAYS INCARCERATED AT INTAKE AND FOLLOW-UP (n = 283)<sup>a</sup>



\*p < .05, \*\*p < .01, \*\*\*p < .001.

a—Significant difference by gender at intake, p < .01.

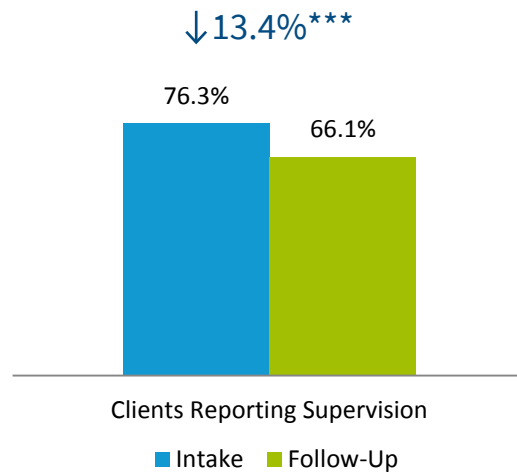
### CLIENT QUOTE

“Had never been in long term treatment. They didn’t rush me and I felt safe.”

### SELF-REPORTED CRIMINAL JUSTICE SYSTEM SUPERVISION

The number of individuals that self-reported they were under criminal justice system supervision (e.g., drug court, probation, or parole) decreased significantly by 13.4% (see Figure 4D.10). The majority of clients were under criminal justice system supervision when they entered the recovery center.

FIGURE 4D.10. CLIENTS REPORTING SUPERVISION BY THE CRIMINAL JUSTICE SYSTEM AT INTAKE AND FOLLOW-UP  
(n = 283)



\*p < .05, \*\*p < .01, \*\*\*p < .001.

## SECTION 5

# RECOVERY SUPPORTS

---

This section focuses on three main changes in recovery supports: (1) percentage of clients attending mutual help recovery group meetings; (2) recovery supportive interactions with family/friends in the past 30 days; and (3) the number of people the individual said they could count on for recovery support.

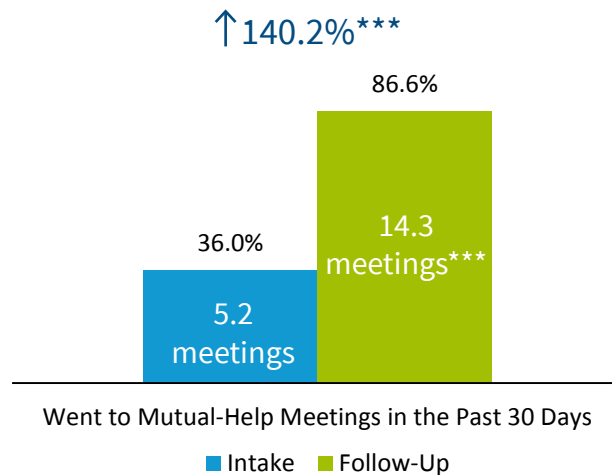


### MUTUAL HELP RECOVERY GROUP MEETINGS

At intake, only 36.0% of individuals reported going to mutual help recovery group meetings (e.g., AA, NA, or faith-based) in the past 30 days (see Figure 5.1). At follow-up, there was a significant increase of 140.2%, with 86.6% of individuals reporting they had gone to mutual help recovery group meetings in the past 30 days.

To have a better idea how often individuals attended mutual-help recovery group meetings before entering the recovery center and follow-up, the average number of meetings attended was examined. The number of meetings attended increased significantly from 5.2 at intake to 14.3 at follow-up; a 175.0% increase for the overall sample (see Figure 5.1).

FIGURE 5.1. RECOVERY SUPPORTS AT INTAKE AND FOLLOW-UP (n=283)

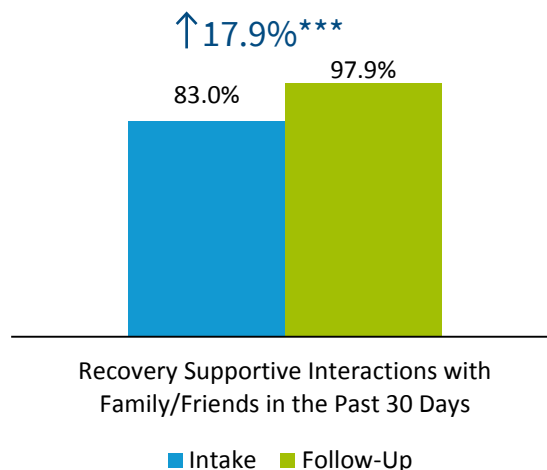


\*p < .05, \*\*p < .01, \*\*\*p < .001.

### RECOVERY SUPPORTIVE INTERACTIONS WITH FAMILY/FRIENDS

As seen in Figure 5.2, at follow-up, significantly more individuals (97.9%) reported that they had interactions with family and friends who were supportive of their recovery in the past 30 days compared to intake (83.0%).

FIGURE 5.2. CLIENTS WITH RECOVERY SUPPORTIVE INTERACTIONS WITH FAMILY/FRIENDS IN THE PAST 30 DAYS (n = 283)

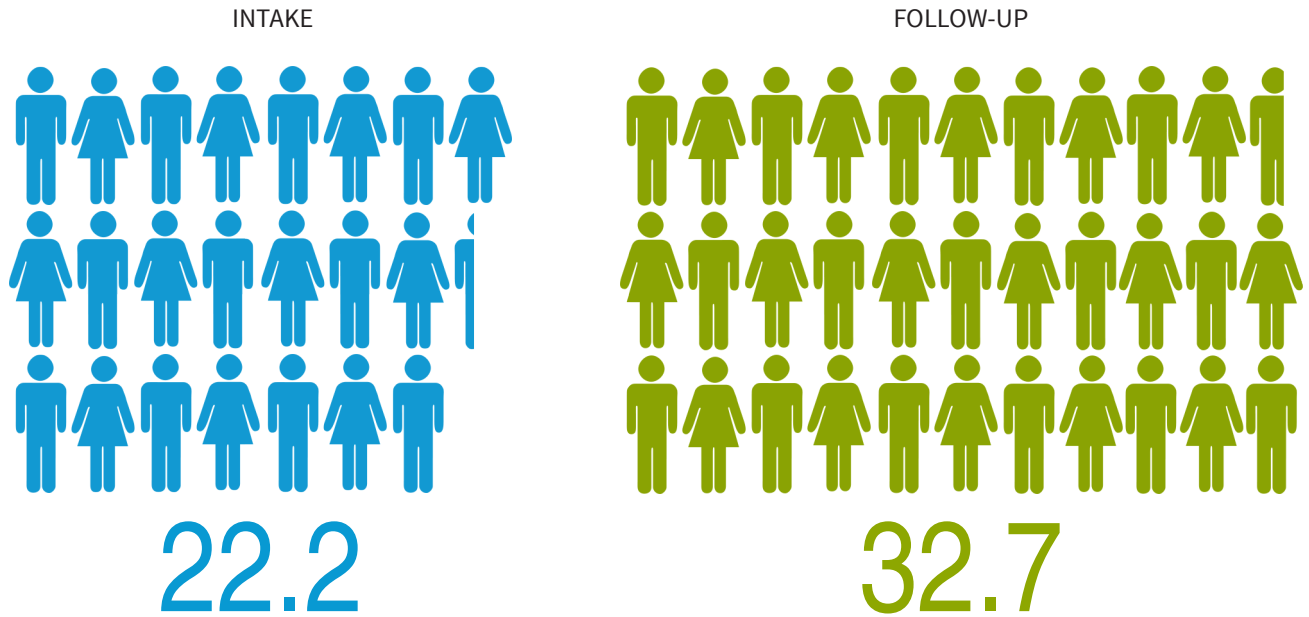


\*p < .05, \*\*p < .01, \*\*\*p < .001.

*AVERAGE NUMBER OF PEOPLE THE PARTICIPANT COULD COUNT ON FOR RECOVERY SUPPORT*

The average number of people individuals reported that they could count on for support increased significantly by 47.3%, from 22.2 people at intake to 32.7 people at follow-up (see Figure 5.3).<sup>29</sup>

FIGURE 5.3. AVERAGE NUMBER OF PEOPLE CLIENTS SAID THEY COULD COUNT ON FOR RECOVERY SUPPORT AT INTAKE AND FOLLOW-UP (n = 282)



<sup>29</sup> 1 case was an outlier with an extreme value at follow-up and was excluded from this analysis.

## SECTION 6

# COST AND IMPLICATIONS FOR KENTUCKY

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This section examines cost reductions or avoided costs to society after Recovery Kentucky Program participation. Using the number of individuals who reported drug or alcohol use at intake and follow-up, a national per/person cost was applied to the sample used in this study to estimate the cost to society for the year before individuals were in recovery and then for the same individuals during the period after leaving Phase I. The cost savings was then divided by the cost of providing Recovery Kentucky Program services, yielding a return of \$3.59 for every dollar spent on recovery programs.

## COST SAVINGS FROM RECOVERY KENTUCKY PROGRAMS

There is great policy interest in examining cost reductions or avoided costs to society after Recovery Kentucky participation. Thorough analysis of cost savings, while increasingly popular in policy making settings, is extremely difficult and complex. Immediate proximate costs can be examined relatively easily; however a thorough assessment requires a great number of econometrics. In order to accommodate these complexities at an aggregate level, data were extrapolated from a large federal study that was published in 1998 to estimate separate annual costs of alcohol abuse and drug abuse in the United States (Harwood et al., 1998). In 2000 the estimated costs of alcohol abuse in the United States were updated (Harwood et al., 2000) and in 2011 the National Drug Intelligence Center updated the estimates of drug abuse in the United States for 2007 (U.S. Office of National Drug Control Policy, 2011). These updated costs were used in the calculations for the cost savings analysis in this RCOS follow-up report.

Most studies on the estimates of cost offsets from interventions with substance abuse focus on savings in various forms after substance abuse treatment participation. Recovery services are not treatment and thus call for separate analysis. Among the recovery centers sponsored by Recovery Kentucky and the Kentucky Housing Corporation, daily cost of care is very low. Recovery centers use considerable volunteer effort from residents and peer mentors who assist in running day-to-day activities such as housekeeping, kitchen work, and other duties. However, individuals stay in residential care for extended periods of time and these two factors mark the Recovery Kentucky Program as very different from treatment programs where residential stays average less than 20 days statewide.

### METHOD

The national cost reports factored in many explicit and implicit costs of alcohol and drug abuse to the nation, such as the costs of lost labor due to illness, accidents, the costs of crime to victims, costs of incarceration, hospital and other medical treatment, social services, motor accidents, and other costs (Harwood et al., 1998; 2000; National Drug Intelligence Center, 2011). Thus, these reports consider both the hidden and obvious costs of substance abuse. For this analysis, the national estimates of the costs of drug and alcohol abuse/dependence were converted to 2012 dollars using CPI indexing from a federal reserve bank (<http://www.minneapolisfed.org>).

In order to calculate the estimate of the cost per alcohol user or drug user, the updated national cost estimates were divided by the estimate of the number of individuals with alcohol abuse/dependence (or drug abuse/dependence). Before we could do this we had to account for the estimate of 2.8 million individuals who had alcohol and drug abuse/dependence because the national costs of substance abuse are estimated separately for alcohol and drugs (SAMHSA, 2013). In other words, we could not count the cross addicted individuals in both categories when figuring out per person costs of alcohol and drug abuse, nor could we ignore the cross addicted individuals in our calculations. Therefore, the 2.8 million individuals who were alcohol and drug misusers were assigned to either the alcohol abuse/dependent category or the drug abuse/dependent category to figure out the estimated cost of alcohol abuse/dependence and drug abuse/dependence per person.<sup>30</sup> Once the cross addicted individuals were assigned to one of the categories the total number of individuals in the alcohol abuse/

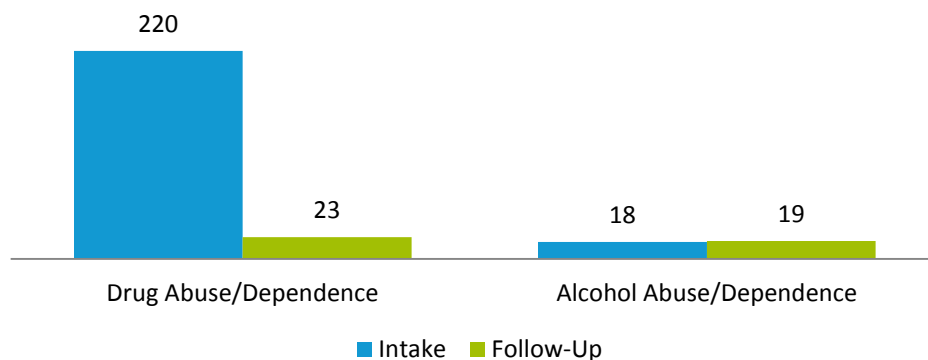
<sup>30</sup> To reclassify the cross addicted individuals, the proportion of individuals who were not in the alcohol and drug abuse/dependent category who were in the alcohol category (0.78) and the drug category (0.22) was extracted. Then the 2.8 million cross-addicted individuals were assigned to the appropriate categories based on the above proportions.

dependence category was 17,050,515 individuals and the number of individuals in the drug abuse/dependence category was 5,149,484. Specifically, the estimate of the cost to society of alcohol abuse/dependence was \$259,154,142,690, after conversion to 2012 dollars. This amount was then divided by the 17,050,515 individuals, yielding a cost per person of alcohol abuse of \$15,199 (after rounding to a whole dollar). The estimate of the cost to society of drug abuse/dependence was \$213,082,750,959 after conversion to 2012 dollars. This amount was then divided by the 5,149,484 individuals, yielding a cost per person of drug abuse of \$41,379 (after rounding to a whole dollar).

Given the high prevalence of severe substance abuse among the individuals entering recovery centers, analyses hinged on estimating the differences in cost to society between persons who are in active addiction compared to those who are abstinent from drug and/or alcohol use. Thus the role that abstinence plays in reducing costs to society was examined because abstinent individuals are far less likely to be arrested, more likely to be employed or spending time volunteering, less likely to be drawing down social services supports, and less likely to be dependent on other family members. These per person costs were then applied to the follow-up sample used in this study to estimate the cost to society for the year before individuals were in Recovery Kentucky programs and then for the same individuals during the period after leaving Phase I.

Figure 6.1 shows the change in the number of individuals who used illegal drugs and the number of individuals who used alcohol but not illegal drugs at intake and follow-up. Individuals who reported any illegal drug use in the corresponding period were classified in the drug abuse/dependent category. Individuals who reported using alcohol but not using illegal drugs were classified in the alcohol abuse/dependent category. The change from intake to follow-up is very dramatic. At intake 220 of the 283 RCOS clients were classified in the drug abuse/dependent category and 18 in the alcohol abuse/dependent category. At follow-up, only 23 individuals were classified in the drug abuse/dependent category and 19 individuals in the alcohol abuse/dependent category.

FIGURE 6.1 THE NUMBER OF INDIVIDUALS WHO WERE ACTIVE DRUG ABUSERS OR ALCOHOL ABUSERS AT INTAKE AND FOLLOW-UP (n = 283)



When the estimated cost per individual drug user was applied to the 220 individuals who were active drug users at intake, the annual estimated cost to society for the RCOS study individuals 12 months before entry into the recovery center was \$9,103,380. When the average annual cost per individual alcohol user was applied to the 18 individuals who were active alcohol users at intake, the estimated cost to society was \$273,582. The total estimated cost of drug and alcohol abuse applied to the sample of individuals in RCOS in the 12 months before intake was \$9,376,962. By follow-up, the estimated cost of the 23 individuals who were still active drug abusers was \$951,717 and the estimated cost of the 19 individuals who were active alcohol abusers was \$288,781, for a total of \$1,240,498. Thus, as shown

in Figure 4.2, after participation in a Recovery Kentucky program, the aggregate cost to society for the RCOS follow-up sample was reduced by \$8,136,464.

FIGURE 4.2. CHANGE IN COST TO SOCIETY AT INTAKE AND FOLLOW-UP (n=283)



The daily cost of participation in a Recovery Kentucky program is \$31.38 per person (Kentucky Housing Corporation communication). Funding sources for the per diem cost includes the Kentucky Department of Corrections, Supplemental Nutrition Assistance Program (SNAP), Section 8 Housing Assistance, and the Community Development Block Grant (CDBG). The total number of days clients in the follow-up sample participated in Recovery Kentucky programs was obtained for each individual. The number of days of participation was multiplied by the daily cost of \$31.38 for a total cost of \$2,267,299 for the 283 individuals included in this report.<sup>31</sup> When the cost of Recovery Kentucky programs is subtracted from the cost savings from increased alcohol and drug abstinence, there is an estimated net savings to society of \$5,869,165 for serving this sample of 283 individuals. Examining the total avoided costs in relation to expenditures on recovery services, **it is estimated that for every dollar spent on recovery, there was a \$3.59 return in avoided costs.**

<sup>31</sup> There were some outliers for number of days of service. To keep the outliers from having too large of an effect on the calculation of cost of services, the value at the 94.9 percentile of the distribution for days of service was applied to the top 5% of cases (i.e., outliers). Once this was done the average number of days of service was 255 days. Also, there were 7 cases with missing data on days of service. The average value of days of service was input for these 7 cases.

# CONCLUSION

This report describes outcomes for 283 men and women who participated in a Recovery Kentucky program and who completed an intake interview at entry to Phase 1 and a follow-up telephone interview about 12 months after the intake survey was submitted to UK CDAR. Evaluation results indicate that Recovery Kentucky programs have been successful in facilitating positive changes in clients.

First, clients overwhelmingly reported satisfaction with Recovery Kentucky programs with the majority indicating that the services helped them get better and feel better about themselves, they were treated with respect and they understood what was expected of them in the program. They also reported reductions in substance use, improved mental health, improvements in employment and education, improvements in living situations, and more positive interactions and relationships with other people. No doubt helping with this increased satisfaction with life was the fact that there was an increase in the percent of clients who felt they had people in their lives who were supportive of their recovery.

Second, Recovery Kentucky clients reported significant reductions in substance use after entering the program. While reported substance use was high in the 12 months prior to entry, by follow-up a small minority of clients reported any substance use. Not only did the number of individuals who reported any alcohol or drug use decrease significantly, but also the number of individuals who met self-reported criteria for alcohol dependence and drug dependence decreased significantly from intake to follow-up.

Clients also made dramatic improvements in reported mental health problems and stress. Before entering the program, the majority of clients had reported depression and/or anxiety; however, at follow-up, only 17.0% reported depression and 24.4% reported anxiety. About 3 in 10 clients (29.0%) reported suicidal ideation or attempts in the 12 months before entering the program, with a significant decrease of 92.7% in the number of clients reporting suicidal ideation or attempts at follow-up. Also, clients self-reported physiological consequences of stress decreased by 71% from intake to follow-up.

Third, Recovery Kentucky Program clients had more success with employment at follow-up with a significant increase of 52% in the number of clients who reported full-time or part-time employment at follow-up. The majority of clients expected to be employed in the next six months after follow-up. In the 2013 RCOS Follow-Up Report, significantly fewer women reported being employed at both intake and follow-up compared to men. In this report, significantly fewer women reported being employed at intake compared to men, but by follow-up the majority of women reported they were employed full-time or part-time. Therefore, this is a significant improvement for women over the previous year. Not only were clients employed for more months and expected to work in the future, but fewer clients considered themselves homeless at follow-up as well.

Fourth, evaluation results show that clients were less involved with the criminal justice system at follow-up. The number of clients reporting being arrested greatly diminished as did the number of clients who reported spending any time in jail or prison.

Thus overall, Recovery Kentucky Program clients made significant strides in all of the targeted areas, were extremely satisfied and appreciative of the services they received through the recovery centers, and the Recovery Kentucky Program saved taxpayer dollars through avoided costs to society or costs that would have been expected based on the rates of drug and alcohol use prior to entry into the recovery center. The finding of reductions in costs related to increased abstinence suggests that commitment of public funds to recovery centers is a solid investment in the futures of many Kentucky citizens. While this study was not resourced to examine net effects of human capital investment, the past research suggests that individuals who commit themselves to recovery and abstinence go on to have gainful employment and reduced involvement with public sector services in their future years.



These preliminary findings suggest that both the behavioral outcomes and cost savings from recovery services are parallel to the outcomes from substance abuse treatment. The fact that recovery centers focus on individuals needing longer term residential support means that they add an important new component to the array of publicly supported substance abuse interventions. State-funded treatment programs typically focus on shorter residential stays and a wide array of outpatient services. Recovery centers complement these services with longer term residential care.

There were a couple of areas where the data results suggest additional services may be needed. Specifically,

- Tobacco use, in particular, smoking, is very high among Recovery Kentucky clients at intake (90%) and follow-up (91%).
- Women reported more days in the past 30 days that their mental health was not good, compared to men, at follow-up.
- Compared to men, women had higher stress-related consequences at intake and follow-up.
- Compared to women, men had higher rates of illegal drug use at intake, alcohol use at intake and follow-up, and alcohol use to intoxication at follow-up.

The study findings must be considered within the context of the project's limitations. First, the data included in this write-up were self-reported by Recovery Kentucky clients. There is reason to question the validity and reliability of self-reported data, particularly with regard to sensitive topics, such as illegal behavior and stigmatizing issues such as mental health and substance use. However, recent research has supported findings about the reliability and accuracy of individuals' reports of their substance use (Del Boca & Noll, 2000; Harrison, Marin, Enev, & Harrington, 2007; Rutherford, Cacciola, Alterman, McKay, & Cook, 2000; Shannon, Mathias, Marsh, Dougherty, & Liguori, 2007). Earlier studies found that the context of the interview influences reliability (Babor, Stephens, & Marlatt, 1987). During the informed consent process at the beginning of the follow-up survey, interviewers tell participants that the research team operates independently from the recovery centers and individuals' responses will be reported in group format and will not be identifiable at the individual level. These assurances of confidentiality and lack of affiliation with the data collectors may minimize individuals' concern about reporting stigmatizing behavior or conditions.

Recovery centers did not begin data collection at the same time, therefore some programs are over-represented, and some programs are under-represented in this annual report.<sup>32</sup> Even though the project is limited for financial reasons to about 280 follow-up surveys to complete in a fiscal year, comparisons of clients who completed a follow-up survey and clients who did not complete a follow-up survey show no differences in demographic factors, substance use, mental health and stress, homelessness, and criminal justice system involvement. Thus, this bolsters confidence that the sample of individuals who are included in this report are representative of individuals who complete an intake survey for RCOS.

These findings are encouraging and continue the first systematic evaluation of long-term residential recovery supports in the nation. Further study will lead to more research to validate the continuing value of recovery services as a key part of state commitment to intervening with the growing problem of substance abuse in Kentucky.

<sup>32</sup> Several of the centers submitted the majority of their intake assessments to CDAR in a one or two month period, although originally the intakes were actually done over a longer period of months. For example, if a center does intakes on a paper version throughout the year but submits them all online to CDAR in a two month period, intakes that were done in previous months would not have been available for selection into the follow-up sample because the follow-up sample is selected monthly (due to the targeted 12 months after intake) and the number of cases per month are capped at approximately 36 cases. Thus, centers that submitted most of their intake surveys within a narrow period are underrepresented in the follow-up sample.

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APPENDIX A

# METHODS

A total of 1,361 individuals had an intake survey submitted from July 1, 2011 through June 30, 2012. Because of a delay in finalizing the contract, the follow-up staff could not begin working on contacting individuals for the follow-up sample until September 2012. Thus, 161 individuals who completed a intake survey in July or August of 2011 were not eligible to be pulled into the follow-up sample. Individuals were selected into the follow-up sample by month (i.e., the month in which their intake survey was submitted). The target month for the follow-up survey was 12 months after the intake survey was submitted. Cases were randomly selected into the follow-up sample by two strata (i.e., gender [male, female] and Department of Corrections referral [yes/no]) so that equal numbers of individuals fell into the following categories: DOC-referred men, DOC-referred women, non-DOC-referred men, and non-DOC-referred women.<sup>33</sup> The window for completing a follow-up survey with an individual selected into the follow-up sample began one month before the target month and spanned until two months after the target month. For example, if an individual was eligible for the follow-up survey in May (i.e., target month was May), then the interviewers would attempt to complete the follow-up survey beginning in April and ending in July.

A total of 463 individuals were selected into the sample of individuals to be followed up from September 2012 to June 2013. Of these individuals 101 were ineligible for the follow-up survey at the time of their follow-up; thus these cases are not included in the calculation of the follow-up rate (see Table AA.1). Of the remaining 362 individuals, interviewers completed follow-up surveys with 283 individuals, representing a follow-up rate of 78.2% (see Table AA.1). Of the eligible individuals, 76 were never successfully contacted or if they were contacted, interviewers were not able to complete a follow-up survey with them during the follow-up period: these cases are classified as expired. Of the eligible individuals, 21.0% were expired cases. Three individuals refused to complete the follow-up survey when the interviewer contacted him/her. The refusal rate was 0.8%. The project interviewers' efforts accounted for 83.6% of the cases (n = 387) included in the follow-up sample. The only cases not considered accounted for are those individuals who are classified as expired.

TABLE AA.1. FINAL CASE OUTCOMES FOR FOLLOW-UP EFFORTS

	Number of Records (n = 463)	Percent
Ineligible for follow-up survey	101	21.8%
	Number of cases eligible for follow-up (n = 362)	
Follow-up rate is calculated by dividing the number of completed surveys by the number of eligible cases and multiplying by 100		78.2%
Expired cases (i.e., never contacted, did not complete the survey during the follow-up period)	76	
Expired rate ((the number of expired cases/eligible cases)*100)		21.0%
Refusal	3	
Refusal rate ((the number of refusal cases/eligible cases)*100)		0.8%
Cases accounted for (i.e., records ineligible for follow-up + completed surveys + refusals)	387	
Percent of cases accounted for ((# of cases accounted for/ total number of records in the follow-up sample)*100)		83.6%

<sup>33</sup> There were too few cases to sample an equal number of individuals in each of the four strata for the June sample.

Individuals were considered ineligible for follow-up if they were living in a controlled environment during the follow-up period (see Table AA.2). Of the 101 cases that were ineligible for follow-up, the majority (88.1%) were ineligible because they were incarcerated during the follow-up period. Nine individuals were ineligible because they were in residential treatment at the time of follow-up. Other reasons a small number of individuals were ineligible for follow-up were because of health conditions, hospitalization, and death.

TABLE AA.2. REASONS CLIENTS WERE INELIGIBLE FOR FOLLOW-UP (n = 101)

	Number	Percent
Incarcerated	89	88.1%
In residential treatment	9	8.9%
Health condition	1	1.0%
Hospitalized	1	1.0%
Death	1	1.0%

## APPENDIX B

# CLIENT CHARACTERISTICS AT INTAKE FOR THOSE WITH COMPLETED FOLLOW- UP INTERVIEWS AND THOSE WITHOUT COMPLETED FOLLOW-UP INTERVIEWS

Individuals who completed a follow-up interview are compared in this section with individuals who did not complete a follow-up interview for any reason (e.g., not selected into the follow-up sample, ineligible for follow-up, and interviewers were unable to locate the client for the follow-up survey).<sup>34</sup>

### DEMOGRAPHIC CHARACTERISTICS

The majority of the sample for this annual report was male and White (see Table AB.1). Because the follow-up sample was stratified by gender, a higher percentage of women completed a follow-up survey than did not. One in ten clients was African American. The average client age was in the early 30s. Fewer clients were married or cohabiting than clients reporting they were never married or divorced. There were no significant differences on demographics between clients who completed a follow-up survey and those who did not.

TABLE AB.1. COMPARISON OF DEMOGRAPHICS FOR CLIENTS WHO WERE FOLLOWED UP AND CLIENTS WHO WERE NOT FOLLOWED UP

	FOLLOWED UP	
	NO n = 1078	YES n = 283
AGE	33.4 years	34.3 years
GENDER		
Female	39.8%	52.7%
RACE		
White	88.6%	85.9%
African American	9.6%	13.4%
Other or multiracial	1.8%	0.7%
MARITAL STATUS		
Never married	41.9%	41.3%
Married or cohabiting	17.8%	22.6%
Separated or divorced	37.8%	33.6%
Widowed	2.4%	2.5%

### SOCIO-ECONOMIC STATUS INDICATORS

Table AB.2 describes clients’ level of education when entering the recovery center. A minority of individuals had less than a high school diploma or GED. A little more than three fourths of clients in both groups had a GED or high school diploma or higher level of education at intake to Phase I.

TABLE AB.2. CLIENTS’ HIGHEST LEVEL OF EDUCATION COMPLETED AT INTAKE

	FOLLOWED UP	
	NO n = 1078	YES n = 283
HIGHEST LEVEL OF EDUCATION COMPLETED		
Less than GED or high school diploma	24.0%	21.6%
GED/high school diploma or higher	76.0%	78.4%

<sup>34</sup> Significance is reported for p<.01.



A little over half of clients who did not complete a follow-up interview and half of clients who completed a follow-up interview reported working 0 months in the 12 months before entering the recovery center. About 1 in 5 clients reported working 1 to 5 months and about one fourth reported working 6 months or more (see Table AB.3). Of the individuals who reported working at least part-time in the 12 months before entering the recovery center, the average number of months worked was 6.1 and 6.4 for clients not followed up and for clients followed up respectively.

TABLE AB.3. EMPLOYMENT IN THE 12 MONTHS BEFORE ENTERING THE RECOVERY CENTER

	FOLLOWED UP	
	NO n = 1078	YES n = 283
<b>EMPLOYMENT</b>		
Percentage of individuals who reported working for:		
0 months	54.5%	50.9%
1 to 5 months	20.5%	21.9%
6 months or more	25.0%	27.2%
Among those who were employed:		
Average # of months employed in the past 12 months	n = 491 6.1 months	n = 139 6.4 months

The majority of individuals reported their usual living arrangement in the 12 months before entering the recovery center was in a private residence (i.e., their own home or apartment or someone else’s home or apartment; see Table AB.4). About one in four individuals were living in a correctional facility (i.e., jail or prison) before entering the recovery center. Small numbers of individuals reported their usual living situation was in a non-correctional facility controlled environment such as a recovery center, residential treatment, sober living home, or hospital. A small number of individuals reported their usual living arrangement had been in a shelter or on the street. At the time individuals entered recovery centers, about half of clients considered themselves to be homeless, with many of those individuals stating that they had lived in a shelter or they had no home to go to after leaving the recovery center (see Table AB.4). There were no significant differences in living situation at intake between individuals who completed a follow-up interview and individuals who did not.

TABLE AB.4 LIVING SITUATION OF CLIENTS BEFORE ENTERING THE RECOVERY CENTER

	FOLLOWED UP	
	NO n = 1078	YES n = 283
<b>USUAL LIVING ARRANGEMENT IN THE 12 MONTHS BEFORE ENTERING THE PROGRAM</b>		
Own or someone else’s home or apartment	69.4%	72.4%
Jail or prison	26.9%	23.3%
Residential program, hospital, recovery center, or sober living home	2.3%	2.8%
Shelter or on the street	1.4%	1.4%
<b>CONSIDERS SELF TO BE CURRENTLY HOMELESS</b>		
Why the individual considers himself/herself to be homeless	51.9% (n = 560)	46.3% (n = 131)
Staying in a shelter	47.1%	45.0%

	FOLLOWED UP	
	NO n = 1078	YES n = 283
Staying temporarily with friends or family	11.2%	15.3%
Have no home to go to after leaving the recovery center	41.4%	39.7%
Staying on the street or living in a car	0.2%	0.0%

## SUBSTANCE USE AT INTAKE

Use of illegal drugs in the 12 months before entering the recovery center is presented by follow-up status in Table AB.5. There were no significant differences in the percentage of individuals who reported using different types of illegal drugs by follow-up status. The majority of the clients reported using any illegal drug in the 12 months before entering the program. The drug class used by the greatest percentage of clients was prescription opiates/opioids. About half of clients reported using marijuana. Sizable minorities of followed up and not followed up clients used sedatives/hypnotics/tranquilizers, cocaine, and amphetamines in the 12 months before entering the recovery center. About one fourth of clients used non-prescribed buprenorphine and methadone. Smaller percentages of individuals used heroin, barbiturates, hallucinogens, and inhalants in the 12 months before entering the recovery center.

TABLE AB.5. PERCENTAGE OF INDIVIDUALS REPORTING ILLEGAL DRUG USE IN THE 12 MONTHS BEFORE ENTERING THE RECOVERY CENTER

SUBSTANCES	FOLLOWED UP	
	NO n = 1078	YES n = 283
Any illicit drug	78.3%	77.7%
Prescription opiates/opioids	58.2%	58.0%
Marijuana	52.9%	51.6%
Sedatives/hypnotics/tranquilizers	42.8%	39.6%
Cocaine	42.1%	38.2%
Amphetamines	32.8%	34.3%
Buprenorphine	28.2%	30.7%
Non-prescribed methadone	25.0%	26.5%
Heroin	23.1%	18.0%
Hallucinogens	10.5%	9.5%
Barbiturates	9.2%	7.4%
Inhalants	4.3%	4.2%
Alcohol	59.3%	59.4%
Tobacco	84.8%	87.6%

Similar patterns were found in the past 30-days substance use measure with fewer individuals reporting use of each substance (not depicted in a Table or Figure).

Alcohol and drug composite severity scores were calculated from items included in the intake survey. Because the ASI composite severity scores are based on past-30-day measures, it is important to take into account clients being in a controlled environment all 30 days when examining composite severity

scores. Thus, alcohol and drug severity composite scores are presented in Table AB.6 separately for those individuals who were in a controlled environment all 30 days before entering the recovery center and individuals who were not in a controlled environment all 30 days before entering the recovery center. The highest composite score is 1.0 for each of the two substance categories.

Of the individuals who were not in a controlled environment all 30 days the majority met or surpassed the Addiction Severity Index (ASI) composite score cutoff for alcohol and/or drug dependence, with no difference by follow-up status (97.0% for not followed up and 94.8% for followed up; see Table AB.6). Among individuals who were not in a controlled environment all 30 days before entering the program, the average score on the alcohol composite score was .51 for individuals who were not followed up and .52 for individuals who were followed up. Among clients who were not in a controlled environment all 30 days before entering the program, the average score for the drug composite score was .35 for individuals who did not complete a follow-up interview and .32 for clients who did complete a follow-up interview. These average cutoff scores include individuals with scores of 0 on the composites.

Of the individuals who were in a controlled environment all 30 days before entering the recovery center, the majority met or surpassed the cutoff for the ASI composite score for alcohol and/or drug dependence, with no difference by follow-up status (see Table AB.6). Among individuals who were in a controlled environment all 30 days before entering the program, the average scores for the alcohol composite score for the two groups were .29 and .31. Of clients who were in a controlled environment all 30 days, the averages for the drug composite scores were .20 for those who were not followed up and .21 for those who were followed up. The percentage of individuals who met or surpassed the cutoff for the drug composite score for drug dependence did not differ significantly by follow-up status.

TABLE AB.6. SELF-REPORTED ALCOHOL AND DRUG SEVERITY AT INTAKE

Recent substance use problems among individuals who were....	Not in a controlled environment all 30 days before entering the recovery center		In a controlled environment all 30 days before entering the recovery center	
	FOLLOWED UP		FOLLOWED UP	
	NO (n = 537)	YES (n = 135)	NO (n = 257)	YES(n = 146)
Percent of Individuals with ASI composite score equal to or greater than cutoff score for ...				
alcohol or drug dependence	97.0%	94.8%	87.4%	89.2%
alcohol dependence	86.0%	88.9%	78.7%	80.4%
drug dependence	78.4%	77.0%	43.8%	47.3%
Average ASI composite score for alcohol use <sup>-a</sup>	.51	.52	.29	.31
Average ASI composite score for drug use <sup>-b</sup>	.35	.32	.20	.21

-a Score equal to or greater than .17 is indicative of alcohol dependence.

-b Score equal to or greater than .16 is indicative of drug dependence.

## SUBSTANCE ABUSE TREATMENT

The majority of RCOS clients reported ever having been in substance abuse treatment in their lifetime, with no difference by follow-up status (see Table AB.7). Among clients who reported a history of substance abuse treatment, the average number of lifetime treatment episodes was 3.2 for individuals who did not complete a follow-up interview and 3.5 for individuals who did complete a follow-up interview.

TABLE AB.7. HISTORY OF SUBSTANCE ABUSE TREATMENT IN LIFETIME

	FOLLOWED UP	
	NO n = 1078	YES n = 283
Ever been in substance abuse treatment in lifetime	62.5%	64.7%
Among those who had ever been in substance abuse treatment in lifetime,	(n = 1078)	(n = 283)
Average number of times in treatment	3.2	3.5

## MENTAL HEALTH AT INTAKE

The mental health questions included in the RCOS intake and follow-up surveys are not clinical measures, but instead are research measures. A total of 9 questions were asked to determine if they met DSM-IV criteria for depression, including the two screening questions: (1) “Did you have a two-week period when you were consistently depressed or down, most of the day, nearly every day?” and (2) “Did you have a two-week period when you were much less interested in most things or much less able to enjoy the things you used to enjoy most of the time?” The majority of clients who were followed up and clients who were not followed up reported symptoms that met criteria for depression, with no significant difference by follow-up status (see Table AB.8).

A total of 7 questions were asked to determine if individuals met criteria for generalized anxiety, including the screening question: “In the 12 months before you entered this recovery center, did you have a period lasting 3 months or longer where you worried excessively or were anxious about multiple things on more days than not (like family, health, finances, school, or work difficulties)?” In the 12 months before entering the recovery center, about 6 in 10 individuals reported symptoms that met the criteria for generalized anxiety, with no significant difference by follow-up status.

Two questions were included in the intake survey that asked about thoughts of suicide and attempted suicide in the 12 months before clients entered recovery centers. About one fourth of individuals who did not complete a follow-up interview (26.3%) and 29.0% of individuals who did complete a follow-up interview reported suicide ideation and/or attempts, with no difference by follow-up status (see Table AB.8).

TABLE AB.8. PERCENTAGE OF INDIVIDUALS REPORTING MENTAL HEALTH PROBLEMS IN THE 12 MONTHS BEFORE ENTERING THE RECOVERY CENTER

	FOLLOWED UP	
	NO n = 1078	YES n = 283
Depression	60.8%	60.8%
Generalized Anxiety	58.7%	61.8%
Suicidality (e.g., thoughts of suicide or suicide attempts)	26.3%	29.0%

## CRIMINAL JUSTICE SYSTEM INVOLVEMENT AT INTAKE

The majority of individuals in the sample reported being referred to the recovery center by the criminal justice system, with no difference between those who were followed up and those who were not (74.6% vs. 71.1% respectively; not depicted in a Table or Figure). Not all of those referred by the criminal justice system were considered DOC cases whose costs were covered by the Department of Corrections.

The majority of individuals (65.3% of those not followed up and 69.3% of those followed up) reported they had been arrested in the 12 months before entering the recovery center (see Table AB.9). Of the individuals who reported being arrested, they reported an average of 2.0-2.3 arrests in the 12 months before entering the recovery center. Three fourths of clients who were not followed up and clients who were followed up were under supervision by the criminal justice system (e.g., in Drug Court, on probation or parole) when they entered the recovery center. There were no significant differences by follow-up status.

TABLE AB.9. CRIMINAL JUSTICE SYSTEM INVOLVEMENT WHEN ENTERING THE RECOVERY CENTER

	FOLLOWED UP	
	NO n = 1078	YES n = 283
Arrested for any charge in the 12 months before entering the recovery center	65.3%	69.3%
Of those with an arrest,	n = 704	n = 196
Average number of arrests	2.3 arrests	2.0 arrests
Currently under supervision by the criminal justice system	75.0%	76.3%
In Drug Court	4.5%	4.2%
On probation	43.4%	49.5%
On parole	34.5%	28.3%

Table AB.10 displays the percentage of individuals arrested and charged with different types of criminal charges among those who reported being arrested in the 12 months before entering the recovery center. There were no significant differences in the percentage of individuals arrested for different types of criminal charges between those who were followed up and those who were not followed up. The criminal offenses reported by the largest percentage of clients were probation or parole violations, followed by drug offenses (e.g., trafficking, possession). Property crime arrests were reported by about 3 in 10 individuals. About 1 in 5 RCOS clients reported an arrest for a DUI offense. The criminal offense category reported by the smallest number of clients in both groups was crimes against persons. Other criminal offenses were reported by 27.6% of individuals who were not followed up and 35.6% of individuals who were followed up.

TABLE AB.10. AMONG THOSE WHO REPORTED BEING ARRESTED IN THE 12 MONTHS BEFORE ENTERING THE RECOVERY CENTER, PERCENTAGE OF INDIVIDUALS ARRESTED AND CHARGED WITH TYPES OF CRIMINAL OFFENSES<sup>a</sup>

TYPES OF CRIMINAL CHARGES	FOLLOWED UP	
	NO n = 1078	YES n = 283
Probation or parole violation	47.8%	50.0%
Drug charge	44.2%	39.4%
Property crime	32.7%	29.3%
DUI	20.8%	17.6%
Crimes against a person	13.9%	11.7%
Other crimes (e.g. contempt, criminal mischief, disorderly conduct, endangering minor, failure to pay child support, failure to comply with court order, moving violations, public intoxication, trespassing, resisting arrest)	27.6%	35.6%

a—28 cases had missing data on number of arrests for specific types of criminal offenses.

Four in 5 of the followed up individuals (80.2%) and a little more than 4 in 5 individuals who were not followed up (83.0%) reported being incarcerated for at least one day in the past 12 months before entering the program (See Table AB.11). Among the individuals who were incarcerated at least one night, the average incarceration time in the 12 months before entering the recovery center was 149.2 days for individuals who were not followed up and 134.0 days for individuals who were followed up, with no significant difference by follow-up status.

TABLE AB.11. INCARCERATION HISTORY IN THE 12 MONTHS BEFORE ENTERING THE RECOVERY CENTER

	FOLLOWED UP	
	NO n = 1078	YES n = 283
Incarcerated at least one day	80.2%	83.0%
Of those incarcerated	(n = 865)	(n = 235)
Average # of days incarcerated in the past 12 months	149.2	134.0

## APPENDIX C

# CHANGE IN USE OF SPECIFIC CLASSES OF DRUGS FROM INTAKE TO FOLLOW-UP

## CHANGE IN 12-MONTH/6-MONTH DRUG USE FROM INTAKE TO FOLLOW-UP FOR INDIVIDUALS NOT IN A CONTROLLED ENVIRONMENT ALL 12 MONTHS BEFORE ENTERING THE RECOVERY CENTER

### MARIJUANA, PAST 12-MONTH/6-MONTH USE

Clients’ self-reported marijuana use decreased significantly by 89.9% from the 12 months before entering the program to the 6 months before follow-up (see Table AC.1).

TABLE AC.1. CHANGE IN MARIJUANA USE FOR INDIVIDUALS WHO WERE NOT IN A CONTROLLED ENVIRONMENT ALL 365 DAYS BEFORE ENTERING THE RECOVERY CENTER

	USE AT INTAKE		USE AT FOLLOW-UP		PERCENT CHANGE <sup>a</sup>
	n	Valid %	n	Valid %	
<b>MARIJUANA</b>					
Men (n =119)	63	52.9%	5	4.2%	-92.1%***
Women (n = 125)	76	60.8%	9	7.2%	-88.2%***
Total (n = 244)	139	57.0%	14	5.7%	-89.9%***

a—Significance established using z test for proportions; \*p < .05, \*\*p < .01, \*\*\*p < .001.

### OPIOIDS (EXCLUDING HEROIN), PAST 12-MONTH/6-MONTH USE

Individuals’ self-reported use of opioids including prescription opiates, methadone, and buprenorphine decreased significantly by 93.3% in the 12 months before entering the recovery center and the 6 months before follow-up (see Table AC.2).

TABLE AC.2. CHANGE IN OPIOID USE (EXCLUDING HEROIN) FOR INDIVIDUALS WHO WERE NOT IN A CONTROLLED ENVIRONMENT ALL 365 DAYS BEFORE ENTERING THE RECOVERY CENTER

	USE AT INTAKE		USE AT FOLLOW-UP		PERCENT CHANGE <sup>a</sup>
	n	Valid %	n	Valid %	
<b>OPIOID (EXCLUDING HEROIN)</b>					
Men (n =119)	77	64.7%	7	5.9%	-90.9%***
Women (n = 125)	87	69.6%	4	3.2%	-95.4%***
Total (n = 244)	164	67.2%	11	4.5%	-93.3%***

a—Significance established using z test for proportions; \*p < .05, \*\*p < .01, \*\*\*p < .001.

### HEROIN, PAST 12-MONTH/6-MONTH USE

The number of individuals who reported using heroin decreased significantly by 89.8% in the 12 months before entering the recovery center to the 6 months before follow-up (see Table AC.3). At intake, significantly more men reported using heroin in the past 12 months compared to women. However, at follow-up, there was no significant difference in the heroin use by gender.



TABLE AC.3. CHANGE IN HEROIN USE FOR INDIVIDUALS WHO WERE NOT IN A CONTROLLED ENVIRONMENT ALL 365 DAYS BEFORE ENTERING THE RECOVERY CENTER

	USE AT INTAKE		USE AT FOLLOW-UP		PERCENT CHANGE <sup>a</sup>
	n	Valid %	n	Valid %	
HEROIN <sup>b</sup>					
Men (n = 119)	32	26.9%	3	2.5%	-90.6%***
Women (n = 125)	17	13.6%	2	1.6%	-88.2%***
Total (n = 244)	49	20.1%	5	2.0%	-89.8%***

a—Significance established using z test for proportions; \*p < .05, \*\*p < .01, \*\*\*p < .001.

b—Significant difference by gender at intake; tested with chi square test of independence (p < .05).

### *CENTRAL NERVOUS SYSTEM (CNS) DEPRESSANTS, PAST 12-MONTH/6-MONTH USE*

The number of individuals who reported using CNS depressants (e.g., tranquilizers, barbiturates, benzodiazepines, sedatives) decreased significantly by 96.5% in the 12 months before entering the recovery center to the 6 months before follow-up (see Table AC.4). There was no significant difference in use of CNS depressants at intake or follow-up by gender.

TABLE AC.4. CHANGE IN CNS DEPRESSANT USE FOR INDIVIDUALS WHO WERE NOT IN A CONTROLLED ENVIRONMENT ALL 365 DAYS BEFORE ENTERING THE RECOVERY CENTER

	USE AT INTAKE		USE AT FOLLOW-UP		PERCENT CHANGE <sup>a</sup>
	n	Valid %	n	Valid %	
CNS DEPRESSANTS					
Men (n = 119)	51	42.9%	2	1.7%	-96.1%***
Women (n = 125)	62	49.6%	2	1.6%	-96.8%***
Total (n = 244)	113	46.3%	4	1.6%	-96.5%***

a—Significance established using z test for proportions; \*p < .05, \*\*p < .01, \*\*\*p < .001.

### *STIMULANTS, PAST 12-MONTH/6-MONTH USE*

The number of individuals who reported using stimulants (e.g., amphetamine, methamphetamine, ecstasy, Ritalin) decreased significantly by 98.9% in the 12 months before entering the recovery center to the 6 months before follow-up (see Table AC.5). There was no significant difference in use of stimulants at intake or follow-up by gender.

TABLE AC.5. CHANGE IN STIMULANT USE FOR INDIVIDUALS WHO WERE NOT IN A CONTROLLED ENVIRONMENT ALL 365 DAYS BEFORE ENTERING THE RECOVERY CENTER

	USE AT INTAKE		USE AT FOLLOW-UP		PERCENT CHANGE <sup>a</sup>
	n	Valid %	n	Valid %	
STIMULANTS					
Men (n = 119)	43	36.1%	1	0.8%	-97.7%***
Women (n = 125)	50	40.0%	0	0.0%	-100.0%***
Total (n = 244)	93	38.1%	1	0.4%	-98.9%***

a—Significance established using z test for proportions; \*p < .05, \*\*p < .01, \*\*\*p < .001.

*OTHER DRUGS, PAST 12-MONTH/6-MONTH USE*

The number of individuals who reported using other illicit drugs (e.g., cocaine, inhalants, hallucinogens) decreased significantly by 97.2% (see Table AC.6).

TABLE AC.6. CHANGE IN USE OF OTHER DRUGS FOR INDIVIDUALS WHO WERE NOT IN A CONTROLLED ENVIRONMENT ALL 365 DAYS BEFORE ENTERING THE RECOVERY CENTER

	USE AT INTAKE		USE AT FOLLOW-UP		PERCENT CHANGE <sup>a</sup>
	n	Valid %	n	Valid %	
OTHER DRUGS					
Men (n =119)	59	49.6%	2	1.7%	-96.6%***
Women (n = 125)	50	40.0%	1	0.8%	-98.0%***
Total (n = 244)	109	44.7%	3	1.2%	-97.2%***

a—Significance established using z test for proportions; \*p < .05, \*\*p < .01, \*\*\*p < .001.

**CHANGE IN 30-DAY DRUG USE FROM INTAKE TO FOLLOW-UP FOR INDIVIDUALS NOT IN A CONTROLLED ENVIRONMENT ALL 30 DAYS BEFORE ENTERING THE RECOVERY CENTER**

*MARIJUANA, PAST 30 DAY USE*

About 2 in 5 individuals who were not in a controlled environment all 30 days before entering the recovery center (42.2%) reported they had used marijuana in the 30 days before entering the recovery center (see Table AC.7). By follow-up, only 2.2% of individuals reported they had used marijuana, which represents a 94.7% significant decrease. There was no significant difference in the percentage of men and women who reported past-30-day use of marijuana at intake or follow-up.

TABLE AC.7. CHANGE IN MARIJUANA USE FOR INDIVIDUALS WHO WERE NOT IN A CONTROLLED ENVIRONMENT ALL 30 DAYS BEFORE ENTERING THE RECOVERY CENTER

	USE AT INTAKE		USE AT FOLLOW-UP		PERCENT CHANGE <sup>a</sup>
	n	Valid %	n	Valid %	
MARIJUANA					
Men (n =72)	30	41.7%	2	2.8%	-93.3%***
Women (n = 63)	27	42.9%	1	1.6%	-96.3%***
Total (n = 135)	57	42.2%	3	2.2%	-94.7%***

a—Significance established using z test for proportions; \*p < .05, \*\*p < .01, \*\*\*p < .001.

*OPIOIDS (EXCLUDING HEROIN), PAST 30 DAY USE*

Opioid use (other than heroin) decreased significantly by 95.4% from intake to follow-up (see Table AC.8). Significantly more men than women reported past-30-day use of opioids at intake. The number of men who reported past-30-day use of opioids decreased by 92.9% and the number of women who reported past-30-day use of opioids decreased by 100%.

TABLE AC.8. CHANGE IN OPIOID USE (EXCLUDING HEROIN) FOR INDIVIDUALS WHO WERE NOT IN A CONTROLLED ENVIRONMENT ALL 30 DAYS BEFORE ENTERING THE RECOVERY CENTER

	USE AT INTAKE		USE AT FOLLOW-UP		PERCENT CHANGE <sup>a</sup>
	n	Valid %	n	Valid %	
OPIOID (EXCLUDING HEROIN) <sup>b</sup>					
Men (n =72)	42	58.3%	3	4.2%	-92.9%***
Women (n = 63)	23	36.5%	0	0.0%	-100.0%***
Total (n = 135)	65	48.1%	3	2.2%	-95.4%***

a—Significance established using z test for proportions; \*p < .05, \*\*p < .01, \*\*\*p < .001.

b—Significant difference by gender tested with chi square test of independence (p < .05).

### HEROIN, PAST 30 DAY USE

Overall 17.8% of individuals reported using heroin in the 30 days before they entered the recovery center (see Table AC.9). Significantly more men than women reported past-30-day use of heroin at intake (26.4% vs. 7.9%). At follow-up, only one individual reported heroin use in the past 30 days—a significant decrease of 95.8% for the overall sample. There was a decrease of 94.7% for men and 100.0% for women in heroin use.

TABLE AC.9. CHANGE IN HEROIN USE FOR INDIVIDUALS WHO WERE NOT IN A CONTROLLED ENVIRONMENT ALL 30 DAYS BEFORE ENTERING THE RECOVERY CENTER

	USE AT INTAKE		USE AT FOLLOW-UP		PERCENT CHANGE <sup>a</sup>
	n	Valid %	n	Valid %	
HEROIN <sup>b</sup>					
Men (n =72)	19	26.4%	1	1.4%	-94.7%***
Women (n = 63)	5	7.9%	0	0.0%	-100.0%*
Total (n = 135)	24	17.8%	1	0.7%	-95.8%***

a—Significance established using z test for proportions; \*p < .05, \*\*p < .01, \*\*\*p < .001.

b—Significant difference by gender at intake; tested by chi square test of independence (p < .01).

### CENTRAL NERVOUS SYSTEM (CNS) DEPRESSANTS, PAST 30 DAY USE

A little less than one third of individuals who were not in a controlled environment all 30 days before entering the recovery center reported using CNS depressants at intake (see Table AC.10). By follow-up, only one individual reported using CNS depressants, representing a significant decrease of 97.7%. There was no difference in the percentage of men and women who reported past-30-day use of CNS depressants at intake or follow-up.

TABLE AC.10. CHANGE IN CNS DEPRESSANT USE FOR INDIVIDUALS WHO WERE NOT IN A CONTROLLED ENVIRONMENT ALL 30 DAYS BEFORE ENTERING THE RECOVERY CENTER

	USE AT INTAKE		USE AT FOLLOW-UP		PERCENT CHANGE <sup>a</sup>
	n	Valid %	n	Valid %	
<b>CNS DEPRESSANTS</b>					
Men (n =72)	24	33.3%	1	1.4%	-95.8%***
Women (n = 63)	19	30.2%	0	0.0%	-100.0%***
Total (n = 135)	43	31.9%	1	0.7%	-97.7%***

a—Significance established using z test for proportions; \*p < .05, \*\*p < .01, \*\*\*p < .001.

*STIMULANTS, PAST 30 DAY USE*

About one fourth of men (27.8%) and 12.7% of women reported using stimulants (e.g., speed, amphetamines, methamphetamine, Ritalin) in the 30 days before they entered the recovery center, with a significant decrease of 100% at follow-up (see Table AC.11).

TABLE AC.11. CHANGE IN STIMULANT USE FOR INDIVIDUALS WHO WERE NOT IN A CONTROLLED ENVIRONMENT ALL 30 DAYS BEFORE ENTERING THE RECOVERY CENTER

	USE AT INTAKE		USE AT FOLLOW-UP		PERCENT CHANGE <sup>a</sup>
	n	Valid %	n	Valid %	
<b>STIMULANTS<sup>b</sup></b>					
Men (n =72)	20	27.8%	0	0.0%	-100%***
Women (n = 63)	8	12.7%	0	0.0%	-100%**
Total (n = 135)	28	20.7%	0	0.0%	-100%***

a—Significance established using z test for proportions; \*p < .05, \*\*p < .01, \*\*\*p < .001.

b—Significant difference by gender tested with chi square test of independence (p < .05).

*OTHER DRUGS, PAST 30 DAY USE*

A little more than one third of individuals (35.6%) who were not in a controlled environment all 30 days reported they had used other illegal drugs in the 30 days before they entered the recovery center (see Table AC.12). At follow-up, only 1.5% reported they had used other illegal drugs, which was a significant decrease of 95.8%. Similar decreases were found for men and women.

TABLE AC.12. CHANGE IN OTHER DRUG USE FOR INDIVIDUALS WHO WERE NOT IN A CONTROLLED ENVIRONMENT ALL 30 DAYS BEFORE ENTERING THE RECOVERY CENTER

	USE AT INTAKE		USE AT FOLLOW-UP		PERCENT CHANGE <sup>a</sup>
	n	Valid %	n	Valid %	
<b>OTHER DRUGS</b>					
Men (n =72)	30	41.7%	2	2.8%	-93.3%***
Women (n = 63)	18	28.6%	0	0.0%	-100.0%***
Total (n = 135)	48	35.6%	2	1.5%	-95.8%***

a—Significance established using z test for proportions; \*p < .05, \*\*p < .01, \*\*\*p < .001.

## APPENDIX D

# LENGTH OF SERVICE, DOC-REFERRAL STATUS, AND TARGETED OUTCOMES

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This section describes the relationship between the length of service (i.e., number of days between entry into the program and discharge), DOC-referral status, and targeted outcomes at follow-up: (1) illegal drug or alcohol use (yes/no) and as average ASI Alcohol and Drug composite scores; (2) mental health (e.g., meeting criteria for depression or anxiety); (3) employment status (e.g., employed or unemployed), and (4) criminal justice system involvement (e.g., arrested at least once, spent at least one night incarcerated).

In the interest of examining how self-reported DOC-referral status and length of service may be related to one another and with program outcomes, we conducted multivariate analysis to examine these associations.

Individuals who report they were referred to the Recovery Kentucky programs by the DOC (252.8 days) did not have significantly different lengths of service in the programs compared to individuals who were not referred to the program by DOC (265.3 days;  $t(1,273) = .832, p < .05$ ).

Individuals who were referred to the Recovery Kentucky programs by the DOC did not have significantly different lengths of service in the programs compared to individuals who were not referred to the program by DOC

To better understand the relationship between DOC-referral status, length of service in the recovery centers, and outcomes at follow-up, we conducted multivariate analyses. We ran several logistic regression models with separate binary outcomes as the dependent variable for each model. The outcomes examined were substance use (i.e., alcohol and/or drug use), meeting criteria for depression, meeting criteria for anxiety, employment status (yes/no), arrests, and incarcerated in the 6 months before follow-up. Gender, DOC-referral status, and length of service (in days) were included in the models as predictor variables. OLS regression was used to examine the relationship between the predictor variables (e.g., gender, DOC-referral status, and length of service) and outcomes that were continuous variables: the ASI Alcohol composite score, the ASI drug composite score, and number of months employed in the 6 months before follow-up.

There were few statistically significant associations between the predictor and outcome variables. First, length of service was significantly associated with the odds of using alcohol or drugs in the 6 months before follow-up, such that shorter lengths of service were associated with greater odds of using alcohol or drugs in the 6 months before follow-up ( $OR_{adj} = .995, p < .01$ ).

Individuals who were referred to the Recovery Kentucky programs by DOC reported significantly fewer months of employment in the 6 months before follow-up. There were no significant associations between DOC-referral status or length of service and ASI alcohol and drug composite scores.

In conclusion, DOC-referral status and length of service were associated with few outcomes:

- Shorter length of service was associated with greater odds of using alcohol or drugs in the 6 months before follow-up;
- Individuals who were referred to Recovery Kentucky programs by DOC reported significantly fewer months of employment in the 6 months before follow-up.

Shorter length of service was associated with greater odds of using alcohol or drugs in the 6 months before follow-up