Findings from the Recovery Center Outcome Study

2019 Annual Report

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Sponsored by:
Kentucky Housing Corporation
1231 Louisville Road
Frankfort, KY 40601
(502) 564-7630

EDWIN KING
Executive Director

MICHAEL E. TOWNSEND
Recovery Kentucky Program Administrator

Report prepared by:
University of Kentucky Center on Drug & Alcohol Research
333 Waller Avenue, Suite 480, Lexington, KY 40504

Phase 1 intake surveys submitted from July 1, 2016 through June 30, 2017 and follow-up assessments completed July 1, 2017 through June 30, 2018.

Additional support from:
Kentucky Department for Behavioral Health, Developmental and Intellectual Disabilities, Division of Behavioral Health
275 East Main St.
Frankfort, KY 40621-0001
(502) 564-4527

WENDY MORRIS
Commissioner

KOLEEN SLUSHER
Division Director

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EXECUTIVE SUMMARY

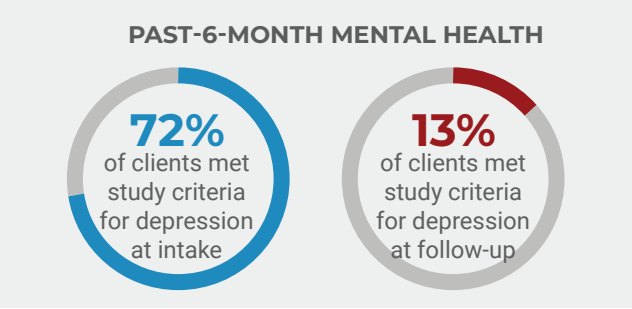
Recovery Kentucky was created to help Kentuckians recover from substance abuse, which often leads to chronic homelessness. There are currently 18 Recovery Kentucky centers across the Commonwealth, providing housing and recovery services for up to 2,200 persons simultaneously.

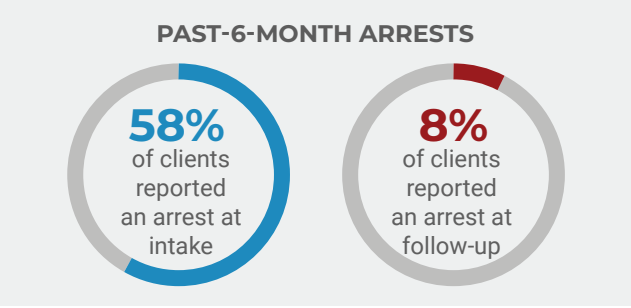
Recovery Kentucky is a joint effort by the Kentucky Department for Local Government (DLG), the Department of Corrections, and Kentucky Housing Corporation. Local governments and communities at each Recovery Kentucky center location have also contributed greatly to making these centers a reality. This is the eighth annual Recovery Center Outcome Study (RCOS) follow-up report conducted by the Behavioral Health Outcome Study team at the University of Kentucky Center on Drug and Alcohol Research (UK CDAR).

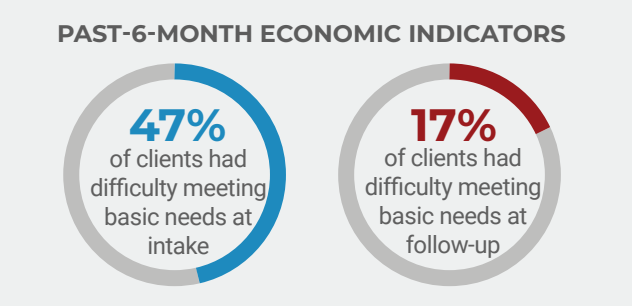
The goals of RCOS are to: (1) describe individuals who participated in the Recovery Kentucky programs; and (2) to examine client satisfaction, recovery support, and program outcomes for several targeted factors including: (a) substance use, (b) mental health, physical health, and stress, (c) criminal justice involvement, (d) quality of life, (e) education and employment, and (f) living situation. More specifically, this report presents: (1) demographics and targeted factors for 2,047 individuals who entered Phase 1 and completed an RCOS intake interview in FY 2017; and (2) outcomes for 280 men and women who attended one of 17[1] Recovery Kentucky programs that participated in FY 2017 data collection, agreed to participate in RCOS, completed an intake interview at entry to Phase 1, and then completed a 12-month follow-up survey between July 2017 and June 2018 (FY 2018). In addition, this report includes analysis and estimates of avoided costs to society in relation to the cost of recovery service programs.

Overall, in FY 2017, 2,047 clients from 17 participating Recovery Kentucky

[1] In FY 2017 there were 17 Recovery Kentucky programs.







programs across the state completed the RCOS intake interview. Information from those intakes indicates that clients were an average of 34 years old ranging from 18 to 73 years old. More than half of clients were male (59.3%) and 40.7% were female. The majority of clients (78.9%) self-reported they were referred to the recovery center by the criminal justice system (e.g., judge, probation officer, Department of Corrections).

A random sample of clients to be followed up was drawn and stratified by gender, Department of Corrections (DOC) referral into the program, and month of intake.[2] Overall, the clients who were followed up received, on average, about 7.6 months of services from the recovery centers. There was no difference in length of service between clients who were referred by DOC and clients who were not referred by DOC. Multivariate analysis examining the relationship between length of service, DOC referral status, and several targeted outcomes showed no significant associations between DOC referral status and the outcomes, but significant associations were found between length of service and four outcomes—the fourth of which overlapped with the other three factors. Specifically, shorter length of service was associated with greater odds of using drugs or alcohol, greater odds of meeting criteria for depression or anxiety, greater odds of being incarcerated, and worse global functioning in the 6-month follow-up period.

Comparisons between those who completed a follow-up and those who did not found no significant differences on key targeted factors including substance use, most mental health symptoms, physical health, and economic and living circumstances. However, significantly more clients who were in the follow-up sample were female because the follow-up sample was stratified by gender. Additionally, more individuals in the follow-up sample had a GED or high school diploma and fewer were under criminal justice system supervision when compared to individuals who were not followed up. Also, individuals in the follow-up sample reported a higher average number of days their mental health was not good in the 30 days before entering the program. For those who completed a follow-up, 8.2% were still involved with the program at the time of the follow-up, with most of those clients (85.0%, n = 17) in Phase II of the program.[3]

At follow-up, there were significant reductions in substance use, improvements in mental health, physical health, and stress-related health consequences, and decreased involvement with the criminal justice system. There were also improvements in quality of life, education and employment, living situation, and recovery supports at follow-up.

Substance Use

RCOS clients are predominately polysubstance users when they enter Recovery Kentucky programs with a history of prior substance abuse treatment. Only one-fourth of clients reported no substance use, alcohol use only, or alcohol use with one drug class in the 6 months before they entered the program. Nearly half of clients who were not in a controlled environment 180 days before entering the program reported using 4 or more drug classes along with alcohol in the 6-month period.

A trend analysis shows that the age of first use of alcohol, illegal drugs, and smoking tobacco has remained steady for the

[2] At the completion of the follow-up period, among the 280 clients with follow-up interviews, 52.9% (n = 148) were referred by the Department of Corrections (DOC) and 47.1% (n = 132) were not DOC-referred.

[3] Three of the individuals who were still in the recovery center had missing values for the variable about the phase in which they were at the time of the follow-up interview.

> ***"When I first got here I was broken. The staff believed in me and loved me, so I could love myself. They would encourage and believe in me. This program is the best thing that has happened to me."***
>
> - RCOS FOLLOW-UP CLIENT

past six fiscal years. Clients' average age of first alcoholic drink is consistently younger than the age reported for illegal drug and tobacco use while smoking and drug use tend to co-occur at similar ages.

A trend analysis from FY 2010 to FY 2017 intake data examining substance use patterns before entering the program shows that even though a higher percentage of clients reported using opioids than using heroin each fiscal year, the percent of clients reporting they misused prescription opioids and non-prescribed methadone has decreased while the percentages of clients that used heroin and methamphetamine have increased. This trend corresponds to other data sources, including the National Drug Use and Health Survey.[4]

Change in substance use from intake to follow-up was significant. Specifically, 92% of clients indicated they used illegal drugs in the 6 months before entering the recovery center and during the 6-month follow-up period, only 10% of clients reported using illegal drugs. There was a similar trend for alcohol use as 56% of clients reported using alcohol in the 6 months before entering the recovery center and only 8% reported using alcohol during the follow-up period.

Mental Health

There were also significant improvements in mental health over time for clients. The vast majority of clients (84%) met criteria for either depression or generalized anxiety at intake. By follow-up, only 21% met criteria for either depression or anxiety. The majority of clients (72%) met study criteria for depression at intake and by follow-up, only 13% of clients met study criteria for depression. At intake, 76% of clients reported symptoms that met study criteria for generalized anxiety and at follow-up, 16% of clients met study criteria for generalized anxiety. In addition, there was a significant decrease in the number of clients who met study criteria for both depression and generalized anxiety, from 64% at intake to 8% at follow-up. The percent of clients reporting suicide ideation and/or attempts decreased significantly from 36% at intake to 3% at follow-up.

Physical Health and Stress

General health status also improved from intake to follow-up. Only 10% of clients reported their health was very good or excellent at intake. By follow-up that number had increased to 59%. The average number of days of poor physical or mental health clients reported in the prior 30 days significantly decreased from intake to follow-up. Nearly one-quarter of clients reported chronic pain at intake and that number decreased to 9% at follow-up. The percent of individuals reporting they used substances to reduce or manage stress decreased from 71% at intake to 8% at follow-up.

Criminal Justice Involvement

The number of clients who reported being arrested decreased significantly

[4] Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality. (September 4, 2014). *The NSDUH Report: Substance Use and Mental Health Estimates from the 2013 National Survey on Drug Use and Health: Overview of Findings*. Rockville, MD.

from before entering the recovery center (58%) to after involvement in the program (8%). Likewise, the percent of clients reporting they spent at least one day in jail or prison decreased from 75% at intake to 13% at follow-up. About 66% of clients were under criminal justice system supervision at intake and that number decreased to 58% at follow-up.

Quality of Life

Clients reported a significantly higher quality of life after the program. On a scale of 1 (worst imaginable) to 10 (best imaginable), the average quality of life rating at intake was a 3.3. This increased significantly to 8.2 at follow-up. Clients were also more satisfied with their lives at follow-up compared to intake.

Education and Employment

Education and employment improved from intake to follow-up. At intake, 86% of clients had a high school diploma/GED or higher degree and this increased to 90% at follow-up. Less than half of clients (47.5%) reported working at least 1 month in the 6 months before program entry and 82% reported working at least 1 month during the follow-up period, representing a 35% increase. Although there was no significant gender difference in the percent of men and women employed at follow-up, men reported working significantly more months at intake and follow-up compared to women. Also, there was a significant wage gap between employed men and women at both intake and follow-up.

Living Situation

The percent of clients who considered themselves currently homeless decreased from 38% at intake to 5% at follow-up. Almost 40% of clients reported living in jail or prison at intake and 50% lived in a private residence. At follow-up, the majority of clients (81%) reported their usual living situation was a private residence. Further, at intake, half of clients reported they had difficulty meeting basic living needs (e.g., food, shelter, utilities, telephone). By follow-up this number had decreased to 17%. Similarly, the number of individuals who reported having difficulty obtaining health care for financial reasons (e.g., doctor, dental, and prescription medications) was 26% at intake and decreased to 7% at follow-up.

Recovery Support

At follow-up, there was a significant increase in the percent of individuals reporting they had gone to mutual help recovery group meetings in the past 30 days, from 38% at intake to 82% at follow-up. Further, of those who did not attend meetings at intake (n = 173), 78% did attend meetings at follow-up.

There was a significant increase in the number of clients who had interactions with family and friends who were supportive of their recovery as well as the number of clients who had supportive interactions with an AA/NA sponsor. The average number of people individuals reported they could count on for recovery support significantly increased from intake (5.1) to follow-up (29.7). Additionally, almost all clients (92%) reported they felt their chances of getting off and staying off drugs or alcohol was moderately or very good at follow-up.

Global Functioning

An index of global functioning that takes into account severity of substance use disorder, employment, homelessness, criminal justice system involvement, suicide ideation, overall health, recovery support, and quality of life was computed for clients at intake and follow-up. Almost all clients were classified as having worse global functioning at intake, whereas only 37% had worse global functioning at follow-up. In addition, in a multivariate analysis, controlling for the other factors, individuals who had shorter stays

in the recovery program, individuals who met criteria for moderate or severe SUD at intake, and individuals who were not employed as their usual employment at intake had significantly greater odds of having worse functioning at follow-up. Additionally, individuals who reported suicidal thoughts or attempts at intake and individuals with lower quality of life at intake had lower odds of having worse functioning at follow-up, after controlling for all the other factors.

Program Satisfaction

Results show that clients were largely satisfied (overall average of 8.6 out of 10 as the highest possible score) with their Recovery Kentucky program experience. The vast majority of clients agreed with a number of statements about positive aspects of the recovery program experience. The majority of clients reported they felt better about themselves as a result of their program experience. Clients reported the biggest benefits of the program were their reduced substance use, major life changes, improved mental health and feelings about self, and positive interactions and relationships with other people, and the positive lessons they learned in the recovery center.

Analysis of Relapse

Using a logistic regression, targeted factors were examined in relation to having reported drug and/or alcohol use in the 6 months before follow-up. Results of the analysis show when controlling for intake variables in the model, length of service in the Recovery Kentucky program was the only variable associated with relapse at follow-up.

Cost Estimate

Examining the total costs of drug and alcohol abuse to society in relation to expenditures on recovery services, estimates suggest that for every dollar invested in Recovery Kentucky programs there was a $2.56 return in avoided 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' lives in a variety of areas including decreased substance use, improved mental health, physical health, and stress, decreased involvement in the criminal justice system, improved education and employment situations, and improved living circumstances. These trends in decreases in substance use, mental health symptoms, physical health problems, stress, homelessness, economic hardship, and involvement in the criminal justice system as well as increases in quality of life, employment, and recovery supports have remained consistent over time across multiple annual reports. For example, trends show the vast majority of clients have reported illegal drug use in the 6 months before entering the program, with only 5.0% to 19.1% reporting illegal drug use at follow-up. Moreover, examining RCOS clients' level of global functioning from intake to follow-up for the past three reports shows that nearly all clients enter Recovery Kentucky programs with worse global functioning and by follow-up, only 31% to 38% have worse global functioning. Results also suggest clients appreciate their experiences in the recovery centers.

OVERVIEW OF REPORT

Recovery Kentucky was created to help Kentuckians recover from substance abuse, which often leads to chronic homelessness. There are currently 18 Recovery Kentucky centers across the Commonwealth, providing housing and recovery services for up to 2,200 persons simultaneously.

Recovery Kentucky is a joint effort by the Kentucky Department for Local Government (DLG), the Department of Corrections, and Kentucky Housing Corporation. Local governments and communities at each Recovery Kentucky center location have also contributed greatly to making these centers a reality.[5]

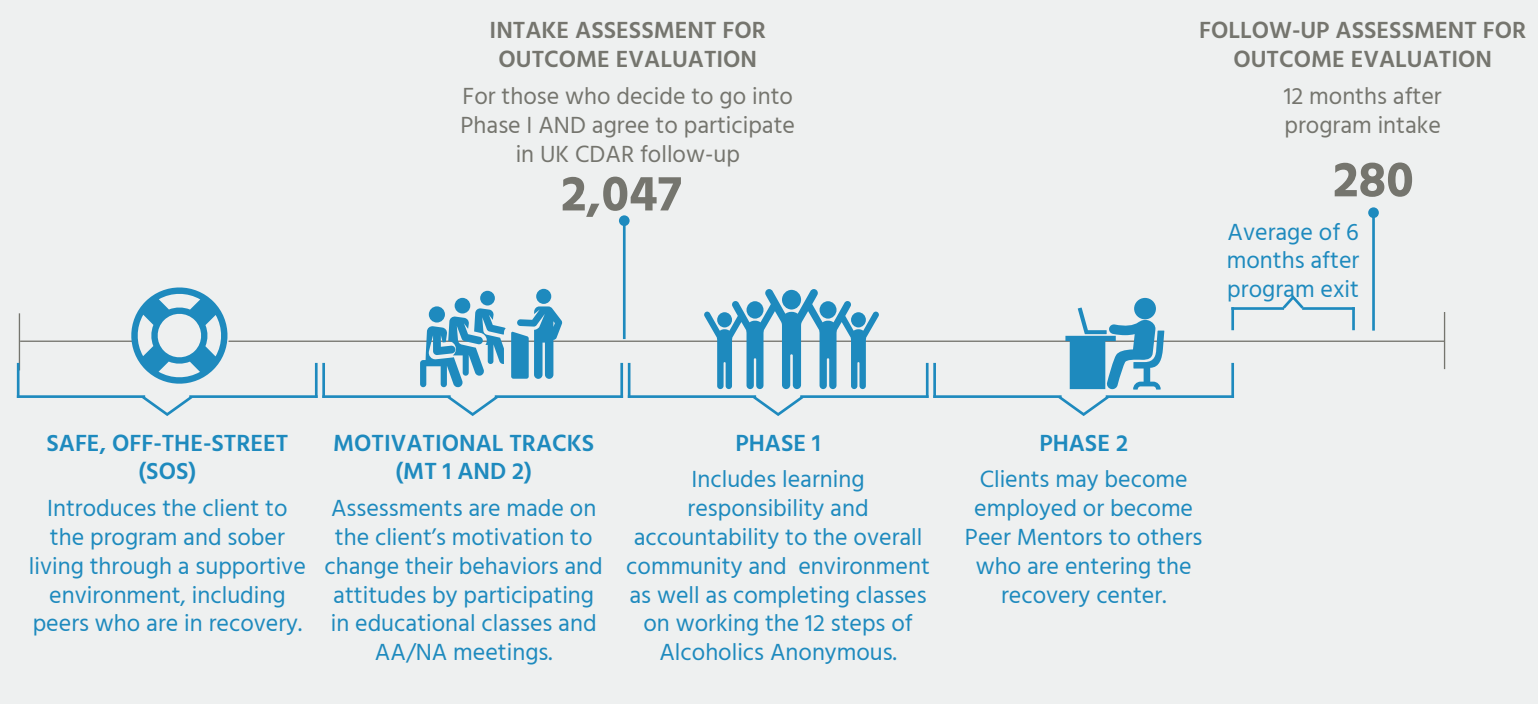
This is the eighth annual Recovery Center Outcome Study (RCOS) follow-up report conducted by the Behavioral Health Outcome Study team at the University of Kentucky Center on Drug and Alcohol Research (UK CDAR). Seventeen of the currently established Recovery Kentucky programs participated in this year's Recovery Center Outcome Study (RCOS). Of the participating recovery centers, there were 7 Recovery Kentucky facilities for women and 10 facilities for men across the state.[6]

Figure 1 below shows the program modules and how the RCOS fits into the timing of the program modules. The first component of the program is the Safe, Off-the-Street (SOS) program which lasts about 3-7 days. Once clients successfully complete SOS they move into the Motivational Tracks which includes assessments of a client's readiness for recovery. Motivational Tracks I and II last approximately 5-6 weeks. After SOS and the Motivational Tracks are completed clients enter Phase I. Phase I lasts about 5 months on average, and then clients can move to Phase 2 which can last 6 months or more. If clients drop out of the program during the motivational tracks or Phase I, they may reenter the program but will restart the SOS program.

[5] For more information about Recovery Kentucky, contact KHC's Mike Townsend toll-free in Kentucky at 800-633-8896 or 502-564-7630, extension 715; TTY711; or email MTownsend@kyhousing.org.

[6] Women's facilities include: Trilogy Center for Women – Hopkinsville; Women's Addiction Recovery Manor – Henderson; Brighton Recovery Center for Women – Florence; Liberty Place for Women – Richmond; Cumberland Hope Community Center for Women – Evarts; The Healing Place for Women – Louisville; The Hope Center for Women – Lexington.
Men's facilities include: Owensboro Regional Recovery Center for Men – Owensboro; The Healing Place for Men – Louisville; The Transitions Grateful Life Center for Men – Erlanger; Morehead Inspiration Center for Men – Morehead; The Healing Place of Campbellsville – Campbellsville; George Privett Recovery Center– Lexington; CenterPoint Recovery Center for Men – Paducah; Hickory Hill Recovery Center – Knott County; Men's Addiction Recovery Campus—Bowling Green; and Genesis Recovery Kentucky Center--Grayson.

FIGURE 1. PROCESS OF RECOVERY KENTUCKY PROGRAM PARTICIPATION



Recovery Kentucky staff conduct a face-to-face interview with clients as they enter Phase 1; thus, only individuals who have progressed through Safe, Off-the-Street, Motivational Tracks 1 and 2, and have entered Phase 1 are offered the opportunity to participate in the outcome evaluation. At the Phase 1 intake, an evidence-based assessment is used to inform about substance use, mental health symptoms, adverse childhood experiences and victimization experiences, health and stress, criminal justice involvement, quality of life, education and employment status, living situation, and recovery supports prior to entering the recovery center.[7] Most intake interview items ask about the 6 months or 30 days before clients entered the recovery center. Then, an evidence-based follow-up interview is conducted with a selected sample of clients about 12 months after the intake interview is completed (see Figure 1). Follow-up interview items ask about the past-6-month or past-30-day periods. 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 an honest evaluation of client outcomes and satisfaction with program services.

Results are presented for the overall sample and by gender when there were significant gender differences. There are thirteen main sections including:

Section 1. Overview of RCOS Methods and Client Characteristics. This section briefly describes the Recovery Center Outcome Study (RCOS) method including how clients are selected into the outcome evaluation. In addition, this section describes characteristics of clients who entered Phase 1 of a recovery center program and agreed to participate in RCOS between July 1, 2016 and June 30, 2017. This section also describes characteristics for clients who completed a 12-month follow-up survey conducted by UK CDAR between July 1, 2017 and June 30, 2018.

Section 2. Substance Use. This section describes change in illegal drug, alcohol, and tobacco use for clients. Past-6-month substance use is examined, as well as past-30-day substance use, separately

[7] Logan, T., Cole, J., Miller, J., Scrivner, A., & Walker, R. (2016). *Evidence Base for the Recovery Center Outcome Study Assessment and Methods.* Lexington, KY: University of Kentucky, Center on Drug and Alcohol Research. (Available upon request).

for clients who were not in a controlled environment all 30 days before entering the Recovery Kentucky program and clients who were in a controlled environment all 30 days before entering the program.

Section 3. Mental Health, Stress, and Physical Health. This section describes change in mental health, stress, and physical health including the following factors: (1) depression, (2) generalized anxiety, (3) comorbid depression and generalized anxiety, (4) suicidal thoughts or attempts, (5) posttraumatic stress symptoms, (6) general health status, (7) chronic pain, and (8) stress-related health consequences.

Section 4. Criminal Justice System Involvement. This section examines change in clients' involvement with the criminal justice system from intake to follow-up. Specifically, information about: (1) arrests, (2) incarceration, (3) self-reported misdemeanor and felony convictions, and (4) self-reported supervision by the criminal justice system.

Section 5. Quality of Life Ratings. This section shows change over time for two measures of quality of life: (1) overall quality of life, and (2) satisfaction with life.

Section 6. Education and Employment. This section examines changes in education and employment including: (1) highest level of education completed, (2) the percent 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 6 months prior to program entry, (4) median hourly wage among employed individuals, and (5) the percent of clients who expect to be employed in the next 6 months.

Section 7. Living Situation. This section examines the clients' living situation before they entered the program and at follow-up. Specifically, clients are asked at both points: (1) if they consider themselves currently homeless, (2) in what type of situation (i.e., own home or someone else's home, residential program, shelter) they have lived, and (3) about economic hardship.

Section 8. Recovery Supports. This section focuses on five main changes in recovery supports: (1) attending mutual help recovery group meetings, (2) recovery supportive interactions in the past 30 days, (3) the number of people the individual said they could count on for recovery support, (4) what will help them stay off drugs or alcohol, and (5) how good their chances are of staying off drugs or alcohol.

Section 9. Client Global Functioning. This section describes an index of global functioning that takes into account severity of substance use disorder, employment, homelessness, criminal justice system involvement, suicide ideation, overall health, recovery support, and quality of life. Change in functioning from intake to follow-up is presented. Furthermore, a multivariate analysis was conducted to examine the intake indicators of global functioning and their association with worse global functioning at follow-up.

Section 10. Client Satisfaction with Recovery Kentucky Programs. This section describes three aspects of client satisfaction: (1) overall client satisfaction, (2) client ratings of program experiences, and (3) client ratings of most positive outcomes of program participation.

Section 11. Multivariate Analysis of Relapse. This section presents a comparison of those who reported drug and/or alcohol use at follow-up and those who did not on targeted factors. It also focuses on a multivariate analysis examining factors related to relapse in the 2019 RCOS follow-up sample.

Section 12: Cost and Implications for Kentucky. 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 of drug and alcohol use for the year before individuals were in recovery and then for the same individuals in the year following entry to Phase I.

Section 13. Conclusion and Study Limitations. This section summarizes the report findings and discusses some major implications within the context of the limitations of the outcome evaluation study.

SECTION 1. OVERVIEW OF RCOS METHOD AND CLIENT CHARACTERISTICS

This section briefly describes the Recovery Center Outcome Study (RCOS) method including how clients are selected into the outcome evaluation. In addition, this section describes characteristics of clients who entered Phase I of a recovery center program and agreed to participate in RCOS between July 1, 2016 and June 30, 2017.

RCOS INTAKE SAMPLE

RCOS is comprised of a face-to-face intake interview using an evidence based assessment conducted by recovery center staff with clients as they enter Phase I. This interview includes demographic questions as well as questions in four main targeted factors (substance use, mental health symptoms, criminal justice system involvement, and quality of life) and four supplemental areas (health and stress-related health consequences, adverse childhood experiences and victimization experiences, economic and living circumstances, and recovery supports).[8] Intake interviews are conducted with clients who voluntarily agree to be included in the outcome evaluation. Most intake interview items ask about the 6 months or 30 days before clients entered the recovery center (i.e., intake). This report examines responses on intakes collected between July 1, 2016 and June 30, 2017 (i.e., FY 2017) for 2,047 clients.[9]

CHARACTERISTICS OF RCOS CLIENTS AT PHASE I INTAKE

DEMOGRAPHICS

Table 1.1 presents demographic information on clients with an intake survey completed in FY 2017. Clients' average age was 33.7 years old and men made up 59.3% of the sample. The majority of clients (91.2%) were White and 5.6% were Black. Half of the RCOS clients reported they had never been married and were not cohabiting at intake (44.5%), 29.7% were separated or divorced, 24.1% were married or cohabiting, and 1.7% were widowed. Over half of RCOS clients had children under the age of 18. A small minority of individuals (2.7%) were currently serving in the military or a veteran.

[8] For more information about the evidence-based assessment, see: Logan, T., Cole, J., Miller, J., Scrivner, A., & Walker, R. (2016). *Evidence Base for the Recovery Center Outcome Study Assessment and Methods.* Lexington, KY: University of Kentucky, Center on Drug and Alcohol Research. (Available upon request).

[9] When a client had more than one intake survey in the same fiscal year, 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 and only once in the data set.

TABLE 1.1. DEMOGRAPHICS FOR ALL RCOS CLIENTS AT PHASE I INTAKE IN FY 2017 (N = 2,047)[10]

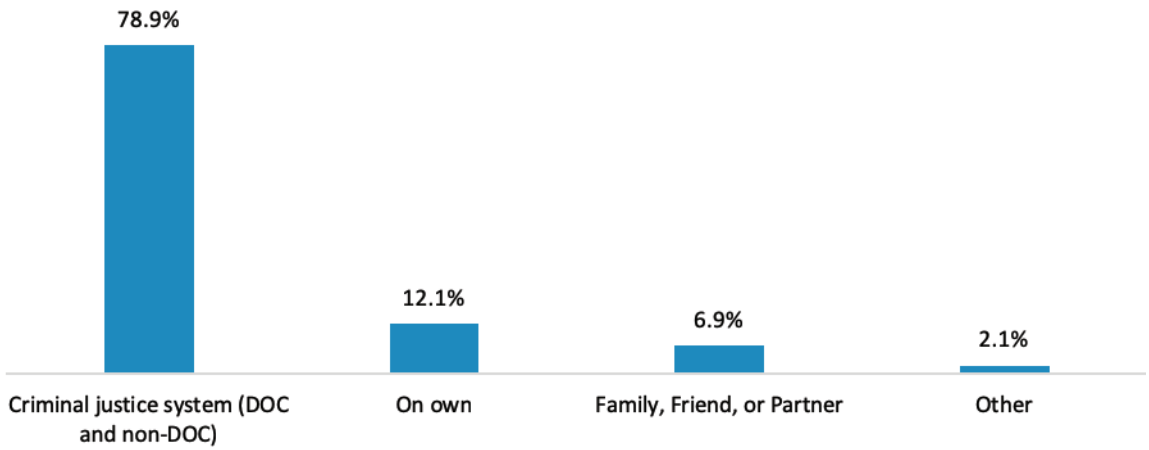
CHARACTERISTIC	
AGE	33.7 (Min. = 18, Max. = 73)
GENDER	
Male	59.3%
Female	40.7%
Transgender	0.0%
RACE	
White	91.2%
Black/African American	5.6%
Other or multiracial	3.2%
MARITAL STATUS	
Never married (and not cohabiting)	44.5%
Separated or divorced	29.7%
Married or cohabiting	24.1%
Widowed	1.7%
HAS CHILDREN UNDER 18 YEARS OLD	59.0%
ACTIVE DUTY OR MILITARY VETERAN	2.7%

SELF-REPORTED REFERRAL SOURCE

Figure 1.1 shows the self-reported referral source for RCOS clients. The majority of clients (78.9%) self-reported they were referred to the recovery center by the criminal justice system (e.g., judge, probation officer, Department of Corrections). The next two largest referral categories were the client decided to get help on his/her own (12.1%) and the client was referred to the recovery center by a relative, friend, or partner (6.9%). The remaining 2.1% indicated another referral source such as a treatment program, a health care provider, a mental health care provider, or another recovery center.

[10] Eight clients had missing data for date of birth and age was not able to be calculated, one client had missing data for race.

FIGURE 1.1. REFERRAL SOURCE FOR ALL RCOS CLIENTS (N = 2,047)



SUBSTANCE USE

The majority of clients reported using illegal drugs, alcohol, and tobacco in the 6-month period before entering the recovery center (see Figure 1.2).[11] Similar results were found when past-30-day use was examined for clients who were not in a controlled environment all 30 days before entering the recovery center.[12]

FIGURE 1.2. ALCOHOL, DRUG AND TOBACCO USE 6 MONTHS AND 30 DAYS BEFORE ENTERING RECOVERY CENTER

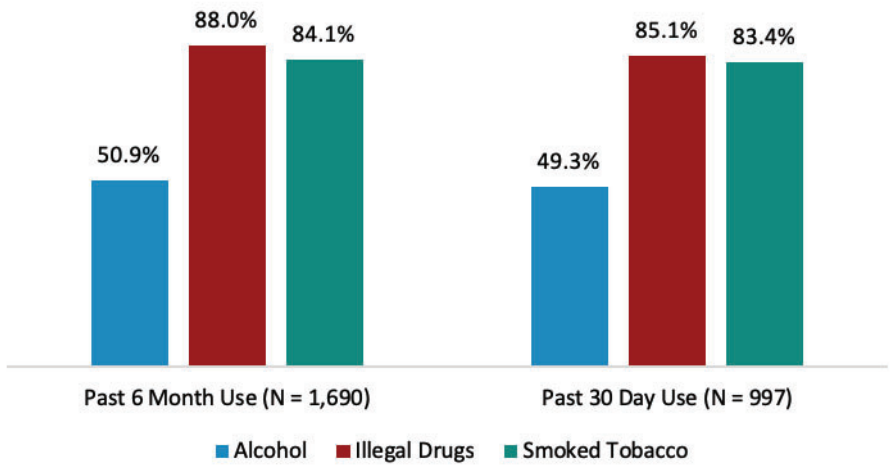


Figure 1.3 presents the percentage distribution of individuals who used alcohol and/or illegal drugs in the 6 months before entering the program. About 2 in 5 for the total sample reported alcohol and illegal drug use and an additional 2 in 5 reported illegal drug use only. Among the individuals who were

[11] Because being in a controlled environment reduces access to alcohol and illegal drugs, individuals who were in a controlled environment the entire intake 6-month period of the study (n = 357) were not included in the analysis of substance use during that period of time.

[12] Because being in a controlled environment reduces access to alcohol and illegal drugs, individuals who were in a controlled environment the entire intake 30-day period assessed for the study (n = 1,050) are not included in the analysis of substance use during that period of time.

not incarcerated all 180 days before entering the program, nearly half reported alcohol and illegal drug use.

FIGURE 1.3. PAST-6-MONTH ALCOHOL AND ILLEGAL DRUG USE AT INTAKE FOR THE TOTAL SAMPLE (N = 2,047) AND FOR THOSE NOT INCARCERATED ALL 180 DAYS BEFORE ENTERING THE PROGRAM (N = 1,690)

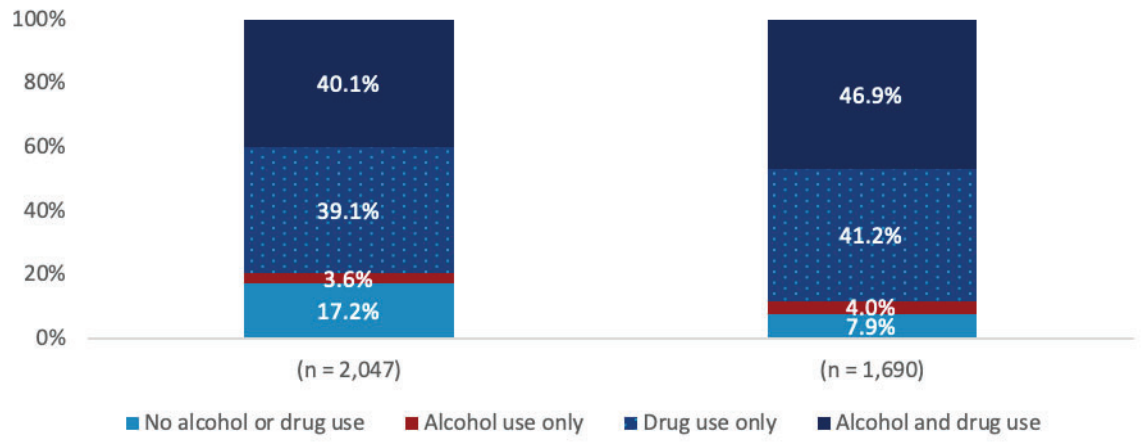
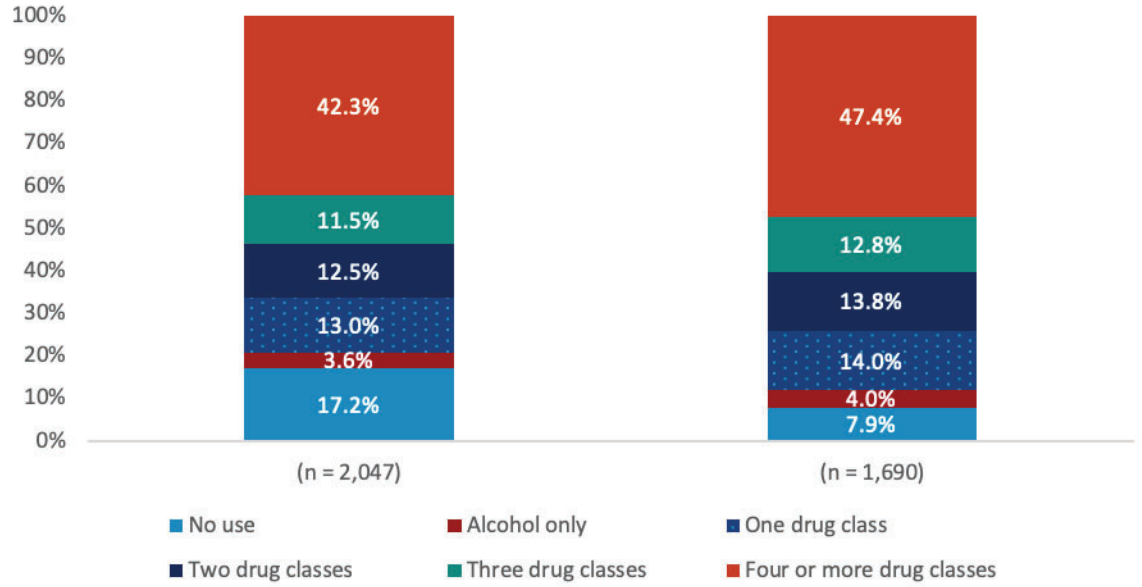


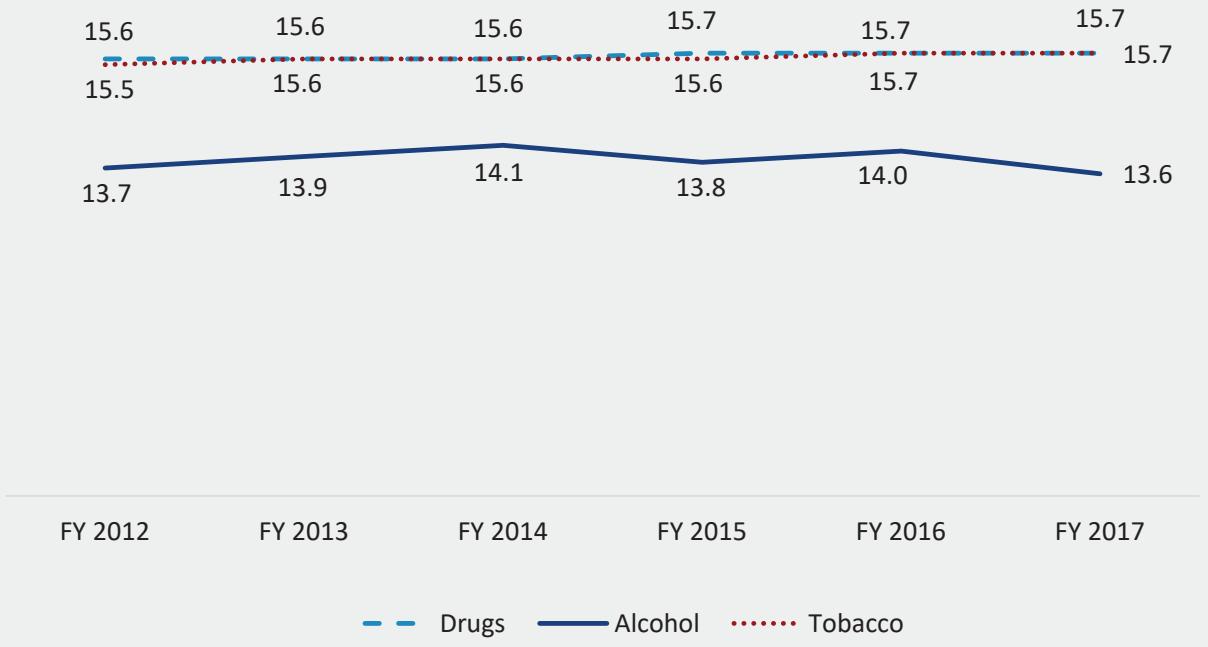
Figure 1.4 presents the percentages of RCOS clients who reported using no drugs, alcohol only, and then various numbers of drug classes from the following: marijuana, opioids (including prescription opioids, buprenorphine, methadone), heroin, CNS depressants (such as benzodiazepines, sedatives, barbiturates), stimulants (including amphetamines and cocaine), and other classes such as hallucinogens, synthetic marijuana, and inhalants). RCOS clients are predominately polysubstance users when they enter programs. Only one-fourth of clients reported no substance use, alcohol use only or alcohol use with one drug class. Nearly half of clients who were not in a controlled environment 180 days before entering the program reported using 4 or more drug classes along with alcohol.

FIGURE 1.4. PAST-6-MONTH POLYSUBSTANCE USE AT INTAKE FOR THE TOTAL SAMPLE (N = 2,047) AND FOR THOSE NOT INCARCERATED ALL 180 DAYS BEFORE ENTERING THE PROGRAM (N = 1,690)



TREND ALERT: AGE OF FIRST USE

Clients were asked, at intake, how old they were when they first began to use illegal drugs, when they had their first alcoholic drink (more than a few sips), and when they began smoking regularly.[13] The age of first use for each substance has remained steady for the past six fiscal years. Clients' average age of first alcoholic drink is consistently younger than the age reported for illegal drug and tobacco use while smoking and drug use tend to co-occur at similar ages.



ADVERSE CHILDHOOD EXPERIENCES

Beginning in October 2016, items about ten adverse childhood experiences from the Adverse Childhood Experiences Study (ACE) were included in the intake interviews.[14],[15],[16] In addition to providing the percentage of men and women who reported each of the 10 types of adverse childhood experiences before the age of 18 years old captured in ACE, the number of types of experiences was computed such that items individuals answered affirmatively were added to create a score equivalent to the ACE score. A score of 0 means the participant answered "No" to the five abuse and neglect items and the five household dysfunction items in the intake interview. A score of 10 means the participant reported all five forms of child maltreatment and neglect, and all 5 types of household dysfunction before the age of 18. The average number of ACE clients reported was 3.7 (not depicted in figure). Figure 1.5

[13] The data reported here is for the entire RCOS intake sample over the past 5 fiscal years, regardless of whether or not they were in a controlled environment.

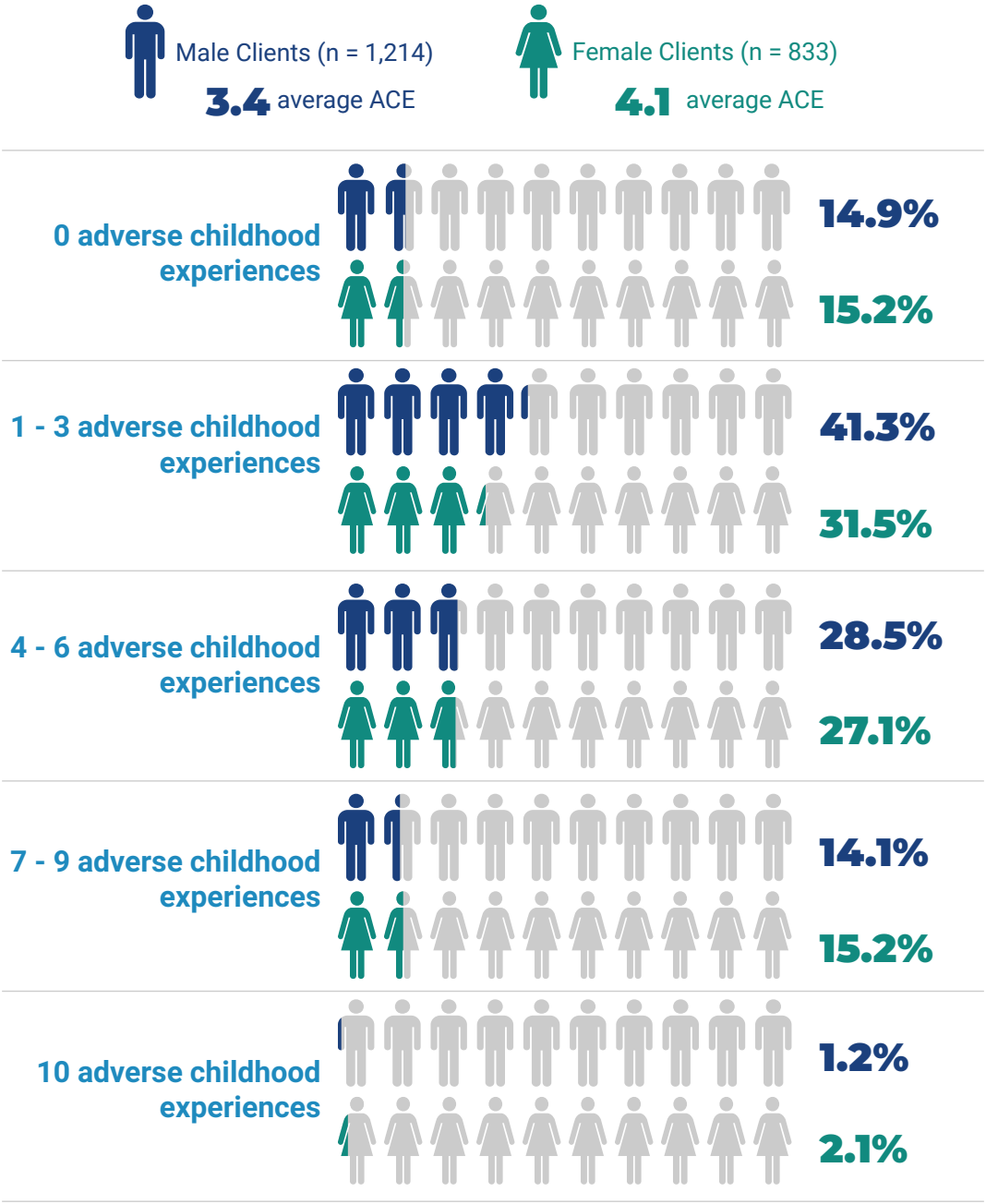
[14] Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., Koss, M. P., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. American Journal of Preventive Medicine, 14(4), 245-258.

[15] Centers for Disease Control and Prevention. (2014). Prevalence of individual adverse childhood experiences. Atlanta, GA: National Center for Injury Prevention and Control, Division of Violence Prevention. http://www.cdc.gov/violenceprevention/acestudy/prevalence.html.

[16] The intake assessment asked about 10 major categories of adverse childhood experiences: (a) three types of abuse (e.g., emotional maltreatment, physical maltreatment, and sexual abuse), (b) two types of neglect (e.g., emotional neglect, physical neglect), and (c) five types of family risks (e.g., witnessing partner violence victimization of parent, household member who was an alcoholic or drug user, a household member who was incarcerated, a household member who was diagnosed with a mental disorder or had committed suicide, and parents who were divorced/separated).

shows that 15.0% reported experiencing none of the ACE included in the interview. More than one-third reported experiencing 1 to 3 ACE, a little more than one-fourth reported experiencing 4 – 6 ACE, and a little less than one-fifth reported experiencing 7 – 9 ACE. A very small percent reported experiencing all 10 types of adverse childhood experiences.

FIGURE 1.5. NUMBER OF TYPES OF ADVERSE CHILDHOOD EXPERIENCES (n = 1,663)[17]



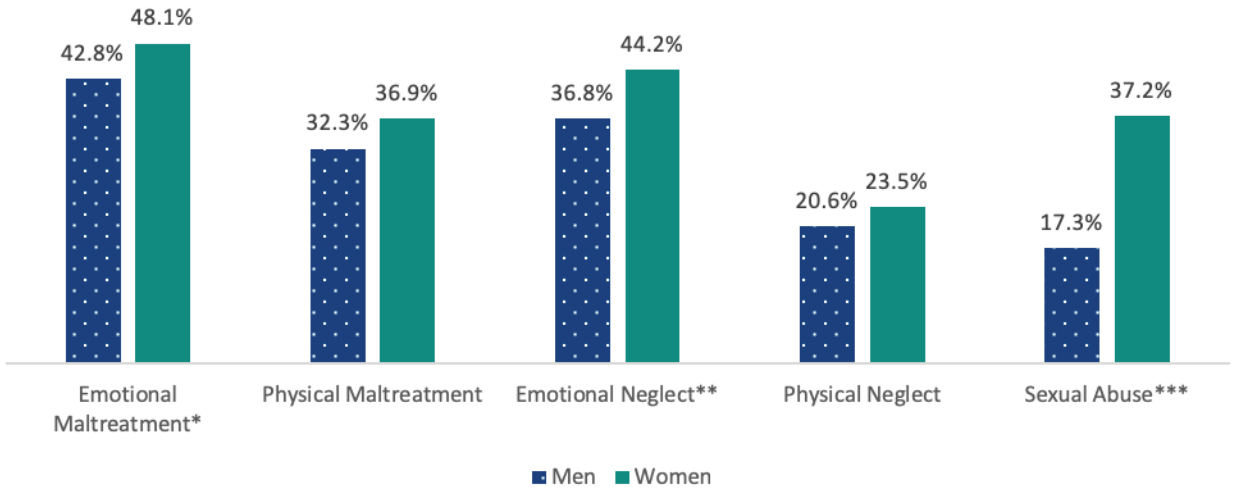
There was a significant difference in the proportion of men and women classified by number of types

[17] The ACE items were added in mid-October 2016, thus, 1,663 individuals who completed an intake interview included in this report answered the ACE items.

of ACE (see Figure 1.6). Significantly more men than women reported experiencing 1 to 3 types of ACE, whereas significantly more women than men reported experiencing 7 – 9 types of ACE.

Nearly half of women (48.1%) reported they had experienced emotional maltreatment in their childhood, compared to 42.8% of men (see Figure 1.7). Around one-third of men and women reported physical maltreatment. Significantly more women than men reported emotional maltreatment, emotional neglect, and sexual abuse in their childhood.

FIGURE 1.7. MALTREATMENT AND ABUSE EXPERIENCES IN CHILDHOOD BY GENDER (n = 1,663)[18]

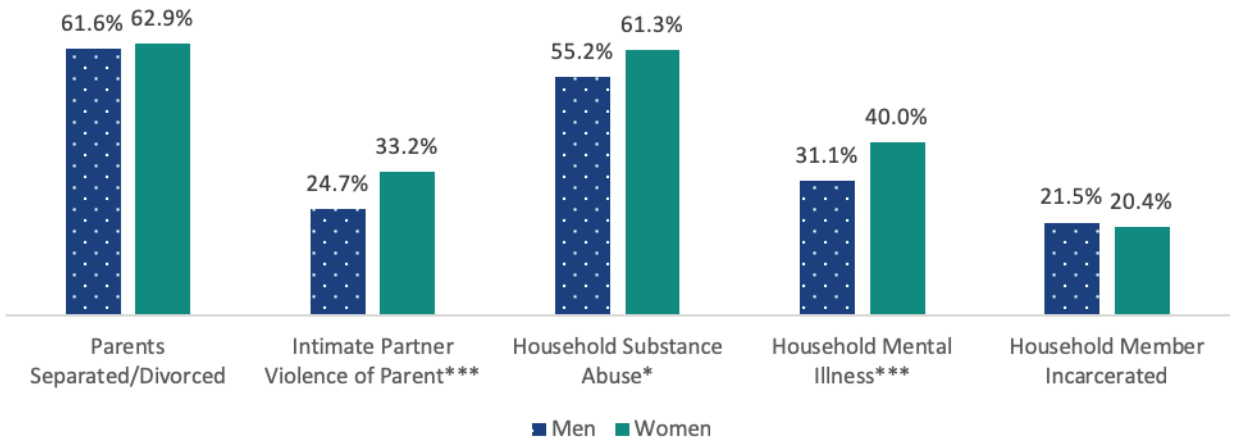


*p < .05, **p < .01, ***p < .001.

Most individuals reported their parents were divorced or lived separately and had a household member with a substance abuse problem (see Figure 1.8). Significantly more women than men reported they had witnessed intimate partner violence of a parent, had a household member with a substance abuse problem, and a household member with a mental illness or had committed suicide. About 1 in 5 individuals reported a household member had been incarcerated.

[18] The ACE items were added in mid-October 2016, thus, 1,663 individuals who completed an intake interview included in this report answered the ACE items.

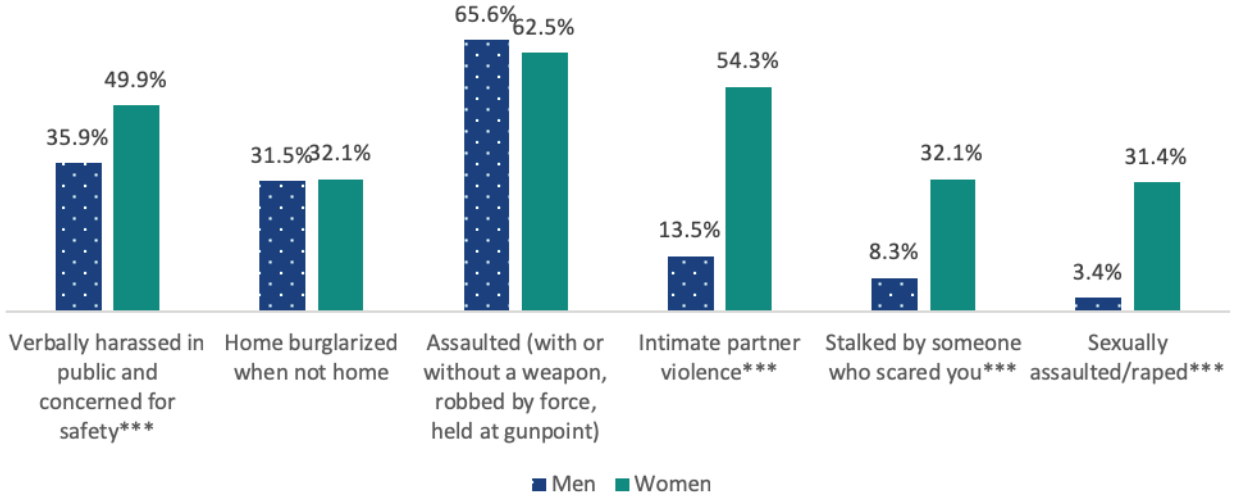
FIGURE 1.8. HOUSEHOLD RISKS IN CHILDHOOD BY GENDER (n = 1,663)[19]



*p < .05, ***p < .001.

Individuals were also asked about victimization experiences (including when they may have been the victim of a crime, harmed by someone else, or felt unsafe) they had in their lifetime and in the 6 months before entering the recovery center program. The results of the most commonly reported experiences are presented by gender in Figure 1.9. Similar percentages of men and women reported ever being the victim of a home burglary or assault (other than IPV). Compared to men, significantly higher percentages of women reported ever being verbally harassed in public and concerned for their safety, intimate partner violence (including controlling behavior), stalked by someone who scared them, and sexually assaulted or raped.

FIGURE 1.9. LIFETIME CRIME AND INTERPERSONAL VICTIMIZATION BY GENDER (n = 1,663)[20]



***p < .001.

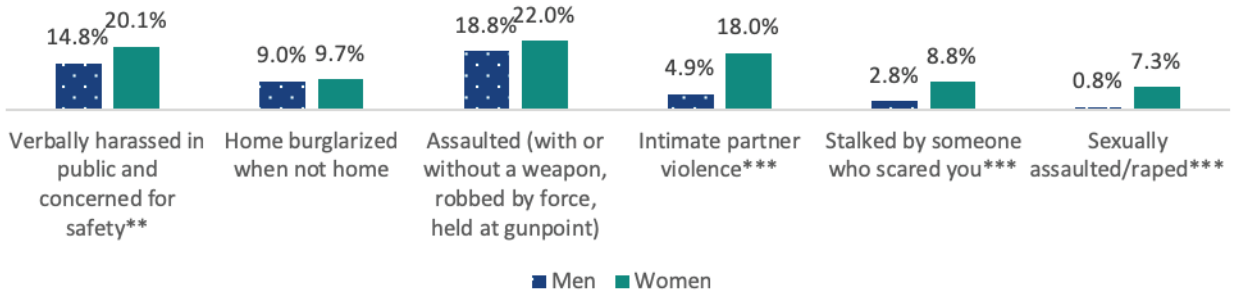
Smaller percentages of clients reported experiencing crime and interpersonal victimization in the 6 months before entering programs (see Figure 1.10). However, the pattern of gender differences was

[19] The ACE items were added in mid-October 2016, thus, 1,663 individuals who completed an intake interview included in this report answered the ACE items.

[20] The victimization items were added in mid-October 2016, thus, 1,663 individuals who completed an intake interview included in this report answered these questions.

the same for the 6-month-period as it was for lifetime prevalence percentages. Significantly higher percentages of women than men reported ever being verbally harassed in public and concerned for their safety, intimate partner violence (including controlling behavior), stalked by someone who scared them, and sexually assaulted or raped.

FIGURE 1.10. PAST-6-MONTH CRIME AND INTERPERSONAL VICTIMIZATION BY GENDER (n = 1,663)[21]

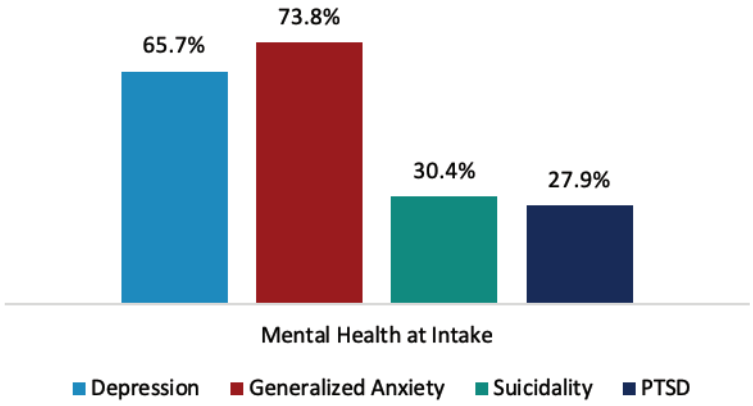


**p < .01, ***p < .001.

MENTAL HEALTH

At intake, nearly two-thirds of RCOS clients met study criteria for depression in the past 6 months (see Figure 1.11). Additionally, nearly three-fourths of RCOS clients met study criteria for generalized anxiety at intake. Three in ten (30.4%) reported suicidal thoughts or attempts in the 6 months before entering the recovery center. Among the individuals who completed an intake interview after the PTSD items were added and who reported any crime or interpersonal victimization (n = 1,327)[22], a little more than one-fourth had PTSD scores that indicated a risk of PTSD.[23]

FIGURE 1.11. DEPRESSION, GENERALIZED ANXIETY, SUICIDALITY, AND POST TRAUMATIC STRESS DISORDER IN THE PAST 6 MONTHS AT INTAKE (N = 2,047)



[21] The victimization items were added in mid-October 2016, thus, 1,663 individuals who completed an intake interview included in this report answered these questions.

[22] The PTSD measure was added in mid-October 2016. Individuals who reported no to all victimization questions were not asked the PTSD symptom items; thus, 1,327 individuals had PTSD scores at intake. A score of 10 or higher is indicative of clinically significant PTSD symptomatology.

[23] Price, M., Szafranski, D. D., van Stolk-Cooke, K., & Gros, D. F. (2016). Investigation of abbreviated 4 and 8 item versions of the PTSD Checklist 5. Psychiatry Research, 239, 124-130.

PHYSICAL HEALTH

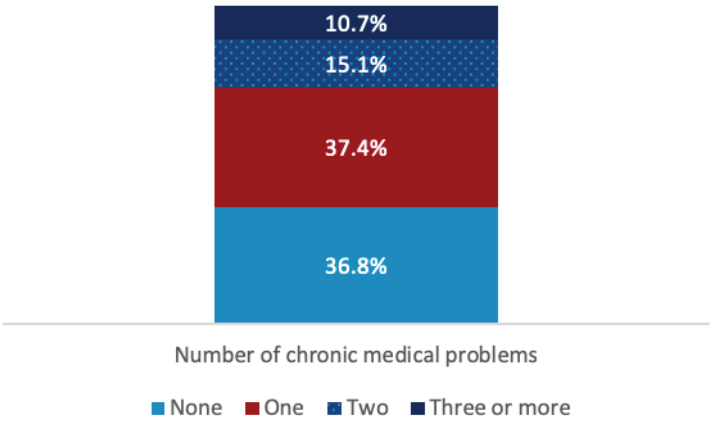
At intake, clients reported an average of 9.3 days of poor physical health in the past 30 days and an average of 16.8 days of poor mental health in the past 30 days (see table 1.2). One quarter of RCOS clients reported chronic pain in the 6 months before entering the recovery center. The majority of individuals (63.2%) reported they had at least one of the 15 chronic health problems listed on the intake interview. The most common medical problems were hepatitis C, arthritis, asthma, and cardiovascular disease.

TABLE 1.2. HEALTH-RELATED CONCERNS FOR ALL RCOS CLIENTS AT INTAKE (N = 2,047)

AVERAGE NUMBER OF POOR HEALTH DAYS IN PAST 30 DAYS	9.3
AVERAGE NUMBER OF POOR MENTAL HEALTH DAYS IN PAST 30 DAYS	16.8
CHRONIC PAIN	25.4%
AT LEAST ONE CHRONIC MEDICAL PROBLEM	63.2%
Hepatitis C	30.7%
Arthritis	14.2%
Asthma	13.5%
Cardiovascular/heart disease	10.8%

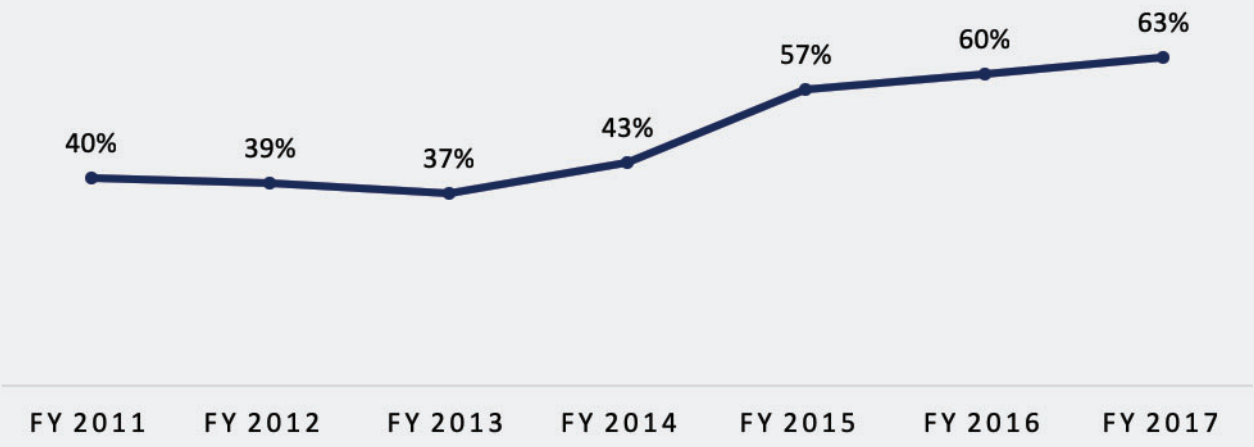
Figure 1.12 shows the percent of clients who reported having different numbers of chronic medical problems at intake. A little more than one-third reported no problems, and more than one-third reported one chronic medical problem. One in 10 reported having three or more chronic medical problems.

FIGURE 1.12. NUMBER OF CHRONIC MEDICAL PROBLEMS AT INTAKE FOR TOTAL SAMPLE (N = 2,047)



TREND ALERT: CHRONIC MEDICAL PROBLEMS AT INTAKE

At intake, clients were asked if, in their lifetime, they have been told by a doctor they have any of the chronic medical problems listed (e.g., diabetes, arthritis, asthma, heart disease, cancer, hepatitis B or C, cirrhosis of the liver). The number of RCOS clients reporting at least one chronic health problem in their lifetime remained steady from FY 2011 (40%) to FY 2013 (37%) and has increased from FY 2013 to FY 2017(63%).



The most common insurance provider reported at intake was Medicaid (57.9%; see Table 1.3). Nearly one-quarter of clients (23.3%) did not have any insurance. Small numbers of clients had insurance through an employer, including through a spouse, partner, or self-employment, Medicare, and through the Health Exchange.

TABLE 1.3. SELF-REPORTED INSURANCE FOR ALL RCOS CLIENTS AT INTAKE (N = 2,025)[24]

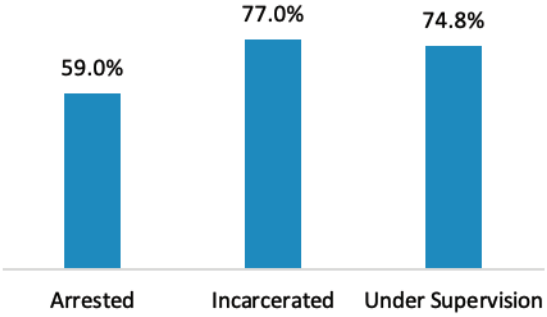
No insurance	23.3%
Medicaid	57.9%
Through employer (including spouse's employer, parents' employer, and self-employed)	9.1%
Medicare	7.8%
Through Health Exchange	1.2%
VA/Champus/Tricare	0.7%

CRIMINAL JUSTICE INVOLVEMENT

Over half of individuals reported they had been arrested at least once (59.0%) and a little over three-fourths reported they had been incarcerated at least one night (77.0%) in the 6 months before they entered the recovery center (see Figure 1.13). Additionally, 74.8% of clients reported they were currently under criminal justice supervision (i.e., probation, parole) at intake.

[24] Twenty-two individuals provided answers that could not be classified into categories: missing values.

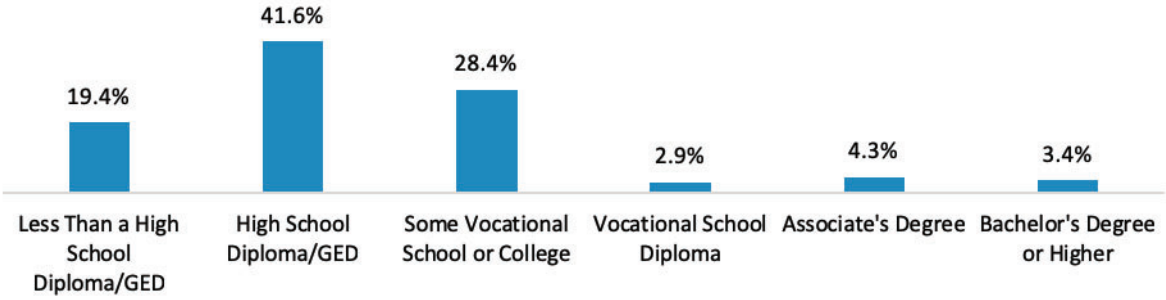
FIGURE 1.13. CRIMINAL JUSTICE INVOLVEMENT BEFORE ENTERING THE RECOVERY CENTER (N = 2,047)



EDUCATION AND EMPLOYMENT STATUS

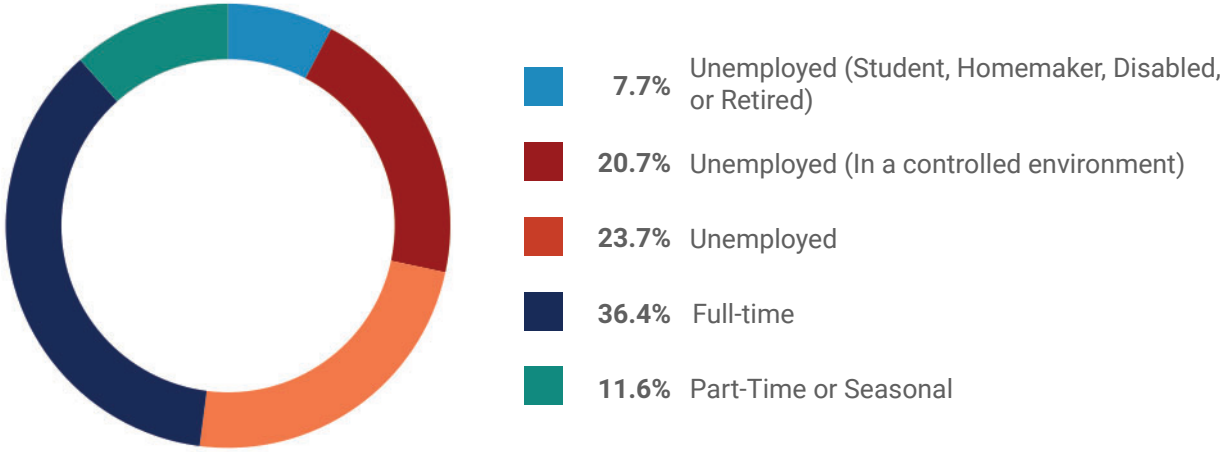
Fewer than one in five clients (19.4%) had less than a high school diploma or GED at intake (see Figure 1.14). Two-fifths (41.6%) of clients had a high school diploma or GED and 28.4% had completed some vocational/technical school or college. Only a minority of clients had completed vocational/technical school (2.9%), an associate's degree (4.3%), or a bachelor's degree or higher (3.4%).

FIGURE 1.14. HIGHEST LEVEL OF EDUCATION COMPLETED AT INTAKE (N = 2,047)



More than one-third of clients (36.4%) reported their usual employment status in the 6 months before they entered the recovery center was full-time employment and 11.6% reported part-time or seasonal work (see Figure 1.15). Less than 7.7% reported they were unemployed because they were a full-time student, parent/homemaker, retired, or disabled. One in five (20.7%) were unemployed because they were in a controlled environment and 23.7% reported they were unemployed for some other reason (i.e., looking for work).

FIGURE 1.15. USUAL EMPLOYMENT STATUS AT INTAKE (N = 2,047)



RCOS FOLLOW-UP SAMPLE

The following sections of this report describe outcomes for 280 men and women who completed both an intake and a follow-up interview about 12 months (average of 363.9 days) after the intake survey was completed. Data from Kentucky Housing Corporation shows that the average length of service for the program participants included in this report was 233.1 days, which includes time in Safe Off the Streets, Motivational Tracks, Phase 1 and Phase 2. The average number of days after program exit the follow-up interviews were conducted was 210, which is about 6.9 months. Detailed information about the methods can be found in Appendix A. Individuals who gave at least one mailing address and one phone number, or two phone numbers if they do not have a mailing address in their locator information, were eligible for selection into the 12-month follow-up component of the study.[25] The follow-up interviews were conducted over the telephone by an interviewer at UK CDAR with eligible individuals. Client responses to the follow-up interview were kept confidential to help facilitate an accurate and unbiased evaluation of client outcomes and satisfaction with program services. Overall, 24 completed follow-ups are targeted for each month. Due to the cost of the follow-up component of the study, the follow-up sample is targeted for as close to 280 follow-up interviews as possible.

Similar to the follow-up sampling plan used in the RCOS 2018 report, the sample to be followed up was originally stratified by target month (i.e., 12 months after intake is the target month for each client), gender, and self-reported DOC referral status at intake so that there were close to equal numbers of individuals in each of the following categories: (1) Male, referred by DOC, (2) Male, not referred by DOC, (3) Female, referred by DOC, and (4) Female, not referred by DOC.[26] Thus, at the completion of the follow-up period, among the 280 clients with follow-up interviews, 52.9% (n = 148) were referred by the Department of Corrections (DOC) and 47.1% (n = 132) were not DOC-referred.[27] The primary reason the sample was stratified by DOC status was to allow examination of whether length of service differs by DOC referral status, and whether either of these factors are related to key targeted outcomes. Analysis presented in Appendix D shows that DOC referral status was not associated with any of the

[25] 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 are unable to contact any friends or family members of the client.

[26] The selection criteria for the follow-up sample was determined in collaboration with Kentucky Housing Corporation and may change each year depending on the study needs and priorities.

[27] For the referral to be considered DOC, the Department of Corrections had to pay per diem for the client. Clients who were referred by the justice system (i.e., probation officer, drug court, etc.) but did not have per diem paid for by the Department of Corrections were considered non-DOC.

targeted outcomes, while length of service was associated with several targeted outcomes. Specifically, shorter length of service was associated with greater odds of using drugs or alcohol, meeting criteria for depression or anxiety, greater odds of being incarcerated, and greater odds of worse global functioning in the 6 months before follow-up.

See Appendix B for detailed information about clients who were followed up (n=280) compared to clients who were not followed up (n=1,767). There were few significant differences between those followed-up and not followed-up. Because of the stratification of the follow-up sample, a significantly higher proportion of followed up individuals were female than the not followed up individuals. Also, significantly more followed up individuals had a GED or high school diploma and fewer followed up individuals were under the supervision of the criminal justice system when compared to individuals who were not followed up. Also, individuals who completed a follow-up reported a higher average number of days their mental health was not good in the 30 days before entering the program than individuals who did not complete a follow-up interview.

Of the 280 individuals who completed a follow-up survey, 8.2% (n = 23) reported they were still in the recovery center at the time of the follow-up. For those clients who were in the recovery center at the time of the follow-up, 16 clients were in Phase 2, 2 clients were in Phase 1, and 3 clients had missing values for this question.[28] Analysis of substance use at follow-up, showed no difference when individuals who were still living at a recovery center at follow-up were included or excluded from the analysis.

CHARACTERISTICS OF RCOS FOLLOW-UP CLIENTS AT INTAKE

DEMOGRAPHICS

Table 1.4 presents demographic information on clients with an intake survey submitted in FY 2017 and a follow-up interview completed between July 2017 and June 2018. Clients' average age was 33.2 years old and women made up 52.5% of the sample. The majority of clients (91.4%) were White and 5.4% were Black. A little less than half of RCOS follow-up clients reported they had never been married (and were not cohabiting) at intake (46.4%), 25.7% were separated or divorced, and 25.4% were married or cohabiting. Over half of RCOS clients had children under the age of 18. About 2% of individuals were currently serving in the military or a veteran.

[28] One individual reported living at the Recovery Center, but not as a client, instead as a staff member.

ABOUT RCOS LOCATING EFFORTS

To ensure the highest possible follow-up rate, extensive locating efforts are made to contact each client selected for the follow-up study. Because of the transient nature of the client population and the living situation at the time of the follow-up (Recovery Centers), it can be challenging to find the clients. In order to understand the specific efforts it takes to achieve a high follow-up rate, project interviewers documented their efforts (e.g., mailings, phone calls, internet searches, etc.) to locate each participant included in the sample of individuals to be followed up from July 2013 to June 2014 (n = 527) for the 2015 RCOS outcomes report. All the locator files* were examined and used to extract information about the efforts project interviewers made to locate and contact participants as well as the type of contact information provided by participants in the original locator information when the intake survey data was submitted to UK CDAR.

The results for all 527 records in the 2015 report show a total of 1,741 phone calls were made to client phone numbers and 1,217 calls to contact persons' phone numbers (see following page). As the pull-out on the following page shows, project interviewers made an average of about 3.3 calls to client phone numbers and 2.4 calls to contact persons' phone numbers. Fewer than 30% of clients called in at any point and only 3.4% called-in to complete the survey after receiving the initial mailing without project interviewers putting additional effort into contacting the clients. That means follow-up interviewers put in considerable effort to attempt to locate, contact, and complete follow-up surveys with 96.6% of the individuals included in the follow-up sample.

Note: At the time of extraction, there were 2 (physical) files missing. Information on phone number, address, and contacts listed was pulled from the electronic data files. The other information was filled in with the sample averages for these 2 files.

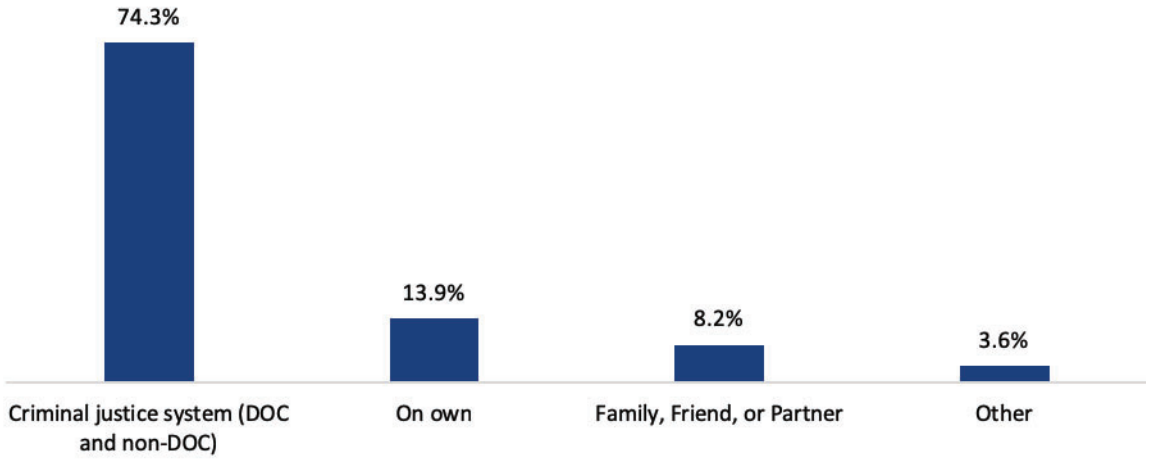
TABLE 1.4. DEMOGRAPHICS FOR FOLLOWED-UP RCOS CLIENTS AT PHASE I INTAKE IN FY 2016 (N = 280)

CHARACTERISTIC	
AGE	33.2 (Min. = 18, Max. = 62)
GENDER	
Male	47.5%
Female	52.5%
RACE	
White	91.4%
Black/African American	5.4%
Other or multiracial	3.2%
MARITAL STATUS	
Never married (and not cohabiting)	46.4%
Separated or divorced	25.7%
Married or cohabiting	25.4%
Widowed	2.5%
HAS CHILDREN UNDER 18 YEARS OLD	59.6%
ACTIVE DUTY OR MILITARY VETERAN	2.1%

SELF-REPORTED REFERRAL SOURCE

Figure 1.16 shows the self-reported referral source for RCOS clients in the follow-up sample. The majority of clients (74.3%) self-reported they were referred to the recovery center by the criminal justice system (e.g., judge, probation officer, Department of Corrections). A little more than one-fifth of clients (22.1%) reported they had a self-referral or a family, friend, or partner referred them to the program: client decided to get help on his/her own (13.9%) and the client was referred to the recovery center by a relative, friend, or partner (8.2%). The remaining 3.6% indicated another referral source such as a treatment program, a health care provider, a mental health care provider, or another recovery center.

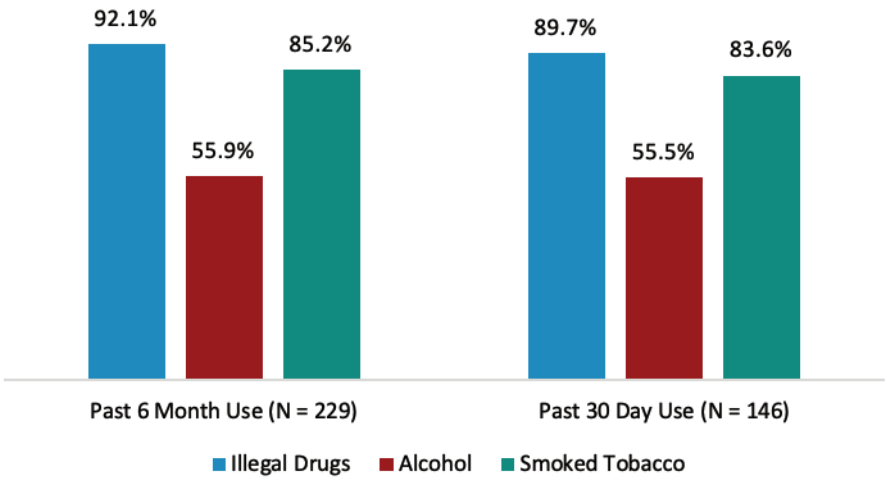
FIGURE 1.16. SELF-REPORTED REFERRAL SOURCE FOR FOLLOWED-UP RCOS CLIENTS (N = 280)



SUBSTANCE USE

The majority of clients in the follow-up sample reported using illegal drugs and tobacco and half of clients reported using alcohol in the 6-month period before entering the recovery center (see Figure 1.17).[29] Similar percentages were found when past-30-day use was examined for clients who were not in a controlled environment all 30 days before entering the recovery center.[30]

FIGURE 1.17. FOLLOW UP SAMPLE ALCOHOL, DRUG AND TOBACCO USE 6 MONTHS AND 30 DAYS BEFORE ENTERING RECOVERY CENTER



MENTAL HEALTH

At intake, 72.1% of RCOS clients in the follow-up sample met study criteria for depression in the past 6 months (see Figure 1.18). Additionally, three-fourths of followed-up clients met study criteria for generalized anxiety at intake. About 36% reported suicidal thoughts or attempts in the 6 months before entering the recovery center. Among the individuals who completed an intake interview after the PTSD items were added and who reported any crime or interpersonal victimization (n = 175)[31], nearly one-third had PTSD scores that indicated a risk of PTSD.[32]

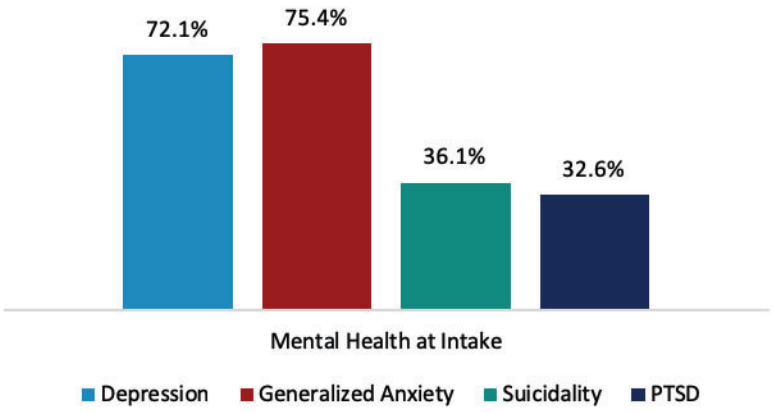
[29] Because being in a controlled environment reduces access to alcohol and illegal drugs, individuals who were in a controlled environment the entire intake 6-month period of the study (n = 51) were not included in the analysis of substance use during that period of time.

[30] Because being in a controlled environment reduces access to alcohol and illegal drugs, individuals who were in a controlled environment the entire intake 30-day period assessed for the study (n = 134) are not included in the analysis of substance use during that period of time.

[31] The PTSD measure was added in mid-October 2016. Individuals who reported no to all victimization questions were not asked the PTSD symptom items; thus, 175 individuals who later completed a follow-up interview had PTSD scores at intake. A score of 10 or higher is indicative of clinically significant PTSD symptomatology.

[32] Price, M., Szafranski, D. D., van Stolk-Cooke, K., & Gros, D. F. (2016). Investigation of abbreviated 4 and 8 item versions of the PTSD Checklist 5. *Psychiatry Research, 239*, 124-130.

FIGURE 1.18. DEPRESSION, GENERALIZED ANXIETY, SUICIDALITY, AND POST TRAUMATIC STRESS DISORDER IN THE PAST 6 MONTHS AT INTAKE FOR FOLLOWED-UP RCOS CLIENTS (N = 280)



PHYSICAL HEALTH

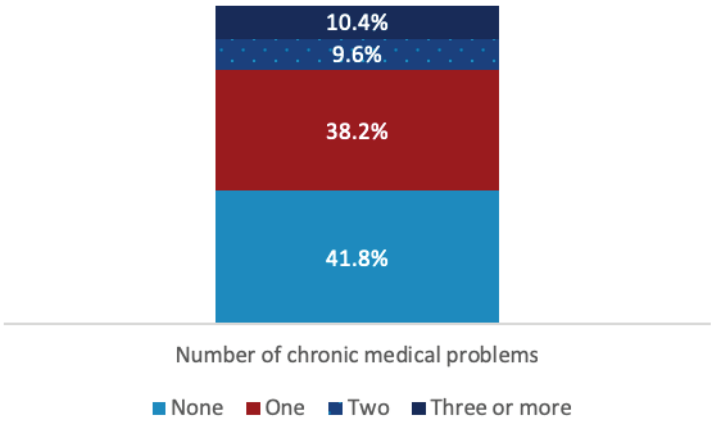
At intake, clients in the follow-up sample reported an average of 9.7 days of poor physical health in the past 30 days and an average of 19.6 days of poor mental health in the past 30 days (see Table 1.5). Nearly one quarter of RCOS follow-up clients (23.9%) reported chronic pain in the 6 months before entering the recovery center. Over half of individuals in the follow-up sample (58.2%) reported they had at least one of the 15 chronic health problems listed on the intake interview. The most common medical problems were hepatitis C, asthma, arthritis, and cardiovascular disease.

TABLE 1.5. HEALTH-RELATED CONCERNS FOR FOLLOWED-UP RCOS CLIENTS AT INTAKE (N = 280)

AVERAGE NUMBER OF POOR HEALTH DAYS IN PAST 30 DAYS	9.7
AVERAGE NUMBER OF POOR MENTAL HEALTH DAYS IN PAST 30 DAYS	19.6
CHRONIC PAIN	23.9%
AT LEAST ONE CHRONIC MEDICAL PROBLEM	58.2%
Hepatitis C	27.1%
Asthma	15.0%
Arthritis	12.5%
Cardiovascular/heart disease	7.1%

Figure 1.19 shows the percent of followed-up clients who reported having different numbers of chronic medical problems at intake. Two-fifths reported no problems, and 38.2% reported one chronic medical problem. One in 10 reported having two problems and 1 in 10 reported having three or more chronic medical problems.

FIGURE 1.19. NUMBER OF CHRONIC MEDICAL PROBLEMS AT INTAKE FOR TOTAL SAMPLE (N = 280)



At intake, the most common insurance provider among followed-up individuals was Medicaid (58.1%; see Table 1.6). Almost one-quarter of clients (23.3%) did not have any insurance. Small numbers of clients had insurance through an employer, including through a spouse, partner, or self-employment (11.1%), Medicare (5.4%), through the Health Exchange (1.8%), and VA/Champus/Tricare (0.4%).

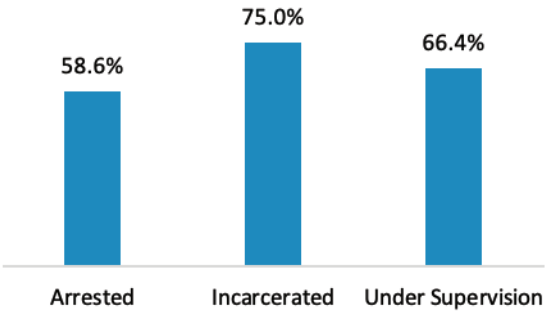
TABLE 1.6 SELF-REPORTED INSURANCE FOR FOLLOWED-UP RCOS CLIENTS AT INTAKE (N = 279)[33]

No insurance	23.3%
Medicaid	58.1%
Through employer (including spouse's employer, parents' employer, and self-employed)	11.1%
Medicare	5.4%
Through Health Exchange	1.8%
VA/Champus/Tricare	0.4%

CRIMINAL JUSTICE INVOLVEMENT

Over half of followed-up individuals reported they had been arrested at least once (58.6%) and three-fourths reported they had been incarcerated at least one night (75.0%) in the 6 months before they entered the recovery center (see Figure 1.20). Additionally, 66.4% of clients reported they were currently under criminal justice supervision (i.e., probation, parole) at intake.

FIGURE 1.20. FOLLOW UP SAMPLE CRIMINAL JUSTICE INVOLVEMENT BEFORE ENTERING THE RECOVERY CENTER (N = 280)

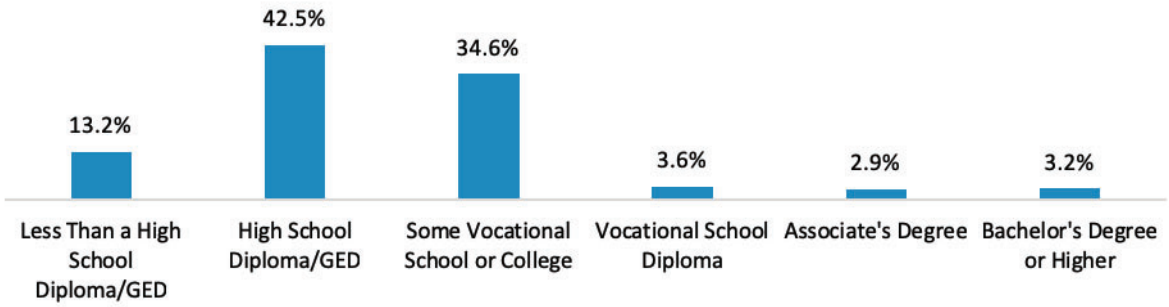


[33] One individual gave responses that could not be classified into a category: missing value.

EDUCATION AND EMPLOYMENT STATUS

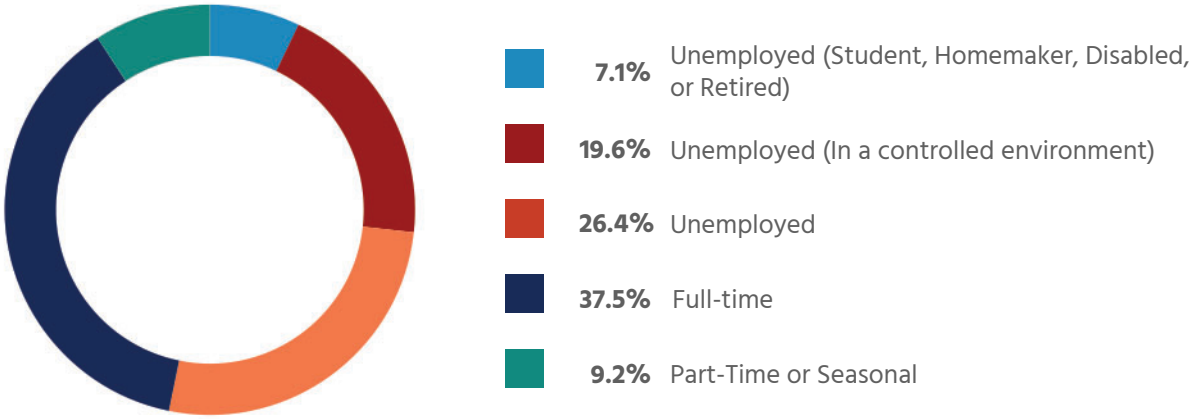
About 13% of followed-up clients had less than a high school diploma or GED at intake (see Figure 1.21). About 43% of clients had a high school diploma or GED and 34.6% had completed some vocational/technical school or college. Only a minority of clients had completed vocational/technical school (3.6%), an associate's degree (2.9%), or a bachelor's degree or higher (3.2%).

FIGURE 1.21. HIGHEST LEVEL OF EDUCATION COMPLETED BY FOLLOW-UP SAMPLE AT INTAKE (N = 280)



More than one-third of followed-up clients (37.5%) reported their usual employment status in the 6 months before they entered the recovery center was full-time employment and 9.3% reported part-time or seasonal work (see Figure 1.22). A minority (7.1%) reported they were unemployed because they were a full-time student, parent/homemaker, retired, or disabled. About 1 in 5 reported their usual employment was unemployed because they were in a controlled environment (19.6%), and 26.4% reported they were unemployed for some other reason (i.e., looking for work).

FIGURE 1.22. USUAL EMPLOYMENT STATUS FOR FOLLOW-UP SAMPLE AT INTAKE (N = 280)



SECTION 2. SUBSTANCE USE

This section describes intake (before entry into SOS) compared to follow-up (i.e., 6 months and 30 days before the follow-up interview) change in illegal drug, alcohol, and tobacco use.[34] Both past-6-months substance use and past 30-day substance use is examined separately for clients who were not in a controlled environment the entire period before entering a recovery program and clients who were in a controlled environment the entire period before entering the program (for the 30 day use). Results for each analysis are presented for the overall sample and then by gender if there were significant gender differences.

Section 2A examines change in the use of (1) any illegal drugs, (2) alcohol,[35] and, (3) tobacco before entering the recovery center and before the follow-up for clients who were not in a controlled environment the entire period before entering the program (i.e., 6 months or 30 days).[36] Results and significant gender differences are presented for each substance group in four main subsections:

1. **Change in 6-month substance use from intake to follow-up for clients not in a controlled environment.**[37] Comparisons of use of substances (any illegal drug use, alcohol use, and tobacco use) in the 6 months before the client entered the program and use of substances during the 6-month follow-up period are presented (n = 226). 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 the substances, the number of months they used the substance before program entry and during the follow-up period are analyzed.

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 = 143) are presented.[38]

4. **Change in self-reported severity of substance use disorder from intake to follow-up.** There are two indices of substance use severity presented in this report. One way to examine overall change in degree of severity of substance use is to ask participants to self-report whether they met the 11

[34] 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.

[35] 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).

[36] McNemar's test 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.

[37] Fifty-four individuals were not included in the analysis of change in substance use from the 6 months before entering the recovery center to the 6 months before follow-up because they reported being incarcerated the entire period measured at intake (n = 51) or they had missing data on the number of days incarcerated at follow-up (n = 3).

[38] 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. A total of 134 individuals were in a controlled environment all 30 days before entering the program and 2 individuals were in a controlled environment all 30 days before follow-up.

criteria included in the DSM-5 for diagnosing substance use disorder in the past 6 months. Under DSM-5 anyone meeting any two of the 11 criteria during the same 12-month period would receive a diagnosis of substance use disorder (SUD) as long as their symptoms were causing clinically significant impairments in functioning. The severity of the substance use disorder in this report (i.e., none, mild, moderate, or severe) is based on the number of criteria met. The percent of individuals in each of the four categories at intake and follow-up is presented.

The Addiction Severity Index (ASI) composite scores are examined for change over time among individuals who reported any illegal drug use (n = 124), among individuals who reported using any alcohol (n = 81) and those who reported both alcohol and/or illegal drug use (n = 135). The ASI composite score assesses self-reported addiction severity even among those reporting no substance use in the past 30 days. The alcohol and drug composite scores are computed from items about 30-day alcohol (or drug) use and the number of days individuals used multiple drugs in a day, as well as the impact of substance use on the individual's life, such as money spent on alcohol, number of days individuals had alcohol (or drug) problems, how troubled or bothered individuals were by their alcohol (or drug) problems, and how important treatment was to them.

Section 2B presents results for each substance group 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 the recovery center or follow-up (n = 134) are presented.

2. **Change in self-reported severity of substance use disorder for clients who were in a controlled environment all 30 days before entering the recovery center.** ASI alcohol and drug severity composite scores are examined for change over time for clients who reported alcohol use in the past 30 days (n = 23) and for clients who reported drug use in the past 30 days (n = 58) at intake and/or follow-up.

2A. SUBSTANCE USE FOR CLIENTS WHO WERE NOT IN A CONTROLLED ENVIRONMENT

ANY ILLEGAL DRUG USE

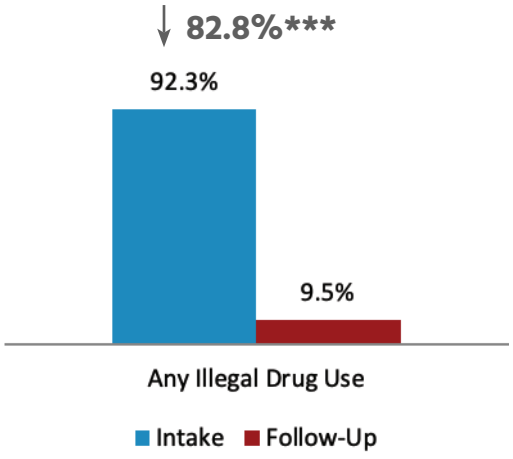
Past-6-Month Illegal Drug Use

At intake, 92.3% of clients reported using any illegal drugs (including prescription drug misuse and other illegal drugs) in the 6 months before entering the recovery center. At follow-up, only 9.5% of clients reported using illegal drugs in the 6 months before follow-up (a significant decrease of 82.8%; see Figure 2A.1).

At intake, clients were asked how old they were when they first used any illegal drugs. RCOS clients, on average, reported they were 16.2 years old when they initiated drug use.[a]

a Three clients had missing data for this question

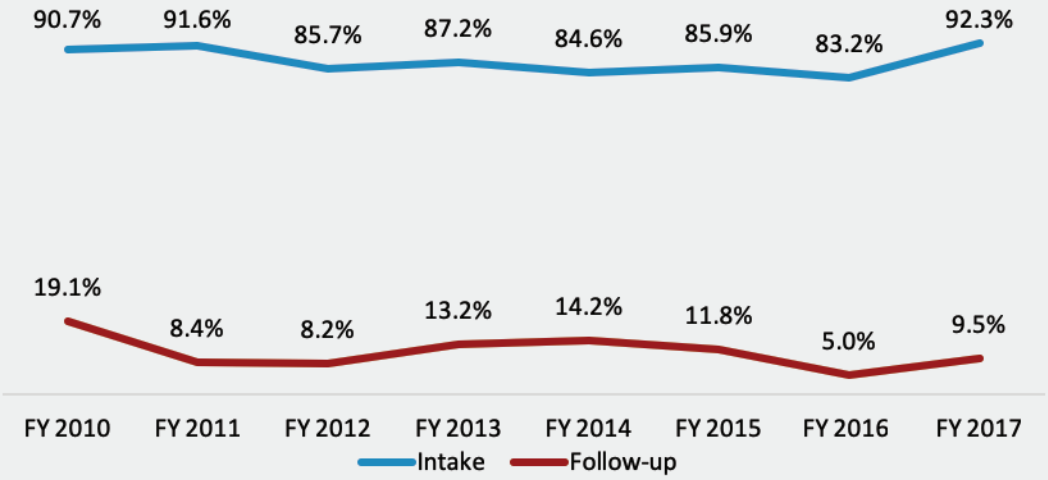
FIGURE 2A.1 ANY ILLEGAL DRUG USE AT INTAKE AND FOLLOW-UP (N = 222)



***p < .001.

TRENDS IN PAST-6-MONTH ILLEGAL DRUG USE

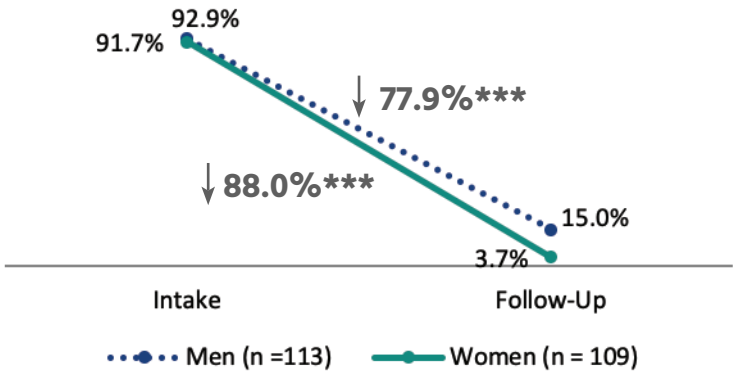
The number of RCOS clients reporting illegal drug use in the 6 months before intake was consistently high. Overall, at follow-up, the number of clients reporting illegal drug use has decreased over the years.



GENDER DIFFERENCES IN PAST-6-MONTH USE OF ANY ILLEGAL DRUGS

At intake, there was no gender difference in illegal drug use in the past 6 months (see Figure 2A.2). The number of men and women reporting past-6-month illegal drug use significantly decreased from intake to follow-up. At follow-up, significantly more men than women reported using any illegal drugs in the past 6 months.

FIGURE 2A.2. GENDER DIFFERENCES IN PAST-6-MONTH USE OF ANY ILLEGAL DRUGS AT INTAKE AND FOLLOW-UP[a]

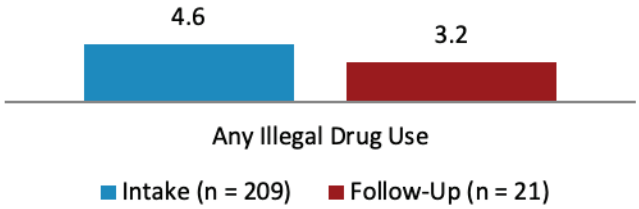


a—Significant difference by gender at follow-up (p < .01).
***p<.001.

AVERAGE NUMBER OF MONTHS USED ANY ILLEGAL DRUGS

Among clients who reported illegal drug use in the 6 months before entering the program (n = 209), they reported using drugs an average of 4.6 months (see Figure 2A.3). Among individuals who reported using illegal drugs at follow-up (n = 21), they reported using an average of 3.2 months.

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

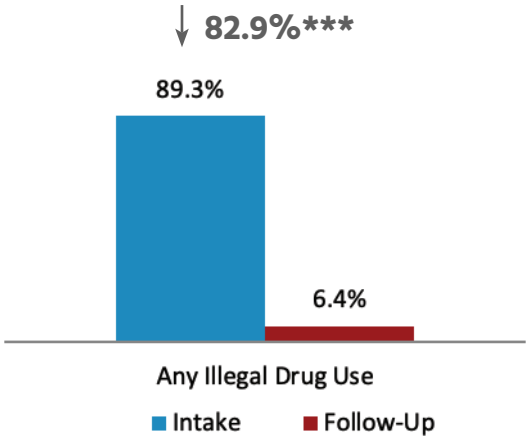


Past-30-Day Illegal Drug Use

About three-quarters of individuals (89.3%) 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 2A.4). At follow-up, only 6.4% of individuals reported they had used illegal drugs in the past 30 days—a significant decrease by 82.9%.

The number of individuals who reported **using illegal drugs in the past 30 days decreased by 83%**

FIGURE 2A.4. PAST 30-DAY USE OF ANY ILLEGAL DRUG USE AT INTAKE TO FOLLOW-UP (n = 140)

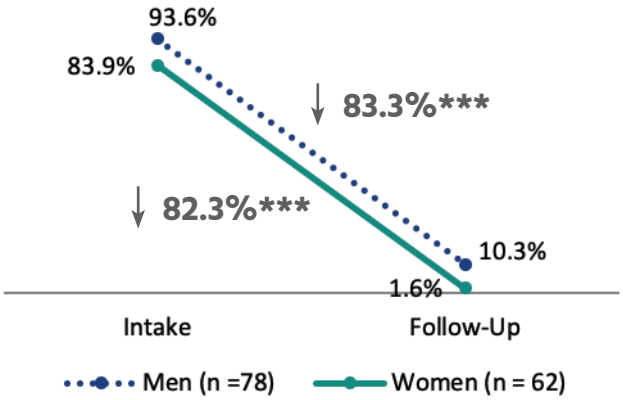


***p < .001.

GENDER DIFFERENCES IN PAST-30-DAY USE OF ANY ILLEGAL DRUGS

For the past 30 days before entering the recovery center program, there was no difference in illegal drug use by gender (see Figure 2A.5). The number of men and women who reported past-30-day illegal drug use decreased significantly over time. However, at follow-up, significantly more men reported any illegal drug use when compared to women.

FIGURE 2A.5. GENDER DIFFERENCES IN PAST-30-DAY USE OF ANY ILLEGAL DRUGS AT INTAKE AND FOLLOW-UPa



a—Significant difference by gender at intake (p < .05).
***p<.001.

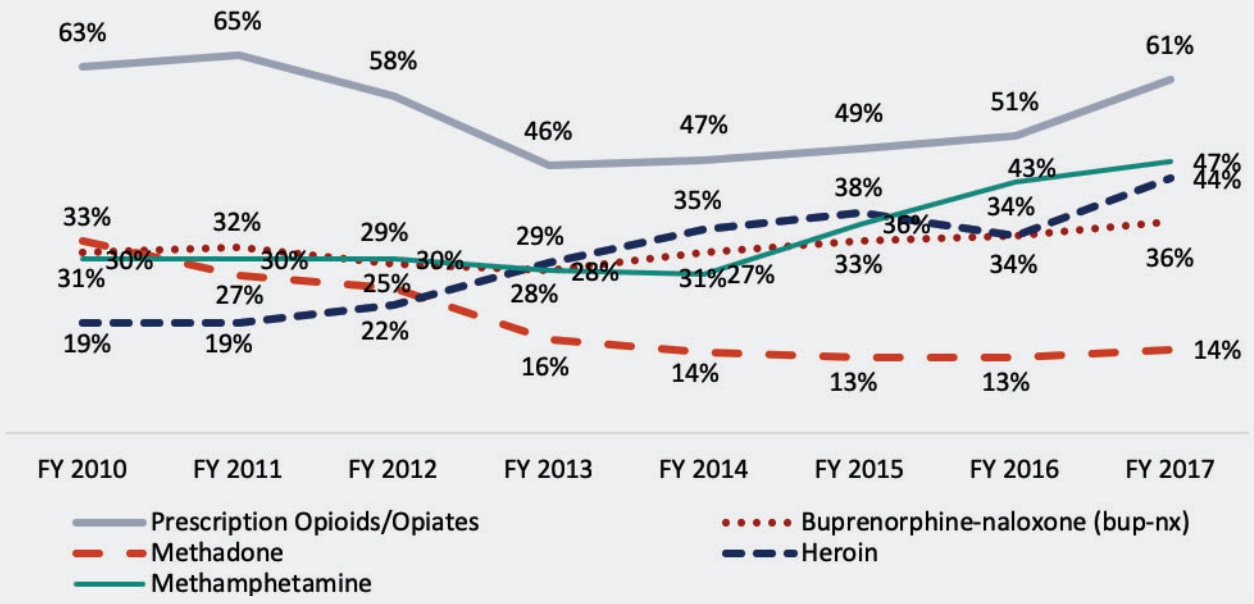
> *"I liked that it was a fellowship of people addicted. You could come and discuss your problems. I retained a lot from that program. It was a good experience."*
>
> - RCOS FOLLOW-UP CLIENT

TREND ALERT: HOW MUCH HAS OPIOID AND METHAMPHETAMINE USE CHANGED OVER TIME?

This trend analysis examines the percent of RCOS clients who reported misusing prescription opiates/opioids, non-prescribed methadone, non-prescribed buprenorphine-naloxone (bup-nx), and heroin in the 6 months before entering the program from FY 2010 to FY 2017. This analysis examined data among the RCOS clients who completed an intake interview each fiscal year.

As the figure shows, about two-thirds of clients reported misusing prescription opioids in FY 2010 and FY 2011. A significant decline in the percent of clients reporting opioid misuse began in FY 2012 (58%) and continued through FY 2013 (46%). This number began to slightly rise again in FY 2014 (47%), FY 2015 (49%), and FY 2016 (51%), with a larger increase in FY 2017.

The number of clients reporting non-prescribed bup-nx has remained relatively stable over the years, dipping to its lowest in FY 2012 (29%) and peaking in FY 2017 (36%). The percent of individuals reporting non-prescribed methadone use has steadily decreased from FY 2010 (33%) to FY 2016 (13%). Heroin use, however, has increased from 19% in FY 2010 to 38% in FY 2015. The number of clients reporting heroin use dipped slightly in FY 2016 to 34%, and increased to 44% in FY 2017. The percent of clients reporting methamphetamine use began increasing in FY 2015 (36%), with the highest percentage in FY 2017 (47%).



ALCOHOL

Past-6-Month Alcohol Use

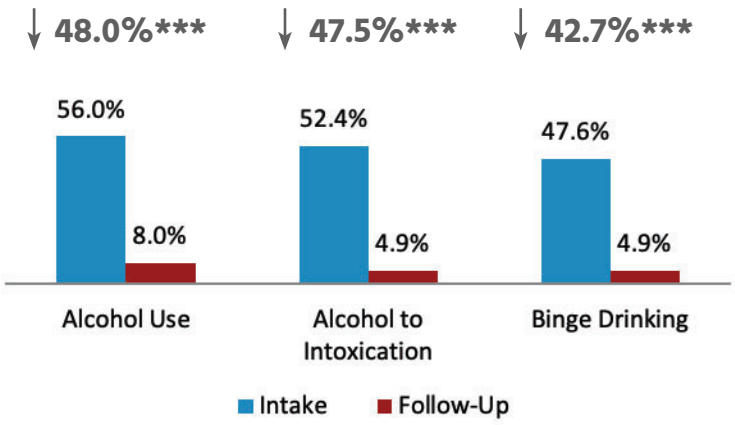
Alcohol use was asked three main ways: (1) how many months/days did you drink any alcohol (i.e., alcohol use), (2) how many months/days did you drink alcohol to intoxication (i.e., alcohol to intoxication), and (3) how many months/days did you have 5 or more (4 or more if female) alcoholic drinks in a period of about 2 hours (i.e., binge drinking).[39]

At intake, clients were asked how old they were when they had their first alcoholic drink (other than a few sips). RCOS clients, on average, reported they were 14.2 years old when they began drinking.[a]

[a]– Nine clients had missing data for this question

Over half of clients (56.0%) reported using alcohol in the 6 months before entering the recovery center while 8.0% of clients reported alcohol use in the 6 months before follow-up. There was a 48.0% decrease in the number of individuals reporting alcohol use (see Figure 2A.6). Overall, 52.4% of individuals reported using alcohol to intoxication before entering the recovery center and 4.9% reported using alcohol to intoxication at follow-up—a 47.5% decline. Also, 47.6% of individuals reported binge drinking in the 6 months before program entry and only 4.9% reported binge drinking in the follow-up period—a 42.7% decrease.

FIGURE 2A.6. PAST-6-MONTH ALCOHOL USE AT INTAKE AND FOLLOW-UP (N = 225)[40]



***p < .001.

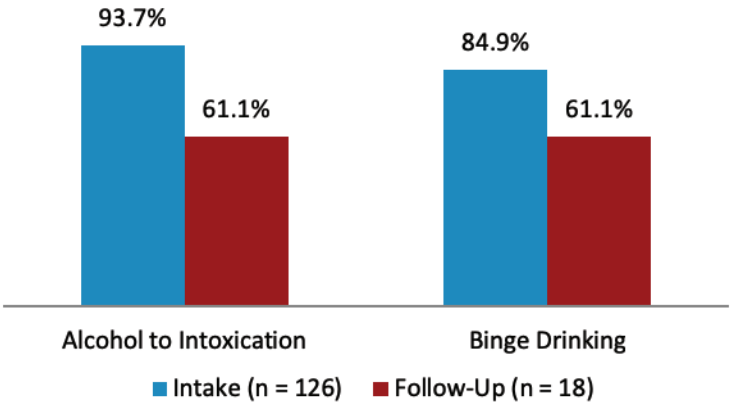
PAST-6-MONTH ALCOHOL INTOXICATION AND BINGE DRINKING AMONG THOSE WHO USED ALCOHOL

Of the individuals who used alcohol in the 6 months before entering the recovery center (n = 126), 93.7% used alcohol to intoxication and 84.9% binge drank alcohol (see Figure 2A.7). Of the individuals who used alcohol in the 6 months before follow-up (n = 18), 61.1% of clients reported alcohol use to intoxication and binge drinking.

[39] National Institute on Alcohol Abuse and Alcoholism. (2004). NIAAA Newsletter, Winter 2004, Number 3. Rockville, MD: U.S. Department of Health and Human Services.

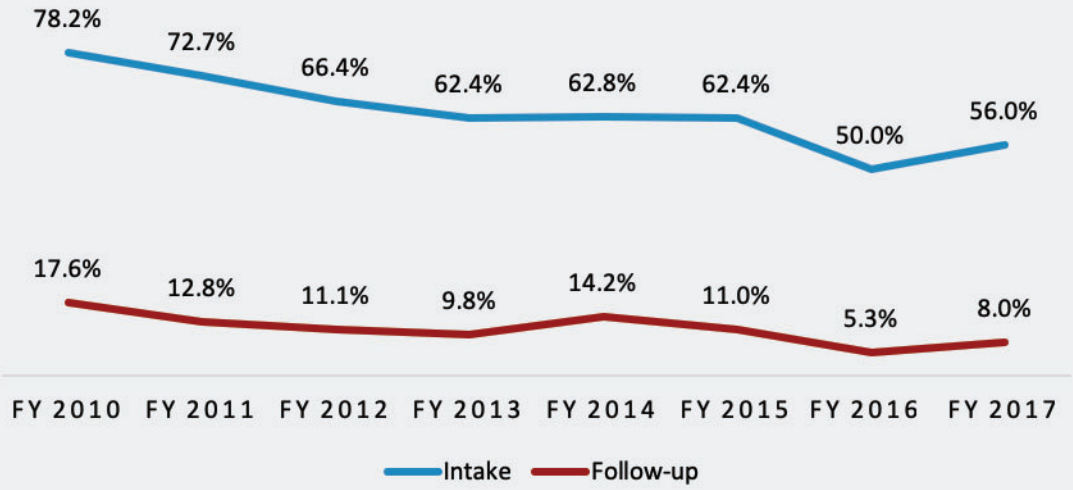
[40] One individual had missing data for alcohol use variables at follow-up.

FIGURE 2A.7. PAST-6-MONTH ALCOHOL USE TO INTOXICATION AND BINGE DRINKING AT INTAKE TO FOLLOW-UP, AMONG THOSE REPORTING ALCOHOL USE AT EACH POINT



TRENDS IN ALCOHOL USE

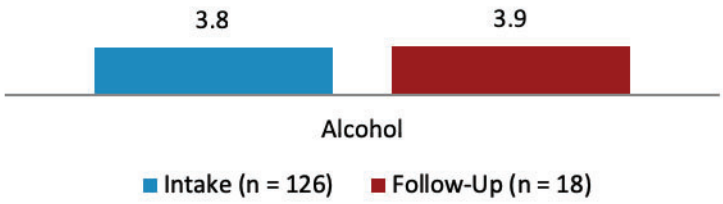
The number of RCOS clients reporting alcohol use in the 6 months before intake was consistently high and has decreased over time. Overall, all follow-up, the number of clients reporting alcohol use has decreased from intake over the years.



AVERAGE NUMBER OF MONTHS USED ALCOHOL

Figure 2A.8 shows the number of months of alcohol use for those who reported using any alcohol in the 6 months before intake and any alcohol in the 6 months before follow-up. Among the individuals who reported using alcohol in the 6 months before entering the program (n = 126), they used an average of 3.8 months. Among individuals who reported using alcohol at follow-up (n = 18), they used an average of 3.9 months.

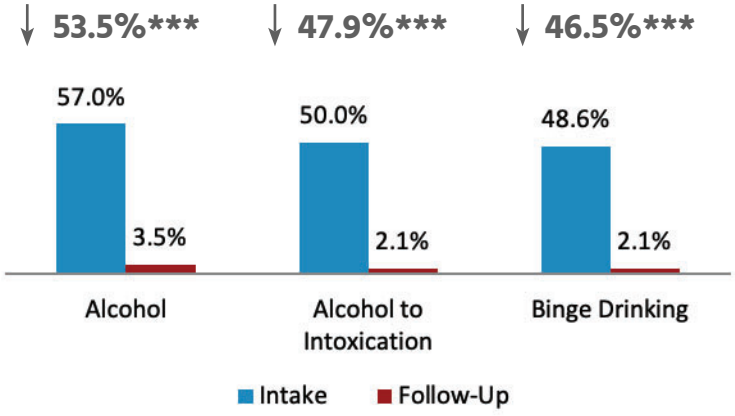
FIGURE 2A.8. AVERAGE NUMBER OF MONTHS OF ALCOHOL USE



Past-30-Day Alcohol Use

There was a decrease of 53.5% in the number of individuals who reported using alcohol in the past 30 days from intake (57.0%) to follow-up (3.5%; see Figure 2A.9). Decreases in the number of individuals who reported using alcohol to intoxication (by 47.9%) and binge drinking (by 46.8%) were also significant for the sample overall.

FIGURE 2A.9. PAST-30-DAY ALCOHOL USE FROM INTAKE TO FOLLOW-UP (N = 142)



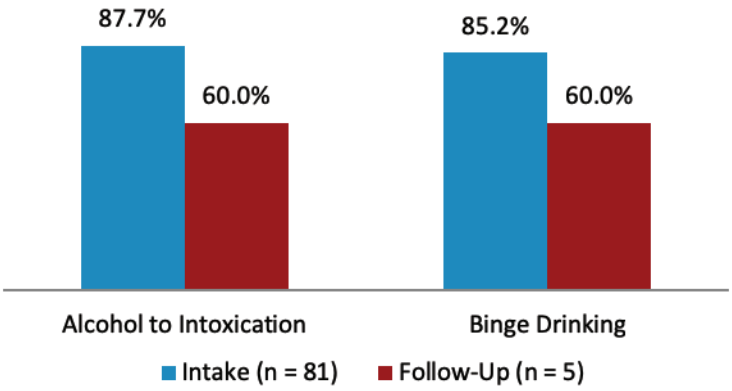
***p < .001.

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

Of the 81 individuals who used alcohol in the 30 days before entering the recovery center, 87.7% used alcohol to intoxication and 85.2% binge drank alcohol in the 30 days before entering the program (see Figure 2A.10). Of the 5 individuals who reported using alcohol in the 30 days before follow-up, 60.0% reported alcohol use to intoxication and binge drinking.[41]

[41] It was not possible to conduct a chi square test to examine difference in the percent of men and women who used alcohol to intoxication and binge drank in the 30 days before follow-up among those who used alcohol because of the small number of individuals who reported using alcohol in the 30 days before follow-up (n = 5).

FIGURE 2A.10. PAST-30-DAY ALCOHOL TO INTOXICATION AND BINGE DRINKING AT INTAKE AND FOLLOW-UP, AMONG THOSE REPORTING ALCOHOL USE AT EACH POINT



SELF-REPORTED SEVERITY OF ALCOHOL AND DRUG USE

DSM-5 Criteria for Substance Use Disorder, Past 6 Months

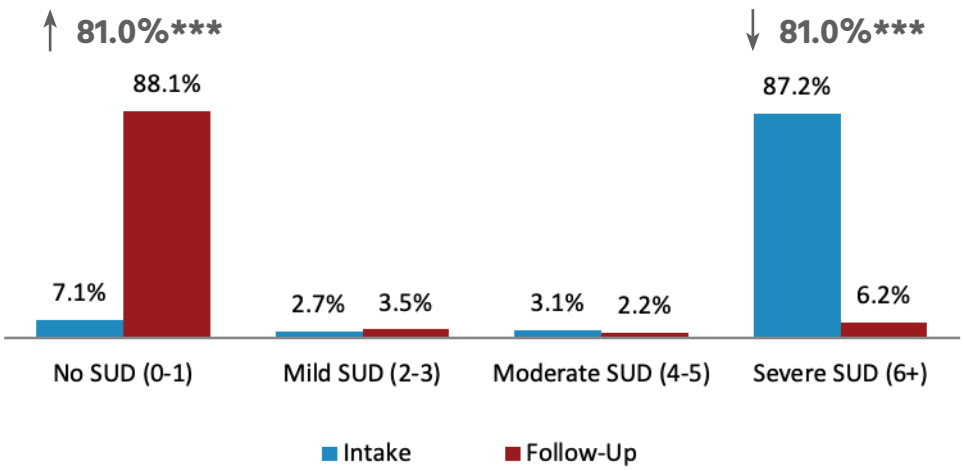
One way to examine overall change in degree of severity of substance use is to ask participants to self-report whether they meet any of the 11 symptoms included in the DSM-5 criteria for diagnosing substance use disorder (SUD) in the past 6 months.[42] The DSM-5 substance use disorder diagnosis has four levels of severity which were used to classify severity groups in this study: (1) no SUD (1 or no criteria met), (2) mild SUD (2 or 3 criteria met), (3) moderate SUD (4 or 5 criteria met), and (4) severe disorder (6 or more criteria met). Client self-reports of DSM-5 criteria suggest, but do not diagnose, a substance use disorder.

Change in the severity of SUD in the prior 6 months was examined for clients at intake and follow-up. Figure 2A.11 displays the change in the percent of individuals in each SUD severity classification, based on self-reported criteria in the preceding 6 months. At intake, only 7.1% met criteria for no substance use disorder (meaning they reported 0 or 1 DSM-5 criteria), while at follow-up, the vast majority (88.1%) met criteria for no SUD, a significant increase of 81.0%. At the other extreme of the continuum, 87.2% of individuals met criteria for severe SUD at intake, while at follow-up, only 6.2% met criteria for severe SUD, a significant decrease of 81.0%.

The number of individuals who met criteria for **no SUD increased significantly from intake to follow-up**

[42] The DSM-5 diagnostic criteria for substance use disorders included in the RCOS intake and follow-up interviews are similar to the criteria for DSM-IV, which has evidence of excellent test-retest reliability and validity. However, the DSM-5 eliminates the distinction between substance abuse and dependence, substituting severity ranking instead. In addition, the DSM-5 no longer includes the criterion about legal problems arising from substance use but adds a new criterion about craving and compulsion to use.

FIGURE 2A.11. DSM-5 SUD SEVERITY AT INTAKE AND FOLLOW-UP (N = 226)[a]



a – Significance tested with the Stuart-Maxwell Test for Marginal Homogeneity (p < .001).
***p < .001.

Addiction Severity Index (ASI), Past 30 Days

Another 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 of past-30-day alcohol and drug use, 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 drug use was examined for individuals who were not in a controlled environment all 30 days before entering the recovery center. Also, 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.

ASI ALCOHOL AND DRUG COMPOSITE SCORES AND SUBSTANCE USE DISORDERS

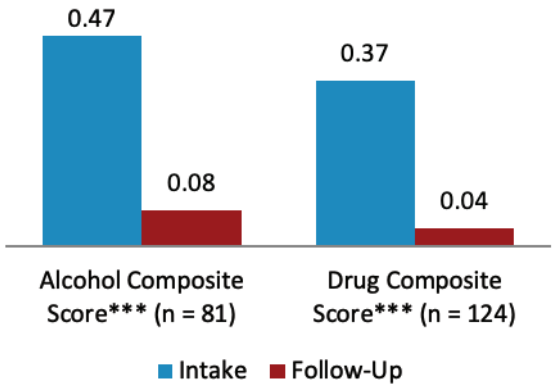
Rikoon et al. (2006) conducted two studies to determine the relationship between the ASI composite scores for alcohol and drug use and DSM-IV substance dependence diagnoses. They identified alcohol and drug use composite score cutoffs that had 85% sensitivity and 80% specificity with regard to identifying 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 reductions in self-reported severity of substance use. In previous years we have used the ASI composite scores to estimate the number and percent of clients who met a threshold for alcohol and drug dependence. However, recent changes in the diagnostics for substance abuse call into question the distinction between dependence and abuse. Thus, ASI composite scores that met the threshold can be considered indicative of severe substance use disorder to be compatible with current thinking about substance use disorders in the DSM-V, where we would have previously referred to them as meeting the threshold for dependence. Change from intake to follow-up in the severity rating as the same clinical relevance as moving from dependence to abuse in the older criteria.

 FINDINGS FROM THE RECOVERY CENTER OUTCOME STUDY | 44

Figure 2A.12 displays the change in average scores.[43] Among individuals who reported using any alcohol, the average alcohol composite score decreased significantly from 0.47 at intake to 0.08 at follow-up. Among individuals who reported any illegal drug use, the average drug composite score decreased significantly from 0.37 at intake to 0.04 at follow-up.

The average ASI alcohol and drug composite scores **decreased significantly from intake to follow-up**

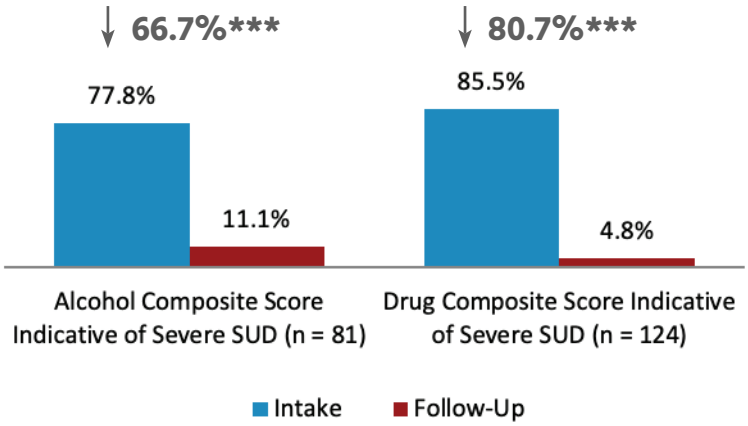
FIGURE 2A.12. AVERAGE ASI ALCOHOL AND DRUG COMPOSITE SCORES AT INTAKE AND FOLLOW-UP



***p < .001

The percent of individuals who had ASI composite scores that met the cutoff for severe substance use disorder (SUD) decreased significantly from intake to follow-up (see Figure 2A.13). At intake, the majority of individuals had alcohol and drug composite scores that met the cutoff for severe SUD (77.8% and 85.5% respectively), while the percent of individuals with alcohol and drug composite scores that met the cutoff for severe SUD were significantly lower at follow-up. Only 11.1% of individuals had an alcohol composite score that met the cutoff for severe SUD at follow-up and only 4.8% had a drug composite score that met the cutoff for severe SUD at follow-up.

FIGURE 2A.13. INDIVIDUALS WITH ASI COMPOSITE SCORES MEETING THE CUTOFF FOR SEVERE SUBSTANCE USE DISORDER AT INTAKE AND FOLLOW-UP

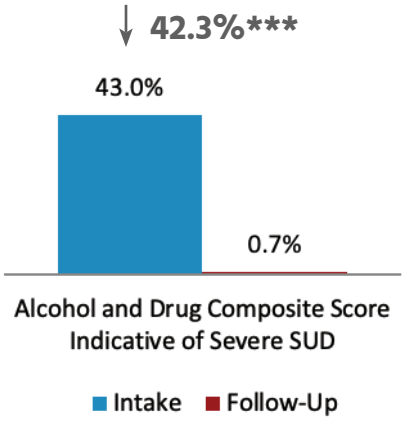


***p < .001.

[43] The following numbers of cases were not included in the analysis of change in the composite score: 62 individuals reported abstaining from alcohol, 15 individuals reported abstaining from drugs at intake and follow-up and 4 individuals had missing values on at least one of the items used to compute the ASI drug composite score at follow-up.

Among individuals who used alcohol and/or drugs in the 30 days before intake, 43.0% had alcohol and drug composite scores that met the cutoff for both severe alcohol use disorder and drug use disorder (see Figure 2A.14). The percent of clients who had composite scores that met the cutoff for severe SUD for both alcohol and drugs decreased significantly by 42.3% to only 0.7% at follow-up.

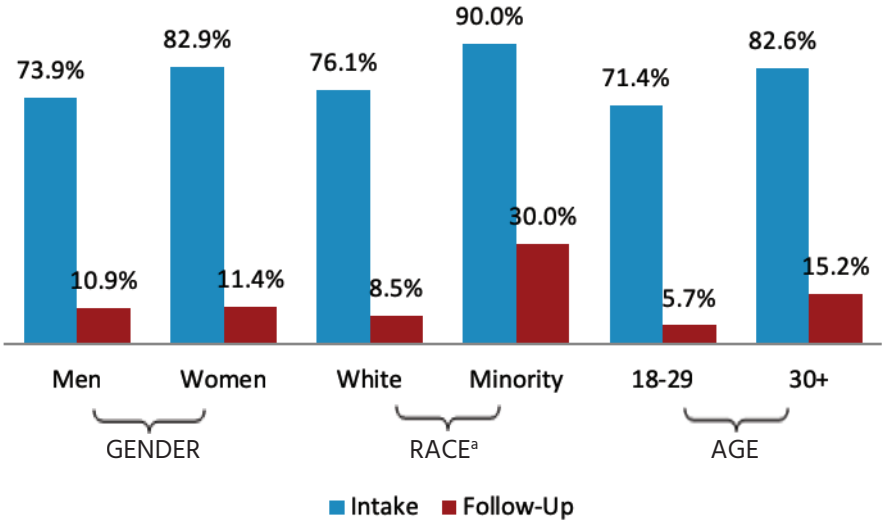
FIGURE 2A.14. INDIVIDUALS WITH ASI COMPOSITE SCORES MEETING THE CUTOFF FOR SEVERE ALCOHOL AND DRUG USE DISORDERS AT INTAKE AND FOLLOW-UP (n = 135)



***p<.001.

Analysis was also conducted to examine differences between individuals who had an alcohol composite score meeting the cutoff for severe SUD at intake and follow-up by gender, race/ethnicity, or age (see Figure 2A.15). At follow-up, significantly more minority clients (30.0%) had an alcohol composite score meeting the cutoff for severe SUD when compared to White clients (8.5%).

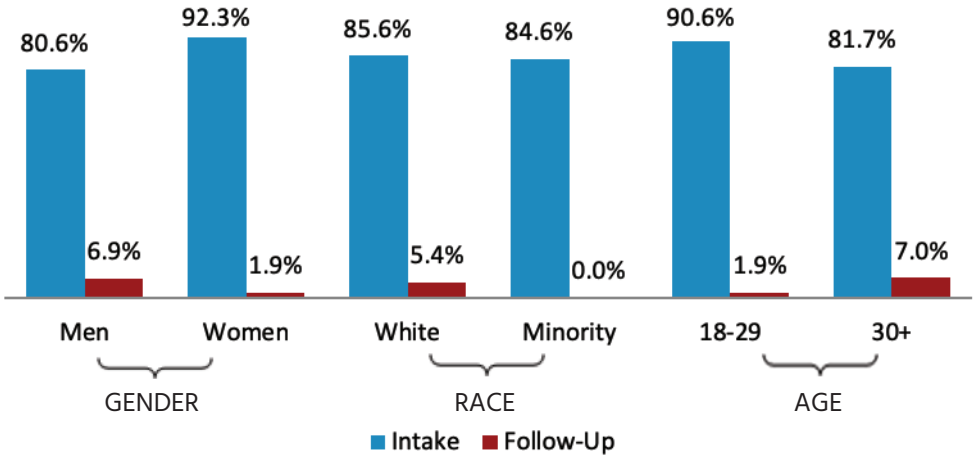
FIGURE 2A.15. ALCOHOL-USING INDIVIDUALS WITH AN ALCOHOL COMPOSITE SCORE INDICATIVE OF SEVERE SUD AT INTAKE AND FOLLOW-UP BY DEMOGRAPHIC FACTORS (N = 81)



a – Significant difference in alcohol composite score at follow-up (p<.05).

Analysis was also conducted to examine whether individuals who had a drug composite score indicative of severe SUD at intake and follow-up differed by gender, race/ethnicity, or age (see Figure 2A.16). There were no significant differences at intake or follow-up.

FIGURE 2A.16. DRUG-USING INDIVIDUALS WITH A DRUG COMPOSITE SCORE INDICATIVE OF SEVERE SUD AT INTAKE AND FOLLOW-UP BY DEMOGRAPHIC FACTORS (N = 124)



TOBACCO USE

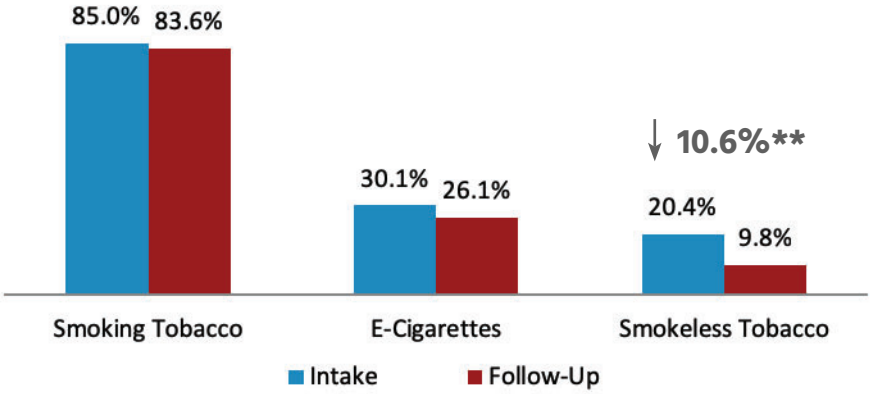
Past-6-month Smoking, E-cigarette, and Smokeless Tobacco Use

Overall, there was no change in smoking tobacco from intake to follow-up (see Figure 2A.17). Most individuals reported smoking tobacco in the 6 months before entering the recovery center (85.0%) and in the 6 months before follow-up (83.6%). The percent of individuals reporting use of e-cigarettes (e.g., battery-powered nicotine delivery devices that vaporize a liquid mixture consisting of propylene glycol, glycerin, flavorings, nicotine, and other chemicals) was more than one-fourth at intake and follow-up, with no significant change. The percent of individuals who reported using smokeless tobacco significantly decreased from intake (20.4%) to follow-up (9.8%).

At intake, clients were asked how old they were when they began smoking regularly (on a daily basis). RCOS clients reported, on average, that they began smoking regularly at 15.5 years old.[a]

[a]– Twenty-nine clients reported they had never smoked regularly.

FIGURE 2A.17. PAST-6-MONTH SMOKING TOBACCO, E-CIGARETTE, AND SMOKELESS TOBACCO USE AT INTAKE AND FOLLOW-UP (N = 226)[44]



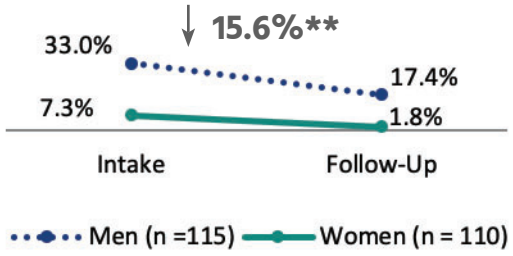
**p<.01.

[44] One client had a missing value for smokeless tobacco use at follow-up.

GENDER DIFFERENCES IN PAST-6-MONTH SMOKELESS TOBACCO

At intake and follow-up, significantly more men than women reported using smokeless tobacco (see Figure 2A.18). One third of men (33.0%) and only 7.3% of women reported using smokeless tobacco at intake. The percent of men who reported using smokeless tobacco decreased significantly from intake to follow-up.

FIGURE 2A.18. GENDER DIFFERENCES IN PAST-6-MONTH SMOKELESS TOBACCO USE AT INTAKE AND FOLLOW-UP[a]

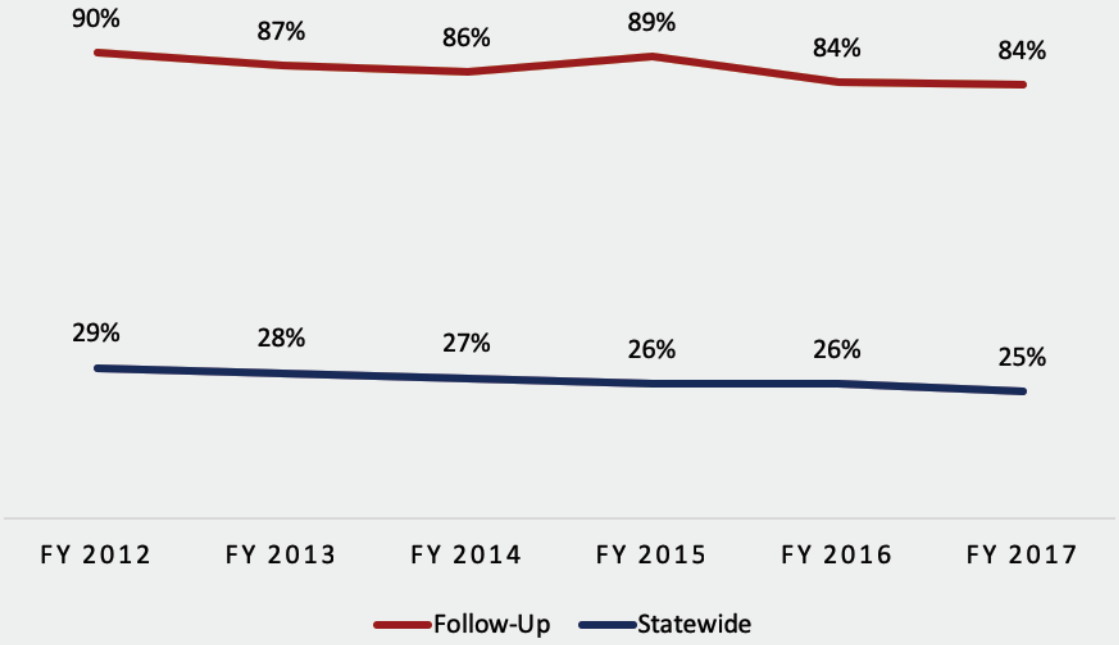


a—Significant difference by gender at intake and follow-up (p < .001).
**p<.01.

TREND ALERT: PAST-6-MONTH SMOKING TOBACCO AT FOLLOW-UP

Smoking rates for RCOS clients consistently remain high in the 6 months before follow-up. In FY 2012, 90% of clients reported smoking at follow-up. A similar percentage was reported in FY 2013 (87%) and in FY 2014 (86%). In FY 2015, 89% of clients reported smoking at follow-up and 84% smoked in the past 6 months in FY 2017.

When compared to a statewide sample, over three times more RCOS clients report smoking at follow-up.[45]

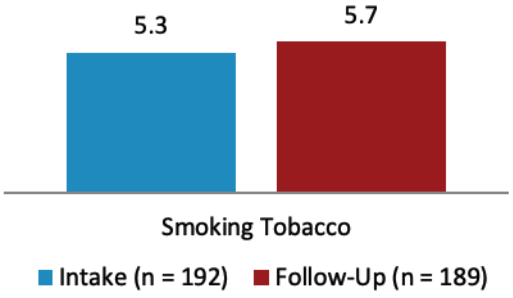


[45] https://www.americashealthrankings.org/explore/2017-annual-report/measure/Smoking/state/KY

AVERAGE NUMBER OF MONTHS SMOKED TOBACCO

Figure 2A.19 shows, among smokers, the average number of months clients reported smoking tobacco at intake and follow-up. Among the individuals who reported smoking tobacco in the 6 months before entering the program (n = 192), they reported smoking tobacco, on average, 5.3 months. Among individuals who reported smoking tobacco at follow-up (n = 189), they reported using, on average, 5.7 months of the 6-month period.

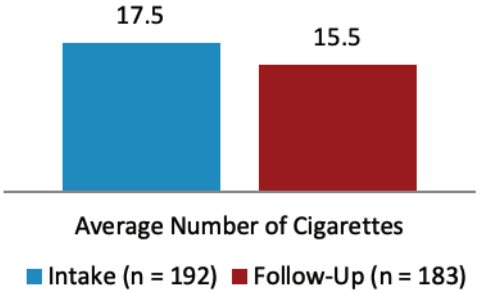
FIGURE 2A.19. AVERAGE NUMBER OF MONTHS TOBACCO USE



AVERAGE NUMBER OF CIGARETTES SMOKED PER DAY

Figure 2A.20 shows, among individuals who smoked tobacco, the average number of cigarettes smoked per day: 17.5 cigarettes per day at intake (n = 192) and 15.5 cigarettes per day at follow-up (n = 183).[46]

FIGURE 2A.20. AVERAGE NUMBER OF CIGARETTES SMOKED PER DAY

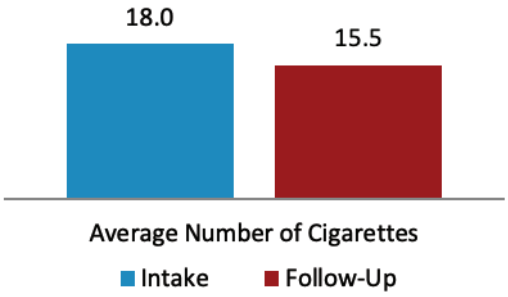


Among the individuals who reported smoking tobacco in the 6 months both before intake and the 6 months before follow-up (n = 171), the average number of cigarettes they smoked per day did not change significantly from 18.0 at intake to 15.5 at follow-up (see Figure 2A.21).

> *"The people are awesome. I met people from everywhere. It's a great experience to meet people from different backgrounds and all have the same goal."*
>
> - RCOS FOLLOW-UP CLIENT

[46] Six individuals did not know how many cigarettes per day they smoked at follow-up.

FIGURE 2A.21. AMONG INDIVIDUALS WHO SMOKED CIGARETTES AT INTAKE AND FOLLOW UP (N = 171)[47], THE AVERAGE NUMBER OF CIGARETTES SMOKED PER DAY[a]

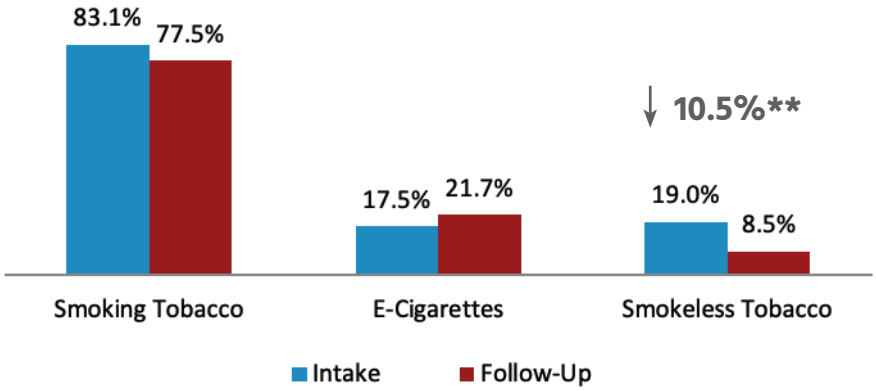


a--Paired sample t-test was conducted.

Past-30-Day Use Smoking, E-Cigarette, And Smokeless Tobacco Use

Among the individuals who were not in a controlled environment all 30 days before entering the program, the majority reported smoking tobacco in the 30 days before entering the recovery center (83.1%) and at follow-up (77.5%), with no significant change from intake to follow-up (see Figure 2A.22). A minority of individuals reported using e-cigarettes in the 30 days before entering the program and at follow-up. One in five individuals reported smokeless tobacco use in the 30 days before entering the program and 8.5% reported use before follow-up, which was a significant decrease.

FIGURE 2A.22. PAST-30-DAY SMOKING, E-CIGARETTE AND SMOKELESS TOBACCO USE AT INTAKE AND FOLLOW-UP
(N = 143)[48]



**p<.01.

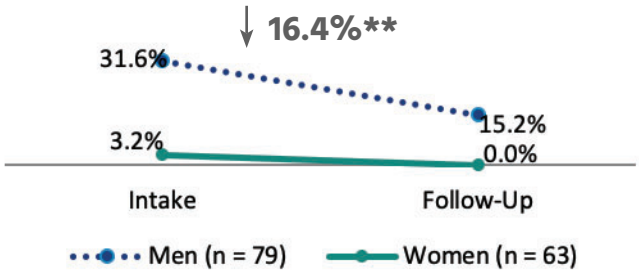
GENDER DIFFERENCES IN PAST-30-DAY SMOKELESS TOBACCO USE

More men reported past-30-day use of smokeless tobacco at intake and follow-up compared to women (see Figure 2A.23). The number of men reporting smokeless tobacco use decreased significantly from intake to follow-up.

[47] 176 individuals reported smoking tobacco in the 6 months before intake and follow-up, however, five had missing values for the number of cigarettes smoked per day at follow-up.

[48] One client had a missing value on smoking tobacco and smokeless tobacco in the 30 days before follow-up.

FIGURE 2A.23. GENDER DIFFERENCES IN PAST-30-DAY SMOKELESS TOBACCO USE AT INTAKE AND FOLLOW-UP[a]



a – Significant difference by gender at intake and follow-up (p<.001).
**p<.01.

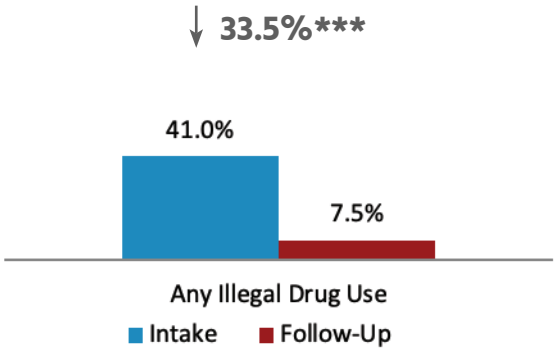
2B. SUBSTANCE USE FOR CLIENTS WHO WERE IN A CONTROLLED ENVIRONMENT

Changes in drug, alcohol, and tobacco 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 = 134) because being in a controlled environment reduces opportunities for alcohol and drug use.

PAST-30 DAY-USE OF ANY ILLEGAL DRUGS

Of the individuals who were in a controlled environment all 30 days, 41.0% reported they used illegal drugs (including marijuana, cocaine, heroin, methadone, hallucinogens, barbiturates, inhalants, synthetic marijuana, and non-prescribed use of prescription opiates, sedatives, and amphetamines) in the 30 days before they entered the recovery center (see Figure 2B.1). In the 30 days before follow-up, 7.5% of clients reported illegal drug use, which is a significant decrease of 33.5%.

FIGURE 2B.1. PAST-30-DAY ILLEGAL DRUG USE AT INTAKE AND FOLLOW-UP FOR CLIENTS IN A CONTROLLED ENVIRONMENT (n = 134)

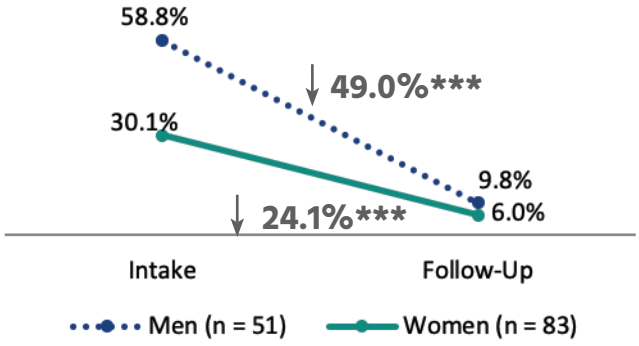


***p < .001.

Gender Differences in Past-30-day Illegal Drug Use

More men reported past-30-day use of illegal drugs at intake compared to women (see Figure 2B.2). The number of men and women reporting illegal drug use decreased significantly from intake to follow-up.

FIGURE 2B.2. GENDER DIFFERENCES IN PAST-30-DAY ILLEGAL DRUG USE AT INTAKE AND FOLLOW-UP UP FOR CLIENTS IN A CONTROLLED ENVIRONMENT[a]

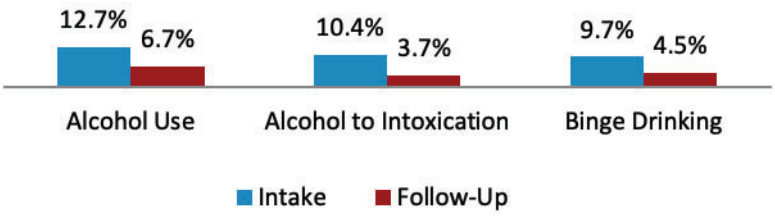


a – Significant difference by gender at intake (p<.01).
**p<.01.

PAST-30-DAY ALCOHOL 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 2B.3). There were no significant changes in the percent of individuals who reported using alcohol, alcohol to intoxication, or binge drinking at follow-up.

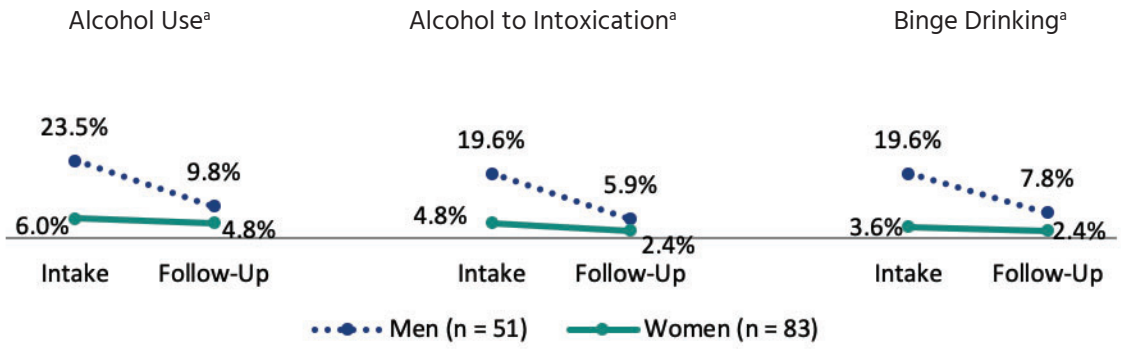
FIGURE 2B.3. PAST-30-DAY ALCOHOL USE AT INTAKE AND FOLLOW-UP FOR CLIENTS IN A CONTROLLED ENVIRONMENT (N = 134)



Gender Differences in Past-30-day Alcohol, Alcohol to Intoxication, and Binge Drinking

More men reported past-30-day use of alcohol, alcohol to intoxication, and binge drinking at intake compared to women (see Figure 2B).

FIGURE 2B.4. GENDER DIFFERENCES IN PAST-30-DAY ALCOHOL, ALCOHOL TO INTOXICATION, AND BINGE DRINKING USE AT INTAKE AND FOLLOW-UP UP FOR CLIENTS IN A CONTROLLED ENVIRONMENT[a]

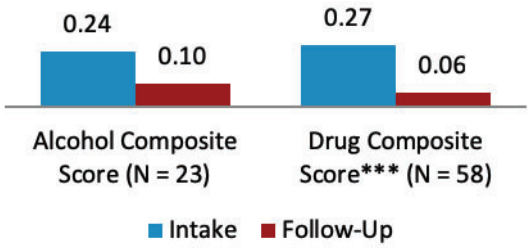


a – Significant difference by gender at intake (p<.01).

SELF-REPORTED SEVERITY OF ALCOHOL AND DRUG USE AMONG CLIENTS WHO WERE 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 composite score for drug use decreased significantly from intake to follow-up (see Figure 2B.5).

FIGURE 2B.5. AVERAGE ALCOHOL ASI ALCOHOL AND DRUG COMPOSITE SCORES AT INTAKE AND FOLLOW-UP

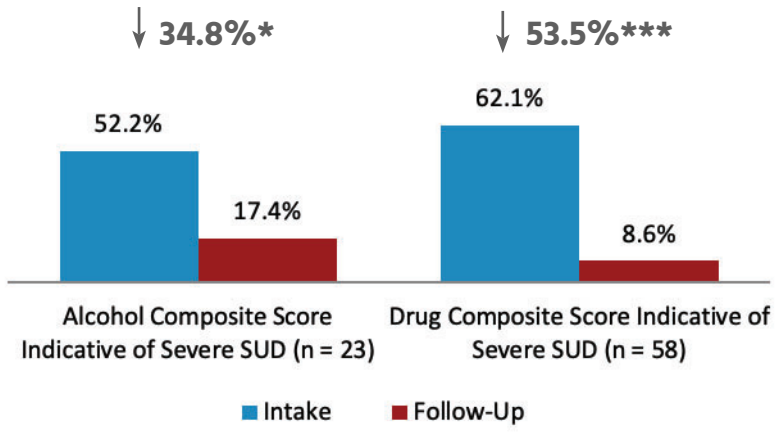


***p < .001.

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, a little more than one half (52.2%) had an alcohol composite score that met the cutoff for severe SUD at intake, and the percent significantly decreased at follow-up (17.4%; see Figure 2B.6). The majority of individuals (62.1%) had a drug composite score that met the cutoff for severe SUD, and only 8.6% had a drug composite score that met the cutoff for severe SUD at follow-up—a significant decrease of 53.5%.[49]

[49] It was not possible to examine demographic differences between individuals who had alcohol composite scores indicative of dependence with those who did not at intake or follow-up because the number of individuals in several of the cells of the cross tabulations were less than 5; thus, chi square test of independence is not appropriate.

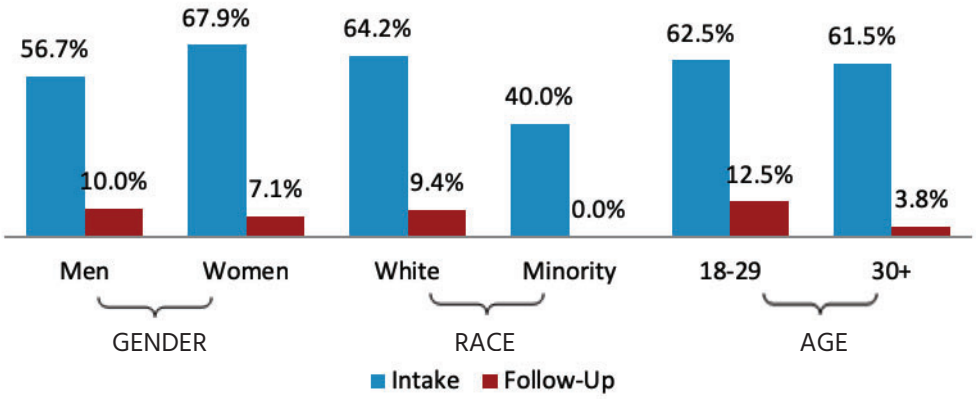
FIGURE 2B.6. ASI COMPOSITE SCORES MEETING THE CUTOFF FOR SEVERE SUBSTANCE USE DISORDER AT INTAKE AND FOLLOW-UP



*p<.05, ***p < .001.

Analysis was also conducted to examine whether individuals who had a drug composite score indicative of severe SUD at intake and follow-up differed by gender, race/ethnicity, or age (see Figure 2B.7). There were no significant differences at intake or follow-up.

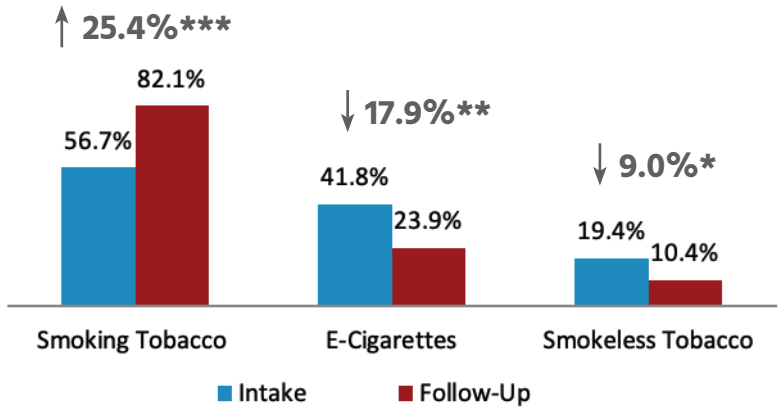
FIGURE 2B.7. DRUG-USING INDIVIDUALS WITH A DRUG COMPOSITE SCORE INDICATIVE OF SEVERE SUD AT INTAKE AND FOLLOW-UP BY DEMOGRAPHIC FACTORS (N = 58)



PAST-30-DAY SMOKING, E-CIGARETTE, AND SMOKELESS TOBACCO USE

Among individuals who were in a controlled environment all 30 days before they entered the recovery center, 56.7% reported they had smoked tobacco in those 30 days (see Figure 2B.8). Unlike alcohol and illegal drug use that decreased from intake to follow-up, there was a significant increase in the number of clients who reported past-30-day tobacco smoking at follow-up to 82.1% (an increase of 25.4%). Over 40% of those who were in a controlled environment all 30 days before entering the program reported using e-cigarettes. That number significantly decreased to 23.9% at follow-up. Nearly 1 in 5 individuals who were in a controlled environment reported they had used smokeless tobacco in the 30 days before entering the program and 10.4% reported using smokeless tobacco in the 30 days before follow-up—a significant decrease of 9.0%.

FIGURE 2B.8. PAST-30-DAY SMOKING, E-CIGARETTE, AND SMOKELESS TOBACCO AT INTAKE AND FOLLOW-UP FOR CLIENTS IN A CONTROLLED ENVIRONMENT (n = 134)

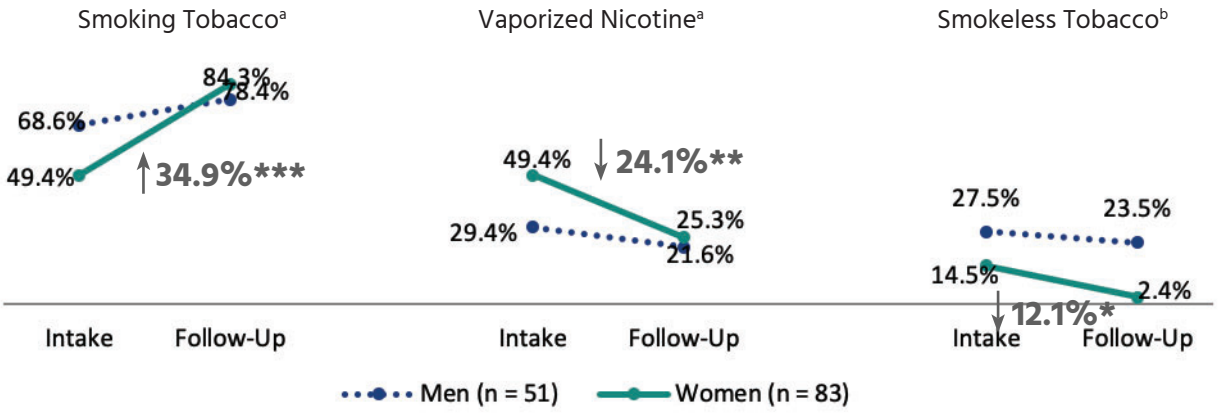


***p < .001.

GENDER DIFFERENCES IN PAST-30-DAY SMOKING TOBACCO, VAPORIZED NICOTINE, AND SMOKELESS TOBACCO USE

Among the individuals in a controlled environment, significantly more men reported smoking tobacco in the 30 days before intake compared to women (see Figure 2B.9). From intake to follow-up there was a significant increase in the percent of women who reported smoking tobacco. Significantly more women reported using vaporized nicotine in the 30 days before intake, but the percentage for women decreased significantly at follow-up. There was a significant decrease in the percent of women who reported using smokeless tobacco from intake to follow-up. At follow-up, significantly more men reported using smokeless tobacco in the 30 days before follow-up.

FIGURE 2B.9. GENDER DIFFERENCE IN PAST-30-DAY SMOKING TOACCO, VAPORIZED NICOTINE, AND SMOKELESS TOBACCO USE AT INTAKE AND FOLLOW-UP[a]



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

SECTION 3. MENTAL HEALTH, PHYSICAL HEALTH, AND STRESS

This section describes changes in mental health, stress, and physical health status at intake compared to follow-up including for: (1) depression, (2) generalized anxiety, (3) comorbid depression and generalized anxiety, (4) depression or anxiety, (5) suicidal thoughts or attempts, (6) general health status, (7) chronic pain, and (8) stress-related health consequences

DEPRESSION

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).

STUDY CRITERIA FOR DEPRESSION

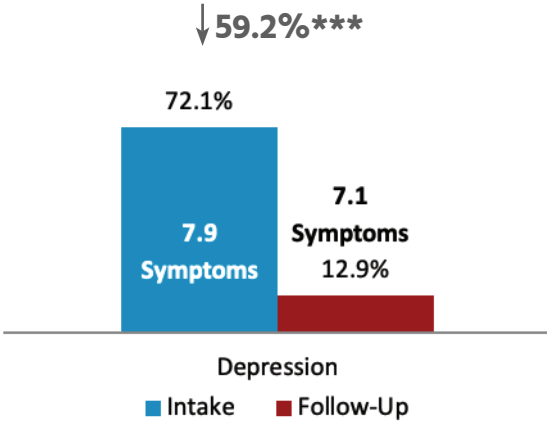
To meet study criteria for depression, clients had to say "yes" to at least one of the two screening questions and at least 4 of the 7 symptoms. Thus, the minimum score to meet study criteria: 5 out of 9.

Almost three-fourths of clients (72.1%) met study criteria for depression in the 6 months before they entered the recovery center (see Figure 3.1). By follow-up, 12.9% met criteria for depression, representing a 59.2% significant decrease.

The percent of clients meeting study criteria for **depression decreased 59% at follow-up**

Of those who met criteria for depression at intake (n = 202), clients reported an average of 7.9 symptoms out of 9. Of those who met criteria for depression at follow-up (n = 36), they reported an average of 7.1 symptoms out of 9.

FIGURE 3.1. CLIENTS MEETING STUDY CRITERIA FOR DEPRESSION AT INTAKE AND FOLLOW-UP (N = 280)



***p < .001.

GENERALIZED ANXIETY

To assess for generalized anxiety, participants were first asked: "Did you have a period lasting 6 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).

In the 6 months before entering the recovery center, three-fourths of clients (75.6%) reported symptoms that met the study criteria for generalized anxiety and 16.1% reported symptoms at follow-up (see Figure 3.2). This indicates there was a 59.5% significant decrease in the number of clients meeting the study criteria for generalized anxiety.

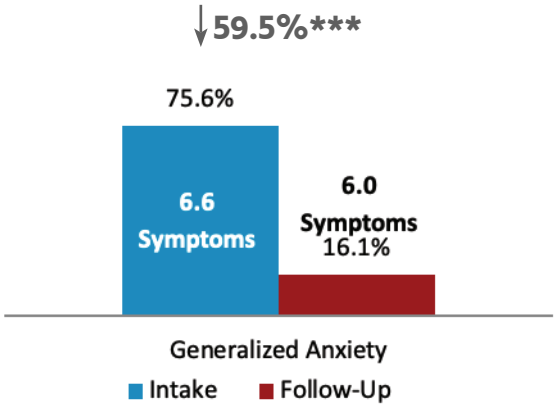
Of those who met study criteria for generalized anxiety at intake (n = 211), clients reported an average of 6.6 symptoms out of 7. At follow-up, those who met criteria for generalized anxiety (n = 45) reported an average of 6.0 symptoms out of 7.

STUDY CRITERIA FOR GENERALIZED ANXIETY

To meet study criteria for depression, clients had to say "yes" to the one screening question and at least 3 of the other 6 symptoms. Thus, minimum score to meet study criteria: 4 out of 7.

The percent of clients meeting study criteria for **generalized anxiety decreased 60% at follow-up**

FIGURE 3.2. CLIENTS MEETING STUDY CRITERIA FOR GENERALIZED ANXIETY AT INTAKE AND FOLLOW-UP (N = 279)[50]



***p < .001.

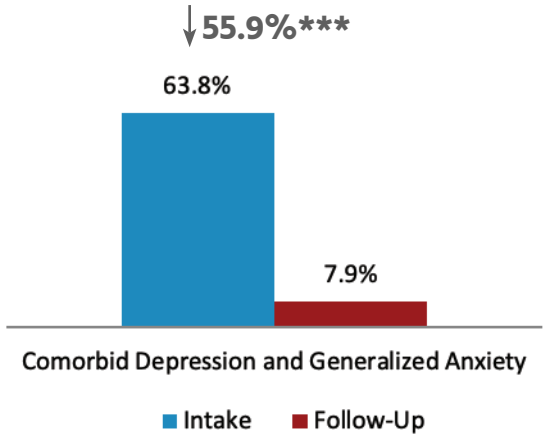
COMORBID DEPRESSION AND GENERALIZED ANXIETY

At intake, the majority of clients (63.8%) met criteria for both depression and generalized anxiety and at follow-up only 7.9% met criteria for both (see Figure 3.3). There was a 55.9% significant reduction in the number of individuals who reported symptoms that met the criteria for both depression and generalized anxiety at follow-up.

The percent of clients meeting criteria for **both depression and generalized anxiety decreased 56% at follow-up**

[50] One individual had a missing value for generalized anxiety at follow-up.

FIGURE 3.3. CLIENTS MEETING CRITERIA FOR COMORBID DEPRESSION AND GENERALIZED ANXIETY AT INTAKE AND FOLLOW-UP (N = 279)

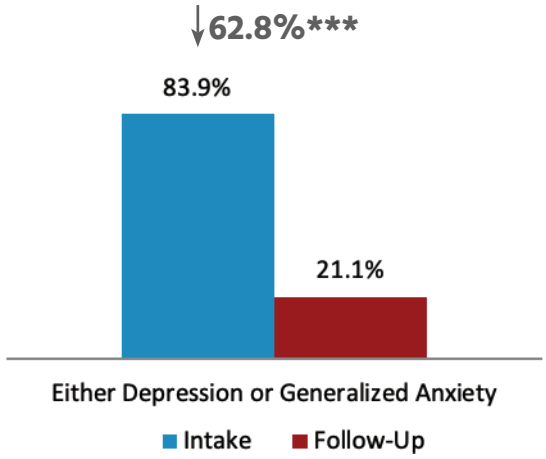


***p < .001.

EITHER DEPRESSION OR GENERALIZED ANXIETY

At intake, the majority of clients (83.9%) met criteria for either depression or generalized anxiety and at follow-up only 21.1% met criteria for either depression or anxiety (see Figure 3.4).

FIGURE 3.4. CLIENTS MEETING CRITERIA FOR EITHER DEPRESSION OR GENERALIZED ANXIETY AT INTAKE AND FOLLOW-UP (N = 280)

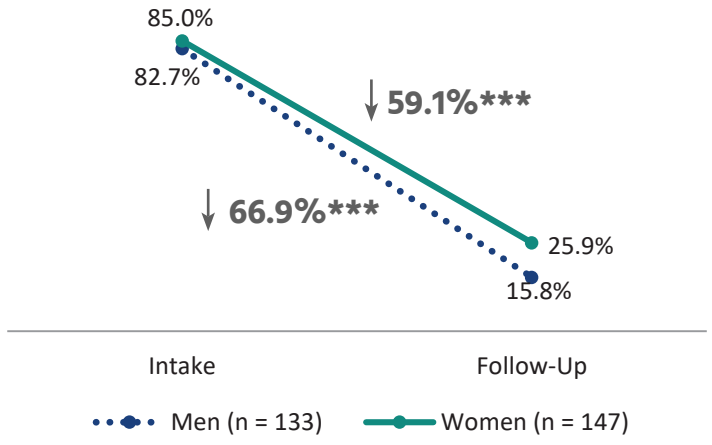


***p < .001.

GENDER DIFFERENCES IN MEETING CRITERIA FOR EITHER DEPRESSION OR GENERALIZED ANXIETY

The majority of men and women met criteria for depression or generalized anxiety at intake, with significant decreases at follow-up (see Figure 3.5). At follow-up, significantly more women than men met criteria for depression or generalized anxiety.

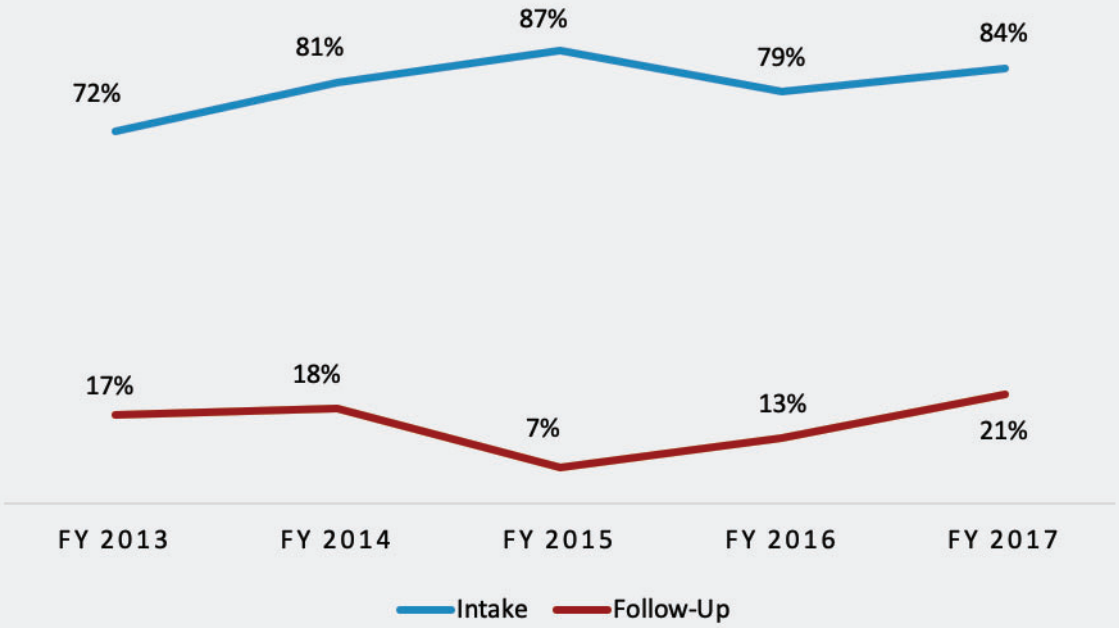
FIGURE 3.5. GENDER DIFFERENCES IN MEETING CRITERIA FOR DEPRESSION OR ANXIETY AT INTAKE AND FOLLOW-UP[a]



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

TREND ALERT: DEPRESSION OR GENERALIZED ANXIETY

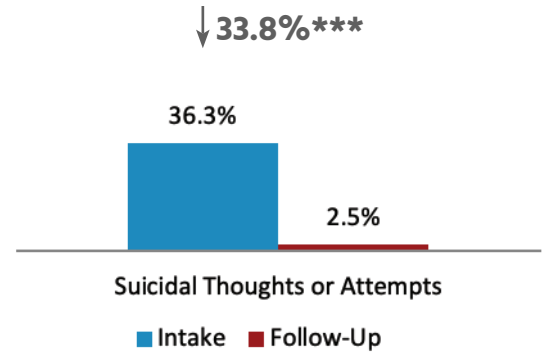
The number of clients meeting criteria for depression or generalized anxiety in the 6 months before entering the recovery center has fluctuated from a little less than three-fourths to 87% over the past five fiscal years. Each year there has been a significant decrease from intake to follow-up in the number of clients reporting either depression or generalized anxiety – with the lowest percentage at follow-up in FY 2015 (7%) and the highest in FY 2017 (21%).



SUICIDE IDEATION AND/OR ATTEMPTS

Suicide ideation and attempts were measured with questions about thoughts of suicide and attempts to commit suicide. A little more than one-third of individuals (36.3%) reported thoughts of suicide or attempted suicide in the 6 months before entering the program. At follow-up, only 2.5% of individuals reported thoughts of suicide or attempted suicide in the 6 months before follow-up. There was a 33.8% decrease in suicidal ideation and attempts from intake to follow-up (see Figure 3.6).

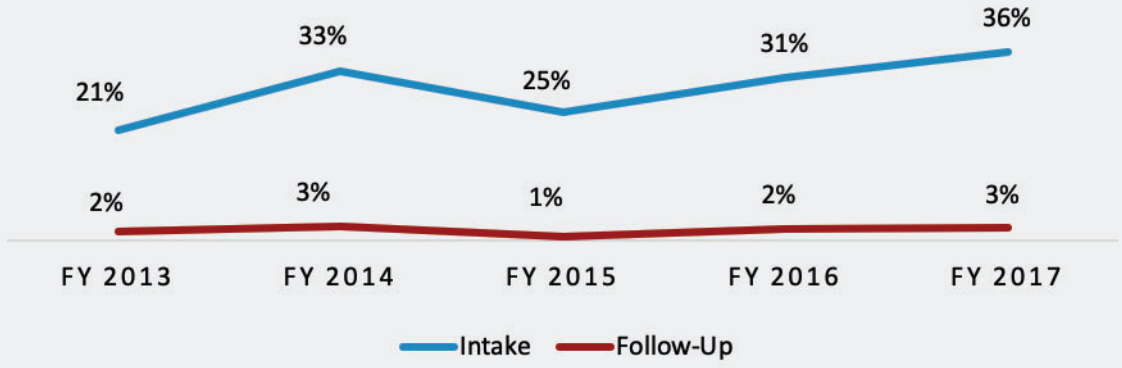
FIGURE 3.6. CLIENTS REPORTING SUICIDAL IDEATION AND/OR ATTEMPTS AT INTAKE AND FOLLOW-UP (N = 278)[51]



***p < .001.

TREND ALERT: SUICIDAL THOUGHTS AND/OR ATTEMPTS

The number of clients reporting suicidal thoughts and/or attempts in the 6 months before entering the recovery center has fluctuated between one-quarter and a little over one-third over the past five fiscal years. Each year there has been a significant decrease from intake to follow-up in the number of clients reporting suicidality – only 2% of clients reported suicidal thoughts or attempts at follow-up in FY 2013, 3% in FY 2014, 1% in FY 2015, 2% in FY 2016, and 3% in FY 2017.



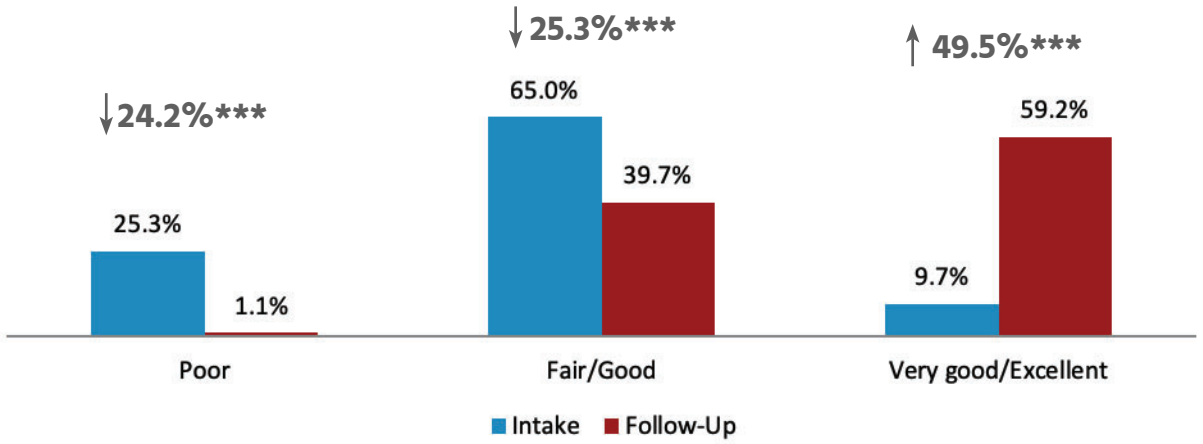
[51] Two individuals had missing values on items about suicide ideation or attempts in the 6 months before follow-up.

GENERAL HEALTH STATUS

OVERALL HEALTH

At both intake and follow-up, clients were asked to rate their overall health in the past 6 months from 1 = poor to 5 = excellent. Clients rated their health, on average, as 2.3 at intake and this significantly increased to 3.7 at follow-up (not depicted in figure). Figure 3.7 shows that significantly more clients rated their overall physical health as very good or excellent (59.2%) at follow-up when compared to intake (9.7%).[52]

FIGURE 3.7. CLIENTS' SELF-REPORT OF OVERALL HEALTH STATUS AT INTAKE AND FOLLOW-UP (N = 277)[a]



a – Significance tested with the Stuart-Maxwell Test for Marginal Homogeneity ($p < .001$).
***$p < .001$.

NUMBER OF DAYS PHYSICAL AND MENTAL HEALTH WAS NOT GOOD

At intake and follow-up, individuals were asked how many days in the past 30 days their physical and mental health were not good. The number of days individuals reported their physical health was not good decreased significantly from intake (9.6) to follow-up (1.3; see Figure 3.8). Also, clients' self-reported number of days their mental health was not good decreased significantly from intake (19.6) to follow-up (2.4).

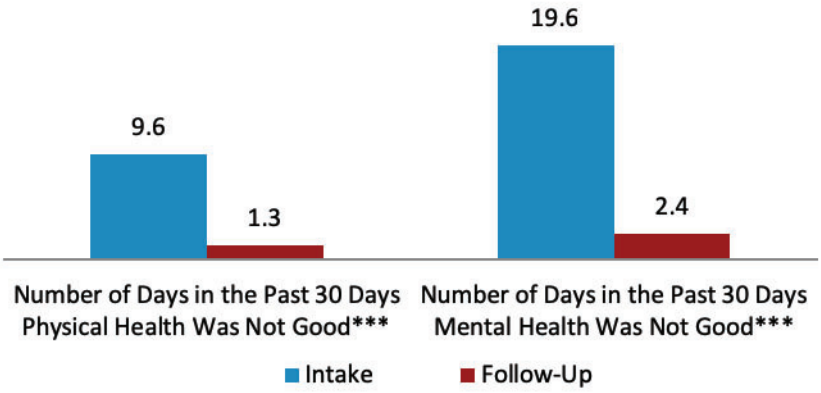
The number of **days clients' physical and mental health was not good decreased significantly**

"I was a chronic user of heroin. I was homeless and had lost my family. The recovery center helped me get sober and stay sober for 16 months."

- RCOS FOLLOW-UP CLIENT

[52] Two individuals had missing data for overall health status at intake and one individual had missing data for overall health at follow-up.

FIGURE 3.8. PERCEPTIONS OF POOR PHYSICAL HEALTH AND MENTAL HEALTH IN THE PAST 30 DAYS AT INTAKE AND FOLLOW-UP (N = 278)a

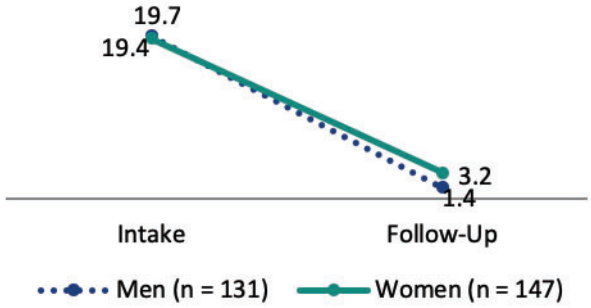


a—Statistical significance tested by paired t-test, ***p < .001.

Gender Differences in Perceptions of Poor Mental Health

Women reported significantly more days their mental health was not good at follow-up compared to men (see Figure 3.9). The number of days clients reported poor mental health decreased significantly for both men and women from intake to follow-up.

FIGURE 3.9. GENDER DIFFERENCES IN PERCEPTION OF POOR MENTAL HEALTH AT INTAKE AND FOLLOW-UP[a,b]

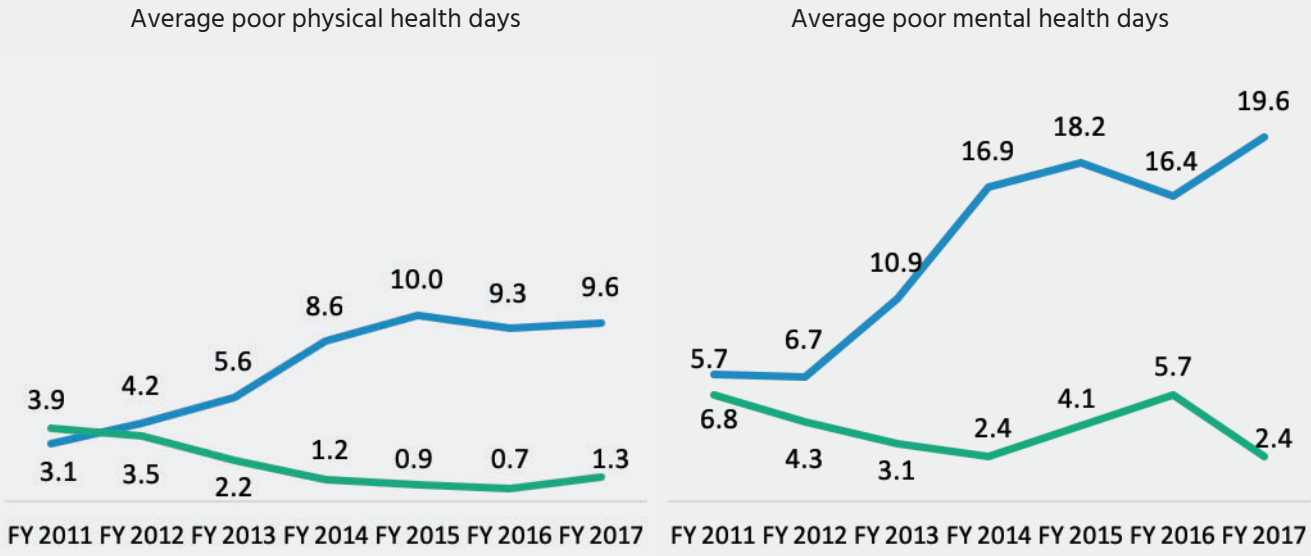


a—Statistical difference by gender at follow-up (p < .001).
b–Significant decrease from intake to follow-up for men and women as measured by paired t-test, p < .001.

TREND ALERT: POOR PHYSICAL AND MENTAL HEALTH DAYS

At intake and follow-up, individuals are asked how many days in the past 30 days their physical health has been poor. Since FY 2011, the average number of poor physical health days at intake has increased from 3.1 days to 10.0 days in FY 2015. In FY 2017, clients reported an average of 9.6 days of poor physical health at intake. The average number of poor physical health days at follow-up has decreased over time: 3.9 days in FY 2011 to 0.7 days in FY 2016, with a slight increase in FY 2017 to 1.3.

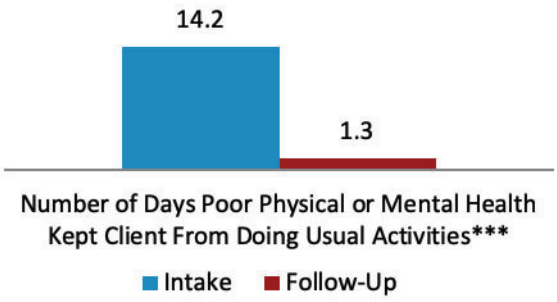
At intake and follow-up, clients are also asked how many days in the past 30 days their mental health has been poor. The average number of poor mental health days reported at intake has increased dramatically from FY 2011 (6.8) to FY 2015 (18.2). In FY 2017, clients reported an average of 19.6 poor mental health days at intake. At follow-up, the number of poor mental health days decreased from FY 2011 (5.7) to FY 2014 (2.4), increased in FY 2015 (4.1), again in FY 2016 (5.7), but decreased in FY 2017 to 2.4.



NUMBER OF DAYS POOR PHYSICAL AND MENTAL HEALTH LIMITED ACTIVITIES

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 3.10). The average number of days clients reported their physical or mental health kept them from doing their usual activities decreased significantly from intake to follow-up (14.2 to 1.3).

FIGURE 3.10. PERCEPTIONS OF POOR PHYSICAL HEALTH AND MENTAL HEALTH LIMITING ACTIVITIES IN THE PAST 30 DAYS (N = 278)[a]



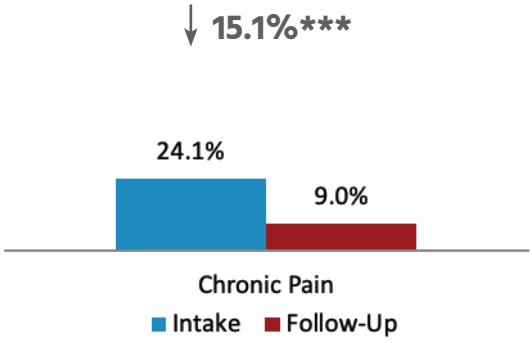
a—Statistical significance tested by paired t-test; ***p < .001.

CHRONIC PAIN

The percent of clients who reported chronic pain that was persistent and lasted at least 3 months decreased significantly from intake to follow-up by 15.1% (see Figure 3.11).[53]

The percent of clients reporting chronic pain **decreased 15% at follow-up**

FIGURE 3.11. CLIENTS REPORTING CHRONIC PAIN AT INTAKE AND FOLLOW-UP (N = 278)



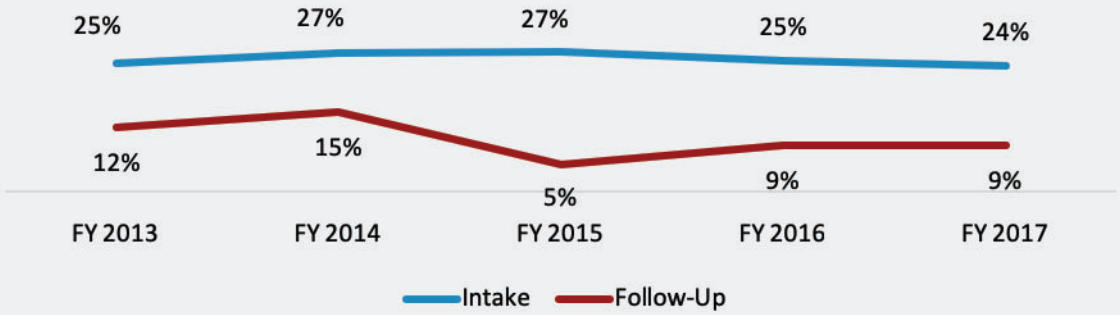
***p < .001

[53] Two individuals had missing values for chronic pain at follow-up.

TREND ALERT: CHRONIC PAIN

Over the past five fiscal years, the percent of RCOS clients reporting chronic pain that persisted for at least 3 months in the 6 months before entering the recovery center has been stable: 25% in FY 2013 and FY 2016, 27% in FY 2014 and FY 2015, and 24% in FY 2017.

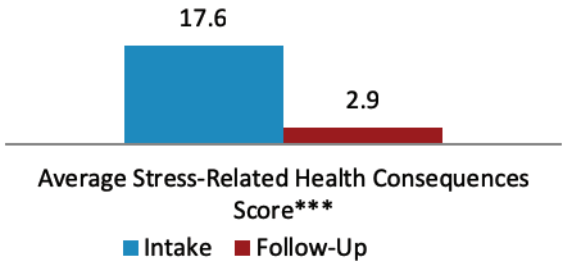
At follow-up, the number of clients reporting persistent chronic pain in the past 6 months increased slightly from FY 2013 (12%) to FY 2014 (15%) and decreased from FY 2014 to FY 2015 (5%), with an increase in FY 2016 (9%). Nonetheless, the percent of individuals reporting chronic pain decreased from intake to follow-up each year.



STRESS-RELATED HEALTH CONSEQUENCES

Clients were also asked 12 items about their physiological symptoms often associated with higher stress called the Stress-Related Health Consequences scale.[54] The index contains 12 symptoms and 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 indicate higher stress and greater physiological indicators of stress. The highest possible score is 36 and the lowest possible score is 0. For the overall sample, scores on the Stress-Related Health Consequences scale decreased significantly from 17.6 at intake to 2.9 at follow-up (see Figure 3.12).[55]

FIGURE 3.12. AVERAGE SCORES ON THE STRESS-RELATED HEALTH CONSEQUENCES SCALE AT INTAKE AND FOLLOW-UP (N = 214)[a]



a—Significance tested with paired t-test (***p < .001).

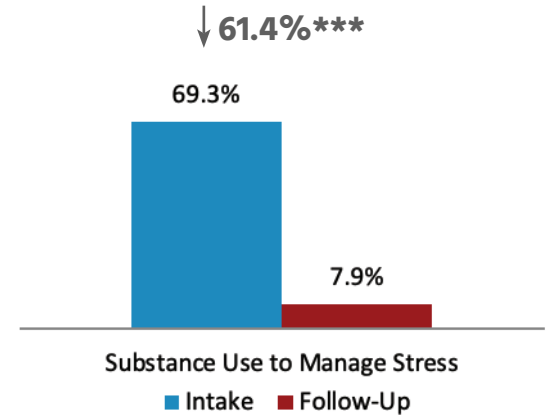
Clients were also asked if they used alcohol, prescription drugs, or illegal drugs in the past 7 days to

[54] Logan, T. & Walker, R. (2010). Toward a deeper understanding of the harms caused by partner stalking. *Violence and Victims, 25*(4), 440-455.

[55] The scale was dropped from the surveys; thus, data is available for 214 individuals.

reduce or manage stress at intake and follow-up. Figure 3.13 shows that 69.3% of clients reported they used at least one type of substance to reduce or manage their stress in the 7 days before entering the recovery center. At follow-up, that number significantly decreased to 7.9%.

FIGURE 3.13. CLIENTS REPORTING SUBSTANCE USE TO REDUCE OR MANAGE STRESS AT INTAKE AND FOLLOW-UP (N = 280)

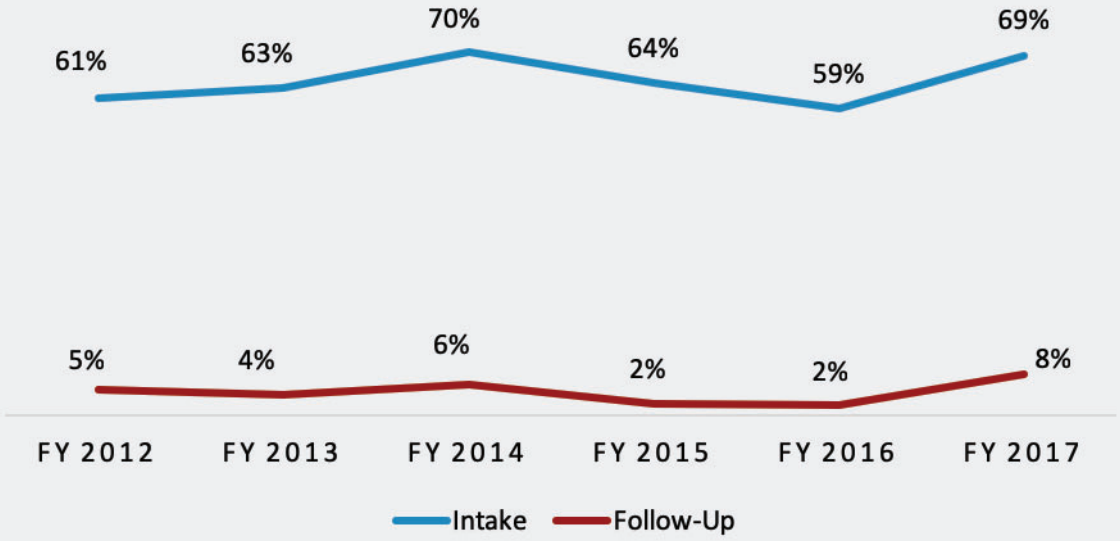


***p < .001

TREND ALERT: SUBSTANCE USE TO MANAGE STRESS

Clients are asked at both intake and follow up if they have used alcohol, prescription drugs, or illegal drugs to reduce any stress, anxiety, worry, or fear in the past 7 days. In FY 2012, 61% of clients reported they used substances to manage their stress or anxiety at intake. This number rose to 63% in FY 2013 and 70% in FY 2014. In FY 2015, the percent that reported substance use to manage stress decreased to 64% and again to 59% in FY 2016. The highest percentage was reported in FY 2014 (70%).

At follow-up, very few RCOS clients reported using any substances, including prescribed drugs, to manage their stress, with an increase in FY 2017 to 8%.



SECTION 4. INVOLVEMENT IN THE CRIMINAL JUSTICE SYSTEM

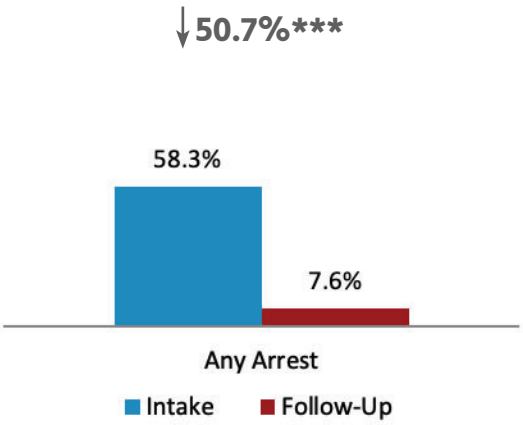
This section describes change in client involvement with the criminal justice system from intake to follow-up. Specifically, the following targeted factors are presented in this section: (1) arrests, (2) incarceration, (3) self-reported misdemeanor and felony convictions, and (4) self-reported supervision by the criminal justice system.

ARRESTS

At intake individuals were asked about their arrests in the 6 months before they entered the recovery center and at follow-up individuals were asked about their arrests in the past 6 months. Over half of individuals (58.3%) reported an arrest in the 6 months before entering the recovery center (see Figure 4.1).[56] At follow-up, this percent had decreased significantly by 50.7% to 7.6%.

The percent of clients reporting **any arrest significantly decreased 51% at follow-up**

FIGURE 4.1. CLIENTS REPORTING ANY ARRESTS AT INTAKE AND FOLLOW-UP (N = 278)



***p < .001.

"It was a life changing experience. It gave me the tools I neede to manage a healthy, recovered lifestyle."

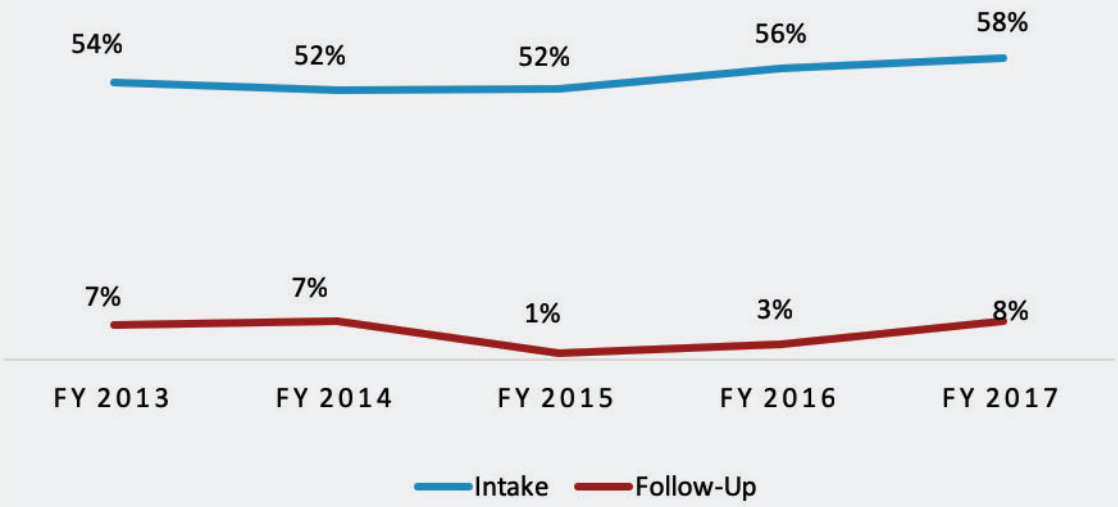
- RCOS FOLLOW-UP CLIENT

[56] Two individuals had missing data on number of arrests in the 6 months before follow-up.

TREND ALERT: ARRESTS

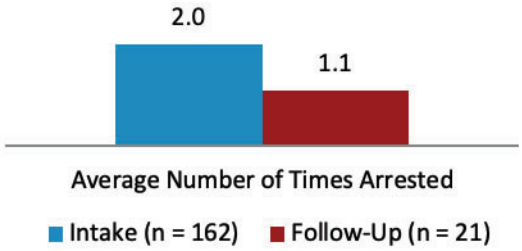
At intake, over half of RCOS clients reported being arrested at least once in the past 6 months. This number fluctuated from 54% in FY 2013 to 52% in FY 2014 and FY 2015. In FY 2017, 58% of clients reported at least one arrest in the past 6 months at intake.

At follow-up, significantly fewer clients reported an arrest in the past 6 months. Only 7% of clients in FY 2013 and FY 2014 reported an arrest and that decreased to 1% in FY 2015, 3% in FY 2016, and jumped up to 8% in FY 2017.



Of those who reported being arrested in the 6 months before entering the recovery center (n = 162), they were arrested an average of 2.0 times (see Figure 4.2). Similarly, of those who reported an arrest in the 6 months before follow-up (n = 21), they reported being arrested 1.1 times.

FIGURE 4.2. AMONG INDIVIDUALS WHO WERE ARRESTED, THE AVERAGE NUMBER OF TIMES ARRESTED AT INTAKE AND FOLLOW-UP

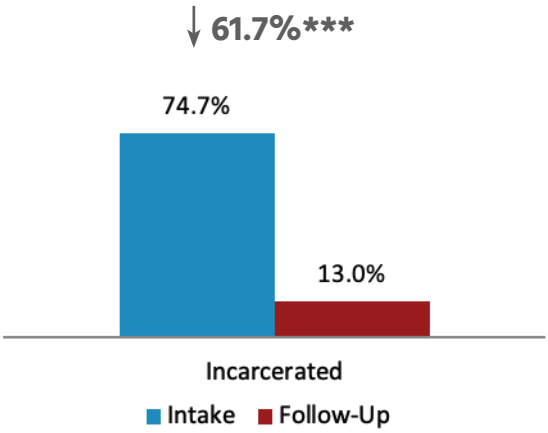


INCARCERATION

Three-fourths of clients (74.7%) reported spending at least one day in jail or prison in the 6 months prior to entering the recovery center (see Figure 4.3). At follow-up, only 13.0% reported spending at least one day incarcerated in the past 6 months.

There was a **62% decrease in the number of individuals who were incarcerated** at follow-up

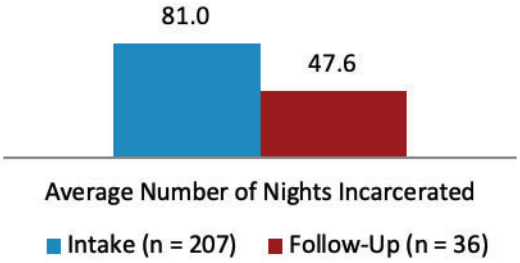
FIGURE 4.3. CLIENTS REPORTING INCARCERATION AT INTAKE AND FOLLOW-UP (N = 277)[57]



***p < .001.

Among individuals who were incarcerated in the 6 months before entering the program (n = 207), the average number of nights incarcerated was 81.0 (see Figure 4.4). Among the number of individuals who reported being incarcerated in the 6 months before follow-up (n = 36), the average number of nights incarcerated was 47.6.

FIGURE 4.4. AMONG INDIVIDUALS WHO WERE INCARCERATED, THE AVERAGE NUMBER OF NIGHTS INCARCERATED AT INTAKE AND FOLLOW-UP

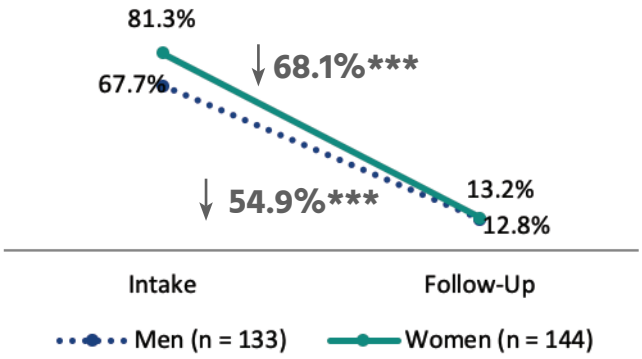


GENDER DIFFERENCES IN THE PERCENT OF INDIVIDUALS INCARCERATED

Significantly more women (81.3%) than men (67.7%) reported they had been incarcerated in the 6 months before entering the program (see Figure 4.5). For both men and women, there were significant decreases from intake to follow-up in those reporting they had been incarcerated. At follow-up, there was no gender difference in those who reported being incarcerated.

[57] Three individuals had missing values for the incarceration variable at follow-up.

FIGURE 4.5. GENDER DIFFERENCES IN PERCENT OF INDIVIDUALS INCARCERATED IN THE PAST 6 MONTHS AT INTAKE AND FOLLOW-UP (N = 277)[a]

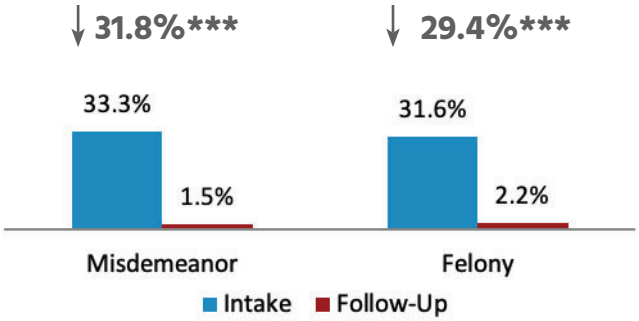


a—Significant difference by gender at intake (p < .01).
***p<.001.

SELF-REPORTED MISDEMEANOR AND FELONY CONVICTIONS

At intake, one third (33.3%) of individuals reported they had been convicted of a misdemeanor in the 6 months before entering the recovery center (see Figure 4.6).[58] That number significantly decreased to 1.5% at follow-up. The number of individuals who reported being convicted of a felony also significantly decreased from intake (31.6%) to follow-up (2.2%).[59]

FIGURE 4.6. CLIENTS REPORTING CONVICTIONS AT INTAKE AND FOLLOW-UP (N = 270)



***p < .001.

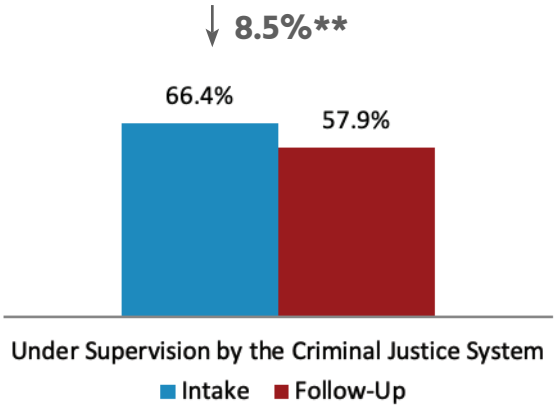
SELF-REPORTED CRIMINAL JUSTICE SYSTEM SUPERVISION

Two-thirds of clients (66.4%) were under criminal justice system supervision (e.g., probation or parole) when they entered the recovery center and 57.9% were under criminal justice supervision at follow-up (a significant decrease of 8.5%; see Figure 4.7).

[58] Ten individuals had missing values for number of convictions for misdemeanors at follow-up.

[59] Eleven individuals had missing values the number of convictions for felonies at follow-up.

FIGURE 4.7. CLIENTS REPORTING SUPERVISION BY THE CRIMINAL JUSTICE SYSTEM AT INTAKE AND FOLLOW-UP (N = 280)



**p < .01.

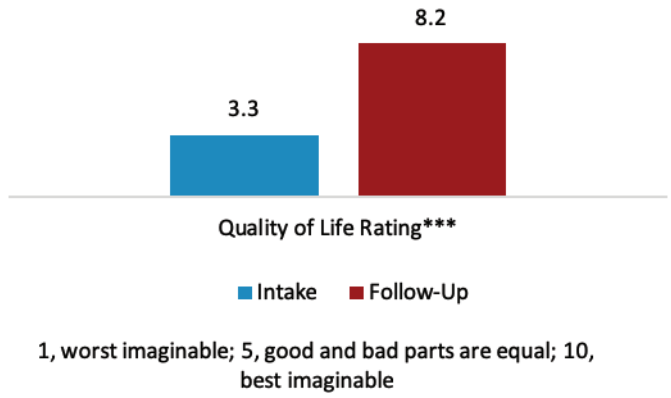
SECTION 5. QUALITY OF LIFE

There were two different measures of quality of life including: (1) overall quality of life rating, and (2) the satisfaction with life scale.

OVERALL QUALITY OF LIFE RATING

At intake, clients were asked to rate their quality of life before entering the recovery center and after participating in the program. Ratings were from 1='Worst imaginable' to 5='Good and bad parts were about equal' to 10='Best imaginable'. RCOS clients rated their quality of life before entering the recovery center, on average, as 3.3 (see Figure 5.1). At follow-up, individuals were asked the same question about their current quality of life. The average rating of quality of life at follow-up increased significantly to 8.2.[60]

FIGURE 5.1. PERCEPTION OF QUALITY OF LIFE BEFORE AND AFTER THE PROGRAM (N = 279)



***p < .001.

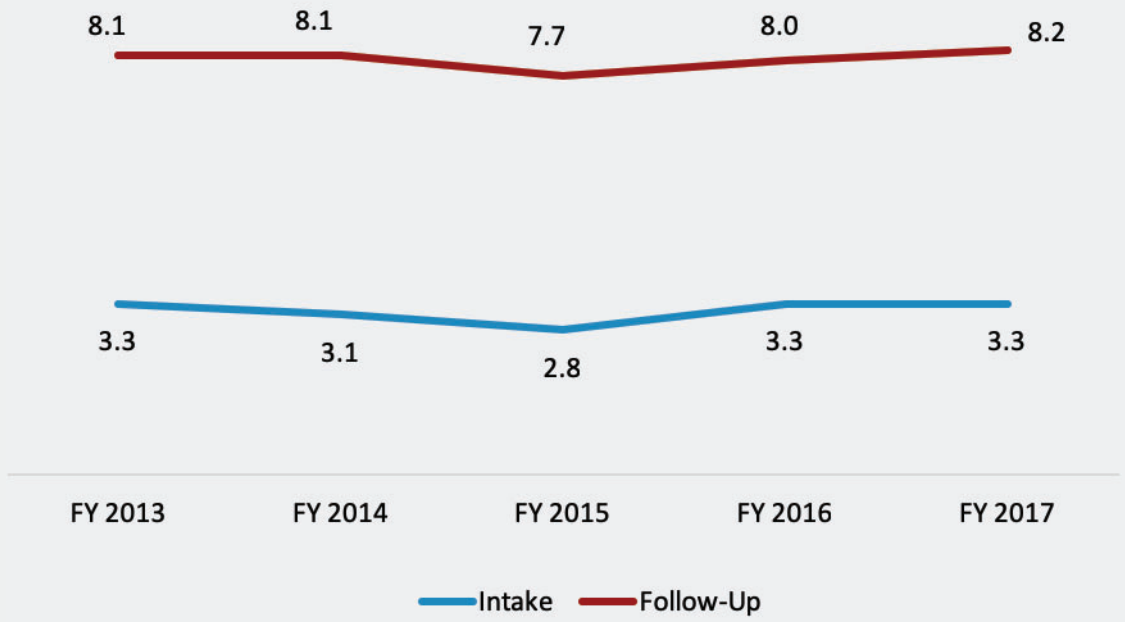
"I liked that the staff have been through what everyone else has. They were helpful with resources and transitioning."

- RCOS FOLLOW-UP CLIENT

[60] One individual had a missing value for quality of life at follow-up.

TREND ALERT: OVERALL QUALITY OF LIFE RATING

Clients are asked to rank their overall quality of life on a scale from 1 (worst imaginable) to 10 (best imaginable) at both intake and follow-up. At intake, RCOS clients have consistently rated their quality of life, on average, around a 3. At follow-up, that rating has significantly increased to an average of about an 8.



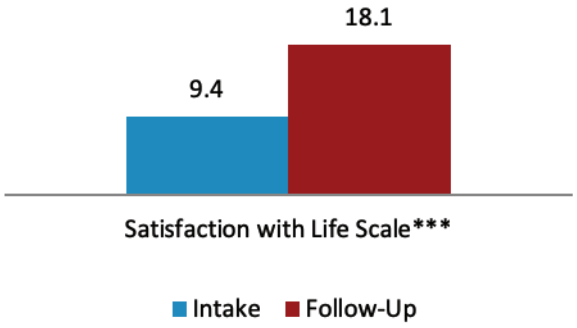
SATISFACTION WITH LIFE

At intake and follow-up, clients were presented with five statements and asked to respond how much they agreed or disagreed with each statement, using a scale with 1 representing "Strongly disagree" and 5 representing "Strongly agree".[61] Each statement is a positively worded aspect of high satisfaction with one's life. One statement, for example, is "In most ways my life is close to my ideal." The values assigned to each response are added to create a life satisfaction score. The lowest possible score is 5 and the highest possible score is 25. Lower scores indicate lower satisfaction and higher scores represent higher satisfaction. Figure 5.2 shows that clients' scores on the satisfaction with life scale increased significantly from intake to follow-up.[62]

[61] Diener, E., Emmons, R.A., Larsen, R.J., & Griffin, S. (1985). The Satisfaction with Life Scale. Journal of Personality Assessment, 49, 71-75.

[62] In the latter part of 2018 the items for the satisfaction with life were dropped from the follow-up survey. Thus, the data is available for 213 cases.

FIGURE 5.2. SATISFACTION WITH LIFE BEFORE INTAKE AND FOLLOW-UP (N = 213)



***p < .001.

SECTION 6. EDUCATION AND EMPLOYMENT

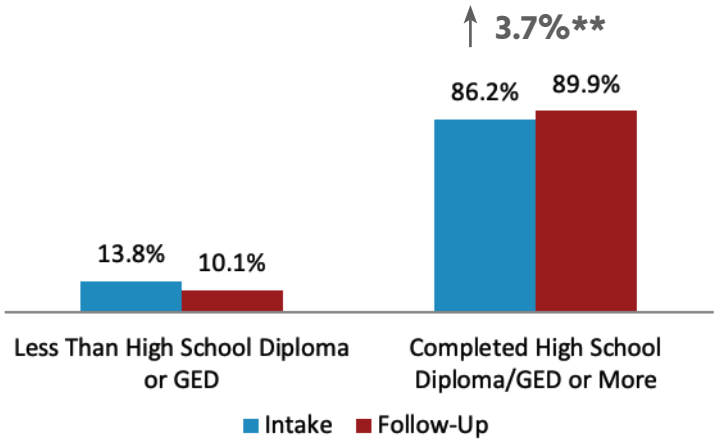
This section examines changes in education and employment from intake to follow-up including: (1) highest level of education completed, (2) the percent of clients who worked full-time or part-time, (3) the number of months clients were employed full-time or part-time, among those who were employed at any point in the 6 month period, (4) the median hourly wage, among those who were employed in the prior 30 days, and (5) expectations to be employed in the next 6 months.

EDUCATION

Overall, the highest number of years of education completed increased significantly from intake (12.4) to follow-up (12.5, $p < .05$).[63]

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 GED, or (2) a high school diploma or GED or higher (see Figure 6.1). At intake, 86.2% 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 percent had increased significantly to 89.9%. At intake, 13.8% of the follow-up sample reported that they had less than a high school diploma or GED. At follow-up, 10.1% reported that they had completed less than a high school diploma or GED.

FIGURE 6.1. HIGHEST LEVEL OF EDUCATION COMPLETED AT INTAKE AND FOLLOW-UP (N = 276)[64]



**p < .01.

EMPLOYMENT

Clients were asked in the intake survey to report the number of months they were employed full-time or part-time in the 6 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. A little less than one half of clients (47.5%) reported at intake they had worked full-time or part-time at least one month in the 6 months before entering the recovery center

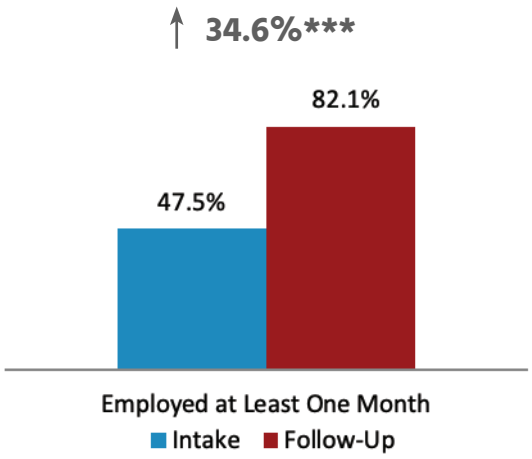
The percent of clients reporting being **employed at least one month increased 35% at follow-up**

[63] Number of years of education was recoded for analysis so that 12 years of education and GED were equal to 12.

[64] Four cases had missing values on highest level of education because of inconsistencies between values in the intake and follow-up surveys.

(see Figure 6.2). At follow-up, 82.1% worked part-time or full-time at least one month in the past 6 months, which was a significant increase of 34.6%.

FIGURE 6.2. EMPLOYED FULL-TIME OR PART-TIME FOR AT LEAST ONE MONTH AT INTAKE AND FOLLOW-UP (N= 280)

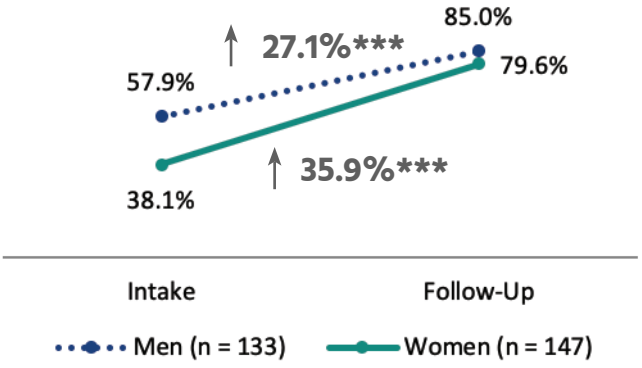


***p < .001.

GENDER DIFFERENCES IN THE PERCENT OF INDIVIDUALS EMPLOYED

Significantly more men (57.9%) than women (38.1%) were employed part-time or full-time at least one month before intake (see Figure 6.3). For both men and women, there was a significant increase in those reporting employment from intake to follow-up. At follow-up, there was no gender difference in those employed.

FIGURE 6.3. GENDER DIFFERENCES IN EMPLOYED AT LEAST ONE MONTH AT INTAKE AND FOLLOW-UP (N = 280)[a]



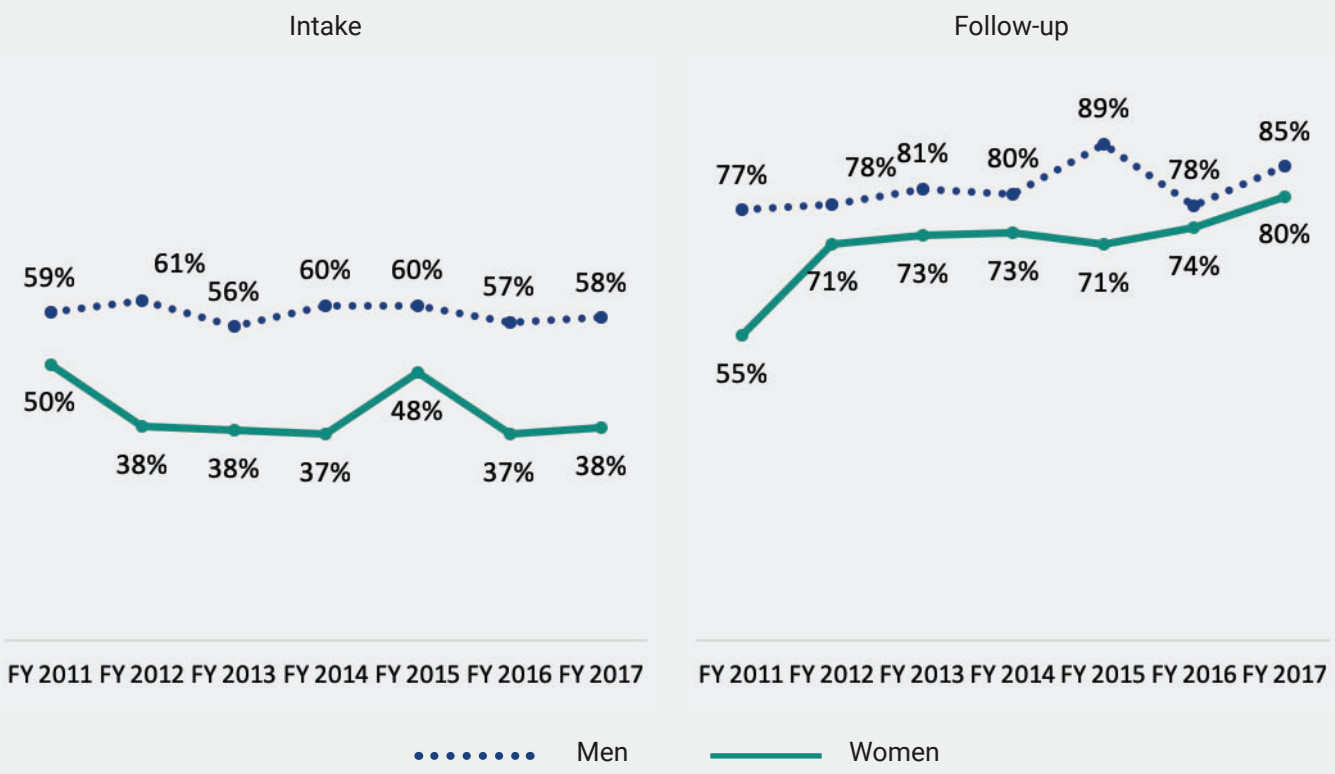
a—Significant difference by gender at intake (p < .01).
***p<.001.

TREND ALERT: EMPLOYMENT TRENDS BY GENDER

Since FY 2011, the disparity in employment between men and women in the RCOS follow-up sample has been documented.

In FY 2013 and FY 2014, significantly fewer women reported being employed at intake compared to men, however in FY 2015, there was no significant difference in the number of men and women reporting employment at intake. In FY 2016, only 37% of women were employed at least one month at intake while 57% of men reported employment. A similar difference in the percent of men vs. women who reported being employed at least one month before entering the program was found in FY 2017.

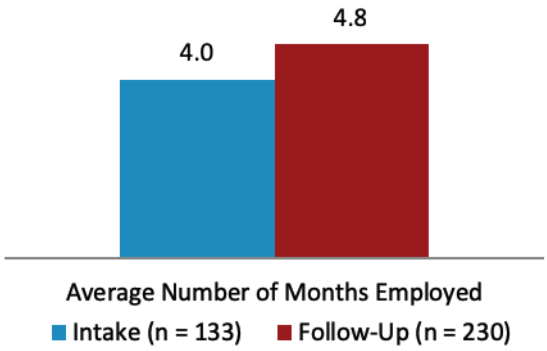
By follow-up, on average, a majority of women reported they were employed full-time or part-time at least one month in the past 6 months but significantly more men reported employment during that same time frame. This is, however, a significant improvement for women compared to findings from FY 2011. In FY 2016 and FY 2017, there was no significant difference in the number of men and women who reported employment at least one month in the past 6 months.



AVERAGE NUMBER OF MONTHS EMPLOYED

As seen in Figure 6.4, among individuals who reported being employed part-time or full-time at all before entering the program (n = 133), the average number of months worked was 4.0. Among the 230 individuals who worked at all in the 6-month follow-up period, the average number of months they worked was 4.8.

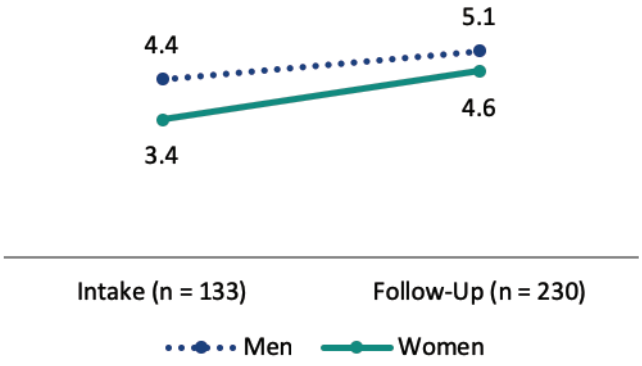
FIGURE 6.4. AVERAGE NUMBER MONTHS EMPLOYED AT INTAKE AND FOLLOW-UP, AMONG THOSE WHO REPORTED



Gender Difference In Average Number Of Months Employed

Figure 6.5 shows that at intake and follow-up, among individuals who were employed, men reported working a higher average number of months than women.

FIGURE 6.5. GENDER DIFFERENCES IN NUMBER OF MONTHS EMPLOYED AT INTAKE AND FOLLOW-UP, AMONG THOSE WHO REPORTED BEING EMPLOYED[a]



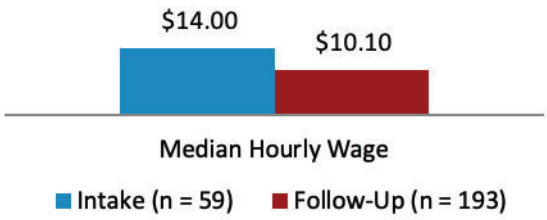
a—Significant difference by gender at intake and follow-up ($p < .01$).

MEDIAN HOURLY WAGE

At each period, individuals who reported they were employed in the 30 days before entering the program were asked their hourly wage. Only a small percent of clients reported they were currently employed at intake (n = 59) and their median hourly wage was $14.00 (see Figure 6.6). At follow-up, the median hourly wage was $10.10.[65]

[65] Of those currently employed at follow-up (n = 205), 12 cases had missing values for hourly wage.

FIGURE 6.6. MEDIAN HOURLY WAGE AT INTAKE AND FOLLOW-UP, AMONG THOSE WHO REPORTED BEING CURRENTLY EMPLOYED

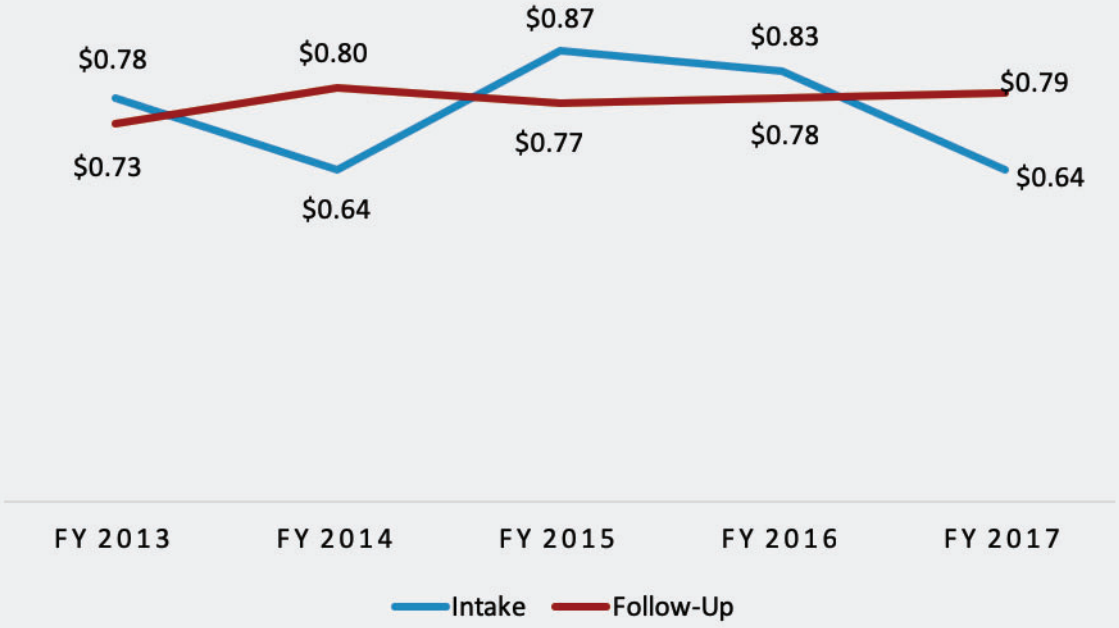


TREND ALERT: GENDER WAGE GAP

For the past five fiscal years, among employed individuals there was a gender wage gap at intake and follow-up: men had higher median hourly wages compared to women.

In the FY 2013 report, employed women made $0.78 for every $1.00 men made at intake and $0.73 for every $1.00 men made at follow-up. The gender wage gap was even more pronounced in the FY 2014 report where, at intake, employed women made just $0.64 for every $1.00 men made. At follow-up this number improved; however, employed women still made $0.20 less, on average, than men.

FY 2015 continued to show a wage gap at both intake ($0.87) and follow-up ($0.77). In FY 2016, women again made less than men: $0.83 for each $1.00 men made at intake and $0.78 at follow-up. In FY 2017 employed women made less than men: $0.64 for every $1.00 employed men made at intake, and at follow-up, employed women made $0.79 for every $1.00 employed men made.

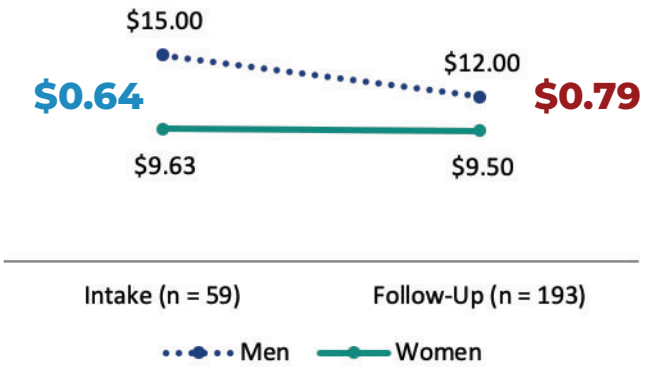


Gender Differences in Median Hourly Wage

At intake, employed women reported a median hourly wage of $9.63, which was lower than the median hourly wage for employed men, $15.00, meaning women made $0.64 for every dollar men made (see Figure 6.7). At follow-up, men again reported significantly higher hourly wages compared to women ($12.00 for men and $9.50 for women). At follow-up, employed women made $0.79 for every dollar employed men made.

At follow-up, employed **women made only $0.79 for every $1 employed men made**

FIGURE 6.7. GENDER DIFFERENCES MEDIAN HOURLY WAGE AT INTAKE AND FOLLOW-UP[a]



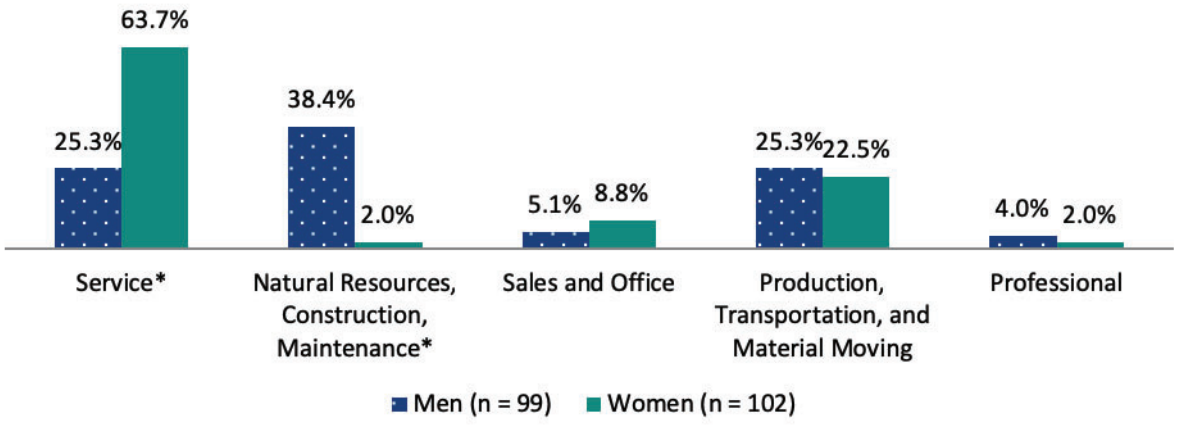
a—Significant difference in hourly wage at intake and follow-up by gender tested with Man-Whitney U test; $p < .001$.

Gender Differences in Occupation Type

At least part of the reason for the marked difference in hourly wages between men and women is due to the significant difference in occupation type for employed individuals by gender.[66] At follow-up, the majority of employed women (63.7%) reported having a service job (i.e., food preparation and serving, child care, landscaping, housekeeping, lifeguard, hair stylist, etc.) whereas only 25.3% of employed men had a service job (see Figure 6.8). More employed men reported having a natural resources, construction, or maintenance job (i.e., mining, farming, logging, construction, plumber, mechanic, etc.) than women (38.4% vs. 2.0%). Small percentages of men and women had sales and office jobs (i.e., cashier, retail, telemarketer, bank teller, etc.). Production, transportation, and material moving jobs (i.e., factory production line, power plant, bus driver, sanitation worker, etc.) were reported by 25.3% of employed men and 22.5% of employed women. Small numbers of men and women reported having professional jobs.

[66] Occupation type was asked only of individuals who reported they were employed in the 30 days before entering the recovery center at intake and the past 30 days at follow-up. Because so few individuals reported employment in the 30 days before entering the recovery center, there were too few cases reporting several occupation types at intake to examine statistical difference by gender.

FIGURE 6.8. AMONG EMPLOYED INDIVIDUALS, TYPE OF OCCUPATION BY GENDER AT FOLLOW-UP (N = 201)[a]

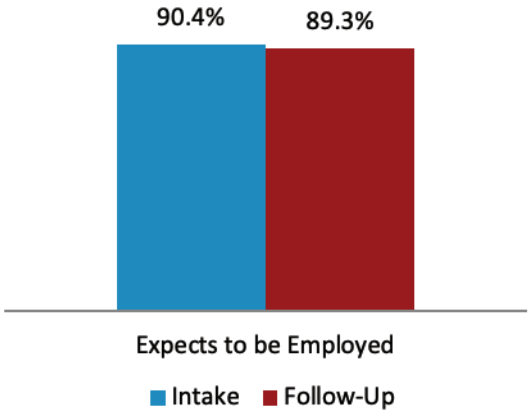


a – Significance tested with a chi-square test of independence ($p < .001$).

EXPECT TO BE EMPLOYED

The vast majority of clients reported they expected to be employed in the next 6 months at intake and follow-up, with no significant change (see Figure 6.9).

FIGURE 6.9. CLIENT EXPECTS TO BE EMPLOYED IN THE NEXT 6 MONTHS AT INTAKE AND FOLLOW-UP (N = 299)[67]



[67] One individual had missing data for this variable at follow-up.

SECTION 7. LIVING SITUATION

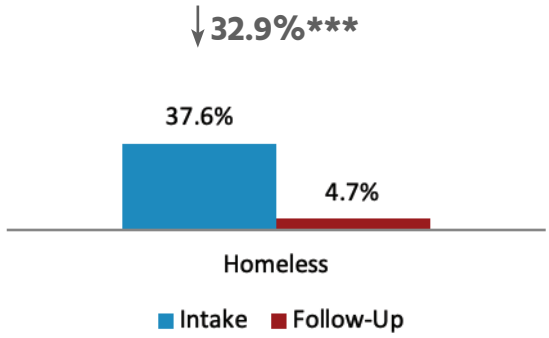
This section of targeted factors examines the clients' living situation before they entered the program and at follow-up. Specifically, clients are asked at both points: (1) if they consider themselves currently homeless, (2) in what type of situation (i.e., own home or someone else's home, residential program, shelter) they have lived, and about (3) economic hardship.

HOMELESSNESS

More than one third of clients (37.6%) reported being homeless when they entered the recovery center and 4.7% reported being homeless at follow-up. This is a significant decrease of 32.9% in the number of clients who reported they were homeless (see Figure 7.1).

There was a **33% decrease in homelessness** at follow-up

FIGURE 7.1. HOMELESSNESS AT INTAKE AND FOLLOW-UP (N = 255)[68]



***p < .001.

"It changed my whole outlook on life. It seemed ridiculous at the time but it changed my life."

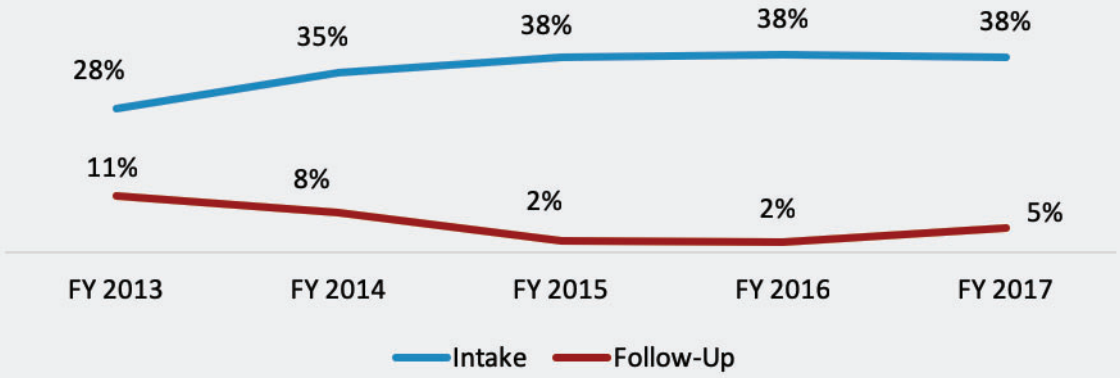
- RCOS FOLLOW-UP CLIENT

[68] Individuals who said they were currently living at a recovery center at follow-up were not asked this question in the follow-up survey (n = 20), and one individual had a missing value for this question at follow-up.

TREND ALERT: HOMELESSNESS

From FY 2013 to FY 2015, the number of people reporting homelessness at intake increased and has remained stable from FY 2015 through FY 2017. The number of people reporting homeless at follow-up decreased from FY 2013 to FY 2015 and had a slight increase in FY 2017.

On average, about one-third of clients entering Phase I of the recovery center reported that they were homeless in the 6 months before entering the program. At follow-up, the number reporting homelessness was significantly lower: 11% in FY 2013, 8% in FY 2014, and only 2% of clients in FY 2015 and FY 2016.

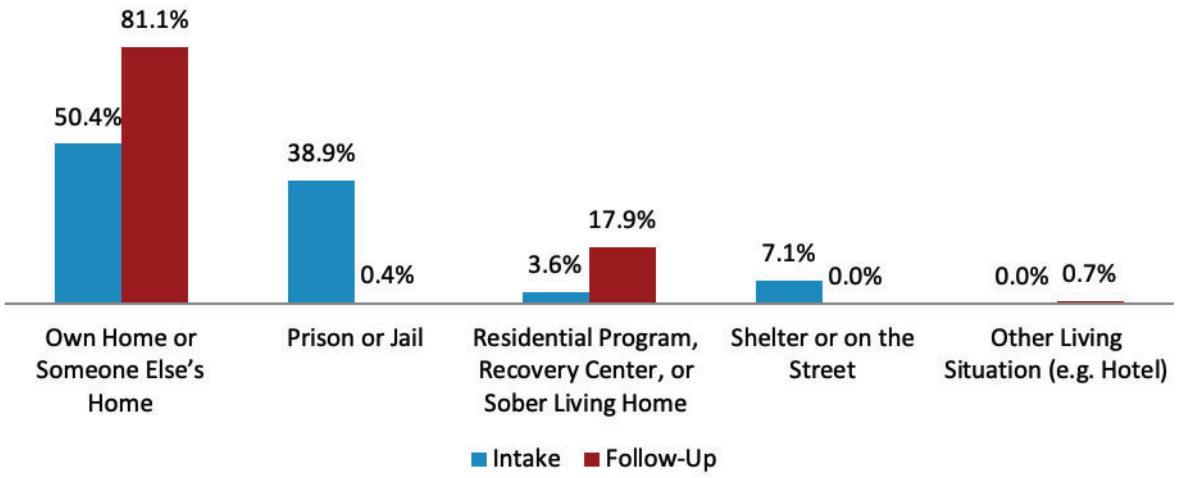


LIVING SITUATION

Change in living situation from intake to follow-up was examined for the RCOS follow-up sample (see Figure 7.2). At intake and follow-up, individuals were asked about where they lived in the past 30 days. Half of individuals (50.4%) reported living in a private residence (i.e., their own home or someone else's home) at intake while the majority (81.1%) reported living in their own home or someone else's home at follow-up. The number of clients who reported living in a jail or prison decreased from 38.9% at intake to 0.4% 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, 17.9% reported living in a recovery center, residential program, or sober living home at follow-up. Only a small number of individuals reported living in a shelter or on the street at intake (7.1%) and no individuals reported living in a shelter or on the street at follow-up.

FIGURE 7.2. LIVING SITUATION AT INTAKE AND FOLLOW-UP (N=280)[a]

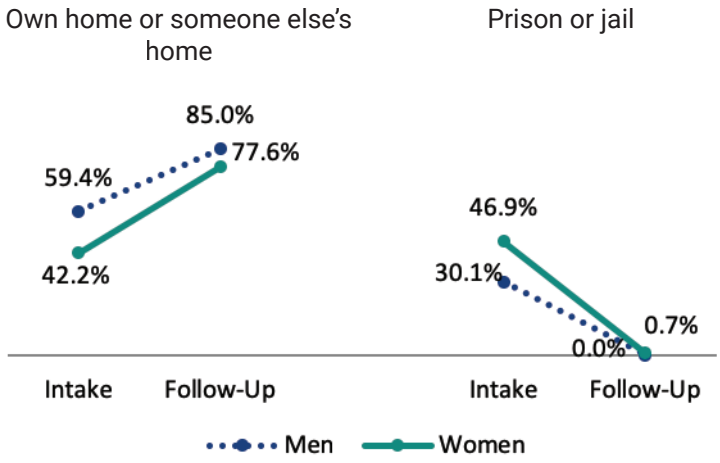


a – No measures of association could be computed for living situation because the value for prison or jail and shelter or on the street at follow-up was 0.

GENDER DIFFERENCE IN LIVING SITUATION

Figure 7.3 shows that at intake significantly more men reported living in a private residence compared to women and more women reported having lived in jail or prison compared to men. There were no significant differences in living situation by gender at follow-up.

FIGURE 7.3. GENDER DIFFERENCES IN LIVING SITUATION AT INTAKE AND FOLLOW-UP[a]



a—Significant difference by gender at intake ($p < .01$).

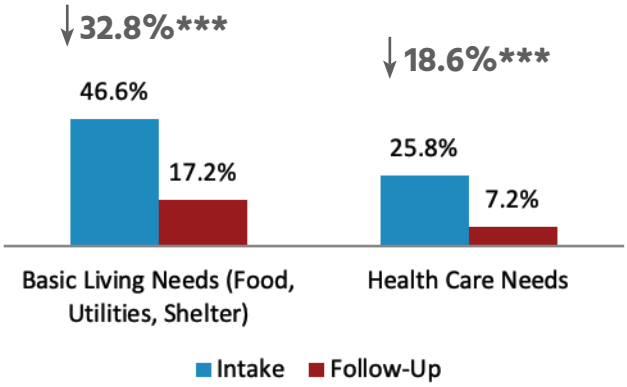
ECONOMIC HARDSHIP

Economic hardship may be a better indicator of the actual day-to-day living situation clients face than a measure of income. Therefore, the intake and follow-up surveys included several questions about clients' difficulty meeting basic living needs and health care needs.[69] Clients were asked eight items, five of which asked about difficulty meeting basic living needs such as food, shelter, utilities, and telephone, and three items asked about difficulty for financial reasons in obtaining health care.

The number of clients who reported having difficulty meeting basic living needs decreased significantly from intake (46.6%) to follow-up (17.2%; see Figure 7.4). Similarly, the number of clients who reported having difficulty in obtaining health care needs (e.g., doctor visits, dental visits, and filling prescriptions) for financial reasons decreased significantly from 25.8% at intake to 7.2% at follow-up.

The number of clients who **reported difficulty meeting basic living needs and health care needs for financial reasons decreased significantly** from intake to follow-up

FIGURE 7.4. DIFFICULTY MEETING BASIC LIVING AND HEALTH CARE NEEDS FOR FINANCIAL REASONS AT INTAKE AND FOLLOW-UP (N=279)[70]



***p < .001

[69] She, P., & Livermore, G. (2007). Material hardship, poverty, and disability among working-age adults. *Social Science Quarterly, 88*(4), 970-989.

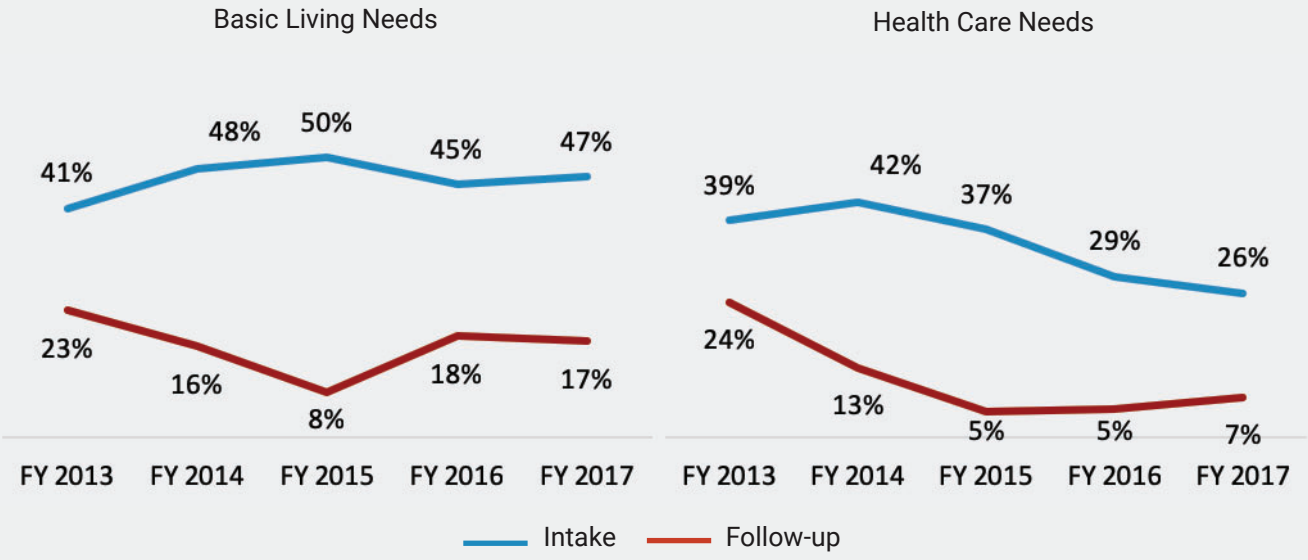
[70] There was missing data on items that comprised the basic living needs and the health care needs for one individual.

TREND ALERT: ECONOMIC HARDSHIP

Since FY 2013, there has been a significant decrease from intake to follow-up each year in the number of clients who reported they had difficulty meeting basic living needs and health care needs in the past 6 months.

At intake, the percent of clients who had difficulty meeting basic living needs (e.g., rent, utilities, food) has increased, from 41% in FY 2013 to a high of 50% in FY 2015. In FY 2017, 47% of clients had difficulty meeting basic needs at intake. At follow-up, the number of clients who had difficulty meeting basic needs was still high in FY 2013 (23%). That number decreased in FY 2014 and FY 2015, where it was the lowest (8%). In FY 2016 and FY 2017, almost one-fifth of RCOS clients were struggling to meet basic needs at follow-up.

Clients reporting difficulty meeting health care needs (e.g., unable to see a doctor, dentist, or pay for prescription medication) at intake and follow-up has seen a more dramatic decrease since FY 2013. Only 5% of clients at follow-up reported difficulty meeting health care needs in FY 2015 and FY 2016, with a slight increase to 7% in FY 2017. The expansion of Medicaid in the state under the implementation of the Affordable Care Act corresponds to the follow-up period in FY 2015.



SECTION 8. CLIENT GLOBAL FUNCTIONING

This section examines change in an index of global functioning from the period before entering the program to follow-up.

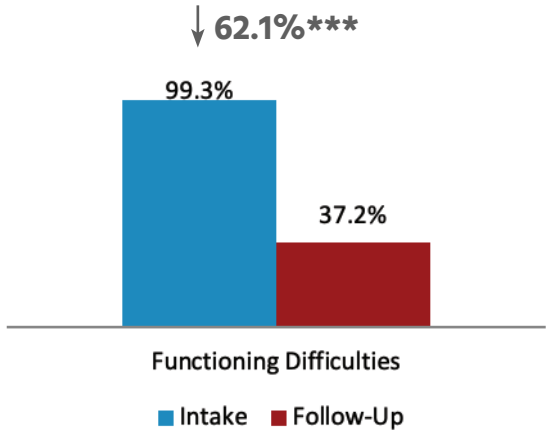
The index of global functioning is based on individuals' reports of substance use, employment, homelessness, criminal justice system involvement, suicide ideation, self-rating of overall health, recovery supports, and rating of quality of life. Table 8.1 describes the factors that compose the index. This index is used to better capture overall recovery functioning at follow-up. The presence of any of the functioning difficulties means an individual is classified as having functioning difficulties.

TABLE 8.1. ALTERNATE INDEX OF GLOBAL FUNCTIONING

INDICATOR	BETTER FUNCTIONING	FUNCTIONING DIFFICULTIES
Substance use	No or mild substance use disorder (SUD)	Moderate or severe substance use disorder (SUD)
Employment	Employed at least part-time or in school	Unemployed (not on disability, not going to school, not a caregiver)
Homelessness	No reported homelessness	Reported homelessness
Criminal Justice System Involvement	No arrest or incarceration	Any arrest or incarceration
Suicide ideation	No suicide ideation (thoughts or attempts)	Any suicide ideation (thoughts or attempts)
Overall health	Fair to excellent overall health	Poor overall health
Recovery support	Had at least one person he/she could count on for recovery support	Had no one he/she could count on for recovery support
Quality of life	Mid to high-level of quality of life	Low-level quality of life

At intake, as expected, almost all individuals (99.3%) were classified as having functioning difficulties (see Figure 8.1). At follow-up, 37.2% had functioning difficulties—a significant decrease of 62.1%.

FIGURE 8.1. FUNCTIONING DIFFICULTIES AT INTAKE AND FOLLOW-UP (N = 277)[71]



***p < .001

[71] Three Individuals had missing data for at least one of the variables that was used to compute the index of global functioning at follow-up.

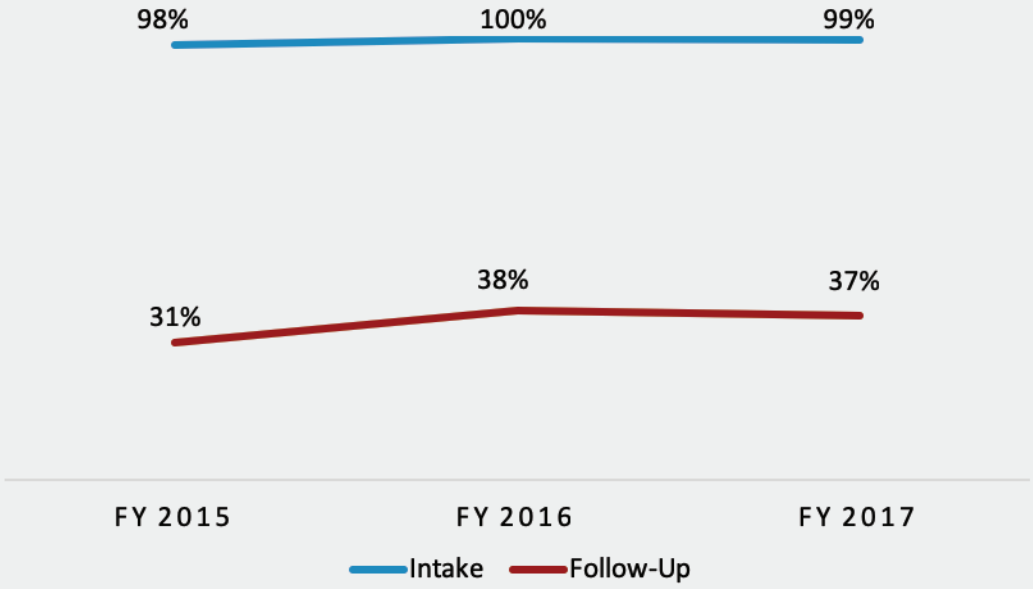
Table 8.2 presents the frequency of clients who reported each indicator of worse functioning at follow-up. Individuals who were in the Yes column in Table 8.2 were classified as having worse functioning at follow-up. The factors with the highest percent of clients answering "yes" to those indicators were no employment as their usual employment in the 6 months before follow-up and being arrested or incarcerated in the 6 months before follow-up.

TABLE 8.2. PERCENT OF CLIENTS WITH INDICATORS OF WORSE FUNCTIONING AT FOLLOW-UP (n = 275)

Factor	No	Yes
Met DSM-5 criteria for moderate or severe SUD in the 6 months before follow-up	91.7%	8.3%
Usual employment was not employed in the 6 months before follow-up	73.6%	26.1%
Homeless at any point in the 6 months before follow-up	95.7%	4.3%
Arrested and/or incarcerated in the 6 months before follow-up	85.9%	14.1%
Had thoughts of suicide or attempted suicide in the 6 months before follow-up	97.5%	2.5%
Self-rating of overall health at follow-up was poor	98.9%	1.1%
Reported having no one he/she could count on for recovery support at follow-up	98.2%	1.8%

TREND ALERT: GLOBAL FUNCTIONING DIFFICULTIES

Beginning in FY 2015 all of the measures that comprise the components of the global functioning index were included in the intake and follow-up surveys. There has been a significant decrease from intake to follow-up each year in the number of clients who reported they had global functioning difficulties in the past 6 months. All or almost all individuals reported global functioning difficulties at intake. The percentage decreased to 31% in FY 2015 and since FY 2016 has been between 37% - 38%.



To better understand which factors at entry to the program are associated with worse functioning at follow-up, each element that defined the global index of functioning at intake as well as the number of days in the recovery center program was entered as a predictor variable in a logistic regression model. Worse functioning at follow-up is the criterion (i.e., dependent) variable. Five of the nine criterion variables were statistically significantly associated with worse functioning at follow-up (see Table 8.3). Specifically, controlling for the other factors, individuals who had shorter stays in the recovery program, individuals who met criteria for moderate or severe SUD at intake, and individuals who were not employed as their usual employment at intake had significantly greater odds of having worse functioning at follow-up. Unexpectedly, individuals who reported suicidal thoughts or attempts at intake and individuals with lower quality of life at intake had lower odds of having worse functioning at follow-up, after controlling for all the other factors.

TABLE 8.3. MULTIVARIATE ASSOCIATIONS WITH WORSE FUNCTIONING AT FOLLOW-UP

Factor	B	Wald	Odds ratio	95% CI	
				Lower	Upper
Length of service (in days)	-.005	13.945	.995***	.992	.997
Met DSM-5 criteria for moderate or severe SUD in the 6 months before entering the program	.903	5.709	2.467*	1.176	5.175
Usual employment was not employed in the 6 months before entering the program	.860	8.463	2.362**	1.324	4.215
Homeless at any point in the 6 months before entering the program	.358	1.494	1.430	.806	2.539
Arrested and/or incarcerated in the 6 months before entering the program	-.304	.816	.738	.381	1.427
Had thoughts of suicide or attempted suicide in the 6 months before entering the program	-.630	4.257	.533*	.293	.969
Self-rating of overall health at intake was poor	-.188	.307	.828	.426	1.612
Reported having no one he/she could count on for recovery support before entering the program	-.308	.640	.735	.346	1.563
Reported a lower quality of life before entering the program	-.837	6.709	.433**	.230	.816

*p<.05, **p<.01, ***p<.001.
Note: Categorical variables were coded in the following ways: Met DSM-5 criteria for SUD (0=no or mild SUD, 1 = moderate or severe SUD), Usual employment was not employed (0=no, 1=yes), homeless (0 = no, 1 = yes), arrested or incarcerated (= no, 1 = yes), had thoughts of suicide or attempts (0 = no, 1 = yes), self-rating of overall health was poor (0 = no, 1 = yes), had no one the client could count on for recovery support (0=no, 1=yes), poor quality of life (0 = rating of 5 - 10, 1 = rating of 0 – 4).

SECTION 9. RECOVERY SUPPORTS

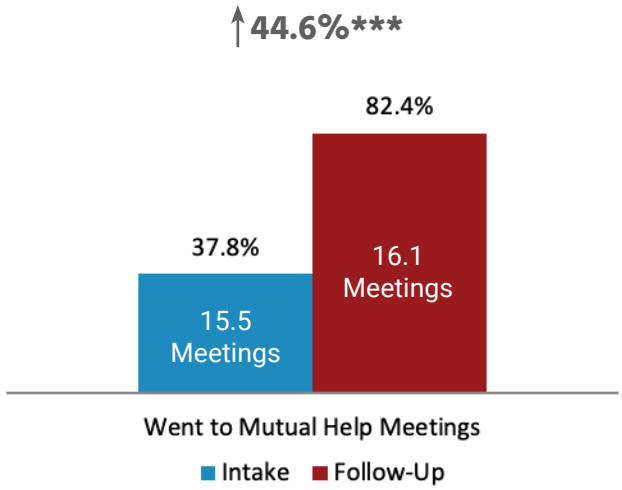
This section focuses on five changes in recovery supports: (1) percent of clients attending mutual help recovery group meetings, (2) recovery supportive interactions in the past 30 days, (3) the number of people the individual said they could count on for recovery support, (4) what would be most useful to them in staying off drugs or alcohol, and (5) how good they felt their chances were of staying off drugs or alcohol in the future.

MUTUAL HELP RECOVERY GROUP MEETINGS

At intake, 37.8% of individuals reported going to mutual help recovery group meetings (e.g., AA, NA) in the 30 days before they entered the recovery center (see Figure 9.1). At follow-up, there was a significant increase of 44.6%, with 82.4% 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 at follow-up, the average number of meetings attended was examined. Of those who attended meetings, the average number of meetings attended at intake (n = 105) was 15.5 and at follow-up (n = 229), clients reported attending 16.1 meetings on average (see Figure 9.1).

FIGURE 9.1. RECOVERY SUPPORTS AT INTAKE AND FOLLOW-UP (N=278)[72]

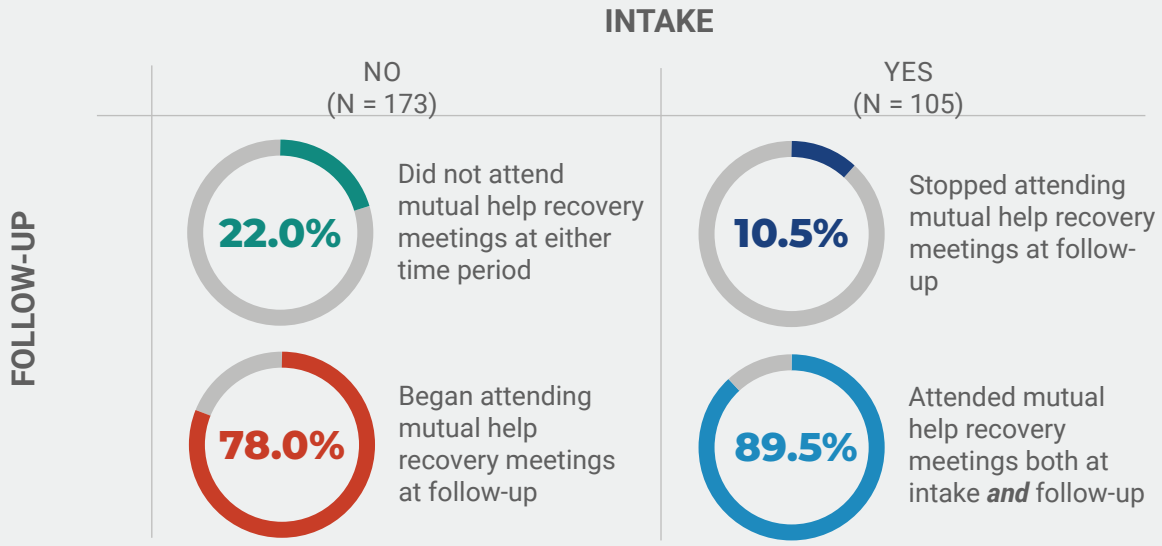


***p < .001.

[72] Two individuals had missing data for recovery meeting attendance at follow-up.

TAKING A CLOSER LOOK AT RECOVERY SUPPORT

Just over one-third of clients reported attending mutual help recovery group meetings in the 30 days before entering the recovery center (37.8%; n = 105). Of these clients who attended meetings at intake, 89.5% also attended meetings in the 30 days before follow-up. Additionally, of those who did not attend recovery self-help meetings at intake (n = 173), 78.0% attended at least one meeting in the past 30 days at follow-up.



RECOVERY SUPPORTIVE INTERACTIONS

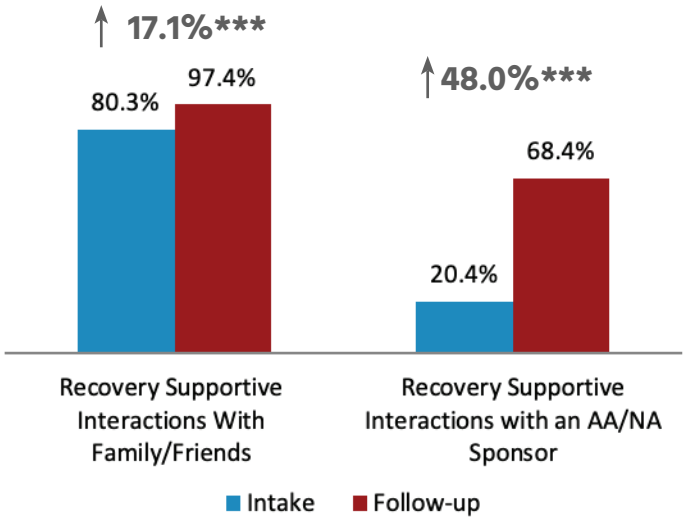
As seen in Figure 9.2, at follow-up, significantly more individuals (97.4%) reported that they had interactions with family and friends who were supportive of their recovery in the past 30 days compared to intake (80.3%).

The number of individuals who reported having contact with an AA, NA, or other self-help group sponsor in the past 30 days also significantly increased from intake (20.4%) to follow-up (68.4%).

"It got me refocused on my struggles and how to approach my struggles. It helped me deal with my emotions that led to my addiction."

- RCOS FOLLOW-UP CLIENT

FIGURE 9.2. RECOVERY SUPPORTIVE INTERACTIONS IN THE PAST 30 DAYS (N = 275)[73]



***p < .001.

AVERAGE NUMBER OF PEOPLE THE CLIENT COULD COUNT ON FOR RECOVERY SUPPORT

The average number of people individuals reported that they could count on for support increased significantly from 5.1 people at intake to 29.7 people at follow-up (see Figure 9.3).[74]

FIGURE 9.3. AVERAGE NUMBER OF PEOPLE CLIENTS SAID THEY COULD COUNT ON FOR RECOVERY SUPPORT AT INTAKE AND FOLLOW-UP (N = 272)[a]

a – Significant increase from intake to follow-up as measured by a paired t-test (p < .001)

WHAT WILL BE MOST USEFUL IN STAYING OFF DRUGS/ALCOHOL

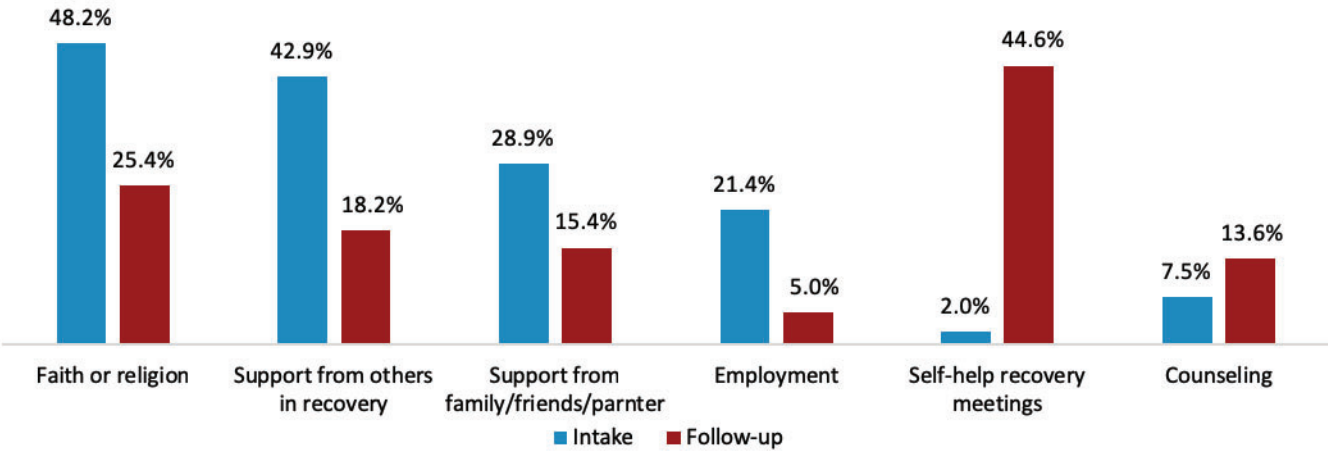
At intake and follow-up, clients were asked what, other than being at the Recovery Center, they believed would be most useful in helping them quit or stay off drugs/alcohol. Rather than conduct analysis on change in responses from intake to follow-up, responses that were reported by 15% of clients or more are presented for descriptive purposes in Figure 9.4. The most common responses at intake were faith or religion, support from others in recovery, support from family/friends/partner,

[73] Six individuals had missing data for recovery supportive interactions at follow-up and five individuals had missing data for contact with a sponsor in the 30 days before follow-up.

[74] Eight individuals had missing data for number of people they could count on at follow-up.

and employment. At follow-up, the most common response was self-help recovery meetings (i.e., AA or NA). Faith or religion, support from others in recovery, support from family/friends/partner, and counseling were also common answers at follow-up.

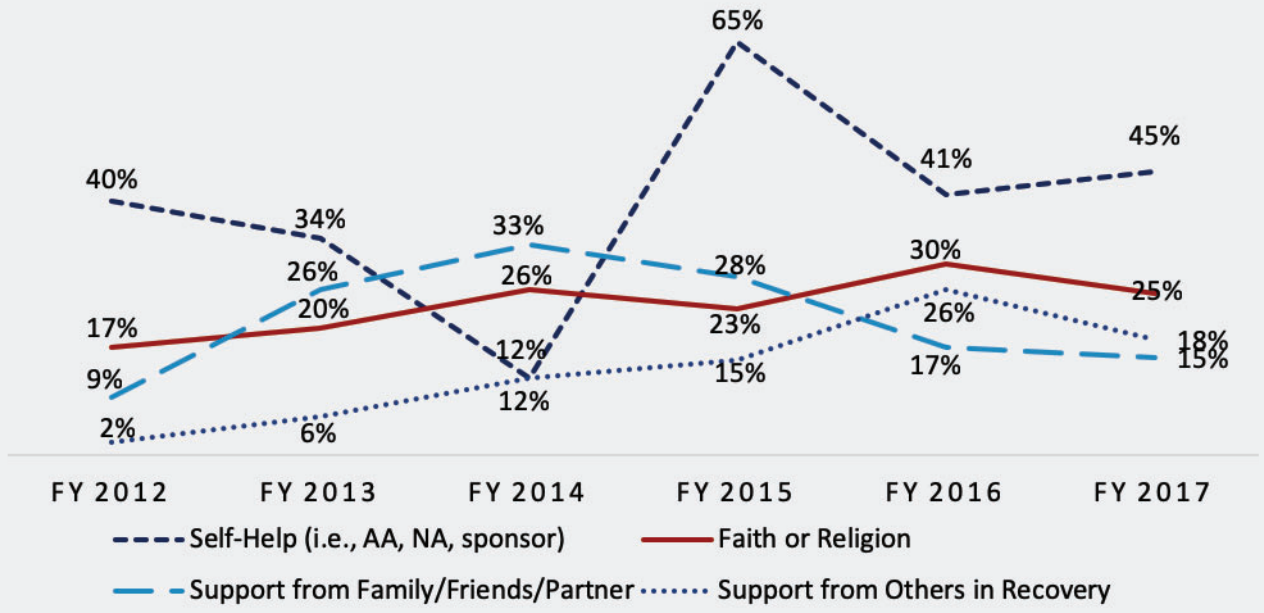
FIGURE 9.4. CLIENTS REPORTING WHAT WILL BE MOST USEFUL IN STAYING OFF DRUGS AND/OR ALCOHOL (N = 280)



TREND ALERT: WHAT WILL BE MOST USEFUL IN STAYING OFF DRUGS/ ALCOHOL AT FOLLOW-UP

At follow-up, clients were asked what, other than being at the recovery center, would be most useful in helping them quit or stay off drugs or alcohol. Examining the trends in four of the most common responses shows that self-help, such as AA/NA meetings, working the 12 steps, and having a sponsor, was the most commonly reported in FY 2012, FY 2013, FY 2015, and FY 2016. In FY 2014, the most common response at follow-up was support from family, friends, or a partner.

The number of individuals reporting that support from others in recovery would be most helpful has increased steadily over time from 2% in FY 2012 to 26% in FY 2016. The percent of clients stating their faith or religion to be most important has increased as well, from 17% in FY 2012 to 26% in FY 2014 and then again from 23% in FY 2015, a greater increase to 30% in FY 2016, and then a return to 25% in FY 2017.



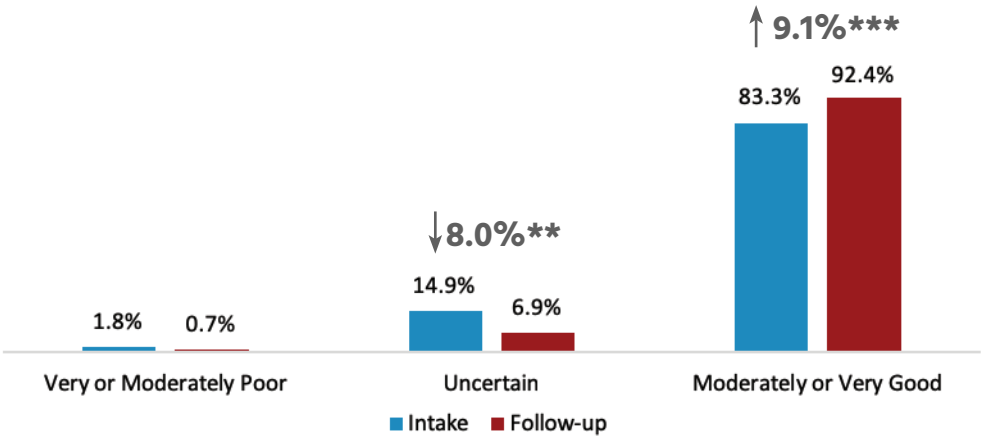
CHANCES OF STAYING OFF DRUGS/ALCOHOL

Clients were asked, based upon their situation, how good they believed their chances were of getting off and staying off drugs/alcohol using a scale from 1 (Very poor) to 5 (Very good).[75] Clients rated their chances of getting off and staying off drugs/alcohol as a 4.3 at intake and a 4.7 at follow-up, which was a significant increase (not depicted in figure).

Overall, 83.3% of clients believed they had moderately or very good chances of staying off drugs/ alcohol at intake, with a significant increase of 9.1% at follow-up (92.4%; see Figure 9.5).

[75] Four individuals had missing data for this question at follow-up.

FIGURE 9.5. CLIENTS REPORTING THEIR CHANCES OF GETTING OFF AND STAYING OFF DRUGS/ALCOHOL AT INTAKE AND FOLLOW-UP (N = 276)a



a – Significance tested with the Stuart-Maxwell Test of Overall Marginal Homogeneity ($p < .01$)
**$p < .01$, ***$p < .001$.

SECTION 10. CLIENT SATISFACTION WITH RECOVERY CENTER PROGRAMS

One of the important outcomes assessed during the follow-up interview is the client's perception of the Recovery Center program experience. This section describes three aspects of client satisfaction with the program: (1) overall client satisfaction, (2) client ratings of program experiences, and (3) positive outcomes of program participation.

OVERALL CLIENT SATISFACTION

The majority of individuals (80.4%) rated their experience in the Recovery Kentucky program between an 8 and a 10, where 10 represented the best possible experience (not in a table). The average rating was 8.6.[76]

CLIENT RATINGS OF PROGRAM EXPERIENCES

Overall, 94.9% of RCOS clients reported they felt better about themselves as a result of participating in the recovery center (not depicted in figure).

In February 2018, program satisfaction questions were expanded and reworked, therefore in this report, only 214 clients were asked to rate the following program experiences. When asked about specific positive aspects of the program, the vast majority of clients reported they either agreed or strongly agreed with many aspects of the Recovery Kentucky program assessed (see Figure 10.1a).

Almost all clients reported they were encouraged to use mutual help recovery groups, staff seemed to think they could grow, change, and recover, they were encouraged to talk about and decide their recovery goals, services were available at times that were good for them, staff helped them obtain the information they needed so they could take charge of substance use problems, and they felt safe while in the program. Most clients stated staff were sensitive to their cultural or ethnic background, if they had experienced harassment or had safety concerns they would have felt comfortable telling staff about it, and they did not need someone to talk to them about their personal safety while in the program.

[76] In February 2018 items about participants' satisfaction and experiences with the programs were changed to provide more in-depth information. Thus, for this item we have responses for 214 individuals.

FIGURE 10.1a. PERCENT OF INDIVIDUALS WHO AGREED/STRONGLY AGREED WITH THE FOLLOWING STATEMENTS ABOUT THE RECOVERY KENTUCKY PROGRAM AT FOLLOW-UP (N = 214)[77]

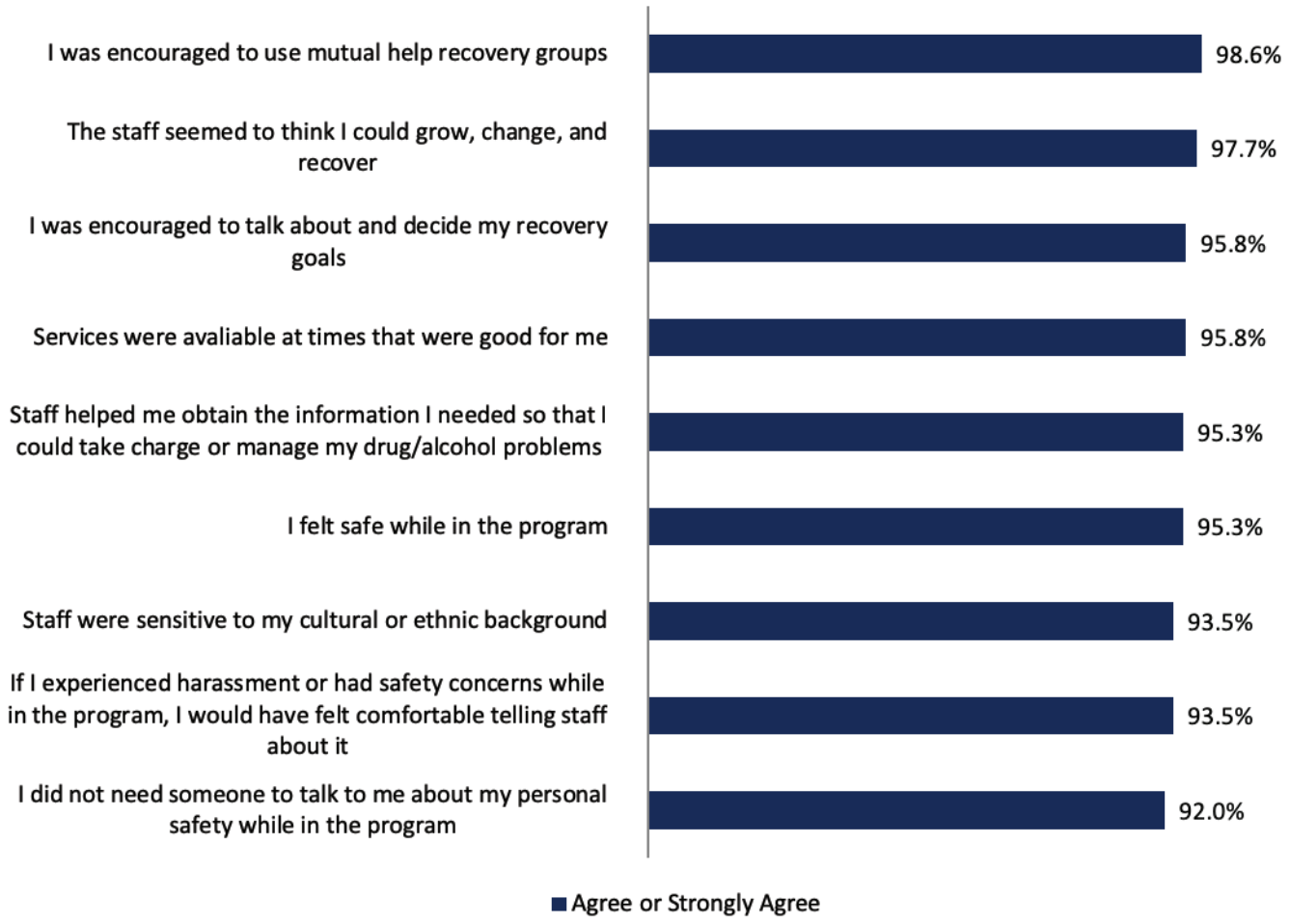
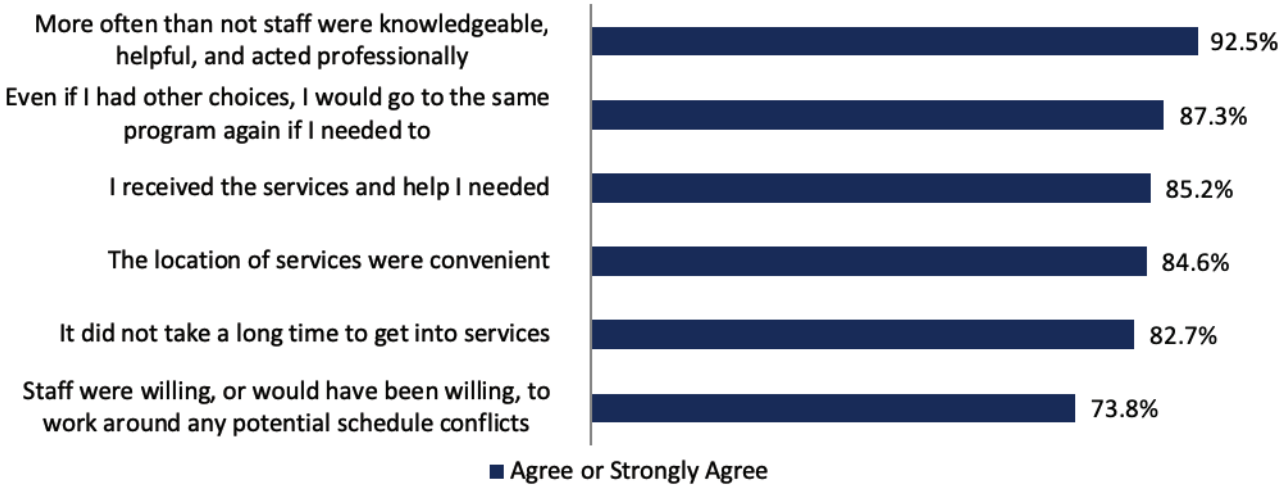


Figure 10.1b shows the program experiences that less than 95% of clients agreed or strongly agreed with. More than 90% of clients reported that more often than not, staff were knowledgeable, helpful, and acted professionally. More than 80% reported that even if they had other choices, they would go to the same program again if they needed to, they received the help they needed, and the locations of services was convenient. About three-fourths of clients stated it did not take a long time to get into services, and staff were willing, or would have been willing, to work around any potential schedule conflicts.

[77] Answers of don't know/don't remember were treated as missing on these items. The number of missing values ranged from 0 to 2 on the items represented in the figure.

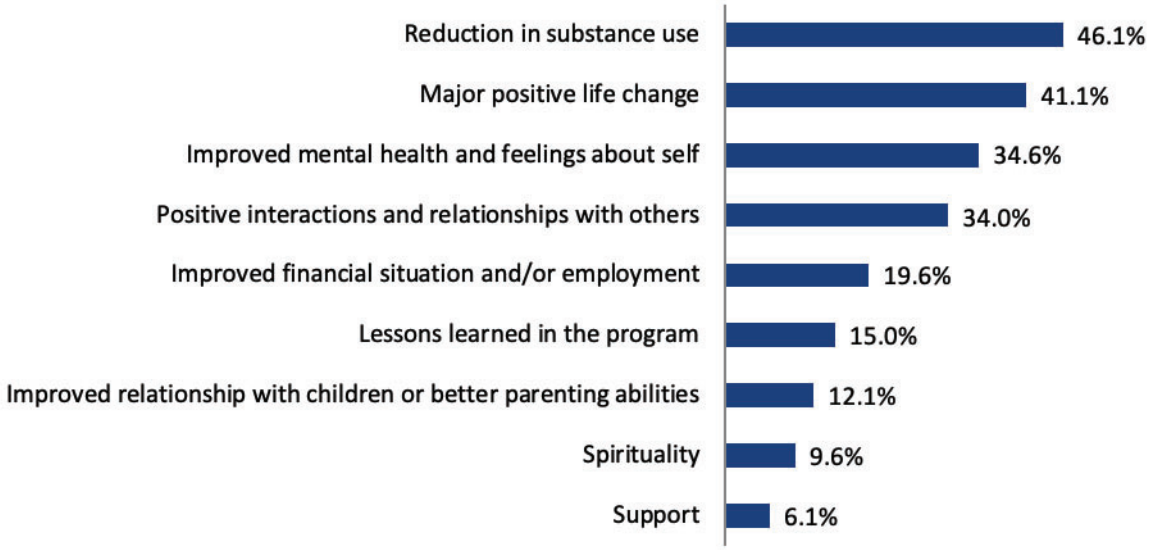
FIGURE 10.1b. PERCENT OF INDIVIDUALS WHO AGREED/STRONGLY AGREED WITH THE FOLLOWING STATEMENTS ABOUT THE RECOVERY KENTUCKY PROGRAM AT FOLLOW-UP (N = 214)[78]



POSITIVE OUTCOMES OF PROGRAM PARTICIPATION

At the beginning of the follow-up survey, individuals were also asked about the most positive outcomes of their Recovery Kentucky program experience (see Figure 10.2). The most commonly self-reported positive outcomes of the program included reduction in substance use, major positive life change (e.g., better quality of life, better able to function, having a "normal" life, having greater control over life), improved mental health and feelings about themselves, increased positive interactions and relationships with other people, and improved financial situation or employment.

FIGURE 10.2. PERCENT OF INDIVIDUALS REPORTING THE MOST POSITIVE OUTCOMES THEY EXPERIENCED FROM THEIR RECOVERY KENTUCKY PROGRAM EXPERIENCE AT FOLLOW-UP (n = 280)



[78] Answers of don't know/don't remember were treated as missing on these items. The number of missing values ranged from 0 to 2 on the items represented in the figure.

SECTION 11. MULTIVARIATE ANALYSIS OF FACTORS ASSOCIATED WITH RELAPSE

This section focuses on a multivariate analysis examining factors related to relapse in the 2019 RCOS follow-up sample.

RCOS clients who reported using any illicit drugs and/or alcohol in the 6 months before follow-up (n = 29) were compared to clients who did not report use of drugs or alcohol in the 6 months before follow-up (n = 247).[79] A logistic regression was used to examine the association between selected targeted factors and use of drugs or alcohol during the follow-up time period (relapse).

In comparing the two groups on the targeted factors, only one statistically significant difference was found in bivariate statistical tests (see Table 11.1). Individuals who reported any drug and/or alcohol use in the 6 months before follow-up had shorter lengths of service in the programs.

TABLE 11.1. COMPARISON OF TARGETED FACTORS FOR RELAPSE AND NON-RELAPSE GROUPS[80]

INTAKE VARIABLES	Used illicit drugs and/or alcohol in past 6 months at follow-up (n = 40)	Did not use illicit drugs or alcohol in the past 6 months at follow-up (n =235)
Average age at intake	32.3	33.3
Male	60.0%	45.1%
Length of service (days)	167.2	244.4***
Met criteria for moderate or severe SUD per DSM-5 criteria	82.5%	77.4%
Number of nights incarcerated in the 6 months before intake	59.3	62.3
Number of months employed in the 6 months before intake	1.9	1.8
Average number of mental health symptoms (depression and anxiety) reported at intake	11.1	10.9
Number of people client could count on for recovery support at intake	3.8	5.3
Average quality of life rating at intake	3.1	3.3
Number of adverse childhood experiences	3.0	3.9

***p<.001.

Gender, length of service, and meeting criteria for moderate or severe SUD at intake were entered into

[79] Five individuals had missing data on at least one of the illegal drug classes at follow-up.

[80] ACE items were integrated into the interviews at a point during data collection; thus, the number of ACE is available for only 175 individuals who did not report relapse at follow-up and 23 individuals who did report relapse.

a logistic regression as predictor variables and any drug or alcohol use in the past 6 months at follow-up (No/Yes) was entered as the dependent variable. Results of the analysis show when controlling for other variables in the model, individuals with shorter stays in the recovery programs had greater odds of relapse during the 6-month follow-up period.

TABLE 11.2. ASSOCIATION OF TARGETED FACTORS AND RELAPSE

Factor	B	Wald	Odds Ratio	95% CI	
				Lower	Upper
Gender	-428	1.378	.652	.319	1.332
Met DSM-5 criteria for moderate or severe SUD at intake	.242	.273	1.274	.514	3.156
Length of service (days)	-.010	18.063	.990***	.986	.995

*p<.05, ***p<.001
Note: Categorical variables were coded in the following ways: gender (1=male, 2= female).

SECTION 12. COST AND IMPLICATIONS FOR KENTUCKY

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 $2.56 for every dollar spent on recovery programs.

RETURN ON INVESTMENT IN 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.[81] In 2000 the estimated costs of alcohol abuse in the United States was updated and in 2011 the National Drug Intelligence Center updated the estimates of drug abuse in the United States for 2007.[82, 83] 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 2017 dollars using a CPI indexing

[81] Harwood, H., Fountain, D., & Livermore, G. (1998). T*he Economic Costs of Alcohol and Drug Abuse in the United States, 1992*. Report prepared for the National Institute on Drug Abuse and the National Institute on Alcohol Abuse and Alcoholism, National Institutes of Health, Department of Health and Human Services. NIH Publication No. 98-4327. Rockville, MD: National Institutes of Health.

[82] Harwood, H. (2000). *Updating Estimates of the Economic Costs of Alcohol Abuse in the United States: Estimates, Update Methods, and Data.* Report prepared by The Lewin Group for the National Institute on Alcohol Abuse and Alcoholism. Rockville, MD: National Institutes of Health.

[83] National Drug Intelligence Center. (2011). *The Economic Impact of Illicit Drug Use on American Society.* Washington, DC: United States Department of Justice.

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 or drug use disorder.[84] The estimate of the cost to society of alcohol use was $277,616,610,024 after conversion to 2017 dollars. This amount was then divided by the 14,500,000 individuals estimated in the NSDUH in 2017 to have an alcohol use disorder, yielding a cost per person of alcohol abuse of $19,146 (after rounding to a whole dollar). The estimate of the cost to society of drug use was $228,263,034,354 after conversion to 2017 dollars. This amount was then divided by the 7,500,000 individuals estimated in the NSDUH in 2017 to have an illicit drug abuse or dependence disorder, yielding a cost per person of drug abuse of $30,435 (after rounding to a whole dollar).

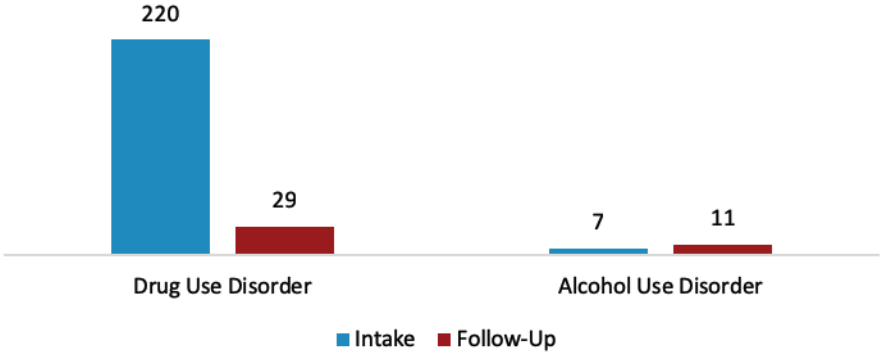
Given the high prevalence of severe substance abuse among the individuals entering recovery centers, analyses hinged on estimating the differences in cost to society between persons who are in active addiction compared to those who are abstinent from drug and/or alcohol use. Thus, the role that abstinence 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 12.1 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 use disorder category. Individuals who reported using alcohol but not using illegal drugs were classified in the alcohol use disorder category. The change from intake to follow-up was substantial (see Figure 12.1). At intake, 220 of the 275 RCOS clients included in the avoided cost analysis[85] were classified in the drug use category and 7 in the alcohol use category. At follow-up, only 29 individuals were classified in the drug use category and 11 individuals in the alcohol use category.

[84] Substance Abuse and Mental Health Services Administration. (2017). *Key substance use and mental health indicators in the United States: Results from the 2016 National Survey on Drug Use and Health* (HHS Publication No. SMA 17-5044, NSDUH Series H-52). Rockville, MD: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration. Retrieved from http://www.samhsa.gov/data

[85] Drug use at follow-up was missing for five individuals. Therefore, these cases were excluded from the avoided cost analysis.

FIGURE 12.1 CHANGE IN THE NUMBER OF INDIVIDUALS WHO WERE ACTIVE DRUG ABUSERS OR ALCOHOL ABUSERS FROM INTAKE TO FOLLOW-UP (N = 275)



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 individuals who used illegal drugs before entry into the recovery center was $6,695,700. When the average annual cost per individual alcohol user was applied to the 7 individuals who were active alcohol users at intake, the estimated cost to society was $134,022. The total estimated cost of drug and alcohol abuse applied to the sample of individuals in RCOS was $6,829,722. By follow-up, the estimated cost of the 29 individuals who were still active drug abusers was $882,615 and the estimated cost of the 11 individuals who were active alcohol abusers was $210,606, for a total of $1,093,221. Thus, as shown in Figure 12.2, after participation in a Recovery Kentucky program, the aggregate cost to society for the RCOS follow-up sample was reduced by $5,736,501.

FIGURE 11.2. CHANGE IN COST TO SOCIETY AT INTAKE AND FOLLOW-UP (AMOUNTS IN MILLIONS OF DOLLARS)

$6.8 million
COST TO SOCIETY AT INTAKE

-

$1 million
COST TO SOCIETY AT FOLLOW-UP

=

$5.8 million
GROSS DIFFERENCE IN COST TO SOCIETY

The daily cost of participation in a Recovery Kentucky program in FY 2016 was $35.04 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 $35.04 for a total cost of $2,243,751 for the 275 individuals included in the avoided cost analysis in this report. 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 $3,492,750 for serving this sample of 275 individuals. Examining the total avoided costs in relation to expenditures on recovery services, these figures suggest that for every dollar invested in recovery, there was a $2.56 return in avoided costs.

SECTION 13. CONCLUSION

This section summarizes the report findings and discusses some major implications within the context of the limitations of the outcome evaluation study.

This report describes outcomes for 280 men and women who participated in a Recovery Kentucky program and who completed an intake interview at Phase 1 entry and a follow-up telephone interview about 12 months after the intake survey was submitted to UK CDAR.

AREAS OF SUCCESS

The 2019 evaluation results indicate that Recovery Kentucky programs have been successful in facilitating substantial positive changes in clients' lives. Clients' level of satisfaction with the programs was high. Specifically, the vast majority indicated that the services helped them get better and feel better about themselves. Clients also reported positive outcomes to their participation in the Recovery Kentucky programs such as reductions in substance use, major positive life changes, improvements in mental health and feelings about themselves, and increases in positive interactions and relationships with other people, and the lessons they learned in the program. Furthermore, significant improvements in clients' lives and functioning were made from intake to follow-up were made in the following areas:

SUBSTANCE USE

There was a significant decrease in past-6-month illegal drug use as well as a decrease in past-6-month alcohol use from intake to follow-up among clients who were not in a controlled environment for the entire period at intake. About 90% of RCOS clients reported abstinence from illegal drugs and 92% reported abstinence from alcohol in the past 6 months at follow-up. Abstinence is linked to a decrease in drug related consequences[86] as well as improvements in health and a decrease in mortality, reductions in crime, increases in employment, and an improved quality of life.[87]

Further, significantly fewer clients met DSM-5 severity criteria for severe substance use disorder during the follow-up time period. The number of clients with an ASI alcohol or drug composite score that met or exceeded the cutoff for severe substance use disorder also decreased significantly in the past 30 days.

Multivariate analysis showed that drug and/or alcohol use in the follow-up period was significantly associated with shorter lengths of service in the Recovery Kentucky programs. No other intake variables were significantly related to relapse at follow-up.

MENTAL HEALTH

Compared to the general population, individuals who have a substance use disorder are more likely to also have a co-occurring mental health disorder.[88] At intake, almost three-fourths of clients met study criteria for depression, three-fourths met criteria for generalized anxiety, and 36.3% reported suicidal thoughts or attempts in the past 6 months. At follow-up, there were significant reductions in mental

[86] Park, T., Cheng, D., Lloyd-Travaglini, C., Bernstein, J., Palfai, T., & Saitz, R. (2015). Changes in health outcomes as a function of abstinence and reduction in illicit psychoactive drug use: A prospective study in primary care. *Addiction, 110*, 1476-1483.

[87] Vederhus, J., Birkeland, B., & Clausen, T. (2016). Perceived quality of life, 6 months after detoxification: Is abstinence a modifying factor? *Quality of Life Research, 25*, 2315-2322.

[88] https://www.samhsa.gov/treatment#co-occurring

health symptoms for RCOS clients – 12.9% met depression criteria, 16.1% met anxiety criteria, and only 2.5% reported suicidality in the past 6 months. Further, the vast majority of clients (83.9%) met criteria for either depression or anxiety at intake, with a significant decrease at follow-up (21.1%).

PHYSICAL HEALTH

Clients' self-reported overall health improved from intake to follow-up. About 1 in 10 rated their overall health as "very good" or "excellent" at intake, which increased significantly to 6 in 10 rating their overall health as "very good" or "excellent" at follow-up. The number of days individuals reported their physical health was not good in the past 30 days decreased significantly from intake (9.6) to follow-up (1.3). Comparing RCOS clients to a statewide sample, the number of poor physical health days reported at follow-up (1.3) was considerably less than others in Kentucky (4.7).[89] Additionally, there was a significant reduction in the number of clients reporting chronic pain in the past 6 months from intake to follow-up.

CRIMINAL JUSTICE INVOLVEMENT

Research has shown that criminal justice involvement, specifically post-treatment arrests, may increase the likelihood of substance use relapse.[90] The number of RCOS clients reporting arrests and incarceration in the past 6 months at follow-up was significantly less than the number at intake. Only 8% of clients reported an arrest at follow-up and 13% reported spending any time incarcerated. The percent of clients who self-reported at least one misdemeanor or felony conviction also decreased from intake to follow-up.

EMPLOYMENT

Unemployment has been linked to higher rates of smoking, alcohol consumption, and illicit drug use.[91] There was a significant increase in employment for RCOS clients from intake (48%) to follow-up (82%). The percent of men who were employed at least one month out of the past 6 months increased by 27% and the number of women employed increased by 36%.

HOMELESSNESS

Homelessness and substance use have often been shown to go hand-in-hand and one recent study found that of those with any substance abuse or dependence diagnosis in their lifetime, three-fourths had also experienced an episode of homelessness.[92] Overall, there was a significant decrease in the number of RCOS clients reporting homelessness in the last 6 months, from 38% at intake to 5% at follow-up.

ECONOMIC HARDSHIP

Economic hardship may be a better indicator of the actual day-to-day living situation clients face than a measure of income. The percent of clients reporting they had difficulty meeting basic living needs

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[89] University of Wisconsin Population Health Institute. (2018). 2017 County Health Rankings: Kentucky. Retrieved from http://www.countyhealthrankings.org/sites/default/files/state/downloads/CHR2017_KY.pdf.

[90] Kopak, A., Haugh, S., Hoffmann, N. (2016). The entanglement between relapse and posttreatment criminal justice involvement. *The American Journal of Drug and Alcohol Abuse, 42*(5), 606-613.

[91] Henkel, D. (2011). Unemployment and substance use: A review of the literature (1990-2010). *Current Drug Abuse Reviews, 4*, 4-27.

[92] Greenberg, G. & Rosenheck, R. (2010). Correlates of pate homelessness in the National Epidemiological Survey of Alcohol and Related Conditions. *Administration and Policy in Mental Health and Mental Health Services Research, 37*, 357-366.

and health care needs decreased significantly from intake to follow-up. For example, half of the clients had difficulty meeting basic living needs at intake, whereas the percent had decreased to 17% at follow-up.

RECOVERY SUPPORT

Research has shown that positive social and recovery supports, like AA, NA, and other 12-step programs, are linked to a lower risk of relapse.[93] For RCOS clients, there was a significant increase in self-help group meeting attendance in the past 30 days from intake to follow-up. Further, of those who did not attend recovery self-help meetings at intake, 78.0% did attend at least one meeting in the past 30 days at follow-up. At follow-up, RCOS clients also reported more recovery supportive contact with family, friends, or a sponsor. Additionally, the number of people clients could count on for support was significantly higher at follow-up (29.7) compared to intake (5.1).

GLOBAL FUNCTIONING

The index of global functioning measures multiple domains of clients' functioning: substance use, employment, homelessness, criminal justice system involvement, suicide ideation, self-rating of overall health, recovery supports, and rating of quality of life. Nearly all clients had worse functioning at intake, with a significant decrease to 37% at follow-up. In addition, in a multivariate analysis, controlling for the other factors, individuals who had shorter stays in the recovery program, individuals who met criteria for moderate or severe SUD at intake, and individuals who were not employed as their usual employment at intake had significantly greater odds of having worse functioning at follow-up. Individuals who reported suicidal thoughts or attempts at intake and individuals with lower quality of life at intake had lower odds of having worse functioning at follow-up, after controlling for all the other factors.

COST REDUCTION

A cost-benefit analysis was beyond the scope of this outcome evaluation. Nonetheless, an estimate of the avoided costs to society in the follow-up period based on national estimates of the cost of alcohol and drug abuse and taking into account the cost of recovery Kentucky services suggests that recovery Kentucky has a positive return on investment. The estimate of avoided costs to society of $5,736,501 divided by the cost of recovery Kentucky services to the individuals in the follow-up sample suggest that for every dollar spent there was an estimated $2.56 of avoided costs to society.

[93] Havassy, B., Hall, S. & Wasserman, D. (1991). Social support and relapse: Commonalities among alcoholics, opiate users, and cigarette smokers. *Addictive Behaviors, 16*, 235-246.

AREAS OF CONCERN

There were a few areas where the data results suggest additional attention may be warranted:

SMOKING RATES

The number of RCOS clients not in a controlled environment who reported past-6-month smoking tobacco use remained high from intake (85%) to follow-up (84%). Past-30-day smoking for those not in a controlled environment was also high at intake (83%) and follow-up (78%). For those clients who were in a controlled environment all 30 days before entering the recovery center, smoking tobacco use in the past 30 days drastically increased 25% from intake to follow-up. There is a common belief that individuals should not attempt to quit smoking while in substance abuse treatment, because smoking cessation can endanger their sobriety. However, this has been contested by recent empirical research studies.[94] Continued tobacco use is associated with increased mental health symptoms as well as well-known physical health problems, including increased mortality. Voluntary smoking cessation during substance abuse treatment has been associated with lower alcohol and drug relapse and improved mental health outcomes.[95, 96]

ECONOMIC HARDSHIP

Even though there was a significant decrease in the percent of clients who difficulty meeting their basic living needs and health care needs from intake to follow-up, 17% of clients reported they had difficulty meeting basic living needs (e.g., food, utilities, rent) at follow-up. Additionally, despite significant increases in employment, women reported working fewer months in the past 6 months at follow-up and earning a lower median hourly wage at intake and follow-up than men. Chronic stressors like sustained economic hardship and unemployment are associated with substance abuse relapse.[97] Additionally, increased substance use may occur in those with financial strain in order to help alleviate the stress.[98]

PROGRAM CONCERNS

Most RCOS clients rated their time at the recovery center highly however, there were a few aspects of program satisfaction that a significant minority disagreed or strongly disagreed with. About 13% of clients did not agree with the statement that they would go to the same recovery center if they needed to. Fifteen percent said they did not receive the help they needed and 17% reported it took a long time to get into services.

About 15% reported that, more often than not, the staff were not knowledgeable, helpful or professional and that the location of services was not convenient. Further, 26% thought the staff were not willing, or would not have been willing, to work around any schedule conflicts.

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[94] Baca, C., & Yahne, C. (2009). Smoking cessation during substance abuse treatment: What you need to know. *Journal of Substance Abuse Treatment, 36*, 205-219.

[95] Proschaska, J. (2010). Failure to treat tobacco use in mental health and addiction treatment settings: A form of harm reduction? *Drug and Alcohol Dependence, 110*, 177-182.

[96] Kohn, C., Tsoh, J., & Weisner, C. (2003). Changes in smoking status among substance abusers: Baseline characteristics and abstinence from alcohol and drugs at 12-month follow-up. *Drug and Alcohol Dependence, 69*(1), 61-71.

[97] Tate, S., Brown, S., Glasner, S., Unrod, M., & McQuaid, J. (2006). Chronic life stress, acute stress events, and substance availability in relapse. *Addiction Research and Theory, 14*(3), 303-322.

[98] Shaw, B. A., Agahi, N., & Krause, N. (2011). Are Changes in Financial Strain Associated with Changes in Alcohol Use and Smoking Among Older Adults? *Journal of Studies on Alcohol and Drugs, 72*(6), 917-925.

ADVERSE CHILDHOOD EXPERIENCES AND INTERPERSONAL VICTIMIZATION IN ADULTHOOD

Adverse childhood experiences were reported by the majority of the sample (85.0%) who completed intake surveys. Of the maltreatment and abuse experiences, the most commonly reported experiences were emotional maltreatment, emotional neglect, and physical maltreatment. Of the household risks experiences, the most commonly reported experiences were parents being separated/divorced, substance abuse by a household member, and mental illness of a household member. Women reported significantly more adverse childhood experiences relative to men. The majority of RCOS clients reported they had been physically assaulted (other than IPV) as adults. Similar percentages of men and women reported ever being the victim of a home burglary or assault (other than IPV). Significantly higher percentages of women reported ever being verbally harassed in public and concerned for their safety, intimate partner violence (including controlling behavior), stalked by someone who scared them, and sexually assaulted or raped. The high number of clients who experience adverse childhood events and interpersonal victimization in adulthood suggest a need to addressed in the programs.

STUDY LIMITATIONS

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, some research has supported findings about the reliability and accuracy of individuals' reports of their substance use.[99, 100, 101] For example, in many studies that have compared agreement between self-report and urinalysis the concordance or agreement is acceptable to high.[102, 103, 104] In fact, in some studies, when there were discrepant results between self-report and urinalysis of drugs and alcohol, the majority were self-reported substance use that was not detected with the biochemical measures.[105, 106, 107] In other studies, higher percentages of underreporting have been found.[108] Prevalence of underreporting of substance use is quite varied in studies. Nonetheless, research has found that certain conditions

[99] Del Boca, F.K., & Noll, J.A. (2000). Truth or consequences: The validity of self-report data in health services research on addictions. *Addiction, 95*, 347-360.

[100] Harrison, L. D., Martin, S. S., Enev, T., & Harrington, D. (2007). *Comparing drug testing and self-report of drug use among youths and young adults in the general population* (DHHS Publication No. SMA 07-4249, Methodology Series M-7). Rockville, MD: Substance abuse and Mental Health Services Administration, Office of Applied Studies.

[101] Rutherford, M.J., Cacciola, J.S., Alterman, A.I., McKay, J.R., & Cook, T.G. (2000). Contrasts between admitters and deniers of drug use. *Journal of Substance Abuse Treatment, 18*, 343-348.

[102] Rowe, C., Vittinghoff, E., Colfax, G., Coffin, P. O., & Santos, G. M. (2018). Correlates of validity of self-reported methamphetamine use among a sample of dependent adults. *Substance Use & Misuse, 53* (10), 1742-1755.

[103] Rygaard Hjorthoj, C., Rygaard Hjorthoj, A., & Nordentoft, M. (2012). Validity of Timeline Follow-Back for self-reported use of cannabis and other illicit substances—Systematic review and meta-analysis. *Addictive Behaviors, 37*, 225-233.

[104] Wilcox, C. E., Bogenschutz, M. P., Nakazawa, M., & Woody, G. (2013). Concordance between self-report and urine drug screen data in adolescent opioid dependent clinical trial participants. *Addictive Behaviors, 38*, 2568-2574.

[105] Denis, C., Fatséas, M., Beltran, V., Bonnet, C., Picard, S., Combourieu, I., Daulouède, J., & Auriacombe, M. (2012). Validity of the self-reported drug use section of the Addiction Severity and associated factors used under naturalistic conditions. *Substance Use & Misuse, 47*, 356-363.

[106] Hilario, E. Y., Griffin, M. L., McHugh, R. K., McDermott, K. A., Connery, H. S., Fitzmaurice, G. M., & Weiss, R. D. (2015). Denial of urinalysis-confirmed opioid use in prescription opioid dependence. *Journal of Substance Abuse Treatment, 48*, 85-90.

[107] Williams, R. J., & Nowatzki, N. (2005). Validity of self-report of substance use. *Substance Use & Misuse, 40*, 299-313.

[108] Chermack, S. T., Roll, J., Reilly, M., Davis, L., Kilaru, U., Grabowski, J. (2000). Comparison of patient self-reports and urianalysis results obtained under naturalistic methadone treatment conditions. *Drug and Alcohol Dependence, 59*, 43-49.

facilitate the accuracy of self-report data such as assurances of confidentiality and memory prompts.[109] Moreover, the "gold standard" of biochemical measures of substance use have many limitations: short windows of detection that vary by substance; detection varies on many factors such as the amount of the substance consumed, chronicity of use, sensitivity of the analytic method used.[110] Therefore, the study method includes several key strategies to facilitate accurate reporting of sensitive behaviors at follow-up including: (a) the follow-up interviews are conducted by telephone with a University of Kentucky Center on Drug and Alcohol Research (UK CDAR) staff person who is not associated with any Recovery Kentucky program; (b) the follow-up responses are confidential and are reported at a group level, meaning no individual responses are linked to participants' identity; (c) the study procedures, including data protections, are consistent with federal regulations and approved by the University of Kentucky Human Subjects Institutional Review Board; (d) confidentiality is protected under Federal law through a Federal Certificate of Confidentiality; (e) participants can skip any question they do not want to answer; and (f) UK CDAR staff are trained to facilitate accurate reporting of behaviors and are regularly supervised for quality data collection and adherence to confidentiality.

Even though the project sample was limited to 280 follow-up surveys this fiscal year due to budget constraints, there are several ways the study method helps to minimize the impact of this limitation including: (a) the follow-up sample is randomly selected from those clients who agree to participate and who provide minimal locator information in the study and is stratified to ensure there are similar numbers of males and females; and (b) clients who did and clients who did not complete a follow-up interview are compared to see how different the follow-up sample is from those not followed up on sociodemographic factors and targeted factors at Phase 1 intake. Results show there are very few differences, and the differences that are found indicate clients who completed follow-up interviews were worse off than the clients who did not complete a follow up interview, which suggests those followed-up are similar to those who were not followed up. A longer-term follow-up would provide more information about the impact of the Recovery Kentucky Program on longer time life changes and events.

CONCLUSION

This RCOS 2019 report findings are encouraging and continue the first multi-year systematic evaluation of long-term residential recovery supports in the United States. 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.

Overall, Recovery Kentucky clients made significant strides in all of the targeted areas, clients were largely satisfied and appreciative of the services they received through the recovery centers, and Recovery Kentucky 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 improvements in global functioning and overall quality of life ratings suggest that client's lives have improved meaningfully and significantly. 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.

[109] Del Boca, F. K., & Noll, J. A. (2000). Truth or consequences: the validity of self-report data in health services research on addictions. *Addiction, 95* (Suppl. 3), S347—S360.

[110] Williams, R. J., & Nowatzki, N. (2005). Validity of self-report of substance use. *Substance Use & Misuse, 40*, 299-313.

APPENDIX A. METHODS

A total of 2,047 individuals had an intake survey completed between July 1, 2016 and June 30, 2017. 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. Thus, at the completion of the follow-up period, among the 280 clients with follow-up interviews, 52.9% (n = 148) were referred by the Department of Corrections (DOC) and 47.1% (n = 139) were not DOC-referred. 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 527 individuals were selected into the sample of individuals to be followed up from July 2017 to June 2018. Of these individuals, 59 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 468 individuals, interviewers completed follow-up surveys with 280 individuals, representing a follow-up rate of 59.8%. Of the eligible individuals, 187 (40.0%) 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. One individual refused to complete the follow-up survey when the interviewer contacted him/her. The project interviewers' efforts accounted for 64.5% of the cases (N = 340) 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 = 527)	Percent
Ineligible for follow-up survey	59	11.2%
	Number of cases eligible for follow-up (N = 468)	
Completed follow-up surveys	280	
Follow-up rate is calculated by dividing the number of completed surveys by the number of eligible cases and multiplying by 100		59.8%
Expired cases (i.e., never contacted, did not complete the survey during the follow-up period)	187	
Expired rate ((the number of expired cases/ eligible cases)*100)		40.0%
Refusal	1	
Refusal rate ((the number of refusal cases/ eligible cases)*100)		0.2%
Cases accounted for (i.e., records ineligible for follow-up + completed surveys + refusals)	340	
Percent of cases accounted for ((# of cases accounted for/total number of records in the follow-up sample)*100)		64.5%

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 59 cases that were ineligible for follow-up, the majority (72.9%) was ineligible because they were incarcerated during the follow-up period. Eight individuals were ineligible because they were in residential treatment and seven were deceased.

TABLE AA.2. REASONS CLIENTS WERE INELIGIBLE FOR FOLLOW-UP (N = 59)

	Number	Percent
Incarcerated	43	72.9%
Residential treatment	8	1.5%
Deceased	7	11.9%
Does not remember being in the program	1	1.7%

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).[111]

DEMOGRAPHIC CHARACTERISTICS

The average client age was about 33 and the majority of the sample for this annual report was White (see Table AB.1). A little less than half of clients reported at intake that they had never been married and almost 30% were separated or divorced. A significantly higher proportion of women were in the follow-up sample than were not followed up because of the stratification by gender when pulling the follow-up sample.

TABLE AB.1. COMPARISON OF DEMOGRAPHICS FOR CLIENTS WHO WERE FOLLOWED UP AND CLIENTS WHO WERE NOT FOLLOWED UP[112]

	FOLLOWED UP	
	NO n = 1,767	YES n = 280
AGE	33.8 years	33.2 years
GENDER**		
Male	61.2%	47.5%
Female	38.8%	52.5%
RACE		
White	91.2%	91.4%
African American	5.7%	5.4%
Other or multiracial	3.2%	3.2%
MARITAL STATUS		
Never married	44.2%	46.4%
Married or cohabiting	23.9%	25.4%
Separated or divorced	30.3%	25.7%
Widowed	1.6%	2.5%

SUBSTANCE USE AT INTAKE

Use of illegal drugs, alcohol, and tobacco in the 6 months before entering the recovery center is presented by follow-up status in Table AB.2 for those clients who were not incarcerated the entire

[111] Significance is reported for p<.01.

[112] Seven individuals who were not followed-up had a missing date of birth and age could not be calculated.

period.[113] There were no significant differences in the percent 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 6 months before entering the program. The drug class used by the greatest percent of clients was prescription opiates/opioids. A little more than half of clients reported using marijuana and about half used other stimulants (methamphetamine, non-prescribed Adderall, Ecstasy). Use of heroin was reported by about two-fifths of clients. More than one-third of clients who were not followed up and two-fifths of clients who were followed up used CNS depressants. About one-third of those not followed-up and 37.6% of those who were followed-up reported using cocaine. Less than one-fifth (16.6%) of clients who completed a follow-up survey used other illegal drugs (e.g., synthetic drugs, hallucinogens, inhalants) and one-fifth of clients who did not complete a follow-up used other illegal drugs.

Half of clients who were not followed up and 55.9% of followed up clients reported using any alcohol at intake. The majority of clients reported smoking tobacco products in the 6 months before entering the program. Nearly one-third of clients reported e-cigarette use. About one-fifth of clients used smokeless tobacco in the 6 months before entering the program.

TABLE AB.2. PERCENT OF INDIVIDUALS REPORTING ILLEGAL DRUG USE, ALCOHOL, AND TOBACCO IN THE 6 MONTHS BEFORE ENTERING THE RECOVERY CENTER

	FOLLOWED UP	
	NO n = 1,461	YES n = 229
SUBSTANCES		
Any illicit drug	87.4%	92.1%
Prescription opiates/opioids (including methadone and buprenorphine-naloxone)	66.5%	68.1%
Marijuana	51.9%	55.9%
Other Stimulants (methamphetamine, Adderall, Ecstasy)	49.5%	49.8%
Heroin	43.9%	42.8%
CNS depressants	36.7%	42.4%
Cocaine	33.9%	37.6%
Other illegal drugs (synthetic drugs, hallucinogens, inhalants)	20.0%	16.6%
Alcohol	50.1%	55.9%
Smoked tobacco	83.9%	85.2%
E-Cigarettes	32.9%	30.1%
Smokeless tobacco	19.8%	20.1%

Analysis of past-30-day substance use of clients who were followed up compared to clients who were not followed up showed similar patterns to the 6-month substance use.

Table AB.3 shows the percent of followed-up and non-followed-up individuals in each DSM-5 severity classification based on self-reported criteria of the 6 months before entering the recovery center. The majority of both groups reported six or more DSM-5 symptoms at intake.

[113] Of those who did not complete a follow-up, 306 were incarcerated all 6 months before entering the program. Of those who completed a follow-up, 51 were incarcerated all 6 months before entering the program.

TABLE AB.3. SELF-REPORTED DSM-5 SYMPTOMS OF SUBSTANCE USE DISORDER

	FOLLOWED UP	
	NO n = 1,767	YES n = 280
No SUD (0-1 symptom)	17.7%	17.1%
Mild SUD (2-3 symptoms)	4.4%	4.6%
Moderate SUD (4-5 symptoms)	3.5%	2.9%
Severe SUD (6+ symptoms)	74.4%	75.4%

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.4 separately for those individuals who were not in a controlled environment all 30 days before entering the recovery center and individuals who were 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 (CS) cutoff for alcohol and/or drug use disorder, with no difference by follow-up status (83.2% for not followed up and 87.0% for followed up individuals; see Table AB.4). Among individuals who were not in a controlled environment all 30 days before entering the program, the average score on the alcohol severity composite score was .29 for individuals who were not followed up and .30 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 severity composite score was .30 for those not followed up and .34 for those who were followed up. 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, less than half met or surpassed the cutoff for the ASI CS for alcohol and/or drug dependence, with no difference by follow-up status (see Table AB.4). Among individuals who were in a controlled environment all 30 days before entering the program, the average score for the alcohol severity composite score for those not followed-up was .14 and for those who were followed-up was .12. Of clients who were in a controlled environment all 30 days, the means for the drug severity composite scores were .17 for both groups. The percent of individuals who met or surpassed the cutoff for the ASI CS for severe SUD did not differ significantly by follow-up status.

TABLE AB.4. SELF-REPORTED ALCOHOL AND DRUG USE SEVERITY AT INTAKE

	FOLLOWED UP		FOLLOWED UP	
	NO n = 851	YES n = 146	NO n = 916	YES n = 134
Percent of Individuals with ASI composite score equal to or greater than cutoff score for …				
alcohol or drug use disorder	83.2%	87.0%	49.0%	42.5%
alcohol use disorder	50.2%	49.3%	28.3%	22.4%
drug use disorder	71.3%	78.8%	39.2%	33.6%
Average ASI composite score for alcohol use -a	.29	.30	.14	.12
Average ASI composite score for drug use -b	.30	.34	.17	.17

-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

A 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.5). Among clients who reported a history of substance abuse treatment, the average number of lifetime treatment episodes was 3.6 for individuals who did not complete a follow-up interview and 3.5 for individuals who did complete a follow-up interview.

TABLE AB.5. HISTORY OF SUBSTANCE ABUSE TREATMENT IN LIFETIME

	FOLLOWED UP	
	NO n = 1,767	YES n = 280
Ever been in substance abuse treatment in lifetime	68.8%	71.1%
Among those who had ever been in substance abuse treatment in lifetime,	(n = 1,215)	(n = 199)
Average number of times in treatment	3.6	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 study 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 reported symptoms that met study criteria for depression, with no significant difference by follow-up status (see Table AB.6).

A total of 7 questions were asked to determine if individuals met criteria for Generalized Anxiety, including the screening question: “In the 6 months before you entered this recovery center, did you

worry excessively or were you anxious about multiple things on more days than not (like family, health, finances, school, or work difficulties) all 6 months?" About three-fourths of clients 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 6 months before clients entered recovery centers. Nearly 30% of individuals who did not complete a follow-up interview and 36.1% of individuals who did completed a follow-up interview reported suicide ideation and/or attempts, with no difference by follow-up status (see Table AB.6).

A screening measure for posttraumatic stress disorder (PTSD) was added in mid-October 2016. The abbreviated version of the PTSD Checklist-5 (PCL-5), comprised of 4 items, was added to intake and follow-up interviews.[114] Individuals had to answer "Yes" to at least one of the victimization questions for the interviewer to ask the PTSD symptom items; thus, 1,327 individuals had PTSD scores at intake: 175 individuals who later completed a follow-up interview had PTSD scores at intake. A score of 10 or higher is indicative of clinically significant PTSD symptomatology.

TABLE AB.6. PERCENT OF INDIVIDUALS REPORTING MENTAL HEALTH PROBLEMS IN THE 6 MONTHS BEFORE ENTERING THE RECOVERY CENTER

	FOLLOWED UP	
	NO n = 1,767	YES n = 280
Depression	64.7%	72.1%
Generalized Anxiety	73.5%	75.4%
Suicidality (e.g., thoughts of suicide or suicide attempts)	29.5%	36.1%
PTSD	27.2%	32.6%

CRIMINAL JUSTICE SYSTEM INVOLVEMENT AT INTAKE

The majority of individuals who were not followed-up (79.7%) and 74.3% of those who were followed-up self-reported being referred to the recovery center by the criminal justice system (e.g., judge, drug court, probation, Department of Corrections; not depicted in a Table or Figure). Not all of those referred by the criminal justice system were considered DOC-referred individuals whose costs were covered by the DOC.

The majority of individuals (59.1% of those not followed up and 58.6% of those followed up) reported they had been arrested in the 6 months before entering the recovery center (see Table AB.7). Significantly more clients who were not followed up (76.1%) were under supervision by the criminal justice system (e.g., on probation or parole) when they entered the recovery center compared to clients who were followed up (66.4%).

[114] Price, M., Szafrankski, D. D., van Stolk-Cooke, K., & Gros, D. F. (2016). Investigation of abbreviated 4 and 8 item versions of the PTSD Checklist 5. Psychiatry Research, 239, 124-130.

TABLE AB.7. CRIMINAL JUSTICE SYSTEM INVOLVEMENT WHEN ENTERING THE RECOVERY CENTER

	FOLLOWED UP	
	NO n = 1,767	YES n = 280
Arrested for any charge in the 6 months before entering the Recovery Center	59.1%	58.6%
Currently under supervision by the criminal justice system*	76.1%	66.4%
On probation	53.7%	47.1%
On parole	25.2%	20.4%

*p<.05.

The majority of clients in each group reported being incarcerated for at least one day in the past 6 months before entering the program (See Table AB.8). Among those who reported being incarcerated at least one day in the 6 months before entering the program, the average number of days they were incarcerated did not differ by follow-up status.

TABLE AB.8. INCARCERATION HISTORY IN THE 6 MONTHS BEFORE ENTERING THE RECOVERY CENTER

	FOLLOWED UP	
	NO n = 1,767	YES n = 280
Incarcerated at least one day	77.3% (n = 1,366)	75.0% (n = 210)
Among those incarcerated at least one day, the average number of days incarcerated	86.7	81.4

PHYSICAL HEALTH AT INTAKE

Table AB.9 presents comparison of physical health status of clients who were not followed up with clients who were followed up. There were no significant differences by follow-up status. The majority of clients reported they had ever been told by a doctor they had a chronic health problem, such as hepatitis C, cardiovascular disease, arthritis, asthma, severe dental problems, and diabetes. About one-quarter of clients in each group reported they had experienced chronic pain in the 6 months before intake. When asked about the 30 days before they entered the recovery center, clients who were followed up and those who were not reported similar average number of days their physical health was not good. However, followed up individuals reported significantly more days their mental health was not good compared to individuals who were not followed up.

TABLE AB.9. CLIENT'S PHYSICAL HEALTH STATUS AT INTAKE

	FOLLOWED UP	
	NO n = 1,767	YES n = 280
Client was ever told by a doctor that client had a chronic medical problem	64.0%	58.2%
Experienced chronic pain (pain lasting 3 months or more)	25.6%	23.9%
In the 30 days before entering the program:		
Average number of days physical health was not good	9.2	9.7
Average number of days mental health was not good**	16.3	19.6

**p<.01.

ECONOMIC AND LIVING CIRCUMSTANCES AT INTAKE

Table AB.10 describes clients' level of education when entering the recovery center. A minority of individuals had less than a high school diploma or GED. Significantly more followed up clients had a GED or high school diploma or higher level of education at Phase I intake when compared to clients who were not followed up.

TABLE AB.10. CLIENTS' HIGHEST LEVEL OF EDUCATION COMPLETED AT INTAKE

	FOLLOWED UP	
	NO n = 1,767	YES n = 280
HIGHEST LEVEL OF EDUCATION COMPLETED*		
Less than GED or high school diploma	20.4%	13.2%
GED/high school diploma or higher	79.6%	86.8%

**p<.01.

There were no differences in usual employment status at intake by follow-up status (see Table AB.11). More than half of followed up and not followed up clients were unemployed, either because they were not looking for work due to being a student, homemaker, retired, disabled, or in a controlled environment or because they were looking for work. Of the individuals who reported working at least part-time in the 6 months before entering the recovery center, the average number of months worked was 3.8 for clients not followed up and 3.9 for clients followed up.

TABLE AB.11. EMPLOYMENT IN THE 6 MONTHS BEFORE ENTERING THE RECOVERY CENTER

	FOLLOWED UP	
	NO n = 1,767	YES n = 280
USUAL EMPLOYMENT STATUS		
Employed full-time	36.2%	37.5%
Employed part-time (including seasonal, occasional work)	11.9%	9.3%
Unemployed and not looking for work due to being a student, homemaker, retired, disabled, or in a controlled environment	28.6%	26.8%
Unemployed	23.3%	26.4%
	(n = 851)	(n = 131)
AMONG THOSE WHO WERE EMPLOYED, AVERAGE NUMBER OF MONTHS CLIENT WAS EMPLOYED	3.8 months	3.9 months

There were no significant differences in living situation at intake between individuals who completed a follow-up interview and individuals who did not. The majority of individuals reported their usual living arrangement in the 6 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.12). About 40% of individuals were living in a correctional facility (i.e., jail or prison) before entering the recovery center. A small number of individuals reported their usual living arrangement had been in a shelter or on the street, or in a non-correctional facility controlled environment such as a recovery center, residential treatment, sober living home, or hospital.

At the time individuals entered recovery centers, 34.2% of clients who were not followed up and 38.6% of clients who were followed up considered themselves to be homeless, with many of those individuals stating that they were temporarily living with family or friends, staying on the street or living in a car, or in jail or prison (see Table AB.12).

TABLE AB.12 LIVING SITUATION OF CLIENTS BEFORE ENTERING THE RECOVERY CENTER

	FOLLOWED UP	
	NO n = 1,767	YES n = 280
USUAL LIVING ARRANGEMENT IN THE 6 MONTHS BEFORE ENTERING THE PROGRAM		
Own or someone else's home or apartment	48.1%	50.4%
Jail or prison	42.8%	38.9%
Shelter or on the street	5.3%	7.1%
Residential program, hospital, recovery center, or sober living home	2.7%	3.6%
Other living situation	1.1%	0.0%
CONSIDERS SELF TO BE CURRENTLY HOMELESSa	34.2%	38.6%
Why the individual considers himself/herself to be homeless	(n = 605)	(n = 108)
Staying temporarily with friends or family	49.1%	45.4%
Staying on the street or living in a car	29.6%	33.3%
In jail or prison	12.1%	13.0%
Staying in a shelter	6.0%	6.5%
Staying in a hotel or motel	1.5%	0.9%
In residential treatment, or other recovery center	0.7%	0.0%
Other reason	1.2%	0.9%

a—These other responses report that the client lost their home and how but not where they were staying temporarily

About half of clients reported they had difficulty meeting any needs for financial reasons in the 6 months before entering the program, with no significant difference by follow-up status (see Table AB.13). Similar percentages of clients who were followed up and clients who were not followed up reported they had difficulty meeting basic living needs or health care needs.

TABLE AB.13. CLIENTS WHO HAD DIFFICULTY MEETING BASIC NEEDS BEFORE ENTERING THE RECOVERY CENTER

	FOLLOWED UP	
	NO n = 1,767	YES n = 280
CLIENT'S HOUSEHOLD HAD DIFFICULTY MEETING ANY NEEDS IN THE 6 MONTHS BEFORE ENTERING THE PROGRAM	49.9%	49.6%
Basic living needs (e.g., housing, utilities, telephone service, food)	44.8%	46.8%
Health care needs	30.3%	26.1%
Average number of needs had difficulty meeting	1.9	1.8

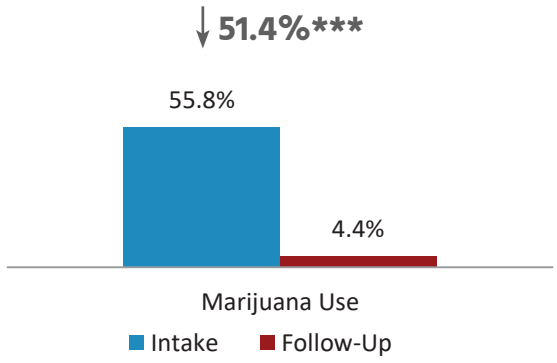
APPENDIX C. CHANGE IN USE OF SPECIFIC CLASSES OF DRUGS FROM INTAKE TO FOLLOW-UP

CHANGE IN 6-MONTH DRUG USE FROM INTAKE TO FOLLOW-UP FOR INDIVIDUALS NOT IN A CONTROLLED ENVIRONMENT THE ENTIRE PERIOD BEFORE ENTERING THE RECOVERY CENTER

PAST-6-MONTH MARIJUANA USE

Clients' self-reported marijuana use decreased significantly by 51.4% from the 6 months before entering the program to the 6 months before follow-up (see Table AC.1).

FIGURE AC.1. MARIJUANA USE FOR INDIVIDUALS WHO WERE NOT IN A CONTROLLED ENVIRONMENT THE ENTIRE PERIOD BEFORE ENTERING THE RECOVERY CENTER (N = 226)

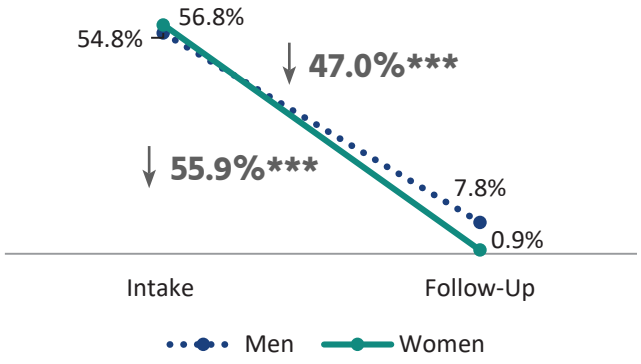


***p<.001.

Gender Difference in Past-6-month Use of Marijuana

Figure AC.2 shows that at intake similar percentages of men and women reported using marijuana in the past 6 months. There were significant decreases in the percent of men and women who used marijuana at follow-up, with significantly more men reporting 6-month marijuana use at follow-up.

FIGURE AC.2. GENDER DIFFERENCES IN MARIJUANA USE AT INTAKE AND FOLLOW-UP[a]

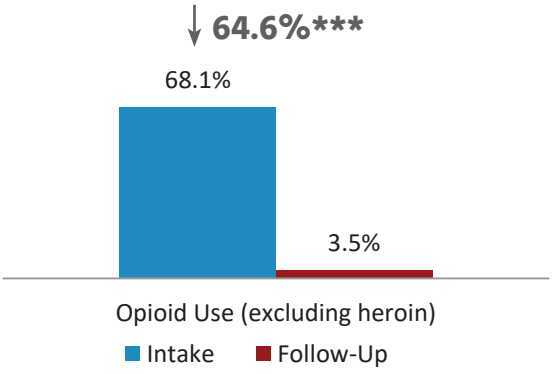


a—Significant difference by gender follow-up (p < .05).

PAST-6-MONTH OPIOID (EXCLUDING HEROIN) USE

Individuals' self-reported use of opioids including prescription opiates, methadone, and buprenorphine-naloxone (bup-nx) decreased significantly by 64.6% from the 6 months before entering the recovery center to the 6 months before follow-up (see Table AC.3). There were no gender differences at intake and there were too few individuals who reported using opioids at follow-up to examine a gender difference.

FIGURE AC.3. OPIOID USE (EXCLUDING HEROIN) FOR INDIVIDUALS WHO WERE NOT IN A CONTROLLED ENVIRONMENT THE ENTIRE PERIOD BEFORE ENTERING THE RECOVERY CENTER (N = 226)

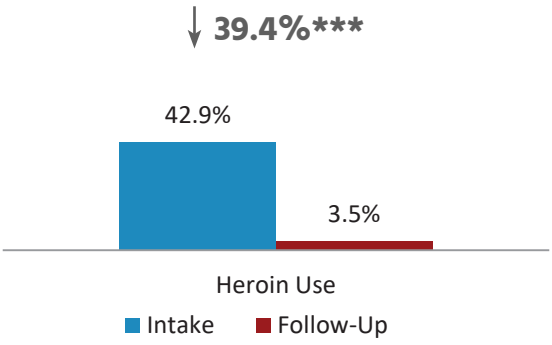


***p<.001.

PAST-6-MONTH HEROIN USE

The number of individuals who reported using heroin decreased significantly by 39.4% in the period before entering the recovery center to the 6 months before follow-up (see Table AC.4). There was no significant difference in use of heroin at intake or follow-up by gender.

FIGURE AC.4. HEROIN USE FOR INDIVIDUALS WHO WERE NOT IN A CONTROLLED ENVIRONMENT THE ENTIRE PERIOD BEFORE ENTERING THE RECOVERY CENTER (N = 226)



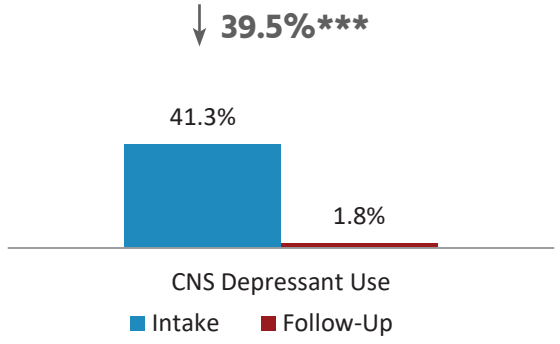
***p<.001.

PAST-6-MONTH CENTRAL NERVOUS SYSTEM (CNS) DEPRESSANT USE

The number of individuals who reported using CNS depressants (e.g., tranquilizers, barbiturates, benzodiazepines, sedatives) decreased significantly by 39.5% in the 6 months before entering the recovery center to the 6 months before follow-up (see Table AC.5). There were no gender differences at intake and there were too few individuals who reported using CNS depressants at follow-up to examine

a gender difference.

FIGURE AC.5. CNS DEPRESSANT USE FOR INDIVIDUALS WHO WERE NOT IN A CONTROLLED ENVIRONMENT THE ENTIRE PERIOD BEFORE ENTERING THE RECOVERY CENTER (N = 223)[115]

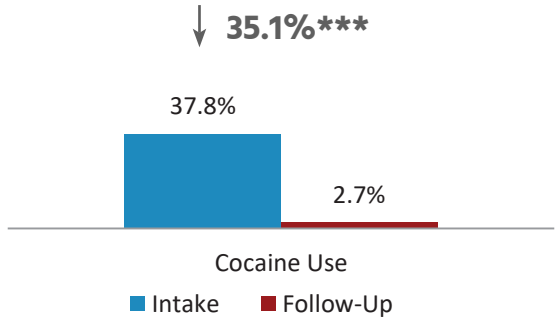


***p<.001.

PAST-6-MONTH COCAINE USE

The number of individuals who reported using cocaine decreased significantly by 35.1% in the period before entering the recovery center to the 6 months before follow-up (see Table AC.6). There were no gender differences at intake and there were too few individuals who reported using cocaine at follow-up to examine a gender difference.

FIGURE AC.6. COCAINE USE FOR INDIVIDUALS WHO WERE NOT IN A CONTROLLED ENVIRONMENT THE ENTIRE PERIOD BEFORE ENTERING THE RECOVERY CENTER (N = 225)[116]



***p<.001.

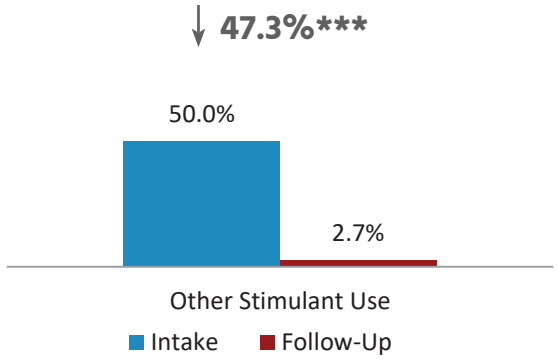
PAST-6-MONTH OTHER STIMULANT USE

The number of individuals who reported using other stimulants (e.g., amphetamine, methamphetamine, ecstasy, Ritalin) decreased significantly by 47.3% in the period before entering the recovery center to the 6 months before follow-up (see Table AC.7). There were no gender differences in the percent of clients who reported using stimulants at intake or follow-up.

[115] Three individuals had missing values for CNS depressant use in the 6 months before follow-up.

[116] One individual had a missing value for cocaine use in the 6 months before follow-up.

FIGURE AC.7. OTHER STIMULANT USE FOR INDIVIDUALS WHO WERE NOT IN A CONTROLLED ENVIRONMENT THE ENTIRE PERIOD BEFORE ENTERING THE RECOVERY CENTER (N = 226)

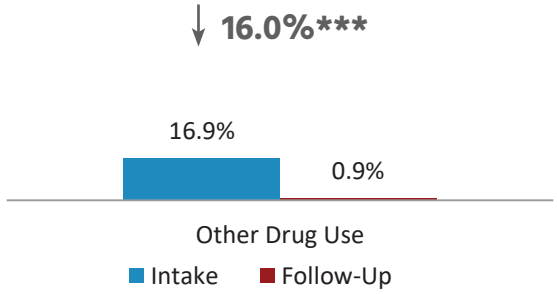


***p<.001.

PAST-6-MONTH USE OF OTHER DRUGS

The number of individuals who reported using other illegal drugs (e.g., inhalants, hallucinogens, synthetic drugs) decreased significantly by 16.0% (see Table AC.8). There were no gender differences in the percent of clients who reported using other illegal drugs at intake or follow-up.

FIGURE AC.8. USE OF OTHER DRUGS FOR INDIVIDUALS WHO WERE NOT IN A CONTROLLED ENVIRONMENT THE ENTIRE PERIOD BEFORE ENTERING THE RECOVERY CENTER (N = 225)[117]



***p<.001.

[117] One individual had a missing value for other illegal drugs in the 6 months before follow-up.

APPENDIX D. LENGTH OF SERVICE, DOC-REFERRAL STATUS, AND TARGETED OUTCOMES

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 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).

Individuals whose per diem was paid by DOC (233.8 days) did not have significantly different lengths of service in the recovery centers compared to individuals whose per diem was not paid by DOC (232.4 days; $t(1, 278) = -.117$, $p > .05$, ns).

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: (1) substance use (i.e., alcohol and/or drug use), (2) meeting criteria for depression or anxiety, (3) employed in the 6 months before follow-up (yes/no), (4) arrested in the 6 months before follow-up (yes/no), (5) incarcerated in the 6 months before follow-up (yes/no), and (6) overall functioning (better/worse). 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 four statistically significant associations between the predictor and the dichotomous 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 ($OR_{adj} = .990$, $p < .001$). Second, length of service was significantly associated with the odds of meeting criteria for generalized anxiety or depression in the 6 months before follow-up, such that shorter lengths of service were associated with greater odds of meeting criteria for anxiety or depression in the 6 months before follow-up ($OR_{adj} = .995$, $p < .01$). Third, individuals with shorter length of service reported greater odds of being incarcerated in the 6 months before follow-up ($OR_{adj.} = .993$, $p < .01$). Finally, individuals with shorter length of service had greater odds of having worse overall functioning at follow-up ($OR_{adj} = .995$, $p < .001$). There were no significant associations between DOC-referral status and any of the targeted outcomes.

Looking at continuous outcome variables, OLS regression models showed that length of service was negatively associated with the ASI drug use composite score at follow-up ($\beta = -.160$, $t = -2.619$, $p < .01$).

In conclusion, after controlling for gender, DOC referral was not associated with any of the outcomes; however, length of service was associated with four outcomes—the fourth of which overlaps with several of the other outcomes because it is a composite measure:

- Shorter length of service was associated with greater odds of using alcohol or drugs in the 6 months before follow-up.
- Shorter length of service was associated with greater odds of meeting criteria for anxiety or depression in the 6 months before follow-up.
- Shorter length of service was associated with greater odds of being incarcerated in the 6 months before follow-up.

- Shorter length of service was associated with greater odds of having worse global functioning in the 6 months before follow-up.