Kentucky Treatment Outcome Study

2023 ANNUAL REPORT

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Sponsored by:

Kentucky Department of Behavioral Health, Developmental and Intellectual Disabilities
Division of Behavioral Health
275 E. Main St. 4WG, Frankfort, KY 40621
(502) 564-4448

Wendy Morris
Commissioner, Department of Behavioral Health, Developmental and Intellectual Disabilities

Koleen Slusher
Director, Division of Behavioral Health

Maggie Schroeder
Program Manager, Substance Abuse Treatment and Recovery Services

Report prepared by:

University of Kentucky
Center on Drug & Alcohol Research
333 Waller Avenue, Suite 480, Lexington, KY 40504
http://cdar.uky.edu/bho

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| Executive Summary

This report summarizes client outcomes from a statewide evaluation of publicly-funded substance abuse treatment programs administered through the Community Mental Health Centers for adults (i.e., 18 years and older). The goal of the Kentucky Treatment Outcome Study (KTOS) is to examine client satisfaction and outcomes for several specific targeted factors including: (1) substance use and severity of substance use, (2) mental health, physical health, and victimization, (3) economic and living circumstances, (4) criminal justice system involvement, (5) quality of life, and (6) recovery supports. Report findings support continued funding of substance abuse treatment programs, which improve the lives of clients and greatly reduce the cost of untreated substance abuse to society.

State-funded substance abuse programs in Kentucky are required by Kentucky Revised Statute (222.465) to collect data on substance abuse clients in a client outcome study. KTOS is an important part of the Division of Behavioral Health's performance-based measurement of treatment outcomes in Kentucky's communities. The study includes an evidence-based assessment administered by substance abuse treatment staff at treatment intake (n = 3,437) in FY 2021) and a follow-up interview administered by the University of Kentucky Center on Drug & Alcohol Research (CDAR) staff with 569 individuals about 12 months later. In previous years' reports, the follow-up sample was randomly selected by month in which individuals completed the intake survey—170 cases per month. However, the number of individuals eligible for follow-up in this year's report was lower than in previous years, because of the lower number of intake surveys completed in FY 2021 (i.e., the first 15 months of the COVID-19 pandemic). Thus, all eligible cases were included in the sample of individuals to be contacted to complete a follow-up survey (n = 880). The follow-up rate for this year's report was 72%. Furthermore, trend analyses across multiple report years are presented in this report.

Substance Use

Results show that there were significant reductions in drug and alcohol use as well as self-reported substance use severity. The percent of individuals who reported using illegal drugs decreased from 87% at intake to 37% at follow-up. A trend report of illegal drug use at intake and follow-up over the past 15 years shows that around three-quarters of KTOS clients reported any illegal drug use in the 12 months before treatment each year, except for the past five years (87%-91%) because the selection criteria for including individuals in the follow-up sample was changed to include alcohol and/or illegal drug use in the 12 months before intake. The percent of individuals who reported using alcohol in the past 12 months decreased from 52% at intake to 26% at follow-up.

Overall, the percent of clients who met DSM-5 study criteria suggesting no substance use (alcohol and/or drug use) disorder increased from 22% at intake to 73% at follow-up. Along the same lines, the percent of individuals who met DSM-5 study criteria for severe substance use disorder decreased from 63% to 20%. Additionally, among individuals who reported using any illegal drugs in the 30 days before intake or follow-up, the percent who had Addiction Severity Index (ASI) drug composite scores

that met the cutoff for severe drug use disorder decreased from 52% at intake to 14% at follow-up. Among individuals who reported using alcohol in the 30 days before intake or follow-up, the percent who had Addiction Severity Index (ASI) alcohol composite scores that met the cutoff for severe alcohol use disorder decreased from 52% at intake to 28% at follow-up.

Past-12-month (82%) and past-30-day (77%) rates of smoking tobacco use were very high at intake, and even though there was a significant decrease at follow-up, the percent of individuals smoking tobacco was still high (76% and 69%, respectively). Vaporized nicotine use did not change significantly from intake to follow-up (for 12-month use), and increased significantly at follow-up (for 30-day use).

For the fourth consecutive year, among individuals who completed an intake survey, a higher percentage of clients reported using methamphetamine, a higher percentage of clients reported using methamphetamine (46%) in the past 12 months than reported illicit use of prescription opioids (31%), buprenorphine-naloxone (16%), heroin (14%), and methadone (2%).

Mental Health, Physical Health, and Victimization

The mental health of clients who participated in treatment also significantly improved from treatment intake to 12-month follow-up. Over half of clients (55%) met study criteria for depression at intake compared to 38% of clients at follow-up. Over half of clients (53%) met study criteria for generalized anxiety at intake compared to 36% at follow-up. About 42% of clients met study criteria for both depression and generalized anxiety compared to 26% at follow-up. In addition, 22% of clients reported suicidal ideation or attempts at intake compared to 10% at follow-up. The average number of days individuals reported their mental health was not good out of the past 30 decreased significantly from 13.2 at intake to 5.1 at follow-up. There was no significant change in the percent of individuals who screened positive for PTSD: at intake, 26% screened positive for PTSD, while at follow-up, 30% screened positive for PTSD. Trends for the past 11 years show that the average number of days clients reported poor mental health in the past 30 days has increased from 9.7 in FY 2014 to 13.2 in FY 2021. Nonetheless, the average number of days clients reported their mental health was not good has remained significantly lower at follow-up, compared to intake, each year since FY 2013.

Physical health was also improved at follow-up. Specifically, clients reported a significantly higher rating of overall health at follow-up than at intake. Also, clients reported fewer average days their physical health was poor in the past 30 days at follow-up compared to intake (4.7 vs. 6.1). Trends for the past 11 years show that while the average number of days clients reported poor physical health in the past 30 days increased at intake from 5.5 in FY 2012 to a high of 7.3 in FY 2016, clients have reported significantly fewer days of poor physical health at follow-up when compared to intake since FY 2013.

Additionally, interpersonal victimization experiences in the past 12 months decreased from 33% of clients at intake to 18% at follow-up.

Economic and Living Circumstances

KTOS clients showed improvements from intake to follow-up in economic and living circumstances. First, significantly fewer clients reported they were homeless at follow-up (9%) than at intake (32%). Trend data shows that the percent of clients reporting homelessness

at treatment intake has increased since FY 2014 (8%) to FY 2021 (32%), while at follow-up, the percent of clients reported homelessness has been 3% to 9% in the same timeframe.

Significantly fewer individuals reported their usual living situation was in a jail or prison in the 12 months before follow-up compared to the 12 months before intake. Also, at follow-up, significantly more clients reported their usual living situation was in a private residence (own home or someone else's home) (87% vs. 82%) and in a residential program, recovery center, or sober living home (10% vs. 6%) at follow-up when compared to intake.

Furthermore, about 43% of clients reported being currently employed full time at follow-up compared to only 26% at intake. The average number of months clients reported working in the past 12 months increased significantly from 4.2 months at intake to 5.7 months at follow-up. Additionally, at intake, 43% of clients reported having difficulty meeting basic living needs (e.g., food, shelter, utilities, and telephone) for financial reasons in the past 12 months. At follow-up, this number decreased to 38%. The percent of clients who reported they had difficulty obtaining health care (e.g., doctor visits, dental visits, and prescription medications) for financial reasons did not change significantly from intake (26%) to follow-up (23%).

"It covers all the bases for me and everything I struggle with. We talk about everything that needs to be talked about for me and answer all my questions."

– KTOS FOLLOW-UP CLIENT

Criminal Justice Involvement

Involvement in the criminal justice system, in terms of being arrested and incarcerated, decreased significantly from intake to follow-up. The percent of individuals who reported they had been arrested in the past 12 months decreased from 51% to 23%. The percent of individuals who reported they had been incarcerated in the past 12 months decreased from 56% to 24%. Trend analyses show that, overall, the percent of clients who reported an arrest was consistent over the past 15 years at intake (minimum of 51% in FY 2021, maximum of 62% in FY 2019) with greater fluctuation at follow-up (minimum of 20% in FY 2015, maximum of 33% in FY 2010). Trend analysis for percent of individuals who were incarcerated in the past 12 months showed a pattern of greater stability at intake and greater fluctuation at follow-up. Finally, at follow-up significantly fewer individuals reported they had been convicted of a misdemeanor (7% vs. 31%) and felony (5% vs. 24%) than at intake.

Quality of Life

Compared to intake (6.9), individuals rated their quality of life as significantly higher at follow-up (8.0) on a scale from 1 to 10, with 10 representing "best imaginable."

Recovery Supports

Compared to intake (30%), significantly more individuals reported they had attended mutual help recovery group meetings in the past 30 days at follow-up (50%). Compared to intake, significantly more individuals reported they had recovery supportive interactions with a sponsor at follow-up (20% vs. 31%). Also, individuals reported having more people they could count on for recovery support at follow-up (13.2) than at intake (6.5). The majority of clients said they had a moderately or very good chance of getting and/or staying off of drugs or alcohol at intake and follow-up.

Multidimensional Recovery Status

Consistent with the framework that recovery is a multidimensional construct,

encompassing multiple dimensions of individuals' lives and functioning, items from the intake and follow-up surveys were combined to measure change in multiple key dimensions of individuals' lives. The multidimensional recovery measure uses items from the intake and follow-up surveys to classify individuals who have all positive dimensions of recovery. At intake, as expected, a small percent of the followed-up sample (7%) was classified as having all eight dimensions of recovery. At follow-up, there was a significant increase of 34% which means that 41% had all eight dimensions of recovery.

Return to Use

Results of multivariate analysis show that when controlling for other variables in the model, being male, spending fewer nights incarcerated in the 12 months before treatment intake, and having lower quality of life ratings were significantly associated with greater odds of illegal drug use and/or problematic alcohol use (i.e., return to use) in the 12 months before follow-up.

Client Satisfaction with Treatment Experience

Program clients were predominately satisfied with the treatment services they received at Kentucky's community mental health centers. Overall, clients rated their treatment experience as an 8.2 out of 10. Overall, the majority of clients (84%) reported that the treatment episode was working/worked pretty well or extremely well for them. Most clients (90%) indicated they would refer a close friend or family member to their treatment provider. The majority of clients reported the following at follow-up: program staff believed in them and that the treatment would work for them; program staff cared about them and their progress; when they told their counselor or program staff personal things, they felt listened to and heard by them; their expectations and hopes for treatment and recovery were met; they had input into their treatment goals, plans, and how they were progressing over time; they had a connection with a staff person; they worked on and talked about things that were most important to them in the program; and the treatment approach and method was a good fit for them.

Significant Gender Differences

There were several important gender differences at treatment intake and follow-

Overall, Kentucky substance abuse treatment clients made significant improvements in all targeted areas

REPORTED ANY ILLEGAL DRUG USE***

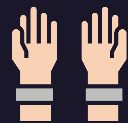
87% at intake | **37%** at follow-up

MET STUDY CRITERIA FOR DEPRESSION***

55% at intake | **38%** at follow-up

CURRENTLY EMPLOYED FULL-TIME***

26% at intake | **43%** at follow-up



REPORTED AN ARREST***

51% at intake | **23%** at follow-up

up. Most, but not all of these, indicate that women had more comorbid mental health problems, worse physical health, more interpersonal victimization experiences, and greater economic hardship than their male counterparts. Significantly more women than men reported they had used illegal drugs, in general, and stimulants, specifically, in the 12 months before intake. More women also reported that treatment for a substance use problem was considerably or extremely important in the 30 days before treatment. However, alcohol use was reported by more men. Specifically, significantly more men than women reported using alcohol in the 12 months before follow-up as well as past-12-month binge drinking and alcohol to intoxication at intake. In the 30 days before intake and follow-up, significantly more men reported alcohol use, binge drinking, and alcohol to intoxication compared to women. In the 30 days before follow-up, significantly more men reported using cannabis compared to women. Significantly more men reported using smokeless tobacco in the 12 months and 30 days before intake and follow-up.

More women than men reported mental health symptoms at intake and follow-up including depression, generalized anxiety, comorbid depression and anxiety, and post-traumatic stress disorder. Women also reported their mental health was not good for significantly more days than men at intake and that poor mental and/or physical health limited their activities in the 30 days before intake.

Women's housing situation, employment, and economic hardship were worse than men's situations. First, significantly more women reported homelessness at intake when compared to men. Significantly more women were unemployed at intake and follow-up when compared to men. Likewise, significantly more men reported they had full-time employment at intake and follow-up when compared to women. Among individuals who were currently employed, men reported working significantly more months at both intake and follow-up. Employed men also had a significantly higher median hourly wage than employed women at both intake and follow-up. At intake, employed women made only $0.83 for every dollar employed men made, and at follow-up, employed women made $0.77 for every dollar employed men made. More women also reported difficulty meeting basic living needs at intake compared to men. Thus, even though women made significant overall gains in their employment by follow-up, they were still behind men in their economic standing.

A higher percentage of men reported being involved with the criminal justice system in the 12 months before entering treatment and the 12 months before follow-up compared to women. Specifically, more men reported they had been convicted with misdemeanors at intake, as well as being arrested, incarcerated, and being under supervision by the criminal justice system at intake and follow-up compared to women.

Cost Savings

Estimates on the total costs of drug and alcohol abuse derived from national estimates applied to the follow-up sample of KTOS for this year's report suggest that for every dollar spent on publicly-funded substance abuse treatment programs there was an estimated $4.11 return in avoided costs (i.e., costs that would have been expected if alcohol and drug use continued at the same level as it was before treatment intake).

Conclusion

This KTOS 2023 report provides a valuable examination of client-level outcomes for adults in publicly-funded substance abuse treatment in Kentucky.

Overall, clients of publicly-funded substance abuse treatment, including a variety of treatment modalities, made significant strides in all the targeted outcomes. Specifically, there were significant decreases in use of alcohol and all drugs, depression and anxiety symptoms, suicidality, homelessness, economic hardship, arrests, convictions, and incarceration, and a significant increase in full-time employment, quality of life, and recovery supports. Moreover, an estimate of the cost to Kentucky for alcohol and drug use disorder in the year before treatment compared to the cost to the state for alcohol and drug use in the year after treatment intake, while accounting for the cost of publicly-funded treatment, showed a significant estimated cost savings.

Nonetheless, sizable minorities of clients had negative outcomes at the 12-month follow-up. For example, nearly half were unemployed at follow-up, over one-third of KTOS clients reported using illegal drugs, one-fourth of clients reported using alcohol, and 20% met criteria for severe SUD at follow-up. More than one-third of clients still reported having difficulty meeting basic living needs and almost one-quarter reported having difficulty obtaining health care needs for financial reasons at follow-up. Even though there were significantly more individuals who had all positive dimensions of recovery at follow-up than at intake (41% vs. 7%), the majority of individuals (57%) were still classified as having at least one negative recovery dimension. Most of the statistically significant differences between men and women on outcomes showed that women had more comorbid mental health problems, worse physical health, more interpersonal victimization experiences, and greater economic hardship than their male counterparts.

| Overview of Report

The goal of KTOS is to provide an annual outcome evaluation for Community Mental Health Centers' (CMHCs) substance abuse treatment programs for the Department for Behavioral Health, Developmental, and Intellectual Disabilities, Division of Behavioral Health in partnership with the Behavioral Health Outcome Studies team at the University of Kentucky Center on Drug and Alcohol Research (UK CDAR). Specifically, the outcome evaluation examines client satisfaction, recovery support, and several other targeted outcomes: (1) substance use and severity of substance use, (2) mental health, physical health, and victimization, (3) economic and living circumstances, (4) criminal justice system involvement, and (5) quality of life. In addition, the estimated avoided costs to society in relation to the cost of publicly-funded substance abuse treatment is presented in this report.

Results are reported in the main sections and are presented for the overall sample and by gender when there were significant gender differences:

Section 1. Study Overview and Client Characteristics. This section briefly describes the KTOS method including how clients are selected into the outcome evaluation. In addition, this section describes characteristics of clients who entered substance abuse treatment in one of Kentucky's Community Mental Health Centers between July 1, 2020 and June 30, 2021 (N = 3,437). This section also describes characteristics of 569 clients who completed a 12-month follow-up interview between July 1, 2021 and June 30, 2022.

Section 2. Substance Use. This section examines substance use changes, which include use of any illegal drugs or alcohol, and then separately for illegal drugs, alcohol, and tobacco at intake and follow-up. Analysis is presented in detail for KTOS study participants who were not in a controlled environment for the entire period of 12 months and/or 30 days before entering treatment. In addition, self-reported severity of alcohol and drug use based on DSM-5 symptoms for substance use disorder and the Addiction Severity Index (ASI) alcohol and drug use composite scores are compared at intake and follow-up.

Section 3. Bivariate and Multivariate Analysis of Relapse. This section focuses on a multivariate analysis examining factors related to relapse in the 2023 KTOS follow-up sample.

Section 4. Mental Health, Physical Health, and Victimization. This section examines changes in mental health symptoms, physical health, and interpersonal victimization from intake to follow-up. Specifically, this subsection examines: (1) depression, (2) generalized anxiety, (3) comorbid depression and generalized anxiety, (4) suicide ideation and attempts, (5) Posttraumatic stress disorder, (6) perceptions of poor physical and mental health, (7) overall health status, (8) chronic medical problems at intake, (9) chronic pain, (10) health insurance, and (11) interpersonal victimization experiences. Mental health and physical health questions in the KTOS intake and follow-up surveys were self-report measures.

Section 5. Economic and Living Circumstances. This section examines changes from intake to follow-up for: (1) living situation, (2) employment, and (3) economic hardship.
Section 6. Criminal Justice System Involvement. This section describes change in client involvement with the criminal justice system during the 12-month period before entering treatment

and during the 12-month period before the follow-up interview. Specifically, results include changes in: (1) any arrest (2) convictions for misdemeanors and felonies, (3) any incarceration, and (4) criminal justice supervision status.

Section 6. Criminal Justice System Involvement. This section describes change in client involvement with the criminal justice system during the 12-month period before entering treatment and during the 12-month period before the follow-up interview. Specifically, results include changes in: (1) any arrest, (2) convictions for misdemeanors and felonies, (3) any incarceration, and (4) criminal justice supervision status. Results for each targeted factor are presented for the overall sample and by gender when there were significant gender differences.

Section 7. Quality of Life. This section describes change in client quality of life during the 12-month period before entering treatment and the 12-month period before the follow-up interview.

Section 8. Multidimensional Recovery Status. This section examines multidimensional recovery at follow-up as well as change in multidimensional recovery before entering the program and at follow-up. Consistent with the framework that recovery is a multidimensional construct, encompassing multiple dimensions of individuals' lives and functioning, items from the intake and follow-up surveys were combined to measure change in multiple key dimensions of individuals' lives.

Section 9. Recovery Supports. This section focuses on five main aspects of recovery support: (1) clients attending mutual help recovery group meetings, (2) recovery supportive interactions with family/friends in the past 30 days, (3) the number of people the participant said they could count on for recovery support, (4) what will be most useful to the client in staying off drugs/alcohol, and (5) clients' perceptions of their chances of staying off drugs/alcohol.

Section 10. Client Satisfaction with Substance Abuse Treatment Programs. This section describes three aspects of client satisfaction: (1) client involvement in the program and how they left, (2) recommend others to the program, and (3) overall client satisfaction and client ratings of program experiences.

Section 11. Cost Savings of Substance Abuse Treatment in Kentucky. This section examines estimated cost reductions or avoided costs to society after participation in substance abuse treatment. Using the number of clients who self-reported illicit drug use and alcohol use at intake and follow-up in the KTOS sample, a national per/person cost was applied to the sample to estimate the cost to society for the year before clients were in treatment and then for the same clients during the year after treatment had begun.

Section 12. Conclusion and Implications. This section summarizes the highlights from the evaluation results and suggests implications from these findings for the state.

| Section 1. Study Overview and Client Characteristics

This section briefly describes the Kentucky Treatment Outcome Study (KTOS) including how clients are selected into the outcome evaluation. In addition, this section describes characteristics of clients who entered substance abuse treatment in one of Kentucky's Community Mental Health Centers between July 1, 2020 and June 30, 2021 (n = 3,437). This section also describes characteristics of 569 clients who completed a 12-month follow-up interview between July 1, 2021 and June 30, 2022.

Study Overview

This is the annual Kentucky Treatment Outcome Study (KTOS) Follow-Up Report conducted by the Behavioral Health Outcome Study team at the University of Kentucky Center on Drug and Alcohol Research (UK CDAR). State-funded substance abuse programs in Kentucky are required by Kentucky Revised Statute (222.465) to collect data on substance abuse clients for a client-level outcome study. KTOS is an important part of the Department for Behavioral Health, Developmental, and Intellectual Disabilities, Division of Behavioral Health's (DBHDID) performance-based measurement of treatment outcomes in Kentucky's communities.

KTOS includes an evidence-based face-to-face interview with clients that is completed by program staff at treatment intake to assess targeted factors prior to entering treatment.[1] In FY 2021, 3,437 adults completed an intake survey between July 1, 2020 and June 30, 2021.

At the completion of the intake interview, program staff talk to individuals about the KTOS follow-up and ask if they are interested in participating. The evidence-based follow-up interview is conducted about 12 months after the intake interview with a selected sample of clients who agree to participate. The follow-up interviews are completed over the telephone by a member of the UK CDAR research team and ask questions like those in the intake interview along with program satisfaction questions. Client responses to follow-up interviews are collected independently from treatment programs and kept confidential to help facilitate the honest evaluation of client outcomes and satisfaction with program services.

The UK CDAR research team secured a good follow-up rate of 71.9% and a low refusal rate (4.6%) for participation in the interviews. Less than one-fourth of clients (23.5%) were not successfully contacted to complete the follow-up telephone interviews (see Appendix A for detailed information on study methods).

Self-report Data

The data (including drug and alcohol use) are self-reported by KTOS clients. There is reason to question the validity and reliability of self-reported data, particularly about 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

[1] Logan, TK, Cole, J., Miller, J., Scrivner, A., & Walker, R. (2020). *Evidence Base for the Kentucky Treatment Outcome Study (KTOS) Assessment and Methods.* Lexington, KY: University of Kentucky, Center on Drug and Alcohol Research.

of their substance use.[2, 3, 4] For example, in many studies that have compared agreement between self-report and urinalysis the concordance or agreement is acceptable to high.[5, 6, 7] 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.[8, 9, 10] In other studies, higher percentages of underreporting have been found.[11] Prevalence of underreporting of substance use is quite varied in studies. Nonetheless, research has found that certain conditions facilitate the accuracy of self-report data such as assurances of confidentiality and memory prompts.[12] 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, and sensitivity of the analytic method used.[13]

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 treatment program; (b) the follow-up responses are confidential and are reported at a group level, meaning no individual responses are linked to participants' identities; (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.
This report describes the sample of treatment clients in two main ways: (1) providing a description of characteristics for 3,437 adults who completed an intake interview in FY 2021 (July 1, 2020 - June 30, 2021), and (2) presentation of client characteristics for 569 adults who completed an

[2] 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.

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[5] 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.

[6] 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.

[7] 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.

[8] 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.

[9] 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.

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

[11] 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.

[12] 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.

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

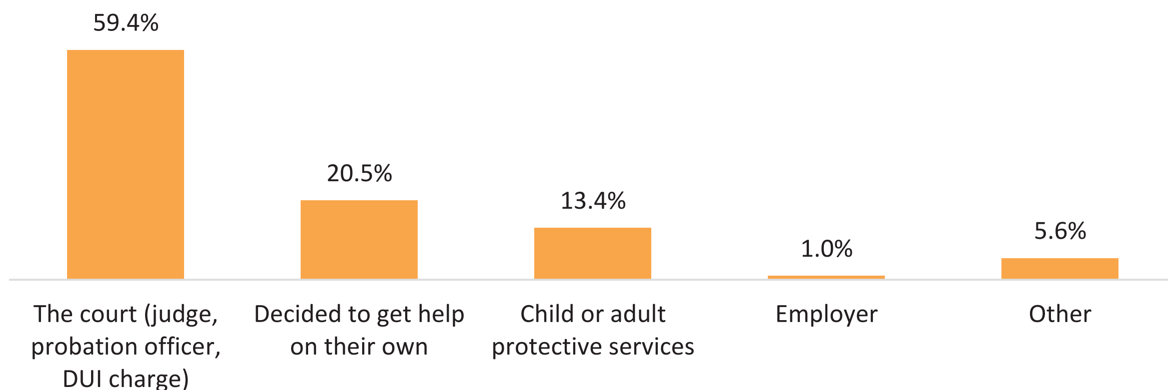
intake interview in FY 2021 and a 12-month follow-up telephone interview with a target date between July 1, 2021 and June 30, 2022.

Description of All KTOS Clients at Treatment Intake

Self-reported Referral Source

Figure 1.1 shows the self-reported treatment referral source for all KTOS clients at intake. The majority of clients (59.4%) reported they were referred to treatment by the court (e.g., judge, court designated worker, probation officer, for DUI offense). This is not necessarily a formal or mandated referral, instead it is the client's perception of referral source. About 1 in 5 (20.5%) of clients self-reported they decided to get help on their own. A minority of clients reported they were referred to treatment by Child or Adult Protective Services (13.4%) or other referral sources (5.6%; e.g., AA/NA sponsor or none of the above) and an even smaller percentage of clients reported they were referred to treatment by an employer (1.0%).

FIGURE 1.1. SELF-REPORTED REFERRAL SOURCE FOR ALL KTOS CLIENTS AT INTAKE (N = 3,437)



Demographics

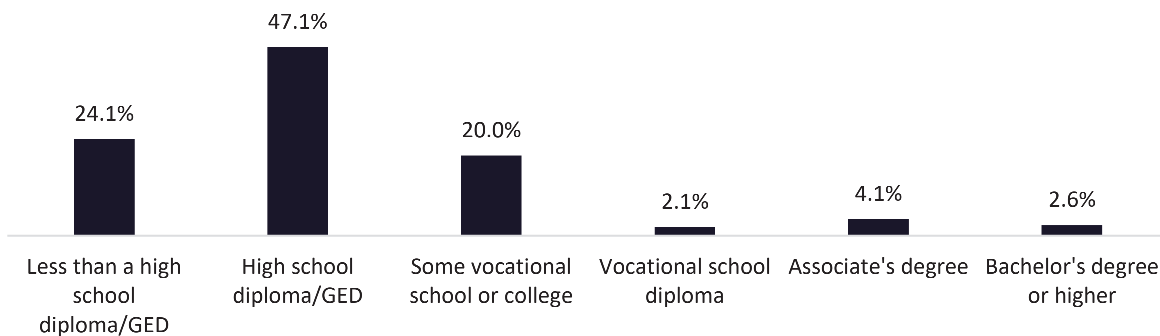
Table 1.1 shows that over half of clients with an intake survey completed in FY 2021 were male (58.3%) and the majority were White (90.3%). A minority of clients reported their race as African American/Black (6.0%) and 3.7% reported they were American Indian, Asian, Hispanic, or multiracial. Clients were, on average, 36.5 years old, ranging from 18 to 74 years old at intake. At intake, around two-fifths (41.1%) were married or cohabiting with a partner, 29.6% had never been married (and were not cohabiting), 27.4% were separated or divorced, and 1.9% were widowed. More than three-quarters of clients reported they had at least one child, and 58.5% had children under the age of 18. A small number of KTOS clients (3.0%) reported they were a veteran or were currently serving in the military, Reserves, or National Guard.

TABLE 1.1. DEMOGRAPHICS FOR ALL KTOS CLIENTS AT INTAKE (N = 3,437)[14]

Age	36.5 years *(range of 18-74)*
Gender	
Male	58.3%
Female	41.3%
Transgender	0.4%
Race	
White	90.3%
African American	6.0%
Other or multiracial	3.7%
Marital Status	
Married or cohabiting	41.1%
Never married	29.6%
Separated or divorced	27.4%
Widowed	1.9%
Have Children	75.3%
Have children under the age of 18	58.5%
Veteran or Currently Serving in Military	3.0%

About one-fourth of clients (24.1%) had less than a high school diploma or GED at intake (see Figure 1.2). The highest level of education of 47.1% of the sample was a high school diploma or GED. Around one-fifth of clients (20.0%) had completed some vocational/technical school or college. Only a small minority of clients had completed vocational/technical school (2.1%), an associate's degree (4.1%), or a bachelor's degree or higher (2.6%).

FIGURE 1.2. HIGHEST LEVEL OF EDUCATION COMPLETED AT INTAKE (N = 3,437)[15]



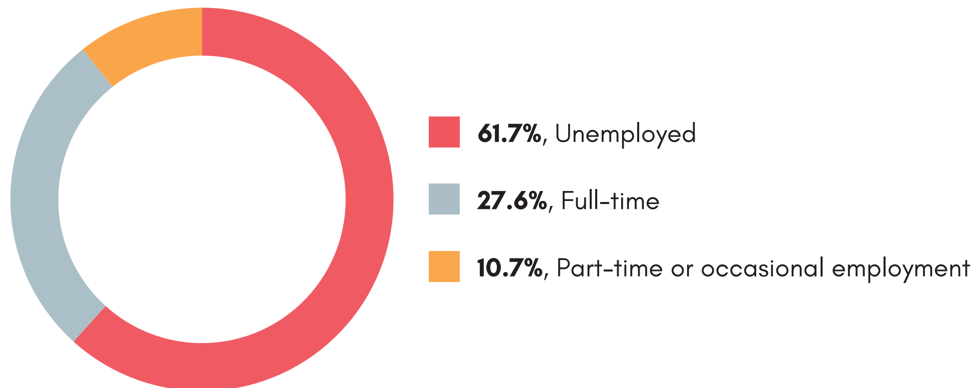
[14] Three clients had missing data for their race.

[15] Five clients had missing data for education level, 5 of which were excluded for inconsistencies in education level.

Employment

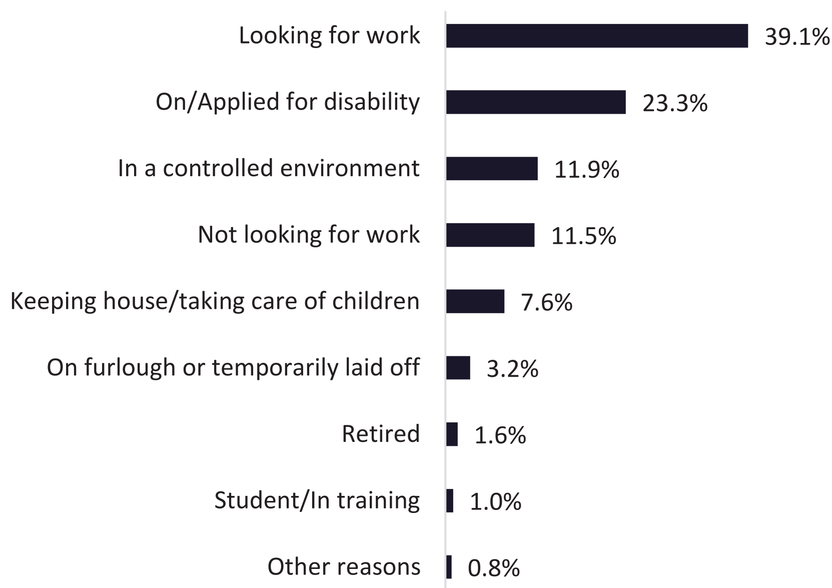
At intake, 40.5% of clients reported they had worked 0 months in the past 12 months, 22.0% had worked 1 to 5 months, and 37.5% had worked 6 or more months (not depicted in a figure). Also, the majority of individuals reported they were unemployed in the 30 days before entering treatment (61.7%), with 27.6% being employed full-time, and 10.7% employed part-time or having occasional or seasonal employment (see Figure 1.3). Among those who reported being employed full or part-time at intake, the median hourly wage was $12.00.

FIGURE 1.3. CURRENT EMPLOYMENT STATUS AT INTAKE (N = 3,437)



Of the individuals who were currently unemployed at intake (n = 2,122)[16], 39.1% stated they were looking for work, 23.3% were on disability (or had applied for disability), 11.9% were in a controlled environment that prohibited them from working, 11.5% were unemployed and not looking for work, 7.6% were keeping the house or taking care of children full-time at home, 3.2% were on furlough or temporarily laid off, 1.6% were retired, and 1.0% were students or in training. The remaining 0.8% gave other reasons for not being employed (e.g., health problems prevented them from work but they were not on disability, were doing odds jobs on the side) (see Figure 1.4).

FIGURE 1.4. OF THOSE UNEMPLOYED, REASONS FOR BEING UNEMPLOYED (N = 2,114)

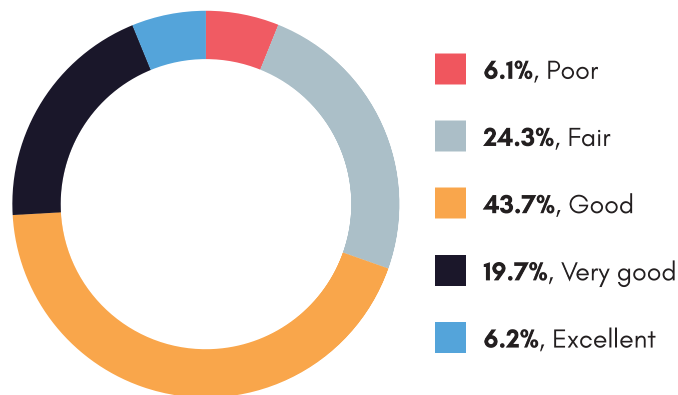


[16] Eight individuals had missing values for the reason they were unemployed at intake.

Physical Health

KTOS clients rated their overall health at intake (see Figure 1.5). About 6% clients reported their health was poor and 24.3% said their health was fair. Two-fifths of clients (43.7%) reported their overall health was good, 19.7% reported very good overall health, and 6.2% said their health was excellent.

FIGURE 1.5. OVERALL HEALTH RATING AT INTAKE (N = 3,437)



Nearly three in 10 KTOS clients (28.0%) reported they experienced chronic pain that persisted for at least 3 months in the 12 months before entering treatment (see Table 1.2). More than half of clients reported they had at least one chronic health problem. The most common medical problems clients reported were arthritis (16.5%), cardiovascular/heart disease (14.7%), hepatitis C (13.7%), asthma (13.0%), and severe dental problems (10.1%).

The majority of KTOS clients reported they had insurance through Medicaid (75.1%) at intake. Less than one-tenth of clients did not have any insurance (8.0%). Small numbers of clients had insurance through an employer, including through their own employer, a spouse's, parent's, or self-employment (6.8%), through Medicare (8.2%), through the Health Exchange (0.4%), or through the VA/Champus/Tricare (0.5%). A small percent of clients gave the name of an insurer, but did not specify the source, such as through the Health Exchange, private insurance.

"They treat you as part of them. Really good at contacting me to support and check in."

- KTOS FOLLOW-UP CLIENT

TABLE 1.2. HEALTH-RELATED CONCERNS FOR ALL KTOS CLIENTS AT INTAKE (N = 3,437)

Chronic Pain	28.0%
At least one chronic medical problem	52.6%
Arthritis	16.5%
Cardiovascular/heart disease	14.7%
Hepatitis C	13.7%
Asthma	13.0%
Severe dental problems	10.1%
Seizures	5.9%
Chronic obstructive pulmonary disease	5.5%
Diabetes	4.8%
Insurance	
No insurance	8.0%
Medicaid	75.1%
Through employer *(including client's employer, spouse's employer, parents' employer, and self-employed)*	6.8%
Medicare	8.2%
Through Health Exchange	0.4%
VA/Champus/Tricare	0.5%
Insured, but source is not known	0.1%

Substance Use

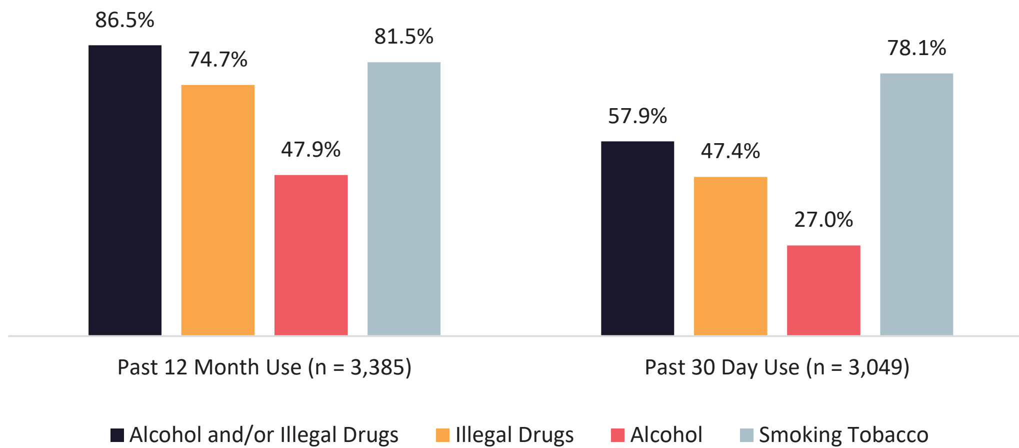
The majority of adults who completed an intake survey reported using alcohol and/or illegal drugs (86.5%) in the 12 months before entering treatment (see Figure 1.6).[17] The drug classes reported by the greatest number of clients were cannabis/marijuana (50.8%) and non-prescribed stimulants (45.9%), followed by prescription opioids (24.8%), non-prescribed buprenorphine-naloxone (15.6%), and non-prescribed sedatives/tranquilizers/benzodiazepines (15.8%; not depicted in a figure). A higher percentage of individuals reported using illegal drugs (74.7%) compared to the percentage of individuals who reported using alcohol (47.9%) in the 12 months before entering treatment. Most clients reported smoking tobacco (81.5%) in the 12 months before intake.

Of the 3,049 individuals who were not in a controlled environment all 30 days,[18] over half (57.9%) reported using illegal drugs and/or alcohol in the past 30 days at intake. Specifically, 47.4% reported using illegal drugs and 27.0% reported using alcohol. Also, 78.1% reported smoking tobacco in the 30 days before entering treatment (see Figure 1.6).

[17] Fifty-two individuals reported being incarcerated all 365 days before intake. Because opportunities to use alcohol and drugs are reduced while incarcerated, these 52 individuals were not included in this analysis.

[18] Because being in a controlled environment decreases opportunities for substance use, individuals who were in a controlled environment all 30 days before entering treatment (n = 388) are not included in the analysis of substance use in the 30 days before entering treatment.

FIGURE 1.6. USE OF ILLEGAL DRUGS, ALCOHOL, AND SMOKING TOBACCO IN THE 12 MONTHS AND 30 DAYS BEFORE TREATMENT

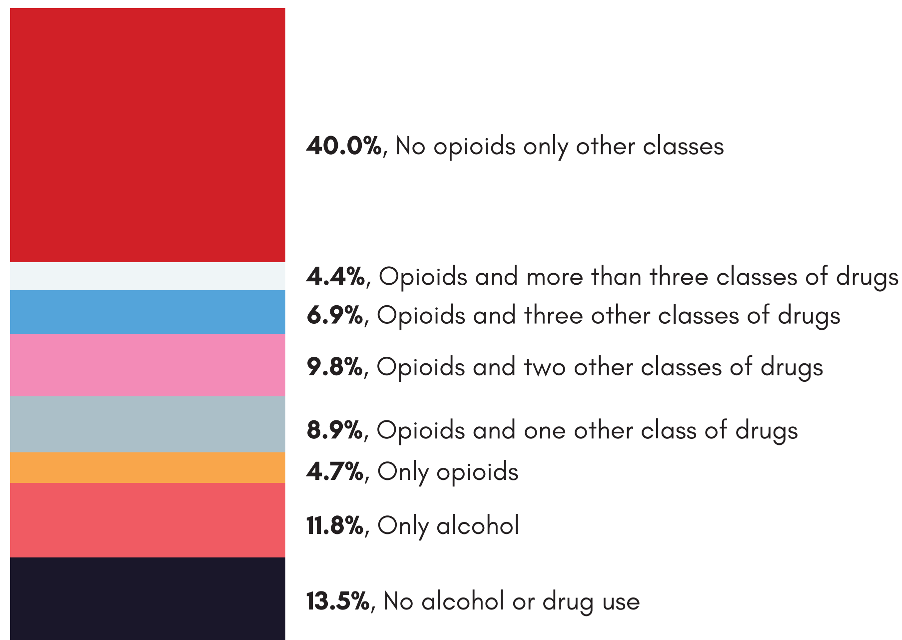


At intake, about one-third of clients (33.4%) reported that they had ever injected drugs in their lifetime (not depicted in a figure).

The majority of clients reported they had been in substance abuse treatment in the past (61.8%). Of the 2,123 clients who reported they had previously been in treatment, they reported an average of 3.2 episodes before the current one (not depicted in a figure).

Among the individuals who were not in a controlled environment all 365 days before entering treatment, Figure 1.7 shows the percent of individuals who used no alcohol and or illegal drugs (13.5%), alcohol only (11.8%), no opioids and other drug classes only (40.0%), and opioids only (4.7%). Figure 1.7 shows the percent of clients who reported using opioids with one other drug class (8.9%), opioids with two other drug classes (9.8%), opioids with three other drug classes (6.9%), and opioids with three or more other drug classes (4.4%).

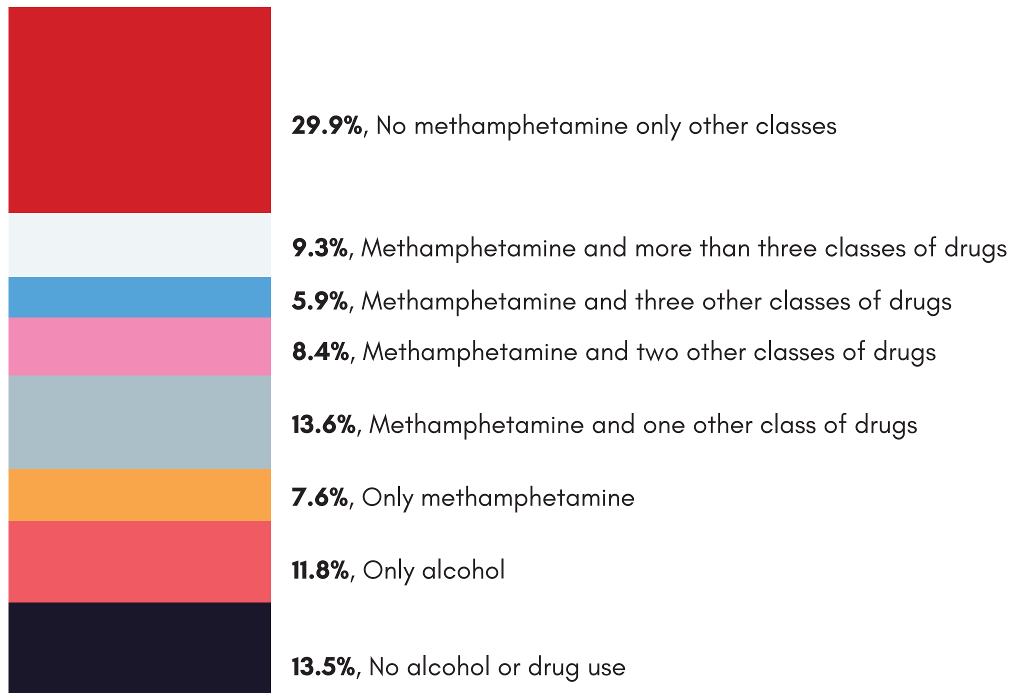
FIGURE 1.7. OPIOID AND OTHER DRUG CLASS USE IN THE 12 MONTHS BEFORE TREATMENT[19]



Like the analysis for opioid use with other classes of substances presented in Figure 1.7, the percent of clients who reported using methamphetamine with other substances in the 12 months before entering treatment is presented in Figure 1.8. Among the individuals who were not in a controlled environment all 365 days before entering treatment, Figure 1.8 shows the percent of individuals who used no alcohol and or illegal drugs (13.5%), alcohol only (11.8%), no methamphetamine and other drug classes only (29.9%), and methamphetamine only (7.6%). The following percentages of clients reported using methamphetamine and other drug classes at intake: one other drug class (13.6%), two other drug classes (8.4%), three other classes (5.9%), and more than three classes (9.3%).

[19] The broad drug classes examined were (1) Cannabis/marijuana, (2) Opioids other than heroin, (3) CNS depressants, (4) Cocaine and stimulants, and (5) Other drugs (hallucinogens, inhalants, synthetic drugs).

FIGURE 1.8. METHAMPHETAMINE AND OTHER DRUG CLASS USE IN THE 12 MONTHS BEFORE TREATMENT[20]

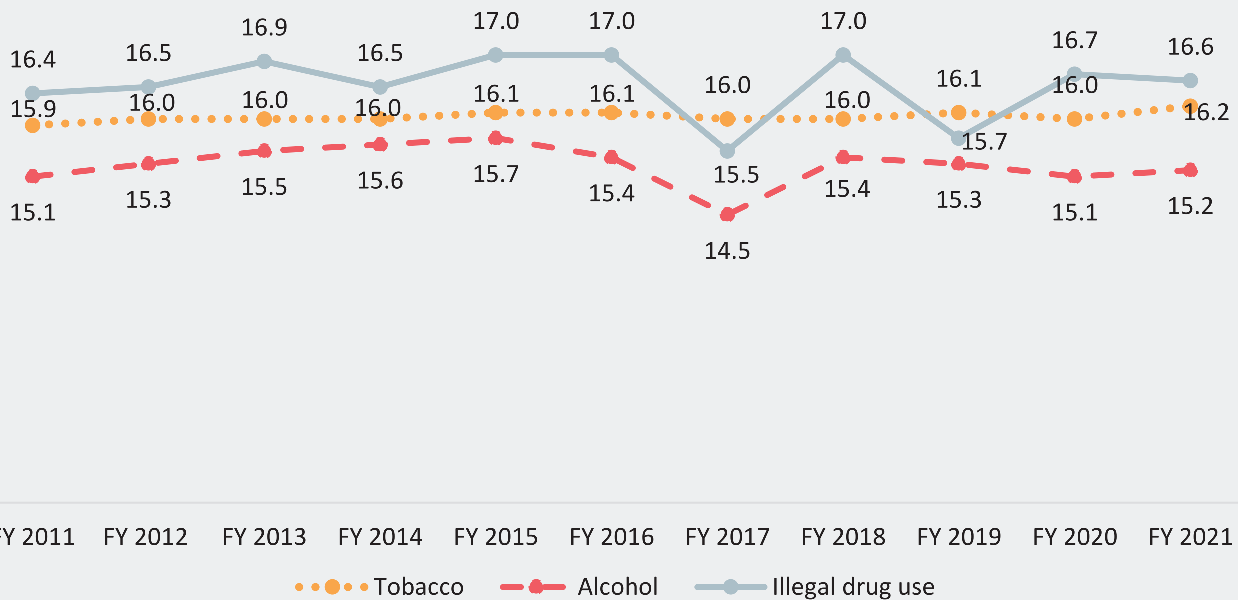


[20] The broad drug classes examined were (1) Marijuana/cannabis, (2) Opioids other than heroin, (3) Heroin, (4) CNS depressants, (5) Cocaine and stimulants, and (5) Other drugs (hallucinogens, inhalants, synthetic drugs).

Trends in 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 just a sip), and when they began smoking cigarettes regularly (see Figure 1.9). The age at which KTOS clients reported drug use was steady for 6 years (close to age 17), with a decrease in FY 2017 to 15.5 and in FY 2018 to 15.7. Clients generally reported having their first alcoholic drink around 15 years old, with a slight decrease in FY 2017. The age of first tobacco use was slightly older than the age of first alcoholic drink (about 16 years old) and remained steady for 10 years.

FIGURE 1.9. TRENDS IN AGE OF FIRST USE REPORTED AT INTAKE, FY 2011-FY 2021



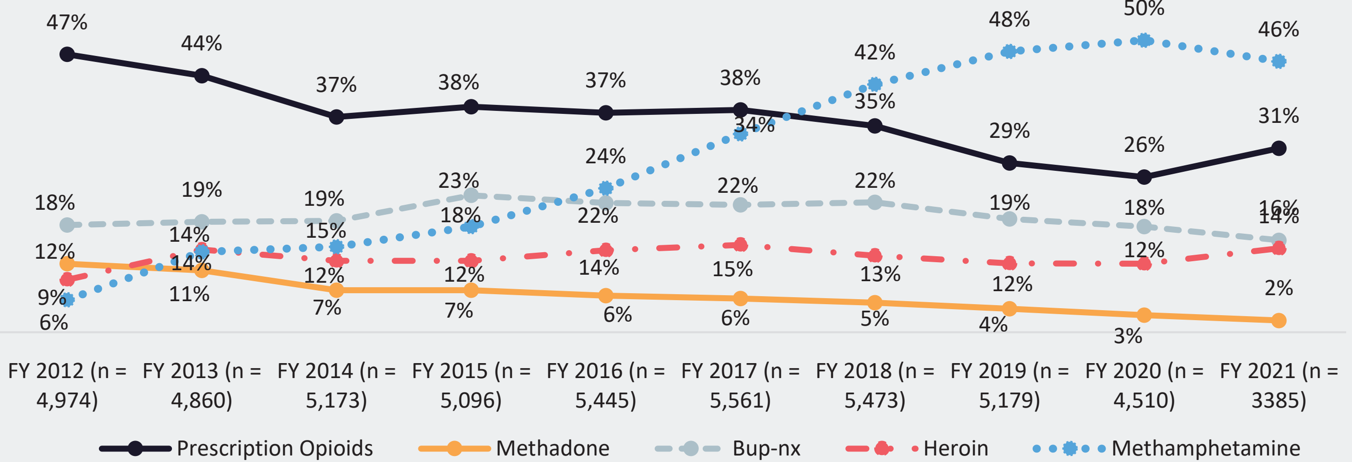
"It did help me with sobriety and maintain it. I'm over a year clean now."

- KTOS FOLLOW-UP CLIENT

Trends in Specific Drug Use

Looking at trends over time for all clients with completed intake surveys, the percent of clients reporting prescription opioid misuse was highest in FY 2012 (47%) and steadily dropped in FY 2013 and FY 2014, stayed steady through FY 2018, and decreased in FY 2019 (29%) and FY 2020 (26%). The percent of clients who reported using non-prescribed methadone in the 12 months before entering treatment has declined from FY 2012 (12%) to FY 2020 (3%). The percent of clients who reported using non-prescribed buprenorphine-naloxone (bup-nx) remained stable from FY 2012 through FY 2014 before increasing to 23% in FY 2015 and remaining at 22% in FY 2016 through FY 2018. In FY 2019 and FY 2020, the percent of clients reporting non-prescription bup-nx use has been just under 20%. The percent of KTOS clients who reported using heroin increased from FY 2012 to FY 2013 and has remained between 12% and 15% since FY 2013. In FY 2012, the percent of clients reporting methamphetamine use was relatively low (6%) but has steadily increased in the past seven years, with a high of 50% in FY 2020, surpassing the number of clients reporting illegal use of prescribed opioids.

FIGURE 1.10. PERCENT OF ALL CLIENTS WITH A COMPLETED INTAKE SURVEY REPORTING NON-PRESCRIBED USE OF PRESCRIPTION OPIOIDS, METHADONE, BUPRENORPHINE-NALOXONE, HEROIN, AND METHAMPHETAMINE IN THE 12 MONTHS BEFORE ENTERING TREATMENT AT THE CMHC (n = 49,656)[21]

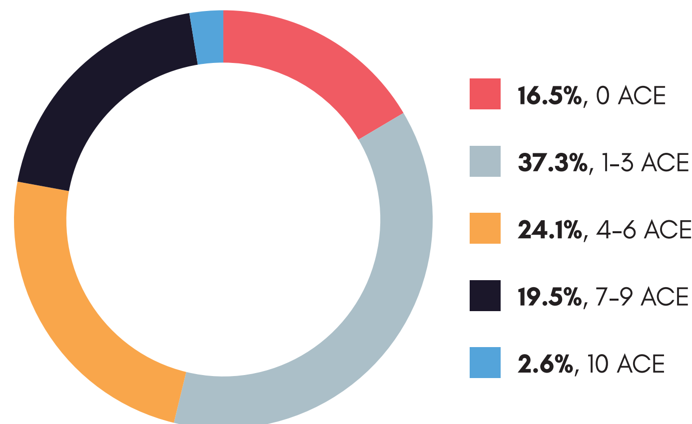


[21] Clients who reported being in a controlled environment all 365 days before entering treatment are not included in this analysis.

Adverse Childhood Experiences

Items about ten adverse childhood experiences from the Adverse Childhood Experiences Study (ACE) were included in the intake interviews.[22], [23], [24] In addition to providing the percent 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 1.11 shows that 16.5% reported experiencing none of the ACE included in the interview. Under two-fifths (37.3%) reported experiencing 1 to 3 ACE, 24.1% reported experiencing 4 – 6 ACE, and 19.5% reported experiencing 7 – 9 ACE. A very small percent (2.6%) reported experiencing all 10 types of adverse childhood experiences.

FIGURE 1.11. NUMBER OF TYPES OF ADVERSE CHILDHOOD EXPERIENCES (n = 3,437)



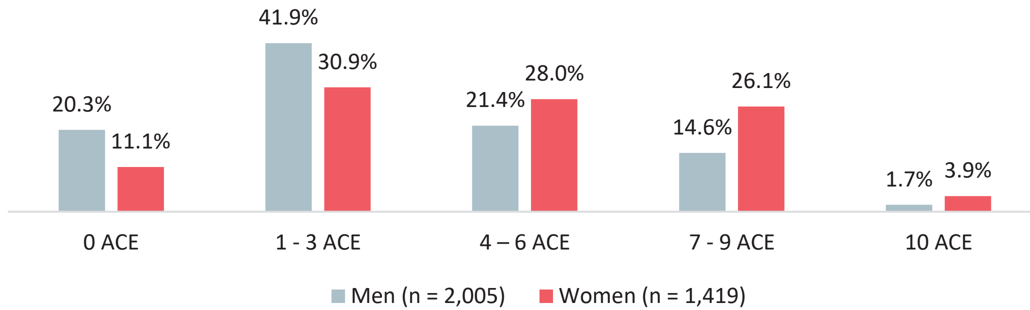
There was a significant difference in the proportion of men and women classified by number of types of ACE (see Figure 1.12). Significantly more men than women reported experiencing 0 ACE as well as 1 to 3 types of ACE, whereas significantly more women than men reported experiencing 4 – 6 types of ACE, 7 – 9 types of ACE, and 10 ACE. Women had a higher average number of ACE compared to men (4.5 vs. 3.1, $t(3422) = -13.224$, $p < .001$).

[22] 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.

[23] 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.

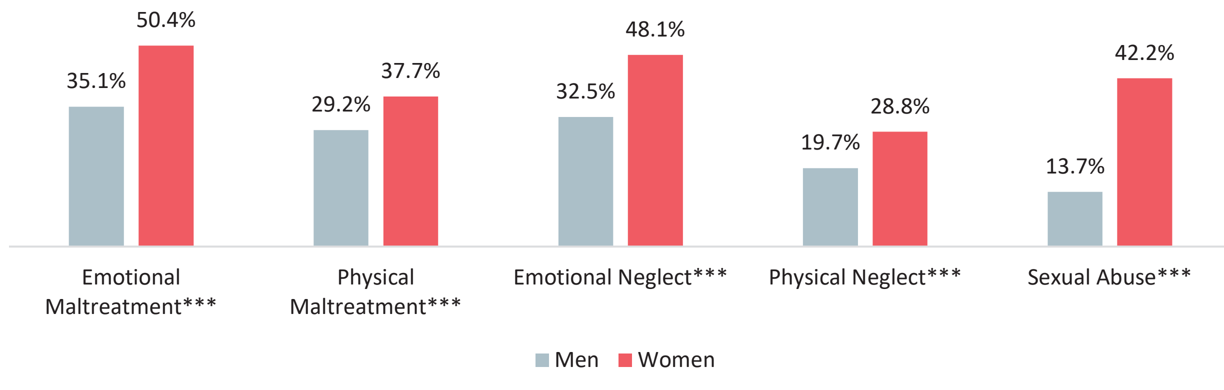
[24] The intake assessment asked about 10 major categories of adverse childhood experiences: (a) three types of abuse (e.g., emotional maltreatment, physical maltreatment, and sexual abuse), (b) two types of neglect (e.g., emotional neglect, physical neglect), and (c) five types of family risks (e.g., 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).

FIGURE 1.12. NUMBER OF TYPES OF ADVERSE CHILDHOOD EXPERIENCES BY GENDER



Significantly more women than men reported experiencing all five types of measured childhood maltreatment. Half of women (50.4%) reported they had experienced emotional maltreatment in their childhood, compared to 35.1% of men (see Figure 1.13). About 38% of women and 29.2% of men reported physical maltreatment. A little less than half of women (48.1%) reported they had experienced emotional neglect compared to 32.5% of men. More than one-fourth of women (28.8%) reported they experienced physical neglect in their childhood homes, which was significantly higher than the 19.7% of men who reported this. About 3 times as many women compared to men reported sexual abuse before the age of 18 as men. Nonetheless, 13.7% of men reported sexual abuse before the age of 18.

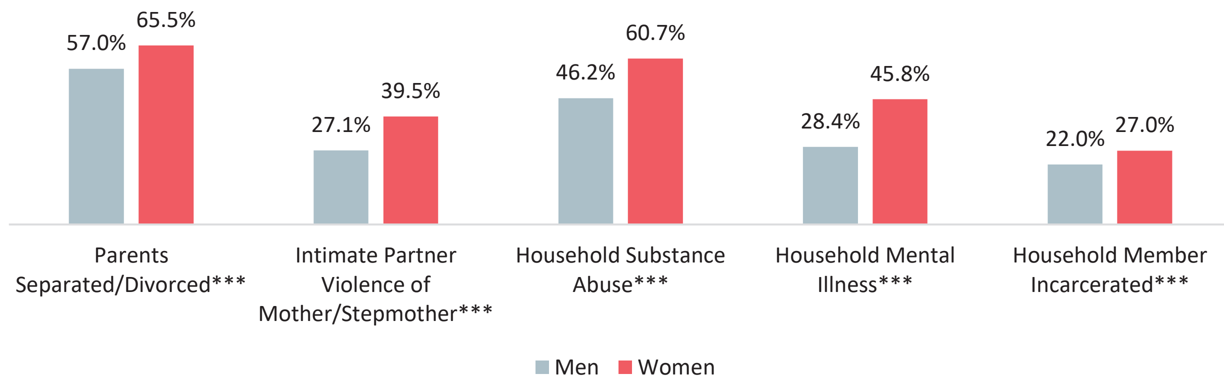
FIGURE 1.13. MALTREATMENT AND ABUSE EXPERIENCES IN CHILDHOOD BY GENDER (n = 3,437)



***p < .001.

Significantly more women than men reported all five types of household risks (see Figure 1.14). The majority of individuals reported their parents were divorced or lived separately and had a household member with a substance abuse problem. More than one-fourth of men and more than one-third of women reported witnessing partner violence perpetrated against their mother/stepmother in their childhood home. About 46% of women reported that someone in their household was depressed, mentally ill, or had attempted suicide compared to 28.4% of men. About 1 in 5 men and more than 1 in 4 women reported a household member had been incarcerated.

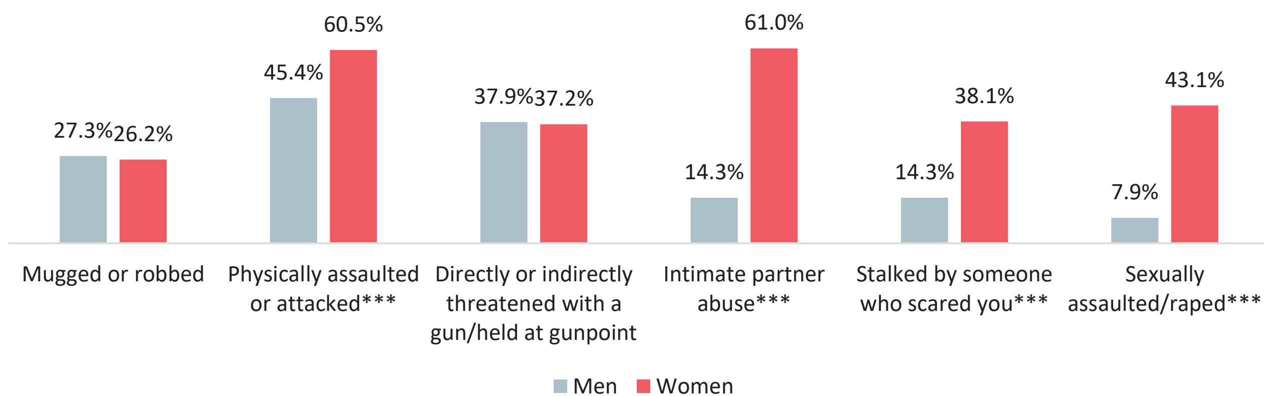
FIGURE 1.14. HOUSEHOLD RISKS IN CHILDHOOD BY GENDER (n = 4,568)



**p < .01, ***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 experienced in their lifetime and in the 12 months before entering treatment. Around three-fourths of women (78.7%) and 60.2% of men reported experiencing at least one type of victimization not classified as an ACE that are presented in Figure 1.15. Similar percentages of men and women reported ever being mugged or robbed by someone threatening to use force or using force. Compared to men, significantly higher percentages of women reported ever being physically assaulted or attacked, abused by an intimate partner, stalked by someone who scared them, and sexually assaulted or raped in their lifetime.

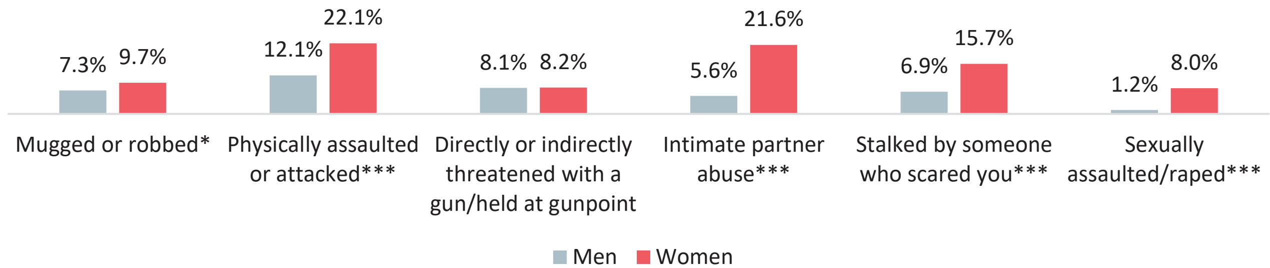
FIGURE 1.15. LIFETIME CRIME AND INTERPERSONAL VICTIMIZATION BY GENDER (n = 3,424)



***p < .001.

Smaller percentages of clients reported experiencing crime and interpersonal victimization in the 12 months before entering programs (see Figure 1.16). Significantly higher percentages of women than men reported being mugged/robbed, assaulted or attacked by someone, intimate partner violence, stalked by someone who scared them, and sexually assaulted or raped in the 12 months before entering treatment.

FIGURE 1.16. PAST-12-MONTH CRIME AND INTERPERSONAL VICTIMIZATION BY GENDER (n = 3,424)

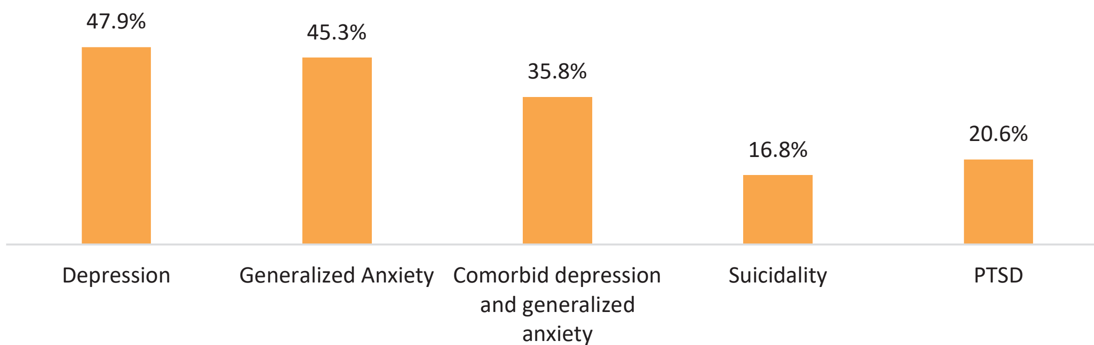


***p < .001.

Mental Health

At intake, 47.9% of individuals met study criteria for depression in the 12 months before they entered treatment (see Figure 1.17). Additionally, 45.3% of clients met study criteria for generalized anxiety at intake and 35.8% of clients met study criteria for comorbid depression and generalized anxiety. About 16.8% of individuals reported suicidal thoughts or attempts in the 12 months before entering treatment and 20.6% of clients had PTSD scores that indicated a risk of PTSD.

FIGURE 1.17. DEPRESSION, GENERALIZED ANXIETY, SUICIDALITY, AND POST TRAUMATIC STRESS DISORDER IN THE PAST 6 MONTHS AT INTAKE (N = 3,437)

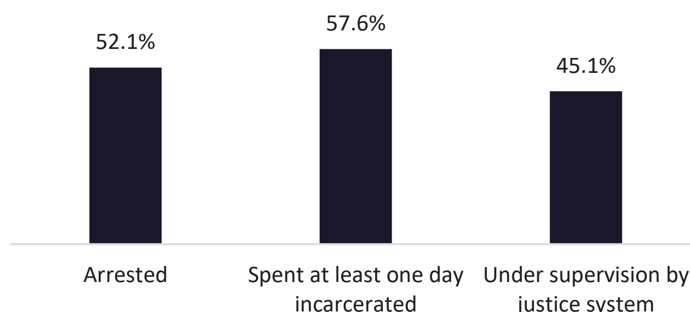


Criminal Justice Involvement

Over half of individuals reported being arrested at least once (52.1%) and 57.6% of clients reported being incarcerated at least one night in the 12 months before treatment (see Figure 1.18). A little less than one half of clients (45.1%) were currently under supervision by the criminal justice system (e.g., probation, parole) at intake.

Among those who were arrested in the past 12 months (n = 1,791), they were arrested an average of 1.9 times. Among those who were incarcerated in the past 12 months (n = 1,978), they were incarcerated an average of 74.6 nights (not depicted in a figure).

FIGURE 1.18. CRIMINAL JUSTICE INVOLVEMENT 12 MONTHS BEFORE TREATMENT AT INTAKE (N = 3,437)



Description of KTOS Follow-up Sample at Intake

This report describes outcomes for 569 adults who participated in publicly-funded substance abuse treatment and who completed an intake interview and a follow-up telephone interview about 12 months (average of 354.1 days) after the intake survey was completed.[25] Detailed information about the methods is presented in Appendix A.

Follow-up interviews are conducted with a selected sample of KTOS clients about 12 months after the intake survey is completed. All individuals who agree to be contacted by UK CDAR for the follow-up interview and have given 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, are eligible for the follow-up component of the study. In previous years' reports, the follow-up sample was randomly selected by month in which individuals completed the intake survey—170 cases per month. However, the number of individuals eligible for follow-up was lower than in previous years, because of the lower number of intake surveys completed in 2021 (i.e., the first 15 months of the COVID-19 pandemic). Thus, all eligible cases were included in the sample of individuals to be contacted to complete a follow-up survey (n = 880). The follow-up interviews are conducted independently from the treatment program and are completed over the telephone by an interviewer at UK CDAR. Client responses to the follow-up interviews are kept confidential to help

[25] The average number of days between when the baseline was submitted to UK CDAR and when the follow-up was completed was 351.4 days

facilitate the honest evaluation of client outcomes and satisfaction with program services. The professionalism of the outcome study is reflected in a low refusal rate for follow-up participation (4.6%) and in a good follow-up rate (71.9%). This means that 23.5% of individuals included in the sample to be followed up were not successfully contacted.[26] These elements indicate KTOS is a solid, dependable research study for publicly-funded substance abuse treatment programs with adults in Kentucky. For a summary of the client locating efforts of UK CDAR staff, see Appendix A.

[26] 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.

About KTOS Locating Efforts

In 2014, 523 randomly selected cases that were included in the follow-up sample were used to examine efforts in locating and contacting participants. In 2019, 2020, and 2021, the research team repeated these efforts to compare how locating efforts and the quality of contact information provided at the end of the intake interviews have changed over time.

LOCATOR EFFORTS	2014[27] (n = 523) (n = 1,269 completed files)	2019[28] (n = 2,026) (n = 1,175 completed files)	2020[29] (n = 1588) (n = 838 completed files)	2021 (n = 880) (n = 569 completed files)
Follow Up Rate	76.3%	69.4%	60.6%	71.9%
Phone Calls				
Average number of outgoing calls to reach client.................	4.3 (0-39 calls)	8.7 (0-62 calls)	12.5 (0-75 calls)	14.5 (0-139 calls)
Average number of outgoing calls to reach any contact........	1.8 (0-23 calls)	3.2 (0-57 calls)	3.0 (0-48 calls)	4.8 (0-70 calls)
Total number of outgoing calls to reach client or any contact[30]	12,438 calls	24,105 calls	25,150 calls	12,782 calls
Average outgoing calls for each completed follow-up.......	10 calls	21 calls	30 calls	23 calls
Mail				
Average number of mailings sent (to client/contact/other)..	2.3 (0-7 mailings)	2.8 (0-6 mailings)	2.9 (0	2.7 (1-9 mailings)
Total number of mailings sent (to client/contact/other)[31]	4,690 mailings	5,563 mailings	4,562 mailings	2,332 mailings
Average outgoing mail for each completed follow-up................	3.7 mailings	4.7 mailings	5.4 mailings	4.1 mailings
% of mail returned	17.8%	21.8%	20.2%	24.0%

[27] 20% random sample of completed, ineligible, expired, and refused files across all 12 months.

[28] There were 8 missing files when the extraction project was completed.

[29] There were 4 total missing files including 1 expired, 1 completed, 1 refusal and 1 expired.

[30] For 2014, since the sample is only 20% of the total, the averages were applied to the total number of files in the follow-up sample, n = 2,039.

[31] For 2014, since the sample is only 20% of the total, the averages were applied to the total number of files in the follow-up sample, n = 2,039.

QUALITY OF CONTACT INFORMATION

	2014 (n = 523)	2019 (n = 2,026)	2020 (n = 1,588)	2021 (n = 880)
Client Locator Number				
None listed	0.0%	1.4%	0.9%	0.8%
Number worked	40.2%	48.4%	52.2%	55.0%
Number worked but not successful	28.5%	27.6%	32.8%	32.0%
Number was disconnected	15.3%	18.6%	11.9%	11.5%
Number listed but never called	16.1%	3.9%	2.2%	0.7%
First Contact Locator Number				
None listed	25.4%	58.9%	25.8%	25.3%
Number worked	21.8%	15.2%	16.1%	20.8%
Number worked but not successful	14.3%	8.9%	13.8%	14.7%
Number was disconnected	4.6%	3.9%	3.9%	4.0%
Number listed but never called	33.8%	13.1%	19.4%	18.9%
Phone number listed but was not unique	Not in data	Not in data	21.0%	16.4%
Second Contact Locator Number				
None listed	69.6%	85.9%	56.2%	58.2%
Number worked	6.7%	4.2%	10.0%	8.6%
Number worked but not successful	5.5%	3.1%	7.7%	8.0%
Number was disconnected	1.9%	1.1%	2.1%	1.6%
Number listed but never called	16.3%	5.7%	17.8%	16.4%
Phone number listed but was not unique	Not in data	Not in data	6.2%	7.3%

Efforts to locate and contact potential follow-up clients increased from 2014 to 2020 for two main reasons. First, because of the increase in robo and other scam calls, people are more hesitant to pick up their phones and more skeptical when they do. Second, the quality of locator information is lower in recent years, making it more difficult to find correct information for clients. Comparison of the efforts interviewers put into conducting the follow-up interviews from 2014 to 2020 shows that the average number of calls increased by 46%, and the average number of mailings increased by 26%.

Demographics

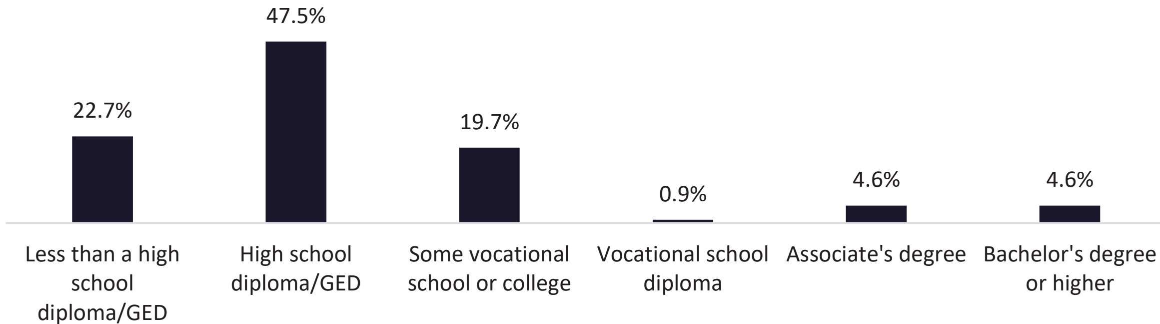
Of the 569 adults who completed a 12-month follow-up interview, 50.4% were male and 49.6% were female (see Table 1.3). The majority of follow-up clients were White (89.1%). A minority were African American/Black (6.9%) and 4.0% were Hispanic, American Indian, or multiracial. Clients in the follow-up sample were an average of 35.9 years old at the time of the intake interview. Over two-fifths of clients (43.4%) reported they were married or cohabiting at intake, 28.8% were never married (and not cohabiting), 26.4% were separated or divorced, and 1.4% were widowed. A little more than three-fourths (76.6%) of followed-up clients had at least one child, with 63.8% having at least one child under the age of 18. A small percentage of the follow-up sample (2.6%) reported they were a veteran or currently serving in the military, Reserves, or National Guard.

TABLE 1.3. DEMOGRAPHICS FOR KTOS CLIENTS WHO WERE FOLLOWED-UP AT INTAKE (n = 569)

Age	35.9 years (range of 18-66)
Gender	
Male	50.4%
Female	49.6%
Transgender	0.0%
Race	
White	89.1%
African American	6.9%
Other or multiracial	4.0%
Marital status	
Married or cohabiting	43.4%
Never married (and not cohabiting)	28.8%
Separated or divorced	26.4%
Widowed	1.4%
Has children	76.6%
Has children under the age of 18	63.8%
Veteran or currently serving in military	2.6%

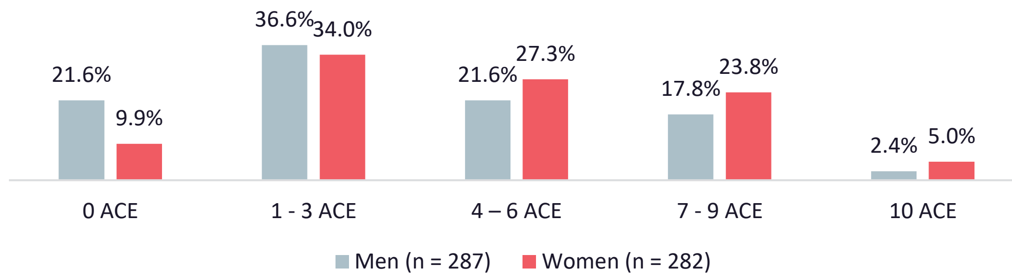
A little more than one-fifth of follow-up clients (22.7%) had less than a high school diploma or GED at intake (see Figure 1.19). The highest level of education of 47.5% of the follow-up sample was a high school diploma or GED. About one-fifth of clients (19.7%) had completed some vocational/technical school or college. Only a small minority of clients had completed vocational/technical school (0.9%), an associate's degree (4.6%), and a bachelor's degree or higher (4.6%).

FIGURE 1.19. HIGHEST LEVEL OF EDUCATION COMPLETED BY FOLLOW-UP CLIENTS AT INTAKE (n = 564)[32]



There was a significant difference in the proportion of men and women classified by number of types of ACE (see Figure 1.20). Significantly more men than women reported experiencing 0 ACE. Women had a higher average number of ACE compared to men (4.4 vs. 3.4).

FIGURE 1.20. NUMBER OF TYPES OF ADVERSE CHILDHOOD EXPERIENCES FOR FOLLOW-UP SAMPLE BY GENDER

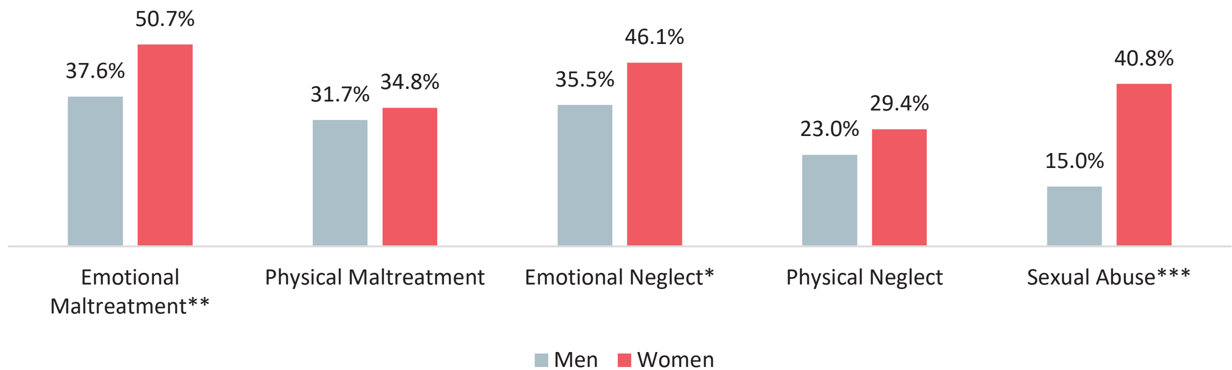


***p < .001.

Half of women (50.7%) reported they had experienced emotional maltreatment in their childhood, compared to 37.6% of men (see Figure 1.21). More than one-third of women and 31.7% of men reported physical maltreatment, with no statistically significant difference by gender. Less than half of women (46.1%) reported they had experienced emotional neglect compared to 35.5% of men. More than one-fourth of women reported they experienced physical neglect in their childhood homes compared to 23.0% of men About 2.7 as many women reported sexual abuse before the age of 18 compared to men. Nonetheless, 15.0% men reported sexual abuse before the age of 18.

[32] Five individuals had missing data for highest level of education at follow-up, because of data inconsistencies.

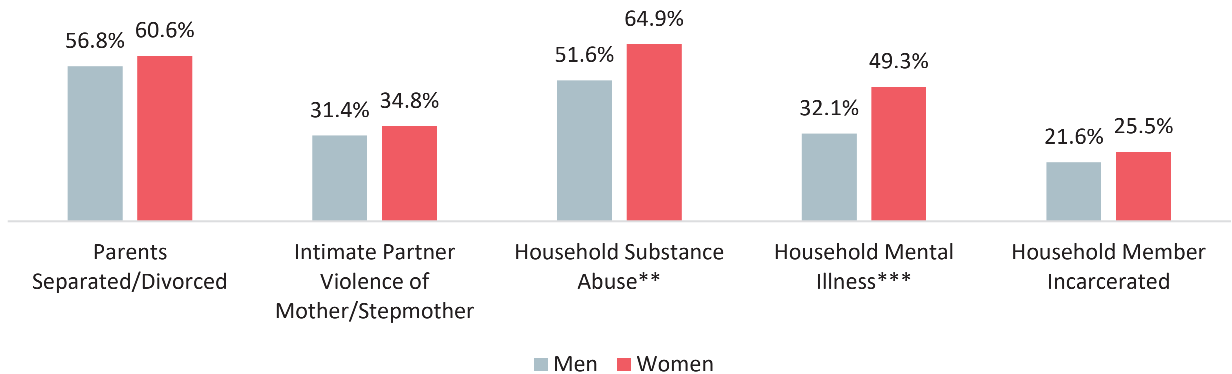
FIGURE 1.21. MALTREATMENT AND ABUSE EXPERIENCES IN CHILDHOOD FOR FOLLOW-UP SAMPLE BY GENDER (n = 569)



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

Compared to men significantly more women reported two of five types of household risks: a household member having a substance abuse problem, and a household member being depressed, mentally ill or attempted suicide (see Figure 1.22). The majority of individuals reported their parents were divorced or lived separately and had a household member with a substance abuse problem. Almost one-third of men and more than one-third of women reported witnessing partner violence perpetrated against their mother/stepmother in their childhood home. About one-half of women reported that someone in their household was depressed, mentally ill, or had attempted suicide compared to 32.1% of men. There was no significant difference by gender in the percent of clients who reported a household member had been incarcerated.

FIGURE 1.22. HOUSEHOLD RISKS IN CHILDHOOD FOR FOLLOW-UP SAMPLE BY GENDER (n = 569)

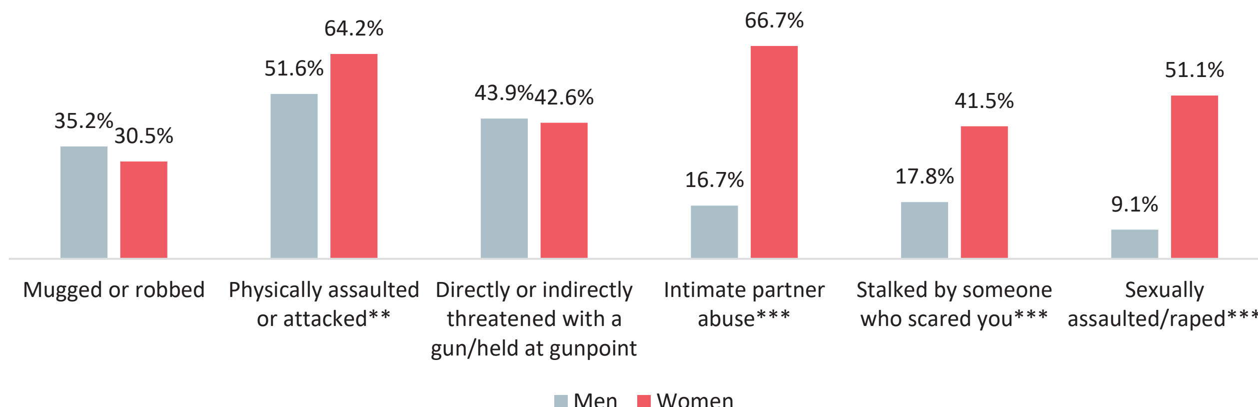


**p < .01, ***p < .001.

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 experienced in their lifetime and in the 12 months before entering treatment. More than four-fifths of women (81.6%) and 68.6% of men reported experiencing at least one type of victimization not classified as an ACE that are presented in Figure 1.23. Similar percentages of men and women reported ever being mugged or robbed by someone threatening to use force or using force and being directly

or indirectly threatened with a gun. Compared to men, significantly higher percentages of women reported ever being physically assaulted or attacked, abused by an intimate partner, stalked by someone who scared them, and sexually assaulted or raped.

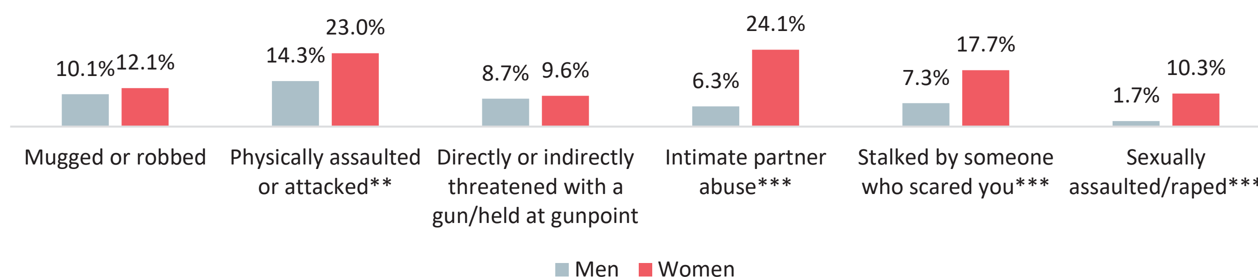
FIGURE 1.23. LIFETIME CRIME AND INTERPERSONAL VICTIMIZATION FOR FOLLOW-UP SAMPLE BY GENDER (n = 569)



***p < .001.

Smaller percentages of clients reported experiencing crime and interpersonal victimization in the 12 months before entering programs (see Figure 1.24). Significantly more women than men reported being physically assaulted/attacked in the 12 months before entering treatment. Significantly higher percentages of women than men reported being abused by an intimate partner, stalked by someone who scared them, and sexually assaulted or raped in the 12 months before entering treatment.

FIGURE 1.24. PAST-12-MONTH CRIME AND INTERPERSONAL VICTIMIZATION FOR FOLLOW-UP SAMPLE BY GENDER (n = 569)



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

When individuals with a follow-up interview were compared with those who did not have a follow-up interview on a variety of intake variables, there were some significant differences for demographics, economic hardship, education, employment, physical health, mental health, substance use, and severity of substance use. These differences indicate that followed-up individuals were worse off in several key domains compared to those who were not followed up (see Table 1.4). See Appendix B for detailed comparisons of clients who completed a follow-up interview (n = 569) and clients who did not complete a follow-up interview (n = 2,868).

In summary, there were some significant differences between clients who were followed up and those who were not. Significantly more women were followed up than were not followed up. Many of the significant differences suggest that followed-up clients were worse off than clients who were not followed up. For example, significantly more followed-up clients reported they had difficulty meeting basic living needs as well as health care needs for financial reasons. Second, significantly more clients who were included in the follow-up sample reported they had chronic pain and a chronic medical problem compared to clients who were not in the follow-up sample. Third, significantly more clients in the follow-up sample reported depression, generalized anxiety, and suicidality in the 12 months before treatment. Because individuals who did not report any alcohol or drug use in the 12 months before entering treatment, were excluded from the follow-up sample, followed-up clients had higher percentages for many drug classes and alcohol use. Specifically, significantly more clients in the follow up sample reported using marijuana, stimulants, and illicit use of prescription opioids, buprenorphine-naloxone, and hallucinogens compared to those who did not complete a follow-up. Significantly more followed-up clients reported using alcohol, alcohol use to intoxication, binge drinking, and using vaporized tobacco compared to clients who were not followed up. Along the same lines, significantly more clients who completed a follow-up and were not in a controlled environment all 30 days before entering treatment met or surpassed the cutoff score for alcohol or drug use SUD, met or surpassed the cutoff score for alcohol use SUD, met or surpassed the cutoff score for drug use SUD, and had a higher average composite score for drug use and for alcohol use when compared to clients who did not complete a follow-up.

TABLE 1.4. FOLLOWED-UP VERSUS NOT FOLLOWED-UP

	Followed up	
	No (n = 2,855)	Yes (n = 569)
Demographic	Fewer female	More female
Socio-economic status indicators *(e.g., education, employment, living situation, inability to meet basic needs)*	Higher quality of life rating	More had difficulty meeting basic living and health care needs for financial reasons
Substance use, severity of alcohol and drug use		• More reported marijuana, stimulants, and illicit use of prescription opioids, buprenorphine, and hallucinogens in the 12 months before entering treatment • More reported alcohol use, alcohol to intoxication, binge drinking, and vaporized tobacco use in the 12 months before treatment • More met or surpassed the cutoff score for alcohol or drug use substance use disorder
Physical health *(e.g., chronic pain, chronic medical problems)*		More had chronic pain More had chronic medical problems
Mental health *(e.g., depression, generalized anxiety, suicidality)*		More met study criteria for depression, generalized anxiety, and suicidality Reported more days mental and physical health prevented daily activities

| Section 2. Substance Use

This section examines substance use changes, which include use of any illegal drugs or alcohol, and then separately for illegal drugs, alcohol, and tobacco at intake and follow-up. Analysis is presented in detail for KTOS study participants who were not in a controlled environment for the entire period of 12 months and/or 30 days before entering treatment. In addition, self-reported severity of alcohol and drug use based on the DSM-5 and the Addiction Severity Index (ASI) alcohol and drug use composite scores are compared at intake and follow-up. Results for each targeted factor are presented for the overall sample and by gender when there were significant gender differences.

In addition to examining the overall use of illegal drugs, several specific categories of illegal drugs were examined including: (a) marijuana; (b) opioids [i.e., prescription opioids, methadone, and buprenorphine-naloxone (bup-nx)]; (c) heroin; (d) Central Nervous System (CNS) depressants [including tranquilizers, benzodiazepines, sedatives, and barbiturates]; (e) cocaine; (f) other stimulants [i.e., methamphetamine, Ecstasy, MDMA, Adderall, and Ritalin]; and (g) other illegal drugs not mentioned above [i.e., hallucinogens, inhalants, and synthetic drugs]. Changes in substance use from intake to follow-up are presented in 4 main groups and organized by type of substance use:

1. **Change in 12-month Substance Use from Intake to Follow-up.** Comparisons of the use of substances including ANY illegal drug use and specifically for marijuana, opioids, heroin, CNS depressants, cocaine, other stimulants, and other illegal drug use, alcohol use, and tobacco use 12 months before the client entered the program and any use of these substances during the 12-month follow-up period (n = 554)[33] are presented.

2. **Average Number of Months Clients Used Substances at Intake and Follow-up.** For those who used any of the substances, the average number of months used in the 12 months before treatment intake and during the 12-month follow-up period are reported.

3. **Change in 30-day Substance Use from Intake to Follow-up.** In addition to looking at past-12-month substance use, change in substance use in the 30 days before program entry and the 30 days before the follow-up interview for any illegal drug use (including marijuana, opioids, heroin, CNS depressants, cocaine, other stimulants, and other illegal drugs), alcohol use, and tobacco use (n = 486)[34] is also examined.

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 any of the 11 DSM-5 symptoms for substance use disorder (SUD) in the past 12 months. For this report, the severity of the substance use disorder (i.e., none,

[33] Cases were excluded from this analysis for the following reasons: they were incarcerated all 365 days before entering treatment (n = 14) and they had missing values for the number of days incarcerated in the 12 months before follow-up (n = 1).

[34] Because some clients enter treatment after leaving jail or prison, substance use in the 30 days before entering the program was examined for clients who were not in a controlled environment all 30 days. The assumption for excluding clients who were in a controlled environment all 30 days before entering treatment (n = 70) or all 30 days before the follow-up (n = 13) from the change in past-30-day substance use analysis is that being in a controlled environment inhibits opportunities for alcohol and drug use.

mild, moderate, or severe) is based on the number of self-reported symptoms. The percent of individuals in each of the four categories at intake and follow-up is presented.

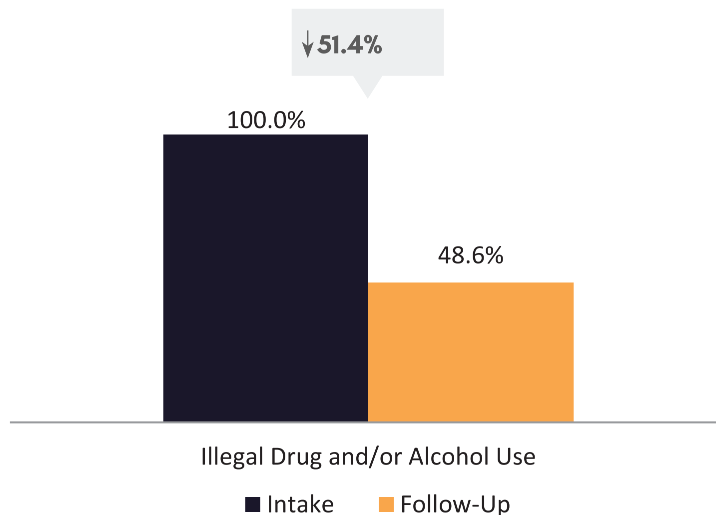
The Addiction Severity Index (ASI) composite scores are examined for change over time for illegal drugs (n = 286), alcohol (n = 169) and those with alcohol and/or illegal drug use (n = 351) among individuals who reported use of the substance at either intake or follow-up. The ASI composite score assesses 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 past-30-days 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.

Alcohol And/or Illegal Drug Use

Past-12-month Alcohol And/or Illegal Drug Use

Because clients were excluded from the follow-up sample if they reported no substance use in the 12 months before intake and were out on the street at least one day in that period, all clients (100%) reported using alcohol and/or illegal drugs in the 12 months before entering substance abuse treatment, which decreased to 48.6% at follow-up (see Figure 2.1).

FIGURE 2.1. PAST-12-MONTH ALCOHOL AND/OR DRUG USE AT INTAKE AND FOLLOW-UP (N = 554)

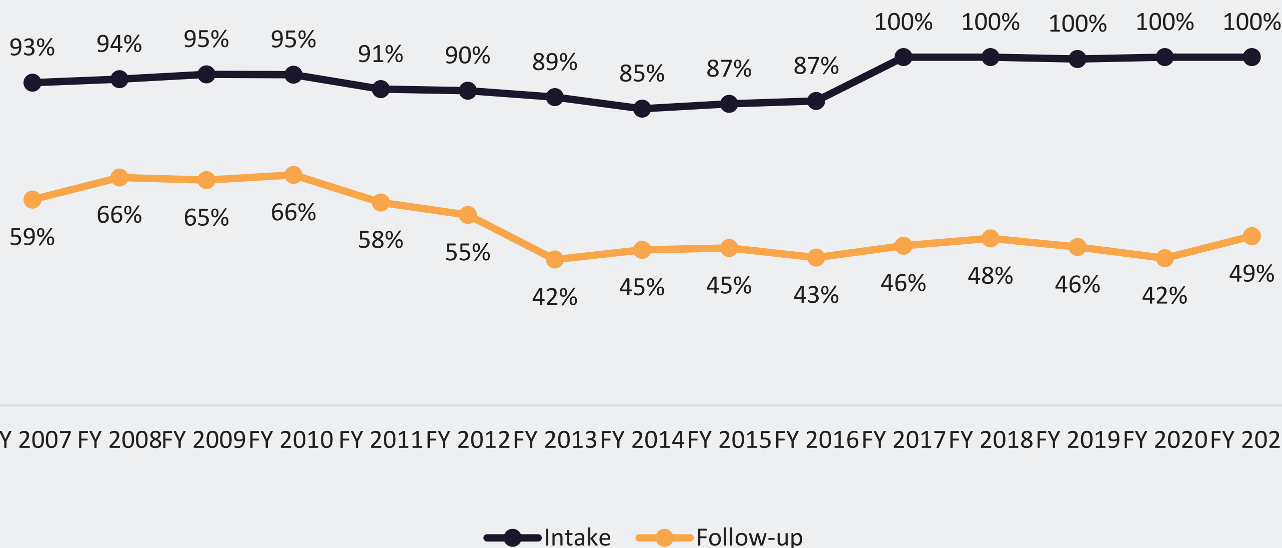


a--No test of statistical association could be computed for illegal drug/alcohol use in the 12 months before entering treatment because one of the cell values was 0.

Trends in Any Alcohol and/or Drug Use

The percent of KTOS clients reporting alcohol and/or drug use in the 12 months before treatment has been consistently high.[35] At follow-up, the number of clients reporting alcohol and/or drug use has decreased over the years.

FIGURE 2.2. TRENDS IN ANY ALCOHOL AND/OR ILLEGAL DRUG USE AT INTAKE AND FOLLOW-UP, FY 2007-2021[36]



Past-30-day Alcohol And/or Illegal Drug Use

About two-thirds of clients (67.3%) reported using alcohol and/or illegal drugs in the 30 days before entering substance abuse treatment, which decreased to 30.0% at follow-up. As a result, there was a 37.3% significant decrease in the number of clients reporting past-30-day use of alcohol and/or illegal drugs (see Figure 2.3).

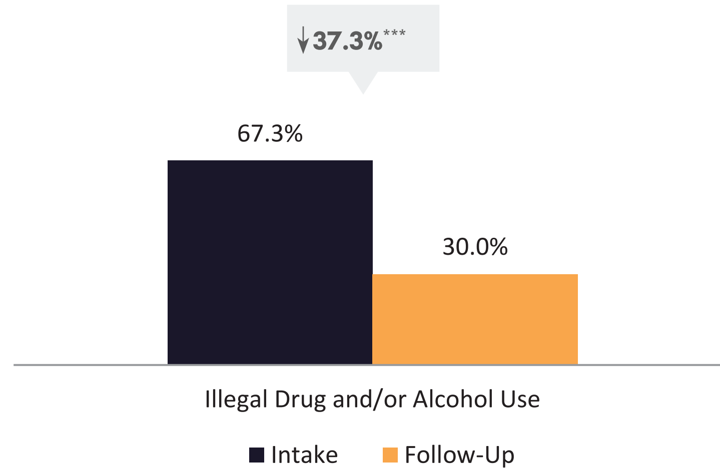
"My counselor gave me good insight on things and clarity on how to be more myself."

- KTOS FOLLOW-UP CLIENT

[35] In the several years preceding FY 2017, the research team noticed that an increasing proportion of clients with completed KTOS intake surveys reported no substance use. Because the focus of this report is on substance abuse treatment outcomes, to be included in the follow-up study individuals had to report past-12-month alcohol and/or drug use, if they were not incarcerated the entire 12 months before entering the program.

[36] The percent of individuals who reported alcohol and/or drug use in the 12 months before intake in FY 2019 was 99.5%. Because the percentages presented in trend analysis are rounded to the nearest integer, 99.5% rounds up to 100%.

FIGURE 2.3. PAST-30-DAY ALCOHOL AND/OR DRUG USE AT INTAKE AND FOLLOW-UP (N = 486)

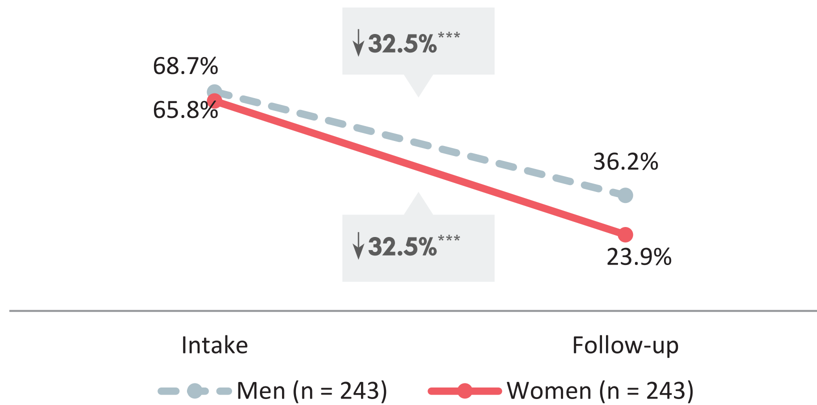


***$p < .001$.

Gender Differences in Past-30-day Alcohol And/or Illegal Drug Use

At intake, there were no significant differences in the number of men (68.7%) and women (65.8%) reporting any alcohol and/or illegal drug use in the past 30 days (see Figure 2.4). The number of men and women who reported any past-30-day alcohol and/or illegal drug use significantly decreased from intake to follow-up by 32.5% and 41.9% respectively. At follow-up, significantly more men reported alcohol and/or illegal drug use in the past 30 days compared to women (36.2% vs. 23.9%, respectively).

FIGURE 2.4. GENDER DIFFERENCES IN PAST-30-DAY ILLEGAL DRUG AND/OR ALCOHOL USE AT INTAKE AND FOLLOW-UP[a]



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

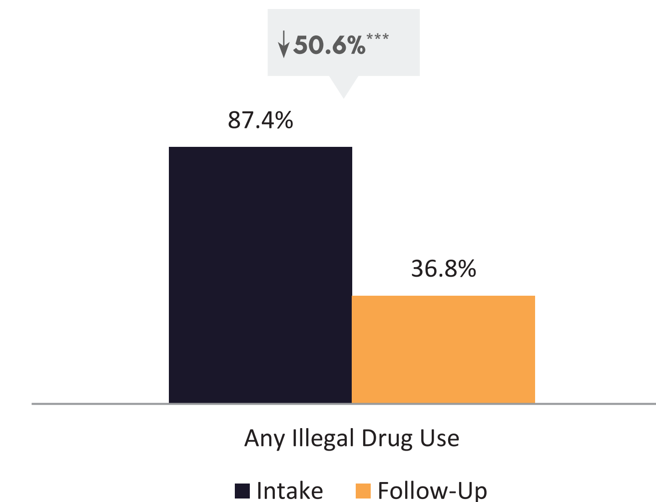
Any Illegal Drugs

Past-12-month Illegal Drug Use

At intake, clients were asked how old they were when they first began to use illicit drugs. On average, KTOS clients reported they were 16.6 years old when they first used illegal drugs (not depicted in figure).

The majority of clients (87.4%) reported using illegal drugs in the 12 months before entering substance abuse treatment, which decreased to 36.8% at follow-up. Overall, for the KTOS follow-up sample, there was a 50.6% decrease in the number of clients reporting use of any illegal drug in the past 12 months (see Figure 2.5).

FIGURE 2.5. PAST-12-MONTH DRUG USE AT INTAKE AND FOLLOW-UP (N = 554)

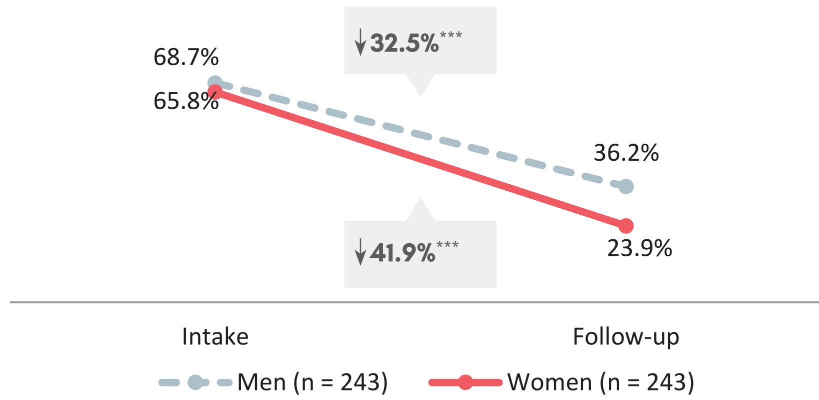


***$p < .001$.

Gender Differences in Past-12-month Overall Illegal Drug Use

At intake, significantly more women than men reported any past-12-month illegal drug use, 90.3% vs. 84.4% (see Figure 2.6). The number of women and men who reported illegal drug use in the past 12 months significantly decreased from intake to follow-up by 64.4% and 54.8% respectively. At follow-up, there was no significant difference in the number of men and women who reported using any illegal drugs in the past 12 months.

FIGURE 2.4. GENDER DIFFERENCES IN PAST-30-DAY ILLEGAL DRUG AND/OR ALCOHOL USE AT INTAKE AND FOLLOW-UP[a]



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

Any Illegal Drugs

Past-12-month Illegal Drug Use

At intake, clients were asked how old they were when they first began to use illicit drugs. On average, KTOS clients reported they were 16.6 years old when they first used illegal drugs (not depicted in figure).

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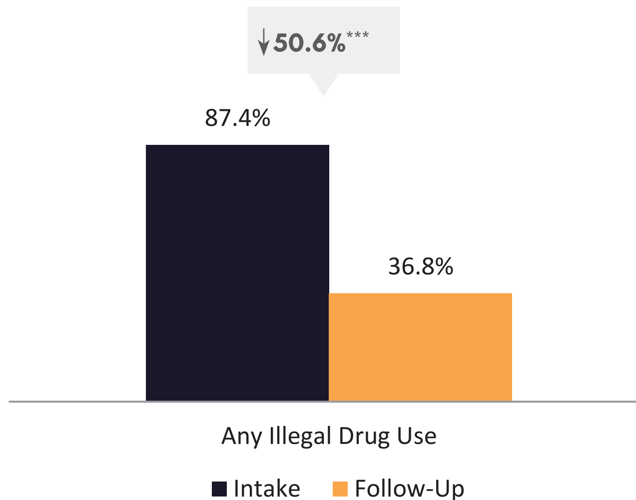
FIGURE 2.5. PAST-12-MONTH DRUG USE AT INTAKE AND FOLLOW-UP (N = 554)



***p < .001.

Gender Differences in Past-12-month Overall Illegal Drug Use

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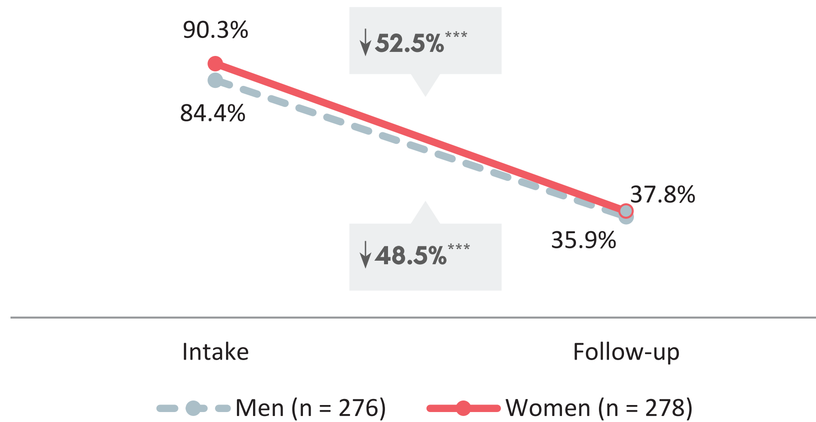
FIGURE 2.6. GENDER DIFFERENCES IN PAST-12-MONTH ILLEGAL DRUG USE AT INTAKE AND FOLLOW-UP[a]

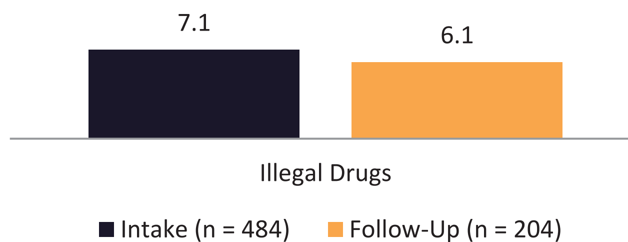


a—Significant difference by gender at intake ($p < .05$).
***$p < .001$.

Average Maximum Number of Months Used Any Illegal Drugs

Among the clients who reported using illegal drugs in the 12 months before entering treatment (n = 484), they reported using illegal drugs an average maximum of 7.1 months (see Figure 2.7).[37] Clients who reported using illegal drugs at follow-up (n = 204) reported using an average maximum of 6.1 months.

FIGURE 2.7. AVERAGE MAXIMUM NUMBER OF MONTHS CLIENTS USED ILLEGAL DRUGS

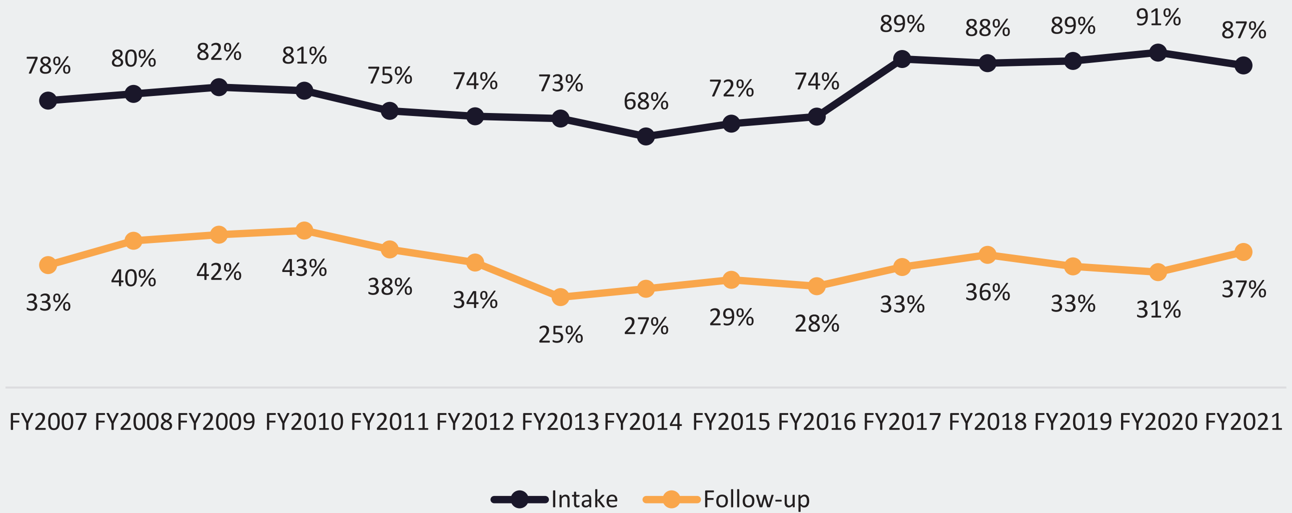


[37] Because number of months of illegal drugs was measured separately for each class of substance, the value is a calculation of the maximum number of months clients used any class of substance.

Trends in Past-12-month Overall Illegal Drug Use

Around three-quarters of KTOS clients reported any illegal drug use in the 12 months before treatment from FY 2007 to FY 2016. In FY 2017, that percent increased to almost 90% and remained high in FY 2020.[38] Overall, at follow-up, the percent of clients reporting any illegal drug use decreased from FY 2010 to FY 2013 but slowly increased until FY 2018.

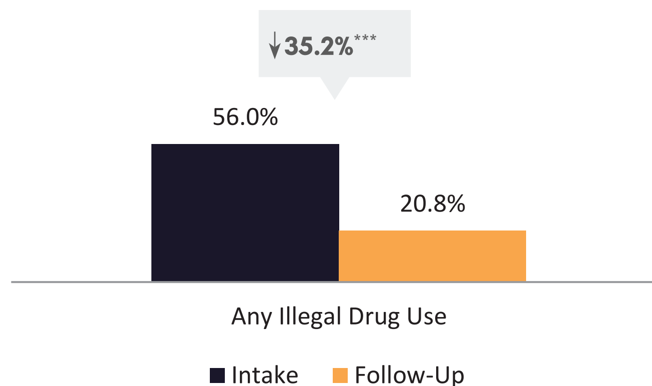
FIGURE 2.8. TRENDS IN ANY PAST-12-MONTH ILLEGAL DRUG USE AT INTAKE AND FOLLOW-UP, FY 2007-2021



Past-30-day Illegal Drug Use

More than half of clients (56.0%) who were not in a controlled environment all 30 days reported they had used illegal drugs in the 30 days before entering treatment (see Figure 2.9). At follow-up, only 20.8% of clients reported they had used illegal drugs in the past 30 days—a significant decrease of 35.2%.

FIGURE 2.9. PAST-30-DAY USE OF ANY ILLEGAL DRUG AT INTAKE AND FOLLOW-UP (N = 486)



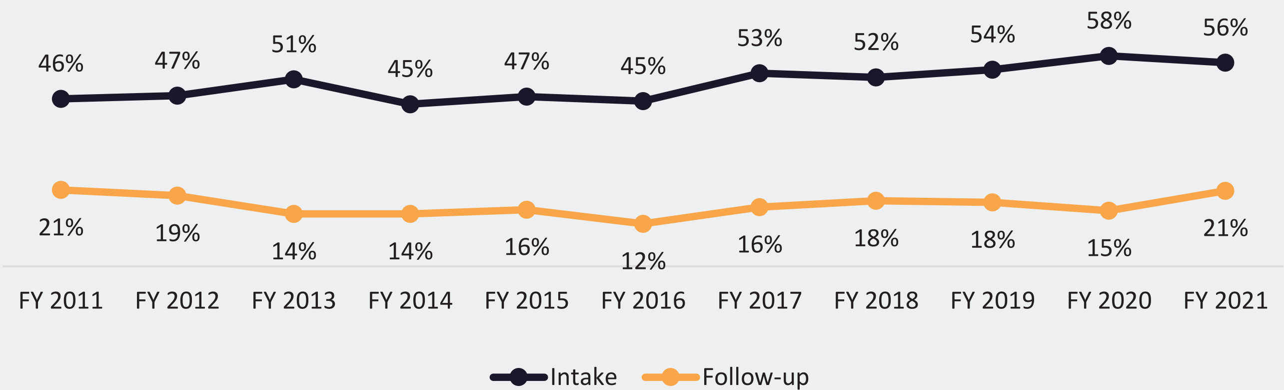
***$p < .001$.

[38] In the several years preceding FY 2017, the research team noticed that an increasing proportion of clients with completed KTOS intake surveys reported no substance use. Because the focus of this report is on substance abuse treatment outcomes, to be included in the follow-up study individuals had to report past-12-month alcohol and/or drug use, if they were not incarcerated the entire 12 months before entering the program.

Trends in Past-30-day Illegal Drug Use

From FY 2011 through FY 2019, among clients who were not in a controlled environment in the 30 days before program entry and the 30 days before the follow-up interview, around half (45% – 53%) reported using any illegal drugs in the past 30 days at intake. In FY 2020, the percent had increased to 58% for the 30 days before intake, and in FY 2021 the percent was 56%. At follow-up, the percent of clients reporting any illegal drug use decreased for 6 years, from 21% in FY 2011 to 12% in FY 2016 but increased in FY 2017 (16%) and was a high of 21% in FY 2021

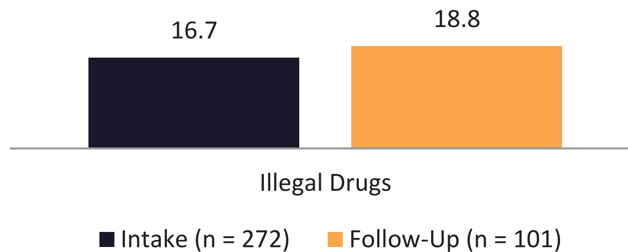
FIGURE 2.10. TRENDS IN PAST-30-DAY ILLEGAL DRUG USE AT INTAKE AND FOLLOW-UP, FY 2011-2021



Average Maximum Number of Days Used Any Illegal Drugs

Among the clients who reported using illegal drugs in the 30 days before entering treatment (n = 272), they reported using illegal drugs an average maximum of 16.7 days (see Figure 2.11). Clients who reported using illegal drugs at follow-up (n = 101) reported using an average maximum of 18.8 days.[39]

FIGURE 2.11. AVERAGE MAXIMUM NUMBER OF DAYS CLIENTS USED ILLEGAL DRUGS IN PAST 30 DAYS



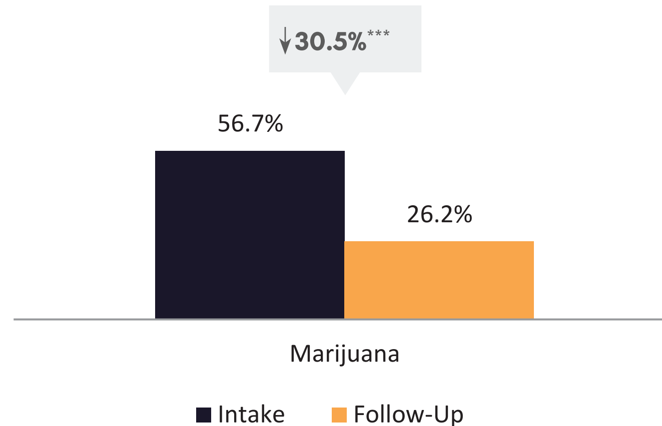
[39] Because number of days of illegal drugs was measured separately for each class of substance, the value is a calculation of the maximum number of days clients used any class of illegal drug.

Cannabis/Marijuana

Past-12-month Cannabis/Marijuana Use

More than half (56.7%) of clients reported using cannabis in the 12 months before entering treatment, which decreased to 26.2% at follow-up. Overall, for the KTOS follow-up sample, there was a 30.5% significant decrease in the number of clients reporting cannabis use (see Figure 2.12).

FIGURE 2.12. PAST-12-MONTH CANNABIS USE AT INTAKE AND FOLLOW-UP (N = 554)

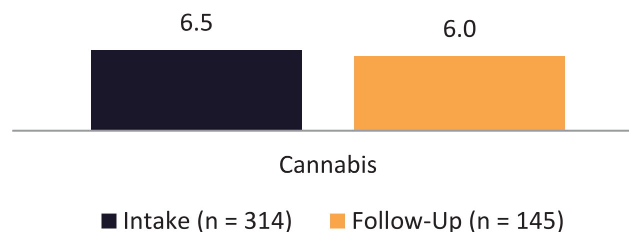


***$p < .001$.

Average Number of Months Used Marijuana

Among the clients who reported using cannabis in the 12 months before entering treatment (n = 314), they reported using illegal drugs an average maximum of 6.5 months (see Figure 2.13). Clients who reported using cannabis at follow-up (n = 145) reported using an average maximum of 6.0 days.

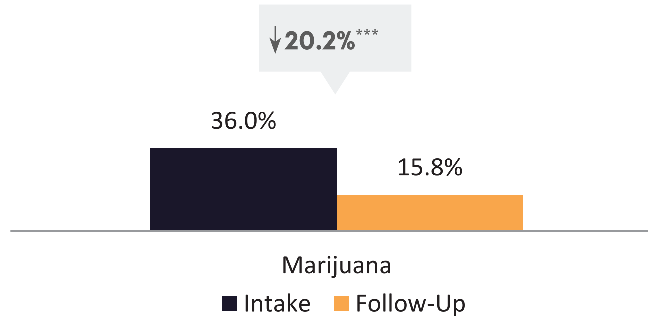
FIGURE 2.13. AVERAGE MAXIMUM NUMBER OF DAYS CLIENTS USED CANNABIS IN PAST 12 MONTHS



Past-30-day Marijuana Use

The number of clients who reported using marijuana in the past 30 days decreased significantly by 20.2%, from 36% at intake to 15.8% at follow-up (see Figure 2.14).

FIGURE 2.14. PAST-30-DAY MARIJUANA USE AT INTAKE AND FOLLOW-UP (N = 486)

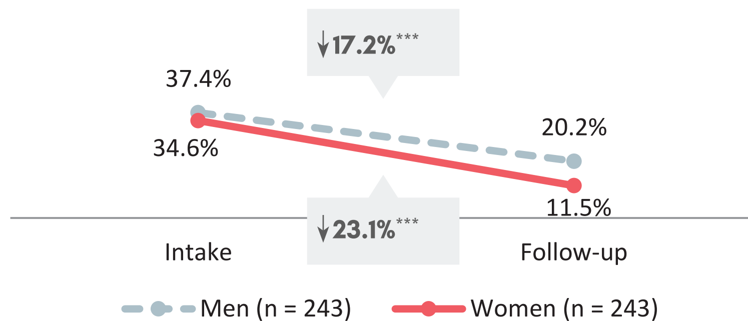


***p < .001.

Gender Differences in Past-30-day Cannabis Use

At intake, there was no significant difference in the percent of men and women who reported past-30-day use of cannabis (see Figure 2.15). The number of men and women who reported cannabis use in the past 30 months significantly decreased from intake to follow-up by 64.4% and 54.8% respectively. At follow-up, significantly more men reported cannabis use in the past 30 days compared to women.

FIGURE 2.15. GENDER DIFFERENCES IN PAST-30-DAY CANNABIS USE AT INTAKE AND FOLLOW-UP[a]



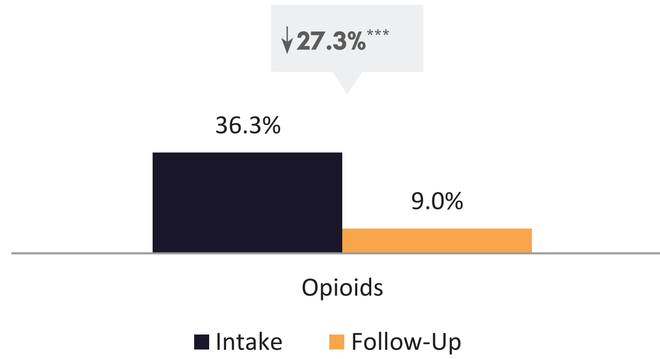
a—Significant difference by gender at follow-up (p < .01).
***p < .001.

Opioids

Past-12-month Opioid Misuse

A little more than two-fifths of clients (36.3%) reported misusing opioids other than heroin, including prescription opioids, methadone, and buprenorphine-naloxone (bup-nx) in the 12 months before entering treatment, which decreased to 9.0% at follow-up. Overall, for the KTOS follow-up sample, there was a 27.3% decrease in the number of clients reporting past-12-month opioid misuse other than heroin (see Figure 2.16).

FIGURE 2.16. PAST-12-MONTH OPIOID MISUSE AT INTAKE AND FOLLOW-UP (N = 554)

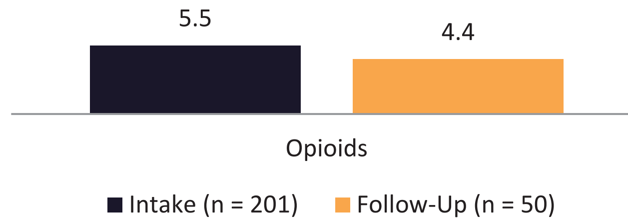


***p < .001.

Average Number of Months Used Opioids

Among the clients who reported misusing opioids in the 12 months before entering treatment (n = 201), they reported misusing opioids on average 5.5 months (see Figure 2.17).[40] Among clients who reported misusing opioids at follow-up (n = 50), they reported misusing an average 4.4 months.

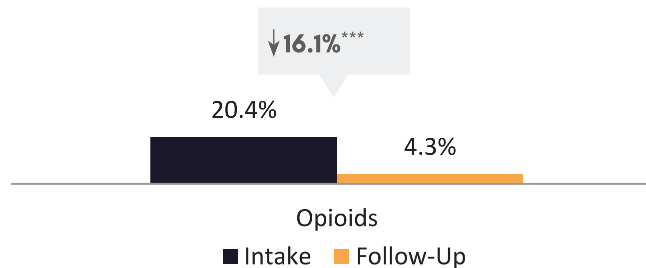
FIGURE 2.17. AVERAGE MAXIMUM NUMBER OF MONTHS CLIENTS MISUSED OPIOIDS



Past-30-day Opioid Misuse

The number of clients who reported misusing opioids in the past 30 days decreased significantly by 16.1%, from 20.4% at intake to 4.3% at follow-up (see Figure 2.18).

FIGURE 2.18. PAST-30-DAY OPIOID MISUSE AT INTAKE AND FOLLOW-UP (N = 486)



***p < .001.

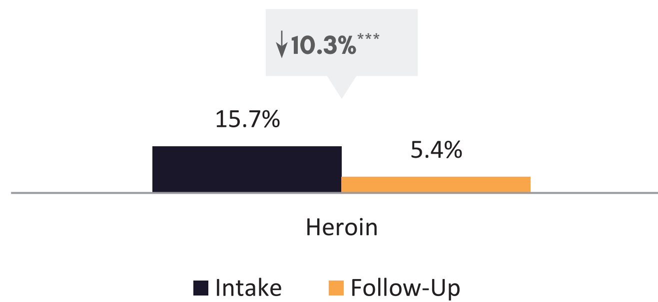
[40] Because number of months of prescription opioids, methadone, and bup-nx were measured separately, the value is a calculation of the maximum number of months clients used any of these specific types of opioids.

Heroin

Past-12-month Heroin Use

A minority of clients (15.7%) reported using heroin in the 12 months before entering treatment, which decreased 5.4% to 10.3% at follow-up (see Figure 2.19).

FIGURE 2.19. PAST-12-MONTH HEROIN USE AT INTAKE AND FOLLOW-UP (N = 554)

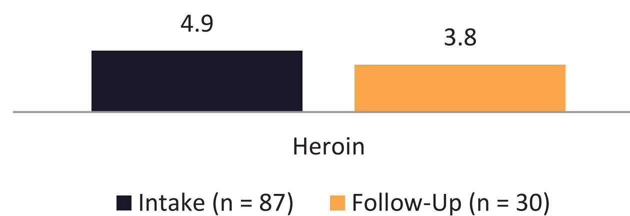


***p < .001.

Average Number of Months Used Heroin

Among the clients who reported using heroin in the 12 months before entering treatment (n = 87), they reported using heroin, on average, 4.9 months (see Figure 2.20). Among clients who reported using heroin at follow-up (n = 30), they reported using, on average, 3.8 months.

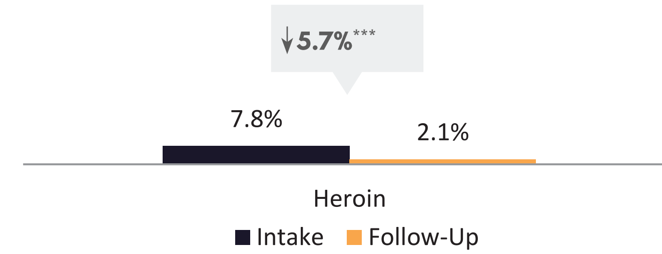
FIGURE 2.20. AVERAGE NUMBER OF MONTHS CLIENTS USED HEROIN



Past-30-day Heroin Use

A minority of clients (7.8%) reported using heroin in the 30 days before intake, with a significant decrease of 5.7% by follow-up to 2.1% (see Figure 2.21).

FIGURE 2.21. PAST-30-DAY HEROIN USE AT INTAKE AND FOLLOW-UP (N = 486)



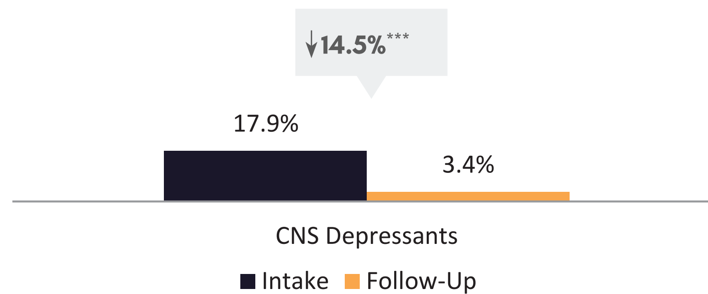
***$p < .001$.

CNS Depressants

Past-12-month CNS Depressant Use

Less than 1 in 5 clients (17.9%) reported using CNS depressants, including tranquilizers, benzodiazepines, sedatives, and barbiturates in the 12 months before entering treatment, which decreased to 3.4% at follow-up. Overall, for the KTOS follow-up sample, there was a 14.5% decrease in the number of clients reporting CNS depressant use in the past 12 months (see Figure 2.22).

FIGURE 2.22. PAST-12-MONTH CNS DEPRESSANT USE AT INTAKE AND FOLLOW-UP (N = 554)



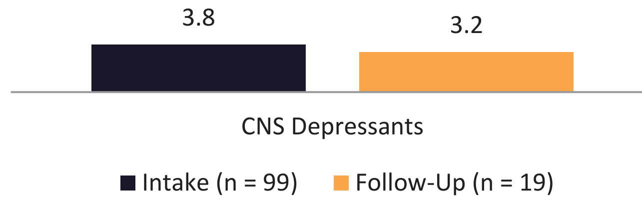
***$p < .001$.

Average Maximum Number of Months Used CNS Depressants

Figure 2.23 shows the average maximum number of months clients who used CNS depressants reported using these illegal drugs.[41] Among the clients who reported using these substances in the 12 months before entering treatment (n = 99), they reported using CNS depressants an average 3.8 months. Among clients who reported using CNS depressants in the 12 months before follow-up (n = 19), they reported using an average of 3.2 months.

[41] Because number of months of use barbiturates and tranquilizers/sedatives/benzodiazepines were measured separately, the value is a calculation of the maximum number of months clients used any substance class.

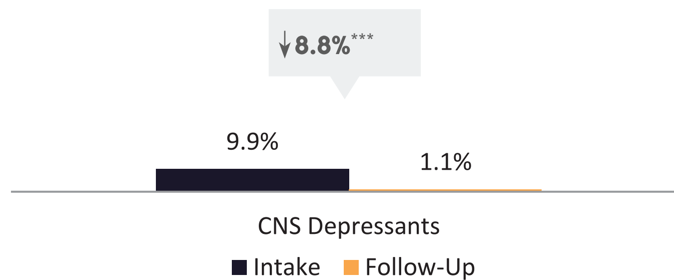
FIGURE 2.23. AVERAGE MAXIMUM NUMBER OF MONTHS OF CNS DEPRESSANT USE



Past-30-day CNS Depressant Use

The percent of clients who reported using CNS depressants in the 30 days before intake decreased significantly by 8.8%, from 9.9% at intake to 1.1% at follow-up (see Figure 2.24).

FIGURE 2.24. PAST-30-DAY CNS DEPRESSANT USE AT INTAKE AND FOLLOW-UP (N = 486)



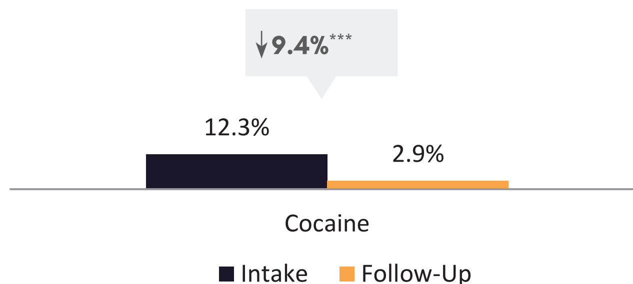
***$p < .001$.

Cocaine

Past-12-month Cocaine Use

A minority of clients (12.3%) reported using cocaine (including crack) in the 12 months before entering treatment, which decreased to 2.9% at follow-up. Overall, there was a 9.4% decrease in the number of clients reporting cocaine use (see Figure 2.25).

FIGURE 2.25. PAST-12-MONTH COCAINE USE AT INTAKE AND FOLLOW-UP (N = 554)

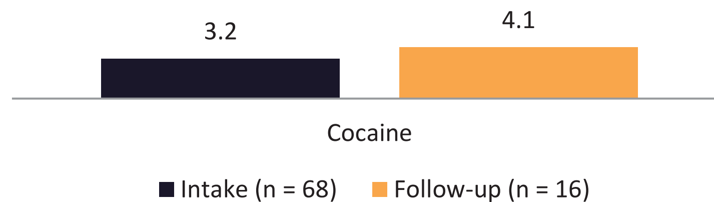


***$p < .001$.

Average Number of Months Used Cocaine

Among the clients who reported using cocaine in the 12 months before entering treatment (n = 68), they reported using cocaine an average of 3.2 months (see Figure 2.26). Clients who reported using cocaine in the 12 months before follow-up (n = 16) reported using cocaine, on average 4.1 months.

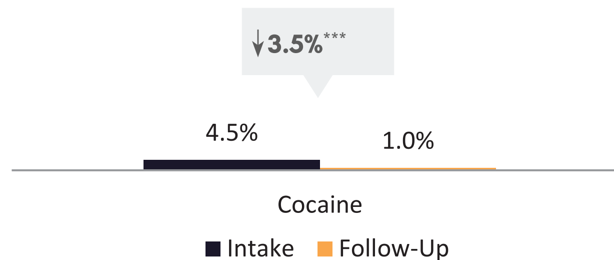
FIGURE 2.26. AVERAGE NUMBER OF MONTHS OF COCAINE USE



Past-30-day Cocaine Use

The percent of clients who reported using cocaine in the past 30 days at intake decreased significantly by 3.5%, from 4.5% at intake to 1.0% at follow-up (see Figure 2.27).

FIGURE 2.27. PAST-30-DAY COCAINE USE AT INTAKE AND FOLLOW-UP (N = 486)



***$p < .001$.

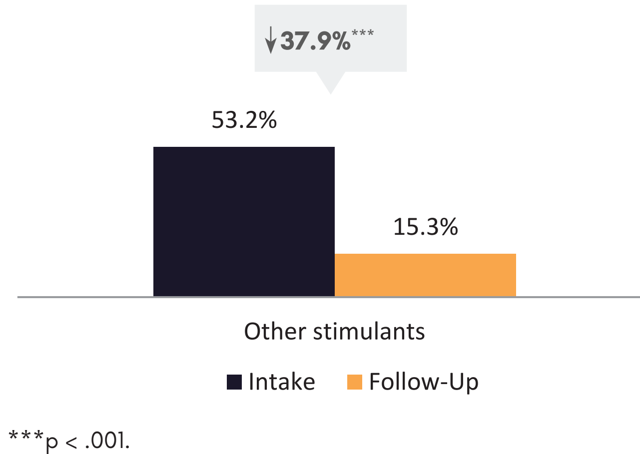
Other Stimulants

Past-12-month Other Stimulant Use

More than half of clients (53.2%) reported using stimulants other than cocaine, including methamphetamine, Ecstasy, MDMA, and non-prescription Adderall and Ritalin in the 12 months before entering treatment, which decreased to 15.3% at follow-up.[42] Overall, for the KTOS follow-up sample, there was a 37.9% decrease in the number of clients reporting other stimulant use (see Figure 2.28).

[42] Among the individuals who reported using stimulants in the 12 months before intake (n = 295), 98.3% reported using methamphetamine, crank, crystal meth.

FIGURE 2.28. PAST-12-MONTH STIMULANT USE OTHER THAN COCAINE AT INTAKE AND FOLLOW-UP (N = 554)

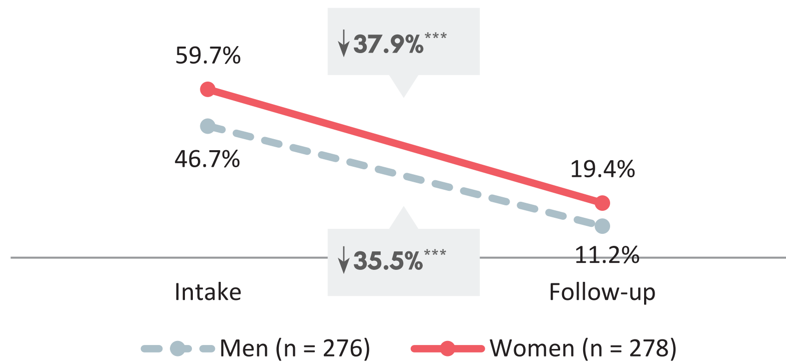


***p < .001.

Gender Differences in Past-12-month Stimulant Use

At intake, significantly more women than men reported any past-12-month stimulant use, 59.7% vs. 46.7% (see Figure 2.29). The number of women and men who reported stimulant use in the past 12 months significantly decreased from intake to follow-up by 40.3% and 35.5% respectively. At follow-up, significantly more women than men reported using stimulants (19.4% vs. 11.2%).

FIGURE 2.29. GENDER DIFFERENCES IN PAST-12-MONTH STIMULANT USE AT INTAKE AND FOLLOW-UP[a]

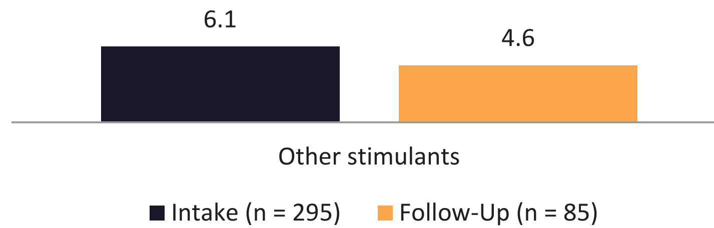


a—Significant difference by gender at intake and follow-up (p < .01).
***p < .001.

Average Number of Months Used Other Stimulants

Among the clients who reported using stimulants other than cocaine in the 12 months before entering treatment (n = 295), they reported using other stimulants an average of 6.1 months (see Figure 2.30). Clients who reported using other stimulants in the 12 months before follow-up (n = 85) reported using other stimulants, on average, 4.6 months.

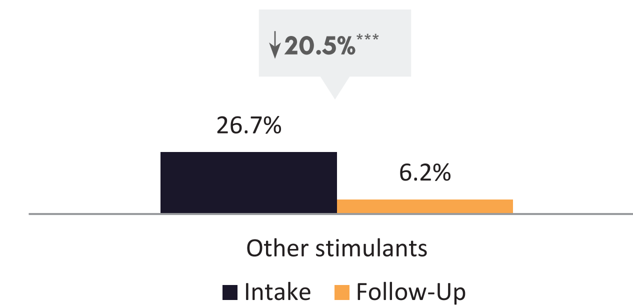
FIGURE 2.30. AVERAGE NUMBER OF MONTHS OF OTHER STIMULANT USE



Past-30-day Other Stimulant Use

A little more than one-fourth of clients reported using stimulants other than cocaine in the past 30 days. At follow-up, only 6.2% of individuals reported past-30-day use of stimulants—a significant decrease of 20.5% (see Figure 2.31).

FIGURE 2.31. PAST-30-DAY STIMULANT USE OTHER THAN COCAINE AT INTAKE AND FOLLOW-UP (N = 486)



***$p < .001$.

Other Illegal Drugs

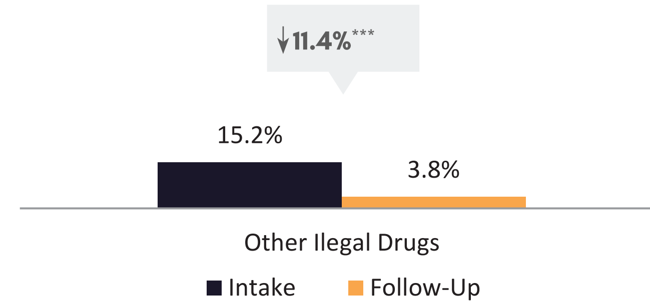
Past-12-month Other Illegal Drugs

A minority of KTOS clients (15.2%) reported using any other illegal drugs (i.e., hallucinogens, inhalants, synthetic drugs) in the 12 months before entering treatment. The number of clients who reported using other illegal drugs decreased to 3.8% at follow-up – a significant decrease of 11.4% (see Figure 2.32).

"The staff was amazing, did not judge me, and gave me full attention and help. It changed mmy life."

– KTOS FOLLOW-UP CLIENT

FIGURE 2.32. PAST-12-MONTH USE OF OTHER ILLEGAL DRUGS AT INTAKE AND FOLLOW-UP (N = 554)

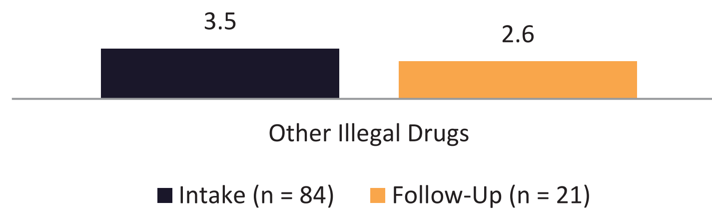


***p < .001.

Average Maximum Number of Months Used Other Illegal Drugs

Figure 2.33 shows the average maximum number of months clients who used other illegal drugs (e.g., hallucinogens, inhalants, synthetic drugs) reported using those illegal drugs[43] in the past 12 months. Among the clients who reported using these drugs in the 12 months before entering treatment (n = 84), they reported using other illegal drugs an average of 3.5 months. Among clients who reported using other illegal drugs in the 12 months before follow-up (n = 21), they reported using an average of 2.6 months.

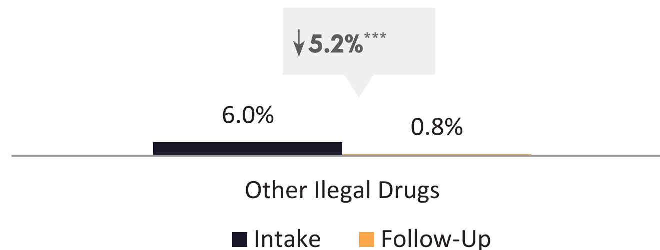
FIGURE 2.33. AVERAGE MAXIMUM NUMBER OF MONTHS OF OTHER ILLEGAL DRUG USE



Past-30-day Other Illegal Drug Use

The percent of clients who reported using other illegal drugs in the 30 days before the intake and follow-up interviews decreased significantly by 5.2%, from 6.0% at intake to 0.8% at follow-up (see Figure 2.34).

FIGURE 2.34. PAST-30-DAY USE OF OTHER ILLEGAL DRUGS AT INTAKE AND FOLLOW-UP (N = 486)



***p < .001.

[43] Because number of months of use of each class of substance was measured separately (e.g., hallucinogens, inhalants, synthetic drugs), the value is a calculation of the maximum number of months clients used any substance class.

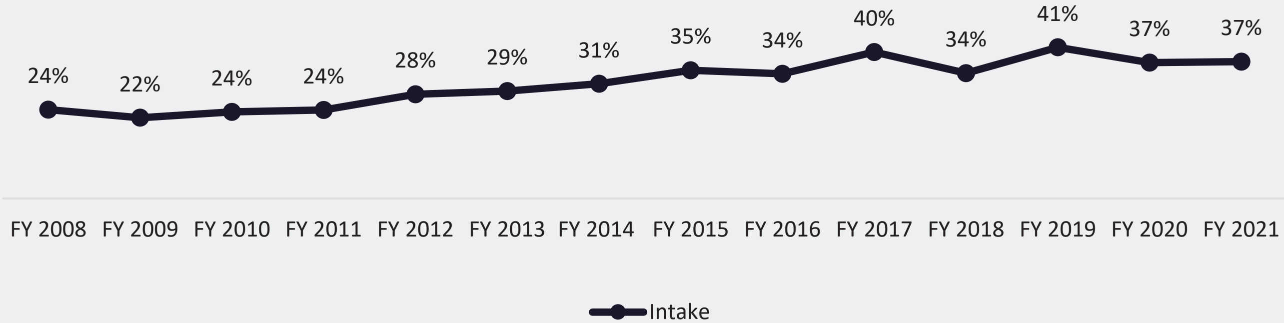
Injection Drug Use

At intake, 37.1% of clients reported having ever injected any drug. Of those clients (n =211), 26.5% reported having ever used a Needle Exchange Program in Kentucky. At follow-up, 9.3% of clients reported injecting drugs in the past 12 months. Of those clients (n = 51), 43.1% reported having used a Needle Exchange program in Kentucky.[44]

Trends in Injection Drug Use

The percent of clients reporting at intake that they had ever injected any drug has generally increased from FY 2008 (24%) to FY 2017 (40%). This number decreased in FY 2018 to 34%, and then increased in FY 2019 to 41%, and was 37% in FY 2020 and FY 2021.

FIGURE 2.35. TRENDS CLIENTS REPORTING HAVING EVER INJECTED ANY DRUG AT INTAKE, FY 2008-2021



Alcohol Use

There were three measures of alcohol use including: (1) any alcohol use, (2) alcohol use to intoxication, and (3) binge drinking. Binge drinking was defined as having 5 or more (4 or more if client was female) alcoholic drinks in a period of about 2 hours.[45]

Past-12-month Alcohol Use

At intake, clients were asked how old they were when they had their first alcoholic drink (other than just a few sips). On average, KTOS clients reported they were 15.2 years old when they had

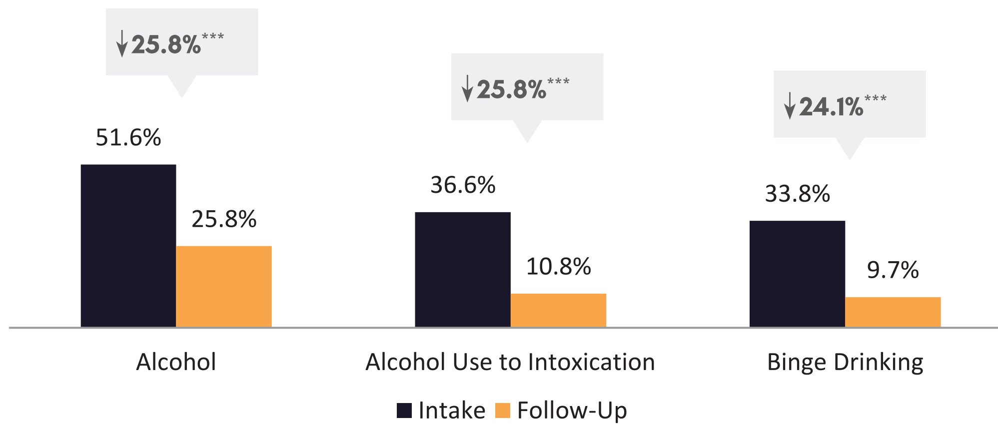
[44] Two clients had missing data for needle exchange program use at follow-up.

[45] National Institute on Alcohol Abuse and Alcoholism. (2004, Winter). NIAAA council approves definition of binge drinking. *NIAAA Newsletter, Winter 2004* (3). Rockville, MD: Department of Health and Human Services, National Institutes of Health, National Institute on Alcohol Abuse and Alcoholism.

their first alcoholic drink (not depicted in figure).[46]

Half of clients (51.6%) reported using alcohol in the 12 months before entering treatment while 25.8% of clients reported alcohol use in the 12 months before follow-up (see Figure 2.36). Overall, for the KTOS follow-up sample, there was a 25.8% decrease in the number of clients reporting alcohol use in the past 12 months. More than one-third of clients (36.6%) reported using alcohol to intoxication at intake, with 10.8% reporting alcohol use to intoxication in the 12 months before follow-up. Similarly, there was a significant decrease of 24.1% in the number of clients who reported past-12-month binge drinking from intake to follow-up (33.8% vs. 9.7%).

FIGURE 2.36. PAST-12-MONTH ALCOHOL USE AT INTAKE AND FOLLOW-UP (N = 554)



***$p < .001$.

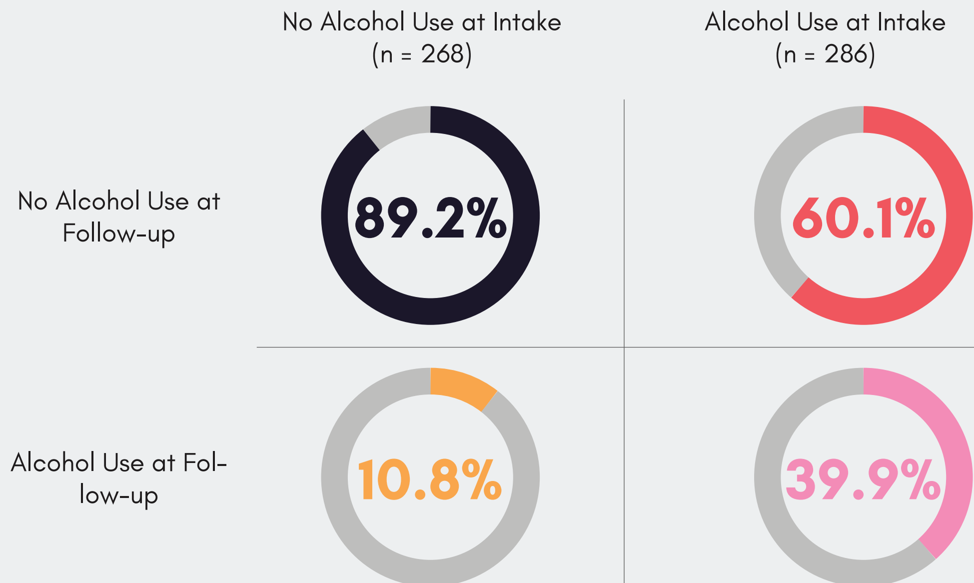
[46] Of the individuals in the follow-up sample, 12 reported they have never had an alcoholic drink.

Taking a Closer Look at Alcohol Use

About half of KTOS clients reported using alcohol in the 12 months before entering treatment (51.6%; n = 286). Of these clients who reported using alcohol in the past 12 months at intake, 60.1% did not use alcohol in the past 12 months at follow-up (see Figure 2.37). However, 39.9% of those who reported alcohol use at intake also reported use at follow-up.

A majority of those who did not use alcohol at intake also reported abstinence at follow-up (89.2%) while 10.8% of clients reported using alcohol at follow-up after reporting no use at intake.

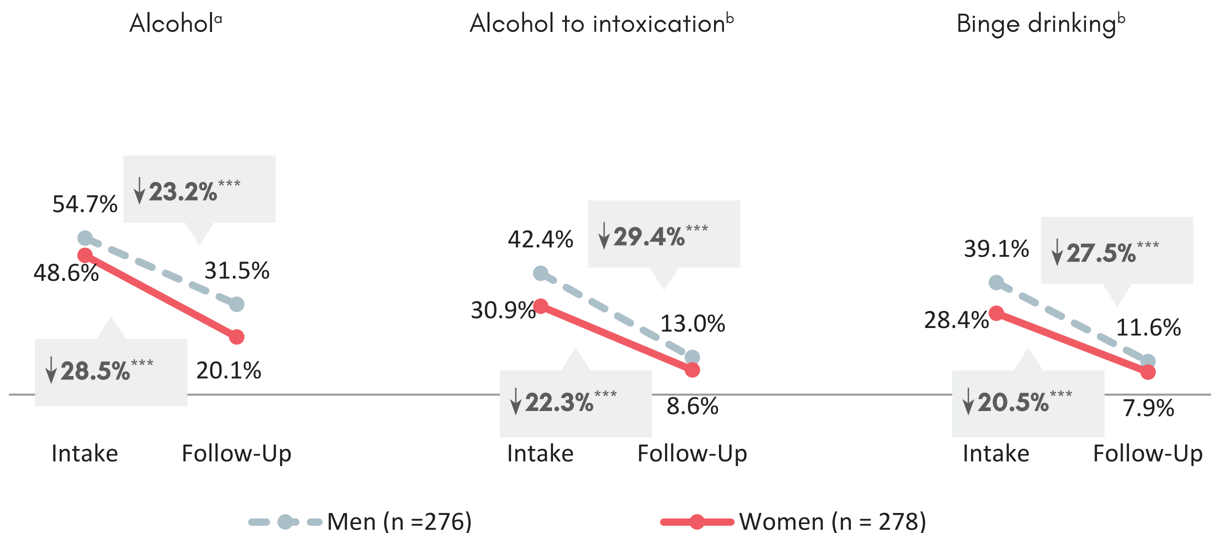
FIGURE 2.37. PAST-12-MONTH ALCOHOL USE AT INTAKE AND FOLLOW-UP BASED ON ALCOHOL USE AT INTAKE



Gender Differences in Past-12-month Alcohol Use, Alcohol to Intoxication, and Binge Drinking

At intake, there was no gender difference in the alcohol use in the 12 months before entering treatment (see Figure 2.38). The number of men and women reporting alcohol use decreased significantly from intake to follow-up. At follow-up, significantly more men reported using alcohol in the 12 months before follow-up compared to women. At intake, significantly more men (42.4%) reported alcohol use to intoxication compared to women (30.9%). The number of men and women reporting alcohol use to intoxication decreased significantly from intake to follow-up. At intake, significantly more men (39.1%) reported binge drinking compared to women (28.4%). The number of men and women reporting binge drinking decreased significantly from intake to follow-up. There was no difference by gender at follow-up for binge drinking.

FIGURE 2.38. GENDER DIFFERENCES IN PAST-12-MONTH ALCOHOL USE, ALCOHOL TO INTOXICATION, AND BINGE DRINKING AT INTAKE AND FOLLOW-UP[a]

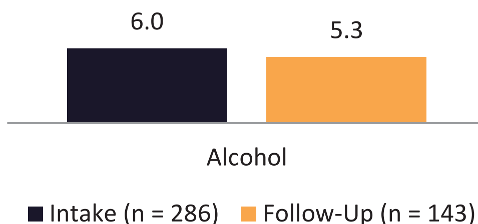


a—Significant difference by gender at follow-up (p < .01)
b—Significant difference by gender at intake (p < .01).
***p < .001.

Average Number of Months Used Alcohol

Figure 2.39 shows the average number of months alcohol users reported using alcohol at intake and follow-up. Among the clients who reported using alcohol in the 12 months before entering treatment (n = 286), they reported using alcohol, on average, 6.0 months. Among clients who reported using alcohol in the 12 months before follow-up (n = 143), they reported using, on average, 5.3 months.

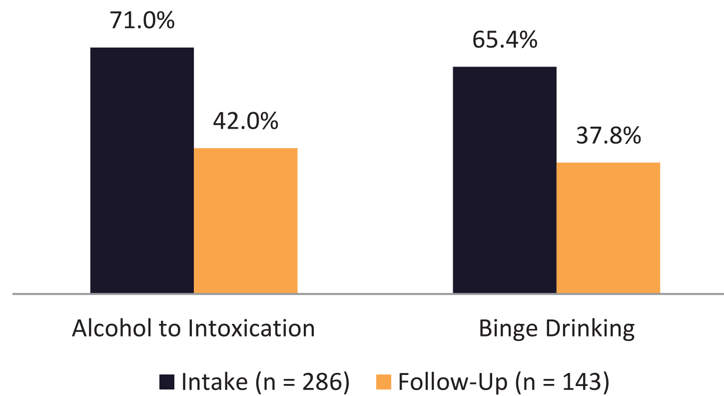
FIGURE 2.39. AVERAGE NUMBER OF MONTHS OF ALCOHOL USE



Past-12-month Alcohol Intoxication and Binge Drinking Among Those Who Used Alcohol at Each Point

Of the clients who used alcohol in the 12 months before entering treatment (n = 286), 71.0% used alcohol to intoxication in the 12 months before intake and 65.4% reported binge drinking (see Figure 2.40). Of the clients who used alcohol in the 12 months before follow-up (n = 143), 42.0% of clients reported alcohol use to intoxication and 37.8% reported binge drinking.

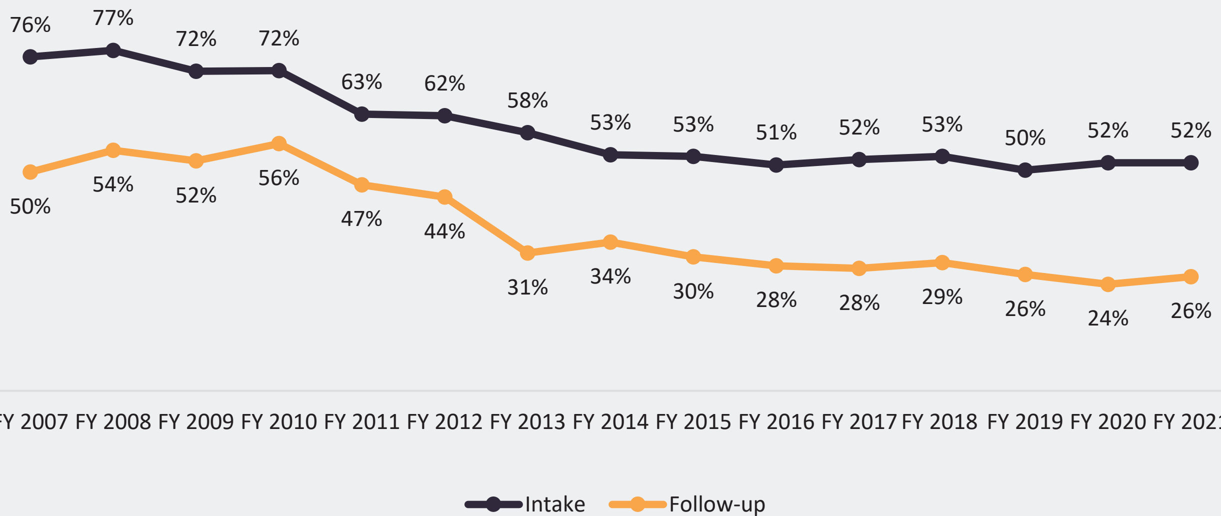
FIGURE 2.40. PAST-12-MONTH ALCOHOL USE TO INTOXICATION AND BINGE DRINKING AT INTAKE AND FOLLOW-UP, AMONG THOSE REPORTING ALCOHOL USE AT EACH POINT



Trends in Past-12-month Alcohol Use

The percent of KTOS clients reporting alcohol use in the 12 months before treatment has decreased over time (see Figure 2.41). Overall, at follow-up, the percent of clients reporting alcohol use has also decreased over the years.

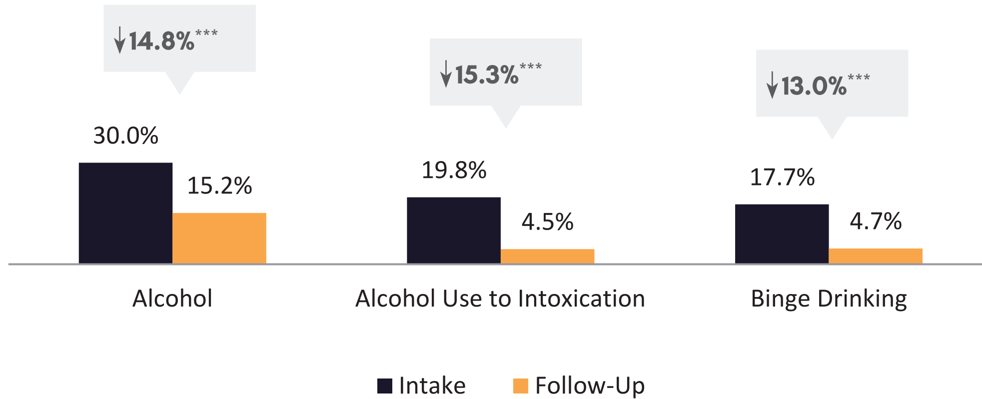
FIGURE 2.41. TRENDS IN ALCOHOL USE AT INTAKE AND FOLLOW-UP, FY 2007-2021



Past-30-day Alcohol Use

There was a 14.8% decrease in the percent of clients who reported using alcohol in the past 30 days from intake (30.0%) to follow-up (15.2%; see Figure 2.42). The decrease in the number of clients who reported using alcohol to intoxication was 15.3% and 13.0% for those who reported binge drinking in the 30 days before entering treatment.

FIGURE 2.42. PAST-30-DAY ALCOHOL USE AT INTAKE AND FOLLOW-UP (N = 486)

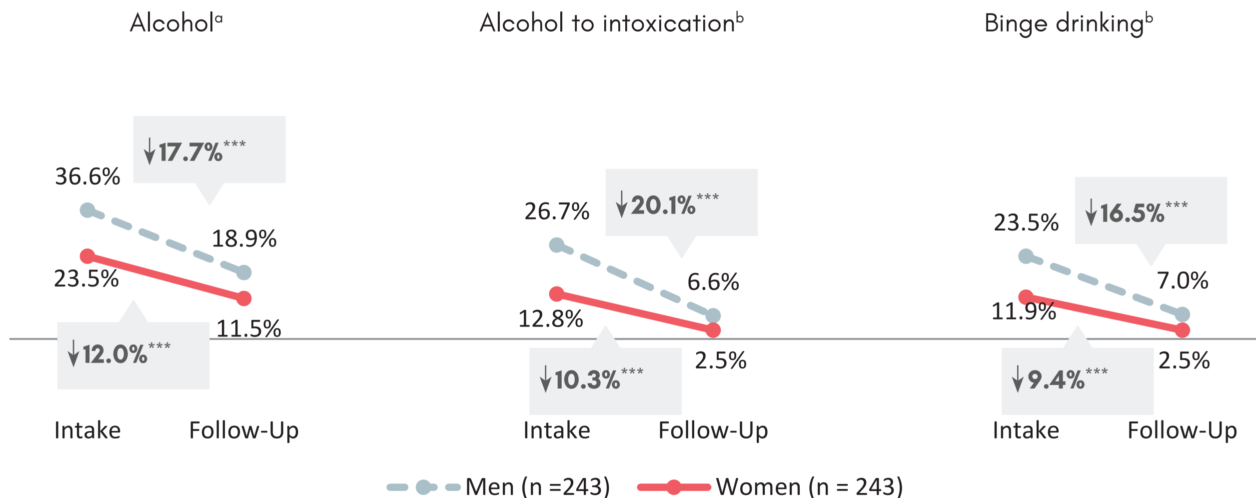


***$p < .001$.

Gender Differences in Past-30-day Alcohol Use

Significantly more men than women reported using alcohol, alcohol to intoxication, and binge drinking in the 30 days before entering treatment and the 30 days before follow-up (see Figure 2.43). The number of men and women who reported alcohol use, alcohol use to intoxication, and binge drinking decreased significantly from intake to follow-up.

FIGURE 2.43. GENDER DIFFERENCES IN PAST-30-DAY ALCOHOL USE AT INTAKE AND FOLLOW-UP

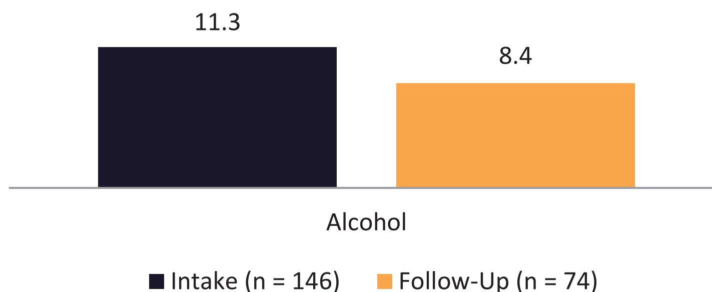


a—Significant difference by gender at intake ($p < .01$) and follow-up ($p < .05$).
b—Significant difference by gender at intake ($p < .001$) and follow-up ($p < .05$).
***$p < .001$.

Average Number of Days Used Alcohol

Figure 2.44 shows the average number of days alcohol users reported using alcohol in the 30 days before intake and follow-up. Among the clients who reported using alcohol in the 30 days before entering treatment (n = 146), they reported using alcohol, on average, 11.3 days. Among clients who reported using alcohol in the 30 days before follow-up (n = 74), they reported using, on average, 8.4 days.

FIGURE 2.44. AVERAGE NUMBER OF DAYS OF ALCOHOL USE

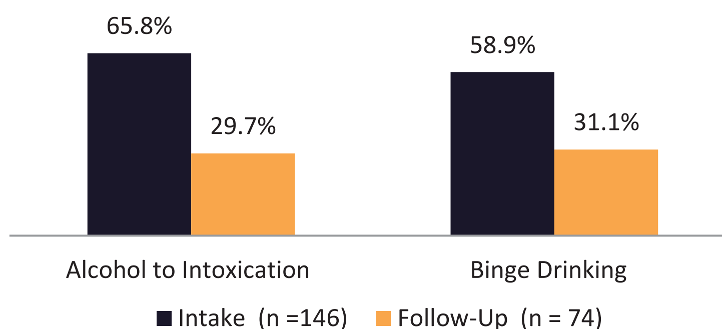


Past-30-day Alcohol Intoxication and Binge Drinking Among Those Who Used Alcohol

Of the 146 clients who used alcohol in the 30 days before intake, 65.8% used alcohol to intoxication and 58.9% binge drank in the 30 days before intake (see Figure 2.45).

Of the 74 clients who reported using alcohol in the 30 days before follow-up, 29.7% reported using alcohol to intoxication and 31.1% reported binge drinking in the 30 days before follow-up.

FIGURE 2.45. PAST-30-DAY ALCOHOL USE TO INTOXICATION AND BINGE DRINKING AT INTAKE AND FOLLOW-UP, AMONG THOSE REPORTING ALCOHOL USE AT EACH POINT



Self-reported Symptoms of Alcohol and Drug Use Severity

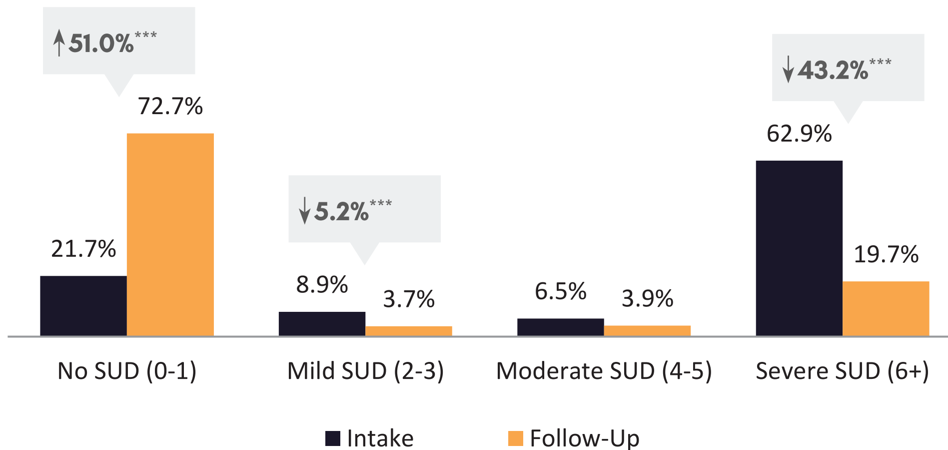
DSM-5 Criteria for Substance Use Disorder, Past 12 Months

One way to examine overall change in degree of severity of substance use is to ask participants to self-report whether they met any of the 11 symptoms included in the DSM-5 criteria for diagnosing substance use disorder (SUD) in the past 12 months.[47] 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 (0 or 1 criterion met), (2) mild SUD (2 or 3 criteria met), (3) moderate SUD (4 or

[47] The DSM-5 diagnostic criteria for substance use disorders included in the KTOS 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.

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. At intake, the majority of clients met criteria for severe SUD, while at follow-up, the majority of clients met criteria for no SUD (see Figure 2.46).[48] Significant changes in the proportion of individuals classified in each category for severity of SUD were found.

FIGURE 2.46. DSM-5 SUD SEVERITY AT INTAKE AND FOLLOW-UP (N = 539)[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 is to use the Addiction Severity Index (ASI) composite score 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 several issues including:

- The 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 treatment is to them for their alcohol (or drug) problems (see sidebar).

[48] Fifteen individuals had missing data for DSM-5 criteria for substance use disorder at follow-up.

ASI Alcohol and Drug Composite Scores and Substance Use Disorder

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 about 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.

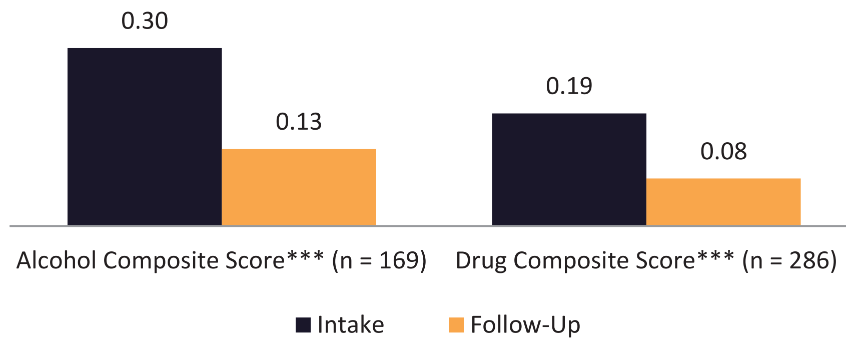
Rikoon, S., Cacciola, J., Carise, D., Alterman, A., McLellan, A. (2006). Predicting DSM-IV dependence diagnoses from Addiction Severity Index composite scores. *Journal of Substance Abuse Treatment*, *31*(1), 17-24.

American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Arlington, VA: American Psychiatric Publishing.

Change in the average ASI composite score for alcohol and drug use was examined for clients who were not in a controlled environment all 30 days before entering treatment. Also, individuals who reported abstaining from alcohol at intake and follow-up were not included in the analysis of change for alcohol composite score. Similarly, clients who reported abstaining from drugs at both intake and follow-up were not included in the analysis of change in drug composite score.

Figure 2.47 displays the change in average composite scores.[49, 50] The average for the alcohol composite score decreased significantly from 0.30 at intake to 0.13 at follow-up. The average for the drug composite score decreased significantly from 0.19 at intake to 0.08 at follow-up.

FIGURE 2.47. AVERAGE ASI ALCOHOL AND DRUG COMPOSITE SCORES AT INTAKE AND FOLLOW-UP



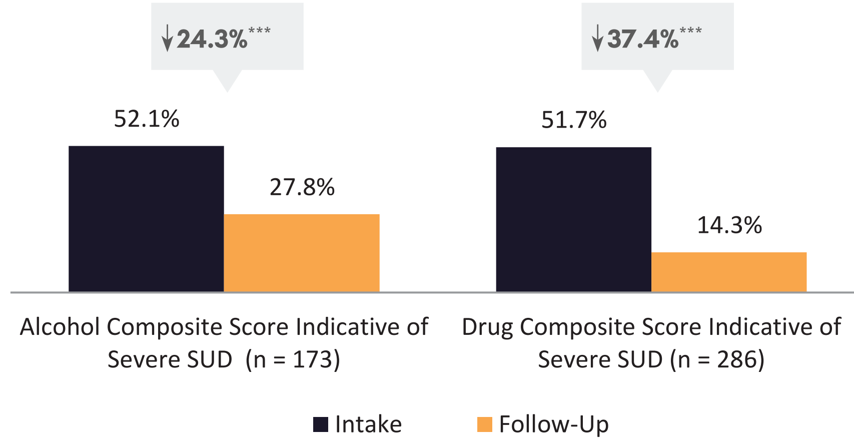
***$p < .001$.

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 2.48). A little more than half individuals (52.1%) who reported any alcohol use in the 30 days before intake and/or follow-up had alcohol composite scores indicative of severe SUD at intake. At follow-up, this percent had decreased to 27.8%. About half of individuals who reported any drug use in the 30 days before intake and/or follow-up had drug composite scores indicative of severe SUD at intake (51.7%). At follow-up, 14.3% had drug composite scores indicative of severe SUD.

[49] The following number of cases were not included in the analysis of change in alcohol composite score: 70 individuals reported being in a controlled environment all 30 days before intake; 13 additional individuals were in a controlled environment all 30 days before follow-up; an additional 313 clients reported abstaining from alcohol in the 30 days before intake and follow-up; and 4 individuals had missing data from items included in the calculation of the alcohol composite at follow-up.

[50] The following numbers were not included in the analysis of change in drug composite score: 70 individuals reported being in a controlled environment all 30 days before intake; 13 individuals were in a controlled environment all 30 days before follow-up; an additional 193 clients reported abstaining from drugs in the 30 days before intake and follow-up, and 7 clients had missing data from items included in the calculation of the drug composite score at follow-up.

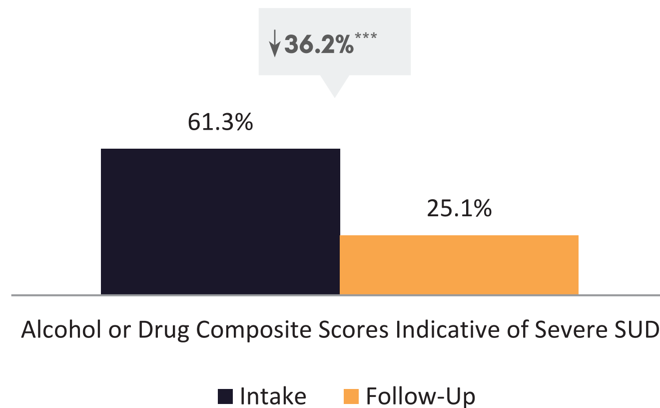
FIGURE 2.48. INDIVIDUALS WITH ASI COMPOSITE SCORES MEETING THE CUTOFF FOR SEVERE SUBSTANCE USE DISORDER AT INTAKE AND FOLLOW-UP[51]



***p < .001.

Among the individuals who were not in a controlled environment all 30 days before entering treatment and who reported using alcohol and/or drugs at intake or follow-up, a majority of individuals had alcohol or drug composite scores that met the cutoff for severe SUD at intake (see Figure 2.49). The percent of clients who had composite scores that met the cutoff for severe SUD for either alcohol or drugs decreased by 36.2% at follow-up.

FIGURE 2.49. CLIENTS WITH ASI COMPOSITE SCORES MEETING THE CUTOFF FOR ALCOHOL OR DRUG SEVERE USE DISORDERS AT INTAKE AND FOLLOW-UP (N = 351)[52]



***p < .001.

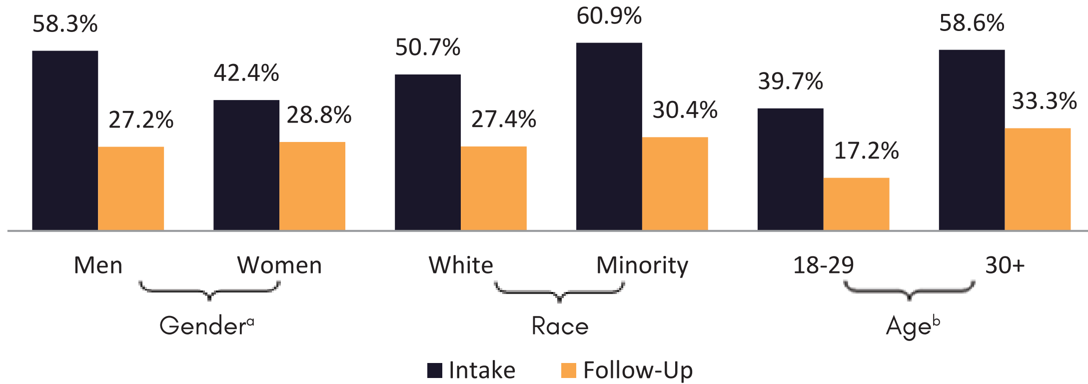
The data was examined to determine whether clients who had alcohol composite scores indicative of severe SUD at intake and follow-up differed by gender, race/ethnicity, or age (see Figure 2.50). At intake, significantly more men than women had an alcohol composite score

[51] Six clients had missing data for the alcohol score variables at follow-up and 11 clients had missing data for the drug composite score variables at follow-up.

[52] The following number of cases were not included in the analysis of change in alcohol composite score: 70 clients were in a controlled environment all 30 days before treatment; 13 additional individuals were in a controlled environment all 30 days before follow-up; and an additional 135 clients reported abstaining from alcohol and drugs in the 30 days before intake and follow-up.

indicative of severe SUD. At both intake and follow-up, significantly more individuals from the 30 and older age group had an alcohol composite score indicative of severe SUD. There were no statistically significant differences between racial groups.

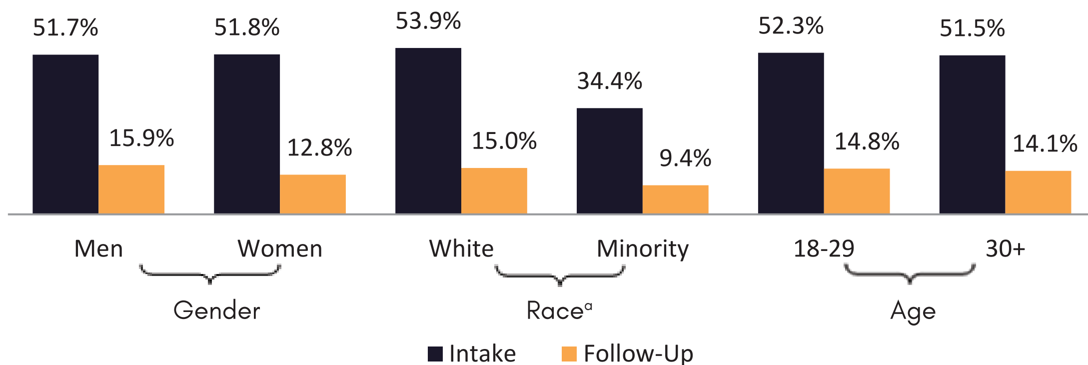
FIGURE 2.50. ALCOHOL-USING CLIENTS WITH AN ALCOHOL COMPOSITE SCORE INDICATIVE OF SEVERE SUD AT INTAKE AND FOLLOW-UP BY DEMOGRAPHIC FACTORS (N = 169)



a—Significant difference by gender at intake ($p < .05$).
b—Significant difference by age group at intake and follow-up ($p < .05$)

Analyses were also conducted to determine if clients who had a drug composite score indicative of severe SUD at intake and follow-up differed by gender, race/ethnicity, or age (see Figure 2.51). Significantly more White individuals had drug composite scores indicative of severe SUD at intake. There were no other statistically significant differences.

FIGURE 2.51. DRUG-USING CLIENTS WITH A DRUG COMPOSITE SCORE INDICATIVE OF SEVERE SUD AT INTAKE AND FOLLOW-UP BY DEMOGRAPHIC FACTORS (N = 286)

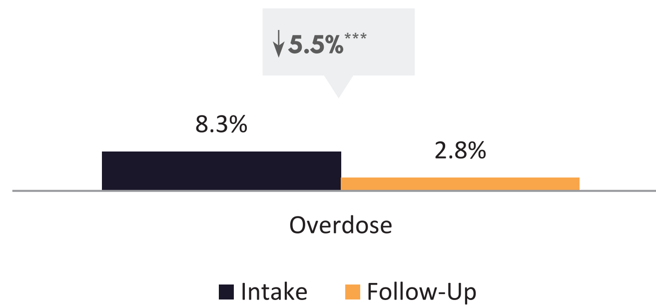


a Significant difference by race at intake ($p<.05$)

Overdose in the Past 12 Months

The percent of individuals who reported that they had experienced an overdose in the past 12 months decreased significantly from intake to follow-up (see Figure 2.52).

FIGURE 2.52. CLIENTS REPORTED OVERDOSE IN THE PAST 12 MONTHS AT INTAKE AND FOLLOW-UP (N = 351)[53]

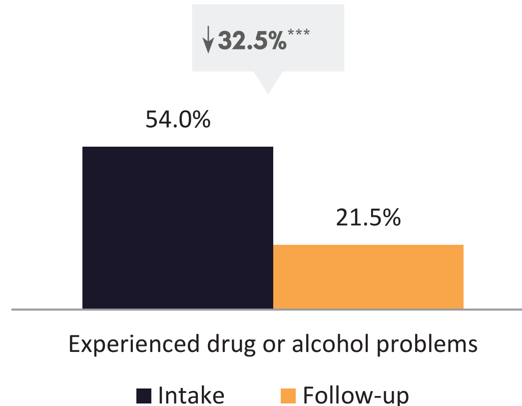


***p < .001.

Problems Experienced with Substance Use in the Past 30 Days

In the past 30 days at intake, 54.0% of clients reported they experienced problems with drugs or alcohol such as craving, withdrawal, wanting to quit but being unable, or worrying about relapse (see Figure 2.53). In the past 30 days at follow-up, 21.5% of clients reported experiencing problems with drugs or alcohol (a significant decrease of 32.5%).

FIGURE 2.53. CLIENTS EXPERIENCING PROBLEMS WITH ILLEGAL DRUGS OR ALCOHOL AT INTAKE AND FOLLOW-UP (N =568)



***p < .001.

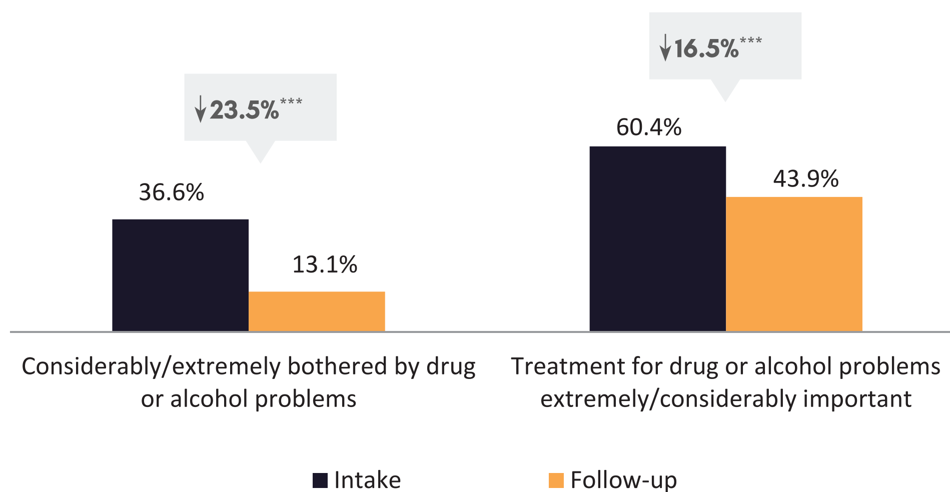
[53] The following number of cases were not included in the analysis of change in alcohol composite score: 70 clients were in a controlled environment all 30 days before treatment; 13 additional individuals were in a controlled environment all 30 days before follow-up; and an additional 135 clients reported abstaining from alcohol and drugs in the 30 days before intake and follow-up.

Readiness for Substance Abuse Treatment

Figure 2.54 shows that 36.6% of clients reported they were considerably or extremely troubled or bothered by drug or alcohol problems in the past 30 days at intake. In the past 30 days at follow-up, 13.1% of clients reported that they were considerably or extremely troubled or bothered by drug or alcohol problems (a significant decrease of 23.5%).

The figure below also shows that 60.4% of clients in the past 30 days at intake and 43.9% of clients in the past 30 days at follow-up reported that treatment for drug or alcohol problems was considerably or extremely important – a significant decrease of 16.5%.

FIGURE 2.54. READINESS FOR TREATMENT FOR ILLEGAL DRUG OR ALCOHOL USE AT INTAKE AND FOLLOW-UP (n = 566)[54]



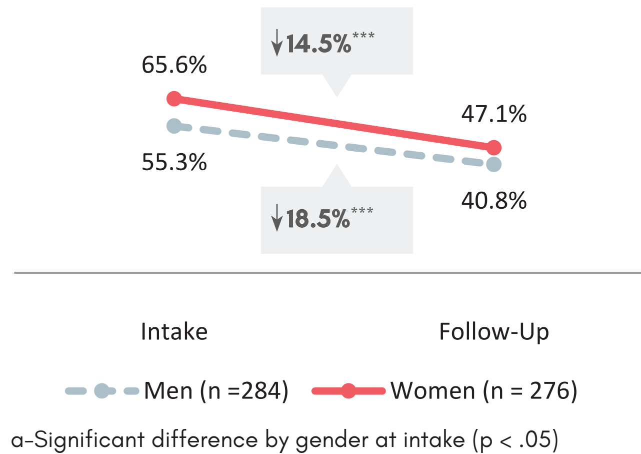
***p < .001.

Gender Differences in Importance of Treatment

Significantly more women reported that treatment for a substance use problem was considerably or extremely important in the 30 days before entering treatment compared to women (See Figure 2.55). The percent of women and men who reported treatment was considerably or extremely important to them decreased significantly from intake to follow-up. There was no gender difference at follow-up.

[54] Two individuals had missing data for how bothered by drug or alcohol problems they were and nine individuals had missing data for the item about how important treatment was for them at follow-up.

FIGURE 2.55. READINESS FOR TREATMENT FOR ILLEGAL DRUG OR ALCOHOL USE AT INTAKE AND FOLLOW-UP BY GENDER (n = 560)[a]



a-Significant difference by gender at intake (p < .05)

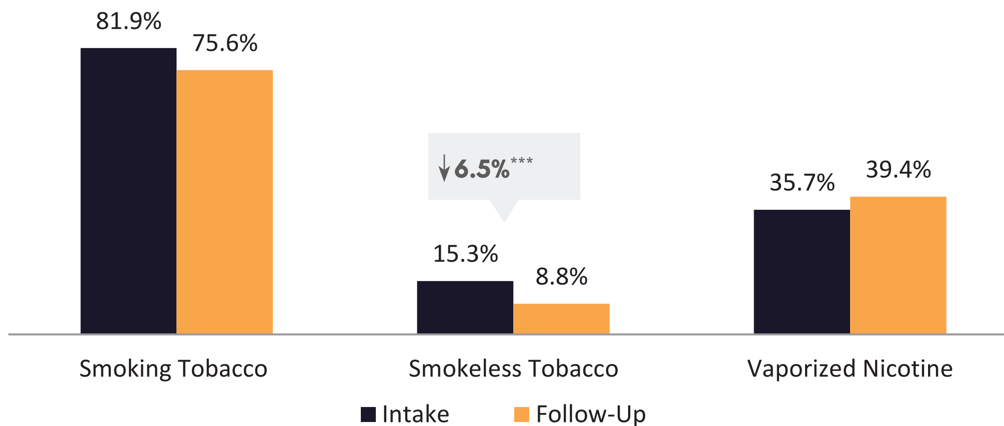
Tobacco Use

Past-12-month Smoking, Smokeless Tobacco, and Vaporized Nicotine Use

At intake, clients were asked how old they were when they first began to smoke tobacco regularly (i.e., on a daily basis). On average, KTOS clients reported they were 16.3 years old when they started smoking tobacco regularly (not depicted in figure).[55]

Past-12-month smoking tobacco use significantly decreased from intake to follow-up while smokeless tobacco use remained stable (see Figure 2.56). Most clients reported smoking tobacco in the 12 months before entering treatment (81.9%) and in the 12 months before follow-up (75.6%). A minority of clients reported using smokeless tobacco in the 12 months before entering treatment and follow-up. About one-third of clients (35.7%) reported using vaporized nicotine in the 12 months before entering treatment and 39.4% of clients reported using vaporized nicotine in the 12 months before follow-up.

FIGURE 2.56. CHANGE IN PAST-12-MONTH TOBACCO AND VAPORIZED NICOTINE USE FROM INTAKE TO FOLLOW-UP (n = 554)



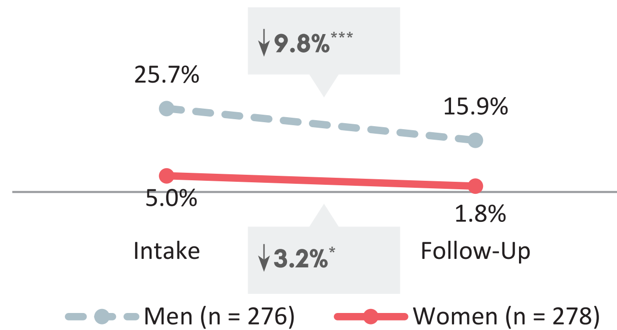
***p < .001.

[55] Of those individuals in the follow-up sample, 106 reported they had never smoked regularly, so they were not included in the analysis.

Gender Differences in Past-12-month Smokeless Tobacco

Significantly more men than women reported using smokeless tobacco at intake and follow-up (see Figure 2.57). There was a significant decrease in the percent of men and women who reported using smokeless tobacco from intake to follow-up.

FIGURE 2.57. GENDER DIFFERENCES IN PAST-12-MONTH SMOKELESS TOBACCO FROM INTAKE TO FOLLOW-UP (n=554)[a]

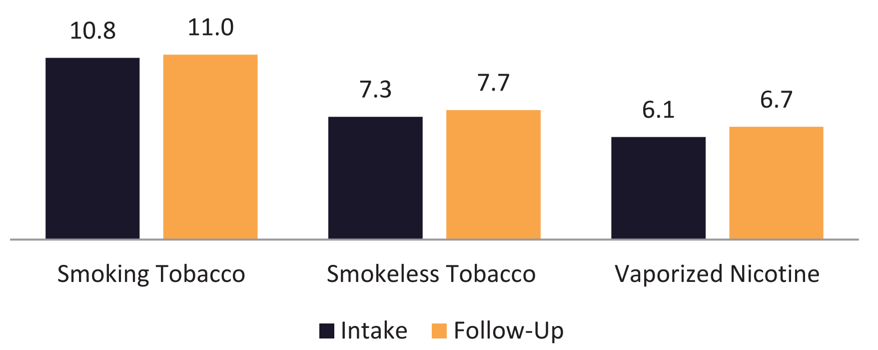


a—Significant difference by gender at intake and follow-up ($p < .001$).
*$p < .05$, ***$p < .001$.

Average Number of Months of Smoking, Smokeless Tobacco, and Vaporized Nicotine Use

Figure 2.58 shows the average number of months clients who smoked tobacco or used smokeless tobacco or vaporized nicotine products reported using tobacco at intake and follow-up. Among the clients who reported using smoking tobacco in the 12 months before entering treatment (n = 454), they reported using tobacco, on average, 10.8 months. Of the clients who reported using smoking tobacco in the 12 months before follow-up (n = 419), they reported using, on average, 11.0 months. Among the clients who reported using smokeless tobacco in the 12 months before entering treatment (n = 85), they reported using it, on average, 7.3 months. Of the clients who reported using smokeless tobacco in the 12 months before follow-up (n = 49), they reported using it, on average, 7.7 months. Among the clients who reported using vaporized nicotine in the 12 months before entering treatment (n = 198), they reported using it, on average, 6.1 months. Of the clients who reported using vaporized nicotine products in the 12 months before follow-up (n = 218), they reported using them, on average, 6.7 months.

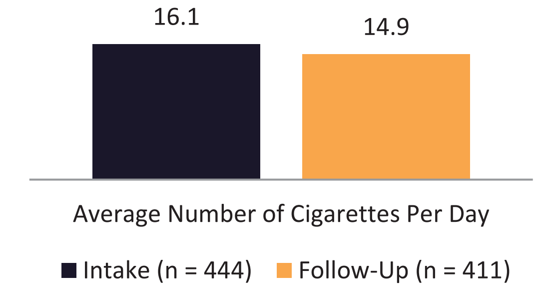
FIGURE 2.58. AVERAGE NUMBER OF MONTHS OF SMOKING, SMOKELESS TOBACCO, AND VAPORIZED NICOTINE USE



Average Number of Cigarettes Smoked

The average number of cigarettes clients reported smoking at intake and follow-up remained relatively stable (see Figure 2.59). Of those who smoked tobacco in the 12 months before entering treatment, clients reported smoking an average of 16.1 cigarettes per day. At follow-up, among clients who reported smoking tobacco, they reported smoking an average of 14.9 cigarettes per day.

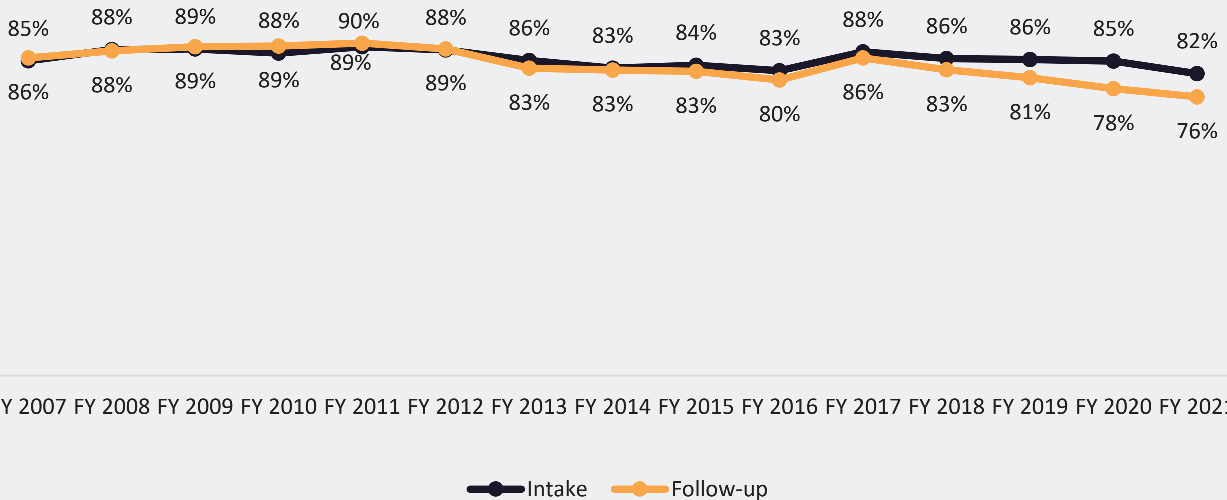
FIGURE 2.59. NUMBER OF CIGARETTES SMOKED IN AN AVERAGE DAY AMONG CLIENTS WHO SMOKED TOBACCO[56]



Trends in Past-12-month Smoking Tobacco Use

The majority of KTOS clients at intake and follow-up reported smoking tobacco. The percent of clients reporting smoking tobacco use at either intake or follow-up has remained between a low of 76% at follow-up in FY 2021 and a high of 90% at follow-up in FY 2011.

FIGURE 2.60. TRENDS IN SMOKING TOBACCO USE AT INTAKE AND FOLLOW-UP, FY 2007-FY 2021

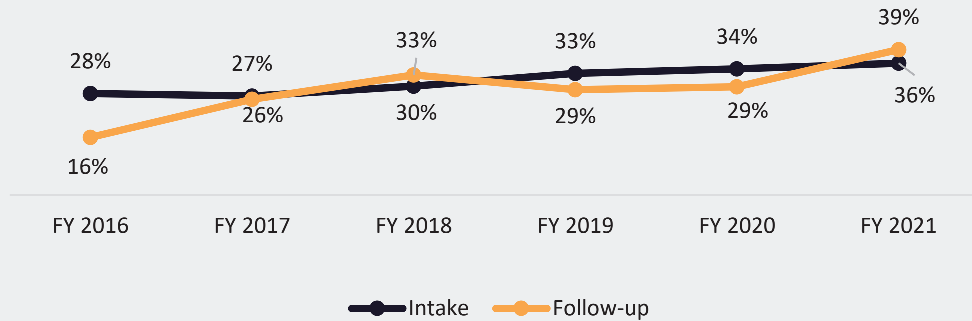


[56] Ten cases had missing data for number of cigarettes smoked at intake, and 4 cases had missing data for number of cigarettes smoked at follow-up.

Trends in Past-12-month Vaporized Nicotine Use

KTOS clients have been providing data about use of vaporized nicotine since FY 2016. The percent of KTOS clients who report past-12-month use of vaporized nicotine has increased from 28% in FY 2016 to 36% in FY 2021. The percent of clients reporting vaporized nicotine use at follow-up has also increased over time, from 16% in FY 2016 to 39% in FY 2021.

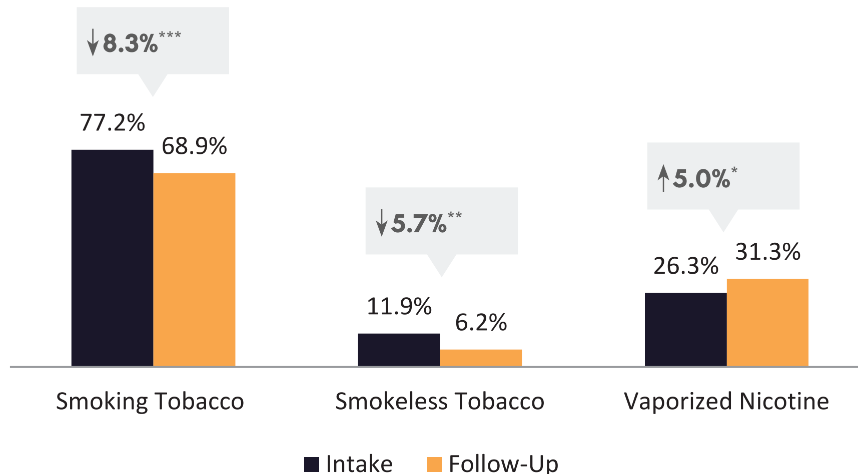
FIGURE 2.61. TRENDS IN VAPORIZED NICOTINE USE AT INTAKE AND FOLLOW-UP, FY 2016-FY 2021



Past-30-day Smoking, Smokeless Tobacco, and Vaporized Nicotine Use

The percent of clients who reported any past-30-day smoking tobacco significantly decreased from intake (77.2%) to follow-up (68.9%; see Figure 2.62). Past-30-day use of smokeless tobacco use decreased significantly intake to follow-up. The percent of clients who vaporized nicotine increased significantly from intake to follow-up.

FIGURE 2.62. PAST-30-DAY SMOKING, SMOKELESS TOBACCO, AND VAPORIZED NICOTINE USE AT INTAKE AND FOLLOW-UP (n = 486)

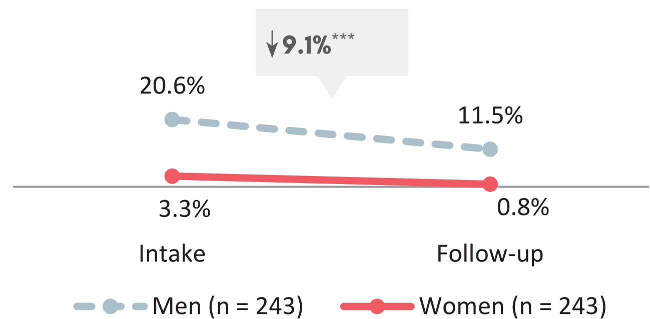


***p < .001, **p<.01, *p<.05.

GENDER DIFFERENCES IN PAST-30-DAY SMOKELESS TOBACCO USE

Significantly more men than women reported using smokeless tobacco in the 30 days before intake and follow-up (See Figure 2.63). There was a significant decrease in the percent of men who reported past-30-day smokeless tobacco use from intake to follow-up.

FIGURE 2.63. GENDER DIFFERENCES IN PAST-30-DAY SMOKELESS TOBACCO AT INTAKE AND FOLLOW-UP[a]

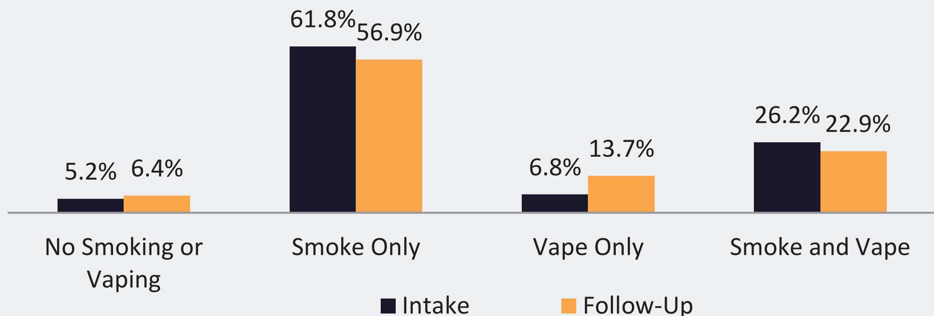


a—Significant different by gender at intake ($p < .001$) and follow-up ($p < .001$).
***$p < .001$.

Taking a Closer Look at Smoking and Vaping

Among individuals who reported vaporizing nicotine or smoking in the 30 days before intake or follow-up (n=497[57]) 61.8% of clients reported smoking only at intake compared to 56.9% at follow-up (See Figure 2.64). The percent of clients who reported vaporizing nicotine increased from 6.8% to 13.7%. About one- quarter of clients reported both smoking and vaporizing nicotine at intake with a slight decrease to 22.9% at follow-up. Comparing nicotine use from intake to follow-up for all followed-up clients (n=569), 6.7% of individuals completely replaced smoking with vaporizing nicotine (not depicted in a figure).

FIGURE 2.64. PAST-30-DAY NICOTINE USE AT INTAKE AND FOLLOW-UP (n = 497)

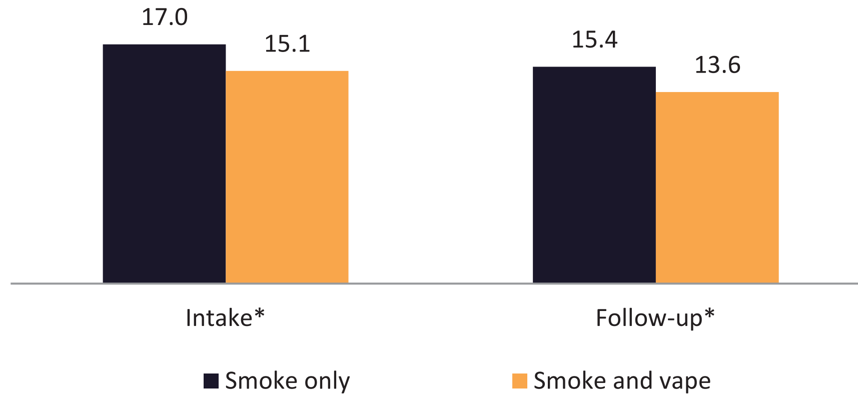


[57] Those who only reported using smokeless tobacco were not included in this analysis.

Past-30-days Number of Cigarettes Smoked by Smoke Only Vs. Smoke and Vape

Between those who only smoked cigarettes and those who used vaporized nicotine in addition to smoking in the 30 days before each period, the clients who supplemented smoking with vaporizing nicotine smoked significantly less cigarettes than those who only smoked at each period (See Figure 2.65). However, no information was collected about the amount of vaporized nicotine consumed.

FIGURE 2.65. GROUP DIFFERENCES IN PAST-30-DAY NICOTINE USE AND NUMBER OF CIGARETTES SMOKED AT INTAKE AND FOLLOW-UP



a—Significant different by group at intake and follow-up (p < .05).

"I didn't think I needed it and didn't want to do it but then I started going and connected with my therapist. Then I had something traumatic happened and my therapist really helped me."

– KTOS FOLLOW-UP CLIENT

| Section 3. Bivarate and Multivariate Analysis of Factors Associated with Relapse

This section focuses on a multivariate analysis examining factors related to relapse in the 2023 KTOS follow-up sample.

KTOS clients who reported using any illegal drugs and/or engaged in problem alcohol use (i.e., alcohol to intoxication or binge drinking) in the 12 months before follow-up (n = 274, 48.2%) were compared to clients who did not report use of any drugs or alcohol in the 12 months before follow-up (n = 295, 51.8%) in bivariate statistical tests. Several factors measured at intake were significantly associated with relapse in the follow-up period (see Table 3.1): number of nights incarcerated, number of mental health symptoms, number of people the client could count on for recovery support, and quality of life rating.

TABLE 3.1. BIVARIATE COMPARISON OF TARGETED FACTORS FOR RELAPSE AND NON-RELAPSE GROUPS

INTAKE FACTORS	Used illegal drugs or engaged in problem alcohol in the 12 months before follow-up (n = 274)	Did not use illegal drugs or engage in problem alcohol use in the 12 months before follow-up (n = 295)
Average age at intake	36.1	35.8
Male	54.0%	47.1%
Met criteria for moderate or severe SUD per DSM-5	69.0%	67.1%
Number of nights incarcerated in the 12 months before intake***	28.7	52.8
Number of months employed in the 12 months before intake	4.2	4.2
Average number of mental health symptoms (depression and anxiety) reported at intake*	8.4	7.3
Number of people client could count on for recovery support at intake*	5.8	7.1
Average quality of life rating at intake***	6.6	7.2
Average number of adverse childhood experiences	4.0	3.7

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

These same factors in Table 3.1 were included in a logistic regression to examine which factors were significantly associated with relapse, after controlling for other factors. Any illegal drug or problem alcohol use in the 12-month follow-up period was the dependent variable. Results of the logistic regression show that when controlling for other variables in the model, gender, number of nights incarcerated, and quality of life rating were significantly associated with illegal drug and/or problem alcohol use in the follow-up period (see Table 3.2). Specifically, males had greater odds of using illegal drugs and/or problem alcohol use at follow-up. Individuals with fewer nights incarcerated in the 12 months before intake had greater odds of alcohol and/or drug use at follow-up. Individuals with lower quality of life ratings at intake had greater odds of return to use in the follow-up period. Nonetheless, two of the significant adjusted odds ratios were close to 1.00.

TABLE 3.2. ASSOCIATION OF TARGETED FACTORS AND RELAPSE

FACTORS AT INTAKE	ß	Wald	Odds ratio	95% CI	
				Lower	Upper
Age	–.001	.023	.999	.982	1.016
Gender [1 = Male, 2 = Female]	–.461	6.251	.630*	.439	.905
Number of nights incarcerated	–.004	13.014	.996***	.993	.998
Number of months employed	–.010	.249	.990	.952	1.029
Number of depression and anxiety symptoms	.016	.912	1.106	.984	1.049
Number of people client could count on for recovery support	–.010	1.116	.990	.971	1.009
Quality of life rating	–.105	5.304	.901*	.824	.985
Number of adverse childhood experiences	.038	1.389	1.039	.975	1.106

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

| Section 4. Mental Health, Physical Health, and Interpersonal Victimization

This section examines changes in mental health symptoms, physical health, and interpersonal victimization from intake to follow-up. Specifically, this subsection examines: (1) depression, (2) generalized anxiety, (3) comorbid depression and generalized anxiety, (4) suicide ideation and attempts, (5) posttraumatic stress disorder, (6) perceptions of poor physical and mental health, (7) overall health status, (8) chronic medical problems at intake, (9) chronic pain, (10) health insurance, and (11) interpersonal victimization experiences. Mental health and physical health questions in the KTOS intake and follow-up surveys were self-report measures.

Depression Symptoms

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

> "Did you have a two-week period when you were consistently depressed or down, most of the day, nearly every day?" and
> "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?"

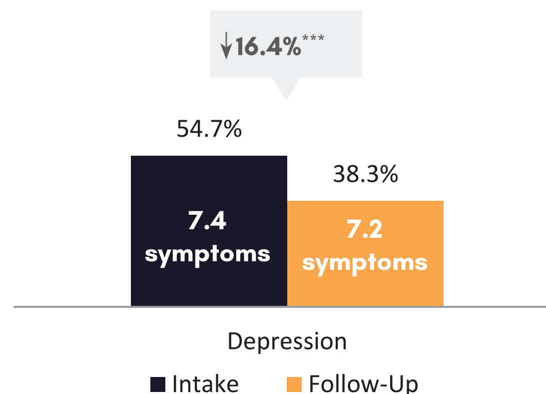
Study Criteria for Depression

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.

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).

More than half of clients (54.7%) met criteria for depression in the 12 months before they entered treatment (see Figure 4.1). At follow-up, over one-third of individuals (38.3%) met criteria for depression—a significant decrease of 16.4%. Of those who met study criteria at intake (n = 311), they had an average of 7.4 symptoms out of 9. At follow-up, among those who met study criteria for depression (n = 218), clients reported an average of 7.2 symptoms out of 9.

FIGURE 4.1. MEETING STUDY CRITERIA FOR DEPRESSION AT INTAKE AND FOLLOW-UP (N = 569)

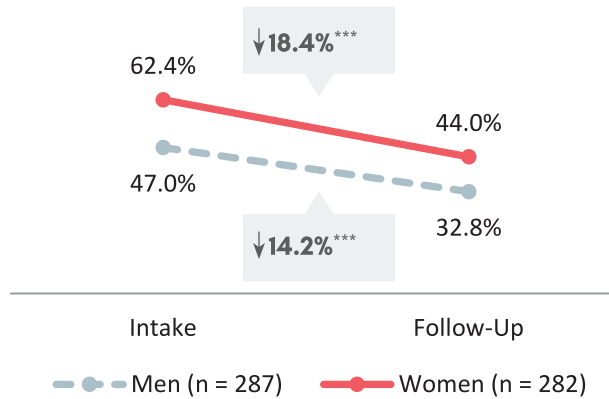


***$p < .001$.

Gender Differences in Depression

Significantly more women met study criteria for depression at intake and follow-up compared to men. At intake, 62.4% of women met study criteria compared to 47.0% of men. At follow-up, the percent of women who reported depression was 44.0% compared to 32.8% of men (see Figure 4.2). The number of women and men who met criteria for depression decreased significantly.

FIGURE 4.2. GENDER DIFFERENCES IN PERCENT OF CLIENTS MEETING STUDY CRITERIA FOR DEPRESSION[a]

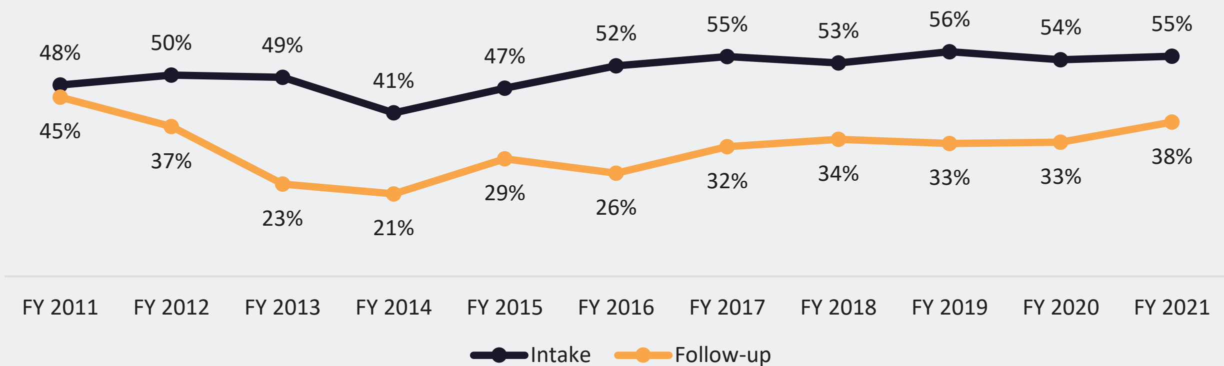


a—Statistical difference by gender at intake ($p < .001$) and follow-up ($p < .01$).
***$p < .001$.

Trends in Past-12-month Depression

The percent of clients who met criteria for depression at intake has been between a low of 41% in FY 2014 and a high of 56% in FY 2019 over the past 11 years. The percent of clients who met criteria for depression at follow-up decreased from 45% in FY 2011 to 21% in FY 2014. In 2019 and 2020, the percent of individuals who met criteria for depression at follow-up was 33%, and even higher in FY 2021 (38%).

FIGURE 4.3. TRENDS IN THE NUMBER OF CLIENTS MEETING STUDY CRITERIA FOR DEPRESSION AT INTAKE AND FOLLOW-UP, FY 2011-FY 2021



Anxiety Symptoms

To assess for generalized anxiety symptoms, participants were first asked:
"In the 12 months before you entered this program, 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)?"

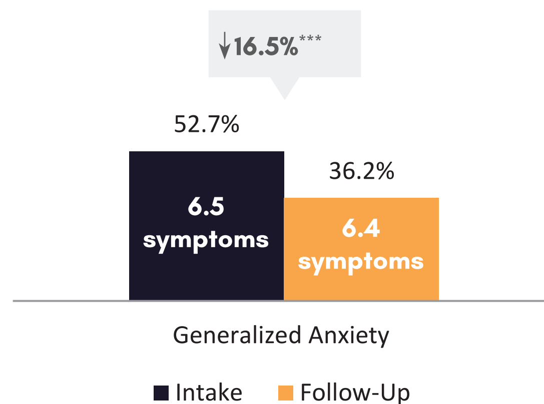
Participants who answered "yes" were then asked 6 additional questions about anxiety symptoms (e.g., felt restless, keyed up or on edge, have difficulty concentrating, feel irritable).

Study Criteria for General Anxiety Disorder

To meet study criteria for general anxiety disorder, 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.

In the 12 months before entering treatment, about half of clients reported symptoms that met study criteria for generalized anxiety (52.7%; see Figure 4.4). By follow-up, the percent of clients meeting study criteria for generalized anxiety had decreased by 16.5% to 36.2%. At intake, among those who met study criteria for generalized anxiety (n = 300), clients reported an average of 6.5 symptoms out of 7. Among those who met study criteria for generalized anxiety at follow-up (n = 206), clients reported an average of 6.4 symptoms out of 7.

FIGURE 4.4. CLIENTS MEETING STUDY CRITERIA FOR GENERALIZED ANXIETY AT INTAKE AND FOLLOW-UP (N = 569)

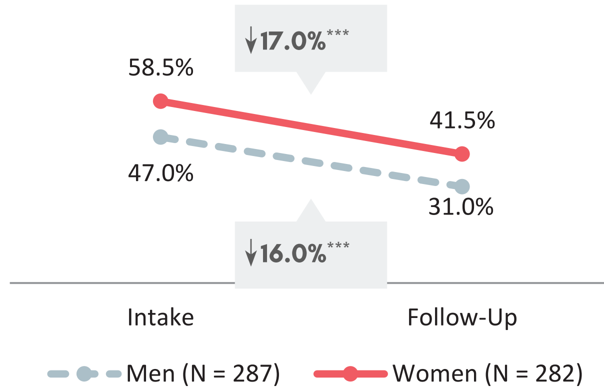


***p < .001.

Gender Differences in Generalized Anxiety Symptoms

Significantly more women met criteria for generalized anxiety at intake and follow-up compared to men (see Figure 4.5). The percent of women and men who met criteria for generalized anxiety decreased significantly from intake.

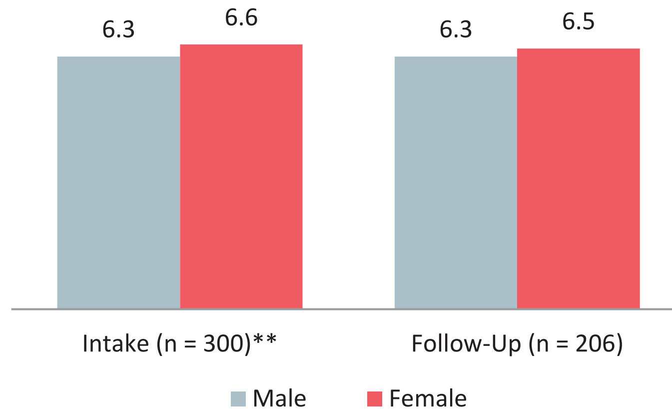
FIGURE 4.5. GENDER DIFFERENCES IN PERCENT OF CLIENTS MEETING STUDY CRITERIA FOR GENERALIZED ANXIETY[a]



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

Of those who met study criteria for generalized anxiety at intake, women reported significantly more anxiety symptoms than men (6.6 vs. 6.3) (see Figure 4.6). There was no significant difference in anxiety symptoms by gender at follow-up.

FIGURE 4.6. GENDER DIFFERENCES IN NUMBER OF GENERALIZED ANXIETY SYMPTOMS REPORTED BY THOSE WHO MET STUDY CRITERIA FOR GAD AT INTAKE AND FOLLOW-UP[a]



a – To meet study criteria, a client had to endorse at least 4 of 7 anxiety symptoms.
**$p < .01$.

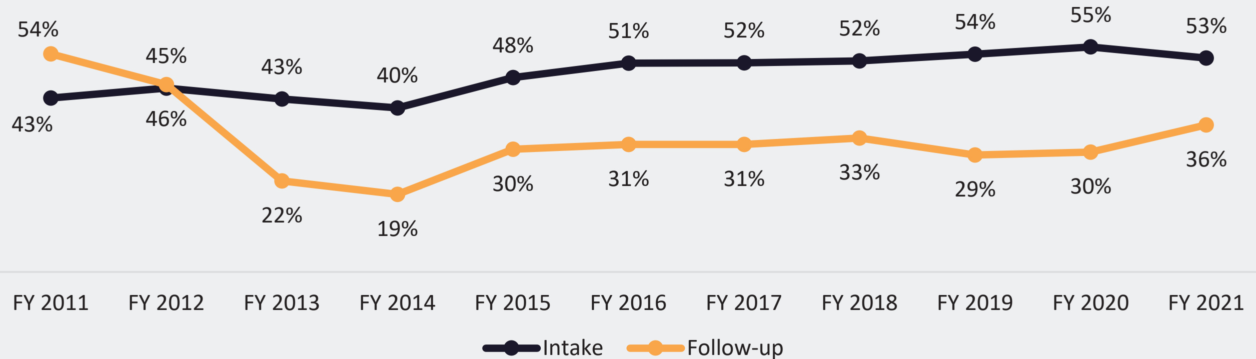
"The program was very good, they really care, build a relationship, and give you the tools to succeed."

– KTOS FOLLOW-UP CLIENT

Trends in Past-12-month Generalized Anxiety

The percent of clients who met criteria for generalized anxiety at intake has steadily and gradually increased over the past 11 years. The percent of clients who met study criteria for generalized anxiety at follow-up decreased from FY 2011 through FY 2014, but was in the low 30s from FY 2015 - 2020. In FY 2021, 36% of clients met study criteria for generalized anxiety.

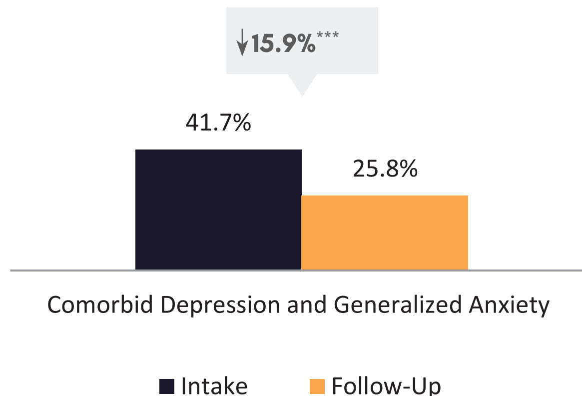
FIGURE 4.7. TRENDS IN THE NUMBER OF CLIENTS MEETING STUDY CRITERIA FOR GENERALIZED ANXIETY AT INTAKE AND FOLLOW-UP, FY 2011-FY 2021



Comorbid Depression and Anxiety Symptoms

Figure 4.8 shows that at intake, 41.7% of clients met study criteria for both depression and generalized anxiety and there was a significant 15.9% decrease in the percent of individuals who met study criteria for depression and generalized anxiety at follow-up (25.8%).

FIGURE 4.8. CLIENTS MEETING STUDY CRITERIA FOR COMORBID DEPRESSION AND GENERALIZED ANXIETY AT INTAKE AND FOLLOW-UP (N = 569)

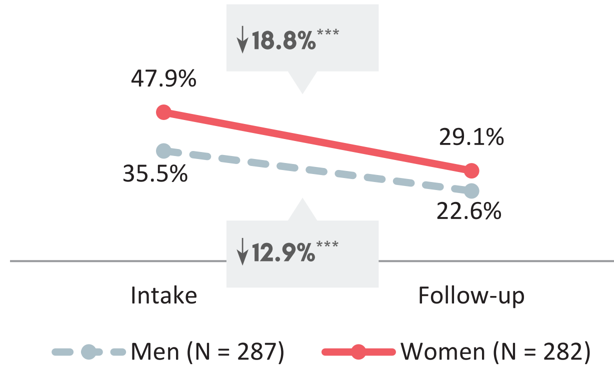


***p < .001.

Gender Differences in Comorbid Depression and Generalized Anxiety Symptoms

Significantly more women met criteria for comorbid depression and generalized anxiety at intake compared to men (see Figure 4.9). The percent of women and men who met criteria for depression and generalized anxiety decreased significantly by 18.8% and 12.9% respectively.

FIGURE 4.9. GENDER DIFFERENCES IN PERCENT OF CLIENTS MEETING STUDY CRITERIA FOR COMORBID DEPRESSION AND GENERALIZED ANXIETY AT INTAKE AND FOLLOW-UP[a]

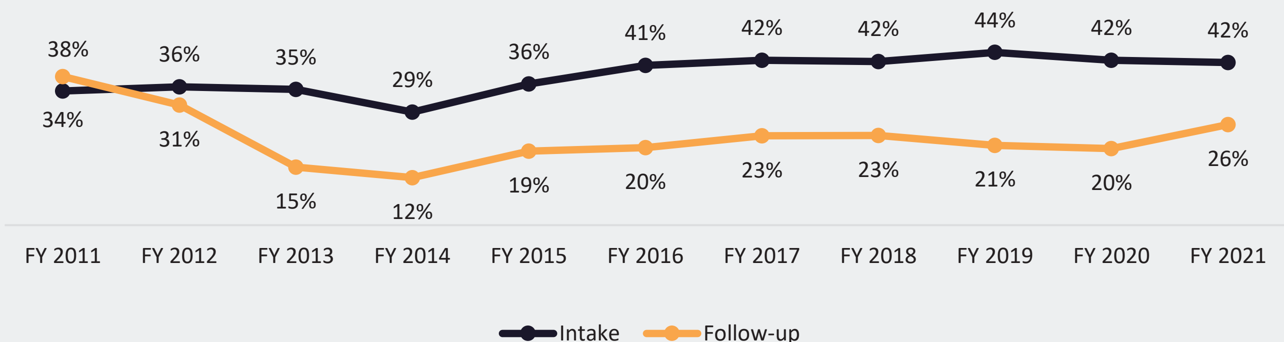


a—Statistical difference by gender at intake (p<.01).
***p < .001.

Trends in Comorbid Depression and Anxiety

Past-11-year trends for comorbid depression and anxiety show that, in general, more clients met study criteria for comorbid depression and anxiety at intake in FY 2019 (44%) than in FY 2011. At follow-up, however, the percent of clients meeting criteria for comorbid depression and anxiety was relatively stable from FY 2015 to FY 2020. In FY 2021, there was an increase in the percent of clients with comorbid depression and anxiety at follow-up (26%).

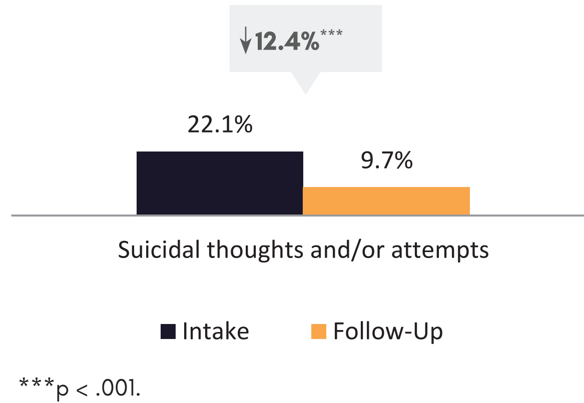
FIGURE 4.10. TRENDS IN THE PERCENT OF CLIENTS MEETING STUDY CRITERIA FOR COMORBID DEPRESSION AND ANXIETY AT INTAKE AND FOLLOW-UP, FY 2011-FY 2021



Suicidal Thoughts and/or Attempts

Suicide ideation and attempts were measured with self-reported questions about thoughts of suicide and actual attempts of suicide. In the 12 months before entering treatment, 22.1% of clients reported thoughts of suicide or attempted suicide and 9.7% of clients reported thoughts of suicide or attempted suicide in the 12 months before follow-up. There was an 12.4% decrease from intake to follow-up in the number of clients reporting suicidal thoughts and attempts (see Figure 4.11).

FIGURE 4.11. CLIENTS REPORTING SUICIDAL THOUGHTS AND/OR ATTEMPTS AT INTAKE AND FOLLOW-UP (N = 569)

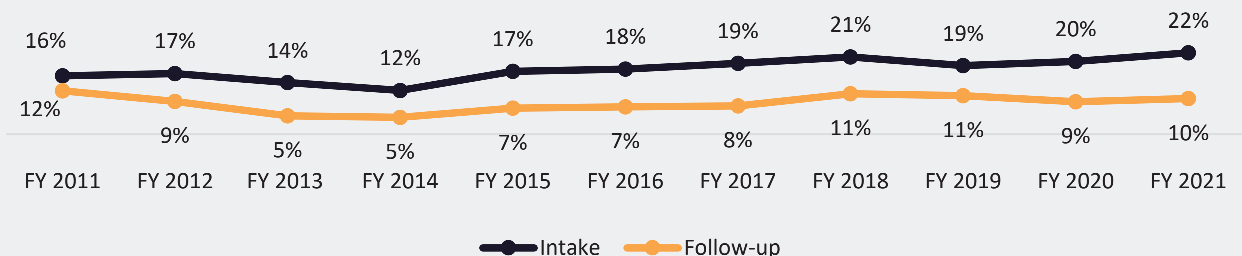


***p < .001.

Trends in Past-12-month Suicidal Thoughts and/or Attempts

The percent of clients who reported suicidal ideation and attempts at intake was a low of 12% in FY 2014 and a high of 22% in FY 2021. The percent of clients reporting suicidal ideation and attempts at follow-up was a high of 12% in FY 2011 and a low of 5% in FY 2013 and FY 2014.

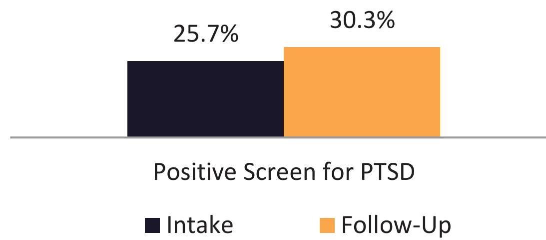
FIGURE 4.12. TRENDS IN THE NUMBER OF CLIENTS REPORTING SUICIDAL THOUGHTS AND/OR ATTEMPTS AT INTAKE AND FOLLOW-UP, FY 2011-2021



Posttraumatic Stress Disorder Symptoms

Included in the intake and follow-up surveys were four items from the PTSD checklist about how bothered they had been about the symptoms in the prior 12 months.[58] At intake, 25.7% screened positive for PTSD, and 30.3% screened positive for PTSD at follow-up (see Figure 4.13).[59] There was no significant change in the percent of individuals who screened positive for PTSD.

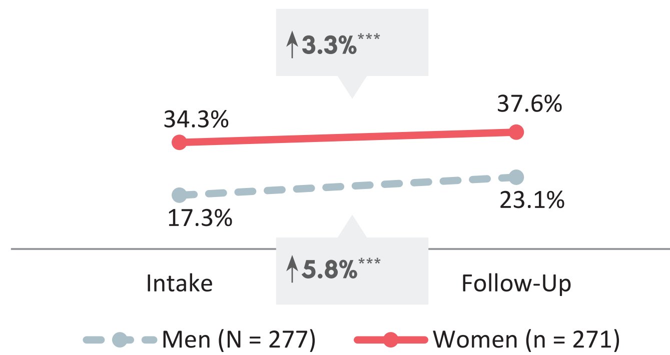
FIGURE 4.13. CLIENTS WHO SCREENED POSITIVE FOR PTSD AT INTAKE AND PAST-12-MONTHS AT FOLLOW-UP (n = 548)[60]



Gender Differences in Posttraumatic Stress Disorder Symptoms

Significantly more women had a positive screen for PTSD at intake and follow-up compared to men (see Figure 4.14).

FIGURE 4.14. GENDER DIFFERENCES IN PERCENT OF CLIENTS WITH A POSITIVE SCREEN FOR PTSD AT INTAKE AND FOLLOW-UP[a]



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

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

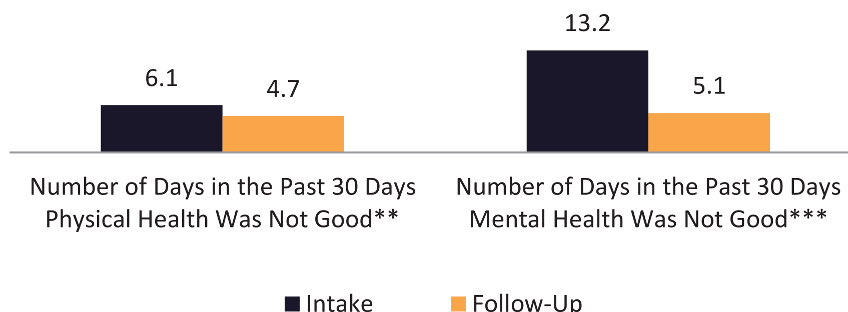
[59] In previous years' reports PTSD symptom questions were asked only of individuals who reported any lifetime victimization. For the data included in this report, the PTSD symptom questions were asked of all clients.

[60] Twenty-one individuals had a missing value on items about PTSD symptoms in the 12 months before follow-up.

Perceptions of Poor Physical and Mental Health

Clients were asked how many days in the past 30 days their physical health was not good and their mental health was not good at intake and follow-up (see Figure 4.15). There was a significant decrease from intake to follow-up in the number of days clients reported their physical health was not good (6.1 vs. 4.7). The number of days clients' mental health was not good also decreased significantly from 13.2 at intake to 5.1 at follow-up.

FIGURE 4.15. PERCEPTIONS OF POOR PHYSICAL HEALTH AND MENTAL HEALTH IN THE PAST 30 DAYS AT INTAKE AND FOLLOW-UP (N =567)[61]

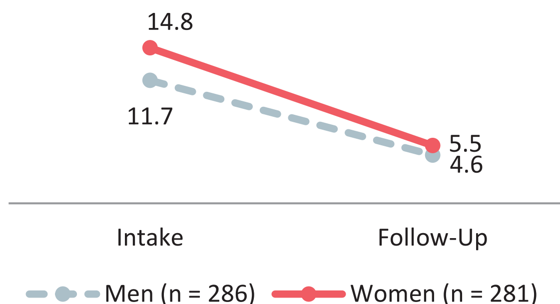


**p < .01, ***p < .001.

Gender Differences in Perceptions of Mental Health

Women's reported average number of days their mental health was not good was significantly higher at intake compared to men (see Figure 4.16). For both men and women, there was a significant decrease from intake to follow-up in the reported number of days their mental health were was not good.

FIGURE 4.16. GENDER DIFFERENCES IN NUMBER OF DAYS IN THE PAST 30 DAYS MENTAL HEALTH WAS NOT GOOD[a]



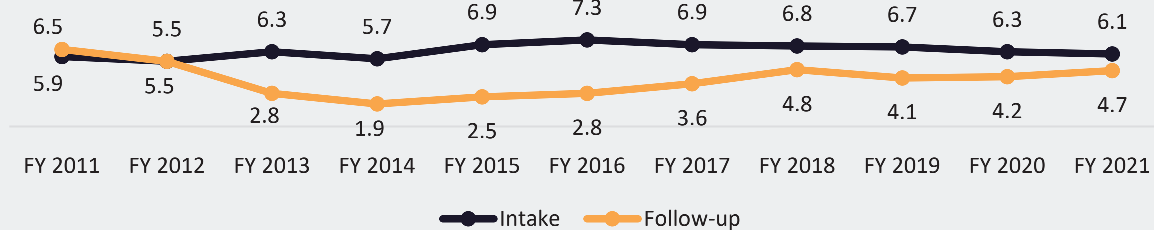
a—Statistical difference by gender at intake (p < .01).

[61] Two clients had missing data for the physical health question at follow-up. Two clients had missing data for the mental health question at follow-up.

Trends in Perceptions of Poor Physical Health

The average number of days clients reported their physical health was not good in the past 30 days at intake has increased from 5.9 days in FY 2011 to 7.3 days in FY 2016. This number is down to 6.1 in FY 2021. The average number of days clients reported their physical health was not good in the past 30 days at follow-up has decreased from 6.5 days in FY 2011 to a low of 1.9 in FY 2014. In FY 2018, the average number of days physical health was not good in the 30 days before follow-up was the highest (4.8) it has been since FY 2012. In FY 2021, individuals reported an average of 4.7 days their physical health was not good at follow-up.

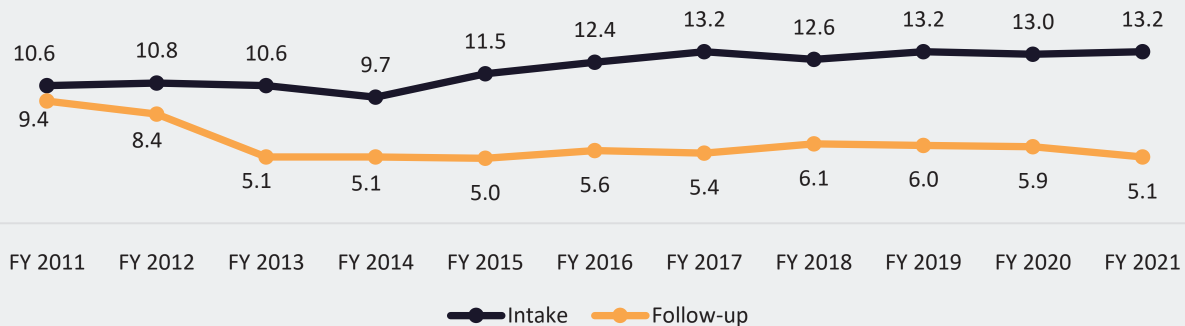
FIGURE 4.17. TRENDS IN SELF-REPORTED AVERAGE NUMBER OF DAYS OF POOR PHYSICAL HEALTH AT INTAKE AND FOLLOW-UP, REPORTS FY 2011-FY 2021



Trends in Perceptions of Poor Mental Health

The average number of days clients reported their mental health was not good in the past 30 days has increased at intake in the past several years to a high of 13.2 in FY 2017, FY 2019, and FY 2021. At follow-up, the average number of days clients reported their mental health was not good in the past 30 days has decreased from a high of 9.4 days in FY 2011 to a low of 5.0 in FY 2015. In FY 2021, individuals reported an average 5.1 days their mental health was not good in the 30 days before follow-up.

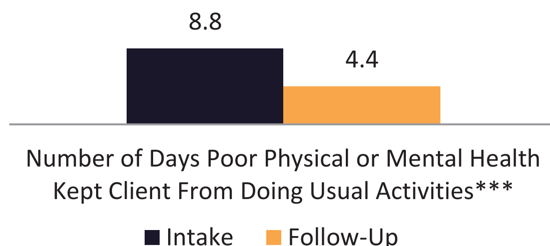
FIGURE 4.18. TRENDS IN SELF-REPORTED AVERAGE NUMBER OF DAYS OF POOR MENTAL HEALTH AT INTAKE AND FOLLOW-UP, FY 2011 - FY 2021



Perceptions of Poor Physical or Mental Health Limiting Activities

Clients 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. The number of days clients reported their physical or mental health kept them from doing their usual activities decreased significantly from 8.8 days at intake to 4.4 days at follow-up (see Figure 4.19).

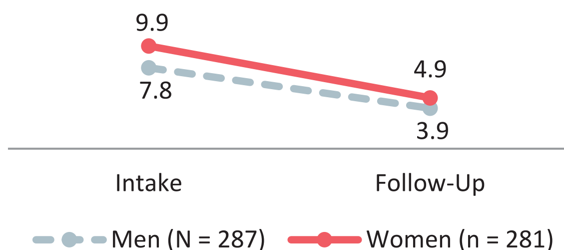
FIGURE 4.19. PERCEPTIONS OF POOR PHYSICAL HEALTH AND MENTAL HEALTH LIMITING ACTIVITIES IN THE PAST 30 DAYS AT INTAKE AND FOLLOW-UP (N = 568)[62]



Gender Differences in Perceptions of Physical or Mental Health Limiting Activities

The average number of days clients indicated their physical or mental health had kept them from doing their usual activities was higher for women than for men at intake (see Figure 4.20). The average number of days physical or mental health kept clients from doing their usual activities decreased from intake to follow-up for men and women.

FIGURE 4.20. GENDER DIFFERENCES IN THE NUMBER OF DAYS POOR PHYSICAL OR MENTAL HEALTH KEPT CLIENT FROM DOING USUAL ACTIVITIES[a,b]



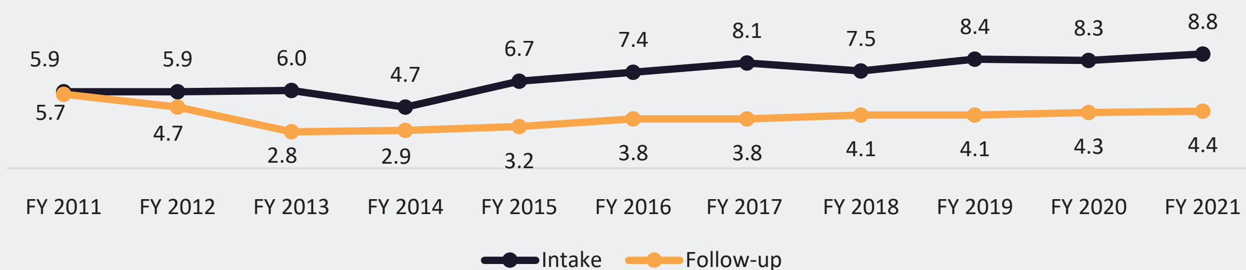
a—Statistical difference by gender at intake ($p < .05$).
b – Significant decrease from intake to follow-up for men and women ($p < .001$).

[62] One client had missing data for the question about perceptions of their physical or mental health limiting their activities at follow-up.

Trends in Number of Days Poor Physical or Mental Health Kept Client from Doing Usual Activities

The average number of days in the past 30 days clients reported their physical or mental health kept them from doing their usual activities has gradually increased at intake from 5.9 in FY 2011 to 8.8 in FY 2021, except in FY 2014 when it decreased to 4.7 days. The average number of days clients reported their physical or mental health kept them from doing their usual activities in the past 30 days at follow-up decreased from FY 2011 (5.7) to FY 2013 (2.8) and increased from FY 2014 (2.9) to FY 2021 (4.4).

FIGURE 4.21. TRENDS IN THE NUMBER OF DAYS THEIR PHYSICAL OR MENTAL HEALTH KEEP CLIENT FROM DOING USUAL ACTIVITIES AT INTAKE AND FOLLOW-UP, REPORTS FY 2011-FY 2021



Physical Health Status

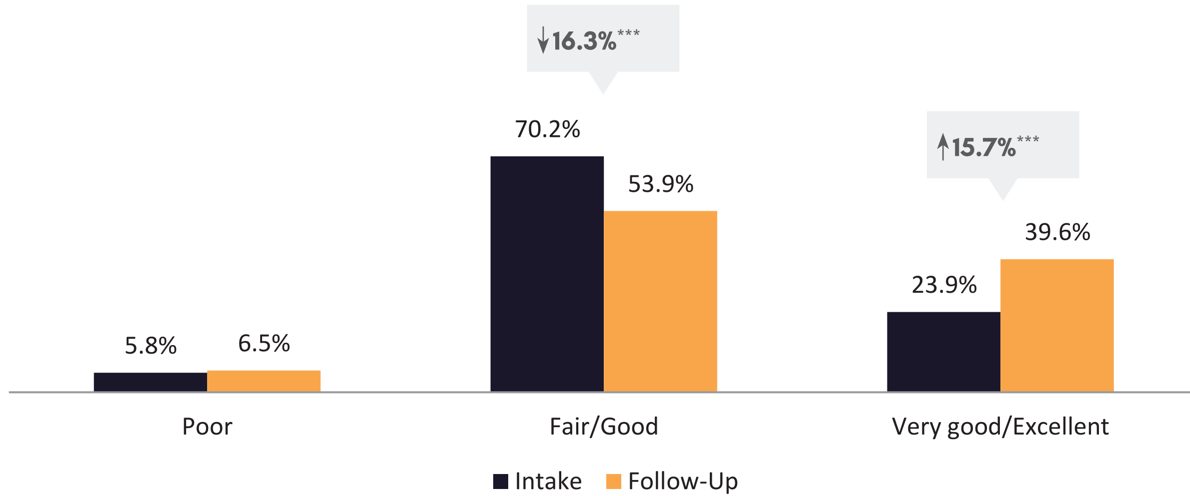
Overall Health

At both intake and follow-up, clients were asked to rate their overall health in the past 12 months from 1 = poor to 5 = excellent. Clients rated their health, on average, as 2.9 at intake and this significantly increased to 3.2 at follow-up (not depicted in figure). Figure 4.22 shows that significantly more clients rated their overall physical health as very good or excellent (39.6%) at follow-up compared to intake (23.9%). Additionally, significantly fewer clients reported their health was fair/good at follow-up than at intake.

"The program helped me realize and look at myself to fix myself, it made me so honest with myself."

- KTOS FOLLOW-UP CLIENT

FIGURE 4.22. CLIENTS' SELF-REPORT OF OVERALL HEALTH STATUS AT INTAKE AND FOLLOW-UP (N = 568)[a63]

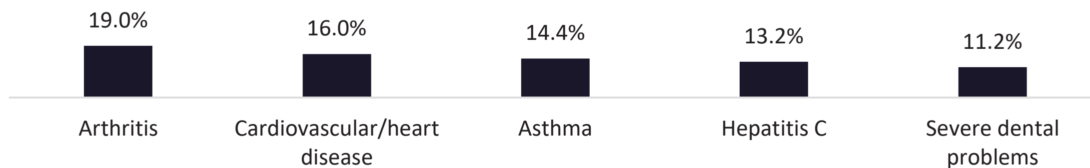


a - Significance tested with the Stuart-Maxwell Test for Marginal Homogeneity ($p < .001$).
***$p < .001$.

Chronic Medical Problems

Over half of clients (56.4%) reported they had at least one chronic health problem at program entry. Further, significantly more women reported a chronic health problem at intake than men (62.1% vs. 50.9%; not depicted in a figure). The most common medical problems clients reported by clients were arthritis (19.0%), cardiovascular disease (16.0%), asthma (14.4%), hepatitis C (13.2%), and severe dental problems (11.2%; see Figure 4.23).

FIGURE 4.23. CHRONIC MEDICAL PROBLEMS REPORTED AT INTAKE (N = 569)

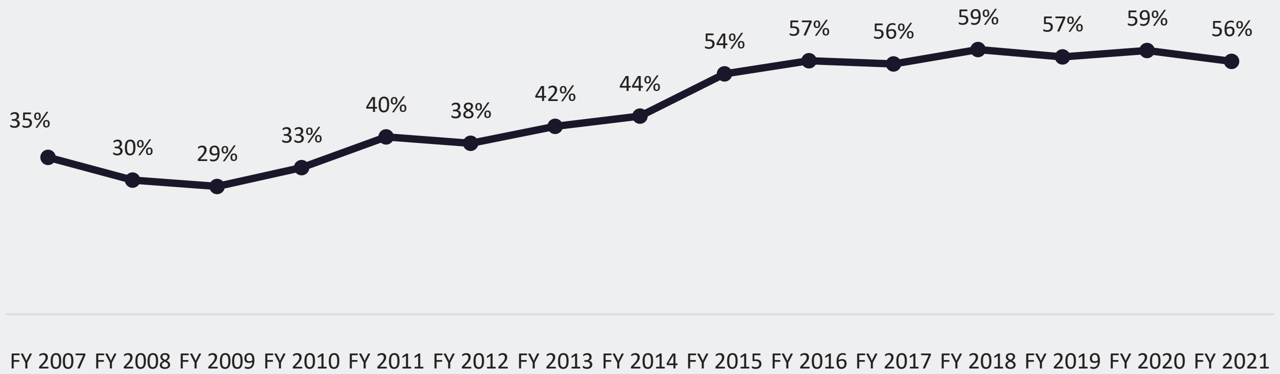


[63] One client had missing data for overall health status at follow-up.

Trends in Chronic Medical Problems

Overall, the trend shows that the percent of clients reporting having at least one chronic medical problem at intake has increased over the past 13 years. In FY 2009, over one-quarter of clients (29%) reported having a chronic medical problem compared to 59% of clients in FY 2020.

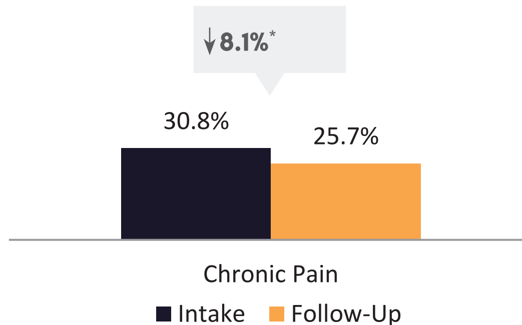
FIGURE 4.24. TRENDS IN THE CLIENTS REPORTING A LIFETIME CHRONIC MEDICAL PROBLEM AT INTAKE, FY 2007-2021



Chronic Pain

Almost 31% of clients reported they had chronic pain at intake (see Figure 4.25). There was a small but significant decrease from intake to follow-up.

FIGURE 4.25. CLIENTS REPORTING CHRONIC PAIN AT INTAKE AND FOLLOW-UP (N = 569)

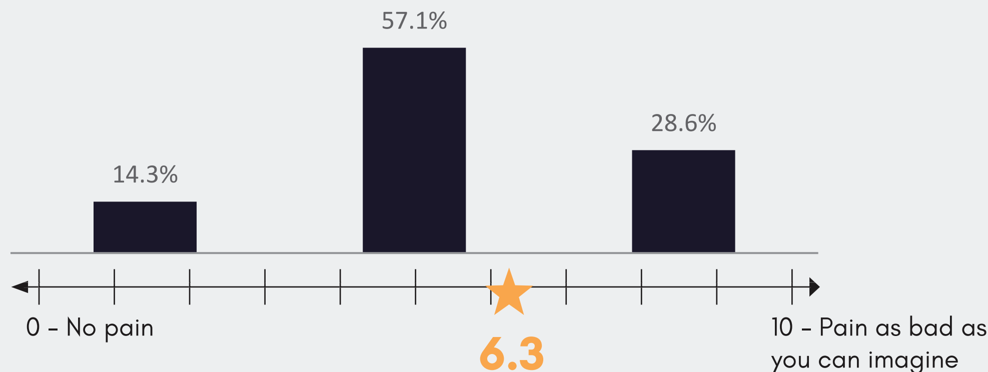


*p < .05.

Taking a Closer Look at Chronic Pain

At intake, 30.8% (n = 175) of KTOS clients reported experiencing chronic pain for at least 3 months before entering treatment. On average, clients reported their chronic pain began at age 26.3 (ranging from less than one year old to age 60). In the 30 days before entering treatment, clients experienced chronic pain, on average, 24.2 days. Clients were also asked to rate their chronic pain on a scale from 0 (no pain) to 10 (pain as bad as you can imagine). At intake, clients rated their pain as an average intensity of 6.3 with 28.6% of clients giving their pain the highest ratings of 8, 9, and 10 (see Figure 4.26).

FIGURE 4.26. INTENSITY RATING OF CHRONIC PAIN AT INTAKE (n = 175)



Prescription Opioid Misuse and Chronic Pain

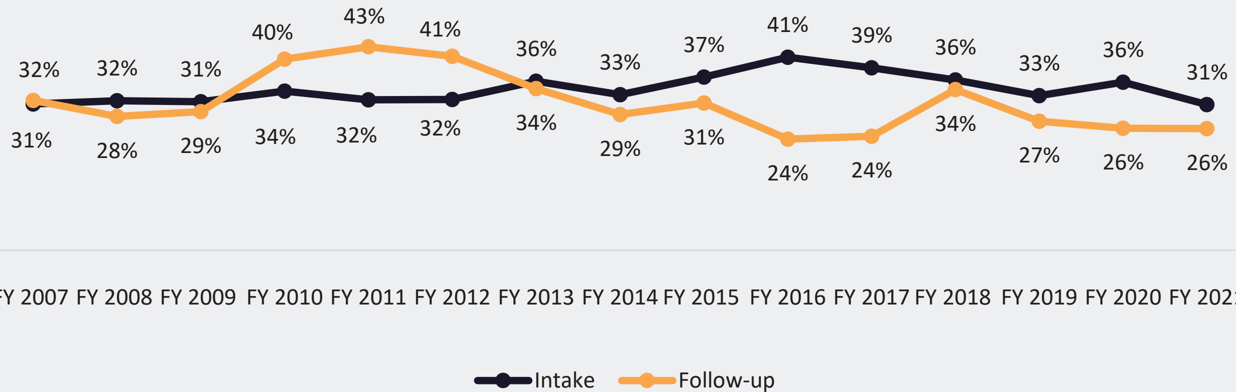
Of those who misused prescription opioids at intake (n = 163), 41.7% reported chronic pain in the 12 months before entering substance abuse treatment and 27.0% experienced chronic pain at follow-up, which was a significant decrease of 14.7%.

Additionally, of the individuals who reported misusing prescription opioids and experiencing chronic pain at intake (n = 68), 39.7% (n = 27) reported chronic pain in the past 12 months at follow-up and 20.6% (n = 14) reported past-12-month misuse of prescription opioids.

Trends in Chronic Pain

The percent of clients who reported chronic pain has fluctuated over time at intake and follow-up. In FY 2008 and 2009, more clients reported chronic pain at intake than at follow-up. Between FY 2010 and FY 2012, however, more clients reported chronic pain at follow-up than at intake. From FY 2014 to FY 2017 the number of clients reporting chronic pain was higher at intake than at follow-up, with the greatest difference in FY 2016. In FY 2019, the number of clients reporting persistent chronic pain at follow-up (26%) was lower than the percent at intake (36%).

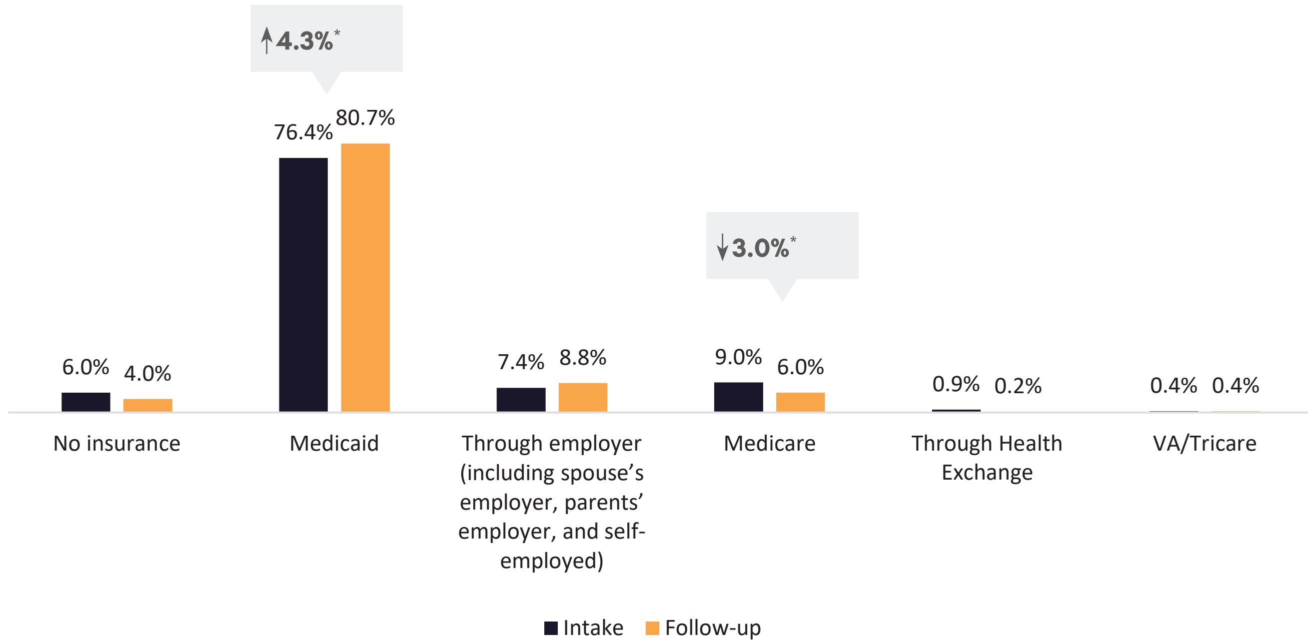
FIGURE 4.27. TRENDS IN THE NUMBER OF CLIENTS REPORTING CHRONIC PAIN AT INTAKE AND FOLLOW-UP, FY 2007-FY 2021



Health Insurance

At intake, the majority of KTOS clients reported they had health insurance through Medicaid (76.4%; see Figure 4.28). A small percentage did not have any insurance (6.0%). Small numbers of clients had insurance through an employer, including through a spouse, parent, or self-employment (7.4%), through Medicare (9.0%), through Health Exchange (0.9%), and VA/Tricare (0.4%). At follow-up, the number of clients reporting they had no insurance and the number reporting they had Medicaid decreased significantly and the number reporting they had Medicare increased significantly.

FIGURE 4.28. HEALTH INSURANCE FOR KTOS CLIENTS AT INTAKE AND FOLLOW-UP (N = 554)[64]



a – Significance tested with the Stuart-Maxwell Test for Marginal Homogeneity ($p < .01$).
*$p < .05$.

A closer look at insurance

Of those clients who were employed full-time at intake (n = 147), only 11.6% had insurance through their employer. At follow-up, of those clients employed full-time (n = 242)[65], only 12.8% had insurance through their employer.

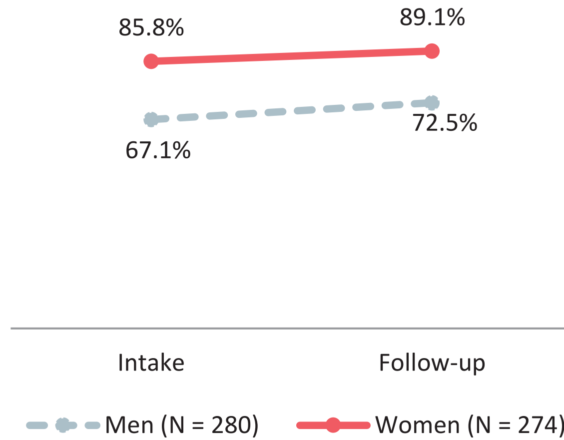
GENDER DIFFERENCES IN MEDICAL INSURANCE

Significantly more women reported being insured by Medicaid at both intake and follow-up compared to men (see Figure 4.29). There was no significant change from intake to follow-up for either women or men.

[64] At intake, 6 individuals had responses that fit under "other" and could not be classified. At follow-up, 2 clients had missing data for insurance at follow-up, and 7 individuals had responses that fit under "other" and could not be classified. The missing responses are not included in this analysis.

[65] Of the 243 clients employed full-time at follow-up, 1 had missing information for insurance at follow-up and 6 mentioned an insurance carrier that could not be classified into one of the categories.

FIGURE 4.29. GENDER DIFFERENCES IN CLIENTS REPORTING HAVING MEDICAID INSURANCE AT INTAKE AND FOLLOW-UPa



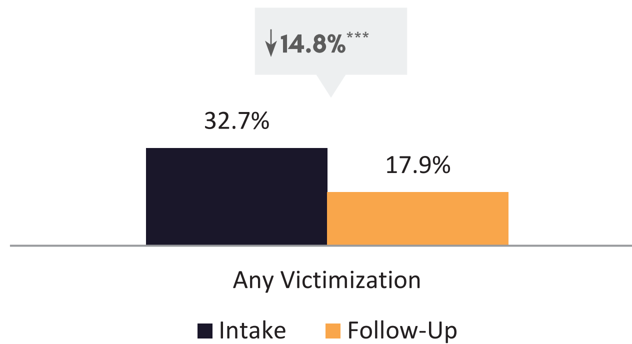
a—Statistical difference by gender at intake and follow-up (p < .001).

Interpersonal Victimization

In addition to items about adverse childhood experiences, clients were asked about several types of interpersonal victimization they may have experienced in two periods: (1) lifetime, and (2) past 12 months. These items were included in the intake and follow-up surveys. Because relatively small percentages of clients reported each type of victimization experience in the 12-month periods, several related items were collapsed into one category: (1) any victimization (e.g., robbed or mugged by force, assaulted with or without a weapon, threatened with a gun, intimate partner violence, stalking).

About one-third of clients reported interpersonal victimization in the 12 months before entering treatment. The percent of clients who reported experiencing any victimization in the past 12 months decreased significantly from intake to follow-up (see Figure 4.30).

FIGURE 4.30. INTERPERSONAL VICTIMIZATION IN THE PAST 12 MONTHS AT INTAKE AND FOLLOW-UP (N = 569)

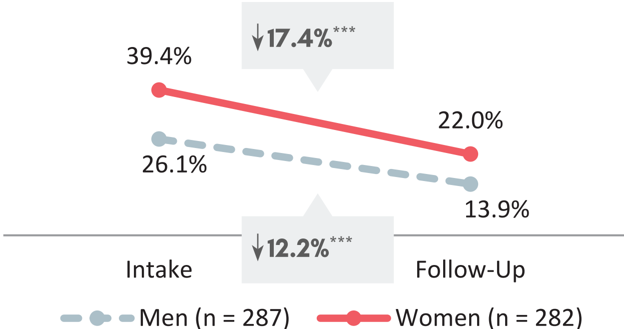


***p < .001.

Gender Differences in Interpersonal Victimization

Significantly more women reported experiencing any victimization in the 12 months intake and follow-up when compared to men (see Figure 4.31). The percent of women and men who reported experiencing any victimization decreased significantly from intake to follow-up by 17.4% and 12.2% respectively.

FIGURE 4.31. GENDER DIFFERENCES IN INTERPERSONAL VICTIMIZATION IN THE PAST 12 MONTHS

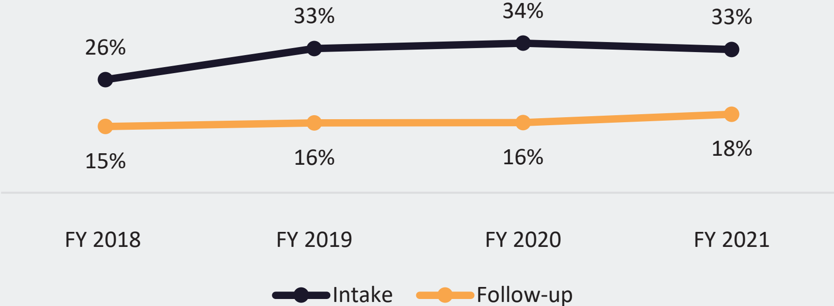


a—Statistical difference by gender at intake ($p < .001$) and follow-up ($p < .05$).
***$p < .001$.

Trends In Interpersonal Victimization

The percent of clients who reported experiencing interpersonal victimization (e.g. assault, threats with a firearm, mugging/robbery, intimate partner violence, stalking, sexual assault, harassment) in the 12 months before entering the program have ranged from about one-fourth to one-third. There have been significant decreases from intake to follow-up in the proportion of individuals who have reported interpersonal victimization in the past 12 months, with a steady percent each year (15% - 18%).

FIGURE 4.32. TRENDS IN THE PERCENT OF CLIENTS REPORTING INTERPERSONAL VICTIMIZATION AT INTAKE AND FOLLOW-UP, FY 2018-FY 2021[66]



[66] The survey items for assessing interpersonal victimization were not comparable in FY 2017 when victimization items were first added in September 2016.

| Section 5. Economic and Living Circumstances

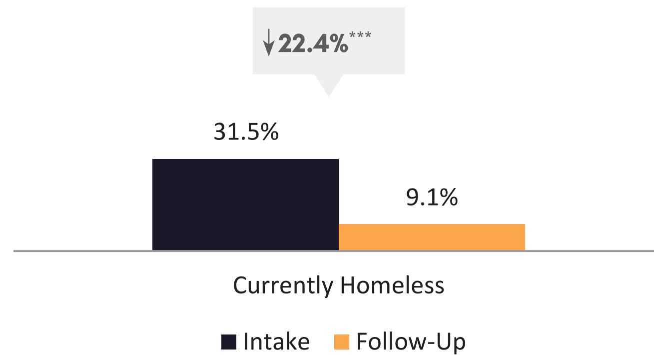
This section examines changes from intake to follow-up on: (1) living situation, (2) employment, and (3) economic hardship. Results for each targeted factor are presented for the overall sample and separately by gender when there were significant differences.

Living Situation

Homelessness

A little less than one-third of clients (31.5%) reported at treatment intake they were currently homeless and at follow-up 9.1% of clients reported they were currently homeless – a significant decrease of 22.4% (see Figure 5.1).

FIGURE 5.1. CURRENT HOMELESSNESS AT INTAKE AND FOLLOW-UP (N = 569)

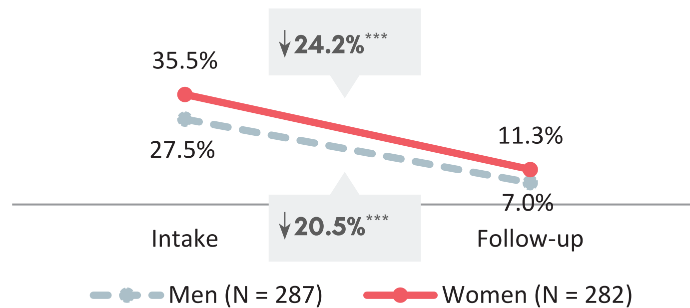


***p < .001.

Gender Differences in Homelessness

Significantly more women reported being homeless at intake when compared to men (see Figure 5.2). The percent of women and men reporting homelessness at follow-up decreased significantly 24.2% and 20.5%, respectively).

FIGURE 5.2. GENDER DIFFERENCES IN CLIENTS REPORTING HOMELESSNESS AT INTAKE AND FOLLOW-UP[a]

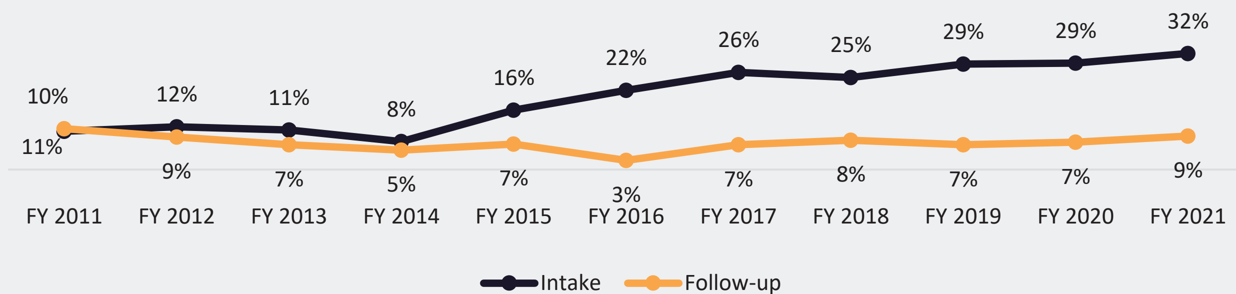


a—Statistical difference by gender at intake (p < .05).
***p < .001.

Trends in Homelessness

From FY 2011 to FY 2014, the percent of clients reporting being currently homeless was consistent at both intake and follow-up. At intake in FY 2015, however, the percent of clients reporting homelessness increased to 16%, increased again to 22% in FY 2016, and was its highest in FY 2021 (32%). The percent of individuals who reported homelessness at follow-up has remained consistent (between 5% and 9%) over the 11 years, with the exception of FY 2011 and FY 2016.

FIGURE 5.3. TRENDS IN THE PERCENT OF CLIENTS REPORTING HOMELESSNESS AT INTAKE AND FOLLOW-UP, FY 2011-FY 2021

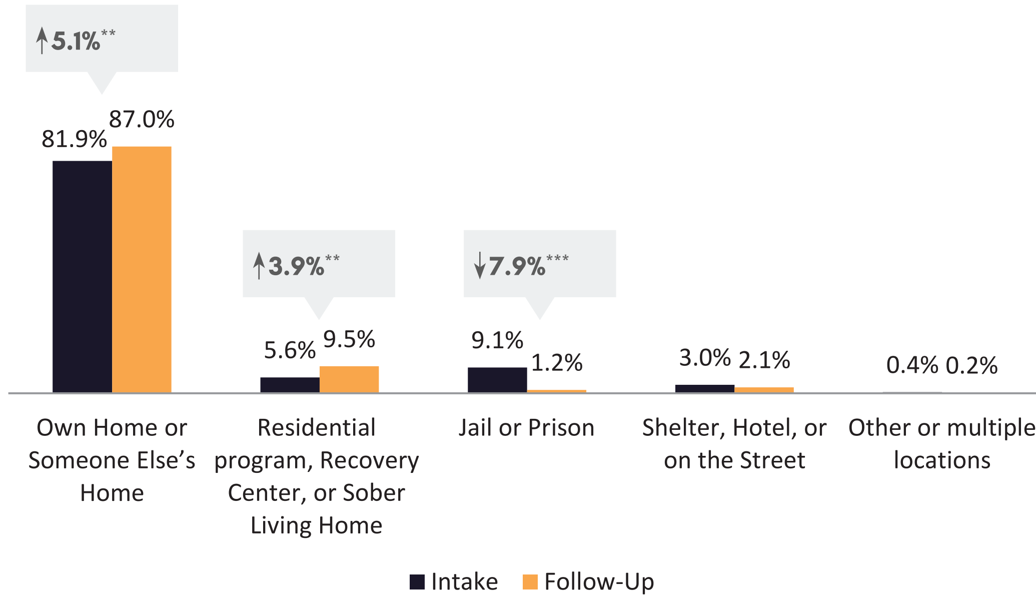


Usual Living Situation

Change in usual living situation from intake to follow-up was examined for the KTOS follow-up sample (see Figure 5.4). At intake, clients were asked about where they lived most of the time in the 12 months before entering treatment and at follow-up clients were asked where they lived most of the time in the 12 months before the follow-up interview.

The majority of clients reported living in their own home or someone else's home for most of the past 12 months at intake (81.9%) and follow-up (87.0%). A small percentage of clients reported their usual living situation was in a residential program, Recovery Center, or Sober Living Home at intake and that number increased significantly to 9.5% at follow-up. There was a significant decrease in the percent of clients who reported their usual living situation in the past 12 months was in a jail or prison: 9.1% vs. 1.2%. A very small percentage of clients reported living in a shelter or on the street at intake.

FIGURE 5.4. USUAL LIVING SITUATION AT INTAKE AND FOLLOW-UP (N = 569)

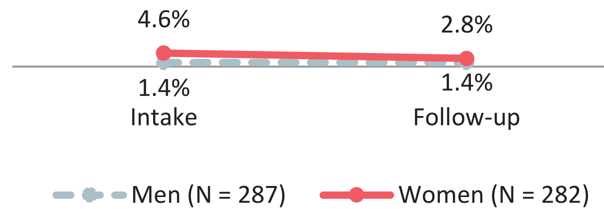


a – Significance tested with the Stuart-Maxwell Test for Marginal Homogeneity ($p < .001$).
**$p < .01$, ***$p < .001$.

Gender Differences in Usual Living Situation

Significantly more women reported their usual living situation at intake was in a shelter or on the streets (in a hotel, motel) when compared to men (see Figure 5.5). The percent of women and men reporting their usual living situation was in a shelter or on the street did not change significantly from intake to follow-up.

FIGURE 5.5. GENDER DIFFERENCES IN CLIENTS USUAL LIVING SITUATION IN A SHELTER OR ON THE STREET AT INTAKE AND FOLLOW-UP[a]



a—Statistical difference by gender at intake ($p < .05$).

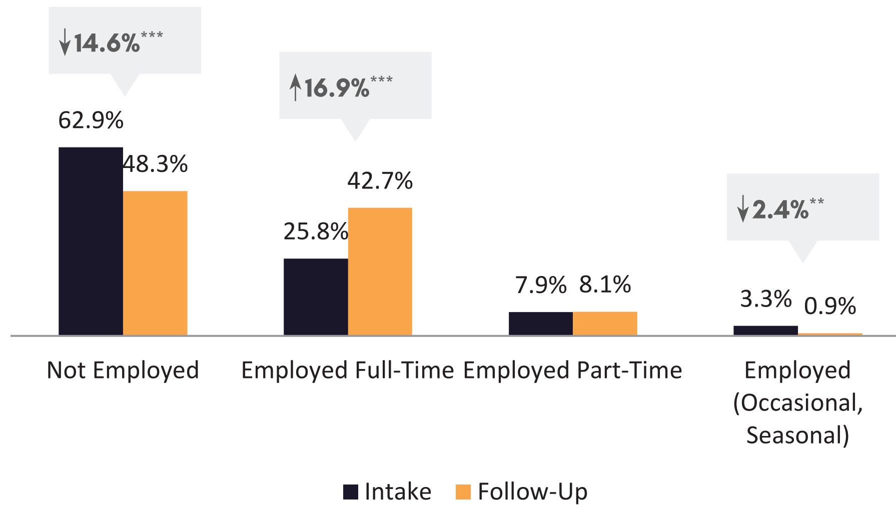
Employment

Current Employment Status

There were significant changes in current employment status from intake to follow-up (see Figure 5.6). The majority of clients (62.9%) reported they were not employed when they entered

treatment, while less than half of clients (48.3%) reported they were unemployed at follow-up. This represents a 14.6% significant decrease in the number of clients who were currently unemployed. The percent of clients who were employed full-time increased significantly by 16.9% from intake to follow-up (25.8% vs. 42.7%), and the percent with occasional/seasonal work decreased significantly at follow-up.

FIGURE 5.6. CHANGE IN CURRENT EMPLOYMENT STATUS (N = 569)[a]



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

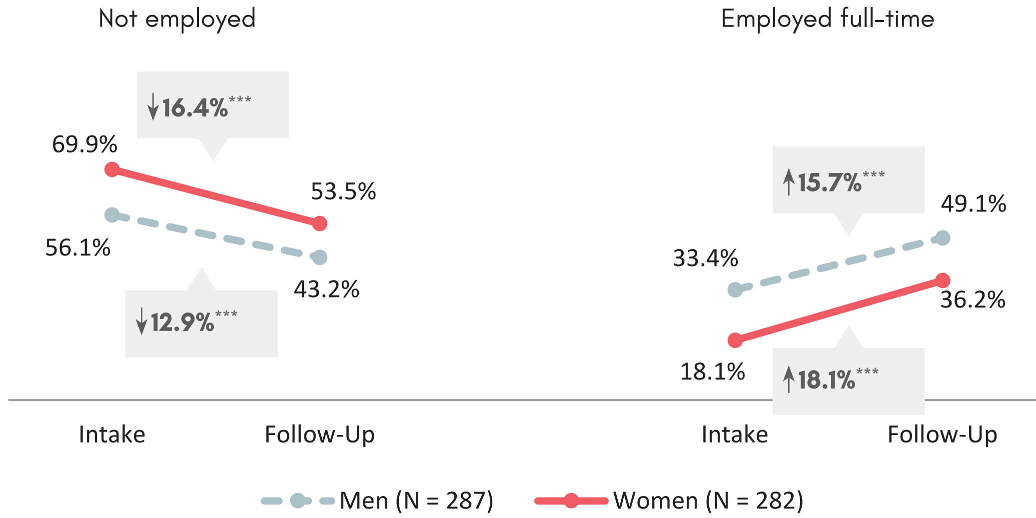
Gender Differences in Current Employment Status

Significantly more women reported at intake and follow-up that they were currently unemployed compared to men: 69.9% vs. 56.1% at intake and 53.5% vs. 43.2% at follow-up. The percent of clients who were currently unemployed decreased significantly for both women and men (see Figure 5.7). The percent of men who reported they were employed full-time was significantly greater than the percent of women who were employed full-time at intake (33.4% vs. 18.1%) and at follow-up (49.1% vs. 36.2%). Both genders, however, had significant increases in full-time employment from intake to follow-up (18.1% for women and 15.7% for men).

"Helped me get off drugs and alcohol and taught me better financial ways to be on my own. I tell other people about this program because it helped me."

– KTOS FOLLOW-UP CLIENT

FIGURE 5.7. GENDER DIFFERENCES IN EMPLOYMENT STATUS AT INTAKE AND FOLLOW-UP[a]

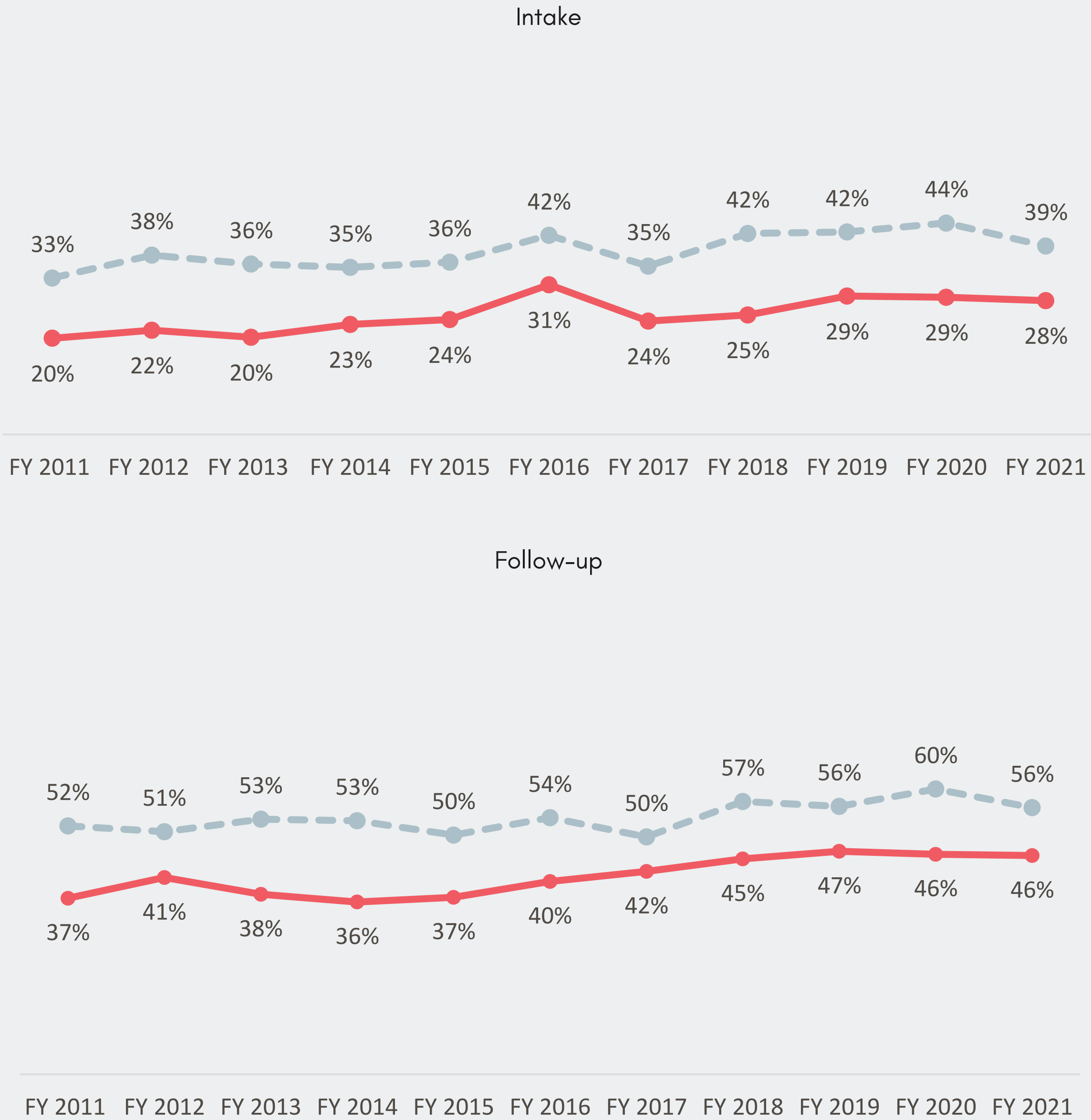


a – Significant difference by gender at intake and follow-up ($p < .001$, $p < .05$).
***$p < .001$.

Trends in Employment

Over the 11 years from FY 2011 through FY 2021, one-fifth to less than one-third of women reported being employed (part- or full-time) compared to as much as 44% of men in FY 2020 and 42% of men in FY 2016, 2018, and 2019. At follow-up, about half or over half of men reported being employed across the 11 years compared to 47% of women, at the highest percentage, in FY 2019.

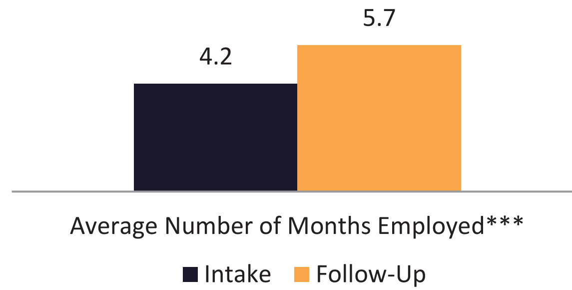
FIGURE 5.8. TRENDS IN GENDER DIFFERENCES IN CLIENTS EMPLOYED AT INTAKE AND FOLLOW-UP, FY 2011-FY 2021



Average Number of Months Employed

Clients were asked in the intake survey and follow-up survey to report the number of months they were employed full-time or part-time in the 12 months before they entered treatment (past 12 months at follow-up). As seen in Figure 5.9, clients reported working significantly more months at follow-up (5.7) than at intake (4.2).

FIGURE 5.9. AVERAGE NUMBER OF MONTHS EMPLOYED AT INTAKE AND FOLLOW-UP (N = 536)[67]

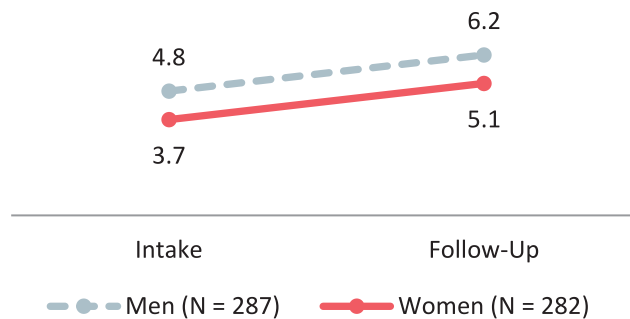


***$p < .001$.

Gender Differences in the Number of Months Employed

Men reported working significantly more months at both periods compared to women (intake, 4.8 vs. 3.7 and follow-up, 6.2 vs. 5.1). The average number of months both men and women worked increased significantly from intake to follow-up (see Figure 5.10).

FIGURE 5.10. GENDER DIFFERENCES IN NUMBER OF MONTHS EMPLOYED AT INTAKE AND FOLLOW-UP[a,b]

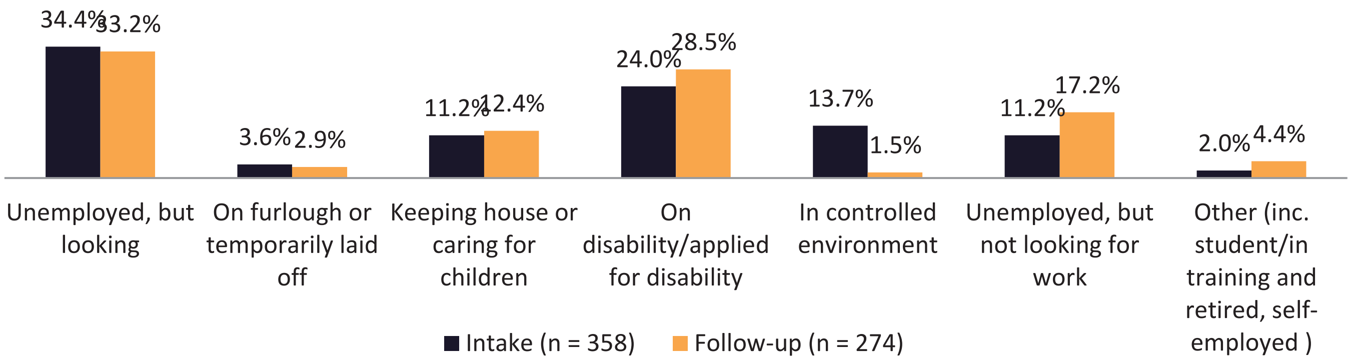


a—Significant difference by gender in number of months worked at intake and follow-up ($p < .001$).
b – Significant increase from intake to follow-up for men ($p < .001$) and women ($p < .001$).

[67] Six individuals had missing data for number of months employed.

Among individuals who were not employed at each point, clients were asked why they were not currently employed. At intake (n = 358), 34.4% of clients reported they were unemployed, but looking for work, and 24.0% were on disability or had applied for disability, 13.7% were in a controlled environment, prohibited from working, 11.2% were keeping house or caring for children/other relatives, and 11.2% were not looking for work (see Figure 5.11). Among clients who were not employed at follow-up (n = 274), 33.2% were unemployed, but looking for work, 28.5% reported they were on disability or had applied for disability, 17.2% were not looking for work, and 12.4% were keeping house or caring for children/other relatives.

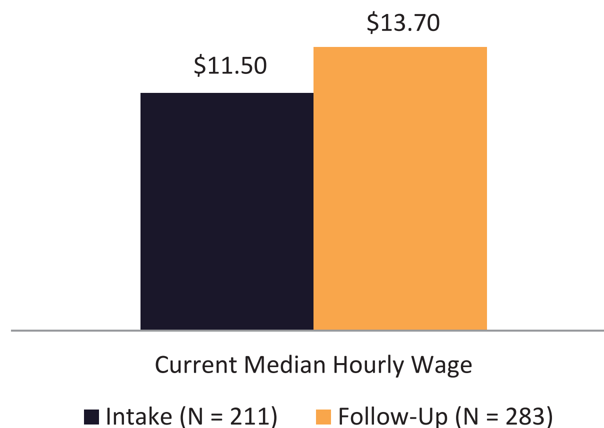
FIGURE 5.11. REASONS FOR UNEMPLOYMENT STATUS AT EACH POINT



Hourly Wage

Among clients who were currently employed at intake (n = 211), the median hourly wage was $11.50. Among clients who were employed at follow-up (n = 283),[68] the median hourly wage was $13.70 (see Figure 5.12).

FIGURE 5.12. CURRENT MEDIAN HOURLY WAGE AT INTAKE AND FOLLOW-UP, AMONG THOSE WHO WORKED

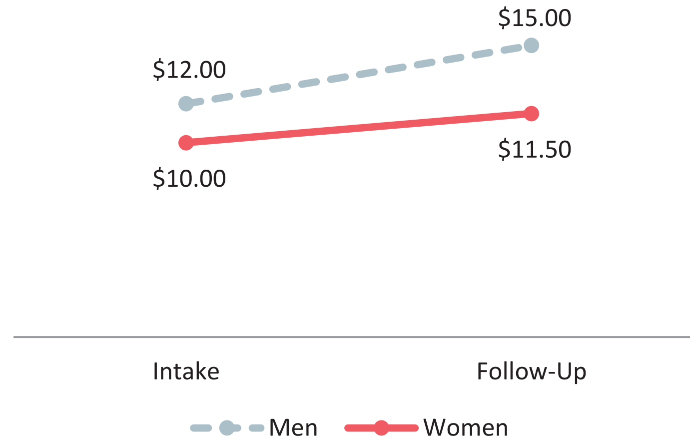


[68] Of the 294 individuals who reported being currently employed full-time, part-time, or seasonally at follow-up, 11 individuals had missing data on hourly wage because they did not know the answer, or they declined to answer.

Gender Differences in Hourly Wage

Among clients who were employed at each period, men had significantly higher hourly wages than women (see Figure 5.13). At intake, employed women made $0.83 for every dollar employed men made in this sample. At follow-up, employed women made $0.77 for every dollar employed men made.

FIGURE 5.13. GENDER DIFFERENCES IN CURRENT MEDIAN HOURLY WAGE AT INTAKE AND FOLLOW-UP

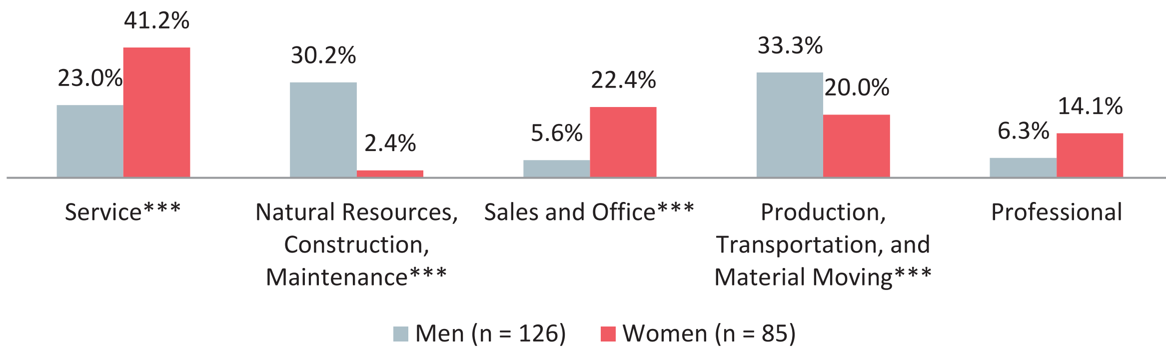


a—Significant difference in median hourly wage at intake and follow-up by gender, tested with Mann-Whitney U test ($p < .01$).

Gender Differences in Occupation Type

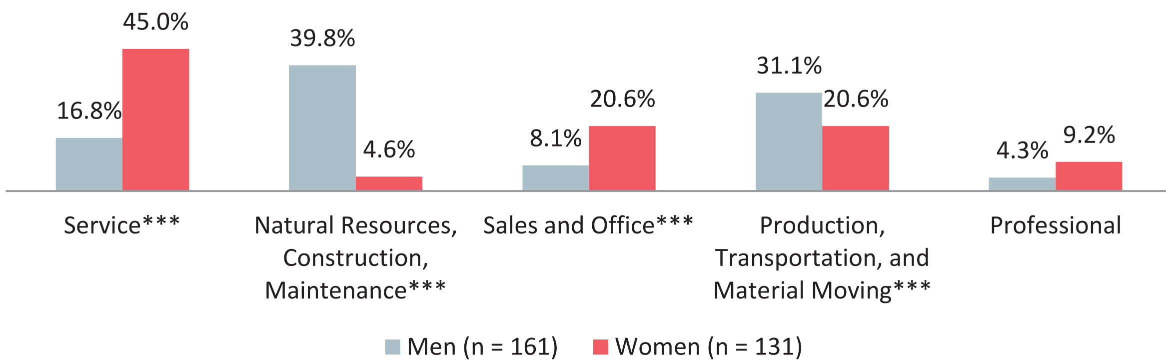
At least part of the reason for the marked difference in hourly wages between men and women is due to the significant difference in occupation type for employed individuals by gender. At intake, the occupation type the highest percentage of women had was the service sector (41.2%), whereas only 23.0% of employed men had a service sector job (see Figure 5.14a). In addition, compared to women (2.4%), 30.2% of employed men reported having a job in the natural resources, construction, and maintenance sector, which typically has higher average wages than service sector jobs. Significantly more women had sales/office jobs compared to men (22.4% vs. 5.6%), and significantly more men had production, transportation and material moving jobs compared to women (33.3% vs. 20.0%). These patterns were also found at follow-up; 45.0% of women had a service sector job, whereas only 16.8% of employed men had a service sector job, while 39.8% of men and only 4.6% of women had natural resources, construction, and maintenance jobs (see Figure 5.14b).

FIGURE 5.14a. AMONG EMPLOYED INDIVIDUALS, TYPE OF OCCUPATION BY GENDER AT INTAKE (N = 211)***



***p < .001.

FIGURE 5.14b. AMONG EMPLOYED INDIVIDUALS, TYPE OF OCCUPATION BY GENDER AT FOLLOW-UP (N = 292)***



***p < .001.

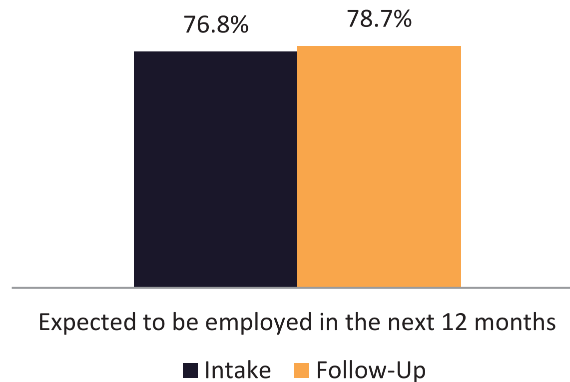
Expect to Be Employed

The majority of individuals said they expected to be employed in the next 12 months at intake and follow-up, with no change over time (see Figure 5.15).

"The program helped me get sober and get a job. If I did not go then I would not be where I is today."

– KTOS FOLLOW-UP CLIENT

FIGURE 5.15. EXPECTED TO BE EMPLOYED IN THE NEXT 12 MONTHS AT INTAKE AND FOLLOW-UP (N = 568)[69]



***p < .001.

Economic Hardship

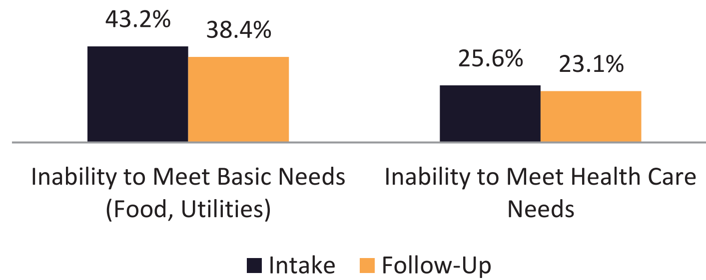
Economic hardship, rather than a measure of income, may be a better indicator of the actual day-to-day stressors clients face. Therefore, the intake and follow-up surveys included several questions about clients' ability to meet expenses for basic needs and food insecurity.[70] Clients were asked eight items, five of which asked about inability to meet basic living needs such as food, shelter, utilities, and telephone, and three items asked about inability to receive medical care for financial reasons. The total number of basic needs individuals reported they had difficulty meeting were summed at intake and follow-up. Individuals reported significantly fewer needs they had difficulty meeting at follow-up (1.2) compared to intake (1.7; not depicted in figure).

Less than one half of clients (43.2%) reported at intake that they had difficulty meeting basic living needs such as food, shelter, or utilities (see Figure 5.16). The percent of individuals who reported having difficulty meeting basic living needs did not change significantly from intake to follow-up. About one-fourth of clients (25.6%) reported their household had difficulty meeting health care needs in the 12 months before clients entered treatment. The percent of individuals reporting they had difficulty with health care did not change significantly from intake to follow-up.

[69] One individual had missing data for expected to be employed in the next 12 months at follow-up.

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

FIGURE 5.16. DIFFICULTY IN MEETING BASIC AND HEALTH CARE NEEDS FOR FINANCIAL REASONS (N = 563)[71]

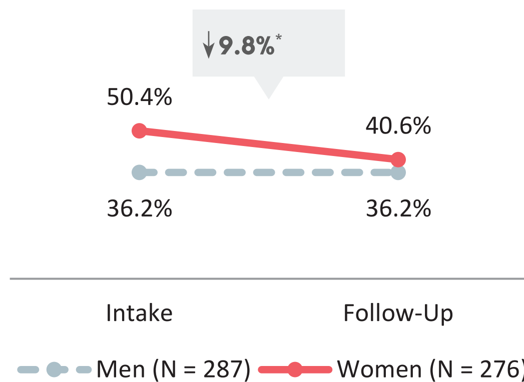


Gender Differences in Economic Hardship

At intake, women reported significantly more basic needs they had difficulty meeting (1.9) compared to men (1.4; not depicted in figure). At follow-up, there was no significant difference by gender.

There was a significant gender difference in clients' inability to meet basic living needs at intake (see Figure 5.17). Compared to men, significantly more women reported having difficulty meeting their basic living needs (e.g., housing, utilities, telephone, and food) at intake. About half of women (50.4%) reported difficulty meeting basic living needs at intake compared to 36.2% of men. There was a significant decrease in the percent of women who reported having difficulty meeting basic living needs at follow-up. The percent of men who had difficulty meeting basic living needs stayed the same.

FIGURE 5.17. GENDER DIFFERENCES IN DIFFICULTY MEETING BASIC LIVING NEEDS FOR FINANCIAL REASONS[a]



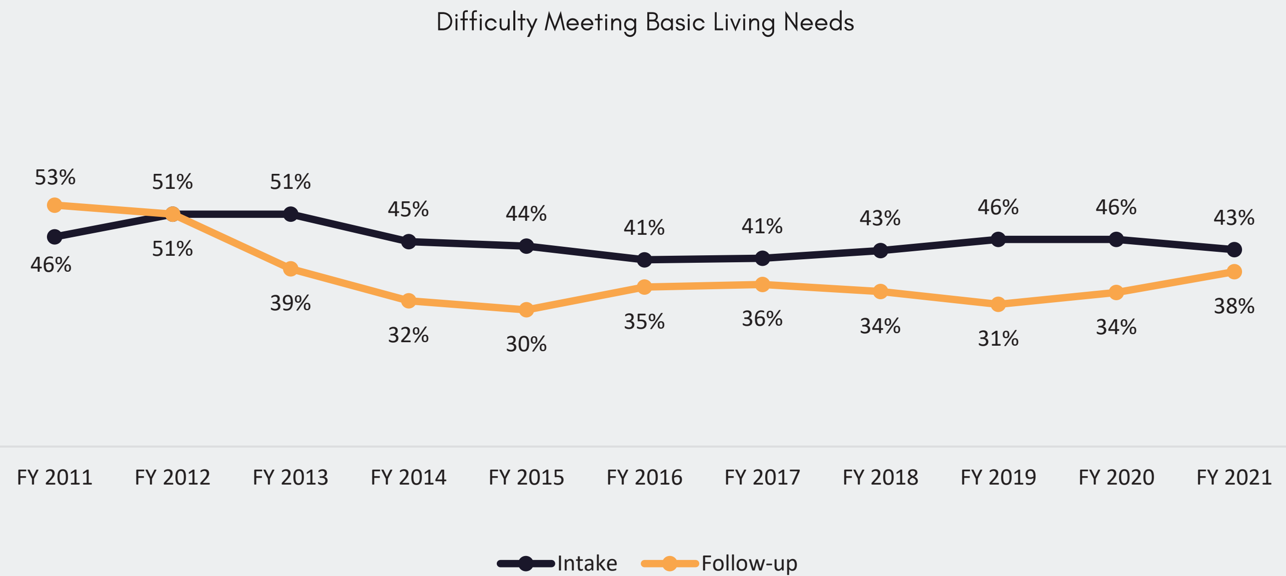
a—Significant difference by gender at intake ($p < .001$).
**$p < .05$.

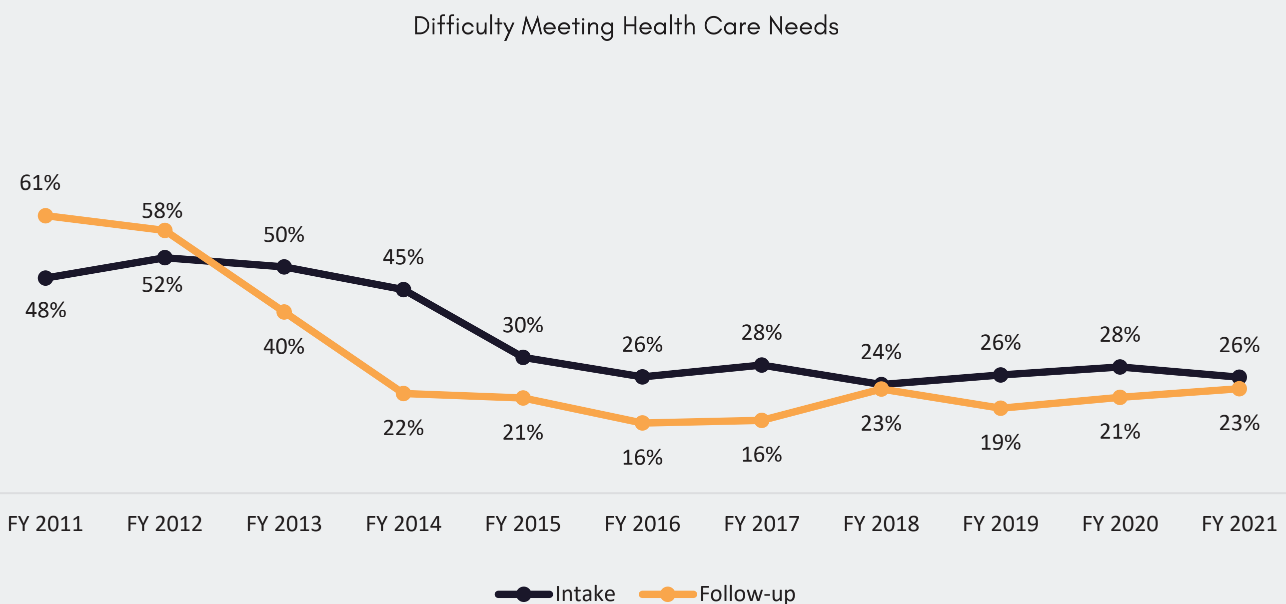
[71] Six individuals had missing data for items on the difficulty meeting needs scale at follow-up.

Trends in Difficulty Meeting Basic Living and Health Care Needs

The percent of KTOS clients who have reported difficulty meeting basic living needs at intake has fluctuated between 41% and 51%. The percent of KTOS clients who have reported difficulty meeting basic living needs at follow-up decreased from FY 2011 until FY 2015, when it began increasing again to 36% in FY 2017 and 38% in FY 2021, but not to the level it was in FY 2011 (53%). The decrease in the percent of clients reporting difficulty meeting health care needs at follow-up was even more dramatic: 61% in FY 2011 to 16% in FY 2017. In FY 2018, this percent increased to 23%, the highest rate since FY 2013, and again in FY 2021.

FIGURE 5.18. TRENDS IN THE NUMBER OF CLIENTS REPORTING ECONOMIC DIFFICULTY IN THE PAST-12-MONTHS AT INTAKE AND FOLLOW-UP, FY 2011-FY 2021





| Section 6. Criminal Justice System Involvement

This section describes change in client involvement with the criminal justice system during the 12-month period before entering treatment and during the 12-month period before the follow-up interview. Specifically, results include changes in: (1) any arrest, (2) convictions for misdemeanors and felonies, (3) any incarceration, and (4) criminal justice supervision status. Results for each targeted factor are presented for the overall sample and by gender when there were significant gender differences.

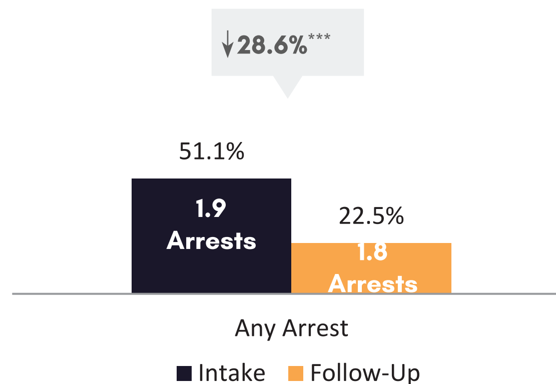
Arrests

Arrested in the Past 12 Months

Clients were asked about their arrests in the 12 months before they entered treatment (at intake) and the past 12 months (at follow-up). About half of clients (51.1%) reported at least one arrest in the 12 months before entering treatment (see Figure 6.1). At follow-up, about one-fourth (22.5%) reported at least one arrest in the past 12 months, which was a significant 28.6% decrease from intake.

Among those clients who reported at least one arrest in the 12 months before intake (n = 290), clients were arrested an average of 1.9 times. Among those clients who reported at least one arrest in the 12 months before follow-up (n = 128)[72], the average number of arrests was 1.8.

FIGURE 6.1. CLIENTS REPORTING ARRESTS AT INTAKE AND FOLLOW-UP (N = 568)[73]



***p < .001.

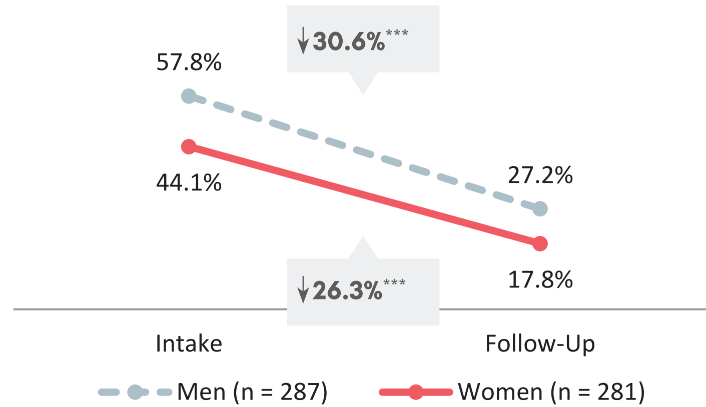
Gender Differences in Arrests

There were significant decreases from intake to follow-up in the percent of men and women who reported being arrested in the previous 12 months. At intake and follow-up, significantly more men reported they had been arrested when compared to women (see Figure 6.2).

[72] One client had missing data for number of arrests at follow-up.

[73] One client had missing data for number of arrests at follow-up.

FIGURE 6.2. GENDER DIFFERENCES IN ARRESTS IN THE PAST 12 MONTHS

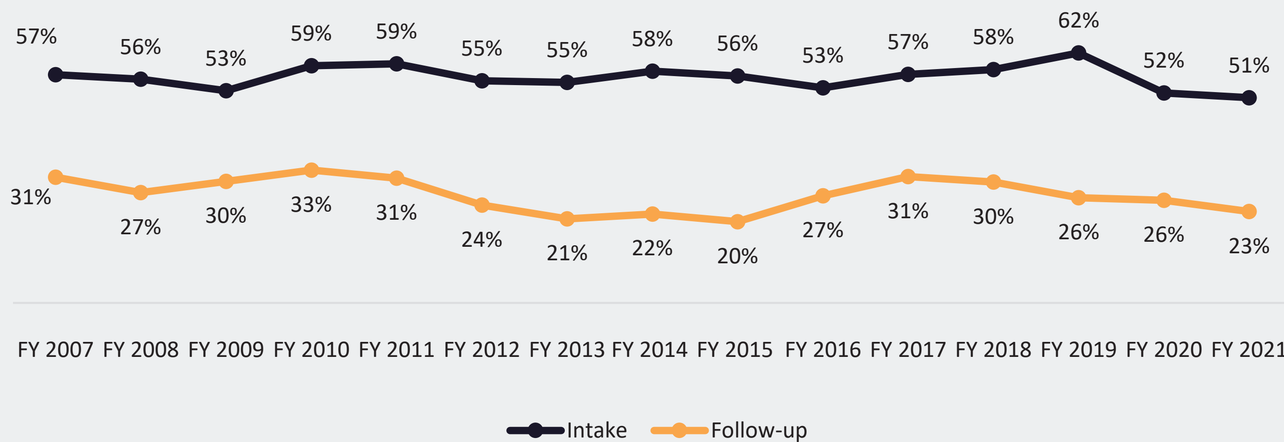


a—Statistical difference by gender at intake ($p < .001$) and follow-up ($p<.01$).
***$p < .001$.

Trends in Past-12-month Arrests

Over the past 15 years the percent of clients reporting an arrest in the past 12 months at intake has ranged from a low of 51% in FY 2021 to a high of 62% in FY 2019. At follow-up, since FY 2007, between one-fifth to nearly one-third of clients reported an arrest, which were significant decreases from intake.

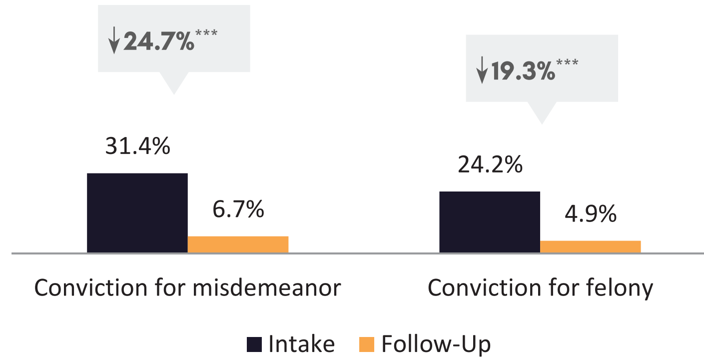
FIGURE 6.3. TRENDS IN THE PERCENT OF CLIENTS REPORTING AN ARREST IN THE PAST-12-MONTHS AT INTAKE AND FOLLOW-UP, FY 2007-FY 2021



Convictions

Almost one-third of individuals (31.4%) reported they had at least one conviction for a misdemeanor in the 12 months before entering treatment (see Figure 6.4). The percent of individuals with a conviction for a misdemeanor in the 12 months before follow-up was significantly lower at 6.7%. Almost one-quarter of clients (24.2%) reported at least one felony conviction in the 12 months before intake. That percent decreased significantly to 4.9% in the 12 months before follow-up.

FIGURE 6.4. CONVICTIONS FOR MISDEMEANOR AND FELONY OFFENSES (N = 567)[74]

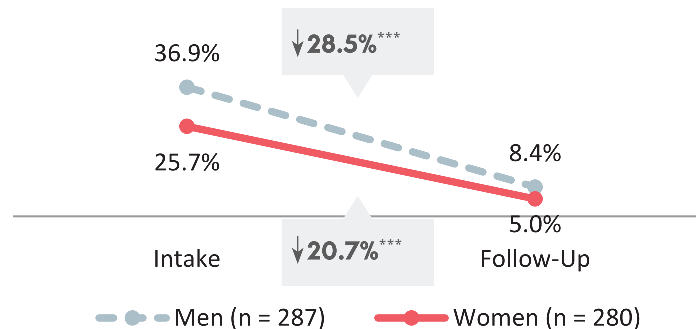


***p < .001.

Gender Differences in Convictions for Misdemeanor Offenses

At intake, significantly more men reported they had received a conviction for a misdemeanor offense in the past 12 months when compared to women. There were significant decreases from intake to follow-up in the percent of men and women who reported convictions for misdemeanor offenses. At follow-up, there was no difference convictions for misdemeanor offenses by gender (see Figure 6.5).

FIGURE 6.5. GENDER DIFFERENCES IN CONVICTIONS FOR MISDEMEANOR OFFENSES IN THE PAST 12 MONTHS



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

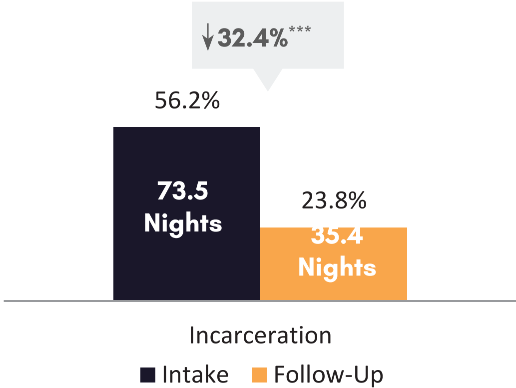
[74] Two cases had missing data on convictions for misdemeanor and felony offenses at follow-up.

Incarceration

Incarcerated in the Past 12 Months

The majority of clients (56.2%) reported spending at least one night in jail or prison in the 12 months prior to entering treatment (see Figure 6.6). At follow-up, 23.8% of clients reported spending at least one day incarcerated in the past 12 months--a significant decrease of 32.4%. Among those who were incarcerated at least one night, they reported spending, on average, less time in jail or prison in the 12 months before follow-up (n = 135, 35.4 nights) when compared to intake (n = 319, 73.5 nights).

FIGURE 6.6. CLIENTS REPORTING BEING INCARCERATED AT INTAKE AND FOLLOW-UP (N = 568)[75]

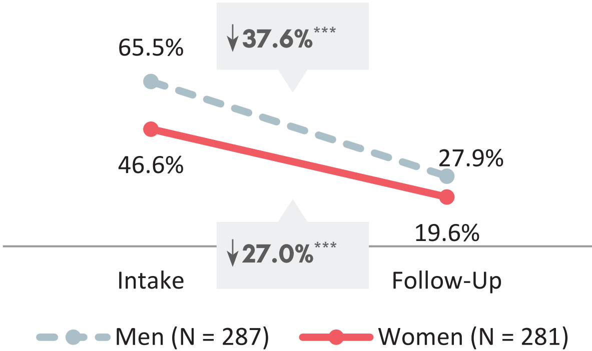


***p < .001.

Gender Differences in Incarceration

Significantly more men reported being incarcerated at least one night in the 12 months before entering treatment and follow-up when compared to women (see Figure 6.7). There was a significant decrease in the percent of men and women who reported incarceration from intake to follow-up.

FIGURE 6.7. GENDER DIFFERENCES IN ANY INCARCERATION AT INTAKE AND FOLLOW-UP[a]



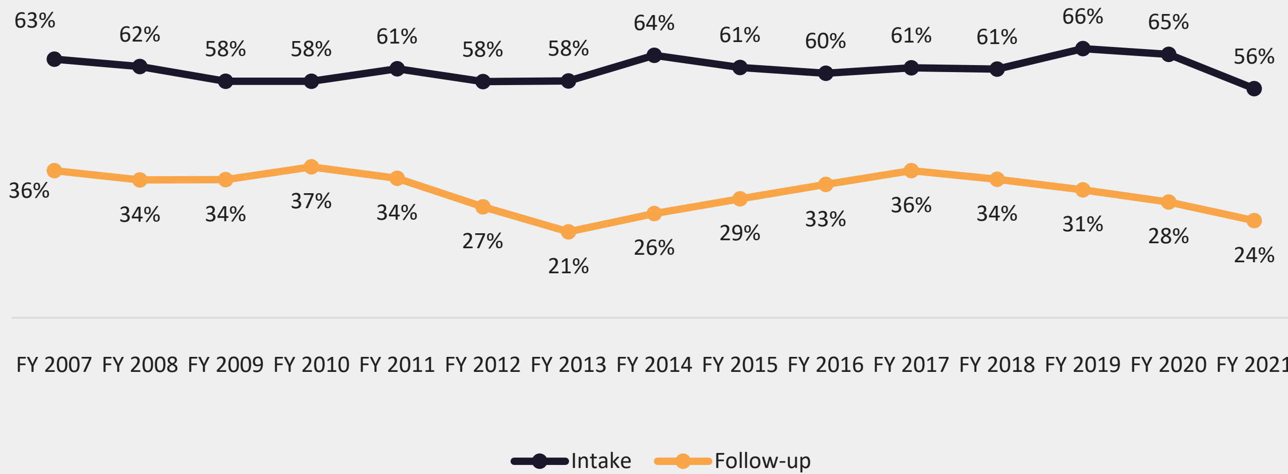
a—Significant difference by gender at intake (p < .001) and at follow-up (p < .05).
***p < .001.

[75] One individual had missing data for incarceration at follow-up.

Trends in Past-12-month Incarceration

The percent of clients reporting spending at least one night in jail or prison has been relatively steady over the past 15years with between 56% and 66% of clients reporting incarceration at intake. At follow-up, the percent of clients reporting spending at least one night in jail or prison in the past 12 months has fluctuated more than at intake: from a low of 21% in FY 2013 to a high of 37% in FY 2010. The decreases from intake to follow-up were significantly different each year.

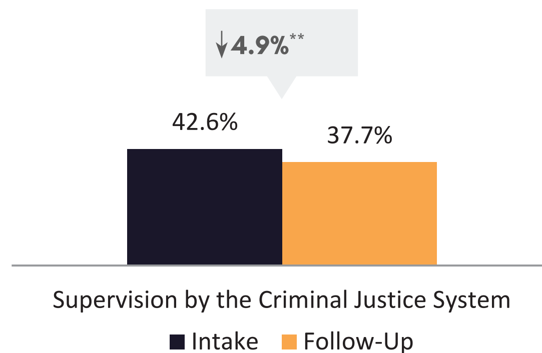
FIGURE 6.8. TRENDS IN THE PERCENT OF CLIENTS REPORTING BEING INCARCERATED IN THE PAST-12-MONTHS AT INTAKE AND FOLLOW-UP, FY 2007-FY 2021



Criminal Justice System Supervision

The percent of clients that self-reported they were under criminal justice system supervision (e.g., probation or parole) decreased from intake (42.6%) to follow-up (37.7%; see Figure 6.9).

FIGURE 6.9. CLIENTS REPORTING SUPERVISION BY THE CRIMINAL JUSTICE SYSTEM AT INTAKE AND FOLLOW-UP (N = 568)[76]



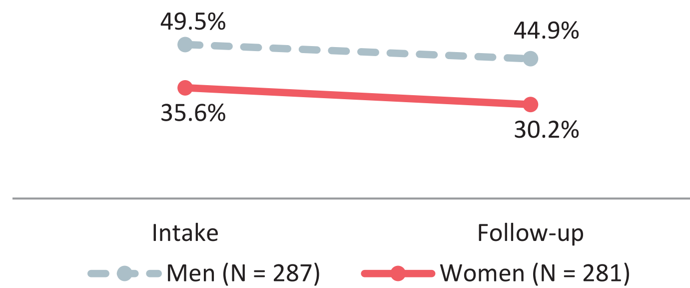
**p < .05.

[76] One client had missing data for criminal justice supervision at follow-up.

Gender Differences in Criminal Justice Supervision

Significantly more men (49.5%) than women (35.6%) reported being under supervision by the criminal justice system in the 12 months before entering treatment and at follow-up (44.9% vs. 30.2%; see Figure 6.10).

FIGURE 6.10. GENDER DIFFERENCES IN CLIENTS REPORTING CRIMINAL JUSTICE SUPERVISION[a]



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

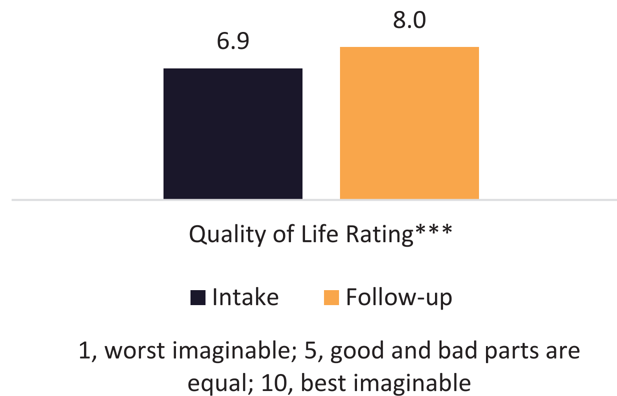
| Section 7. Quality of Life

This section describes change in client quality of life during the 12-month period before entering treatment and the 12-month period before the follow-up interview. Results for each targeted factor are presented for the overall sample and by gender when there were significant gender differences.

Quality of Life Ratings

At intake and follow-up, clients were asked to rate their quality of life at the time of the interview. Ratings were from 1 = 'Worst imaginable' to 5 = 'Good and bad parts were about equal' to 10 = 'Best imaginable'. KTOS clients rated their quality of life as a 6.9, on average, at intake (see Figure 7.1). The average quality of life rating significantly increased to 8.0 at follow-up.

FIGURE 7.1. RATING OF QUALITY OF LIFE AT INTAKE AND FOLLOW-UP (N = 568)[77]



***$p < .001$.

"I thought it was a great place, the staff was really good and easy to talk to. Made you feel like they cared about you. Can really tell they cared and made me feel like I was in the right place.

– KTOS FOLLOW-UP CLIENT

[77] One client had missing data for the rating of quality of life at follow-up.

| Section 8. Recovery Support

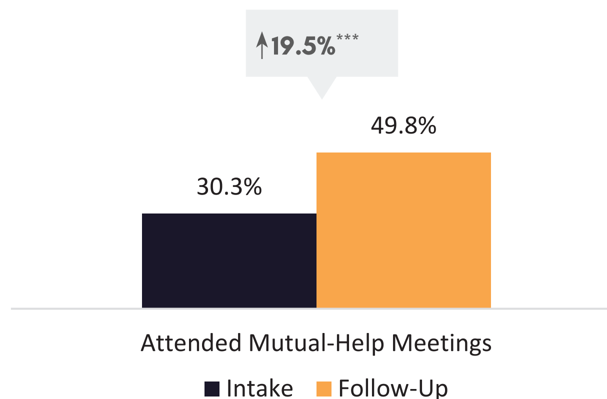
This section focuses on five main areas of recovery support: (1) clients attending mutual help recovery group meetings, (2) recovery supportive interactions with family/friends and a sponsor in the past 30 days, (3) the number of people the participant said they could count on for recovery support, (4) what will be most useful to the client in staying off drugs/alcohol, and (5) clients' perceptions of their chances of staying off drugs/alcohol. Results for each targeted factor are presented for the overall sample and by gender when there were significant gender differences.

Mutual Help Recovery Group Meeting Attendance

At intake, about three in ten (30.3%) of clients reported going to mutual help recovery group meetings (e.g., AA, NA, or faith-based) in the past 30 days (see Figure 8.1). At follow-up, there was a significant increase of 19.5%, with half of clients (49.8%) reporting they had gone to mutual help recovery group meetings in the past 30 days.

Among individuals who attended self-help meetings at intake (n = 172), they reported attending an average of 14.7 meetings in the past 30 days. Those who attended self-help meetings at follow-up (n = 283) reported an average of 13.3 meetings attended in the past 30 days.

FIGURE 8.1. MUTUAL HELP RECOVERY GROUP ATTENDANCE AT INTAKE AND FOLLOW-UP (N = 568)[78]



***$p < .001$.

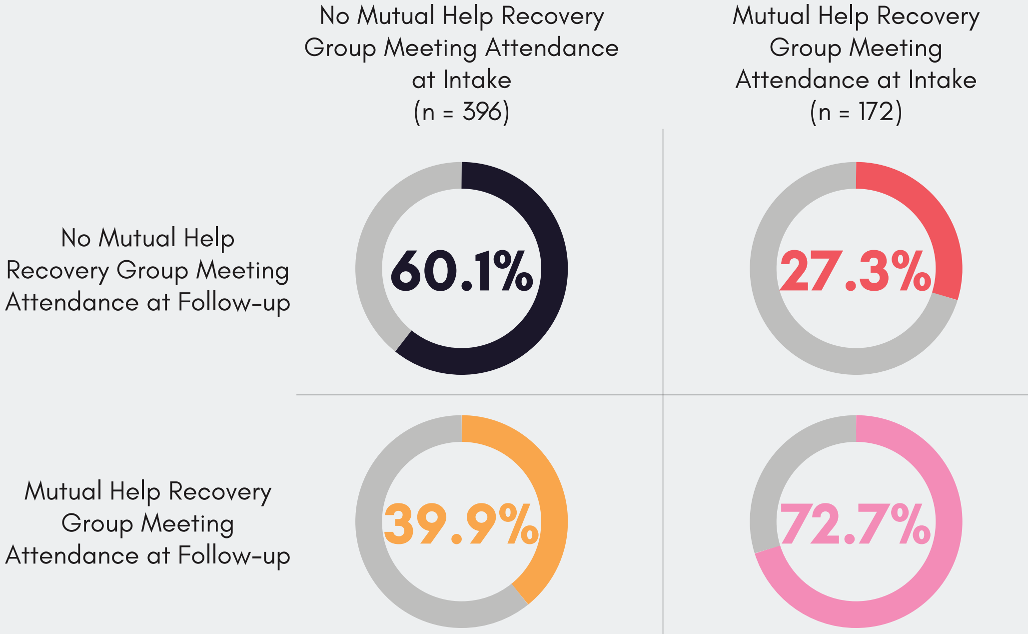
[78] One individual had missing data for self-help meeting attendance at follow-up.

Taking a Closer Look at Recovery Support

About 3 in 10 clients reported attending mutual help recovery group meetings in the 30 days before entering treatment (30.3%; n = 172). Among clients who reported attending mutual help recovery group meetings at intake, 72.7% also attended mutual help recovery group meetings at follow-up (see Figure 8.2).

Alternatively, 39.9% of those who did not report attending mutual help recovery group meetings in the 30 days before entering treatment attended meetings at follow-up.

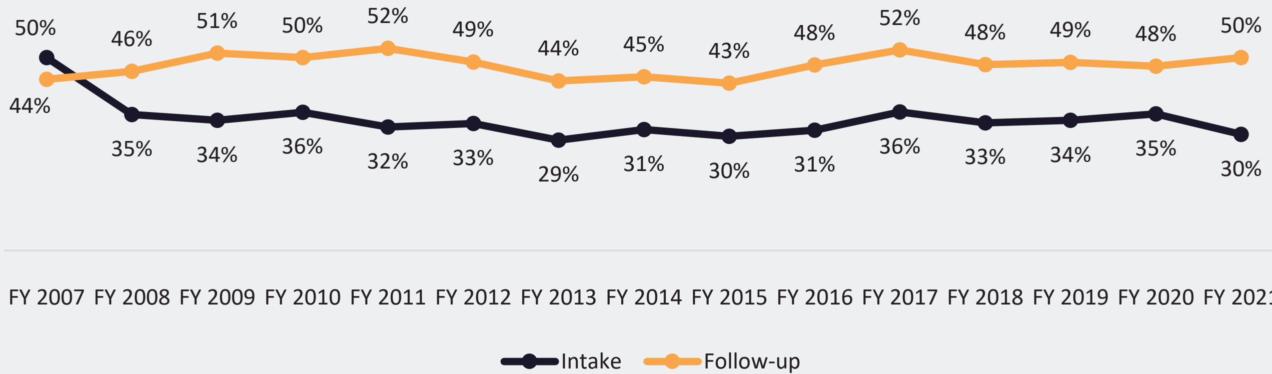
FIGURE 8.2. MUTUAL HELP RECOVERY GROUP MEETING ATTENDANCE AT INTAKE AND FOLLOW-UP BASED ON MEETING ATTENDANCE AT INTAKE



Trends in Clients Attending Mutual Help Recovery Meetings

More clients reported attending meetings like AA/NA at follow-up compared to intake, except in FY 2007 when the number of clients reporting attending mutual help recovery group meetings was higher at intake than follow-up. Overall, around one-third of clients reported attending meetings at intake and less than one half to about one half reported attending meetings at follow-up from FY 2008 through FY 2021.

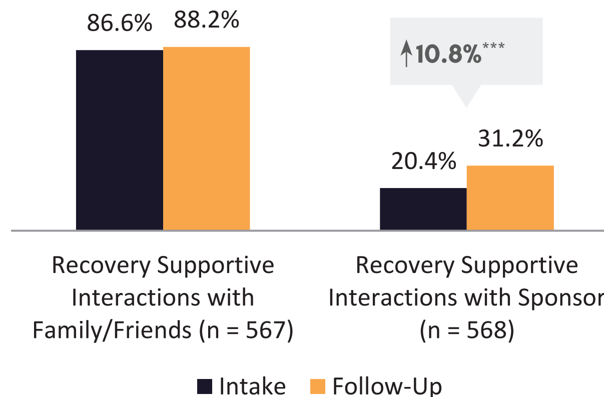
FIGURE 8.3. TRENDS IN THE PERCENT OF CLIENTS REPORTING PAST-30-DAY MUTUAL HELP RECOVERY GROUP MEETINGS AT INTAKE AND FOLLOW-UP, FY 2007-FY 2021



Recovery Supportive Interactions

The majority of clients reported they had interactions with family or friends who were supportive of their recovery in the 30 days before treatment intake and before follow-up, with no significant change over time (see Figure 8.4). One in five clients reported being in contact with an AA/NA or other self-help group sponsor at intake. That number increased significantly to 31.2% at follow-up.

FIGURE 8.4. RECOVERY SUPPORTIVE INTERACTIONS IN THE PAST 30 DAYS[79]



***$p < .001$.

[79] Two clients had missing data for contact with recovery supports at follow-up.

Average Number of People Client Could Count on for Recovery Support

The average number of people clients reported that they could count on for recovery support increased significantly, from 6.5 people at intake to 13.2 people at follow-up (see Figure 8.5).

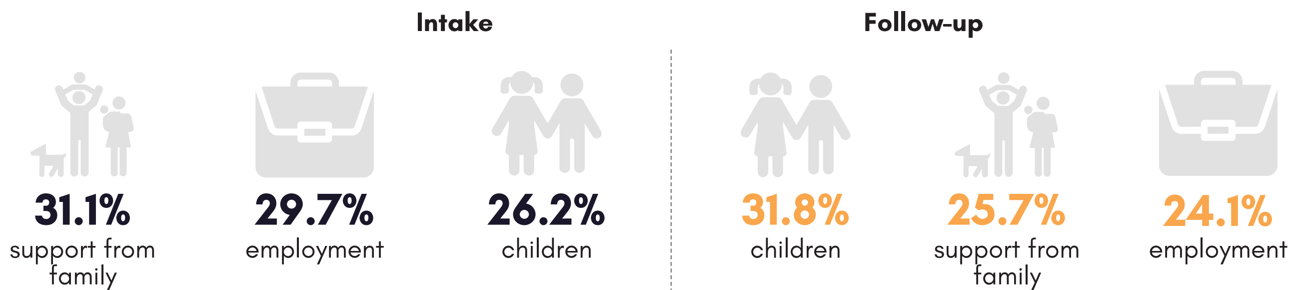
FIGURE 8.5. AVERAGE NUMBER OF PEOPLE CLIENTS COULD COUNT ON FOR RECOVERY SUPPORT AT INTAKE AND FOLLOW-UP (N = 568)[80]

***p < .001.

What Will Be Most Useful in Staying Off Drugs/Alcohol

At intake and follow-up, clients were asked what 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, the top responses that were reported by clients are presented for descriptive purposes in Figure 8.6. The most common responses at intake were support from family, employment, and taking care of their children or dependents. At follow-up, the most common responses were caring for children or dependents, support from family, and employment.

FIGURE 8.6. TOP CATEGORIES CLIENTS REPORTED THAT WILL BE MOST USEFUL IN STAYING OFF DRUGS AND/OR ALCOHOL AT INTAKE AND FOLLOW-UP (N = 835)[81]



Chances of Staying Off Drugs/Alcohol

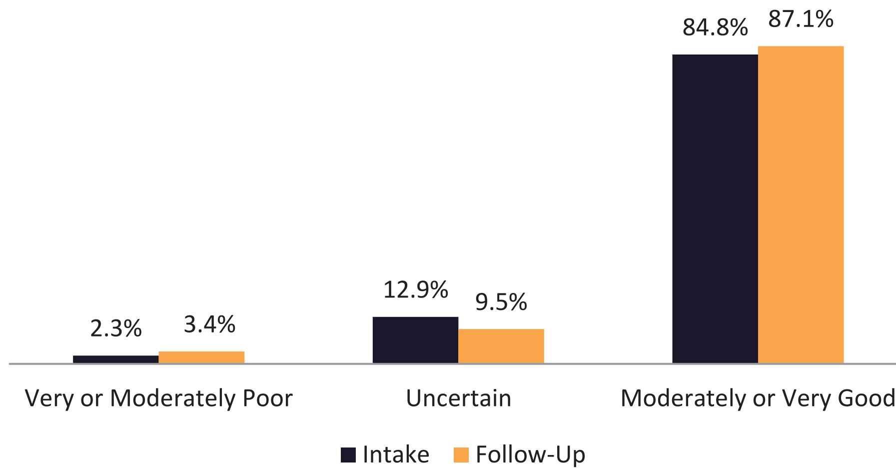
Clients were asked, based upon their situation, how good they believed their chances were of getting off and staying off drugs/alcohol using a scale from 1 (very poor) to 5 (very good). Clients rated their chances of getting off and staying off drugs/alcohol as a 4.4 at intake and a 4.5 at follow-up, which was a significant increase (not depicted in figure). Overall, 84.8% of clients believed they had a moderately or very good chance of staying off drugs/alcohol at intake with

[80] Data on the number of people the client could count on for recovery support at follow-up was missing for 1 case.

[81] Four individuals had missing data on what will be most useful in staying off drugs and/or alcohol at follow-up.

no significant change at follow-up (87.1%; see Figure 8.7).[82]

FIGURE 8.7. CLIENTS REPORTING THEIR CHANCES OF GETTING OFF AND STAYING OFF DRUGS/ALCOHOL AT INTAKE AND FOLLOW-UP (N = 567)[a]



a – Significance tested with the Stuart-Maxwell Test for Marginal Homogeneity.

[82] Two individuals had missing data for chances of staying off drugs/alcohol at follow-up.

| Section 9. Multidimensional Recovery Status

This section examines change in multidimensional recovery before entering the program and at follow-up.

Recovery goes beyond relapse or return to occasional drug or alcohol use. Recovery from substance use disorders can be defined as "a process of change through which an individual achieves abstinence and improved health, wellness and quality of life" (p. 5).[83] The SAMHSA definition of recovery is similarly worded and encompasses health (including but not limited to abstinence from alcohol and drugs), having a stable and safe home, a sense of purpose through meaningful daily activities, and a sense of community.[84] In other words, recovery encompasses multiple dimensions of individuals' lives and functioning. The multidimensional recovery measure uses items from the intake and follow-up surveys to classify individuals who have all positive dimensions of recovery.

TABLE 9.1. COMPONENTS OF MULTIDIMENSIONAL RECOVERY STATUS

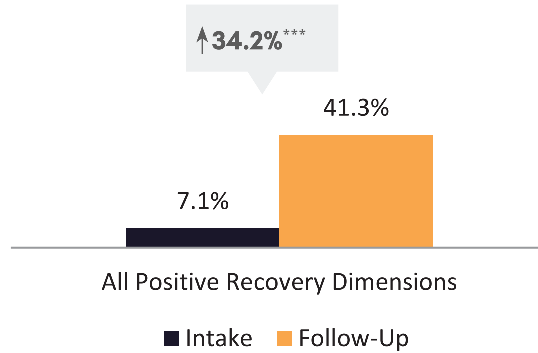
Indicator	Positive Recovery Dimensions	Negative Recovery Dimensions
Substance use disorder (SUD) symptoms	No substance use disorder (SUD)	Mild, moderate or severe substance use disorder (SUD)
Employment	Employed at least part-time or in school	Unemployed (not on disability, not going to school, not a 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, a small percent of the followed-up sample (7.1%) was classified as having all eight dimensions of recovery (see Figure 9.1). At follow-up, there was a significant increase of 34.2% so that about two-fifths of the sample (41.3%) had all positive dimensions of recovery.

[83] Center on Substance Abuse Treatment. (2007). *National summit on recovery: conference report* (DHHS Publication No. SMA 07-4276). Rockville, MD: Substance Abuse and Mental Health Services Administration.

[84] Laudet, A. (2016). *Measuring recovery from substance use disorders*. Workshop presentation at National Academies of Sciences, Engineering, and Medicine (February 24, 2016). Retrieved from https://sites.nationalacademies.org/cs/groups/dbassesite/documents/webpage/dbasse_171025.pdf

FIGURE 9.1. MULTIDIMENSIONAL RECOVERY AT INTAKE AND FOLLOW-UP (N = 552)[85]



***p < .001.

Table 9.2 presents the frequency of clients who reported each of the specific components of the multidimensional recovery index at intake and follow-up. At intake, the positive dimensions of recovery with the lowest percent of individuals reporting them were meeting criteria for no substance use disorder and not being arrested or incarcerated. At follow-up, the positive dimensions of recovery with the lowest percent of individuals reporting them were not being arrested or incarcerated and meeting criteria for no substance use disorder.

TABLE 9.2. PERCENT OF CLIENTS WITH SPECIFIC POSITIVE DIMENSIONS OF RECOVERY AT INTAKE AND AT FOLLOW-UP (n = 552)

FACTOR	Intake Yes	Follow-Up Yes
Met DSM-5 criteria for no SUD in the past 12 months	23.4%	72.8%
Usual employment was employed full-time or part-time in the past 12 months (or retired, on disability, a student, or caregiver)	77.2%	77.5%
Reported no homelessness	68.3%	91.1%
Reported not being arrested and/or incarcerated in the past 12 months	38.9%	73.6%
Reported no thoughts of suicide or attempted suicide in the 12 months	77.5%	90.0%
Self-rating of overall health was fair, good, very good, or excellent	94.0%	94.0%
Reported having someone they could count on for recovery support	92.9%	96.4%
Reported a quality of life rating in the mid or higher range (rating of 5 or higher)	87.0%	95.8%

To better understand which factors at entry to the program were associated with having all positive dimensions of recovery at follow-up, each element that defined the multidimensional status at intake was entered as predictor variables in a logistic regression model (see Table 9.3). Having all positive dimensions of recovery at follow-up is the criterion (i.e., dependent) variable. Two of the intake predictor variables were significantly associated with having all the positive dimensions of recovery at follow-up: meeting DSM-5 criteria for no SUD and having a mid to higher quality of life rating at intake.

[85] Seventeen individuals had missing data for at least one of the variables that was used to compute the multidimensional recovery status at follow-up and could not be assigned to a group. Additional numbers of cases had missing values for some of the variables used to compute the multidimensional recovery at follow-up, but because they had at least one negative dimension, they could be classified as not having all eight positive dimensions of recovery at follow-up.

TABLE 9.3. MULTIVARIATE ASSOCIATIONS HAVING ALL POSITIVE DIMENSIONS OF RECOVERY AT FOLLOW-UP

FACTOR	B	Wald	Odds Ratio	95% CI	
				Lower	Upper
Met DSM-5 criteria for no SUD in the 12 months before entering the program	.718	10.832	2.051***	1.337	3.145
Usual employment was employed (or retired, on disability, a student, or caregiver) in the 12 months before entering the program	.019	.007	1.019	.663	1.566
No homelessness in the 12 months before entering the program	.253	1.451	1.288	.853	1.944
Not arrested or incarcerated in the 12 months before entering the program	-.223	1.427	.800	.555	1.154
Reported no thoughts of suicide or attempted suicide in the 12 months before entering the program	.329	2.060	1.389	.887	2.175
Self-rating of overall health at intake was fair, good, very good, or excellent	.591	1.837	1.806	.768	4.247
Reported have at least one person he/she could count on for recovery support before entering the program	.130	.120	1.138	.546	2.375
Reported a mid to higher quality of life before entering the program	.684	4.970	1.981*	1.086	3.613

Note: Categorical variables were coded in the following ways: Met DSM-5 criteria for SUD (0= mild, moderate, or severe SUD, 1 = no SUD), Usual employment was employed (0=not employed or in a controlled environment, 1= employed full-time, part-time, or retired, on disability, a student, or caregiver), homeless (0 = yes, 1 = no), arrested or incarcerated (0 = yes, 1 = no), had thoughts of suicide or attempts (0 = yes, 1 = no), self-rating of overall health was fair, good, very good, or excellent (0 = no, 1 = yes), had at least one person the client could count on for recovery support (0=no, 1=yes), mid to high quality of life (0 = no, 1 = yes).
*p < .05, ***p < .001

"The place was just right for me. It was a small group so I was comfortable to get personal and open up.

– KTOS FOLLOW-UP CLIENT

| Section 10. Client Satisfaction with Substance Abuse Treatment Programs

One of the important outcomes assessed during the follow-up interview is the client perception of the treatment program experience. This section describes three aspects of client satisfaction: (1) client involvement in the program and how they left, (2) recommendation to the program, and (3) overall client satisfaction and client ratings of program experiences.

Client Involvement in the Program

The majority of clients (61.7%) reported at follow-up that they had completed the program they attended or that the program agreed they were ready to leave, 21.1% did not complete the program, and 17.1% were still involved in the program at follow-up (see Figure 10.1). The average number of months individuals reported at follow-up they were involved in the program was 5.3.[86] Individuals who reported they were still in the treatment program reported they had been involved in the program an average of 10.6 months. In contrast, individuals who had completed the program reported being in the program an average of 4.6 months and those who did not complete the program reported an average of 3.8 months. Women reported a higher average number of months they were in treatment compared to men (5.8 vs. 4.9, $t(560) = -2.061$, $p < .05$).

FIGURE 10.1. CLIENTS WHO REPORTED HOW THE TREATMENT PROGRAM ENDED FOR THEM (N = 549)[87]

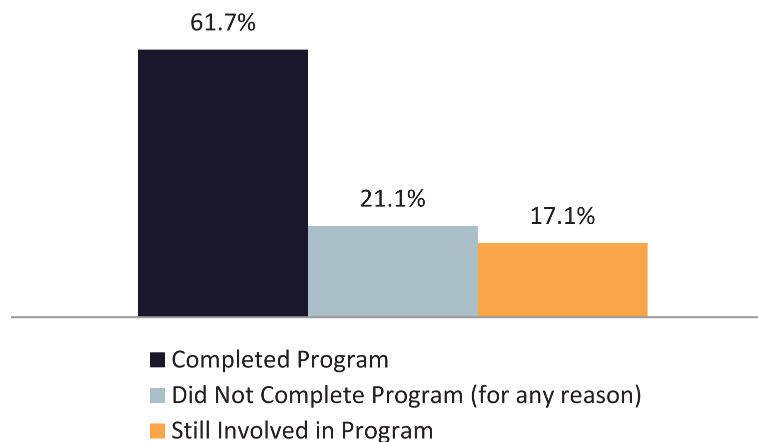
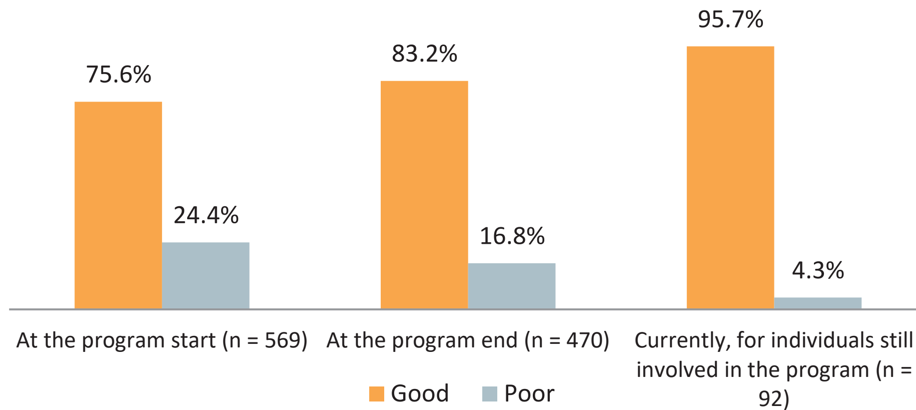


Figure 10.2 shows the percent of clients who reported the program started poor or good and ended poor or good. The majority of clients reported that the program started good (75.6%) and among individuals who were no longer involved in the program, they reported it ended good (83.2%). The vast majority of clients who were still involved in the program at follow-up reported the program was currently good for them.

[86] Seven individuals had missing data for the length of time they were involved in the SAT program.

[87] Twenty individuals had missing data for how treatment ended.

FIGURE 10.2. PERCENT OF CLIENTS WHO REPORTED AT FOLLOW-UP THE TREATMENT STARTED AND ENDED POOR OR GOOD[88]



Overall, the majority of clients (83.8%) reported that the treatment episode was working/worked pretty well or extremely well for them, 10.7% said the program worked somewhat well for them, and 5.5% said the program did not work for them at all.

A little less than one-fourth of clients (23.7%) reported they had been in other treatment programs since they left this treatment episode. Of those clients (n = 132),[89] they reported they had been involved in an average of 1.4 (Min. = 1, Max. = 10) other treatment programs or episodes.

Recommend Others to the Program

The majority of clients (91.3%) indicated they would refer a close friend or family member to their treatment provider. Of the clients who reported they would refer a close friend or family member to the program (n = 513),[90] 41.8% reported they would warn their friend or family member about certain things or tell them who to work with or who to avoid.

Overall Client Satisfaction

At the beginning of the follow-up survey, interviewers asked participants questions about their satisfaction with the treatment programs where 1 represented the worst experience and 10 represented the best experience. Overall, the majority of clients (74.1%) gave a high positive rating between 8 and 10 of their satisfaction with the treatment program (not in a table).[91] The average rating was 8.2.

[88] Seven individuals had missing data for program rating at the start of treatment and 7 had missing data for program rating at the end of treatment.

[89] One individual who had been to other treatment programs had missing data for the number of other programs they attended.

[90] Seven individuals had missing data about referring a friend or family to the program. Eight individuals reported they would refer a close friend or family member to the treatment program but had missing values on the item about warning others about certain things of who to work with or who to avoid in the program.

[91] Nine individuals had missing data for treatment satisfaction questions due to the interviewer skipping the questions, the client refusing to answer, or the client not remembering the program we were asking about.

Figure 10.3 shows that KTOS clients were satisfied with the overall program services. About 4 in 5 individuals (81.3%) said the program staff believed in them and believed that treatment would work for them, reported the program staff cared about them and their treatment progress (80.7%), and clients also said that when they told their counselor or program staff personal things, they felt listened to and heard by them (79.7%). More than three-fourths of clients agreed they worked on the things that were most important to them in treatment (77.8%), they had a connection with their counselor or staff person (76.6%), they had input into their treatment goals, plans, and how they were progressing over time (76.5%), and their expectations and hopes for treatment and recovery were met (76.1%). The majority reported that the treatment approach and method was a good fit for them (72.0%), and the length of the program was just right (63.5%). The majority of clients said they fully discussed or talked about everything they wanted to with their counselor or program staff.

FIGURE 10.3. RATINGS OF 8, 9, or 10 OF SPECIFIC TREATMENT PROGRAM EXPERIENCES (N = 554)[92]

[92] Between 7 and 15 individuals had missing data for some satisfaction questions because the interviewer skipped the question, the client refused to answer, or the client did not remember the program we were asking about.

| Section 11. Cost Savings of Substance Abuse Treatment in Kentucky

This section examines cost reductions or avoided costs to society after clients begin participation in publicly-funded substance abuse treatment. Using the number of clients who self-reported illegal drug and alcohol use at intake and follow-up in the KTOS sample, a cost per person based on national aggregate data was applied to this study sample. This information was then used to estimate the cost to society for the year prior to when clients entered treatment and then for the same clients during the year after treatment intake.

Importance of Cost Savings Analysis

There is great continuing policy interest in examining cost reductions or avoided costs to society after individuals participate in publicly-funded substance abuse treatment. This policy interest is fueled by concerns over the cost of substance abuse to overall personal health and to incarceration. 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, thorough assessment requires a great number of econometrics. To accommodate these complexities at an aggregate level, data were extrapolated from a large federal study that estimated annual costs drug abuse in the United States[93] and a separate study of the societal costs of excessive alcohol consumption in the U.S. in 2006.[94] In 2010 the estimated costs of excessive alcohol consumption 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.[95, 96] These updated costs were used in the calculations for the cost savings analysis in this KTOS follow-up report.

Cost of Alcohol and Drug Use Disorders

The national report and the subsequent revisions of estimates of costs referenced in this report factored in all the 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. Thus, each of these reports analyzes the hidden and obvious costs that are caused by clients with substance abuse. To calculate the estimate of the cost per alcohol user or drug user, the national cost estimates were divided by the estimate of the number of individuals with alcohol

[93] Harwood, H., Fountain, D., & Livermore, G. (1998). *The 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.

[94] Bouchery, E.E., Harwood, H.J., Sacks, J.J., Simon, C.J., & Brewer, R.D. (2011). Economic costs of excessive alcohol consumption in the U.S., 2006. *American Journal of Preventive Medicine*, *41*(5), 516-524.

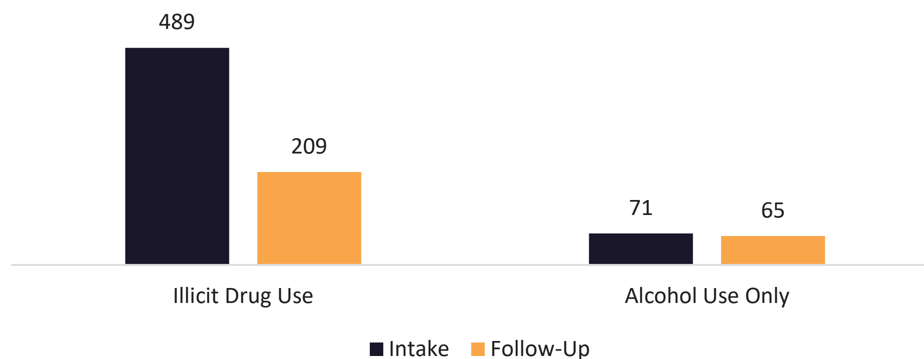
[95] Sacks, J.J., Gonzales, K.R., Bouchery, E.E., Tomedi, L.E., & Brewer, R.D. (2015). 2010 national and state costs of excessive alcohol consumption. *American Journal of Preventive Medicine*, *49*(5), e73-e79.

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

or drug use disorder in the corresponding years (2010 for alcohol use and 2011 for drug use).[97] The estimate of the cost to society of excessive alcohol consumption was $249,026,400,000 in 2010. This amount was then divided by the 17,900,000 individuals estimated in the NSDUH in 2010 to have an alcohol use disorder, yielding a cost per person of alcohol abuse of $13,912 (after rounding to a whole dollar) in 2010 dollars. The estimate of the cost to society of drug use was $193,096,930,000 in 2007. This amount was then divided by the 6,900,000 individuals estimated in the NSDUH in 2007 to have an illicit drug abuse or dependence disorder, yielding a cost per person of drug abuse of $27,985 (after rounding to a whole dollar) in 2007 dollars. The costs per person were then converted to 2021 dollars using a CPI indexing from a federal reserve bank (http://www.minneapolisfed.org). Thus, the estimate of cost per person of alcohol abuse is $17,286 in 2021 dollars and the estimate of the cost per person of drug abuse is $36,577 in 2020 dollars. Analysis hinged on estimating the differences in cost to society between persons who are actively addicted compared to those who are abstinent from drug and/or alcohol use. Thus, reductions in the number of clients who reported using illicit drugs and alcohol in the period before treatment to after treatment was examined.

Figure 11.1 shows the change in the number of clients who reported any use of drugs and/or alcohol in the 12 months before intake and follow-up. Clients who reported using illicit drugs only or illicit drugs as well as alcohol were counted in the drug use category because the cost per person of drug use was higher per drug user than the cost per person of alcohol use. Clients who reported using alcohol only were counted in the alcohol use category. The change from intake to follow-up was significant. At intake, 489 clients reported using illicit drugs and an additional 71 clients reported using alcohol only. At follow-up, 209 clients reported using illicit drugs and 65 additional clients reported using any alcohol.

FIGURE 11.1. THE NUMBER OF CLIENTS WHO REPORTED USING ILLICIT DRUGS AND/OR ALCOHOL IN THE 12 MONTHS BEFORE INTAKE AND FOLLOW-UP (N = 569)



When the estimated cost per individual drug user was applied to the 489 individuals who were active drug users at intake, the annual estimated cost to society for the KTOS sample who used illegal drugs before entry into treatment was $17,886,153. When the average annual cost per individual alcohol abuser was applied to the 71 clients who reported using alcohol only at intake,

[97] Substance Abuse and Mental Health Services Administration. (2019). Key substance use and mental health indicators in the United States: Results from the 2018 National Survey on Drug Use and Health (HHS Publication No. PEP19-5068, NSDUH Series H-54). Rockville, MD: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration. Retrieved from http://www.samhsa.gov/data

the estimated annual cost to Kentucky in 2021 was $1,227,306. The estimated total annual cost of drug and alcohol use in the 12 months before intake applied to the follow-up sample of KTOS clients was $19,113,459. By follow-up, the estimated cost of the 209 individuals who reported illicit drug use was $7,644,593 and the estimated cost of the 65 individuals who reported using alcohol was $1,123,590, for a total of $8,768,183. Thus, as shown in Figure 11.2, after participation in publicly-funded substance abuse treatment, the estimated gross cost to Kentucky taxpayers for these 569 clients was reduced by $10,345,276.

FIGURE 11.2. ESTIMATED COST TO SOCIETY AT INTAKE AND FOLLOW-UP (AMOUNTS IN MILLIONS OF DOLLARS) (N=569)

Cost of Treatment

In KTOS reports from 2002 until the 2017 report, clinical service event data collected by the community mental health centers (CMHCs) that were submitted to DBHDID and managed by the University of Kentucky Institute for Pharmaceutical Outcomes and Policy (IPOP) was included in sections presenting clinical service data for KTOS participants. In these reports, the clinical service event data was matched to the KTOS survey data for the KTOS follow-up sample to calculate an estimate of the cost of substance abuse treatment for the KTOS follow-up sample. Unit costs for different types of services was provided by the Department for Behavioral Health, Developmental and Intellectual Disabilities (DBHDID) and the Department for Medicaid Services Behavioral Health and Substance Abuse Services Inpatient and Outpatient Fee Schedules,[98, 99] and then applied to the total number of services KTOS clients received wherein the payer was Medicaid or the DBHDID from the date of the intake survey submission to the follow-up survey completion date. However, the number of cases included the follow-up sample with no service data in the IPOP data has increased over the past few years. For example, in the KTOS 2018 report, when the clinical service data was matched to clients in the KTOS follow-up sample (n = 1,224), 1,047 cases had no services listed or no services that could be assigned a unit cost (e.g., other than miscellaneous services). There are concerns that CMHC providers may not enter all the services, particularly Medicaid-funded services with the expansion of Medicaid funding of substance abuse services in recent years, into the data set. Because the services included in the current IPOP data may not capture all the services clients included in the follow-up sample may have received, we decided to compute the average cost of treatment per client over several years (2012 – 2015), and use this average in the calculation of avoided costs. The average total costs of providing publicly-funded behavioral health treatment services in 2012, 2013, 2014, and 2015 as calculated from the service event data submitted to IPOP by the CMHCs were updated to 2015 dollar amounts, divided by the total number of clients included in the follow-up samples

[98] Department of Medicaid Services. Behavioral Health and Substance Abuse Services Inpatient (facility) Fee Schedule (Rev 06/2016). Retrieved from http://chfs.ky.gov/NR/rdonlyres/5F888306-0400-4FC1-91D1-530BC7A554CD/0/BHandSUFeeSchduleIPFrev612016r1.pdf.

[99] Department of Medicaid Services. Behavioral Health and Substance Abuse Services Outpatient (facility) Fee Schedule (Rev 06/2016). Retrieved from http://chfs.ky.gov/NR/rdonlyres/63561642-4335-45FB-9F06-FE3E75A9E101/0/BHandSUFeeScheduleOPNFrev612016.pdf.

for those years, yielding an average cost of treatment of $4,423 (in 2021 dollars). The average cost of $4,423 was multiplied by 569, which was the number of individuals in the follow-up sample for whom we had alcohol and illicit drug use data for the 12-month follow-up period. The estimate of the cost of treatment was $2,516,687.

Cost Savings

The estimated net cost savings of providing treatment to the KTOS follow-up sample was estimated using the net difference in costs of alcohol and drug use divided by the cost of providing treatment: $10,345,276/$2,516,687, which equals $4.11 (see Table 11.1). In other words, for every dollar spent on publicly-funded substance abuse treatment in FY 2021, there was an estimated savings of $4.11 in costs to Kentucky taxpayers associated with alcohol and drug addiction.

TABLE 11.1. ESTIMATED COST SAVINGS OF PROVIDING TREATMENT TO INDIVIDUALS WHO USED ILLICIT DRUGS AND/OR ALCOHOL

	Used Alcohol And/or Illicit Drugs in the 12-month Period	
	Intake	Follow-up
Drug use		
Number of clients	489	209
Alcohol use		
Number of clients	71	65
Estimate of total cost to society of drug and alcohol use	$19,113,459	$8,768,183
Gross cost difference from intake to follow-up	$10,345,276	
Estimate of cost of treatment (based on average cost per client in 2012 – 2015)	$2,516,687	
Off-set as net cost/benefit ratio	$10,345,276/$2,516,687	
Return on $1.00 Investment	$4.11	

| Section 12. Conclusions and Implications

The KTOS 2023 Annual Follow-Up Report describes characteristics of clients who participated in state-funded substance abuse treatment programs in Kentucky and completed intake interviews in FY 2021 (N = 3,437). In addition, outcomes are presented for 569 clients who completed a follow-up telephone interview about 12 months later which was a 71.9% follow up rate for those selected into the statewide sample.

Overall, of the clients with intake interviews (N = 3,437), over half were male (58.3%) and 41.3% were female, with ages 18 to 74 (average age 36.5 years old). Most were White (90.3%), had children under the age of 18 (58.5%), and 83.5% had experienced at least one adverse childhood experience. The majority of clients (61.7%) were unemployed at intake. About 52% had been arrested and 56.2% spent at least one night in jail 12 months before treatment.

When looking at referral to treatment for all those with intakes, most clients self-reported they were court-referred (40.2%) and self-referred (17.2%) to treatment. The majority of adults who completed an intake interview reported using illegal drugs (87.4%), alcohol (51.6%), and smoking tobacco (81.9%) in the 12 months before intake. On average, clients reported being about 16.6 years old when they first began using drugs, 15.2 years old when they had their first alcoholic drink (other than a sip) and 16.3 years old when they began smoking tobacco.

Past-10-year trends in specific drug use at intake indicate that the percent of clients reporting non-prescribed opioid and methadone use have both decreased while the percent of clients reporting heroin use has remained relatively stable after an increase to the low teens in FY 2013. The use of bup-nx increased in FY 2015 and has been less than one-quarter since FY 2016. The percent of clients reporting methamphetamine use has increased from 6% in FY 2012 to a high of 50% in FY 2020 and 46% in FY 2021.

Of the 569 adults who completed a 12-month follow-up interview in FY 2021 for this report, 49.6% of the sample was female, and 50.4% was male. The majority of follow-up clients (89.1%) were White. Clients in the follow-up sample were an average of 35.9 years old at the time of the intake interview and less than half (43.4%) reported they were married or cohabiting at intake. When individuals with a follow-up interview were compared with those who did not have a follow-up interview on a variety of intake variables, there were some significant differences for demographics, economic hardship, physical health, mental health, substance use, and severity of substance use. These differences indicate that followed-up individuals were worse off in several key domains (economic hardship, substance use, mental health) compared to those who were not followed up.

Many clients showed significant improvements in substance use, mental health, physical health, criminal justice system involvement, employment and economic hardship, quality of life, and recovery supports. Clients also report high levels of satisfaction with their substance abuse treatment experiences. These improvements will be summarized in more detail below.

Areas of Success

Substance Use

Severity of substance use decreased significantly at follow-up. The percent of individuals with self-reported symptoms of DSM-5 severe substance use disorder decreased from intake (62.9%) to follow-up (19.7%). Further, the percent of clients with ASI alcohol or drug composite scores that met or surpassed the cutoff for SUD decreased from intake to follow-up. There were significant decreases from intake to follow-up in the percent of clients reporting that they experienced problems with drugs and alcohol and that they were considerably or extremely bothered by drug or alcohol problems in the prior 30 days.

Trends in any illegal drug use show that the percent of clients reporting illegal drug use at follow-up has been significantly lower at follow-up than at intake each year for the last 15 years. Percentages of clients reporting any illegal drug use in the 12 months before follow-up has been a high of 43% in FY 2010 and a low of 25% in FY 2013. The percent for the follow-up sample in the current year's report was 37%.

Analysis of specific past-12-month drug use indicates more than half of clients (56.7%) reported using cannabis at intake, whereas 26.2% reported cannabis use at follow-up. For the second year since the trend analyses have been included in the KTOS reports, more than half of clients reported using stimulants (other than cocaine) at intake in FY 2021. Among the individuals who reported using stimulants at intake, 98.3% of them reported using methamphetamine. Significantly fewer individuals reported stimulant use at follow-up (15.3%) than at intake (53.2%). A little more than one-third of clients (36.3%) reported using opioids (other than heroin) at intake, whereas 9.0% of clients reported opioid misuse at follow-up. A minority of followed-up clients (17.9%) reported using CNS depressants in the 12 months before intake, with a significant decrease to 3.4% at follow-up.

About half of clients reported using alcohol in the 12 months before intake, with a 25.8% decrease at follow-up. There were similar percent decreases in the use of alcohol to intoxication (25.8%) and binge drinking (24.1%). Since FY 2008, the percent of the KTOS follow-up sample that has reported past-12-month alcohol use has decreased steadily from 77% to a low of 50% in FY 2019.

Mental Health, Physical Health, and Interpersonal Victimization

Clients' mental health showed significant improvements over the study follow-up period. The percent of individuals who reported depression, generalized anxiety, comorbid depression and anxiety, suicidal thoughts or attempts, and screened positive for post-traumatic stress disorder decreased significantly from intake to follow-up. Trends in depression and trends in anxiety show that the percent of clients reporting these mental health problems have increased at intake since FY 2014 when 41% reported symptoms that met study criteria for depression and 40% of clients reported symptoms that met study criteria for generalized anxiety. In FY 2021, 55% of clients reported depression and 53% reported generalized anxiety. The percent of clients with depression at follow-up has fluctuated from a high of 45% in FY 2011 to a low of 21% in FY 2014, whereas the percent of clients with anxiety decreased from a high in FY 2011 (54%) until FY 2014

(19%), then increased to 30% in FY 2015 and remained between 29%-33% in FY 2015 through FY 2020. In FY 2021, 36% of clients met study criteria for generalized anxiety at follow-up.

Nearly one-third of clients (32.7%) reported they had experienced any interpersonal victimization in the 12 months before intake. By follow-up, significantly fewer clients (17.9%) reported they had experienced any interpersonal victimization in the past 12 months.

KTOS clients' perceptions of poor physical and mental health decreased significantly from intake to follow-up. For example, at intake, KTOS clients reported that for nearly half of the past 30 days their mental health was not good (average of 13.2 days), whereas at follow-up, the average number of days was 5.1. Individuals' rating of overall health significantly improved from intake to follow-up.

Economic Status and Living Conditions

Overall, individuals' economic and living circumstances improved from intake to follow-up. Significantly fewer clients considered themselves homeless in the past 12 months before follow-up (9.1%) than in the 12 months before entering treatment (31.5%). About 43% of clients reported being employed full-time at follow-up compared to 25.8% at intake. Furthermore, the average number of months clients reported working in the past 12 months increased from 4.2 months at intake to 5.7 months at follow-up. Individuals reported significantly fewer needs they had difficulty meeting at follow-up (1.2) compared to intake (1.7).

Criminal Justice System Involvement

Individuals' involvement with the criminal justice system decreased from the 12 months before treatment intake to the 12 months before follow-up. Over half of individuals (51.1%) reported an arrest at intake, which decreased significantly to 22.5% at follow-up. A trend report shows that the percent of clients reporting an arrest in the past 12 months has remained between 52% and 62% at intake (with a high of 62% in FY 2019 and a low of 52% in FY 2020). Percentages at follow-up have fluctuated between a low of 20% in FY 2015 and a high of 33% in FY 2010.

In this year's sample, 31.4% of individuals reported they had a conviction for a misdemeanor in the 12 months before intake, and at follow-up, only 6.7% reported a conviction for a misdemeanor. About 24% of individuals reported a conviction for a felony in the 12 months before entering treatment, whereas at follow-up, only 4.9% of individuals had a conviction for a felony. The majority of clients (56.2%) reported being incarcerated at least one night in the past 12 months at intake compared to 23.8% of clients at follow-up. Like arrests, the trend report for incarceration shows that, overall, the number of clients reporting spending at least one night in jail has been relatively stable at intake (with a high of 66% in FY 2019 and a low of 56% in FY 2021). The percentages of individuals who were incarcerated in the past 12 months at follow-up have fluctuated from a low of 21% in FY 2013 to a high of 37% in FY 2010.

Quality of Life

Clients rated their quality of life as significantly higher, on average, after participating in substance abuse treatment.

Recovery Supports

Compared to intake (30.3%), significantly more individuals reported they had attended mutual help recovery group meetings in the past 30 days at follow-up (49.8%). Also, at follow-up, clients reported having significantly more people they could count on for recovery support: 13.2 vs. 6.5. Significantly more individuals reported they had recovery supportive interactions with a sponsor at follow-up than at intake. Clients reported that parenting children, support from their families, and employment would be most useful in staying off drugs/alcohol at follow-up.

Multidimensional Recovery Status

Consistent with the framework that recovery is a multidimensional construct, encompassing multiple dimensions of individuals' lives and functioning, items from the intake and follow-up surveys were combined to measure change in multiple key dimensions of individuals' lives. At intake, as expected, a small percent of the followed-up sample (7.1%) was classified as having all eight dimensions of recovery. At follow-up, there was a significant increase of 34.2% so that more than two-fifths of the sample (41.3%) had all dimensions of recovery.

Program Satisfaction and Engagement

Client ratings of the treatment services they received were high (an average of 8.2 out of 10, with 10 representing the best possible experience). Almost three-fourths of individuals (74.1%) gave a high positive rating of 8 to 10. About 4 in 5 individuals (81.3%) said the program staff believed in them and believed that treatment would work for them, reported the program staff cared about them and their treatment progress (80.7%), and clients also said that when they told their counselor or program staff personal things, they felt listened to and heard by them (79.7%). More than three-fourths of clients agreed they worked on the things that were most important to them in treatment (77.8%), they had a connection with their counselor or staff person (76.6%), they had input into their treatment goals, plans, and how they were progressing over time (76.5%), and their expectations and hopes for treatment and recovery were met (76.1%). The majority reported that the treatment approach and method was a good fit for them (72.0%), and the length of the program was just right (63.5%).

Areas of Concern

While there were many positive outcomes overall, there are also potential opportunities to make even more significant improvements in some clients' functioning after they begin treatment.

Drug Use

Looking at trends over time in past-12-month use at intake, results show that while prescription

opioid and methadone use has decreased gradually over the past 10 years, the percent of clients reporting methamphetamine use has increased from 6% in FY 2012 to 50% in FY 2020 and remained high in FY 2021 (46%). Furthermore, the percent of clients who reported at intake that they had ever injected drugs in their lifetime was 37.1% for the follow-up sample. The percent of clients reporting at intake that they had ever injected any drug increased from FY 2008 (24%) to FY 2019 (41%).

Even though there were significant decreases in substance use and severity of substance use problems, it is worth noting that 36.8% of KTOS clients reported using illegal drugs, about one-fourth of clients reported using alcohol, and 19.7% met criteria for severe SUD in the 12 months before follow-up.

Smoking

Smoking rates remained very high for KTOS clients with 75.6% reporting smoking tobacco in the 12 months before follow-up. Moreover, the smoking rates at intake and follow-up were stable from FY 2007 to FY 2019, when the percent of individuals reporting smoking at follow-up began decreasing. Further, about two-fifths of clients (39.4%) reported using vaporized nicotine products at follow-up, and this percent has been increasing in recent years. There is a commonly held belief that individuals should not attempt to quit smoking while in substance abuse treatment, because smoking cessation can endanger their sobriety. This belief, however, has been refuted by recent empirical research studies.[100] Voluntary smoking cessation during substance abuse treatment has been associated with lower relapse. Tobacco use is associated with increased mental health symptoms as well as well-known physical health problems, including increased mortality, and smoking cessation has been associated with lower alcohol and drug relapse.[101] At follow-up, the number of individuals who used only vaporized nicotine increased significantly by 8%. When looking at nicotine use from intake to follow-up, 6.7% of individuals replaced smoking cigarettes with vaporizing nicotine. Those who supplemented smoking with vaporizing nicotine smoked significantly less cigarettes than those who only smoked.

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.[102] Individuals with co-occurring substance use and mental health disorders often have medication noncompliance, relapse, homelessness, and suicidal behavior.[103] Overall, there was a significant decrease in mental health problems from intake to follow-up. However, 38.3% individuals were still reporting symptoms of depression and 36.2% were still reporting symptoms of anxiety at follow-up. Also, 30.3% screened positive for PTSD at follow-up. Also, even though there were significant reductions in the average

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

[101] 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.

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

[103] Center for Substance Abuse Treatment. Substance Abuse Treatment: Addressing the Specific Needs of Women. Treatment Improvement Protocol (TIP) Series, No. 51. HHS Publication No. (SMA) 15-4426. Rockville, MD: Center for Substance Abuse Treatment, 2009. Retrieved from: https://store.samhsa.gov/shin/content//SMA15-4426/SMA15-4426.pdf.

number of days individuals reported their mental health was not good at follow-up, the average number of days was 5.1 at follow-up, which is 1 in 6 days, on average, individuals' mental health was poor in the past 30 days. Further, trend reports show that the percent of clients reporting depression and anxiety at follow-up were at similar levels for the 2017 through 2022 reports, but the percentages are higher in this year's report.

Chronic Pain

At follow-up, about one-fourth of KTOS clients reported persistent chronic pain that lasted at least 3 months. Research has shown that individuals with persistent or chronic pain are more likely to report anxiety, depression, lower overall health ratings[104] and substance use disorders.[105] Self-medication can be problematic in substance abuse treatment program participants who report chronic pain.[106] Of those KTOS clients who reported misusing prescription opioids and experiencing chronic pain at intake (n = 163), 41.7% (n = 68) reported chronic pain in the past 12 months at follow-up and 27.0% (n = 44) reported past-12-month misuse of prescription opioids.

Basic Needs for Recovery Success

Meeting basic needs including health, stable living arrangements, having a purpose with daily meaningful activities, and recovery community are the four key dimensions to recovery.[107] In this year's report, there was no significant change in the percent of individuals who reported having difficulty meeting basic living needs (such as paying for rent/mortgage, utilities, phone, or food) or health care needs from intake to follow-up: 38.4% of clients still reported having difficulty meeting basic living needs and 23.1% reported having difficulty obtaining health care needs for financial reasons at follow-up. Similarly, while the number of clients reporting current full-time employment increased significantly, 48.3% of clients remained unemployed at follow-up. The resulting financial strain from these economic factors could lead to increased substance use to alleviate the stress.[108] Providing referrals and support for these factors may help improve basic living situations for many clients and support continued recovery living for long-term positive results after treatment.

Multidimensional Recovery Status

Even though there were significantly more individuals who had all positive dimensions of recovery at follow-up than at intake (41.3% vs. 7.1%), the majority of individuals (58.7%) were still classified as not having all eight positive dimensions of recovery.

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[104] Gureje, O., Von Korff, M., Simon, G., & Gater, R. (1998). Persistent pain and well-being: A World Health Organization study in primary care. *JAMA*, *280*(2), 147-151.

[105] Ballantyne, J. & LaForge, S. (2007). Opioid dependence and addiction during opioid treatment of chronic pain. *Pain*, *129*(3), 235-255.

[106] Rosenblum, A., Joseph, H., Fong, C., Kipnis, S., Cleland, C., Portenoy, R. (2003). Prevalence and characteristics of chronic pain among chemically dependent patients in methadone maintenance and residential treatment facilities. *JAMA*, *289*(18), 2370-2378.

[107] https://www.samhsa.gov/find-help/recovery

[108] 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.

Gender Differences on Targeted Factors

Similar to previous years' reports, there were several gender differences in targeted factors found in this report. Most, but not all of these, indicate that women had more overall drug use, more stimulant use, more mental health problems, more interpersonal victimization experiences, and greater economic hardship than their male counterparts. Men reported more alcohol use, more cannabis use, smokeless tobacco use and criminal justice system involvement compared to women.

Significantly more women reported using illegal drugs in the 12 months before intake. Significantly more women than men reported using stimulants in the past 12 months at intake and follow-up. Significantly more men than women reported using alcohol in the 12 months before follow-up as well as past-12-month binge drinking and alcohol to intoxication at intake. In the 30 days before intake and follow-up, significantly more men reported alcohol use, binge drinking, and alcohol to intoxication compared to women. In the 30 days before follow-up, significantly more men reported using cannabis compared to women. More women than men reported that treatment for a substance use problem was considerably or extremely important in the 30 days before treatment. Significantly more men reported using smokeless tobacco in the 12 months and 30 days before intake and follow-up.

More women than men reported mental health symptoms at intake and follow-up including depression, generalized anxiety, and post-traumatic stress disorder. They reported their mental health was not good for significantly more days than men at intake and that poor mental and/or physical health limited their activities in the 30 days before intake. Significantly more women reported they had experienced any interpersonal victimization than men at intake and follow-up. Research shows that women with co-occurring mental health and substance use disorders have poorer treatment outcomes and high rates of program dropout. Men and women have been shown to use different coping styles and thus may benefit from separate groups to plan recovery support.

Women's housing situation, employment, and economic hardship were worse than men's situations. First, significantly more women reported homelessness at intake when compared to men. Second, more women also reported difficulty meeting basic living needs at intake compared to men. Significantly more women were unemployed at intake and follow-up when compared to men. Likewise, significantly more men reported they had full-time employment at intake and follow-up when compared to women. Among individuals who were currently employed, men reported working significantly more months at both intake and follow-up. Even though women made significant gains in their employment by follow-up, they still lagged behind men in their economic standing. Employed men also had a significantly higher median hourly wage than employed women at both intake and follow-up. At intake, employed women made only $0.83 for every dollar employed men made at intake and $0.77 at follow-up. One possible explanation for men's higher median hourly wage when compared to women's is likely due to gender differences in occupation type. At follow-up, 41.2%of employed women had a service sector job, whereas 30.2% of employed men had a job in the natural resources, construction, and maintenance sector--which has higher average wages than service sector jobs.

Overall, a higher percentage of men reported being involved with the criminal justice system

in the 12 months before entering treatment and the 12 months before follow-up compared to women. Specifically, more men reported they had been convicted with misdemeanors at intake, as well as being arrested, incarcerated, and being under supervision by the criminal justice system at intake and follow-up compared to women.

Study Limitations

The study findings must be considered within the context of the study's limitations. First, because there is no appropriate group of substance-using individuals who would like to receive substance abuse treatment but do not receive it to compare with the KTOS individuals who participate in treatment, one cannot attribute all changes from intake to follow-up to substance abuse treatment. Second, because not all clients agree to participate in the 12-month follow-up survey, it is unclear how generalizable the findings are to the entire client population that completes an intake survey. Analysis comparing those individuals who completed a follow-up survey with those who did not complete a follow-up survey (for any reason, for example, they did not agree to be in the follow-up study, they were not selected into the follow-up sample, or they were not successfully contacted for the follow-up survey) found some significant differences between the two groups (gender, difficulty meeting basic needs, chronic pain, depression, generalized anxiety, suicidality, and substance use disorder severity. Significantly more women were followed up than were not followed up. For the most part, the significant differences suggest that individuals who were followed up were worse off in terms of physical health, mental health, and substance use severity when compared to individuals who were not followed up. Most of the examined factors were not significantly different between the two groups, suggesting that the findings may generalize fairly well to the entire client population.

Third, data included in this report were self-reported by clients. There is reason to question the validity and reliability of self-reported data, particularly about sensitive topics, such as illegal behavior and stigmatizing issues such as mental health and substance use. However, recent research has supported findings about the reliability and accuracy of individuals' reports of their substance use.[109, 110, 111, 112] Earlier studies found that the context of the interview influences reliability.[113] During the informed consent process for the KTOS follow-up study, interviewers tell participants that the research team operates independently from the community mental health centers, responses will be reported in group format and will not be identifiable at the individual level, and that the research team has a federal Certificate of Confidentiality. These assurances of confidentiality and lack of affiliation with the data collectors may minimize individuals' concern about reporting stigmatizing or illegal behavior or conditions.

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[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*(Supplement 3), S347-S360.

[110] 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.

[111] Rutherford, M. J., Cacciola, J. S., Alterman, A. I., McKay, J. R., & Cook, T. G. (2000). Contrasts between admitters and deniers of drug us. *Journal of Substance Abuse Treatment*, *18*(4), 343-348.

[112] Shannon, E. E., Mathias, C. W., Marsh, D. M., Dougherty, D. M., & Liguori, A. (2007). Teenagers do not always lie: Characteristics and correspondence of telephone and in-person reports of adolescent drug use. *Drug and Alcohol Dependence*, *90*(2), 288-291.

[113] Babor, T. F., Stephens, R. S., & Marlatt, G. A. (1987). Verbal report methods in clinical research on alcoholism: Response bias and its minimization. *Journal of Studies on Alcohol and Drugs*, *48*(05), 410.

Collecting all the secondary data that would be required to estimate the costs and cost savings for the individuals who participated in the KTOS follow-up study is labor intensive, expensive, and beyond the scope of the treatment outcome study; thus, funding constraints prevented estimating actual costs of alcohol and drug abuse for the clients. The cost-offset analysis included in this report is based on using national estimates of the annual cost of alcohol and drug abuse and the annual NSDUH estimate of the number of individuals with alcohol use disorder and drug use disorder in the U.S. to estimate a cost per person with a SUD. This cost per person was then applied to the KTOS clients based on their self-reported alcohol and drug use at intake and follow-up. As with any cost-offset analysis, there are several assumptions underlying the logic of this approach—any of which could prove to be faulty. Therefore, we have clearly laid out the assumptions in Section 11 to help interpret the findings.

CONCLUSION

This KTOS 2023 report provides a valuable examination of client-level outcomes for adults in publicly-funded substance abuse treatment in Kentucky. Overall, clients of publicly-funded substance abuse treatment, including a variety of treatment modalities, made significant strides in all the targeted outcomes. Specifically, there were significant decreases in use of alcohol and all drugs, depression and anxiety symptoms, suicidality, homelessness, economic hardship, arrests, convictions, and incarceration, and a significant increase in full-time employment, quality of life, and recovery supports. Moreover, an estimate of the cost to Kentucky for alcohol and drug use disorder in the year before treatment compared to the cost to the state for alcohol and drug use in the year after treatment intake, while accounting for the cost of publicly-funded treatment, showed a significant estimated cost savings.

| Appendix A. Methods

The KTOS evaluation uses a pre- and post-intervention research design, meaning that client data is collected at treatment intake and compared to data collected 12 months later at follow-up. All publicly-funded substance abuse treatment programs in Kentucky are required to collect intake data on individuals entering treatment. Intake data are collected by clinicians on-site via an evidence-based web-based survey. At the end of the intake survey, clinicians explain the follow-up study to clients and give them the opportunity to volunteer to participate. During the informed consent process clients are told that the research staff at the University of Kentucky have obtained a Certificate of Confidentiality from the U.S. Department of Health and Human Services to protect the research team from being forced to release client-identifying data to law enforcement or other government agencies. Clients who agree to participate in the follow-up study give their consent using an electronic consent form on the web survey, which is approved by the University of Kentucky Medical Institutional Review Board (IRB). Identifying data are encrypted as the data are submitted on the web-based survey. Electronic data are stored on password protected computers and servers in secure facilities.

Of the 3,437 clients who completed an intake survey in FY 2021, 1,076 (31.3%) agreed to be contacted for the follow-up study. The percent of clients who agree to be contacted for the follow-up survey has decreased over the past few years, and is varied by region. This suggests that changing ways the information about the follow-up study is being presented to some clients is having a negative impact on their willingness to agree to be contacted. From this group of clients who voluntarily agreed to be contacted for the follow-up study, the research team pulled the follow-up sample by first identifying clients who had provided the minimum amount of contact information (e.g., two phone numbers or one phone number and one address), and individuals who reported either alcohol or drug use in the 12 months before treatment (or if they did not they were incarcerated all 365 days before entering treatment), and then selecting clients by intake month (n = 880).

Follow-up surveys were conducted by interviewers on the research team at the University of Kentucky Center on Drug and Alcohol Research via telephone 12 months after the intake survey is submitted. Of the 880 clients included in the follow-up sample, 89 were ineligible for participating in the follow-up survey for a variety of reasons (e.g., incarcerated, in residential treatment, deceased), which left 791 clients eligible for follow-up. Of these clients, 569 completed a follow-up survey (see Table AA.1). Thus, the follow-up rate was 71.9%. The remaining clients either (1) refused (4.6%) to complete the follow-up survey, or (2) were never successfully contacted, or if contacted they never completed the follow-up survey (23.5%).

TABLE AA.1. FINAL CASE OUTCOMES FOR FOLLOW-UP EFFORTS (N = 880)

	Number of Records	Percent
Ineligible for follow-up survey	89	10.1%
	Number of cases eligible for follow-up (N = 791)	
Completed follow-up surveys	569	
Follow-up rate ((the number of completed surveys/ the number of eligible cases)*100)		71.9%
Expired cases (i.e., never contacted, did not complete the survey during the follow-up period)	186	
Expired rate ((the number of expired cases/eligible cases)*100)		23.5%
Refusal	36	
Refusal rate (the number of refusal cases/eligible cases)*100)		4.6%
Cases accounted for (i.e., records ineligible for follow-up + completed surveys + refusals)	694	
Percent of cases accounted for ((the number of cases accounted for/total number of records in the follow-up sample)*100		78.9%

Clients were considered ineligible for follow-up if they were living in a controlled environment during the follow-up period or were deceased (see Table AA.2). Of the 89 cases that were ineligible for follow-up, the majority (68.5%) were ineligible because they were incarcerated during the follow-up period. In other words, of the 880 individuals selected into the sample to be followed up, 6.9% were ineligible for participation at the time of follow-up because they were incarcerated. Among the 89 individuals who were ineligible at the time of follow-up, 16.9% were deceased, 13.5% were in residential treatment at the time of follow-up, and one person (1.1%) was living overseas.

TABLE AA.2. REASONS CLIENTS WERE INELIGIBLE FOR FOLLOW-UP (N = 89)

	Number	Percent
Incarcerated	61	68.5%
In residential treatment	12	13.5%
Deceased	15	16.9%
Living overseas	1	1.1%

Appendix B presents analysis on comparisons between clients who completed a follow-up interview and clients who did not complete a follow-up interview for any reason on key variables included in the intake survey.

| Appendix B. Client Characteristics at Intake for Those Who Completed Follow-up Interviews and Those Who Did Not Complete a Follow-up Interview

Clients who completed a follow-up interview are compared in this section with clients who did not complete a follow-up interview for any reason[114] (e.g., did not agree to be contacted for the follow-up survey, not selected into the follow-up sample, ineligible for follow-up, unable to be located for the follow-up).

Demographics

The majority of the clients represented in this annual report were White (see Table AB.1). Significantly more female clients completed a follow-up survey than did not complete a follow-up survey. There were no significant differences on other demographics between clients who completed a follow-up survey and those who did not. More clients reported their marital status as married or cohabiting than any other category in both groups. The percent of clients who reported being never married, separated or divorced, or widowed were similar by follow-up status.

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

	FOLLOWED UP	
	NO n = 2,868	YES n = 569
Age	36.6 years[a]	35.9 years
Gender**		
Male	59.9%	50.4%
Female	36.6%	49.6%
Transgender	0.4%	0.0%
Race		
White	90.6%	89.1%
African American	5.8%	6.9%
Other or Multiracial	3.6%	4.0%
Marital status		
Never married	29.7%	28.8%
Married or cohabiting	40.7%	43.4%
Separated or divorced	27.6%	26.4%
Widowed	2.0%	1.4%

a—Three individuals had missing values for race.
**$p < .001$.

[114] Significance is reported for $p < .01$ because of the large sample size.

Socioeconomic Indicators

More than four-fifths of clients reported that their usual living arrangement in the 12 months before entering substance abuse treatment was living in their own or someone else's home or apartment (i.e., private residence; see Table AB.2). The second most frequently reported usual living situation was in jail or prison. Small percentages of clients reported their usual living situation was in a residential treatment, sober living home, or in a shelter or on the streets. There was no statistically significant difference in living situation by follow-up status.

At the time of entering treatment, significantly more followed-up clients reported they were homeless compared to clients who were not followed up: 31.5% vs. 24.5%. Most clients who were currently homeless at intake, considered themselves to be homeless because they were staying temporarily with friends or family, or they were living on the street or in a car, with no significant difference by follow-up status (see Table AB.2).

TABLE AB.2 LIVING SITUATION OF CLIENTS BEFORE ENTERING TREATMENT

	FOLLOWED UP	
	NO n = 2,868	YES n = 569
Usual living arrangement in the 12 months before entering the program[a]		
Own or someone else's home or apartment	80.3%	81.9%
Residential treatment, Recovery Center, sober living home, personal care home, hospital, school or work dormitory	3.9%	5.6%
Jail or prison	10.4%	9.1%
Shelter, hotel/motel, or on the street	5.2%	3.0%
Other or multiple situations above	0.2%	0.4%
Considers self to be currently homeless**	24.5%	31.5%
Why the individual considers himself/herself to be homeless	(n = 702)	(n = 179)
Staying temporarily with friends or family	48.3%	55.3%
Staying on the street or living in car	37.2%	31.3%
Staying in a shelter	7.5%	4.5%
Staying in a hotel or motel	2.0%	2.8%
Incarcerated and does not have a place to stay after release	1.6%	1.7%
Staying in residential treatment, recovery center, or hospital	0.9%	1.7%
Multiple options selected (such as all of the above)	1.7%	1.7%
Other reason	0.9%	1.1%

**$p < .001$.

Measures of economic hardship may be better indicators of the actual day-to-day stressors clients face than a measure of income. Therefore, the intake survey included several questions about clients' ability to meet expenses for basic needs and food insecurity. Clients were asked eight items, five of which asked about inability to meet basic living needs such as food, shelter, utilities, and telephone, and three items asked about inability to receive medical care for financial

reasons.

Table AB.3 presents the percent of clients who reported inability to meet basic living needs (e.g., food, shelter, utilities, telephone), and any of their health care needs. Significantly more clients who completed a follow-up reported that in the 12 months before they entered treatment their household had difficulty meeting the basic living needs of food, shelter, utilities, or telephone because of financial reasons and difficulty meeting health care needs because of financial reasons compared to those who did not complete a follow-up.

TABLE AB.3. DIFFICULTY MEETING BASIC AND HEALTHCARE NEEDS IN THE 12 MONTHS BEFORE ENTERING TREATMENT

	FOLLOWED UP	
	NO n = 2,868	YES n = 569
Had difficulty meeting basic living needs (e.g. shelter, utilities, phone, food)*	37.2%	43.6%
Had difficulty obtaining needed health care for financial reasons (e.g., doctor visit, dental care, or fill prescription)*	20.4%	25.3%

*$p < .01$.

Table AB.4 describes clients' level of education when entering treatment. Nearly half of both groups had a high school diploma or GED.

TABLE AB.4. CLIENTS' HIGHEST LEVEL OF EDUCATION COMPLETED AT INTAKE

	FOLLOWED UP	
	NO n = 2,868	YES n = 569
Highest level of education completed		
Less than GED or high school diploma	24.3%	22.5%
GED or high school diploma	47.1%	47.1%
Some vocational school to graduate school	28.6%	30.4%

There was no difference in the number of months clients worked in the 12 months before treatment intake by follow-up status (see Table AB.5).

TABLE AB.5. EMPLOYMENT IN THE 12 MONTHS BEFORE ENTERING TREATMENT

	FOLLOWED UP	
	NO n = 2,868	YES n = 569
Employment		
Percent of clients who reported working for:		
0 months	40.8%	38.8%
1 to 5 months	21.3%	25.5%
6 months or more	37.9%	35.7%
Among those who were employed:	n = 1,697	n = 348
Average # of months employed in the past 12 months	7.3 months	6.9 months

Among the clients who reported they were currently unemployed at treatment intake, there was no significant difference in their unemployment situation (see Table AB.6).

TABLE AB.6. DESCRIPTION OF SITUATION AMONG THOSE NOT EMPLOYED

	FOLLOWED UP	
	NO n = 2,868	YES n = 569
Unemployed but looking for work	40.0%	34.4%
Unemployed but on furlough or laid-off	3.1%	3.6%
Unemployed but keeping house or caring for children	6.8%	11.2%
On disability/applied for disability	23.1%	24.0%
In a controlled environment (jail or treatment center)	11.6%	13.7%
Other (Retired, student, health issues, other)	3.8%	2.0%

Criminal Justice System Involvement

Less than one half of clients reported being under supervision by the criminal justice system, with no difference by follow-up status (see Table AB.7).

Over half of clients reported they had been arrested in the 12 months before entering treatment, with no difference by follow-up status. Of the clients who reported they were arrested, clients who did not complete a follow-up and clients who completed a follow-up reported an average of 1.9 arrests. The majority of both groups reported being incarcerated at least one night in the 12 months before entering treatment (see Table AB.7). Among the clients who were incarcerated at least one night, the average incarceration time in the 12 months before entering treatment was 74.8 days for clients who were not followed up and 73.5 days for clients who were followed up, with no significant difference by follow-up status.

TABLE AB.7. CRIMINAL JUSTICE SYSTEM INVOLVEMENT WHEN ENTERING TREATMENT

	FOLLOWED UP	
	NO n = 2,868	YES n = 569
Currently under supervision by the criminal justice system	45.6%	42.5%
Arrested for any charge in the 12 months before entering treatment	52.3%	51.0%
Of those with an arrest,	n = 1,501	n = 290
Average number of arrests	1.9	1.9
Incarcerated at least one day	57.8%	56.1%
Of those incarcerated	(n = 1,659)	(n = 319)
Average number of days incarcerated in the past 12 months	74.8	73.5

Physical Health

Physical health measures were included in the intake survey (see Table AB.8). Clients rated their overall health as 3.0 (for clients who did not complete a follow-up) and as 2.9 (for clients who completed a follow-up), with no statistically significant difference. Clients' self-reported average number of days their physical health was not good did not differ by follow-up status.

Clients were asked at intake if a doctor had ever told them they had any of the 12 chronic medical problems listed (e.g., asthma, arthritis, cardiovascular disease, diabetes, chronic obstructive pulmonary disease [COPD], tuberculosis, severe dental disease, cancer, Hepatitis B, Hepatitis C, HIV, and other sexually transmitted diseases). There was no significant difference in the percent of followed-up and not followed-up clients who reported they had been told by a doctor that they had at least one of the chronic medical problems (56.4% vs. 51.8%).

TABLE AB.8. PHYSICAL HEALTH STATUS AT INTAKE

	FOLLOWED UP	
	NO n = 2,868	YES n = 569
Average rating of overall health *[1 = Poor, 5 = Excellent]*............	3.0	2.9
Average number of days physical health was not good in the past 30 days	5.7	6.1
Chronic pain (lasting at least 3 months)	27.4%	30.8%
Ever told by a doctor that client had one of the 12 chronic medical problems listed	51.8%	56.4%

Mental Health

The mental health questions included in the KTOS intake and follow-up surveys are not clinical measures, but instead are research measures (see Table AB.9). A total of 9 questions were asked to determine if they met study criteria for depression, including at least one of the two leading 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?" Significantly more clients who completed a follow-up interview than clients who did not complete a follow-up interview reported symptoms that met criteria for depression: 54.7% vs. 46.6%.

A total of 7 questions were asked to determine if clients met study criteria for generalized anxiety, including the leading question: "In the 12 months before you entered this program, 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)?" Significantly more clients who completed a follow-up interview than clients who did not complete a follow-up interview reported symptoms that met study criteria for generalized anxiety: 52.7% vs. 43.9%.

Two questions were included in the intake survey that asked about thoughts of suicide and

attempted suicide in the 12 months before clients entered treatment. Significantly more clients who were followed-up reported suicidality compared to those who were not followed-up.

TABLE AB.9. PERCENT OF CLIENTS REPORTING MENTAL HEALTH PROBLEMS IN THE 12 MONTHS BEFORE ENTERING TREATMENT

	FOLLOWED UP	
	NO n = 2,868	YES n = 569
Depression**	40.0%	34.4%
Generalized Anxiety Disorder**	3.1%	3.6%
Suicidality (e.g., thoughts of suicide or suicide attempts)**	6.8%	11.2%
Number of days mental health was not good**	23.1%	24.0%

**p < .001.

Substance Use

Use of illegal drugs in the 12 months before entering treatment is presented by follow-up status in Table AB.10. Significantly more clients in the follow up sample reported using cannabis, stimulants, heroin, illicit use of prescription opioids, and hallucinogens compared to those who did not complete a follow-up.

The most frequently reported illegal drugs used in the 12 months before entering treatment were marijuana, stimulants, non-prescribed use of prescription opioids, non-prescribed buprenorphine-naloxone (bup-nx), tranquilizers/sedatives/benzodiazepines, cocaine, and heroin.

TABLE AB.10. PERCENT OF CLIENTS REPORTING ILLEGAL DRUG USE IN THE 12 MONTHS BEFORE ENTERING TREATMENT[115]

	FOLLOWED UP	
	NO n = 2,830	YES n = 555
Any illegal drug**	72.2%	87.4%
Cannabis*	49.6%	56.8%
Stimulants**	44.5%	53.3%
Prescription opioids (illegal use)*	23.9%	29.2%
Non-prescribed buprenorphine-naloxone (bup-nx)	15.0%	18.4%
Tranquilizers, sedatives, benzodiazepines	14.5%	16.9%
Cocaine	11.3%	12.3%
Heroin	13.9%	15.7%
Synthetic Drugs (synthetic marijuana, bath salts)	7.1%	7.9%
Non-prescribed methadone	2.0%	1.6%
Hallucinogens*	5.5%	8.5%
Barbiturates	2.0%	1.6%
Inhalants	1.2%	2.2%

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

[115] Thirty-eight clients who were not followed up and 14 clients who were followed up were not included in the substance use comparison because they were incarcerated all 365 days before entering treatment.

There were no significant differences in alcohol use in the 12 months before entering treatment by follow-up status (see Table AB.11).

TABLE AB.11. PERCENT OF CLIENTS REPORTING ALCOHOL USE IN THE 12 MONTHS BEFORE ENTERING TREATMENT

	FOLLOWED UP	
	NO n = 2,830	YES n = 555
Alcohol	47.2%	51.7%
Alcohol to intoxication	31.8%	36.6%
Binge drank alcohol *(i.e., drank 5 or more (4 for women) drinks in 2 hours)*	28.6%	33.7%

A majority of followed-up and non-followed-up clients reported they had smoked tobacco products in the 12 months before entering treatment, with no difference by follow-up status (see Table AB.12). A minority of both groups reported using vaporized nicotine and smokeless tobacco use, with no difference by follow-up status.

TABLE AB.12. PERCENT OF CLIENTS REPORTING TOBACCO USE IN THE 12 MONTHS BEFORE ENTERING TREATMENT

	FOLLOWED UP	
	NO n = 2,830	YES n = 555
Smoked tobacco	81.4%	82.0%
Vaporized nicotine	30.5%	35.9%
Used smokeless tobacco	15.4%	15.5%

Self-reported severity of alcohol and drug use was measured with Addiction Severity Index (ASI) alcohol and drug composite scores. Alcohol and drug composite scores are presented in Table AB.12 The lowest composite score is 0 and the highest composite score is 1.0.

Of clients who were not in a controlled environment all 30 days, 39.1% of those not followed-up and 48.3% of those followed-up met or surpassed the Addiction Severity Index (ASI) composite score cutoff for alcohol and/or drug severe SUD, which was a significant difference (see Table AB.13). Significantly more clients who completed a follow-up surpassed the cutoff score for severe drug use disorder when compared to those who did not complete a follow-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 0.11 for clients who did not complete a follow-up interview and 0.14 for followed up clients, which was statistically significant (see Table AB.13).

TABLE AB.13. SUBSTANCE ABUSE AND DEPENDENCE PROBLEMS AT INTAKE

	FOLLOWED UP	
	NO n = 2,550	YES n = 499
Percent of clients with ASI composite score equal to or greater than cutoff score for ...		
Severe alcohol or drug use disorder**	39.1%	48.3%
Severe alcohol use disorder	20.0%	23.2%
Severe drug use disorder*	27.5%	33.5%
Average composite score for alcohol use[a]	.11	.14
Average composite score for drug use[b]**	.11	.14

a Score equal to or greater than .17 is indicative of severe alcohol use disorder.
b Score equal to or greater than .16 is indicative of severe drug use disorder.
*p < .01, **p < .001.

A similar percent of clients in the follow-up and non-follow-up groups reported they had a history of prior substance abuse treatment in their lifetime (see Table AB.14). Among clients who reported a history of substance abuse treatment, there was no significant difference in the average number of treatment episodes by follow-up status.

TABLE AB.14. HISTORY OF SUBSTANCE ABUSE TREATMENT IN LIFETIME

	FOLLOWED UP	
	NO n = 2,868	YES n = 569
Ever been in substance abuse treatment in lifetime	61.4%	63.8%
Among those who had ever been in substance abuse treatment in lifetime,	(n = 1,760)	(n = 363)
Average number of times in treatment.........................	3.1	3.4