



**Adult Kentucky Treatment Outcome Study**  
2019 ANNUAL REPORT

# Project Acknowledgments

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The 2019 KTOS report includes data from 1,279 clients from Kentucky publicly-funded substance abuse treatment programs who completed both an intake interview between July 2016 to June 2017 and a 12-month follow-up interview targeted between July 2017 and June 2018.

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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 stress, (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 = 5,619 in FY 2017) and a follow-up interview administered by the University of Kentucky Center on Drug & Alcohol Research (CDAR) staff with 1,279 individuals about 12 months later. The CDAR team randomly selects individuals who are eligible for follow-up to be included in the follow-up sample. The follow-up rate for this year's report was 75.6%. 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 number of individuals who reported using illegal drugs decreased from 89% at intake to 33% at follow-up. A trend report of illegal drug use at intake and follow-up over the past 11 years shows that around three-quarters of KTOS clients reported any illegal drug use in the 12 months before treatment each year, with the exception of this past year (89%) 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 decreased from 52% at intake to 28% 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 23% at intake to 70% at follow-up. 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 just over half (56%) at intake to 8% 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 45% at intake to 20% at follow-up.

Past-12-month (87.8%) and past-30-day (85.1%) rates of smoking tobacco use were very high and remained stable from intake to follow-up (86.2% and 83.8%, respectively).

*"I went to rehab, I didn't want to change, but I was given an opportunity. So I was grateful."*

- KTOS FOLLOW-UP CLIENT

## Mental Health, Physical Health, Stress, and Victimization

The mental health of clients who participated in treatment also significantly improved. Over half of clients met study criteria for depression at intake compared to 32% of clients at follow-up. Trends in depression, however, indicate that there was an increase over past years in clients meeting study criteria for past-12-month depression in FY 2017 at intake (55%), and also an increase in FY 2017 at follow-up (32%). Over half of clients met study criteria for generalized anxiety at intake compared to 31% at follow-up. In addition, 19% of clients reported suicidal ideation or attempts at intake compared to 8% at follow-up.

Stress and physical health were 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 (3.6 vs. 6.9) and mental health (5.4 vs. 13.2) were poor in the past 30 days at follow-up compared to intake. Trend analysis shows 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 2011 to 7.3 in FY 2016, clients have reported fewer days of poor physical health at follow-up when compared to intake over the years. The same trend pattern was found for the average number of

days of poor mental health. In addition, clients reported significantly fewer stress symptoms at follow-up (3.8) compared to intake (12.2) and fewer clients reported using substances to reduce or manage their stress at follow-up (24.1%) than at intake (46.1%).

## Economic and Living Circumstances

KTOS clients showed improvements in economic and living circumstances from intake to follow-up. First, significantly fewer clients reported they were homeless at follow-up than at intake. Significantly more individuals reported their usual living situation was a private residence (i.e., their own home or someone else's home) and 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. Furthermore, about 35% of clients reported being currently employed full time at follow-up compared to 20% at intake. The average number of months clients reported working in the past 12 months increased significantly from 4.5 months at intake to 5.1 months at follow-up. Additionally, at intake, 41% 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 36%. The number of clients who

## 2019 Report Highlights



REPORTED ANY  
ILLEGAL DRUG USE

**89%** at intake | **33%** at follow-up



REPORTED USE OF  
SUBSTANCES TO  
MANAGE STRESS

**46%** at intake | **24%** at follow-up



MET STUDY CRITERIA  
FOR COMORBID  
DEPRESSION AND  
ANXIETY

**42%** at intake | **23%** at follow-up



AVERAGE NUMBER OF  
DAYS MENTAL HEALTH  
WAS NOT GOOD

**13.2** at intake | **5.4** at follow-up

reported they had difficulty obtaining health care (e.g., doctor visits, dental visits, and prescription medications) for financial reasons decreased from 28% at intake to 16% at follow-up.

## 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 57% at intake to 31% at follow-up and the percent of individuals who reported they had been incarcerated in the past 12 months decreased from 61% at intake to 36% at follow-up. Trend analyses show that, overall, the percent of clients who reported an arrest was consistent over the past 11 years at intake (minimum of 53%, maximum of 59%) with greater fluctuation at follow-up (minimum of 21% in FY 2013, maximum of 33% in FY 2010). Trend analysis for average number of days incarcerated showed a similar pattern of greater stability at intake and greater fluctuation at follow-up. Finally, significantly fewer individuals reported they had been convicted for a misdemeanor and felony at follow-up than at intake.

## Quality of Life

Compared to intake, individuals rated their quality

of life as significantly higher at follow-up. They also had a higher overall rating on satisfaction with life, on average, at follow-up than at intake.

## Global Functioning

The index of global functioning is based on individuals' reports of substance use, employment, homelessness, criminal justice system involvement, suicide ideation, self-rating of overall health, recovery supports, and rating of quality of life. The presence of any of the functioning difficulties means an individual is classified as having functioning difficulties. This index is used to better capture overall recovery functioning at follow-up. At intake, as expected, the majority of the followed-up sample (93.0%) was classified as having functioning difficulties. At follow-up, 64.0% had functioning difficulties—a significant decrease of 29.0%.

## Recovery Supports

Compared to intake, significantly more individuals reported they had attended mutual help recovery group meetings in the past 30 days at follow-up. Also, individuals reported having more people they could count on for recovery support at follow-up than at intake. The vast 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.

## 2019 Report Highlights



CURRENTLY EMPLOYED FULL-TIME

**20%** at intake | **35%** at follow-up



REPORTED DIFFICULTY MEETING BASIC LIVING NEEDS

**41%** at intake | **36%** at follow-up



REPORTED ANY ARREST

**57%** at intake | **31%** at follow-up



REPORTED ANY OF THE FUNCTIONING DIFFICULTIES

**93%** at intake | **64%** at follow-up

## Relapse

Results of multivariate analysis show that when controlling for other variables in the model, gender, number of nights incarcerated, and number of adverse childhood experiences were significantly associated with alcohol and/or drug use in the follow-up period. Specifically, males had greater odds of using alcohol and/or drugs at follow-up. Second, individuals who spent fewer nights incarcerated had greater odds of using alcohol and/or drugs at follow-up. Finally, individuals with more adverse childhood experiences had greater odds of reporting alcohol and/or drugs in the 12-month follow-up period.

## 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 8.7 out of 10. Most clients felt they were highly satisfied with the treatment program, the services they received, and treatment staff. For example, 94% of clients said they felt better about themselves as a result of treatment. The vast majority of clients agreed that the program staff addressed safety concerns, that they felt safe in the programs, and they were encouraged to use mutual help recovery groups to help them maintain

recovery.

## Significant Gender Differences

There were several important gender differences at treatment intake and follow-up. Most, but not all of these, indicate that women struggle with more comorbid mental health problems and greater economic hardship than their male counterparts. Significantly more women reported using illegal drugs in the 12 months and 30 days before intake, whereas significantly more men reported using illegal drugs in the 30 days before follow-up. Specifically, more women than men reported using opioids, heroin, CNS depressants, and cocaine at intake. More women than men also reported past-12-month and past-30-day heroin, CNS depressant, cocaine, and stimulant use at intake. Also, significantly more women than men reported they had experienced problems with substance use in the 30 days before entering the program and that treatment for drug or alcohol problems was considerably or extremely important. Significantly more women reported smoking tobacco at intake and follow-up while significantly more men reported using smokeless tobacco at intake and follow-up. In contrast, significantly more men than women reported using alcohol in the 12 months before both intake and follow-up, and the 30 days before follow-up.

More women than men reported mental health symptoms at intake and follow-up including depression, generalized anxiety, and comorbid depression and anxiety. Of those who met study criteria for anxiety at intake, women reported significantly more anxiety symptoms than men. Also, women rated their overall health lower at intake compared to men. They reported their physical health was not good for significantly more days than men at intake and their mental health was not good for significantly more days than men at intake and follow-up. Additionally, women reported more stress symptoms than men at intake and follow-up. Significantly more women than men reported they used substances to reduce or manage stress at intake and follow-up.

Women's housing situation, employment, and economic hardship were worse than men's. 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

*“It really helped me. They didn't just ask questions, they listened to me and gave feedback.”*

- KTOS FOLLOW-UP CLIENT



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 \$0.86 for every dollar employed men made and at follow-up, the gap in median hourly wages was even greater, with employed women making only \$0.78 for every dollar employed men made. Women also reported more economic difficulties at both intake and follow-up compared to men. Thus, even though women made significant overall gains in their employment by follow-up, they still lagged behind men in their economic standing.

A higher percentage of men reported criminal justice supervision (e.g., probation or parole) compared to women at intake and follow-up. Compared to women, men also reported a higher satisfaction with life rating and more people they could count on for recovery support at intake. More women reported attending self-help group meetings at intake and follow-up compared to men. Finally, significantly more women reported they had recovery supportive interactions with a sponsor in the 30 days before follow-up when compared to men.

## Cost Savings

Estimates on the total costs of drug and alcohol abuse to Kentucky in relation to expenditures on treatment programs suggest that for every dollar spent on publicly-funded substance abuse treatment programs there was an estimated \$4.13 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).

The KTOS 2019 outcome evaluation, using valid and reliable measures, indicates that publicly-funded substance abuse treatment programs in Kentucky have been successful in facilitating positive changes in clients' lives in a variety of ways. These include decreased substance use, decreased severity of substance use, decreased mental health symptoms and stress, increased full-time employment, decreased homelessness, decreased economic hardship, and decreased involvement with the criminal justice system. Results also show that clients appreciate and value their experiences in treatment programs and have more support for recovery after participating in treatment. Finally, publicly-funded substance abuse treatment (in a variety of modalities) saves Kentucky taxpayers' money in avoided costs that ongoing substance abuse would have cost without treatment. Overall, findings

from the 2019 Kentucky Treatment Outcome Study showed positive changes for individuals from the 12 months before treatment intake to the 12-month follow-up.

## 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 stress, (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 eleven 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, 2016 and June 30, 2017 (N = 5,619). This section also describes characteristics of 1,279 clients who completed a 12-month follow-up interview between July 1, 2017 and June 30, 2018.

**Section 2. Substance Use.** This section examines changes in substance use (illegal drugs, alcohol, and tobacco) from intake to follow-up as well as change in substance use severity. 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 2019 KTOS follow-up sample.

**Section 4. Mental Health, Physical Health, Stress, and Interpersonal Victimization.** This section examines changes in mental health symptoms, physical health, stress-related health consequences, 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) general health status, (6) chronic pain, (7) stress-related health consequences, and (8) interpersonal victimization experiences.

**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) any incarceration, and (3) criminal justice supervision status.

**Section 7. Quality of Life.** This section describes change in client quality of life and satisfaction with life during the 12-month period before entering treatment and the 12-month period before the follow-up interview. Specifically, results include changes in: (1) quality of life rating and (2) satisfaction with life rating.

**Section 8. 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 9. Client Global Functioning.** This section describes an index of global functioning that takes into account severity of substance use disorder, employment, homelessness, criminal justice system involvement, suicide ideation, overall health, recovery support, and quality of life. Change in functioning from intake to follow-up is presented. Furthermore, a multivariate analysis was conducted to examine the intake indicators of global functioning and their association with worse global functioning at follow-up.

**Section 10. Client Satisfaction with Substance Abuse Treatment Programs.** This section describes two aspects of client satisfaction: (1) overall client satisfaction and (2) 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, 2016 and June 30, 2017 (N = 5,619). This section also describes characteristics of 1,279 clients who completed a 12-month follow-up interview between July 1, 2017 and June 30, 2018.*

### 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.<sup>1</sup> In FY 2017, 5,619 adults completed an intake survey between July 1, 2016 and June 30, 2017.<sup>2</sup>

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 similar to 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 high follow-up rate of 75.6% and a low refusal rate (0.8%) for participation in the interviews. That means that 23.6% of clients were not successfully contacted to complete the follow-up telephone interviews (see Appendix A for detailed information on study methods).

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<sup>1</sup> Logan, TK, Cole, J., Miller, J., Scrivner, A., & Walker, R. (2016). *Evidence Base for the Kentucky Treatment Outcome Study (KTOS) Assessment and Methods*. Lexington, KY: University of Kentucky, Center on Drug and Alcohol Research.

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

## 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 with regard to sensitive topics, such as illegal behavior and stigmatizing issues such as mental health and substance use. However, some research has supported findings about the reliability and accuracy of individuals' reports of their substance use.<sup>3,4,5</sup> For example, in many studies that have compared agreement between self-report and urinalysis the concordance or agreement is acceptable to high.<sup>6,7,8</sup> 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.<sup>9,10,11</sup> In other studies, higher percentages of underreporting have been found.<sup>12</sup> 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.<sup>13</sup> Moreover, the “gold standard” of biochemical measures of substance use have many limitations: short windows of detection that vary by substance; detection varies on many factors such as the amount of the substance consumed, chronicity of use, sensitivity of the analytic method used.<sup>14</sup>

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' identity; (c) the study procedures, including data protections, are consistent with federal regulations and approved by the University of Kentucky Human Subjects Institutional Review Board; (d) confidentiality is protected under Federal law through a Federal Certificate of Confidentiality; (e) participants can skip any question they do not want to answer; and (f) UK CDAR staff are trained to facilitate accurate reporting of behaviors and are regularly supervised for quality data collection and adherence to confidentiality.

<sup>3</sup> 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.

<sup>4</sup> 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.

<sup>5</sup> Rutherford, M.J., Cacciola, J.S., Alterman, A.I., McKay, J.R., & Cook, T.G. (2000). Contrasts between admitters and deniers of drug use. *Journal of Substance Abuse Treatment*, *18*, 343-348.

<sup>6</sup> 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.

<sup>7</sup> 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.

<sup>8</sup> 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.

<sup>9</sup> 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.

<sup>10</sup> 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.

<sup>11</sup> Williams, R. J., & Nowatzki, N. (2005). Validity of self-report of substance use. *Substance Use & Misuse*, *40*, 299-313.

<sup>12</sup> Chermack, S. T., Roll, J., Reilly, M., Davis, L., Kilaru, U., Grabowski, J. (2000). Comparison of patient self-reports and urinalysis results obtained under naturalistic methadone treatment conditions. *Drug and Alcohol Dependence*, *59*, 43-49.

<sup>13</sup> 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.

<sup>14</sup> Williams, R. J., & Nowatzki, N. (2005). Validity of self-report of substance use. *Substance Use & Misuse*, *40*, 299-313.

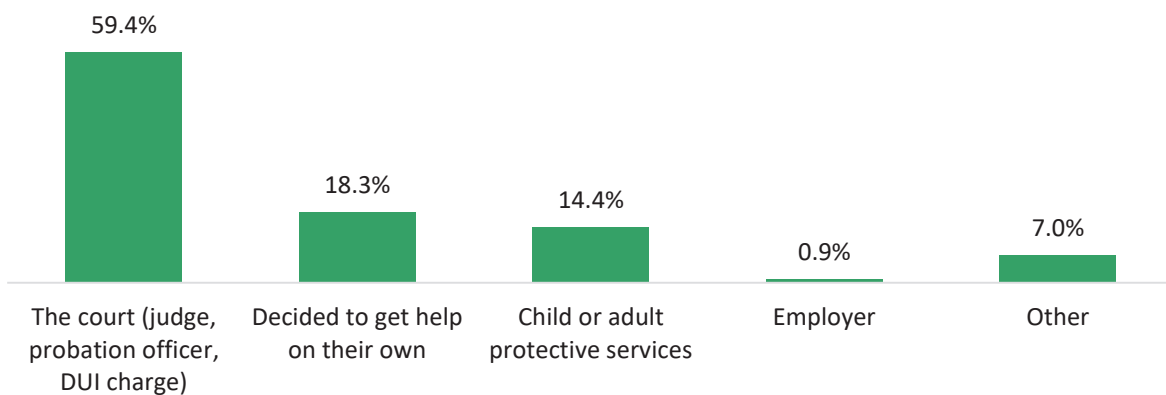
This report describes the sample of treatment clients in two main ways: (1) providing a description of characteristics for 5,619 adults who completed an intake interview in FY 2017 (July 1, 2016 – June 30, 2017), and (2) presentation of client characteristics for 1,279 adults who completed an intake interview in FY 2017 and a 12-month follow-up telephone interview with a target date between July 1, 2017 and June 30, 2018.

## 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. Nearly 60% of clients 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, but is the client's perception of referral source. About 18% 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 (14.4%) or other referral sources (7.0%; 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 (0.9%).

FIGURE 1.1. SELF-REPORTED REFERRAL SOURCE FOR ALL KTOS CLIENTS AT INTAKE (N = 5,619)



### Demographics

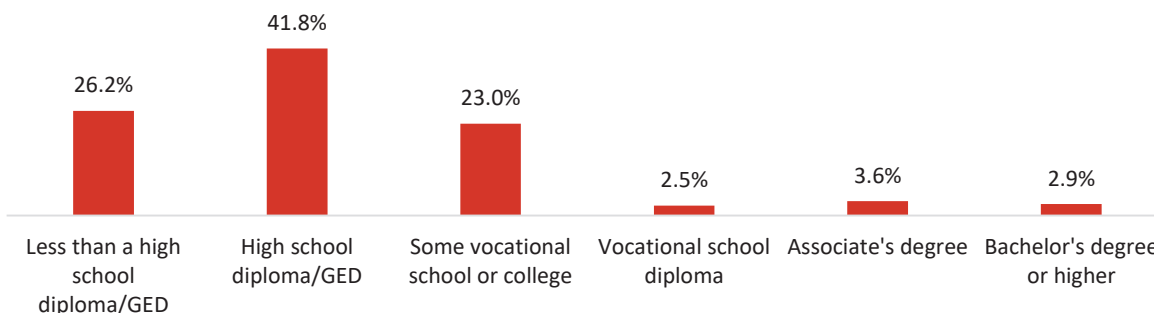
Table 1.1 shows that over half of clients with an intake survey completed in FY 2017 were male (57.1%) and the majority were White (92.3%). A minority of clients reported their race as African American/Black (5.7%) and 2.0% reported they were American Indian, Asian, Hispanic, or multiracial. Clients were, on average, 35.2 years old, ranging from 18 to 78 years old at intake. At intake, around 43% were married or cohabiting with a partner at intake, 27.9% had never been married (and were not cohabiting), 26.5% were separated or divorced, and 2.0% were widowed. About three-quarters of clients reported they had at least one child. A small number of KTOS clients (3.4%) 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 = 5,619)

<b>Age</b> .....	35.2 years (range of 18-78)
<b>Gender</b>	
Male.....	57.1%
Female.....	42.9%
Transgender .....	0.0%
<b>Race</b>	
White .....	92.3%
African American .....	5.7%
Other or multiracial .....	2.0%
<b>Marital status</b>	
Married or cohabiting.....	43.6%
Never married.....	27.9%
Separated or divorced .....	26.5%
Widowed.....	2.0%
<b>Have children</b> .....	76.8%
<b>Veteran or currently serving in military...</b>	3.4%

A little more than one-fourth of clients (26.2%) had less than a high school diploma or GED at intake (see Figure 1.2). The highest level of education of 41.8% of the sample was a high school diploma or GED. Twenty-three percent of clients had completed some vocational/technical school or college. Only a small minority of clients had completed vocational/technical school (2.5%), an associate’s degree (3.6%), or a bachelor’s degree or higher (2.9%).

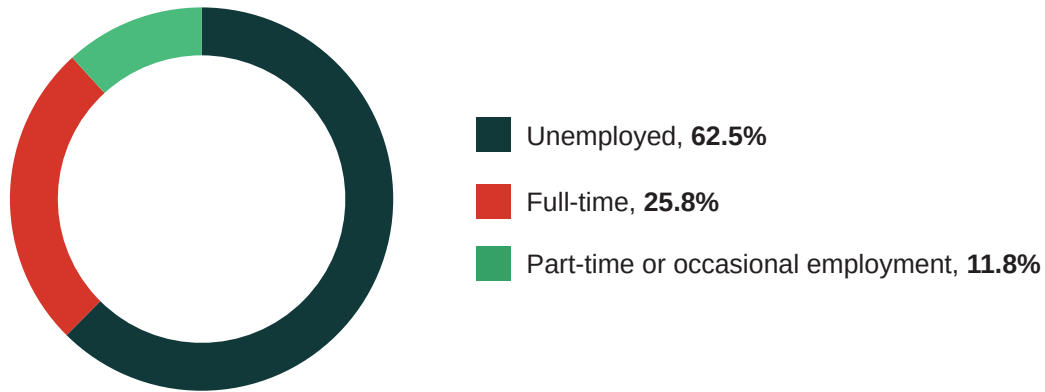
FIGURE 1.2. HIGHEST LEVEL OF EDUCATION COMPLETED AT INTAKE (N = 5,619)



At intake, 39.6% of clients reported they had worked 0 months in the past 12 months, 20.8% had worked 1 to 5 months, and 39.7% 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 (62.5%), with 25.8% being employed full-time, and 11.8% employed part-time or having occasional or seasonal employment (see Figure 1.3). Among those who reported being employed full or part-time at

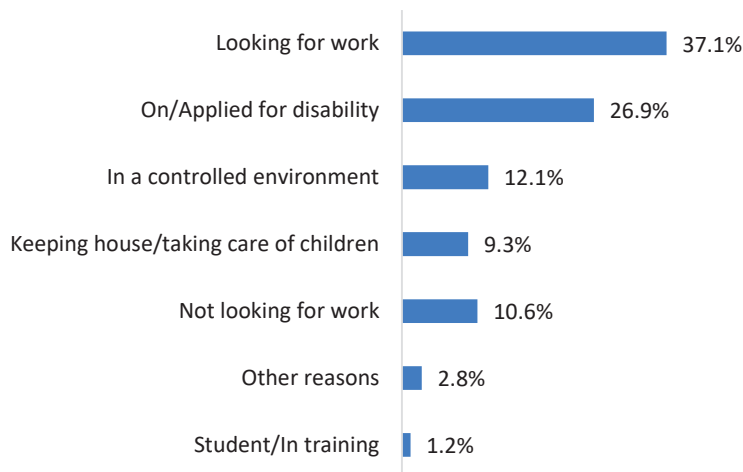
intake, the median hourly wage was \$10.00.

FIGURE 1.3. CURRENT EMPLOYMENT STATUS AT INTAKE (N = 5,619)



Of the individuals who were currently unemployed at intake ( $n = 3,496$ ),<sup>15</sup> about 37.1% stated they were looking for work (see Figure 1.4). Over one-quarter (26.9%) were on disability (or had applied for disability), 12.1% were in a controlled environment that prohibited them from working, 9.3% were keeping the house or taking care of children full-time at home, 10.6% were unemployed and not looking for work, 1.2% were students or in training, and the remaining 2.8% gave other reasons for not being employed (e.g., on furlough or temporarily laid off, retired, health problems prevented them from work but they were not on disability).

FIGURE 1.4. OF THOSE UNEMPLOYED, REASONS FOR BEING UNEMPLOYED (N = 3,496)



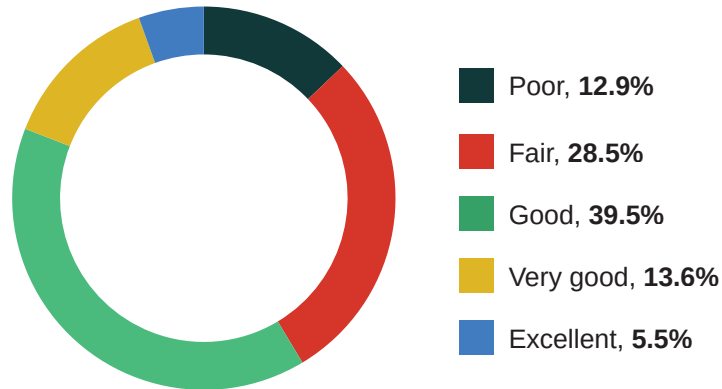
## Physical Health

KTOS clients rated their overall health at intake (see Figure 1.5). Almost 4 in 10 clients (39.5%) said their health was good and 28.5% said their health was fair. About 14% percent rated their health as very good, 12.9% said their health was poor, and 5.5% reported their health was excellent.

<sup>15</sup> Fourteen individuals had missing values for the reason they were unemployed at intake.



FIGURE 1.5. OVERALL HEALTH RATING AT INTAKE (N = 5,619)



About 35% of KTOS clients reported they experienced chronic pain that persisted for at least 3 months in the 12 months before entering treatment (see Table 1.2). Fifty-two percent of clients reported they had at least one chronic health problem. The most common medical problems clients reported were arthritis (18.6%), cardiovascular/heart disease (14.6%), hepatitis C (12.6%), asthma (11.8%), and severe dental problems (9.8%).

A majority of KTOS clients reported they had insurance through Medicaid (73.5%) at intake. One in ten clients did not have any insurance (10.9%). Small numbers of clients had insurance through an employer, including through a spouse, parent, or self-employment (6.9%), through Medicare (7.0%), through the Health Exchange (1.1%), or through the VA/Champus/Tricare.

TABLE 1.2. HEALTH-RELATED CONCERNS FOR ALL KTOS CLIENTS AT INTAKE (N = 5,619)

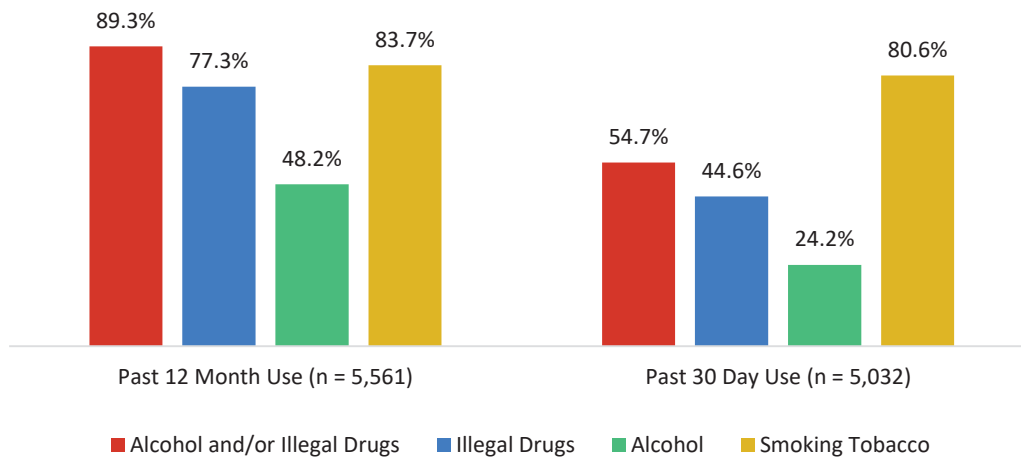
<b>Chronic pain</b> .....	35.3%
<b>At least one chronic medical problem</b> .....	52.3%
Arthritis .....	18.6%
Cardiovascular/heart disease .....	14.6%
Hepatitis C.....	12.6%
Asthma .....	11.8%
Severe dental problems.....	9.8%
<b>Insurance</b>	
No insurance .....	10.9%
Medicaid .....	73.5%
Through employer (including spouse's employer, parents' employer, and self-employed).....	6.9%
Medicare.....	7.0%
Through Health Exchange.....	1.1%
VA/Champus/Tricare.....	0.5%

## Substance Use

The majority of adults who completed an intake survey reported using alcohol and/or illegal drugs (89.3%) in the 12 months before entering treatment (see Figure 1.5).<sup>16</sup> The drug classes reported by the greatest number of clients were marijuana (48.0%), prescription opioids (37.7%), non-prescribed sedatives/tranquilizers/benzodiazepines (22.1%), and non-prescribed buprenorphine-naloxone (21.6%; not depicted in a figure). Overall, a higher percentage of individuals reported using illegal drugs (77.3%) compared to the percent of individuals who reported using alcohol (48.2%) in the 12 months before entering treatment. The vast majority of clients reported smoking tobacco (83.7%) in the 12 months before intake.

Of the 5,032 individuals who were not in a controlled environment all 30 days,<sup>17</sup> over half (54.7%) reported using illegal drugs and/or alcohol in the past 30 days at intake. Specifically, 44.6% reported using illegal drugs and 24.2% reported using alcohol. Also, 80.6% reported smoking tobacco in the 30 days before entering treatment (see Figure 1.6).

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



At intake, a little more than one-third of clients (34.7%) reported that they had ever injected drugs in their lifetime (not depicted in a figure).

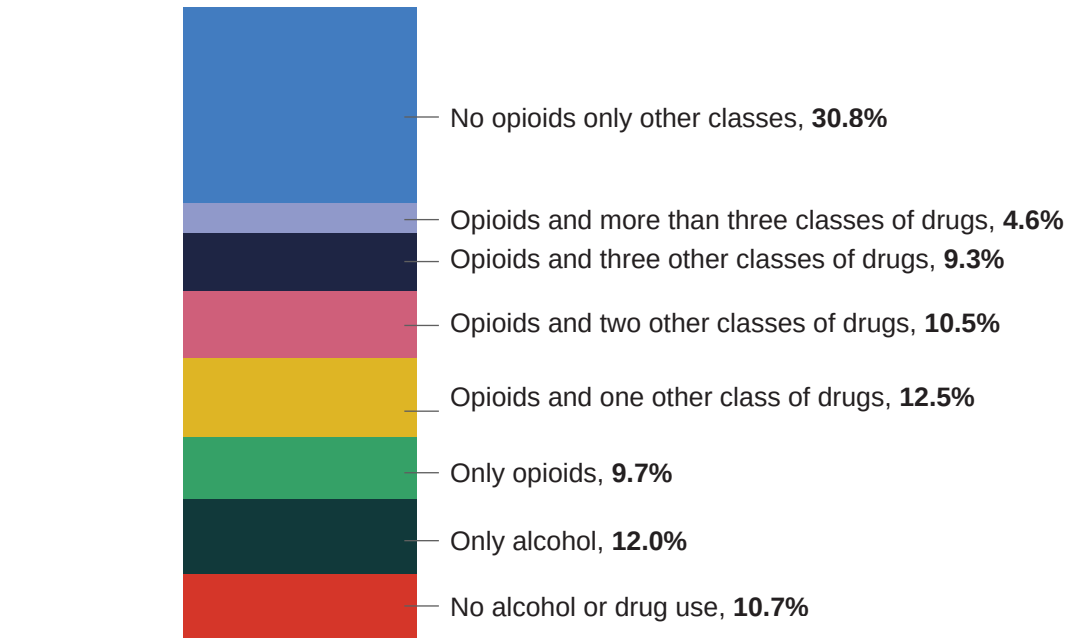
The majority of clients reported they had been in substance abuse treatment in the past (55.9%). Of the 3,143 clients who reported they had previously been in treatment, they reported an average of 2.8 episodes before the current one (not depicted in a figure).

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 (10.7%), alcohol only (12.0%), no opioids and other drug classes only (30.8%), and opioids only (9.7%), opioids with one other drug class (12.5%), opioids with two other drug classes (10.5%), opioids with three other drug classes (9.3%), and opioids with three or more other drug classes (4.6%).

<sup>16</sup> 58 individuals reported being incarcerated all 365 days before intake. Because opportunities to use alcohol and drugs are severely reduced while incarcerated these individuals were not included in this analysis.

<sup>17</sup> 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 = 587) are not included in the analysis of substance use in the 30 days before entering treatment.

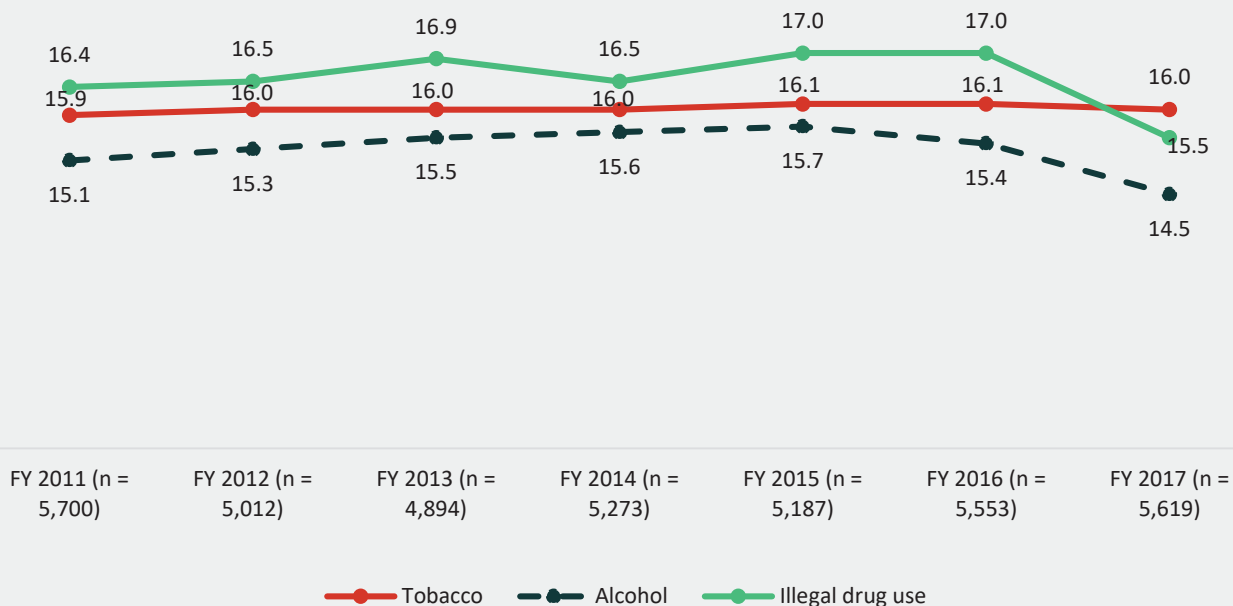
FIGURE 1.7. OPIOID AND OTHER DRUG CLASS USE IN THE 12 MONTHS BEFORE TREATMENT



### 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 1.8). The age at which KTOS clients reported drug use was steady for 6 years (close to age 17), with a slight decrease in FY 2017 to 15.5. 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 7 years.

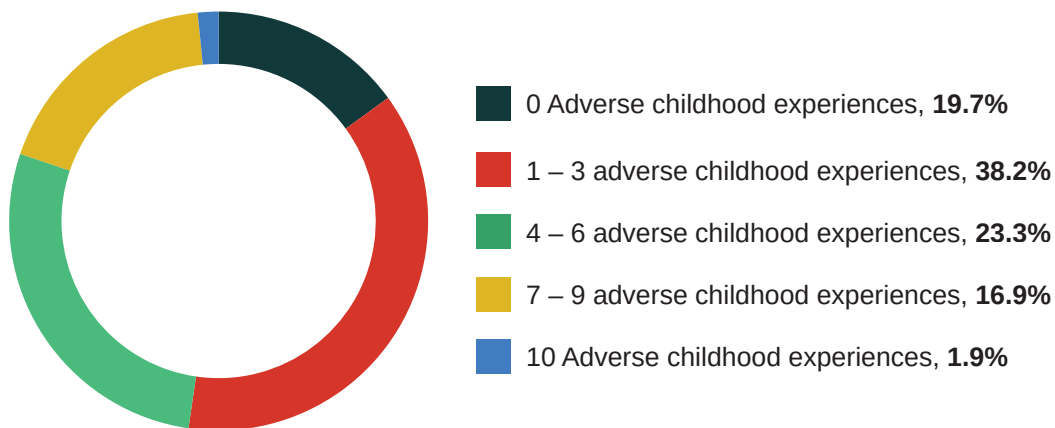
FIGURE 1.8. TRENDS IN AGE OF FIRST USE REPORTED AT INTAKE, FY 2011-FY 2017



## Adverse Childhood Experiences

Beginning in October 2016, items about ten adverse childhood experiences from the Adverse Childhood Experiences Study (ACE) were included in the intake interviews.<sup>18, 19, 20</sup> 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 3.4 (not depicted in figure). Figure 1.9 shows that 19.7% reported experiencing none of the ACE included in the interview. More than one-third (38.2%) reported experiencing 1 to 3 ACE, a little less than one-fourth reported experiencing 4 – 6 ACE, and 16.9% reported experiencing 7 – 9 ACE. A very small percent reported experiencing all 10 types of adverse childhood experiences.

FIGURE 1.9. NUMBER OF TYPES OF ADVERSE CHILDHOOD EXPERIENCES (n = 4,426)<sup>21</sup>



<sup>18</sup> 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.

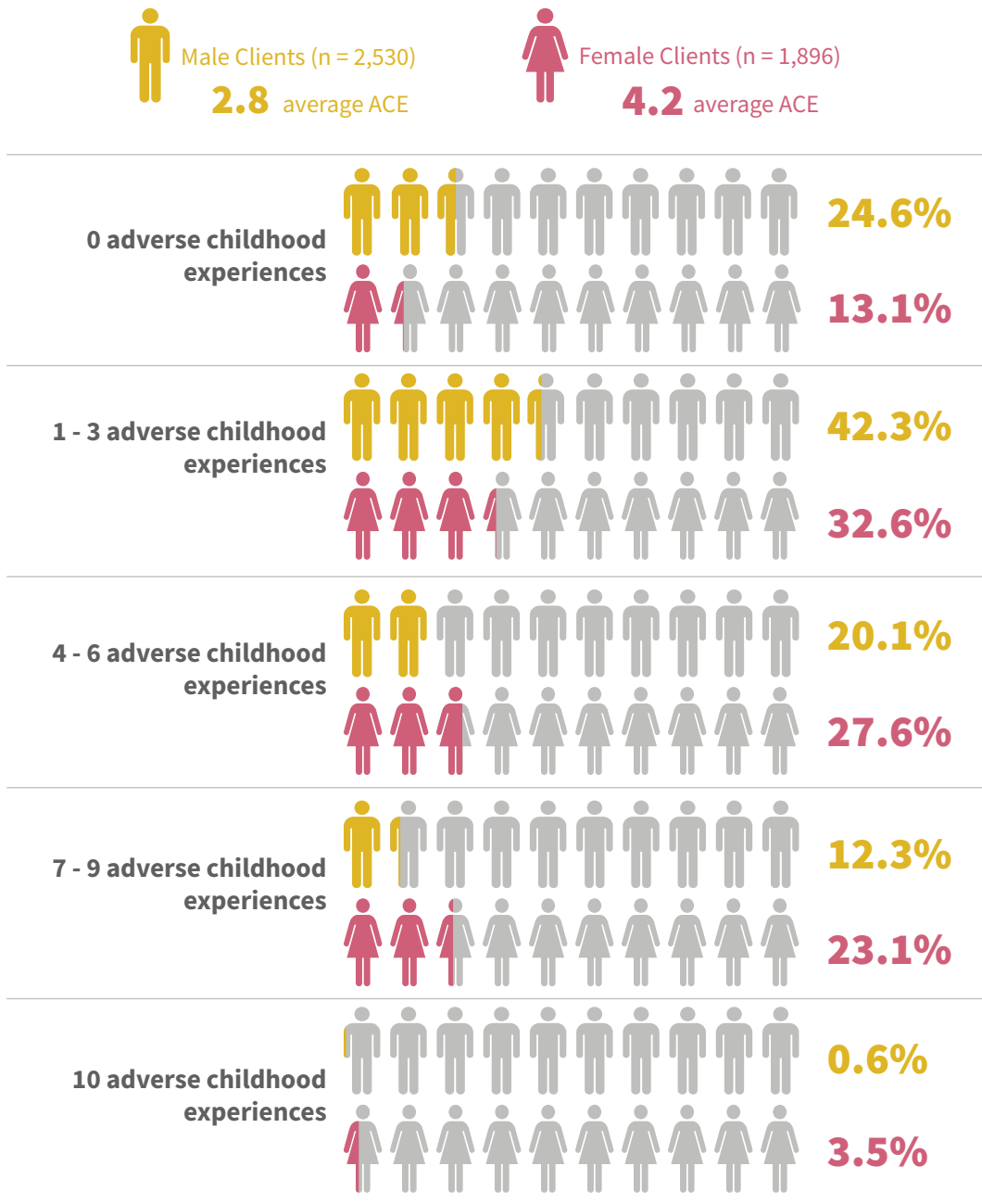
<sup>19</sup> Centers for Disease Control and Prevention. (2014). *Prevalence of individual adverse childhood experiences*. Atlanta, GA: National Center for Injury Prevention and Control, Division of Violence Prevention. <http://www.cdc.gov/violenceprevention/acestudy/prevalence.html>.

<sup>20</sup> 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).

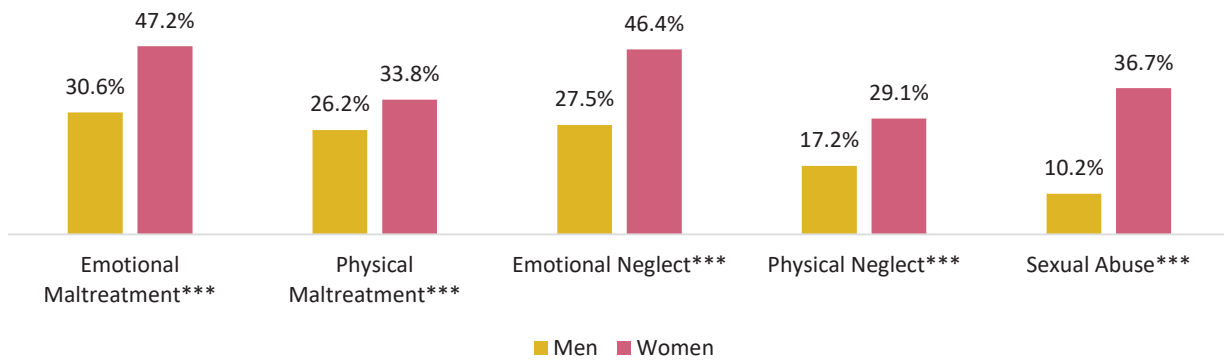
<sup>21</sup> The ACE items were added in mid-October 2016, thus, 4,426 individuals who completed an intake interview included in this report answered the ACE items.

There was a significant difference in the proportion of men and women classified by number of types of ACE (see Figure 1.10). Significantly more men than women reported experiencing 1 to 3 types of ACE, whereas significantly more women than men reported experiencing 7 – 9 types of ACE.

FIGURE 1.10. NUMBER OF TYPES OF ADVERSE CHILDHOOD EXPERIENCES BY GENDER

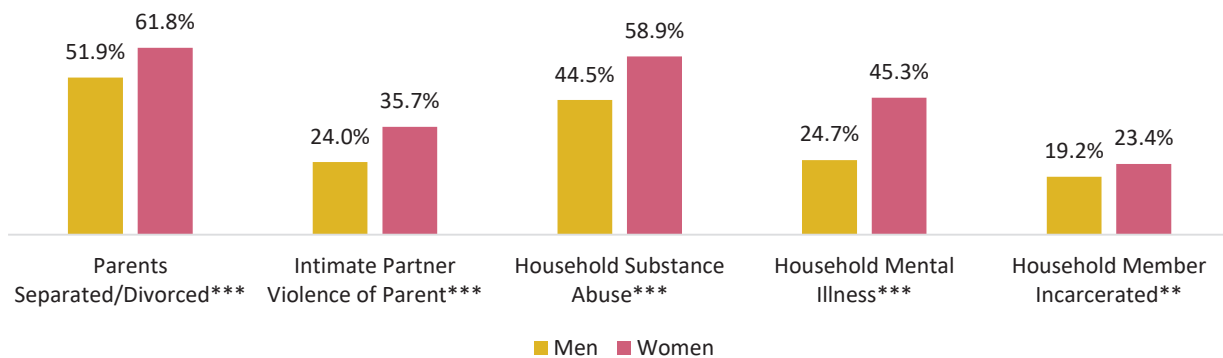


Nearly half of women (48.1%) reported they had experienced emotional maltreatment in their childhood, compared to 30.6% of men (see Figure 1.11). Around one-third of women and one-fourth of men reported physical maltreatment. Nearly half of women (46.4%) reported they had experienced emotional neglect compared to 27.5% of men. Significantly more women than men reported experiencing all five types of measured childhood maltreatment.

FIGURE 1.11. MALTREATMENT AND ABUSE EXPERIENCES IN CHILDHOOD BY GENDER (n = 4,426)<sup>22</sup>

\*\*\*p < .001.

The majority of individuals reported their parents were divorced or lived separately and had a household member with a substance abuse problem (see Figure 1.12). Significantly more women than men reported all five types of household risks. Nearly half of women reported that someone in their household was depressed, mentally ill, or had attempted suicide. About 1 in 5 individuals reported a household member had been incarcerated.

FIGURE 1.12. HOUSEHOLD RISKS IN CHILDHOOD BY GENDER (n = 4,426)<sup>23</sup>

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

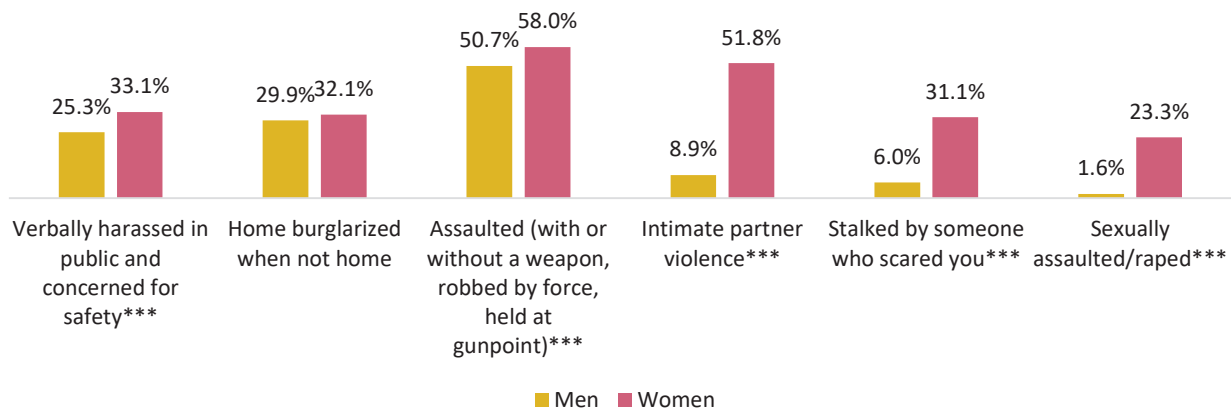
Individuals were also asked about victimization experiences (including when they may have been the victim of a crime, harmed by someone else, or felt unsafe) they had experienced in their lifetime and in

<sup>22</sup> The ACE items were added in mid-October 2016, thus, 4,426 individuals who completed an intake interview included in this report answered the ACE items.

<sup>23</sup> The ACE items were added in mid-October 2016, thus, 4,426 individuals who completed an intake interview included in this report answered the ACE items.

the 12 months before entering treatment. The results of the most commonly reported experiences are presented by gender in Figure 1.13. Similar percentages of men and women reported ever being the victim of a home burglary. Compared to men, significantly higher percentages of women reported ever being verbally harassed in public and concerned for their safety, assaulted (not IPV), intimate partner violence, stalked by someone who scared them, and sexually assaulted or raped.

FIGURE 1.13. LIFETIME CRIME AND INTERPERSONAL VICTIMIZATION BY GENDER (n = 4,426)<sup>24</sup>



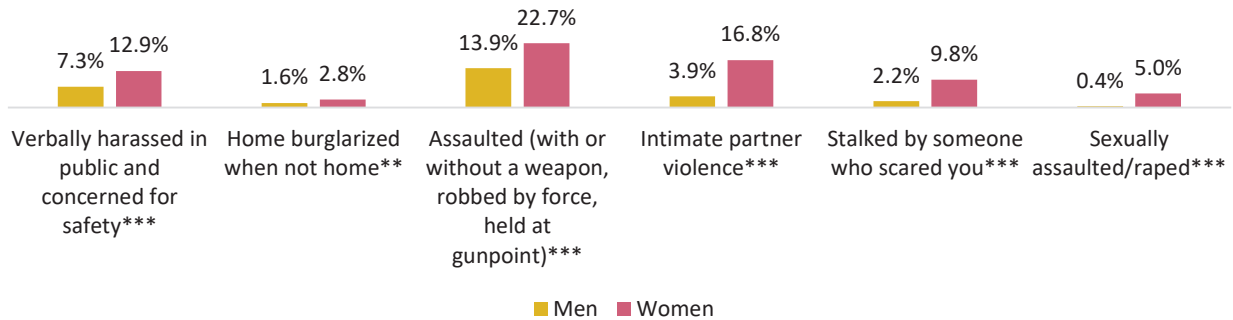
\*\*\*p < .001.

Smaller percentages of clients reported experiencing crime and interpersonal victimization in the 12 months before entering programs (see Figure 1.14). However, the pattern of gender differences was the same for the 12-month-period as it was for lifetime prevalence percentages. Significantly higher percentages of women than men reported being verbally harassed in public and concerned for their safety, their home was burglarized when they were not home, being assaulted (non-IPV), intimate partner violence, stalked by someone who scared them, and sexually assaulted or raped in the 12 months before entering treatment.

*“The staff were recovering addicts, so they were relatable and helpful. The environment was relaxed.”*

- KTOS FOLLOW-UP CLIENT

<sup>24</sup> The victimization items were added in mid-October 2016, thus, 4,426 individuals who completed an intake interview included in this report answered these questions.

FIGURE 1.14. PAST-12-MONTH CRIME AND INTERPERSONAL VICTIMIZATION BY GENDER (n = 4,426)<sup>25</sup>

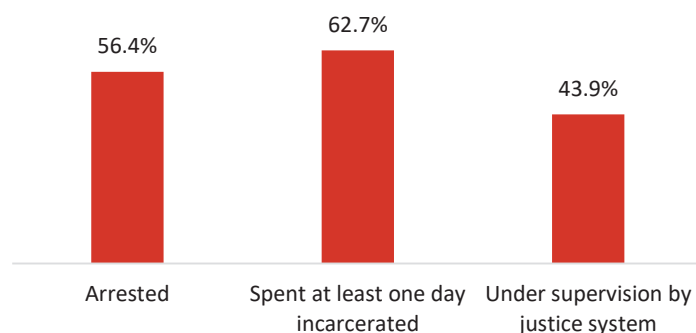
\*\*p < .01, \*\*\*p < .001.

## Criminal Justice Involvement

Over half of individuals reported being arrested at least once (56.4%) and 62.7% of clients reported being incarcerated at least one night in the 12 months before treatment (see Figure 1.15). Nearly 44% 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 = 3,169), they were arrested an average of 2.0 times. Among those who were incarcerated in the past 12 months (n = 3,521), they were incarcerated an average of 71.1 nights (not depicted in a figure).

FIGURE 1.15. CRIMINAL JUSTICE INVOLVEMENT 12 MONTHS BEFORE TREATMENT AT INTAKE (N = 5,619)



<sup>25</sup> The victimization items were added in mid-October 2016, thus, 4,426 individuals who completed an intake interview included in this report answered these questions.



## Description of KTOS Follow-up Sample at Intake

*This report describes outcomes for 1,279 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 325.8 days) after the intake survey was completed.<sup>26</sup> 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. Of those eligible, individuals are then randomly selected by the month in which they completed intake surveys (about 170 clients per month). 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 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 (0.8%) and in the high follow-up rate (75.6%). This means that 23.5% of individuals included in the sample to be followed up were not successfully contacted.<sup>27</sup> 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 page Appendix C.

## Demographics

Of the 1,279 adults who completed a 12-month follow-up interview, 48.2% were male and 51.8% were female (see Table 1.3). The majority of follow-up clients were White (92.3%). A minority were African American/Black (5.9%) and 1.8% were Hispanic, American Indian, or multiracial. Clients in the follow-up sample were an average of 34.7 years old at the time of the intake interview. Less than half (44.2%) reported they were married or cohabiting at intake, 27.8% were not married (and not cohabiting), 26.0% were separated or divorced, and 2.0% were widowed. A little more than three-fourths (78.1%) of followed-up clients had at least one child. A small percentage of the follow-up sample (3.2%) reported they were a veteran or currently serving in the military, Reserves, or National Guard.

<sup>26</sup> The average number of days between when the baseline was submitted to UK CDAR and when the follow-up was completed was 323.3 days.

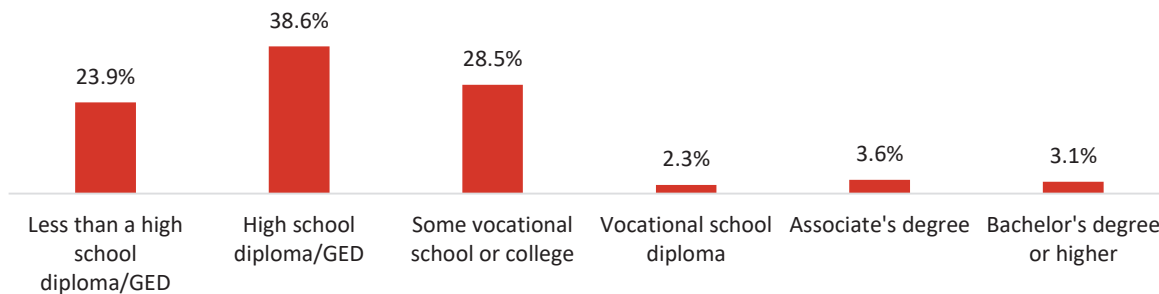
<sup>27</sup> Clients are not contacted for a variety of reasons including follow-up staff are not able to find a working address or phone number or are unable to contact any friends or family members of the client.

TABLE 1.3. DEMOGRAPHICS FOR KTOS CLIENTS WHO WERE FOLLOWED-UP AT INTAKE (n = 1,279)

<b>Age</b> .....	34.7 years (range of 18-67)
<b>Gender</b>	
Male.....	48.2%
Female.....	51.8%
Transgender .....	0.0%
<b>Race</b>	
White .....	92.3%
African American .....	5.9%
Other or multiracial .....	1.8%
<b>Marital status</b>	
Married or cohabiting.....	44.2%
Never married.....	27.8%
Separated or divorced .....	26.0%
Widowed.....	2.0%
<b>Have children</b> .....	78.1%
<b>Veteran or currently serving in military...</b>	3.2%

A little under one-quarter of follow-up clients (23.9%) had less than a high school diploma or GED at intake (see Figure 1.16). The highest level of education of 38.6% of the follow-up sample was a high school diploma or GED. About one-quarter of clients (28.5%) had completed some vocational/technical school or college. Only a small minority of clients had completed vocational/technical school (2.3%), an associate’s degree (3.6%), or a bachelor’s degree or higher (3.1%).

FIGURE 1.16. HIGHEST LEVEL OF EDUCATION COMPLETED BY FOLLOW-UP CLIENTS AT INTAKE (n = 1,279)



When those 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, living situation, 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 compared to those who were not followed up. See Appendix B for detailed comparisons of clients who

completed a follow-up interview (n = 1,279) and clients who did not complete a follow-up interview (n = 4,340).

In summary, there were many significant differences between clients who were followed up and those who were not, and most of these significant differences suggest that followed-up clients are worse off than clients who were not followed up (see Table 1.4). First, significantly more women were followed up than were not followed up. Second, significantly more followed-up clients reported they were homeless and had difficulty meeting health care needs for financial reasons. Third, significantly more clients who were included in the follow-up sample reported they had chronic pain and a chronic medical problem when compared to clients who were not in the follow-up sample. Fourth, significantly more clients in the follow-up sample reported depression, generalized anxiety, and suicidality in the 12 months before treatment. Fifth, significantly more clients who were followed up reported using most classes of illegal drugs, alcohol, and smoking tobacco compared to clients who were not followed up. Sixth, 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, 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. Seventh, significantly more followed-up clients reported they had a history of prior substance abuse treatment than clients who were not followed-up. Nonetheless, there were a couple statistically significant differences in which the followed-up clients had better indicators than the individuals who were not followed-up: education and the number of days incarcerated, among those who spent any time incarcerated in the 12 months before entering treatment.

TABLE 1.4. FOLLOWED-UP VERSUS NOT FOLLOWED-UP

	Followed up	
	No (n = 4,340)	Yes (n = 1,279)
Demographic	More male	More female
Socio-economic status indicators (e.g., education, employment, living situation, inability to meet basic needs)	Lower level of education	<ul style="list-style-type: none"> <li>• More were homeless</li> <li>• More had difficulty meeting health care needs for financial reasons</li> </ul>
Substance use, severity of alcohol and drug use		<ul style="list-style-type: none"> <li>• More reported marijuana, illicit use of prescription opioids, stimulants, tranquilizers/sedatives/benzodiazepines, non-prescribed buprenorphine-naloxone (bup-nx), cocaine, heroin, non-prescribed methadone, hallucinogens, and inhalants in the 12 months before entering treatment</li> <li>• More reported alcohol use, alcohol to intoxication, binge drinking, and smoking tobacco use in the 12 months before treatment</li> <li>• More met or surpassed the cutoff score for alcohol or drug use substance use disorder</li> </ul>
Health (e.g., overall health status, chronic medical problems, chronic pain)		More had chronic pain and chronic medical problems
Mental health (e.g., depression, generalized anxiety, suicidality)		More met study criteria for depression, generalized anxiety, and suicidality
Criminal justice involvement (e.g., arrested, incarcerated)	More days incarcerated among those with any incarceration	
Treatment history		More had a history of prior substance abuse treatment

## 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 = 1,250)<sup>28</sup> 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 = 1,113)<sup>29</sup> 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, 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

<sup>28</sup> 14 cases were excluded from this analysis because they were incarcerated all 365 days before entering treatment, 1 case was excluded because the individual was incarcerated all 365 days before follow-up, and 14 cases were excluded because either the interviewer skipped the question (n = 2) or the client declined to answer (n = 12).

<sup>29</sup> 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 = 146) or all 30 days before the follow-up (n = 20) from the change in past-30-day substance use analysis is that being in a controlled environment inhibits opportunities for alcohol and drug use.

illegal drugs (n = 607), alcohol (n = 366) and those with alcohol and/or illegal drug use (n = 762) 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.

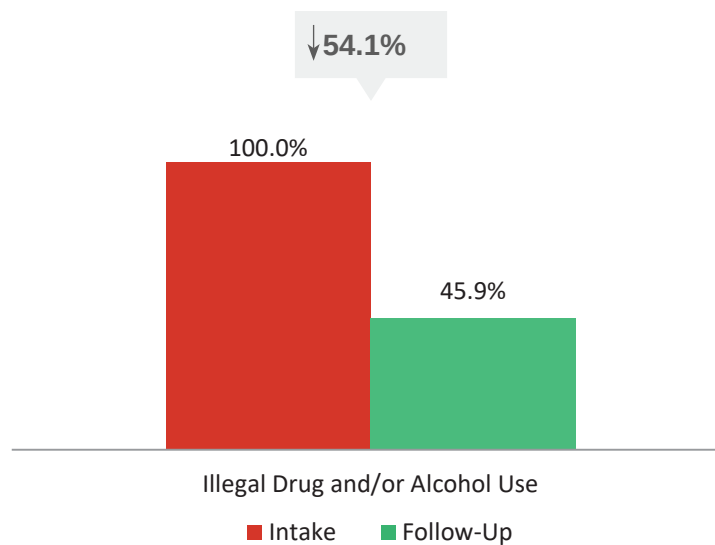
## Alcohol and/or Illegal Drug Use

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

All clients (100%) reported using alcohol and/or illegal drugs in the 12 months before entering substance abuse treatment, which decreased to 45.9% at follow-up. As a result, there was a 54.1% significant decrease in the number of clients reporting use of alcohol and/or illegal drugs (see Figure 2.1).

The number of clients reporting alcohol and/or illegal drug use decreased by 54%

FIGURE 2.1. PAST-12-MONTH ALCOHOL AND/OR DRUG USE AT INTAKE AND FOLLOW-UP (N = 1,250)<sup>a</sup>

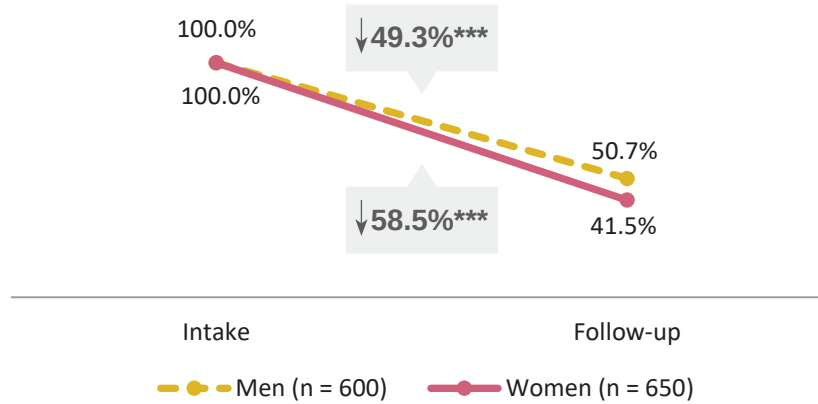


a--No test of statistical association could be computed for illegal drug/alcohol use in the 12 months before entering treatment because the value was a constant.

### Gender Differences in Past-12-month Alcohol And/or Illegal Drug Use

At intake, there were no significant differences in the number of men and women reporting alcohol and/or drug use in the past 12 months, because all clients reported using any alcohol and/or illegal drugs in the 12 months before they entered treatment (see Figure 2.2). The percent of women and men who reported any past-12-month alcohol and/or illegal drug use significantly decreased from intake to follow-up by 58.5% and 49.3% respectively. At follow-up, significantly more men reported alcohol and/or illegal drug use in the past 12 months compared to women (50.7% vs. 41.5%, respectively).

FIGURE 2.2. GENDER DIFFERENCES IN PAST-12-MONTH ILLEGAL DRUG AND/OR ALCOHOL USE AT INTAKE AND FOLLOW-UP<sup>a,b</sup>

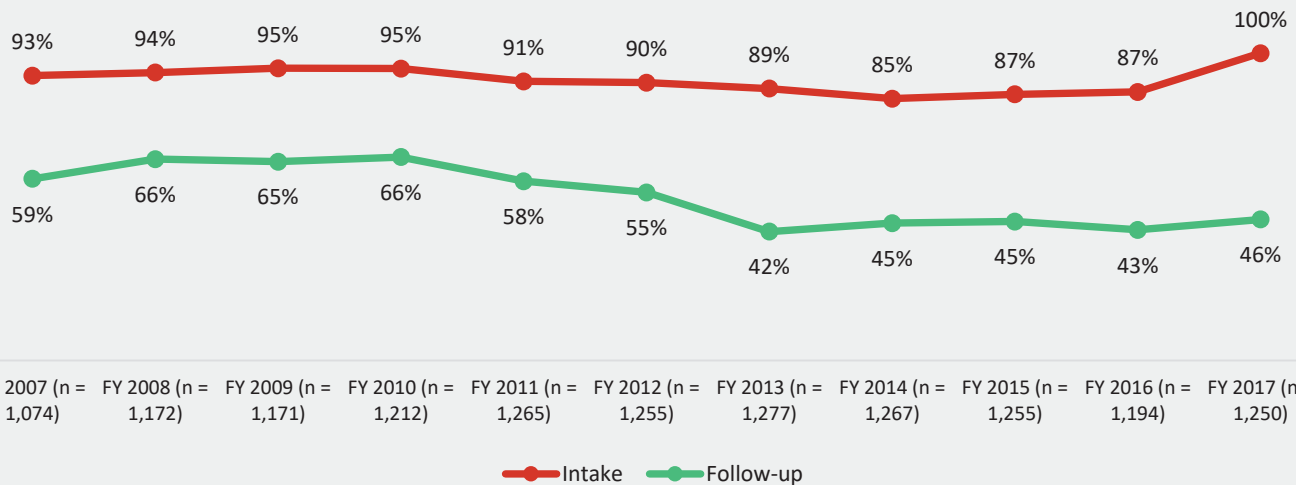


a—Significant difference by gender at follow-up,  $p < .01$   
 b—No test of statistical association could be computed for illegal drug/ alcohol use in the 12 months before entering treatment because the value was a constant.

### Trends in Any Alcohol and/or Drug Use

The number of KTOS clients reporting alcohol and/or drug use in the 12 months before treatment was consistently high.<sup>30</sup> Overall, at follow-up, the number of clients reporting alcohol and/or drug use has decreased over the years.

FIGURE 2.3. TRENDS IN ANY ALCOHOL AND/OR ILLEGAL DRUG USE AT INTAKE AND FOLLOW-UP, FY 2007-2017

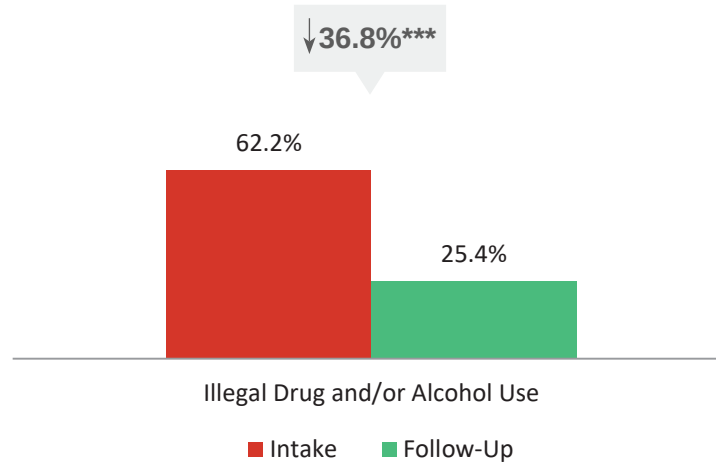


<sup>30</sup> In the several years preceding FY 2017, the research team had noticed that an increasing proportion of clients with completed KTOS intake surveys reported no substance use. Because the focus of this report is on substance abuse treatment outcomes, to be included in the follow-up study individuals had to report past-12-month alcohol and/or drug use, if they were not incarcerated the entire 12 months before entering the program.

## Past-30-day Alcohol and/or Illegal Drug Use

Over half of clients (62.2%) reported using alcohol and/or illegal drugs in the 30 days before entering substance abuse treatment, which decreased to 25.4% at follow-up. As a result, there was a 36.8% significant decrease in the number of clients reporting past-30-day use of alcohol and/or illegal drugs (see Figure 2.4).

FIGURE 2.4. PAST-30-DAY ALCOHOL AND/OR DRUG USE AT INTAKE AND FOLLOW-UP (N = 1,113)

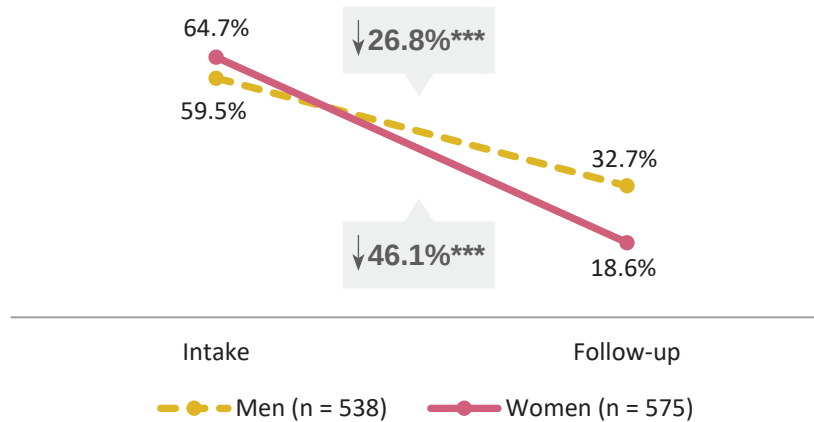


\*\*\*p < .001.

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

At intake, there were no significant differences in the number of women (64.7%) and men (59.5%) reporting any alcohol and/or illegal drug use in the past 30 days (see Figure 2.5). The number of women and men who reported any past-30-day alcohol and/or illegal drug use significantly decreased from intake to follow-up by 46.1% and 26.8% respectively. At follow-up, significantly more men reported alcohol and/or illegal drug use in the past 30 days compared to women (32.7% vs. 18.6%, respectively).

FIGURE 2.5. GENDER DIFFERENCES IN PAST-30-DAY ILLEGAL DRUG AND/OR ALCOHOL USE AT INTAKE AND FOLLOW-UP<sup>a</sup>



<sup>a</sup>—Significant difference by gender at follow-up, p < .001

\*\*\*p < .001.

## Any Illegal Drugs

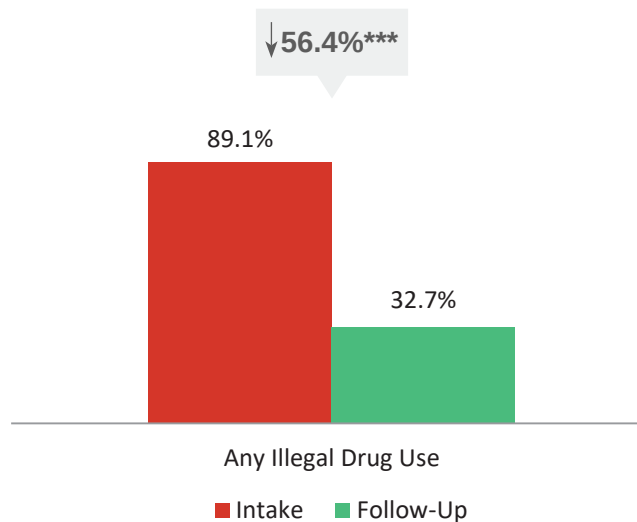
### Past-12-month Illegal Drug Use

At intake, clients were asked how old they were when they first began to use illicit drugs. On average, KTOS clients reported they were 16.7 years old when they first used illegal drugs (not depicted in figure).

About 9 in 10 clients (89.1%) reported using illegal drugs in the 12 months before entering substance abuse treatment, which decreased to 32.7% at follow-up. Overall, for the KTOS follow-up sample, there was a 56.4% decrease in the number of clients reporting use of any illegal drug in the past 12 months (see Figure 2.6).

**The number of clients reporting illegal drug use in the past 12 months decreased by 56%**

FIGURE 2.6. PAST-12-MONTH DRUG USE AT INTAKE AND FOLLOW-UP (N = 1,244)<sup>31</sup>



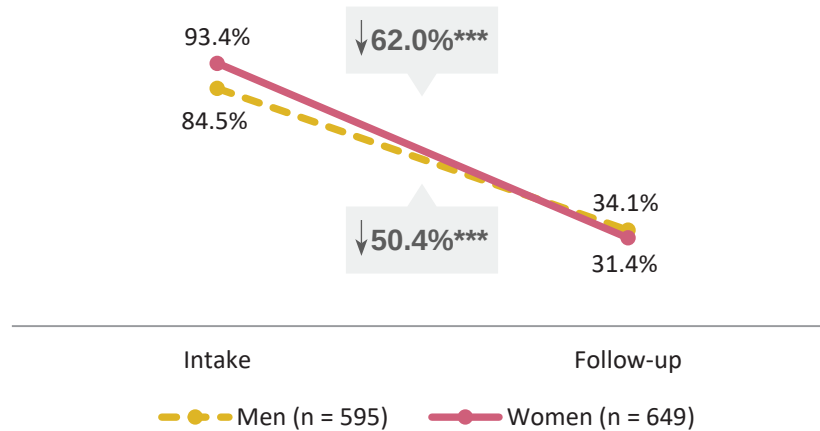
### Gender Differences in Past-12-month Overall Illegal Drug Use

At intake, significantly more women than men reported any past-12-month illegal drug use, 93.4% vs. 84.5% (see Figure 2.7). The number of women and men who reported illegal drug use in the past 12 months significantly decreased from intake to follow-up by 62.0% and 50.4% 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.

**Significantly more women than men reported using any illegal drugs in the 12 months before intake**

<sup>31</sup> Six clients were missing data for illegal drug use at follow-up.



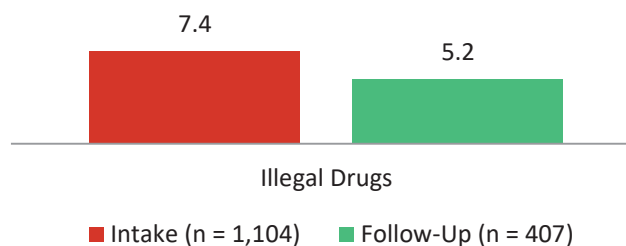
FIGURE 2.7. GENDER DIFFERENCES IN PAST-12-MONTH ILLEGAL DRUG USE AT INTAKE AND FOLLOW-UP<sup>a</sup>

a—Significant difference by gender at intake,  $p < .001$   
 \*\*\* $p < .001$ .

### Average Maximum Number of Months Used Any Illegal Drugs

Among the clients who reported using illegal drugs in the 12 months before entering treatment ( $n = 1,104$ ), they reported using illegal drugs an average maximum of 7.4 months (see Figure 2.8).<sup>32</sup> Clients who reported using illegal drugs at follow-up ( $n = 407$ ) reported using an average maximum of 5.2 months.

FIGURE 2.8. AVERAGE MAXIMUM NUMBER OF MONTHS CLIENTS USED ILLEGAL DRUGS



*“The best thing to ever happen to me, I would recommend it to anyone.”*

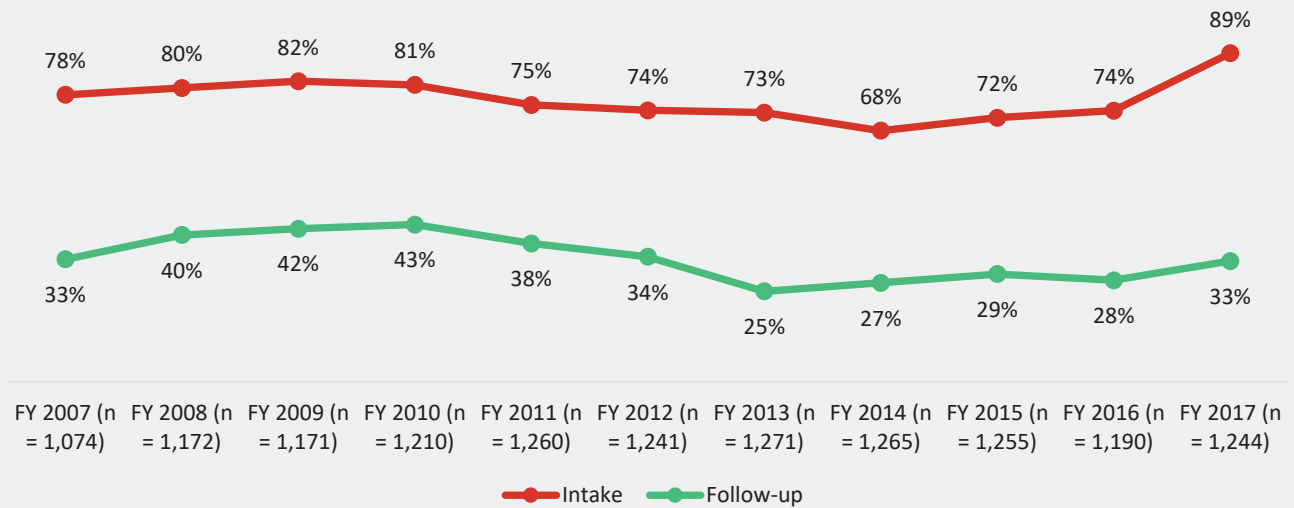
- KTOS FOLLOW-UP CLIENT

<sup>32</sup> 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. This year, that number increased to almost 90%.<sup>33</sup> Overall, at follow-up, the number of clients reporting any illegal drug use decreased from FY 2010 to FY 2013 but has slowly increased in recent years.

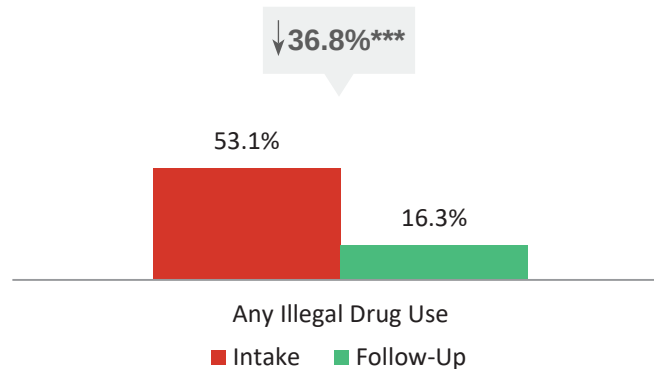
FIGURE 2.9. TRENDS IN ANY PAST-12-MONTH ILLEGAL DRUG USE AT INTAKE AND FOLLOW-UP, FY 2007-2017



## Past-30-day Illegal Drug Use

A little more than half of clients (53.1%) 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 2.10). At follow-up, only 16.3% of clients reported they had used illegal drugs in the past 30 days—a significant decrease of 36.8%.

FIGURE 2.10. PAST-30-DAY USE OF ANY ILLEGAL DRUG AT INTAKE AND FOLLOW-UP (N = 1,104)<sup>34</sup>



\*\*\*p < .001.

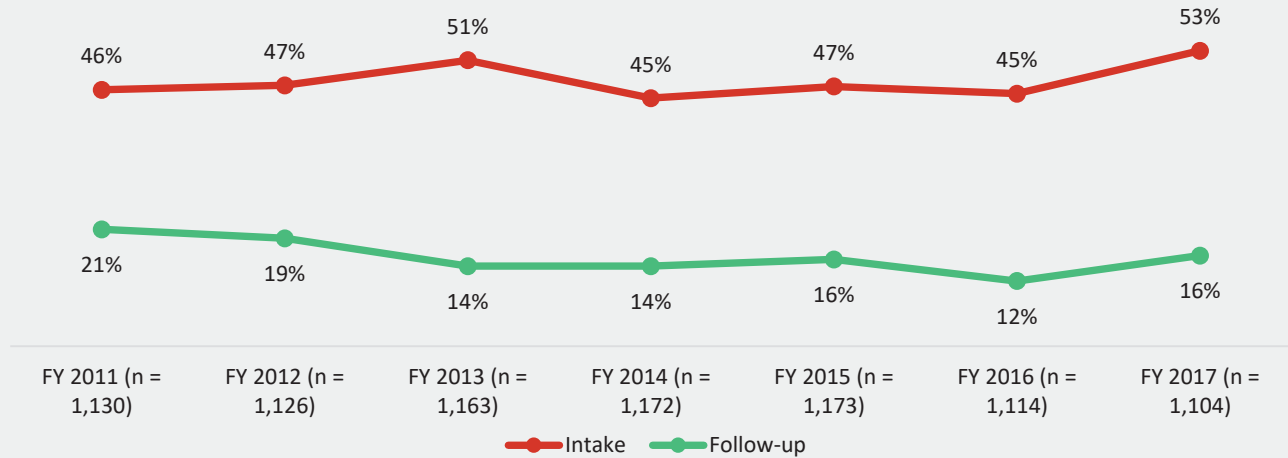
<sup>33</sup> In the several years preceding FY 2017, the research team had noticed that an increasing proportion of clients with completed KTOS intake surveys reported no substance use. Because the focus of this report is on substance abuse treatment outcomes, to be included in the follow-up study individuals had to report past-12-month alcohol and/or drug use, if they were not incarcerated the entire 12 months before entering the program.

<sup>34</sup> Eleven clients had missing data for past-30-day illegal drug use at follow-up.

## Trends in Past-30-day Illegal Drug Use

Of those 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 (44% - 53%) reported using any illegal drugs in the past 30 days at intake. At follow-up, the number of clients reporting any illegal drug use decreased over the past 6 years, from 21% in FY 2011 to 12% in FY 2016, and increased in FY 2017 (16%).

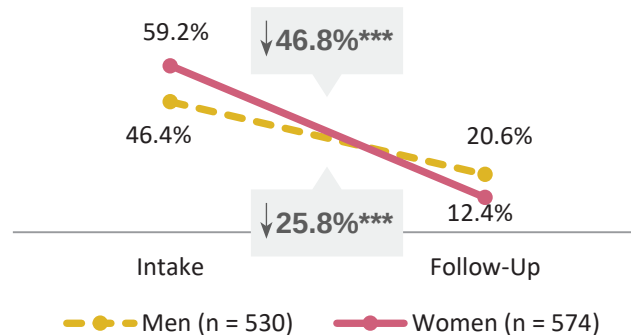
FIGURE 2.11. TRENDS IN PAST-30-DAY ILLEGAL DRUG USE AT INTAKE AND FOLLOW-UP, FY 2011-2017



## Gender Differences in Past-30-day Illegal Drug Use

Significantly more women reported illegal drug use in the 30 days before intake when compared to men (59.2% vs. 46.4%). The number of women and men who reported illegal drug use decreased significantly, with the decrease for women being greater. The difference between men and women who reported past-30-day illegal drug use was statistically significant at follow-up, with more men reporting illegal drug use at follow-up when compared to women (see Figure 2.12).

FIGURE 2.12. GENDER DIFFERENCES IN PAST-30-DAY ILLEGAL DRUG USE AT INTAKE AND FOLLOW-UP<sup>a</sup>

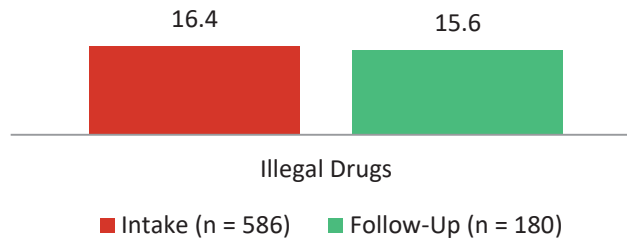


a—Significant difference by gender at intake and follow-up,  $p < .001$ .  
 \*\*\* $p < .001$ .

## 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 = 586), they reported using illegal drugs an average maximum of 16.4 days (see Figure 2.13). Clients who reported using illegal drugs at follow-up (n = 180) reported using an average maximum of 15.6 days.<sup>35</sup>

FIGURE 2.13. AVERAGE MAXIMUM NUMBER OF DAYS CLIENTS USED ILLEGAL DRUGS IN PAST 30 DAYS



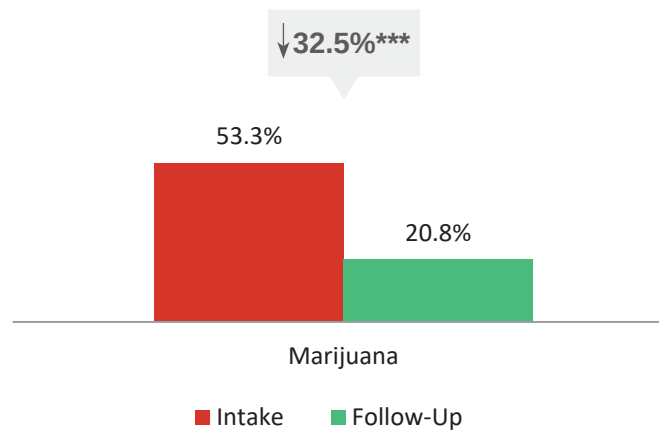
## Marijuana

### Past-12-month Marijuana Use

More than half of clients reported using marijuana in the 12 months before entering treatment, which decreased to 20.8% at follow-up. Overall, for the KTOS follow-up sample, there was a 32.5% significant decrease in the number of clients reporting marijuana use (see Figure 2.14).

The number of clients reporting past-12-month marijuana use decreased by 33%

FIGURE 2.14. PAST-12-MONTH MARIJUANA USE AT INTAKE AND FOLLOW-UP (N = 1,246)<sup>36</sup>



\*\*\*p < .001.

<sup>35</sup> 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.

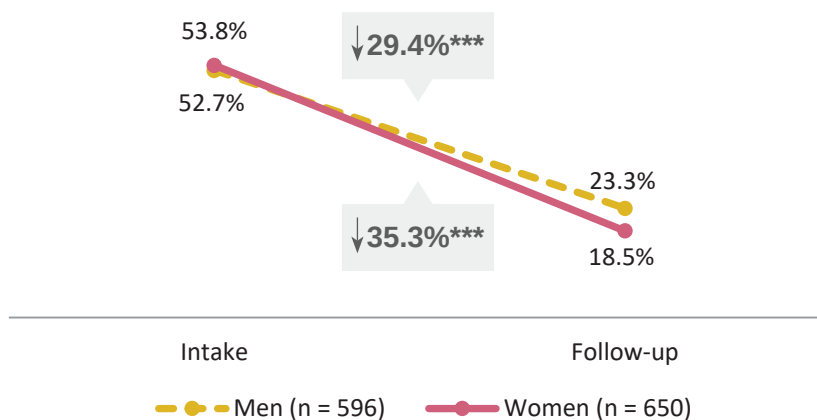
<sup>36</sup> Two clients had missing data for past-12-month marijuana use.

## Gender Differences in Past-12-month Marijuana Use

At intake, a similar percentage of men and women reported any marijuana use in the past 12 months, 52.7% vs. 53.8% (see Figure 2.15). The percent of women and men who reported past-12-month marijuana use significantly decreased from intake to follow-up by 35.3% and 29.4% respectively. At follow-up, significantly more men than women reported they had used marijuana in the past 12 months.

Significantly more men than women reported using marijuana 12 months before follow-up

FIGURE 2.15. GENDER DIFFERENCES IN PAST-12-MONTH MARIJUANA USE AT INTAKE AND FOLLOW-UP<sup>a</sup>



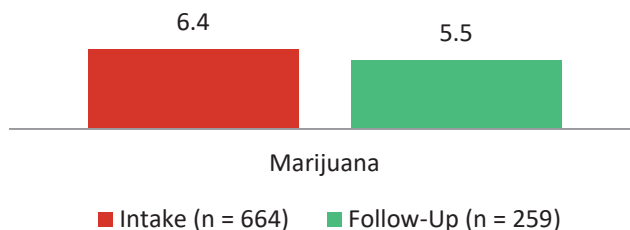
a—Significant difference by gender at follow-up,  $p < .05$ .

\*\*\* $p < .001$ .

## Average Number of Months Used Marijuana

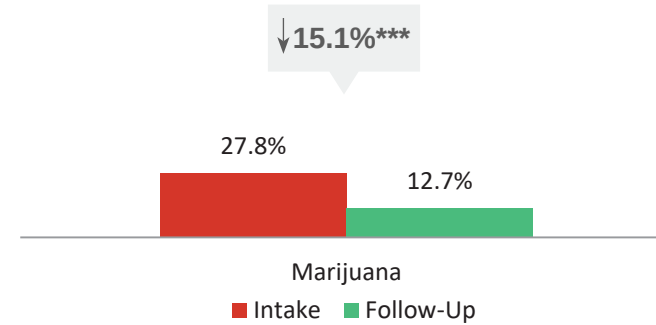
Among the clients who reported using marijuana in the 12 months before entering treatment ( $n = 664$ ), they reported using marijuana, on average, 6.4 months (see Figure 2.16). Among clients who reported using marijuana at follow-up ( $n = 259$ ), they reported using, on average 5.5 months.

FIGURE 2.16. AVERAGE NUMBER OF MONTHS CLIENTS USED MARIJUANA



## Past-30-day Marijuana Use

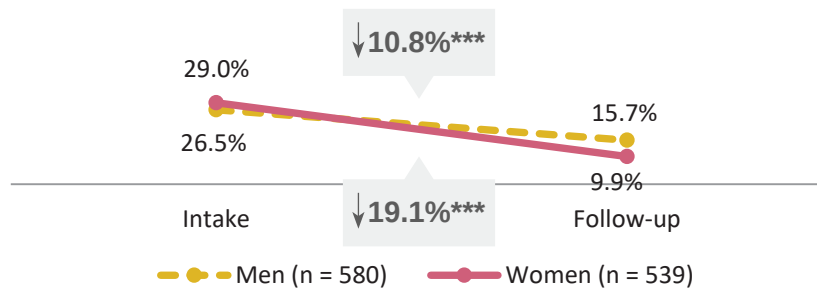
The number of clients who reported using marijuana in the past 30 days decreased significantly by 15.1%, from 27.8% at intake to 12.7% at follow-up (see Figure 2.17).

FIGURE 2.17. PAST-30-DAY MARIJUANA USE AT INTAKE AND FOLLOW-UP (N = 1,119)<sup>37</sup>

\*\*\*p &lt; .001.

### Gender Differences in Past-30-day Marijuana Use

At intake, similar percentages of men (26.5%) and women (29.0%) reported marijuana use in the past 30 days (see Figure 2.18). The percent of men and women who reported marijuana use significantly decreased from intake to follow-up by 10.8% and 19.1% respectively. At follow-up, significantly more men (15.7%) reported marijuana use in the past 30 days compared to women (9.9%).

FIGURE 2.18. GENDER DIFFERENCES IN PAST-30-DAY MARIJUANA USE AT INTAKE AND FOLLOW-UP<sup>a</sup>

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

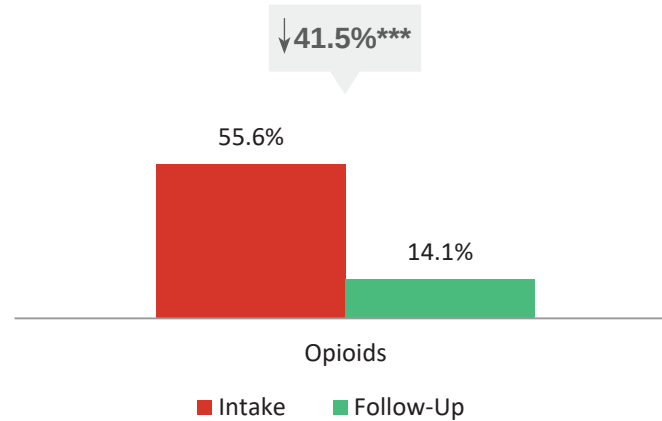
## Opioids

### Past-12-month Opioid Misuse

More than half of clients (55.6%) 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 14.1% at follow-up. Overall, for the KTOS follow-up sample, there was a 41.5% decrease in the number of clients reporting past-12-month opioid misuse other than heroin (see Figure 2.19).

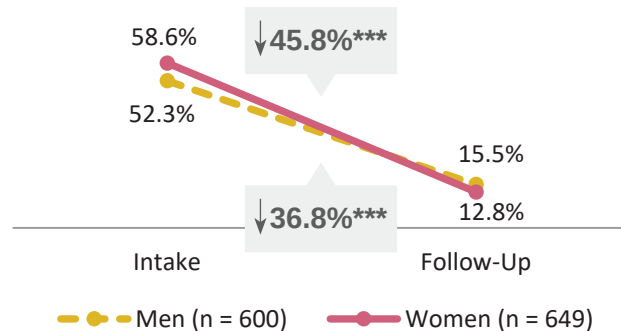
**The number of clients reporting past-12-month opioid misuse decreased by 42%**

<sup>37</sup> Two clients had missing data on past-30-day marijuana use at follow-up.

FIGURE 2.19. PAST-12-MONTH OPIOID MISUSE AT INTAKE AND FOLLOW-UP (N = 1,249)<sup>38</sup>

### Gender Differences in Past-12-month Opioid Misuse

Significantly more women than men reported opioid misuse in the 12 months before intake, 58.6% vs. 52.3%. The percent of women and men who reported opioid misuse significantly decreased from intake to follow-up and at follow-up, there was no significant difference in the percent of women (12.8%) and men (15.5%) who reported past-12-month opioid misuse (see Figure 2.20).

FIGURE 2.20. GENDER DIFFERENCES IN PAST-12-MONTH OPIOID MISUSE AT INTAKE AND FOLLOW-UP<sup>a</sup>

### Average Maximum Number of Months Misused Opioids

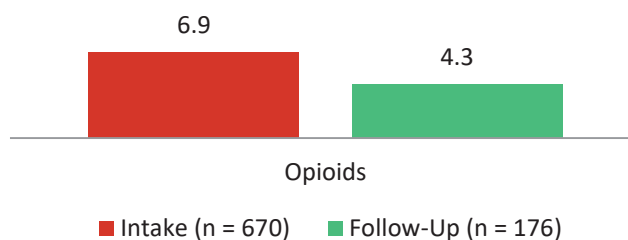
Among the clients who reported misusing opioids in the 12 months before entering treatment (n = 670),<sup>39</sup> they reported misusing opioids on average 6.9 months (see Figure 2.21).<sup>40</sup> Among clients who reported misusing opioids at follow-up (n = 176), they reported misusing an average 4.3 months.

<sup>38</sup> One case had a missing value for opioid use in the 12 months before follow-up.

<sup>39</sup> Twenty-four cases had missing values for number of months used prescription opioids in the 12 months before entering treatment.

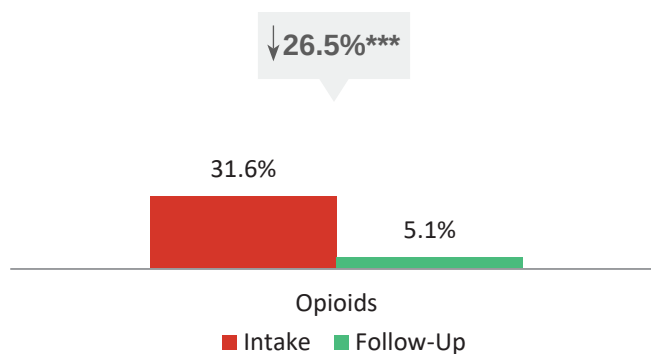
<sup>40</sup> Because number of months of prescription opioids, methadone, and bup-nx were measured separately, the value is a calculation of the maximum number of months clients used any of these specific types of opioids.

FIGURE 2.21. AVERAGE MAXIMUM NUMBER OF MONTHS CLIENTS MISUSED OPIOIDS



## Past-30-day Opioid Misuse

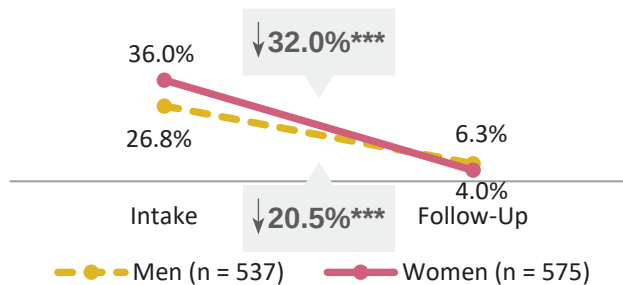
The number of clients who reported misusing opioids in the past 30 days decreased significantly by 26.5%, from 31.6% at intake to 5.1% at follow-up (see Figure 2.22).

FIGURE 2.22. PAST-30-DAY OPIOID MISUSE AT INTAKE AND FOLLOW-UP (N = 1,112)<sup>41</sup>

\*\*\*p < .001.

## Gender Differences in Past-30-day Opioid Misuse

Significantly more women than men reported opioid misuse in the 30 days before intake, 36.0% vs. 26.8%. The percent of women and men who reported opioid misuse significantly decreased from intake to follow-up and at follow-up, there was no significant difference in the percent of women (4.0%) and men (6.3%) who reported past-30-day opioid misuse (see Figure 2.23).

FIGURE 2.23. GENDER DIFFERENCES IN PAST-30-DAY OPIOID MISUSE AT INTAKE AND FOLLOW-UP<sup>a</sup>

a—Significant difference by gender at intake; p < .01.  
\*\*\*p < .001.

<sup>41</sup> One case had missing values on past-30-day opioid misuse at follow-up.



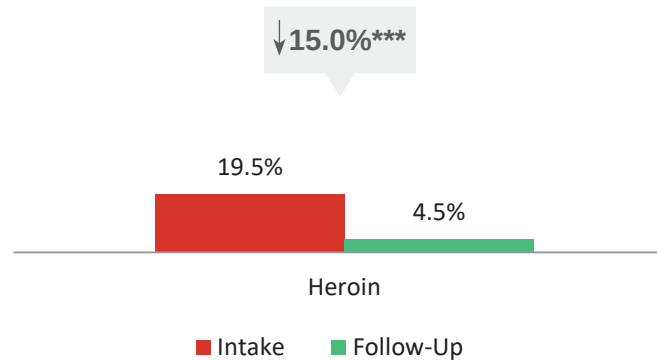
# Heroin

## Past-12-month Heroin Use

About 1 in 5 clients reported using heroin in the 12 months before entering treatment (19.5%), which decreased 15.0% to 4.5% at follow-up (see Figure 2.24).

The number of clients reporting past-12-month heroin use decreased by 15%

FIGURE 2.24. PAST-12-MONTH HEROIN USE AT INTAKE AND FOLLOW-UP (N = 1,248)<sup>42</sup>



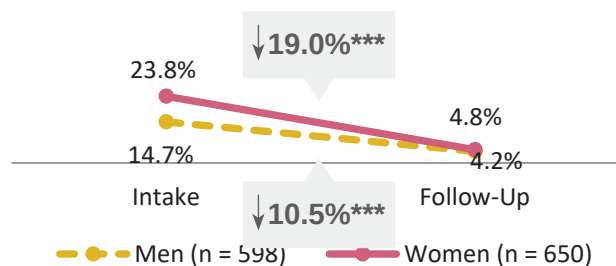
\*\*\*p < .001.

## Gender Differences in Past-12-month Heroin Use

Significantly more women than men reported heroin misuse in the 12 months before intake, 23.8% vs. 14.7%. The percent of women and men who reported heroin use significantly decreased from intake to follow-up and at follow-up, there was no significant difference in the percent of women (4.8%) and men (4.2%) who reported past-12-month heroin use (see Figure 2.25).

Significantly more women than men reported heroin use in the 12 months before intake

FIGURE 2.25. GENDER DIFFERENCES IN PAST-12-MONTH HEROIN USE AT INTAKE AND FOLLOW-UP<sup>a</sup>



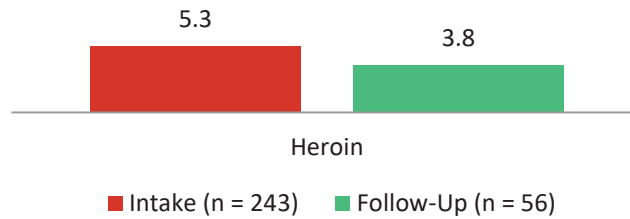
a—Significant difference by gender at intake; p < .001.  
\*\*\*p < .001.

## Average Number of Months Used Heroin

Among the clients who reported using heroin in the 12 months before entering treatment (n = 243), they reported using heroin, on average, 5.3 months (see Figure 2.26). Among clients who reported using heroin at follow-up (n = 56), they reported using, on average, 3.8 months.

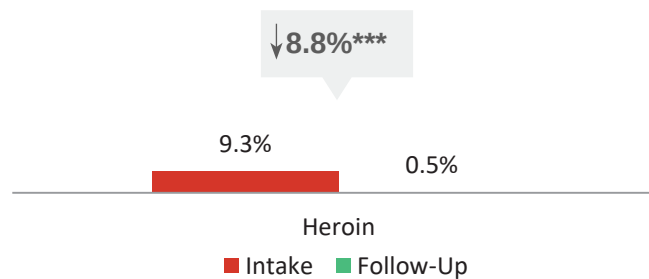
<sup>42</sup> Two clients had missing data for past-12-month heroin use at follow-up.

FIGURE 2.26. AVERAGE NUMBER OF MONTHS CLIENTS USED HEROIN



## Past-30-day Heroin Use

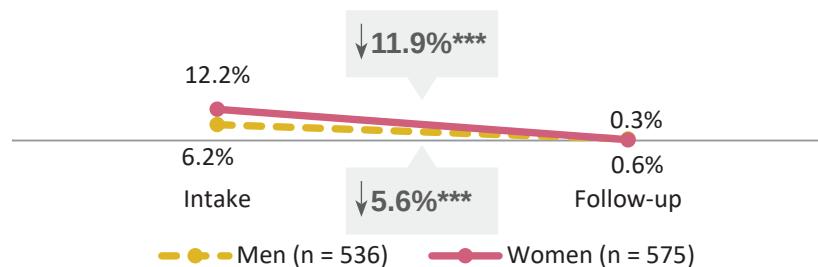
A minority of clients (9.3%) reported using heroin in the 30 days before intake, with a significant decrease of 8.8% by follow-up to 0.5% (see Figure 2.27).

FIGURE 2.27. PAST-30-DAY HEROIN USE AT INTAKE AND FOLLOW-UP (N = 1,111)<sup>43</sup>

\*\*\*p < .001.

## Gender Differences in Past-30-day Heroin Use

At intake, significantly more women than men reported heroin use in the past 30 days, 12.2% vs. 6.2% (see Figure 2.28). The number of women and men who reported heroin use significantly decreased from intake to follow-up, and by follow-up, there was no significant difference in the number of men and women who reported past-30-day heroin use.

FIGURE 2.28. GENDER DIFFERENCES IN PAST-30-DAY HEROIN USE AT INTAKE AND FOLLOW-UP<sup>a</sup>

a—Significant difference by gender at intake, p < .01.  
\*\*\*p < .001.

<sup>43</sup> Two clients had missing data for heroin use at follow-up.

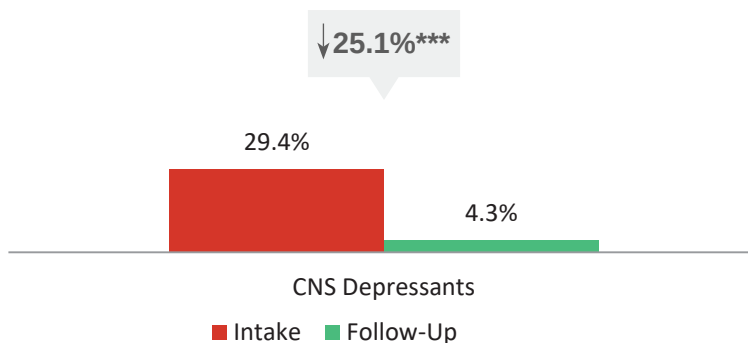
## CNS Depressants

### Past-12-month CNS Depressant Use

More than one-fourth of clients (29.4%) reported using CNS depressants, including tranquilizers, benzodiazepines, sedatives, and barbiturates in the 12 months before entering treatment, which decreased to 4.3% at follow-up. Overall, for the KTOS follow-up sample, there was a 25.1% decrease in the number of clients reporting CNS depressant use in the past 12 months (see Figure 2.29).

The number of clients reporting past-12-month CNS depressant use decreased by 25%

FIGURE 2.29. PAST-12-MONTH CNS DEPRESSANT USE AT INTAKE AND FOLLOW-UP (N = 1,245)<sup>44</sup>



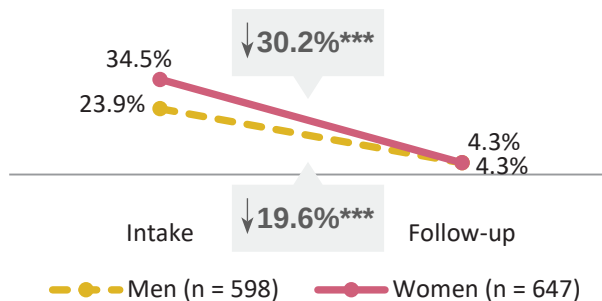
\*\*\*p < .001.

### Gender Differences in Past-12-month CNS Depressant Use

Significantly more women than men reported CNS depressant use in the 12 months before intake, 34.5% vs. 23.9% (see Figure 2.30). The number of women and men who reported CNS depressant use significantly decreased from intake to follow-up by 30.2% and 19.6% respectively. At follow-up, there was no significant difference in the percent of women and men who reported using CNS depressants.

Significantly more women than men reported CNS depressant use at intake

FIGURE 2.30. GENDER DIFFERENCES IN PAST-12-MONTH CNS DEPRESSANT USE FROM INTAKE TO FOLLOW-UP<sup>a</sup>



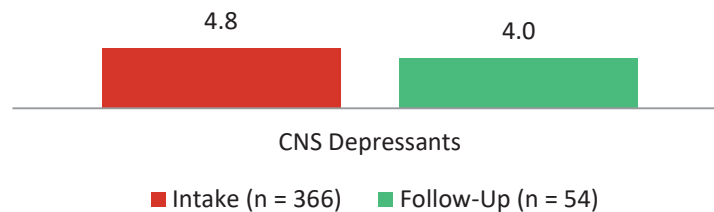
a—Significant difference by gender at intake; p < .001  
 \*\*\*p < .001.

<sup>44</sup> Five clients had missing values on past-12-month CNS depressant use at follow-up.

## Average Maximum Number of Months Used CNS Depressants

Figure 2.31 shows the average maximum number of months clients who used CNS depressants reported using these illegal drugs.<sup>45</sup> Among the clients who reported using these substances in the 12 months before entering treatment (n = 366), they reported using CNS depressants an average 4.8 months. Among clients who reported using CNS depressants in the 12 months before follow-up (n = 54), they reported using an average of 4.0 months.

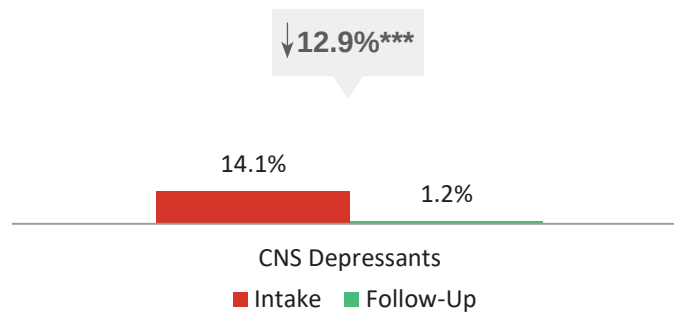
FIGURE 2.31. AVERAGE MAXIMUM NUMBER OF MONTHS OF CNS DEPRESSANT USE



## Past-30-day CNS Depressant Use

The percent of clients who reported using CNS depressants in the 30 days before intake decreased significantly by 12.8%, from 14.1% at intake to 1.2% at follow-up (see Figure 2.32).

FIGURE 2.32. PAST-30-DAY CNS DEPRESSANT USE AT INTAKE AND FOLLOW-UP (N = 1,109)<sup>46</sup>



\*\*\*p < .001.

## Gender Differences in Past-30-day CNS Depressant Use

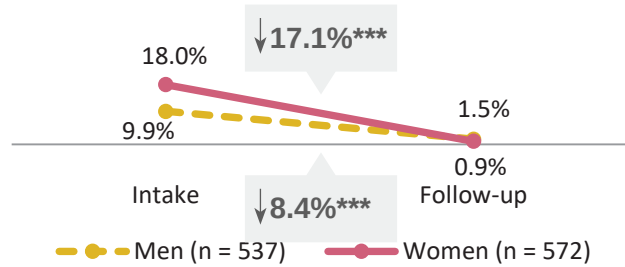
Significantly more women than men reported CNS depressant use in the 30 days before intake, 18.0% vs 9.9% (see Figure 2.33). The percent of women and men who reported CNS depressant use decreased significantly from intake to follow-up. At follow-up, there was no significant difference in past-30-day CNS depressant use by gender.

*“I was able to be honest with myself there.”*

- KTOS FOLLOW-UP CLIENT

<sup>45</sup> 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.

<sup>46</sup> Four cases had missing values on past-30-day CNS depressant use at follow-up.

FIGURE 2.33. GENDER DIFFERENCES IN PAST-30-DAY CNS DEPRESSANT USE FROM INTAKE TO FOLLOW-UP<sup>a</sup>

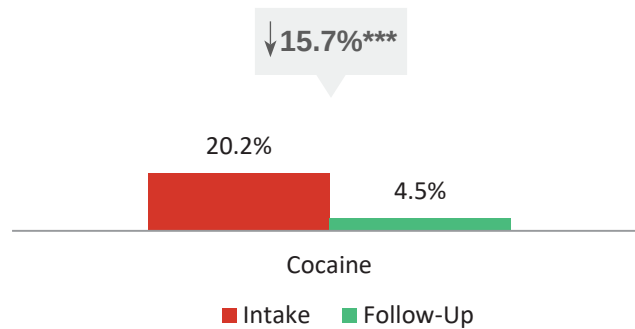
a—Significant difference by gender at intake;  $p < .001$ .  
 \*\*\* $p < .001$ .

## Cocaine

### Past-12-month Cocaine Use

One in five clients reported using cocaine in the 12 months before entering treatment, which decreased to 1 in 20 (4.5%) at follow-up. Overall, there was a 15.7% decrease in the number of clients reporting cocaine use (see Figure 2.34).

The number of clients reporting past-12-month cocaine use decreased by 16%

FIGURE 2.34. PAST-12-MONTH COCAINE USE AT INTAKE AND FOLLOW-UP (N = 1,249)<sup>47</sup>

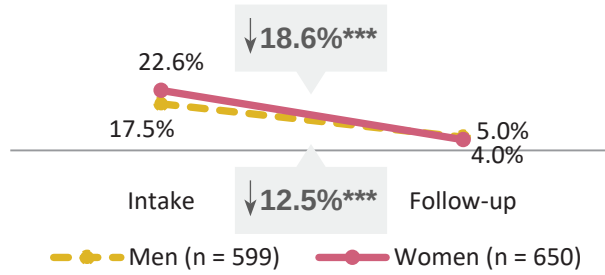
\*\*\* $p < .001$ .

### Gender Differences in Past-12-month Cocaine Use

Significantly more women (22.6%) reported cocaine use in the 12 months before entering treatment when compared to men (17.5%; see Figure 2.35). The percent reporting cocaine use significantly decreased for both women and men, respectively (18.6% vs. 12.5%), and at follow-up there was no significant difference in the number of women and men reporting cocaine use in the past 12 months.

<sup>47</sup> One client was missing data for past-12-month cocaine use at follow-up.

FIGURE 2.35. GENDER DIFFERENCES IN PAST-12-MONTH COCAINE USE FROM INTAKE TO FOLLOW-UP<sup>a</sup>

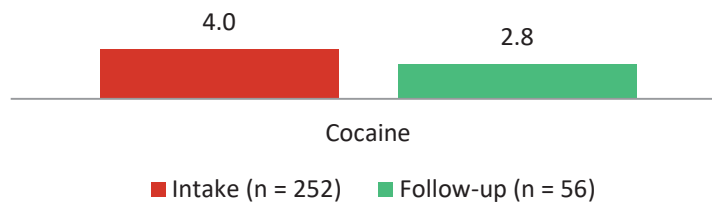


a—Significant difference by gender at intake;  $p < .05$   
 \*\*\* $p < .001$ .

### Average Number of Months Used Cocaine

Among the clients who reported using cocaine in the 12 months before entering treatment (n = 252), they reported using cocaine an average of 4.0 months (see Figure 2.36). Clients who reported using cocaine in the 12 months before follow-up (n = 56) reported using cocaine, on average 2.8 months.

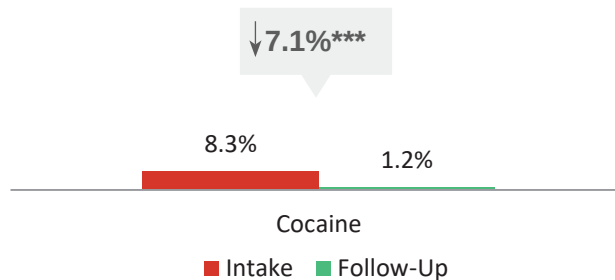
FIGURE 2.36. AVERAGE NUMBER OF MONTHS OF COCAINE USE



### Past-30-Day Cocaine Use

The percent of clients who reported using cocaine in the past 30 days at intake decreased significantly by 7.1%, from 8.3% at intake to 1.2% at follow-up (see Figure 2.37).

FIGURE 2.37. PAST-30-DAY COCAINE USE AT INTAKE AND FOLLOW-UP (N = 1,112)<sup>48</sup>



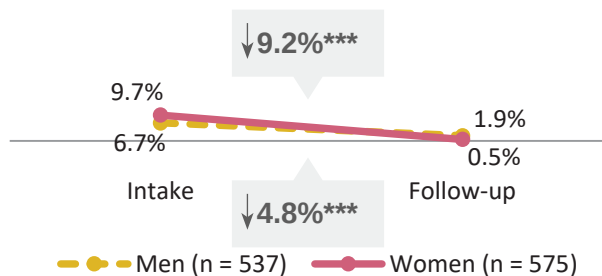
\*\*\* $p < .001$ .

<sup>48</sup> One client was missing data for past-30-day cocaine use at follow-up.

## Gender Differences in Past-30-Day Cocaine Use

At intake, a similar percentage of men (6.7%) and women (9.7%) reported past-30-day cocaine use (see Figure 2.38). The percent of women and men who reported cocaine use in the past 30 days decreased significantly over time. Although small percentages of both genders reported past-30-day cocaine use at follow-up, significantly more men reported past-30-day cocaine use at follow-up when compared to women.

FIGURE 2.38. GENDER DIFFERENCES IN PAST-30-DAY COCAINE USE FROM INTAKE TO FOLLOW-UP<sup>a</sup>



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

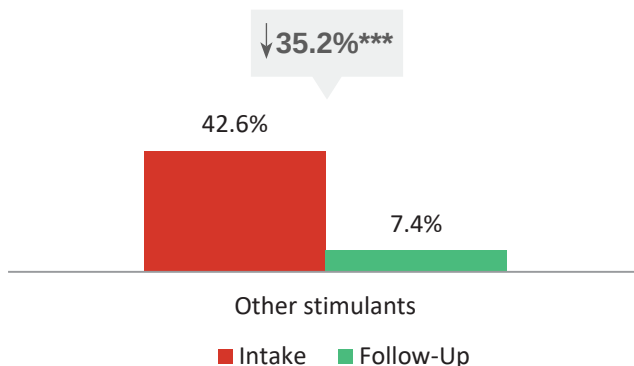
## Other Stimulants

### Past-12-Month Other Stimulant Use

More than two-fifths of clients (42.6%) 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 7.4% at follow-up.<sup>49</sup> Overall, for the KTOS follow-up sample, there was a 35.2% decrease in the number of clients reporting other stimulant use (see Figure 2.39).

The number of clients reporting past-12-month stimulant use other than cocaine decreased by 35%

FIGURE 2.39. PAST-12-MONTH STIMULANT USE OTHER THAN COCAINE AT INTAKE AND FOLLOW-UP (N = 1,250)



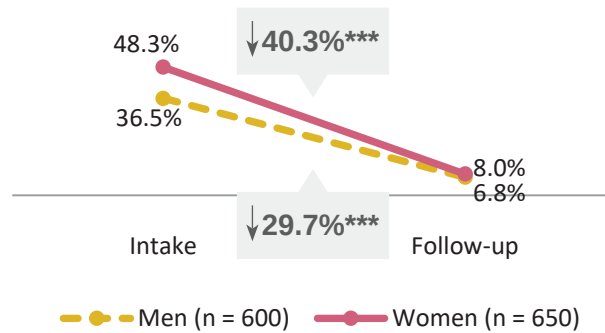
\*\*\* $p < .001$ .

<sup>49</sup> Among the individuals who reported using stimulants in the 12 months before intake (n = 1,977), 76.4% reported using methamphetamine, crank, crystal meth only. Thus, most of the amphetamine use is methamphetamine.

## Gender Differences in Past-12-month Other Stimulant Use

Significantly more women (48.3%) reported other stimulant use in the 12 months before entering treatment when compared to men (36.5%; see Figure 2.40). The percent reporting other stimulant use significantly decreased for both women and men, respectively (40.3% vs. 29.7%), and at follow-up there was no significant difference in the number of women and men reporting other stimulant use in the past 12 months.

FIGURE 2.40. GENDER DIFFERENCES IN PAST-12-MONTH OTHER STIMULANT USE FROM INTAKE TO FOLLOW-UP<sup>a</sup>

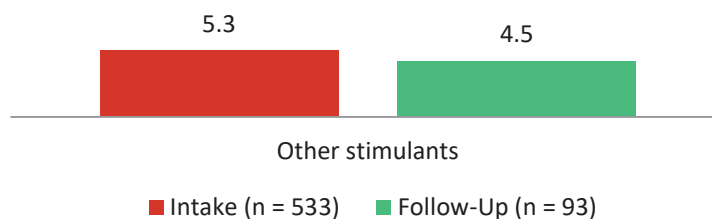


a—Significant difference by gender at intake;  $p < .001$ .  
 \*\*\* $p < .001$ .

## Average Number Of Months Used Other Stimulants

Among the clients who reported using stimulants other than cocaine in the 12 months before entering treatment ( $n = 533$ ), they reported using other stimulants an average of 5.3 months (see Figure 2.41). Clients who reported using other stimulants in the 12 months before follow-up ( $n = 93$ ) reported using other stimulants, on average, 4.5 months.

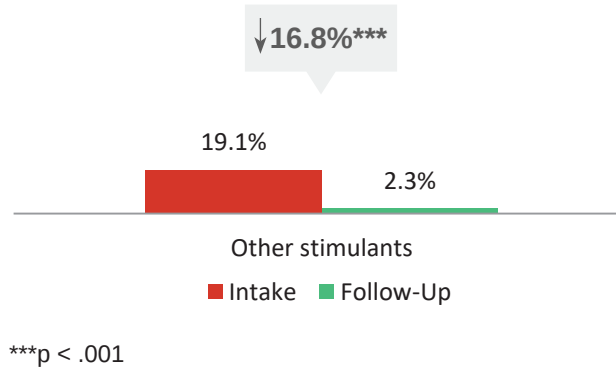
FIGURE 2.41. AVERAGE NUMBER OF MONTHS OF OTHER STIMULANT USE



## Past-30-Day Other Stimulant Use

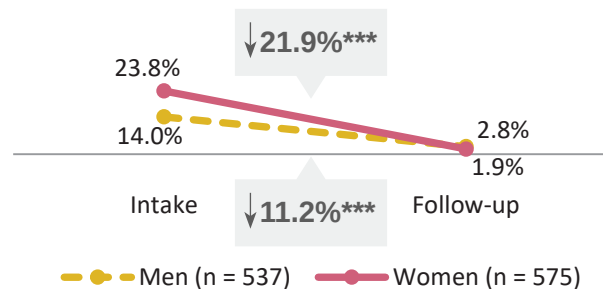
The number of clients who reported using stimulants other than cocaine in the past 30 days decreased significantly by 16.8%, from 19.1% at intake to 2.3% at follow-up (see Figure 2.42).



FIGURE 2.42. PAST-30-DAY STIMULANT USE OTHER THAN COCAINE AT INTAKE AND FOLLOW-UP (N = 1,120)<sup>50</sup>

### Gender Differences in Past-30-Day Other Stimulant Use

At intake, significantly more women (23.8%) reported other stimulant use in the past 30 days when compared to men (14.0%; see Figure 2.43). The number of women and men who reported other stimulant use decreased significantly from intake to follow-up. At follow-up, there was no difference in the number of women and men who reported past-30-day other stimulant use.

FIGURE 2.43. GENDER DIFFERENCES IN PAST-30-DAY OTHER STIMULANT USE FROM INTAKE TO FOLLOW-UP (n = 1,112)<sup>a</sup>

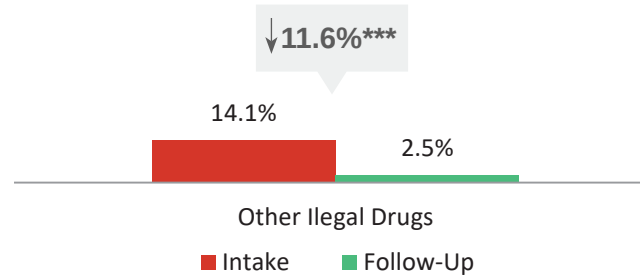
a—Significant difference by gender at intake; p < .001.  
\*\*\*p < .001.

## Other Illegal Drugs

### Past-12-Month Other Illegal Drugs

A small minority of KTOS clients (14.1%) 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 2.5% at follow-up – a significant decrease of 11.6% (see Figure 2.44).

<sup>50</sup> One case had missing values on past-30-day other stimulant use at follow-up.

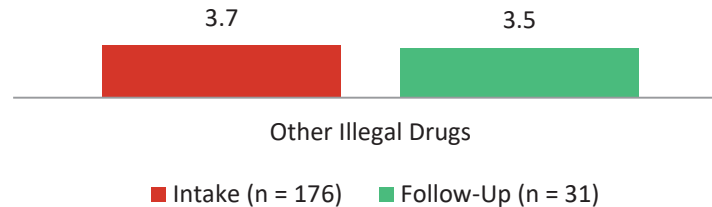
FIGURE 2.44. PAST-12-MONTH USE OF OTHER ILLEGAL DRUGS AT INTAKE AND FOLLOW-UP (N = 1,248)<sup>51</sup>

\*\*\*p < .001.

### Average Maximum Number of Months Used Other Illegal Drugs

Figure 2.45 shows the average maximum number of months clients who used other illegal drugs (e.g., hallucinogens, inhalants, synthetic drugs) reported using those illegal drugs<sup>52</sup> in the past 12 months. Among the clients who reported using these drugs in the 12 months before entering treatment (n = 176), they reported using other illegal drugs an average of 3.7 months. Among clients who reported using other illegal drugs in the 12 months before follow-up (n = 31), they reported using an average of 3.5 months.

FIGURE 2.45. AVERAGE MAXIMUM NUMBER OF MONTHS OF OTHER ILLEGAL DRUG USE



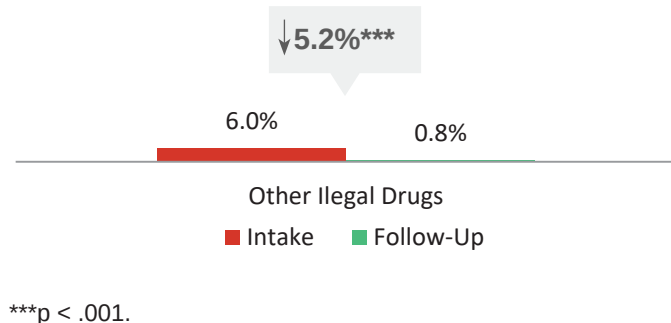
### Past-30-Day Other Illegal Drug Use

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 2.46).

<sup>51</sup> Two clients had missing data for past-12-month use of other illegal drugs at follow-up.

<sup>52</sup> 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.

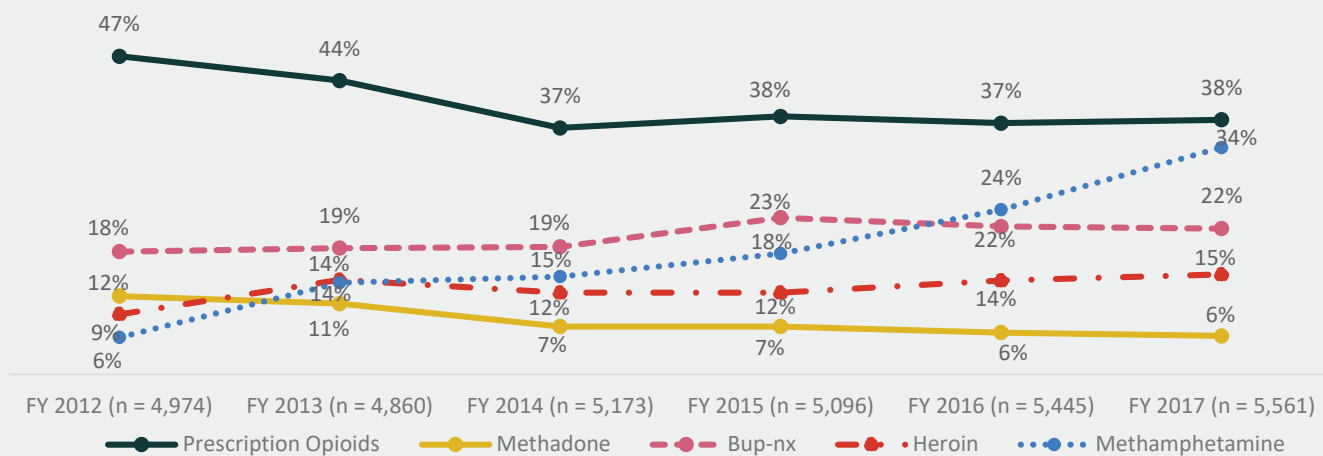
FIGURE 2.46. PAST-30-DAY USE OF OTHER ILLEGAL DRUGS AT INTAKE AND FOLLOW-UP (N = 1,111)<sup>53</sup>



### 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 FY12 and steadily dropped in FY13 and FY14. In FY15, 38% of clients reported prescription opioid misuse at intake and that percent remained similar in FY16 and FY17. The percent of clients who reported using non-prescribed methadone in the 12 months before entering treatment declined from FY12 to FY14 and again in FY16 (6%) and FY17 (6%). The percent of clients who reported using buprenorphine-naloxone (bup-nx) remained stable from FY12 through FY14 but increased to 23% in FY15. Clients reporting bup-nx use declined to 15% in FY17. The percent of KTOS clients who reported using heroin increased from FY12 to FY13, remained stable in FY14 and FY15 (12%), and increased slightly in FY16 and FY17. In FY12, the number of clients reporting methamphetamine use was relatively low (6%), but has steadily increased in the past 5 years to 34% in FY17.

FIGURE 2.47. 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 = 26,609)<sup>54</sup>



<sup>53</sup> Two clients had missing data for past-30-day other illegal drugs at follow-up.

<sup>54</sup> Clients who reported being in a controlled environment all 365 days before entering treatment are not included in this analysis.

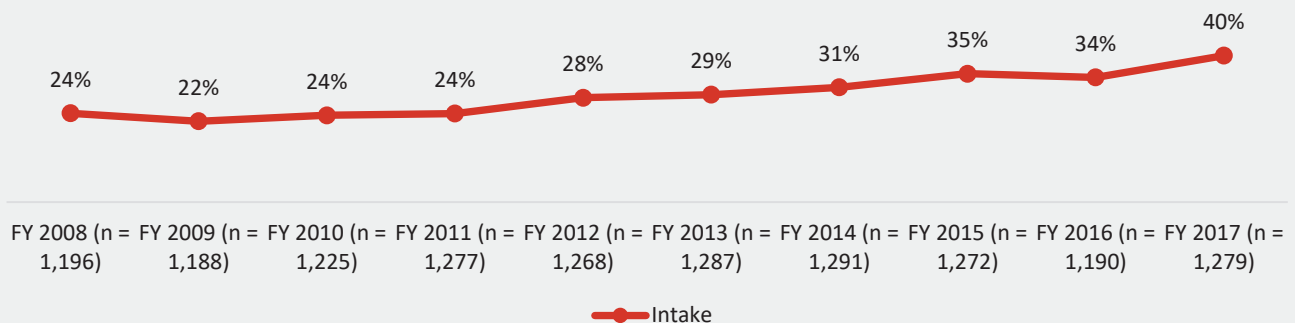
## Injection Drug Use

At intake, 39.7% of clients reported having ever injected any drug. Of those clients (n = 508), 6.3% reported having ever used a Needle Exchange Program in Kentucky. At follow-up, 7.2% of clients reported injecting drugs in the past 12 months.<sup>55</sup> Of those clients (n = 90), 23.3% reported having used a Needle Exchange program in Kentucky.<sup>56</sup>

### Trends in Injection Drug Use

The number of clients reporting at intake that they had ever injected any drug has generally increased from FY 2008 (24%) to FY 2017 (40%).

FIGURE 2.48. TRENDS CLIENTS REPORTING HAVING EVER INJECTED ANY DRUG AT INTAKE, FY 2008-2017



## 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.<sup>57</sup>

### 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 15.3 years old when they had their first alcoholic drink (not depicted in figure).<sup>58</sup>

A little more than half of clients (52.3%) reported using alcohol in the 12 months before entering treatment while 27.7% of clients reported alcohol use in the 12 months before follow-up (see Figure 2.49). Overall, for the KTOS follow-up sample, there was a 24.6% decrease in the number of clients reporting alcohol use in the past 12 months. More than one-third of clients

**The percent of clients reporting past-12-month alcohol use decreased by 25%**

<sup>55</sup> Twenty-four clients had missing values for the question on injection drug use at follow-up.

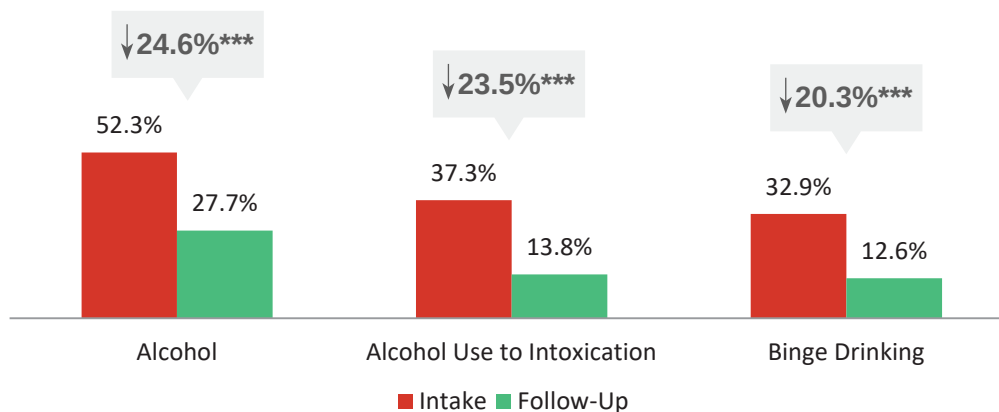
<sup>56</sup> Four cases had missing data for the needle exchange program at follow-up.

<sup>57</sup> 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.

<sup>58</sup> Of the individuals in the follow-up sample, 79 reported they have never had an alcoholic drink.

(37.3%) reported using alcohol to intoxication at intake, with 13.8% reporting alcohol use to intoxication in the 12 months before follow-up. Similarly, there was a significant decrease of 20.3% in the number of clients who reported past-12-month binge drinking from intake to follow-up (32.9% vs. 12.6%).<sup>59</sup>

FIGURE 2.49. PAST-12-MONTH ALCOHOL USE AT INTAKE AND FOLLOW-UP (N = 1,250)<sup>60</sup>



\*\*\*p < .001.

### Taking a Closer Look at Alcohol Use

A little over half of KTOS clients reported using alcohol in the 12 months before entering treatment (52.3%; n = 653). Of these clients who reported using alcohol in the past 12 months at intake, 59.6% did not use alcohol in the past 12 months at follow-up (see Table 2.1). However, 40.4% of those who reported alcohol use at intake also reported use at follow-up.

Alternatively, a majority of those who did not use alcohol at intake also reported abstinence at follow-up (86.2%) while 13.8% of clients reported using alcohol at follow-up after reporting no use at intake.

TABLE 2.1. PAST-12-MONTH ALCOHOL USE AT INTAKE AND FOLLOW-UP BASED ON ALCOHOL USE AT INTAKE

	No Alcohol Use at Intake (n = 595)	Alcohol Use at Intake (n = 653)
No Alcohol Use at Follow-up .....	86.2%	59.6%
Alcohol Use at Follow-up.....	13.8%	40.4%

### Gender Differences in Past-12-month Alcohol Use

At intake, significantly more men (57.3%) reported alcohol use compared to women (47.8%; see Figure 2.50). The number of men and women reporting alcohol use decreased significantly from intake to follow-up, however, at follow-up, more men still reported using alcohol compared to women.

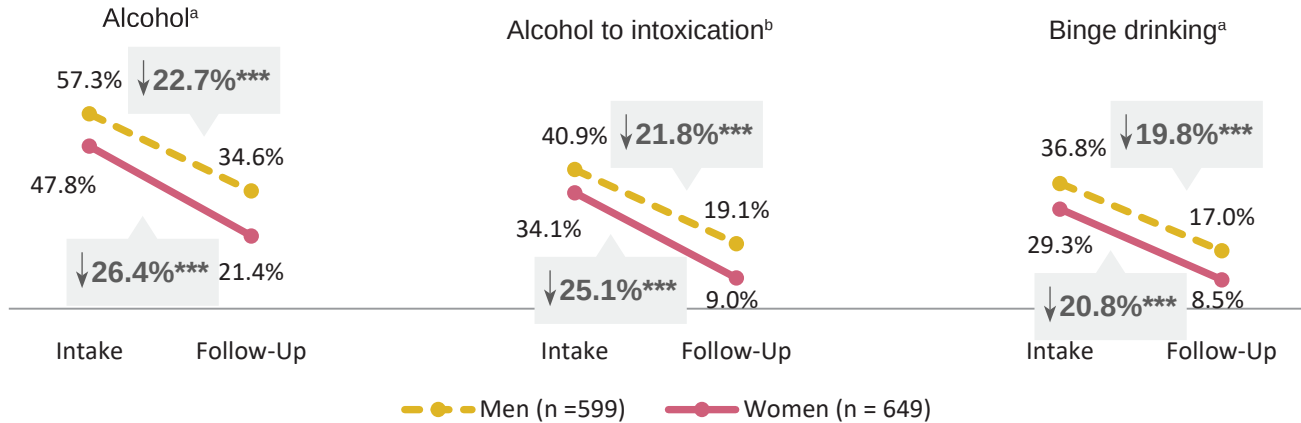
**Significantly more men than women reported using alcohol in the 12 months before intake and follow-up**

<sup>59</sup> There was missing data for the 12-month follow-up measures of alcohol use (n = 2), alcohol to intoxication (n = 5), and binge drinking (n = 9).

<sup>60</sup> Twelve cases were missing data for alcohol use to intoxication, and 13 cases were missing for binge drinking at follow-up.

Similar patterns were found for alcohol use to intoxication and binge drinking in the 12 months before intake.

FIGURE 2.50. GENDER DIFFERENCES IN PAST-12-MONTH ALCOHOL USE AT INTAKE AND FOLLOW-UP<sup>61</sup>



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

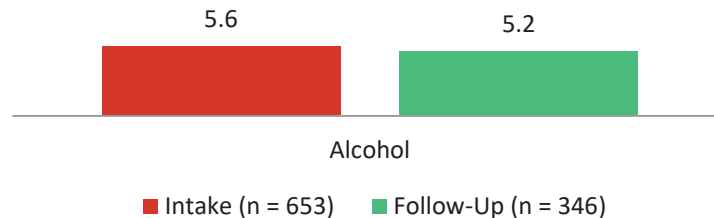
b—Significant difference by gender at intake (p < .05) and follow-up (p < .001).

\*\*\*p < .001.

### Average Number Of Months Used Alcohol

Figure 2.51 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 = 653), they reported using alcohol, on average, 5.6 months. Among clients who reported using alcohol in the 12 months before follow-up (n = 346), they reported using, on average, 5.2 months.

FIGURE 2.51. AVERAGE NUMBER OF MONTHS OF ALCOHOL USE



### PAST-12-MONTH ALCOHOL INTOXICATION AND BINGE DRINKING AMONG THOSE WHO USED ALCOHOL AT EACH POINT

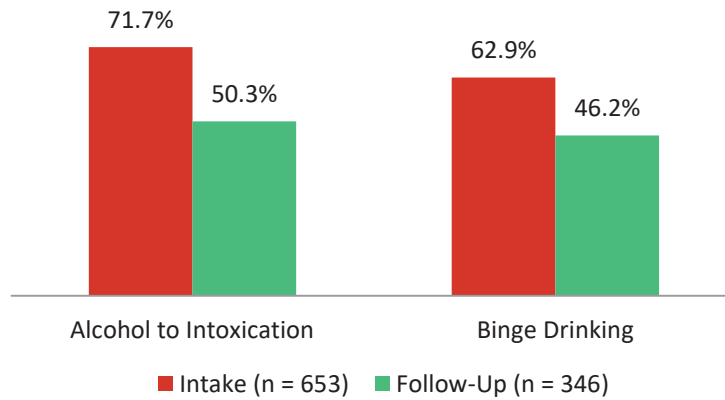
Of the clients who used alcohol in the 12 months before entering treatment (n = 653), 71.7% used alcohol to intoxication in the 12 months before intake and 62.9% reported binge drinking (see Figure 2.52). Of the clients who used alcohol in the 12 months before follow-up (n = 346), 50.3% of clients reported alcohol use to intoxication<sup>62</sup> and 46.2% reported binge drinking.<sup>63</sup>

<sup>61</sup> There were missing values on the past-12-month alcohol use variables at follow-up: alcohol use (n = 2), alcohol use to intoxication (n = 5), and binge drinking (n = 9).

<sup>62</sup> 4 cases had missing data on past-12-month alcohol intoxication (therefore n = 342).

<sup>63</sup> 8 cases had missing data on past-12-month binge drinking at follow-up (therefore n = 338).

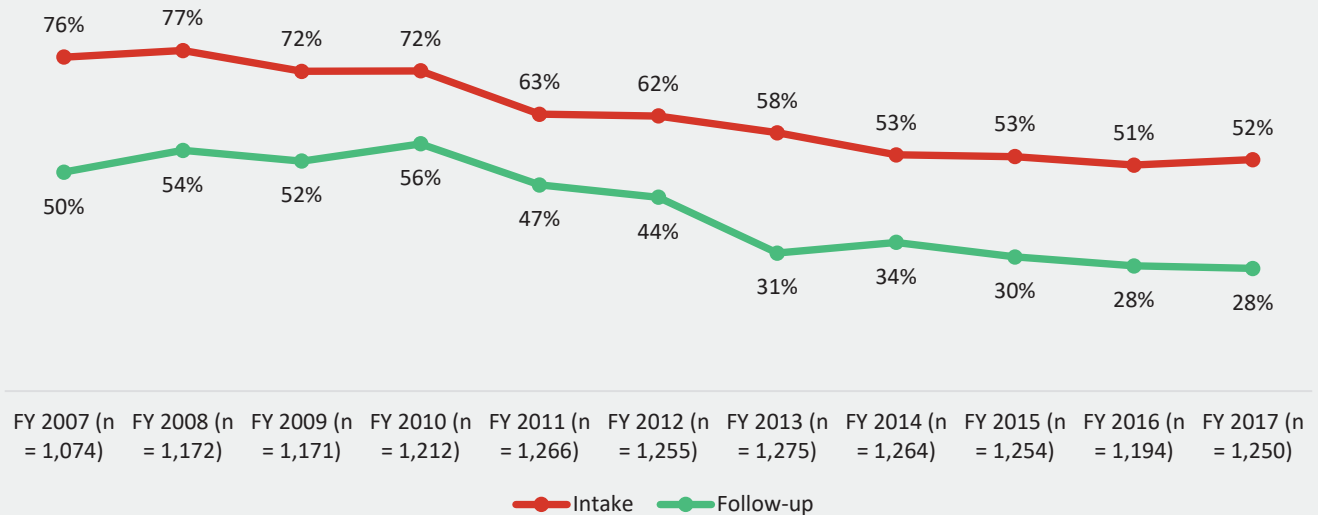
FIGURE 2.52. PAST-12-MONTH ALCOHOL USE TO INTOXICATION AND BINGE DRINKING AT INTAKE AND FOLLOW-UP, AMONG THOSE REPORTING ALCOHOL USE AT EACH POINT



### Trends in Past-12-month Alcohol Use

The number of KTOS clients reporting alcohol use in the 12 months before treatment has decreased over time. Overall, at follow-up, the number of clients reporting alcohol use has also decreased over the years.

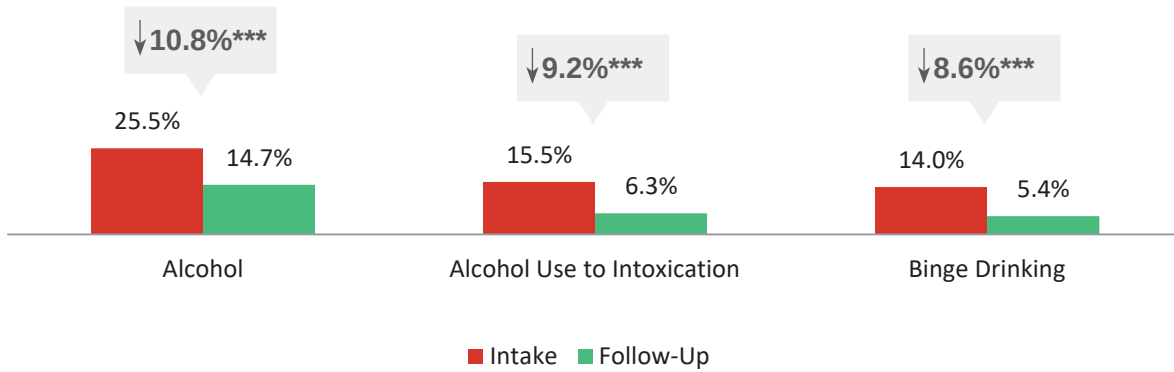
FIGURE 2.53. TRENDS IN ALCOHOL USE AT INTAKE AND FOLLOW-UP, FY 2007-2017



### Past-30-Day Alcohol Use

There was a 10.8% decrease in the percent of clients who reported using alcohol in the past 30 days from intake (25.5%) to follow-up (14.7%; see Figure 2.54). The decrease in the number of clients who reported using alcohol to intoxication was 9.2% and 8.6% for those who reported binge drinking in the 30 days before entering treatment.

FIGURE 2.54. PAST-30-DAY ALCOHOL USE AT INTAKE AND FOLLOW-UP (N = 1,113)<sup>64</sup>



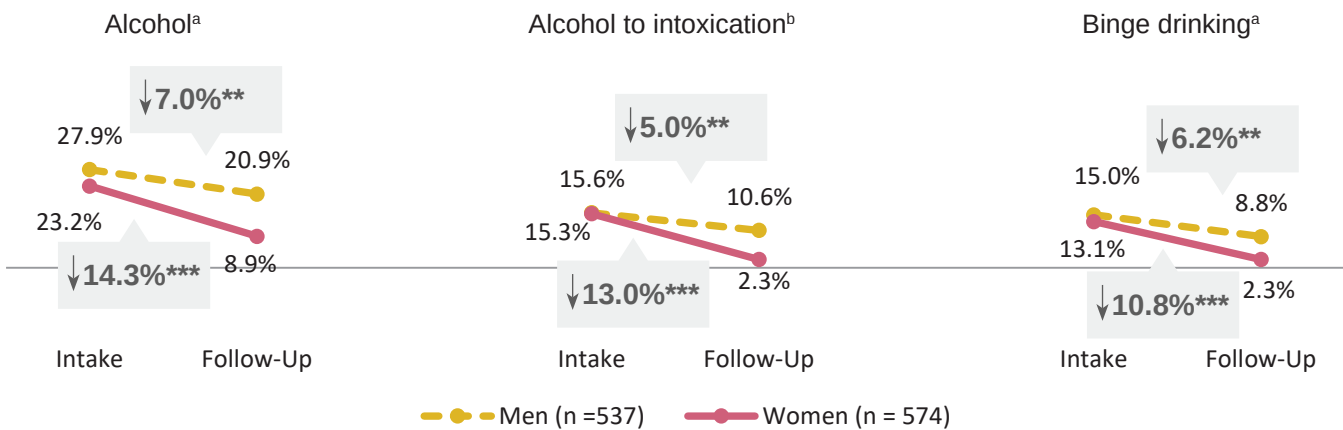
\*\*\*p < .001.

### GENDER DIFFERENCES IN PAST-30-DAY ALCOHOL USE

There were no significant differences by gender for the percent of clients reporting of alcohol use, alcohol use to intoxication, and binge drinking in the 30 days before entering treatment. However, at follow-up, significantly more men than women reported using alcohol, alcohol to intoxication, and binge drinking in the 30 days before follow-up (see Figure 2.55). The number of men and women who reported alcohol use, alcohol use to intoxication, and binge drinking decreased significantly from intake to follow-up.

Significantly more men than women reported alcohol use, alcohol to intoxication, and binge drinking in the 30 days before follow-up

FIGURE 2.55. GENDER DIFFERENCES IN PAST-30-DAY ALCOHOL USE AT INTAKE AND FOLLOW-UP



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

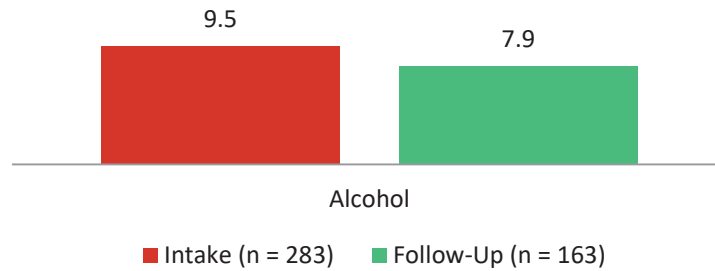
### AVERAGE NUMBER OF DAYS USED ALCOHOL

Figure 2.56 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 = 283), they reported using alcohol, on average, 9.5 days. Among clients who reported using alcohol in the 30 days before follow-up (n = 163), they reported using, on average, 7.9 days.

<sup>64</sup> The following numbers of cases had missing data for the past-30-day measures at follow-up: alcohol (n = 2), alcohol to intoxication (n = 1), and binge drinking (n = 5).



FIGURE 2.56. AVERAGE NUMBER OF DAYS OF ALCOHOL USE

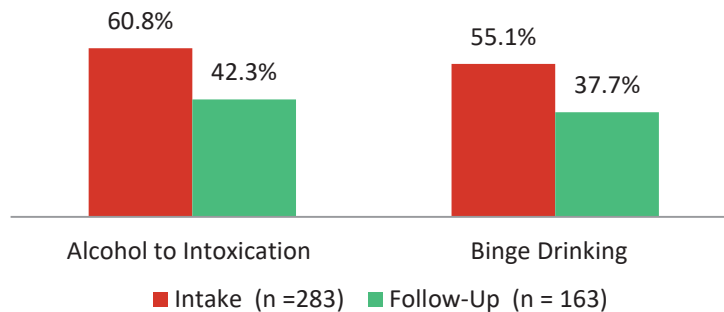


## PAST-30-DAY ALCOHOL INTOXICATION AND BINGE DRINKING AMONG THOSE WHO USED ALCOHOL

Of the 283 clients who used alcohol in the 30 days before intake, 60.8% used alcohol to intoxication and 55.1% binge drank in the 30 days before intake (see Figure 2.57).

Of the 163 clients who reported using alcohol in the 30 days before follow-up, 42.3% reported using alcohol to intoxication and 37.7% reported binge drinking in the 30 days before follow-up.<sup>65</sup>

FIGURE 2.57. 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.<sup>66</sup> 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)

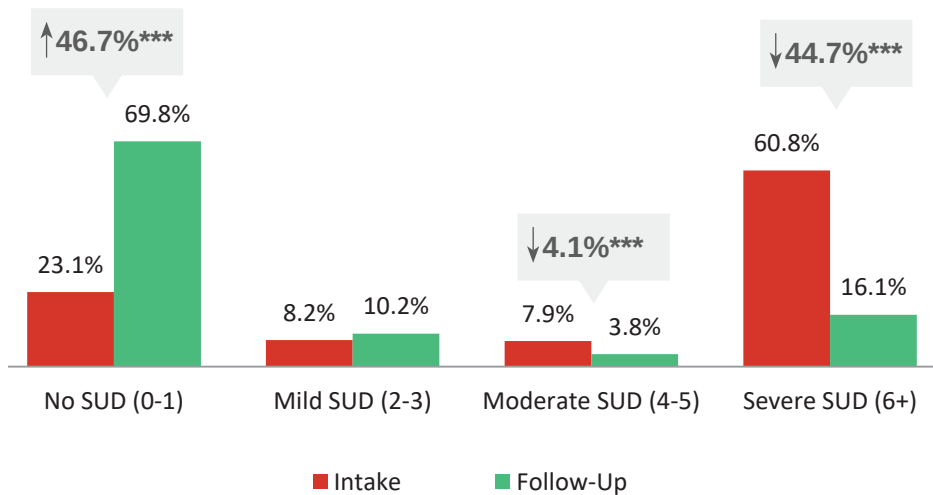
**The number of individuals who met criteria for no SUD increased significantly from intake to follow-up**

<sup>65</sup> Four cases had missing data for binge drinking in the 30 days before follow-up.

<sup>66</sup> 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.

moderate SUD (4 or 5 criteria met), and (4) severe disorder (6 or more criteria met). Client self-reports of DSM-5 criteria suggest, but do not diagnose, a substance use disorder. 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 2.58).

FIGURE 2.58. DSM-5 SUD SEVERITY AT INTAKE AND FOLLOW-UP (N = 1,251)<sup>a</sup>



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 a number of 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).

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.

## 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 with regard to identifying DSM-IV substance dependence diagnoses: .17 for alcohol composite score and .16 for drug composite score. These composite score cutoffs can be used to estimate the number of individuals who are likely to meet criteria for active alcohol or drug dependence, and to show reductions in self-reported severity of substance use. In previous years we have used the ASI composite scores to estimate the number and percent of clients who met a threshold for alcohol and drug dependence. However, recent changes in the diagnostics for substance abuse call into question the distinction between dependence and abuse. Thus, ASI composite scores that met the threshold can be considered indicative of severe substance use disorder to be compatible with current thinking about substance use disorders in the DSM-V, where we would have previously referred to them as meeting the threshold for dependence. Change from intake to follow-up in the severity rating as the same clinical relevance as moving from dependence to abuse in the older criteria.

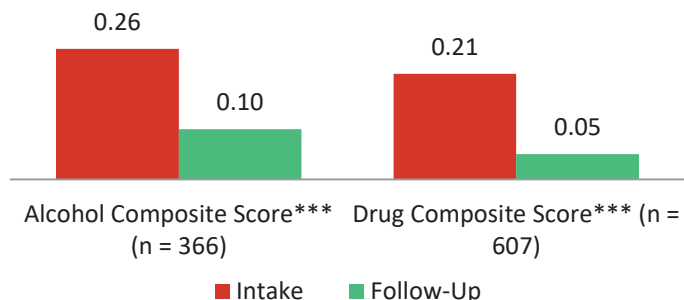
Rikoon, S., Cacciola, J., Carise, D., Alterman, A., McLellan, A. (2006). Predicting DSM-IV dependence diagnoses from Addiction Severity Index composite scores. *Journal of Substance Abuse Treatment*, 31(1), 17–24.

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 2.59 displays the change in average composite scores.<sup>67, 68</sup> The average for the alcohol composite score decreased significantly from 0.26 at intake to 0.10 at follow-up. The average for the drug composite score decreased significantly from 0.21 at intake to 0.05 at follow-up.

FIGURE 2.59. AVERAGE ASI ALCOHOL AND DRUG COMPOSITE SCORES AT INTAKE AND FOLLOW-UP



\*\*\*p < .001.

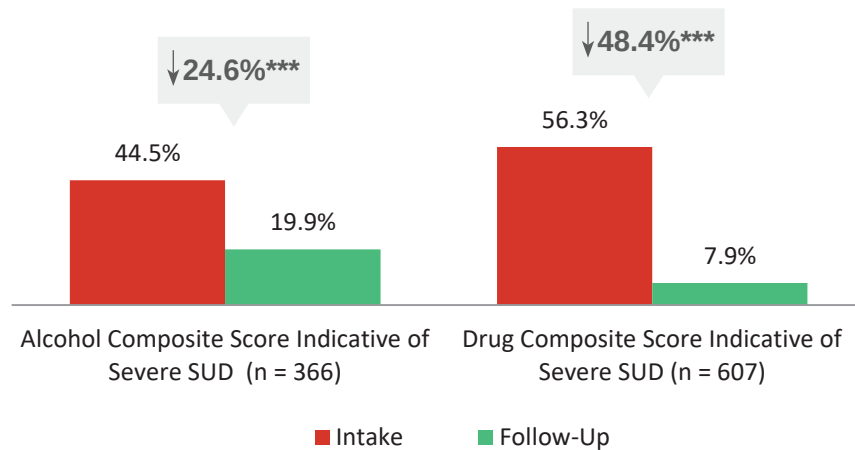
The percent of individuals who had ASI composite scores that met the cutoff for severe substance use disorder (SUD) decreased significantly from intake to follow-up (see Figure 2.60). Less than one-half of individuals (44.5%) who reported any alcohol use in the 30 days before intake and/or follow-up had alcohol composite scores indicative of severe SUD at intake. At follow-up, this percent had decreased to 19.9%. More than one 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 (56.3%). At follow-up, less than 1 in 10 had drug composite scores indicative of severe SUD (7.9%).

*“When I started, I was depressed and had angry outbursts. I liked talking to someone there.”*

- KTOS FOLLOW-UP CLIENT

<sup>67</sup> The following number of cases were not included in the analysis of change in alcohol composite score: 146 clients were in a controlled environment all 30 days before treatment; 20 additional individuals were in a controlled environment all 30 days before follow-up; an additional 738 clients reported abstaining from alcohol in the 30 days before intake and follow-up; and 9 individuals had missing data from items included in the calculation of the alcohol composite at follow-up.

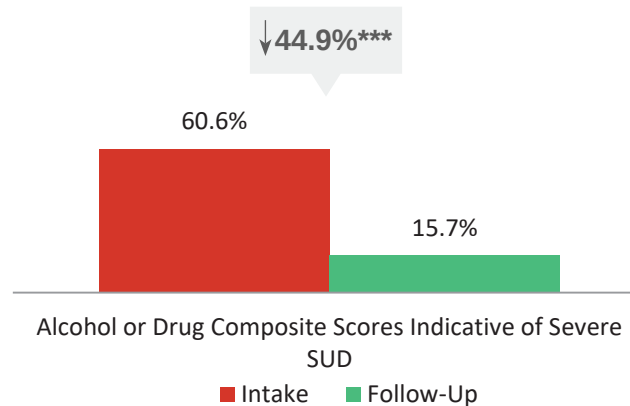
<sup>68</sup> The following numbers were not included in the analysis of change in drug composite score: 146 clients were in a controlled environment all 30 days before treatment; 20 additional individuals were in a controlled environment all 30 days before follow-up; 470 clients reported abstaining from drugs in the 30 days before intake and follow-up, and 36 clients had missing data from items included in the calculation of the drug composite score at follow-up.

FIGURE 2.60. INDIVIDUALS WITH ASI COMPOSITE SCORES MEETING THE CUTOFF FOR SEVERE SUBSTANCE USE DISORDER AT INTAKE AND FOLLOW-UP<sup>69</sup>

\*\*\*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, the majority of individuals had alcohol or drug composite scores that met the cutoff for severe SUD at intake (see Figure 2.61). The percent of clients who had composite scores that met the cutoff for severe SUD for either alcohol or drugs decreased by 44.9% at follow-up.

FIGURE 2.61. CLIENTS WITH ASI COMPOSITE SCORES MEETING THE CUTOFF FOR ALCOHOL OR DRUG SEVERE USE DISORDERS AT INTAKE AND FOLLOW-UP (N = 762)

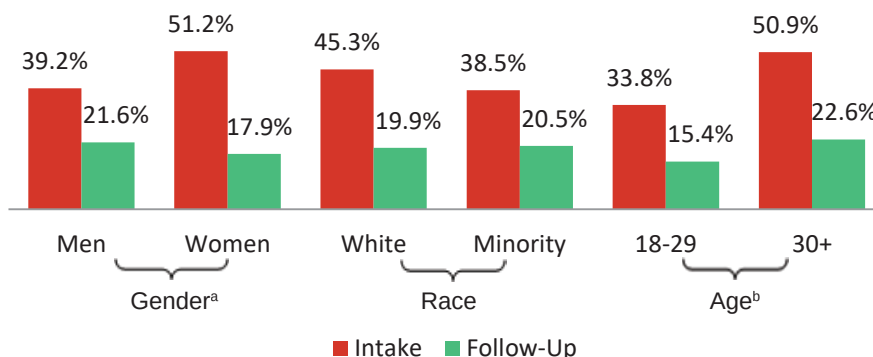


\*\*\*p < .001.

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 2.62). At intake, significantly more female clients than male clients and significantly more clients who were 30 years of age and older compared to clients younger than 30 had an alcohol composite score indicative of severe SUD. There were no other statistically significant differences.

<sup>69</sup> Eighteen clients had missing data for the alcohol score variables at follow-up and 45 clients had missing data for the drug composite score variables at follow-up.

FIGURE 2.62. ALCOHOL-USING CLIENTS WITH AN ALCOHOL COMPOSITE SCORE INDICATIVE OF SEVERE SUD AT INTAKE AND FOLLOW-UP BY DEMOGRAPHIC FACTORS (N = 366)

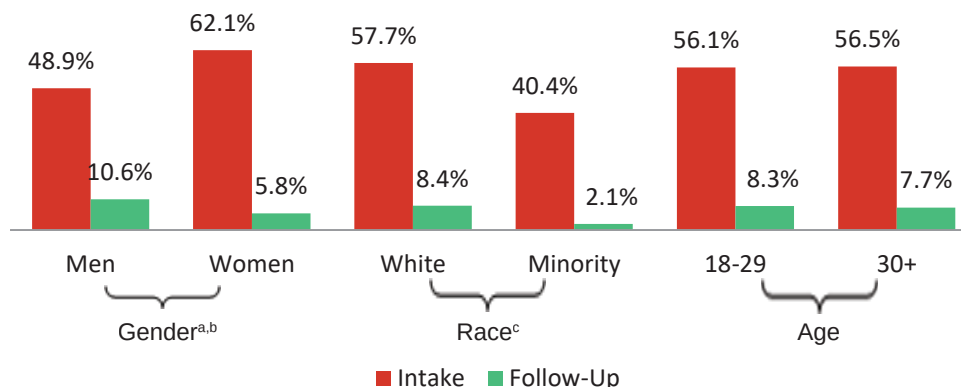


a – Significant difference by gender at intake ( $p < .05$ ).

b – Significant difference by age at intake ( $p < .01$ ).

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 2.63). At intake, significantly more women had a drug composite score indicative of severe SUD than men. However, at follow-up, significantly more men than women had a drug composite score indicative of severe SUD. Also, at intake, significantly more White individuals had a drug composite score indicative of severe SUD than minority individuals. By follow-up, there was no significant difference by race.

FIGURE 2.63. DRUG-USING CLIENTS WITH A DRUG COMPOSITE SCORE INDICATIVE OF SEVERE SUD AT INTAKE AND FOLLOW-UP BY DEMOGRAPHIC FACTORS (N = 607)



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

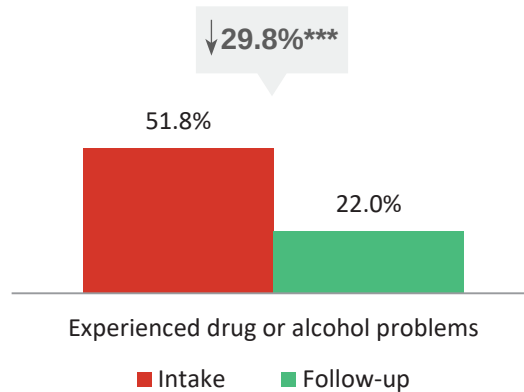
b—Significant difference by gender at follow-up ( $p < .05$ ).

c—Significant difference by racial group at intake ( $p < .05$ ).

## Problems Experienced with Substance Use in the Past 30 Days

In the past 30 days at intake, 51.8% 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 2.64). In the past 30 days at follow-up, 22.0% of clients reported experiencing problems with drugs or alcohol (a significant decrease of 29.8%).

FIGURE 2.64. CLIENTS EXPERIENCING PROBLEMS WITH ILLEGAL DRUGS OR ALCOHOL AT INTAKE AND FOLLOW-UP  
(N = 1,276)<sup>70</sup>

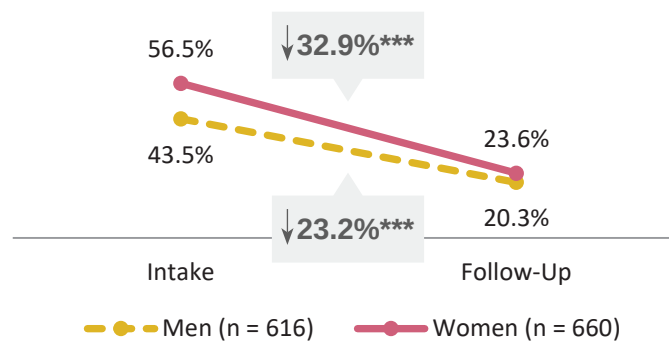


\*\*\*p < .001.

## Gender Differences in Problems Experienced with Substance Use in the Past 30 Days

At intake, significantly more women (56.5%) than men (43.5%) reported problems experienced with substance use in the past 30 days at intake (see Figure 2.65). The number of women and men who reported experiencing problems with substance use decreased significantly from intake to follow-up. At follow-up however, there was no significant difference by gender.

FIGURE 2.65. GENDER DIFFERENCES IN CLIENTS EXPERIENCING PROBLEMS WITH ILLEGAL DRUGS OR ALCOHOL AT INTAKE AND FOLLOW-UP<sup>a</sup>



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

## Readiness for Substance Abuse Treatment

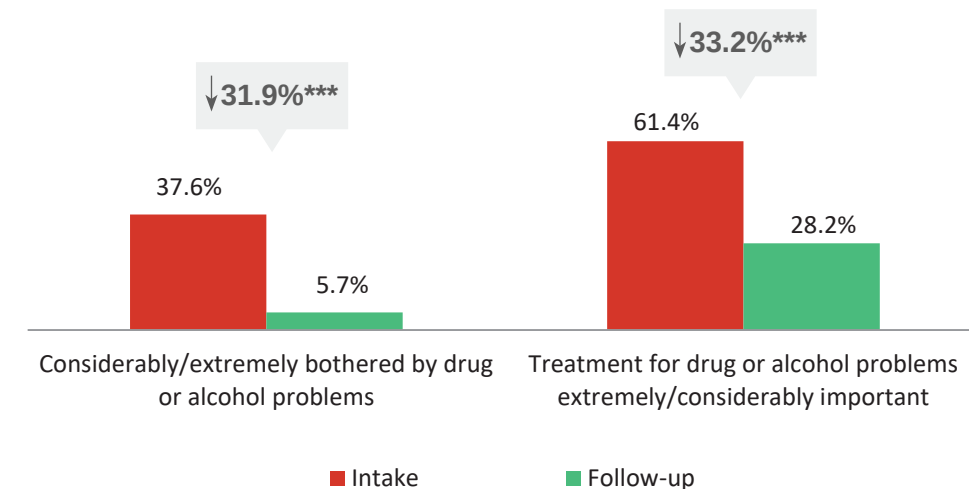
Figure 2.66 shows that 37.6% of clients reported they were considerably or extremely troubled or bothered by drug or alcohol problems in the past 30 days at intake. In the past 30 days at follow-up, 5.7% of clients reported that they were considerably or extremely troubled or bothered by drug or alcohol problems (a significant decrease of 31.9%).

The figure below also shows that 61.4% of clients in the past 30 days at intake and 28.2% of clients in the past 30 days at follow-up reported that treatment for drug or alcohol problems was considerably or

<sup>70</sup> Three individuals had missing values on the variables at follow-up.

extremely important – a significant decrease of 33.2%

FIGURE 2.66. READINESS FOR TREATMENT FOR ILLEGAL DRUG OR ALCOHOL USE AT INTAKE AND FOLLOW-UP (n = 1,265)<sup>71</sup>

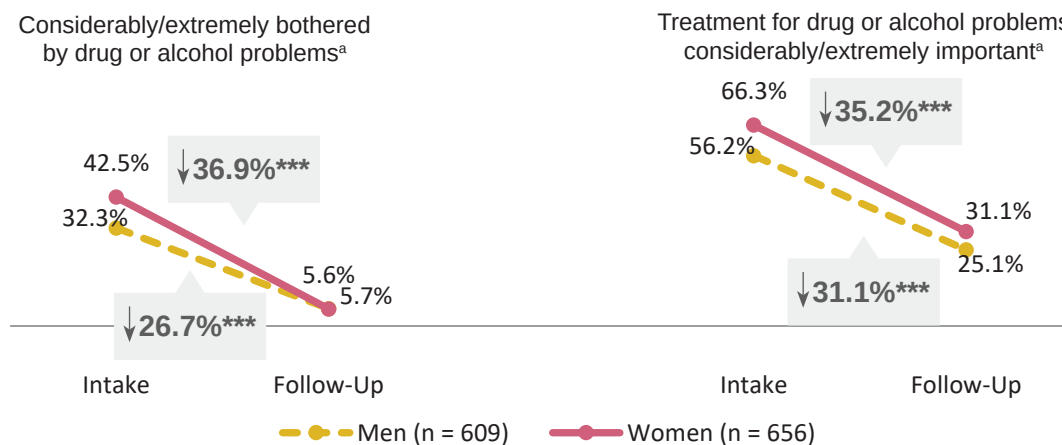


\*\*\*p < .001.

### Gender Differences in Readiness for Treatment in the Past 30 Days

At intake, significantly more women (42.5%) reported experiencing problems with substance use in the past 30 days compared to men (32.3%; see Figure 2.67). More women than men also reported that treatment for drug or alcohol problems was considerably or extremely important. There were significant decreases for both men and women in experiencing problems with substance use and reporting that treatment for drug or alcohol problems was considerably or extremely important. At follow up, there was no significant difference in the percent of men and women who reported experiencing problems related to drug or alcohol use. However, at follow-up, significantly more women reported that treatment was considerably or extremely important to them.

FIGURE 2.67. GENDER DIFFERENCES IN READINESS FOR TREATMENT FOR ILLEGAL DRUG OR ALCOHOL USE AT INTAKE AND FOLLOW-UP



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

<sup>71</sup> Fourteen individuals had missing data for the variable at follow-up.

## Tobacco Use

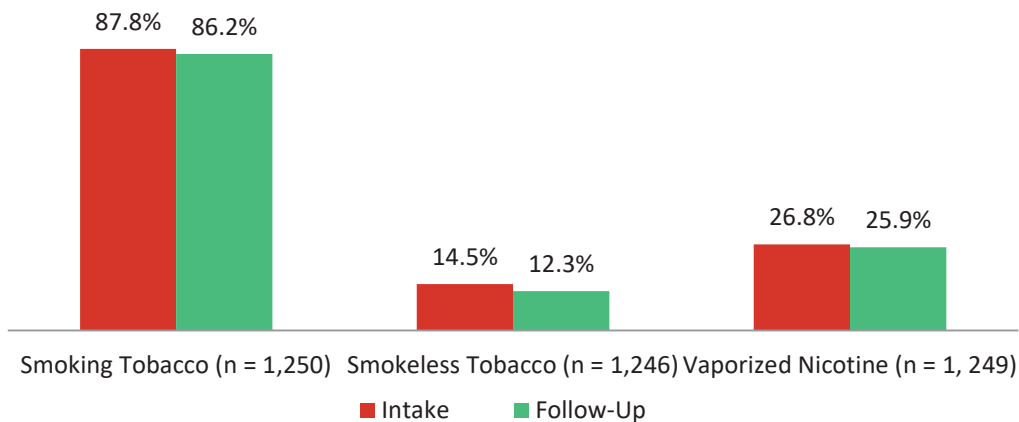
### Past-12-month Smoking, Smokeless Tobacco, and Vaporized Nicotine Use

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 16.1 years old when they started smoking tobacco regularly (not depicted in figure).<sup>72</sup>

Smoking tobacco, smokeless tobacco, and vaporized nicotine use remained stable from intake to follow-up (see Figure 2.68). Most clients reported smoking tobacco in the 12 months before entering treatment (87.8%) and in the 12 months before follow-up (86.2%). A minority of clients (14.5%) reported using smokeless tobacco in the 12 months before entering treatment and 12.3% reported using smokeless tobacco in the 12 months before follow-up. Over one-quarter of clients reported using e-cigarettes in the 12 months before entering treatment and 25.9% of clients reported using e-cigarettes in the 12 months before follow-up.

Smoking tobacco, smokeless tobacco, and vaporized nicotine use remained stable

FIGURE 2.68. CHANGE IN PAST-12-MONTH TOBACCO AND VAPORIZED NICOTINE USE FROM INTAKE TO FOLLOW-UP



### Gender Differences in Past-12-month Smoking Tobacco, and Smokeless Tobacco

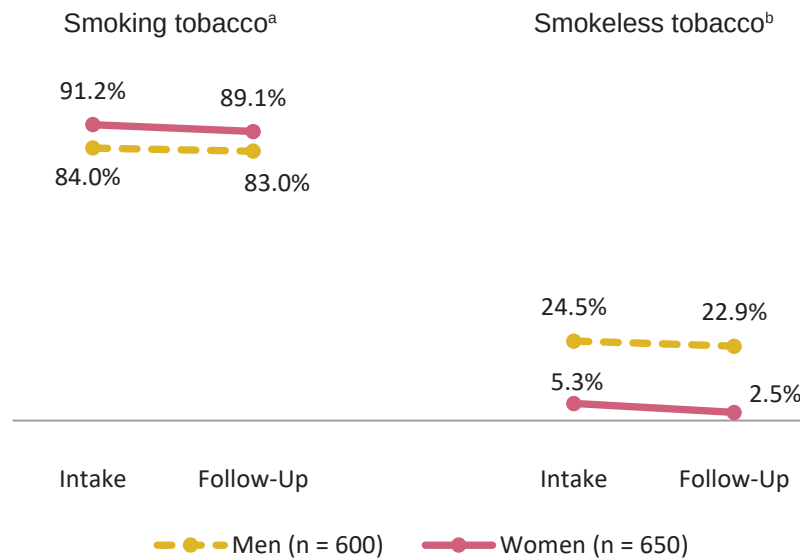
Significantly more women than men reported smoking tobacco at intake and follow-up whereas significantly more men than women reported using smokeless tobacco at intake and follow-up (see Figure 2.69).<sup>73</sup> The percent of women who reported smoking tobacco in the past 12 months significantly decreased from intake to follow-up. The percent of women who reported using smokeless tobacco in the past 12 months decreased significantly from intake to follow-up.

<sup>72</sup> Of those individuals in the follow-up sample, 147 reported they had never smoked regularly.

<sup>73</sup> One man and three women had missing values for smokeless tobacco use in the 12 months before follow-up.



FIGURE 2.69. GENDER DIFFERENCES IN PAST-12-MONTH SMOKING TOBACCO AND SMOKELESS TOBACCO FROM INTAKE TO FOLLOW-UP



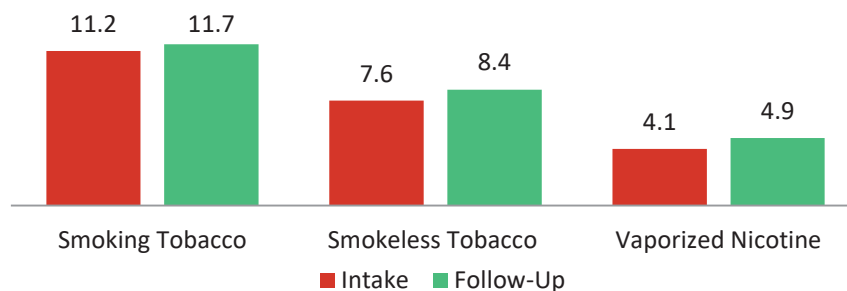
a—Significant difference by gender at intake ( $p < .001$ ) and follow-up ( $p < .01$ ).

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

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

Figure 2.70 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 ( $n = 1,097$ ), they reported using tobacco, on average, 11.2 months. Of the clients who reported using smoking tobacco in the 12 months before follow-up ( $n = 1,077$ ), they reported using, on average, 11.7 months. Among the clients who reported using smokeless tobacco in the 12 months before entering treatment ( $n = 181$ ), they reported using it, on average, 7.6 months. Of the clients who reported using smokeless tobacco in the 12 months before follow-up ( $n = 153$ ), they reported using it, on average, 8.4 months. Among the clients who reported using vaporized nicotine in the 12 months before entering treatment ( $n = 335$ ), they reported using it, on average, 4.1 months. Of the clients who reported using vaporized nicotine products in the 12 months before follow-up ( $n = 323$ ), they reported using them, on average, 4.9 months.

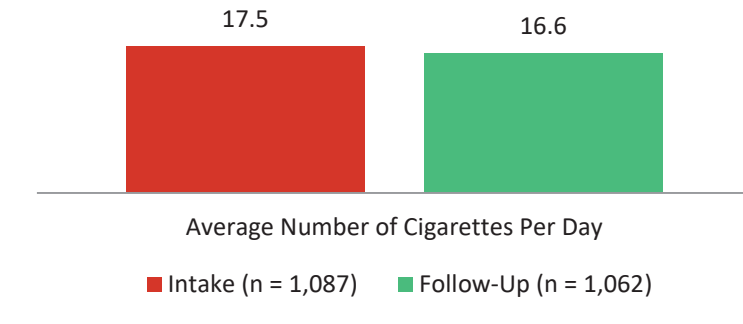
FIGURE 2.70. AVERAGE NUMBER OF MONTHS OF SMOKING, SMOKELESS TOBACCO, AND VAPORIZED NICOTINE USE



### Average Number of Cigarettes Smoked

The average number of cigarettes clients reported smoking at intake and follow-up remained stable (see Figure 2.71). Of those who smoked tobacco in the 12 months before entering treatment, clients reported smoking an average of 17.5 cigarettes per day. At follow-up, among clients who reported smoking tobacco, they reported smoking an average of 16.6 cigarettes per day.

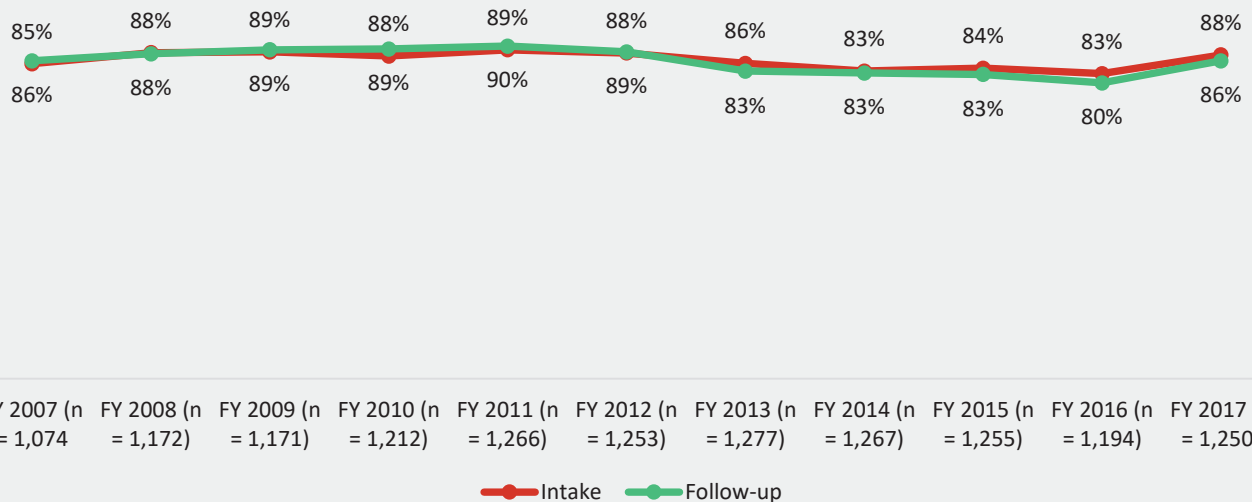
FIGURE 2.71. NUMBER OF CIGARETTES SMOKED IN AN AVERAGE DAY AMONG CLIENTS WHO SMOKED TOBACCO<sup>74</sup>



### Trends in Past-12-month Smoking Tobacco Use

The majority of KTOS clients at intake and follow-up reported smoking tobacco. In the last 3 years, the number of clients reporting smoking tobacco use at either intake or follow-up has decreased slightly compared to earlier years. In FY17, the percent of clients who reported smoking tobacco increased slightly at both intake and follow-up compared to FY16.

FIGURE 2.72. TRENDS IN SMOKING TOBACCO USE AT INTAKE AND FOLLOW-UP, FY 2007-FY 2016

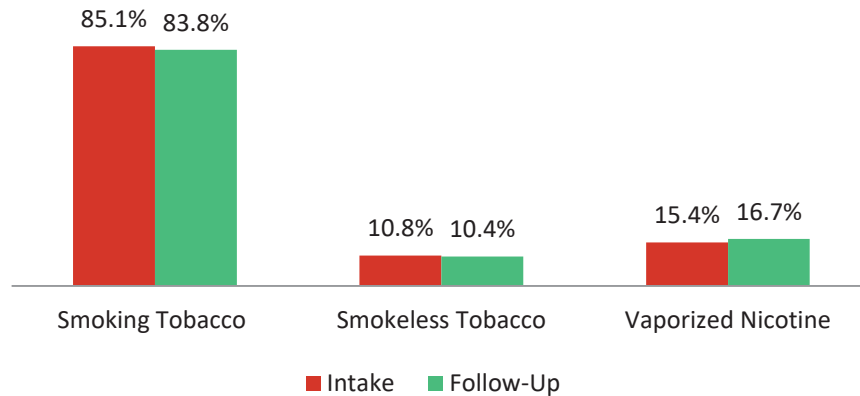


<sup>74</sup> Ten cases had missing data for number of cigarettes smoked at intake, and 15 cases had missing data for number of cigarettes smoked at follow-up.

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

The number of clients who reported any past-30-day smoking tobacco remained stable from intake (85.1%) to follow-up (83.8%; see Figure 2.73). Past-30-day smokeless tobacco and vaporized nicotine use also remained stable from intake to follow-up.

FIGURE 2.73. PAST-30-DAY SMOKING, SMOKELESS TOBACCO, AND VAPORIZED NICOTINE USE AT INTAKE AND FOLLOW-UP (n = 1,111)<sup>75</sup>



### Gender Differences in Past-30-day Smoking, Smokeless Tobacco, and Vaporized Nicotine Use

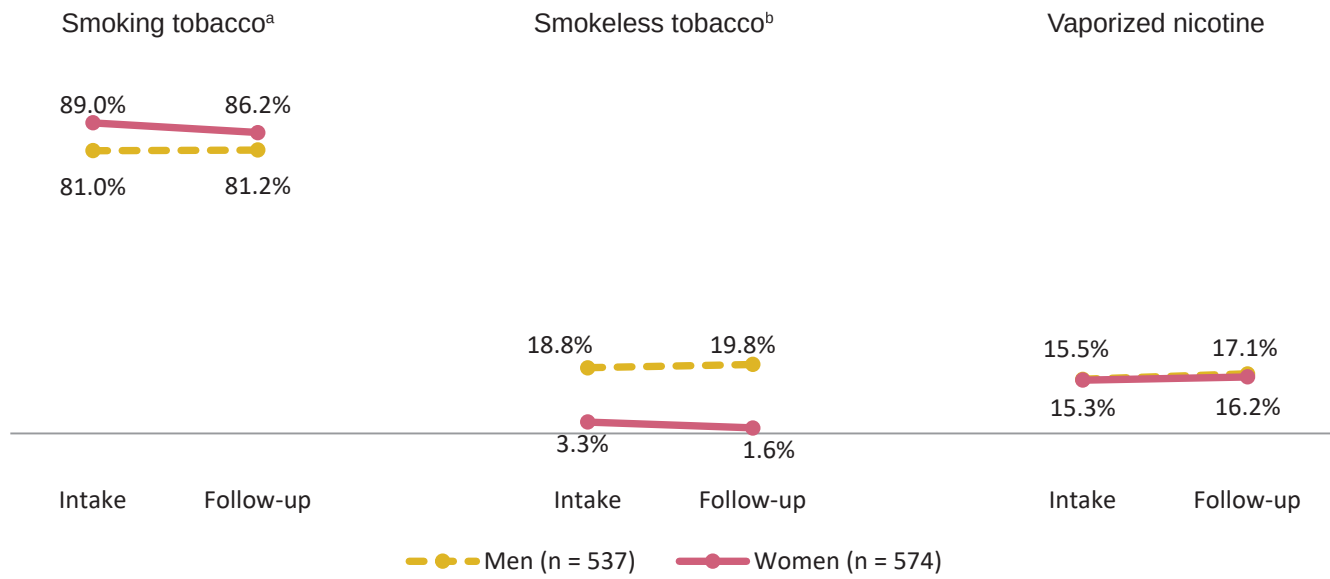
Similar to the 12-month measure of smoking and smokeless tobacco, significantly more women than men reported smoking tobacco in the 30 days before intake and follow-up (see Figure 2.74). More men than women reported using smokeless tobacco in the 30 days before intake and follow-up. Similar percentages of men and women reported using vaporized nicotine products in the 30 days before entering treatment and the 30 days before follow-up. There were no significant changes in the percent of men and women who reported past-30-day use.

*“I went when I was 5 months pregnant and they got me in really quickly. They were good with everything, they changed my life. They made me get out of my comfort zone I needed that.”*

- KTOS FOLLOW-UP CLIENT

<sup>75</sup> Two cases had missing data for past-30-day smoking tobacco and past-30-day vaporized nicotine use, and 5 cases had missing data for past-30-day smokeless tobacco use at follow-up.

FIGURE 2.74. GENDER DIFFERENCES IN PAST-30-DAY TOBACCO AND VAPORIZED NICOTINE USE FROM INTAKE TO FOLLOW-UP<sup>a</sup>



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

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

## Section 3. Bivariate and Multivariate Analysis of Factors Associated with Relapse

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

KTOS clients who reported using any illegal drugs and/or alcohol in the 12 months before follow-up (n = 584, 45.8%) were compared to clients who did not report use of any drugs or alcohol in the 12 months before follow-up (n = 690, 54.2%) in bivariate statistical tests.<sup>76</sup> Several factors measured at intake were significantly associated with relapse in the follow-up period (see Table 11.1): gender, meeting criteria for moderate or severe SUD, number of nights incarcerated, average number of depression and anxiety symptoms, average quality of life, and average number of adverse childhood experiences.

TABLE 11.1. BIVARIATE COMPARISON OF TARGETED FACTORS FOR RELAPSE AND NON-RELAPSE GROUPS

Intake Factors	Used illegal drugs or alcohol in the 12 months before follow-up (n = 584)	Did not use illegal drugs or alcohol in the 12 months before follow-up (n = 690)
Average age at intake.....	34.3	35.1
Male** .....	53.4%	43.8%
Met criteria for moderate or severe SUD per DSM-5**	72.8%	64.9%
Number of nights incarcerated in the 12 months before intake** .....	31.2	42.9
Number of months employed in the 12 months before intake .....	4.8	1.2
Average number of mental health symptoms (depression and anxiety) reported at intake** .....	8.3	7.1
Number of people client could count on for recovery support at intake .....	6.0	6.4
Average quality of life rating at intake** .....	5.8	6.1
Average number of adverse childhood experiences** <sup>a</sup>	3.9	3.3

a—Because the adverse childhood experiences items were integrated into the intake survey several months into the data collection for this fiscal year, data for ACE is included for 969 individuals.

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

Factors that were significantly associated with drug and/or alcohol use at follow-up (i.e., relapse) were included in a logistic regression to examine which factors were still significantly associated with relapse, after controlling for other factors. Gender, meeting criteria for moderate or severe SUD, number of nights incarcerated, number of depression and anxiety symptoms, quality of life, and number of adverse childhood experiences were entered as predictor variables. Any drug or 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 number of adverse childhood experiences were significantly associated with alcohol and/or drug use in the follow-up period (see Table 11.2). Specifically, males had greater odds of using alcohol and/or drugs at follow-up. Individuals who spent fewer nights incarcerated had greater odds of using alcohol and/or drugs at follow-up. Finally, individuals with more adverse childhood experiences had greater odds of reporting alcohol and/or drugs in the 12-month follow-up period.

<sup>76</sup> Five individuals had missing data for at least some of the illegal drug classes and because they did not report alcohol use they could not be classified as either having used alcohol and/or drugs or not. Thus, this analysis includes 1,274 individuals.

TABLE 11.2. ASSOCIATION OF TARGETED FACTORS AND RELAPSE

Factors at intake	B	Wald	Odds ratio	95% CI	
				Lower	Upper
Gender.....	-.599	17.893	.549***	.416	.725
Met criteria for moderate or severe SUD at intake .....	.264	3.023	1.302	.967	1.753
Number of nights incarcerated .....	-.003	6.647	.997*	.995	.999
Number of depression and anxiety symptoms .....	.009	.506	1.009	.985	1.034
Number of people client could count on for recovery support.....	-.005	.501	.995	.980	1.010
Quality of life rating.....	-.058	3.046	.944	.885	1.007
Number of adverse childhood experiences .....	.075	9.313	1.077**	1.027	1.130

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

## Section 4. Mental Health, Physical Health, Stress, and Interpersonal Victimization

This section examines changes in mental health symptoms, physical health, stress-related health consequences, 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) general health status, (6) chronic pain, (7) stress-related health consequences, and (8) 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:

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

If participants answered “yes” to at least one of these two screening questions, they were then asked seven additional questions about symptoms of depression (e.g., sleep problems, weight loss or gain, feelings of hopelessness or worthlessness).

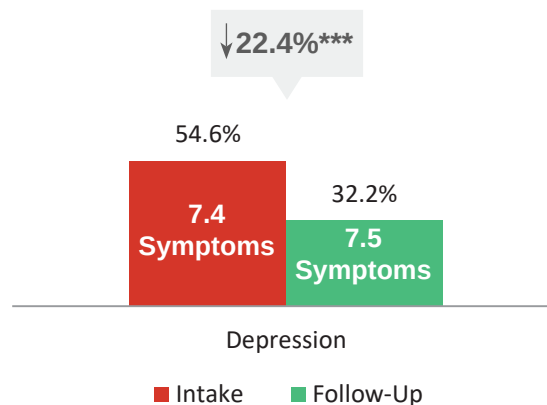
More than half of clients (54.6%) met criteria for depression in the 12 months before they entered treatment (see Figure 4.1). At follow-up, 32.2% met criteria for depression—a significant decrease of 22.4%. Of those who met study criteria at intake ( $n = 695$ ), they had an average of 7.4 symptoms out of 9. At follow-up, among those who met study criteria for depression ( $n = 406$ ), clients reported an average of 7.5 symptoms out of 9.

#### 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**.

The percent of clients meeting criteria for depression decreased significantly by 22% from intake to follow-up

FIGURE 4.1. MEETING STUDY CRITERIA FOR DEPRESSION AT INTAKE AND FOLLOW-UP (N = 1,272)<sup>77</sup>



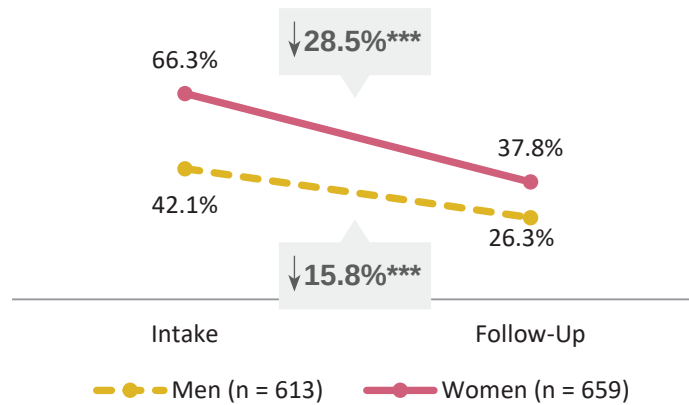
<sup>77</sup> Seven individuals had missing data for depression criteria at follow-up.

## Gender Differences in Depression

Significantly more women met study criteria for depression at intake and follow-up compared to men. At intake, 66.3% of women met study criteria compared to 42.1% of men. At follow-up, the percent of women who reported depression was 37.8% compared to 26.3% of men (see Figure 4.2). The number of women and men who met criteria for depression decreased significantly.

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

FIGURE 4.2. GENDER DIFFERENCES IN PERCENT OF CLIENTS MEETING STUDY CRITERIA FOR DEPRESSION<sup>a</sup>

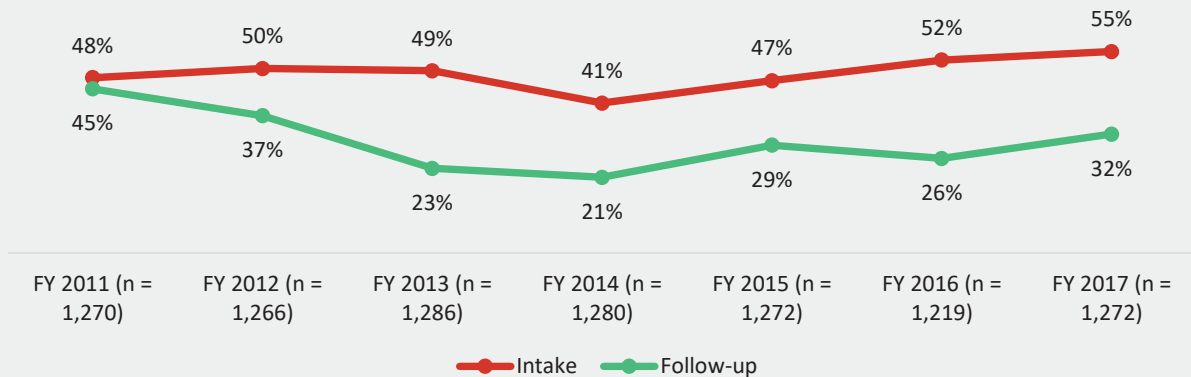


a—Statistical difference by gender at intake ( $p < .001$ ) and follow-up ( $p < .001$ ).  
 \*\*\* $p < .001$ .

## 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 55% in FY 2017 over the past 7 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 2017, the percent of individuals who met criteria for depression at follow-up was 32%.

FIGURE 4.3. TRENDS IN THE NUMBER OF CLIENTS MEETING STUDY CRITERIA FOR DEPRESSION AT INTAKE AND FOLLOW-UP, FY 2011-FY 2017





## 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).

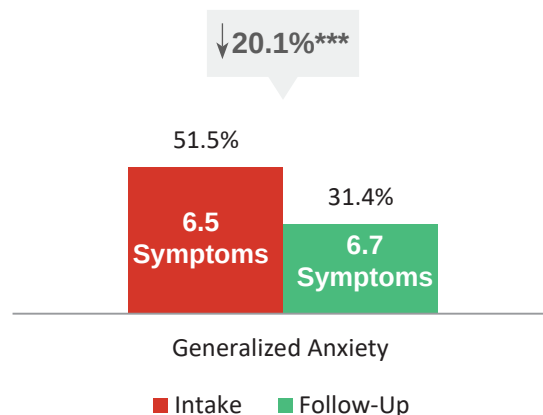
In the 12 months before entering treatment, about half of clients reported symptoms that met study criteria for generalized anxiety (51.5%; see Figure 4.4). By follow-up, the percent of clients meeting study criteria for generalized anxiety had decreased by 20.1% to 31.4%. At intake, among those who met study criteria for generalized anxiety ( $n = 657$ ), clients reported an average of 6.5 symptoms out of 7. Among those who met study criteria for generalized anxiety at follow-up ( $n = 398$ ), clients reported an average of 6.7 symptoms out of 7.

### STUDY CRITERIA FOR GENERALIZED ANXIETY

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

The percent of clients meeting criteria for generalized anxiety was significantly lower at follow-up compared to intake

FIGURE 4.4. CLIENTS MEETING STUDY CRITERIA FOR GENERALIZED ANXIETY AT INTAKE AND FOLLOW-UP (N = 1,275)<sup>78</sup>



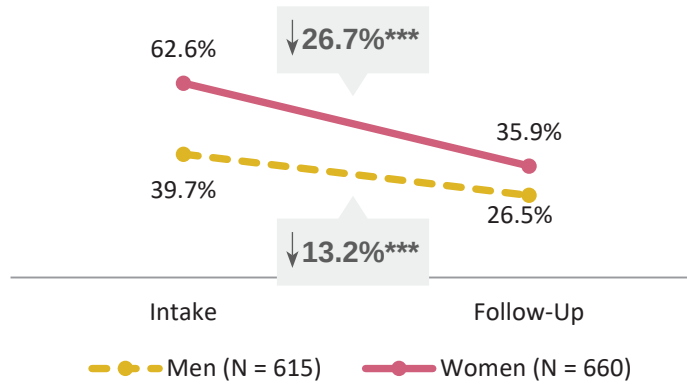
## Gender Differences in Generalized Anxiety Symptoms

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.

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

<sup>78</sup> Missing data on generalized anxiety at follow-up for 4 clients.

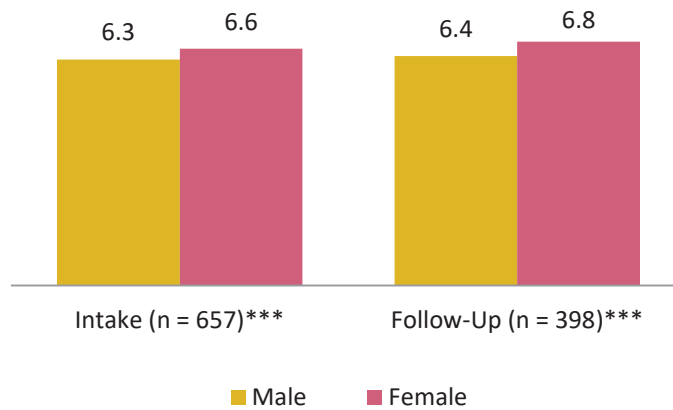
FIGURE 4.5. GENDER DIFFERENCES IN PERCENT OF CLIENTS MEETING STUDY CRITERIA FOR GENERALIZED ANXIETY<sup>a</sup>



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

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). Of those who met study criteria for generalized anxiety at follow-up, women reported significantly more anxiety symptoms when compared to men (6.8 vs. 6.4).

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<sup>a</sup>

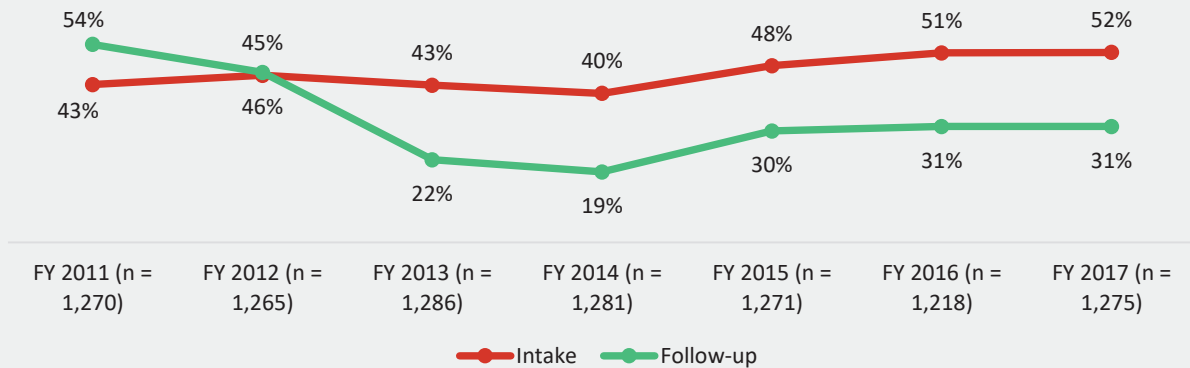


a – To meet study criteria, a client had to endorse at least 4 of 7 anxiety symptoms.  
 \*\*\* $p < .001$ .

## Trends in Past-12-month Generalized Anxiety

The number of clients who met criteria for generalized anxiety at intake has slightly increased over the past seven years. The percent of clients who met study criteria for generalized anxiety at follow-up fluctuated from FY 2011 through FY 2014, but has remained steady for the past three years.

FIGURE 4.7. TRENDS IN THE NUMBER OF CLIENTS MEETING STUDY CRITERIA FOR GENERALIZED ANXIETY AT INTAKE AND FOLLOW-UP, FY 2011-FY 2017

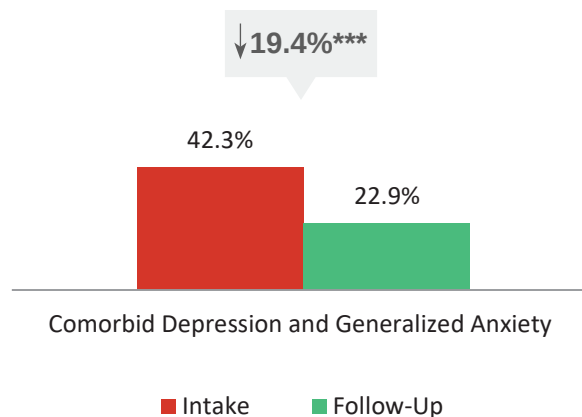


## Comorbid Depression and Anxiety Symptoms

Figure 4.8 shows that at intake, 42.3% of clients met study criteria for both depression and generalized anxiety and there was a significant 19.4% decrease in the percent of individuals who met study criteria for depression and generalized anxiety at follow-up (22.9%).

The percent of clients meeting criteria for both depression and generalized anxiety decreased 19%

FIGURE 4.8. CLIENTS MEETING STUDY CRITERIA FOR COMORBID DEPRESSION AND GENERALIZED ANXIETY AT INTAKE AND FOLLOW-UP (N = 1,269)<sup>79</sup>



\*\*\*p < .001.

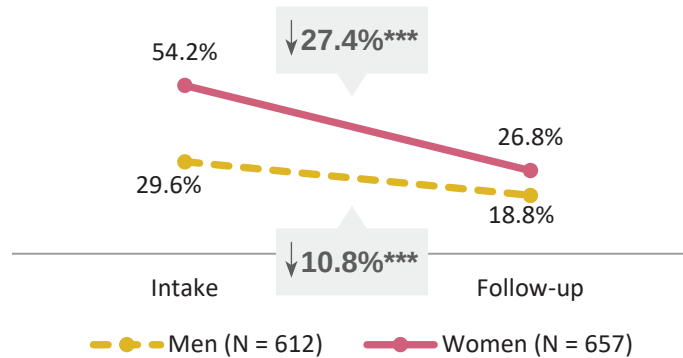
<sup>79</sup> Ten cases had missing data for depression and/or generalized anxiety at follow-up.

## Gender Differences in Comorbid Depression and Generalized Anxiety Symptoms

Significantly more women met criteria for comorbid depression and generalized anxiety at intake and follow-up compared to men (see Figure 4.9). The percent of women and men who met criteria for depression and generalized anxiety decreased significantly by 27.4% and 10.8% respectively.

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

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

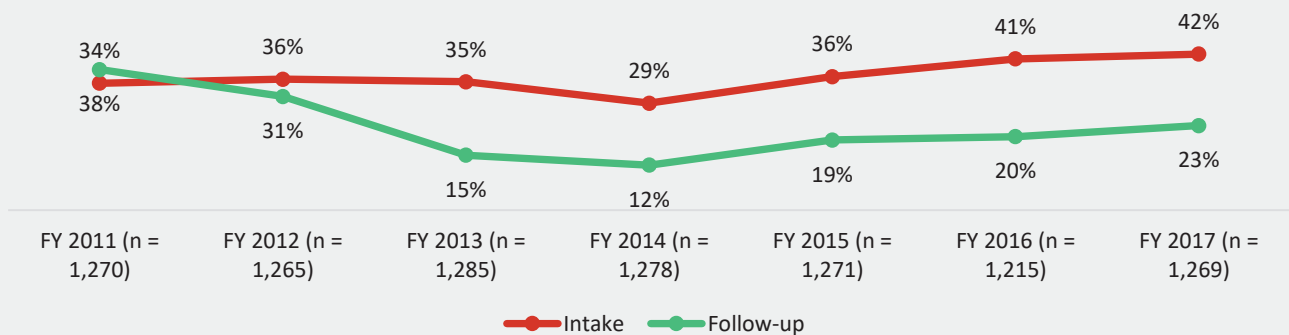


a—Statistical difference by gender at intake ( $p < .001$ ) and follow-up ( $p < .01$ ).  
 \*\*\* $p < .001$ .

## Trends in Comorbid Depression and Anxiety

Past-7-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 2017 (42%) than in FY 2011. At follow-up, however, fewer clients met study criteria for comorbid depression and anxiety in FY 2016 (20%) compared to FY 2017 (23%).

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 2017

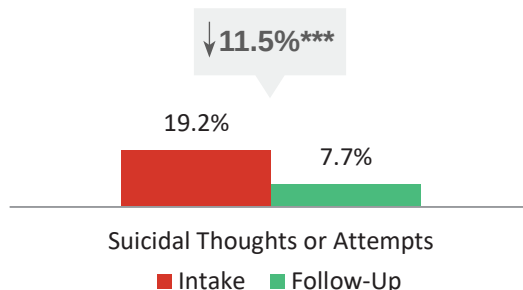


## Suicidal Thoughts and/or Attempts

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, 19.2% of clients reported thoughts of suicide or attempted suicide and 7.7% of clients reported thoughts of suicide or attempted suicide in the 12 months before follow-up. There was an 11.5% decrease from intake to follow-up in the number of clients reporting suicidal thoughts and attempts (see Figure 4.11).

The percent of clients reporting suicidal thoughts and/or attempts decreased nearly 12% at follow-up

FIGURE 4.11. CLIENTS REPORTING SUICIDAL THOUGHTS AND/OR ATTEMPTS AT INTAKE AND FOLLOW-UP (N = 1,279)

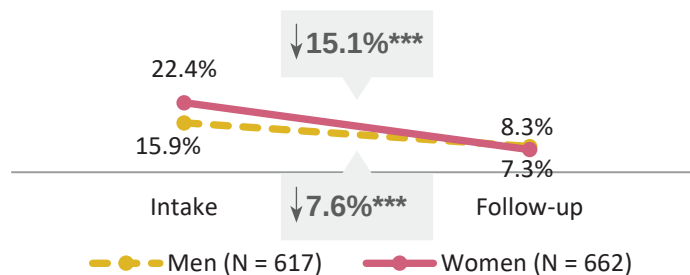


\*\*\*p < .001.

## Gender Differences in Suicidal Thoughts and/or Attempts

Significantly more women reported suicidal thoughts and/or attempts at intake compared to men (see Figure 4.12). The percent of women and men who reported suicidal ideation or attempts decreased significantly by 15.1% and 7.6% respectively.

FIGURE 4.12. GENDER DIFFERENCES IN PERCENT OF CLIENTS REPORTING SUICIDAL THOUGHTS AND/OR ATTEMPTS AT INTAKE AND FOLLOW-UP<sup>a</sup>



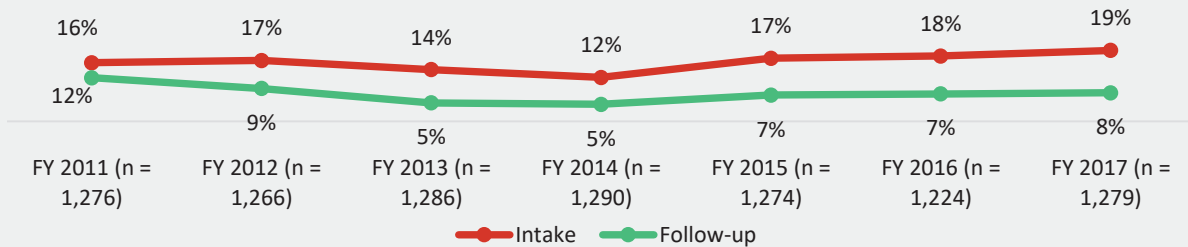
a—Statistical difference by gender at intake (p < .01).

\*\*\*p < .001.

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

The percent of clients who reported suicidal ideation and attempts at intake decreased slightly from 16% in FY 2011 to 12% in FY 2014 and then increased to 19% in FY 2017. The percent of clients reporting suicidal ideation and attempts at follow-up also decreased slightly from 12% in FY 2011 to 5% in FY 2014 and then increased to 8% in FY 2017.

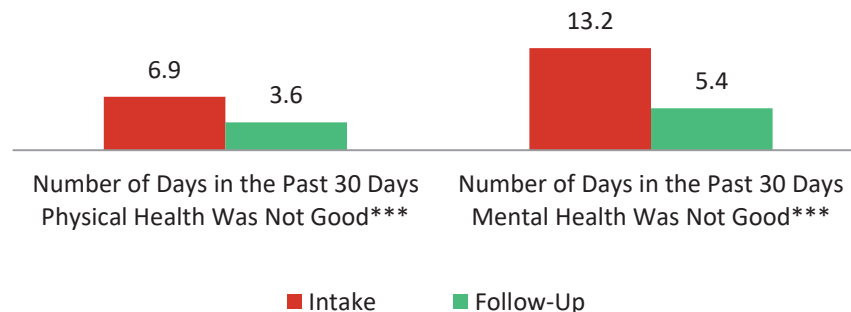
FIGURE 4.13. TRENDS IN THE NUMBER OF CLIENTS REPORTING SUICIDAL THOUGHTS AND/OR ATTEMPTS AT INTAKE AND FOLLOW-UP, FY 2011-2017



## Perceptions of Poor Physical and Mental Health

Clients were asked how many days in the past 30 days their physical was not good and their mental health was not good at intake and follow-up (see Figure 4.14). There was a significant decrease from intake to follow-up in the number of days clients reported their physical health was not good (6.9 vs. 3.6). The number of days clients' mental health was not good also decreased significantly from 13.2 at intake to 5.4 at follow-up.

FIGURE 4.14. PERCEPTIONS OF POOR PHYSICAL HEALTH AND MENTAL HEALTH IN THE PAST 30 DAYS AT INTAKE AND FOLLOW-UP (N = 1,277)<sup>80</sup>



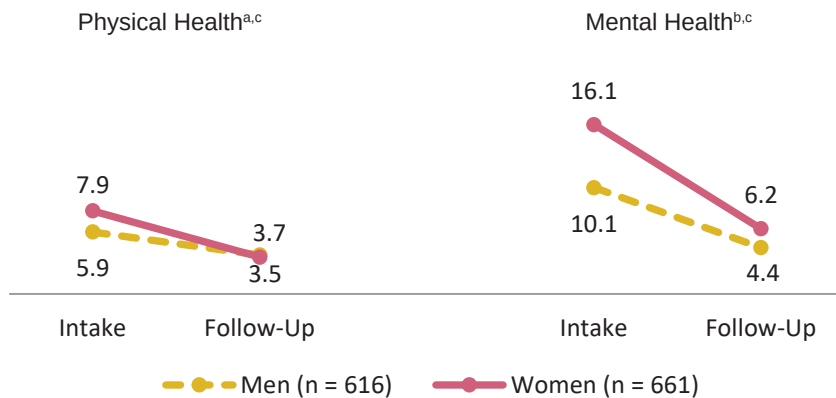
\*\*\*p < .001.

## Gender Differences in Perceptions of Physical and Mental Health

Women's reported number of days their physical health was not good was higher at intake when compared to men's. Also, women's reported number of days their mental health was not good was higher at intake and follow-up compared to men (see Figure 4.15).

<sup>80</sup> Two clients had missing data for the physical health question at follow-up, and three had missing data for the mental health question at follow-up.

FIGURE 4.15. GENDER DIFFERENCES IN NUMBER OF DAYS IN THE PAST 30 DAYS PHYSICAL AND MENTAL HEALTH WAS NOT GOOD

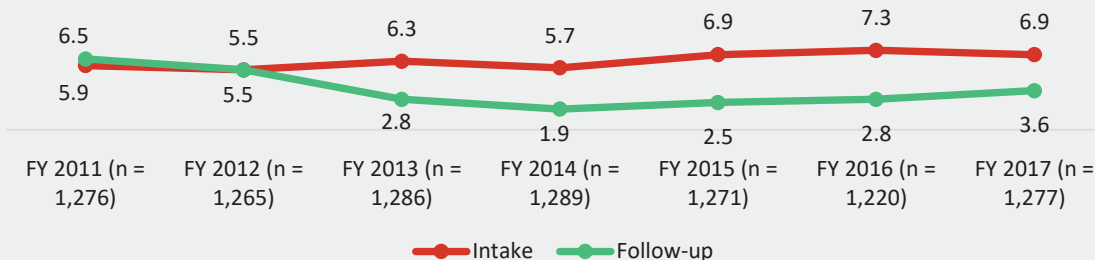


a—Statistical difference by gender at intake (p < .01).  
 b – Statistical difference by gender at intake (p < .001) and follow-up (p < .01).  
 c – Significant decrease from intake to follow-up for men and women (p < .001).

### Trends in Perceptions of Poor Physical Health

The average number of days clients reported their physical health was poor in the past 30 days at intake has increased from 5.9 days in FY 2011 to 7.3 days in FY 2016, and down slightly to 6.9 in FY 2017. The average number of days clients reported their physical health was poor 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 2017, the average number of days of poor physical health in the 30 days before follow-up was highest since FY 2012.

FIGURE 4.16. TRENDS IN PERCEPTIONS OF PHYSICAL HEALTH AT INTAKE AND FOLLOW-UP, REPORTS FY 2011-FY 2017



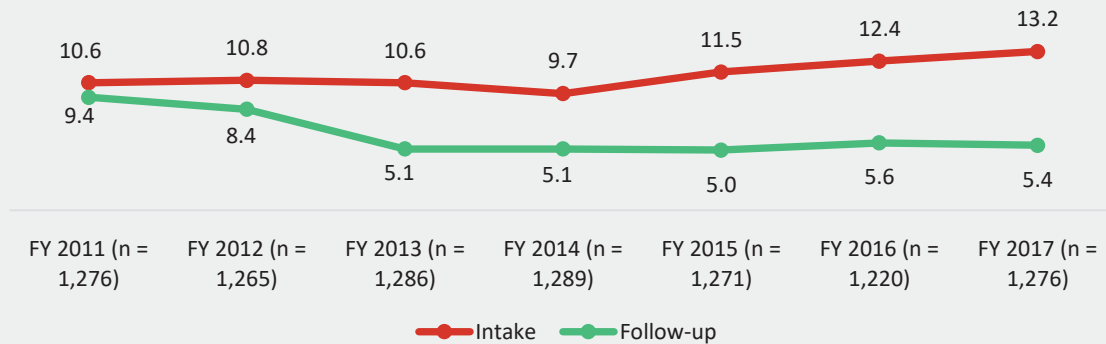
*“They taught me structure and responsibility. I learned who I am and to live life on my terms.”*

- KTOS FOLLOW-UP CLIENT

## 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. The average number of days clients reported their mental health was poor in the past 30 days at follow-up has decreased from 9.4 days in FY 2011 to 5.4 days in FY 2017.

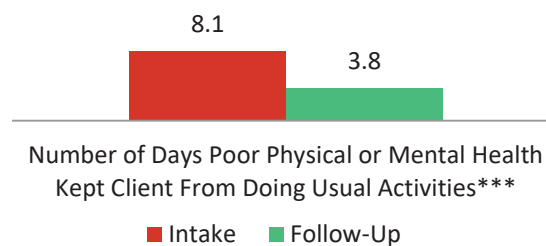
FIGURE 4.17. TRENDS IN PERCEPTIONS OF MENTAL HEALTH AT INTAKE AND FOLLOW-UP, FY 2011 – FY 2017



## 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 8.1 days at intake to 3.8 days at follow-up (see Figure 4.18).

FIGURE 4.18. PERCEPTIONS OF POOR PHYSICAL HEALTH AND MENTAL HEALTH LIMITING ACTIVITIES IN THE PAST 30 DAYS AT INTAKE AND FOLLOW-UP (N = 1,263)<sup>81</sup>



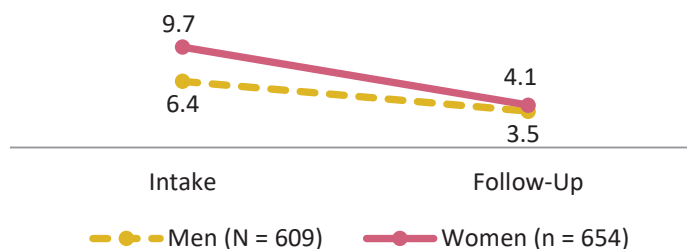
\*\*\*p < .001.

## Gender Differences in Perceptions of Physical or Mental Health Limiting Activities

The average number of days clients indicated their poor physical or mental health had kept them from doing their usual activities was higher for women than for men at intake (see Figure 4.19).

<sup>81</sup> Sixteen clients had missing data for the question about perceptions of poor physical or mental health limiting their activities at follow-up.



FIGURE 4.19. GENDER DIFFERENCES IN THE NUMBER OF DAYS POOR PHYSICAL OR MENTAL HEALTH KEPT CLIENT FROM DOING USUAL ACTIVITIES<sup>a,b</sup>

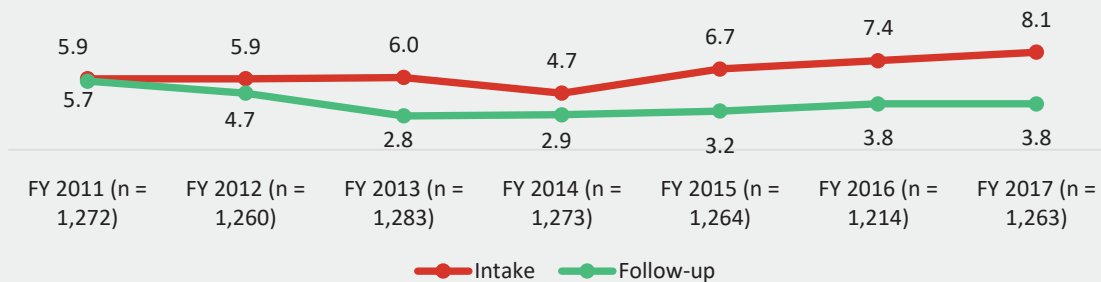
a—Statistical difference by gender at intake ( $p < .001$ ).

b – Significant decrease from intake to follow-up for men and women ( $p < .001$ ).

## 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 poor physical or mental health kept them from doing their usual activities has gradually increased at intake. At intake in FY 2014, clients reported an average of 4.7 days that their poor physical or mental health kept them from doing their usual activities and in FY 2017 clients reported an average of 8.1 days. The average number of days clients reported their poor 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 2016 and 2017 (3.8).

FIGURE 4.20. TRENDS IN THE NUMBER OF DAYS POOR PHYSICAL OR MENTAL HEALTH KEEP CLIENT FROM DOING USUAL ACTIVITIES AT INTAKE AND FOLLOW-UP, REPORTS FY 2011-FY 2017

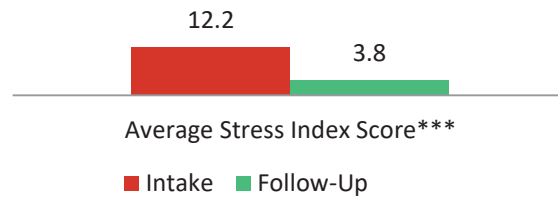


## Stress-related Health Consequences

Clients were also asked 12 items about physiological symptoms often associated with higher stress called the Stress-Related Health Consequences Scale.<sup>82</sup> The scale contains 12 symptoms; the client indicates how often they have experienced each symptom in the past 7 days (e.g., experienced unexplained aches and pains, slept poorly, experienced an increased heart rate). Higher scores on the scale indicate higher stress and greater physiological indicators of stress. The highest possible score is 36 and the lowest possible score is 0. For the overall sample, scores on the Stress-Related Health Consequences Scale decreased significantly from 12.2 at intake to 3.8 at follow-up (see Figure 4.21).

<sup>82</sup> Measure created by Logan, T. and Walker, R. Stress-Related Health Consequences Scale.

FIGURE 4.21. AVERAGE SCORES ON THE STRESS-RELATED HEALTH CONSEQUENCES SCALE AT INTAKE AND FOLLOW-UP (N = 1,010)<sup>83</sup>



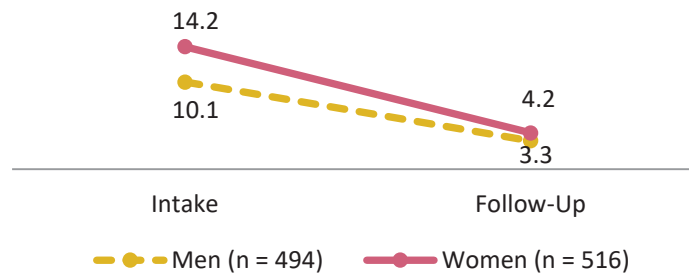
\*\*\*p < .001.

### Gender Differences in Stress-related Health Consequences

Figure 4.22 shows that women’s scores on the Stress-Related Health Consequences Scale were significantly higher than men’s scores at intake and follow-up. Nonetheless, both men’s and women’s scores decreased significantly from intake to follow-up.

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

FIGURE 4.22. GENDER DIFFERENCES IN AVERAGE SCORES ON THE STRESS-RELATED HEALTH CONSEQUENCES SCALE<sup>a,b</sup>



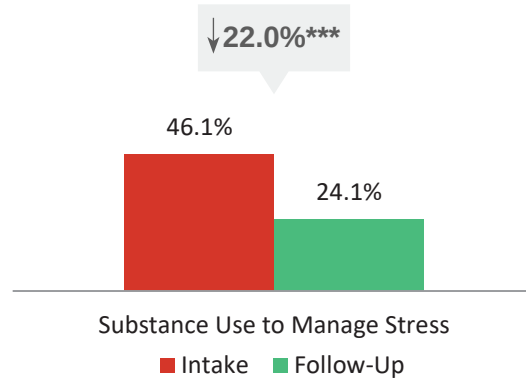
a—Statistical difference by gender at intake (p < .001) and follow-up (p < .01).  
 b – Significant decrease from intake to follow-up for men and women (p < .001).

### Using Substances to Reduce or Manage Stress

Clients were also asked if they used alcohol, prescription drugs, or illegal drugs in the past 7 days to reduce or manage stress at intake and follow-up. Figure 4.23 shows that 46.1% of clients reported they used at least one type of substance to reduce or manage their stress in the 7 days before entering treatment. At follow-up, that number significantly decreased to 24.1%.

<sup>83</sup> The stress-related health consequences scale was deleted from the follow-up survey in May 2018; thus, 269 clients were not asked these items at follow-up.

FIGURE 4.23. CLIENTS REPORTING SUBSTANCE USE TO REDUCE OR MANAGE STRESS AT INTAKE AND FOLLOW-UP (N = 1,279)

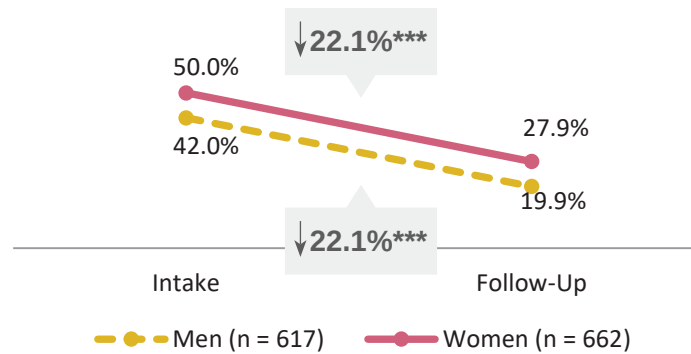


\*\*\*p < .001

### Gender Differences in Using Substances to Reduce or Manage Stress

Figure 4.24 shows that significantly more women than men reported using substances to reduce or manage stress at intake and follow-up. Nonetheless, the percent of men and women who reported using substances to reduce or manage stress decreased 22.1% from intake to follow-up.

FIGURE 4.24. GENDER DIFFERENCES IN SELF MEDICATION<sup>a</sup>



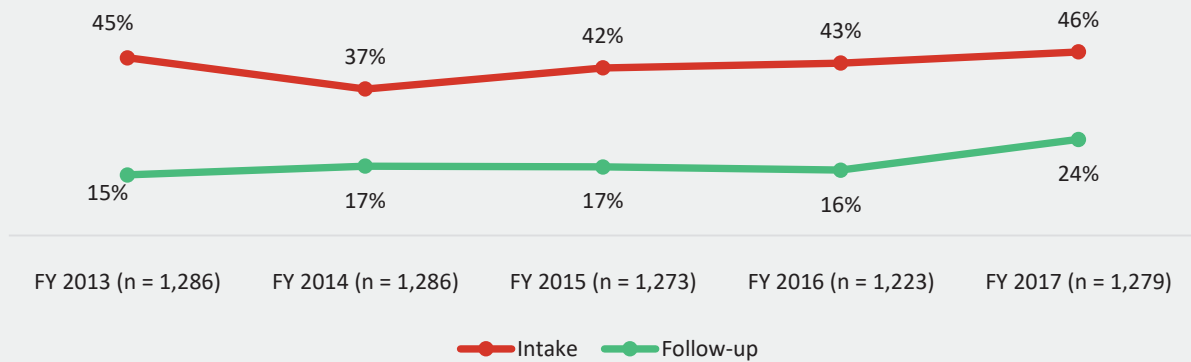
a—Statistical difference by gender at intake (p < .01) and follow-up (p < .01).  
\*\*\*p < .001.

## Trends in Substance Use to Reduce or Manage Stress

Clients are asked at both intake and follow up if they have used alcohol, prescription drugs, or illegal drugs to reduce any stress, anxiety, worry, or fear in the past 7 days. The percent of clients at intake who reported using substances to manage stress has been in the low to mid-40 percent with the exception of FY 2014 (37%). The highest percentage was in FY 2017 (46%).

At follow-up, the percent of clients who reported using substances to reduce or manage stress also remained relatively steady until FY 2017, when it climbed to 24%.

FIGURE 4.25. TRENDS IN THE NUMBER OF CLIENTS REPORTING SUBSTANCE USE TO REDUCE OR MANAGE THEIR STRESS AT INTAKE AND FOLLOW-UP, FY 2013-FY 2017



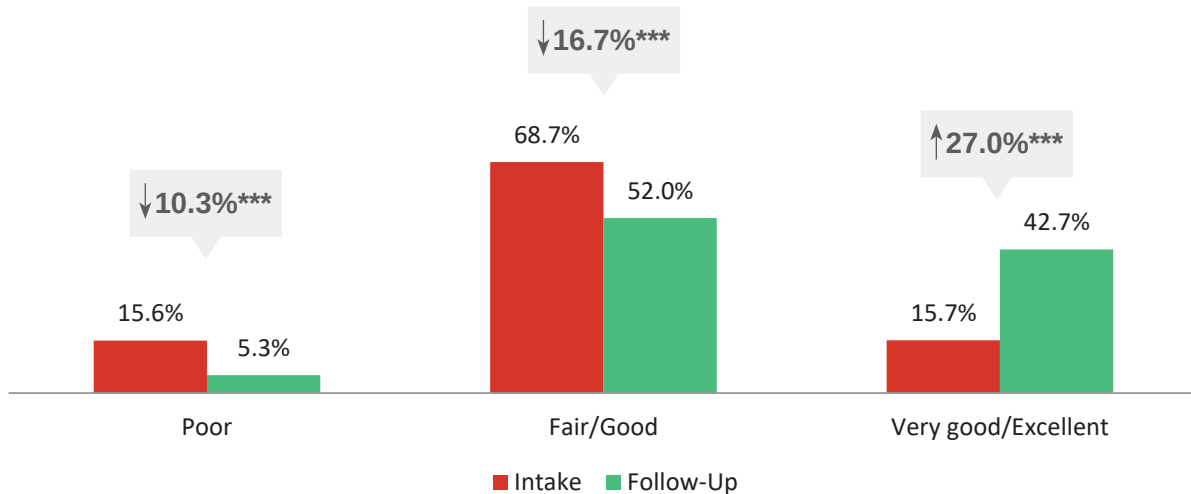
## Physical Health Status

### 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 2.6 at intake and this significantly increased to 3.3 at follow-up (not depicted in figure). Figure 4.26 shows that significantly more clients rated their overall physical health as very good or excellent (42.7%) at follow-up when compared to intake (15.7%). Additionally, significantly fewer clients reported their health was poor, or fair/good at follow-up than at intake.

*“The therapy and counseling was great. They brought my spirit back up. It was excellent.”*

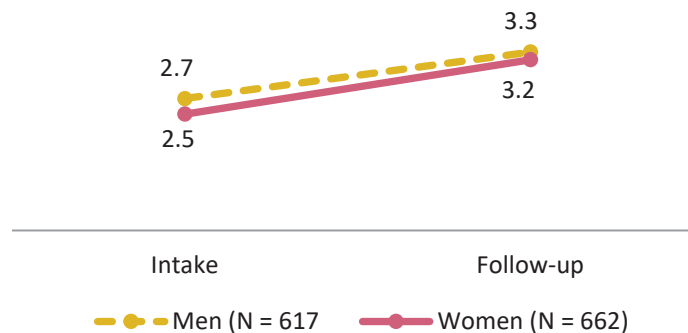
- KTOS FOLLOW-UP CLIENT

FIGURE 4.26. CLIENTS' SELF-REPORT OF OVERALL HEALTH STATUS AT INTAKE AND FOLLOW-UP (N = 1,279)<sup>a</sup>

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

### Gender Differences in Overall Health Status

At intake, women rated their overall health significantly lower than men rated their health (2.5 vs. 2.7; see Figure 4.27). For both men and women, there was a significant increase in overall health status rating and at follow-up, there was no significant difference in health status rating by gender.

FIGURE 4.27. GENDER DIFFERENCES IN CLIENTS' SELF-REPORT OF OVERALL HEALTH STATUS AT INTAKE AND FOLLOW-UP<sup>a,b</sup>

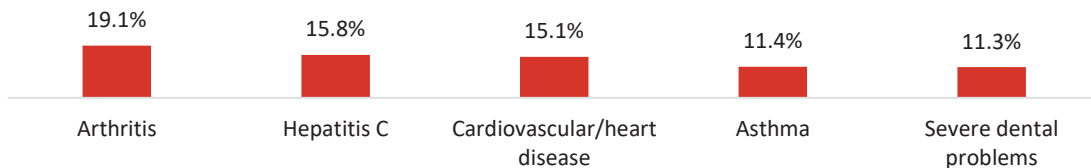
a—Statistical difference by gender at intake ( $p < .001$ ).

b – Significant increase from intake to follow-up for men and women ( $p < .001$ ).

### Chronic Medical Problems

Over half of clients (55.8%) reported they had at least one chronic health problem at program entry. Overall, the most common medical problems clients reported were arthritis (19.1%), hepatitis C (15.8%), heart disease (15.1%), asthma (11.4%), and severe dental problems (11.3%).

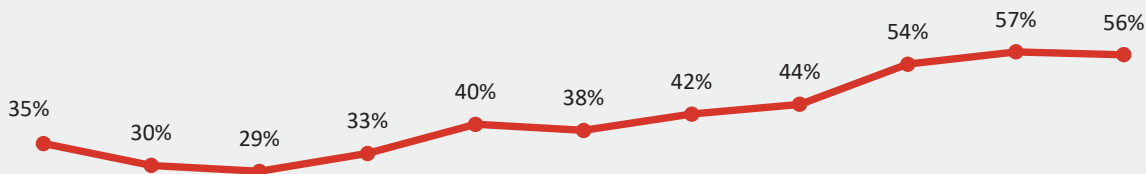
FIGURE 4.28. CHRONIC MEDICAL PROBLEMS REPORTED AT INTAKE (N = 1,279)



### 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 11 years. In FY 2009, over one-quarter of clients (29%) reported having a chronic medical problem compared to 56% of clients in FY 2017.

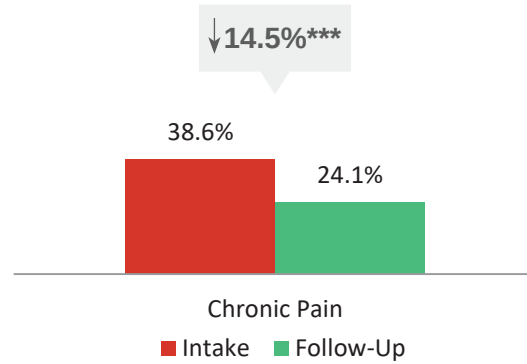
FIGURE 4.29. TRENDS IN THE CLIENTS REPORTING A CHRONIC MEDICAL PROBLEM AT INTAKE, FY 2007-2017



FY 2007 (n = 1,090) FY 2008 (n = 1,196) FY 2009 (n = 1,188) FY 2010 (n = 1,225) FY 2011 (n = 1,277) FY 2012 (n = 1,268) FY 2013 (n = 1,287) FY 2014 (n = 1,291) FY 2015 (n = 1,274) FY 2016 (n = 1,224) FY 2017 (n = 1,279)

### Chronic Pain

The percent of clients who reported chronic pain that was persistent and lasted at least 3 months decreased significantly from 38.6% at intake to 24.1% at follow-up (see Figure 4.30).

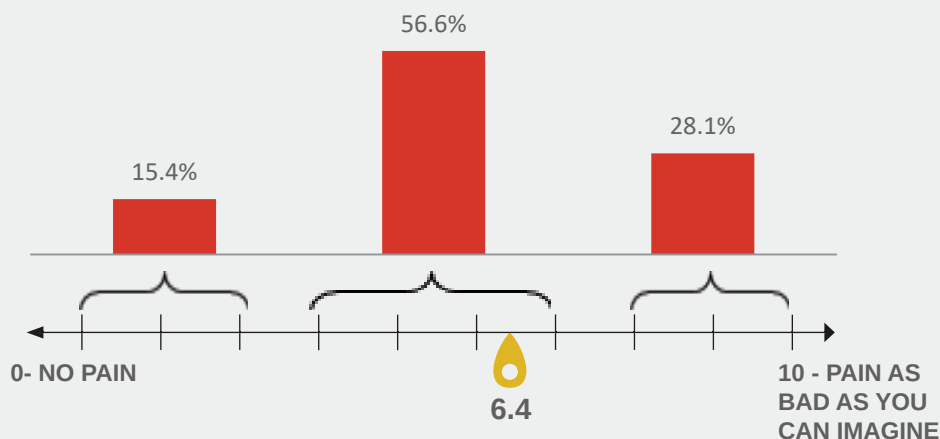
FIGURE 4.30. CLIENTS REPORTING CHRONIC PAIN AT INTAKE AND FOLLOW-UP (N = 1,268)<sup>84</sup>

\*\*\*p &lt; .001

## Taking a Closer Look at Chronic Pain

At intake, 38.7% of KTOS clients reported experiencing chronic pain for at least 3 months before entering treatment (n = 495). On average, clients reported their chronic pain began at age 26.6 (ranging from less than one year old to age 64).<sup>85</sup> In the 30 days before entering treatment, clients experienced chronic pain, on average, 23.3 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 of 6.4 with 28.1% of clients giving their pain the highest ratings of 8, 9, and 10 (see Figure 4.31).

FIGURE 4.31. INTENSITY RATING OF CHRONIC PAIN AT INTAKE (n = 495)



<sup>84</sup> Eleven individuals had missing data for chronic pain at follow-up.

<sup>85</sup> Two individuals had missing data for this question.



## Prescription Opioid Misuse and Chronic Pain

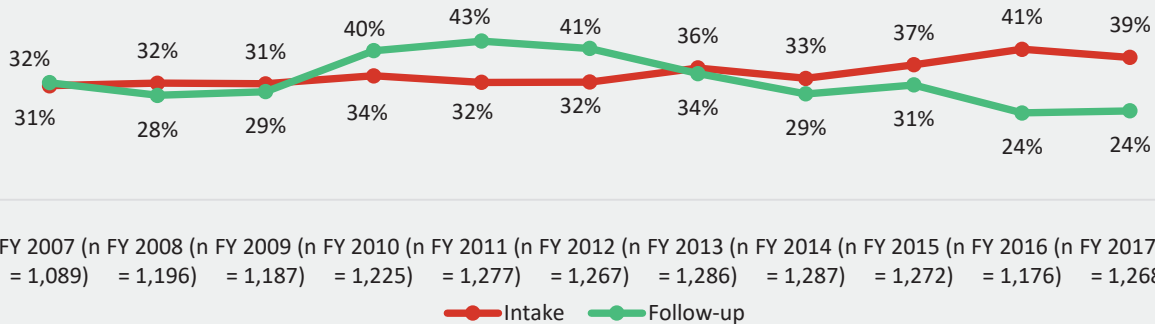
Of those who misused prescription opioids at intake (n = 611), 43.9% reported chronic pain in the 12 months before entering substance abuse treatment and 26.4% experienced chronic pain at follow-up<sup>86</sup>, which was a significant decrease of 17.5%.

Additionally, of those who reported misusing prescription opioids and experiencing chronic pain at intake (n = 266), 43.6% (n = 16) reported chronic pain in the past 12 months at follow-up<sup>87</sup> and 15.8% (n = 42) reported past-12-month misuse of prescription opioids.

## Trends Chronic Pain

The percent of clients who reported chronic pain 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.

FIGURE 4.32. TRENDS IN THE NUMBER OF CLIENTS REPORTING CHRONIC PAIN AT INTAKE AND FOLLOW-UP, FY 2007-FY 2017



FY 2007 (n = 1,089)   FY 2008 (n = 1,196)   FY 2009 (n = 1,187)   FY 2010 (n = 1,225)   FY 2011 (n = 1,277)   FY 2012 (n = 1,267)   FY 2013 (n = 1,286)   FY 2014 (n = 1,287)   FY 2015 (n = 1,272)   FY 2016 (n = 1,176)   FY 2017 (n = 1,268)

—●— Intake   —●— Follow-up

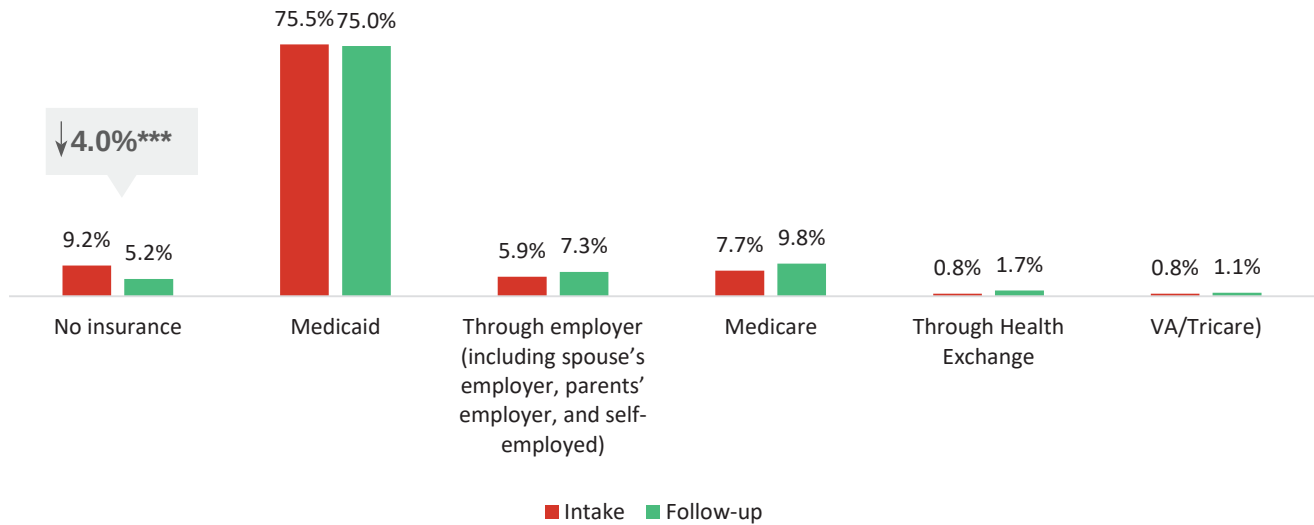
## Health Insurance

At intake, the majority of KTOS clients reported they had health insurance through Medicaid (75.3%; see Figure 4.33). Nearly 1 in 10 did not have any insurance (9.2%). Small numbers of clients had insurance through an employer, including through a spouse, parent, or self-employment (5.9%), through Medicare (7.7%), and through Health Exchange (0.8%). At follow-up, the number of clients reporting they had no insurance decreased significantly.

<sup>86</sup> Five clients who reported prescription opioid use at intake had missing data for chronic pain at follow-up; thus, the n = 606.

<sup>87</sup> Among the 269 individuals who reported misusing prescription opioids and experiencing chronic pain, three individuals had missing data about chronic pain at follow-up.



FIGURE 4.33. HEALTH INSURANCE FOR KTOS CLIENTS AT INTAKE AND FOLLOW-UP (N = 1,266)<sup>88</sup>

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

\*\*\* $p < .001$ .

### A closer look at insurance



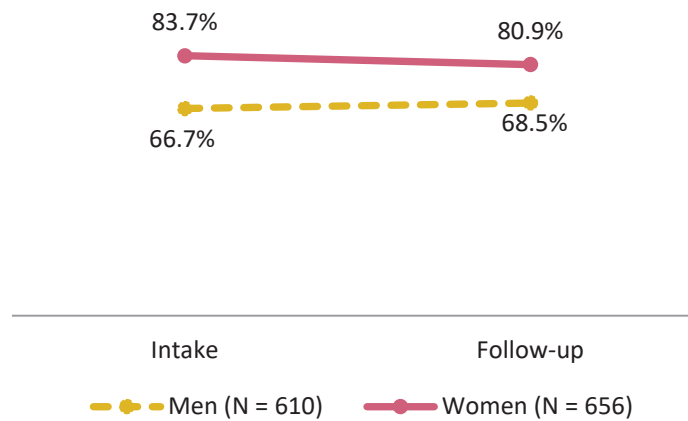
Of those clients who were employed full-time at intake ( $n = 260$ ), only 16.5% had insurance through an employer (including a spouse's or parent's employer). At follow-up, of those clients employed full-time ( $n = 442$ )<sup>89</sup>, only 15.2% had insurance through an employer.

### Gender Differences in Medical Insurance

Significantly more women reported being insured by Medicaid at both intake and follow-up compared to men (see Figure 4.34). There was no significant change in the percent of men and women who had Medicaid at follow-up compared to intake.

<sup>88</sup> Seven clients at follow-up had missing data for insurance at follow-up, and 6 individuals had responses that fit under "other" or could not be classified. The missing responses are not included in this analysis.

<sup>89</sup> Of the 442 clients employed full-time at follow-up, one had missing information for insurance at follow-up.

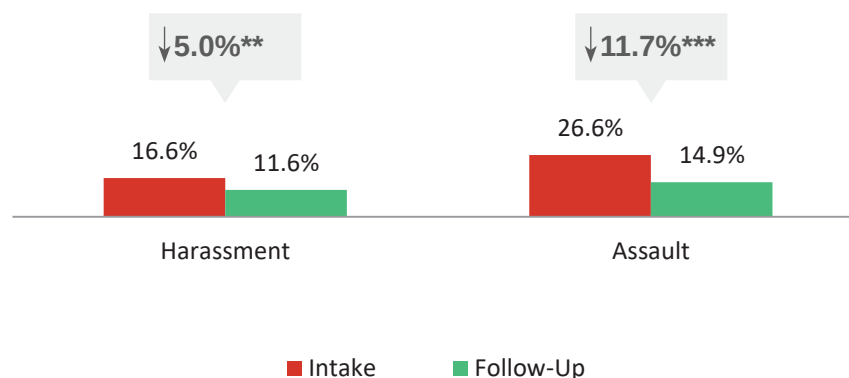
FIGURE 4.34. GENDER DIFFERENCES IN CLIENTS REPORTING HAVING MEDICAID INSURANCE AT INTAKE AND FOLLOW-UP<sup>a</sup>

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, beginning in October 2016. Because relatively small percentages of clients reported each type of victimization experience in the 12-month periods, several related items were collapsed into two different categories: (1) any harassment (e.g., verbally harassed on the street or in public, harassed on the road, and sexually harassed on the street), and (2) any assault (e.g., robbed or mugged by force, assaulted with or without a weapon), threatened with a gun, intimate partner violence, stalking).

The percent of clients who reported experiencing any harassment and any assault in the past 12 months decreased significantly from intake to follow-up (see Figure 4.35).

FIGURE 4.35. INTERPERSONAL VICTIMIZATION IN THE PAST 12 MONTHS AT INTAKE AND FOLLOW-UP (N = 866)<sup>90</sup>

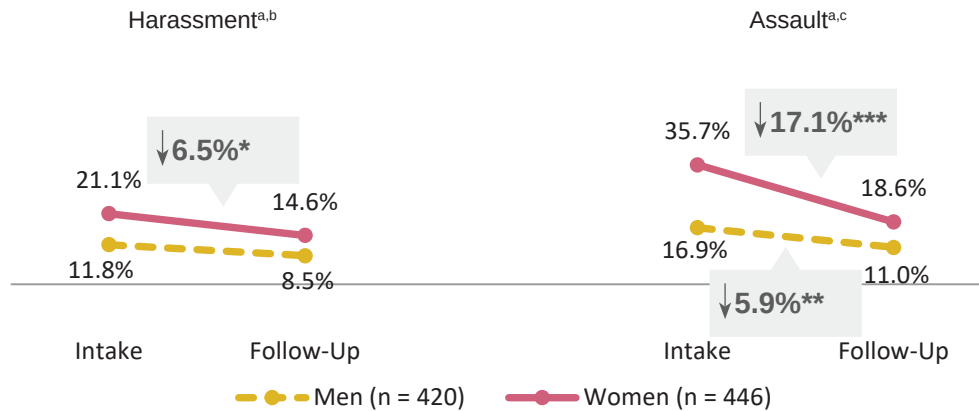
\*\* $p < .01$ , \*\*\* $p < .001$ .

<sup>90</sup> Because victimization items were added to the intake surveys in mid-October 2016, there is missing data at intake for 306 individuals. An additional 107 individuals had missing data for the items at follow-up for the assault items and 122 individuals had missing data for the assault items at follow-up.

## Gender Differences in Interpersonal Victimization

Significantly more women reported experiencing harassment and assault when compared to men (see Figure 4.36). The percent of women who reported harassment decreased significantly from 21.1% at intake to 14.6% at follow-up. The percent of men and women who reported experiencing assault decreased significantly from intake to follow-up: 16.9% vs. 11.0% for men and 35.7% vs. 18.6% for women.

FIGURE 4.36. GENDER DIFFERENCES IN INTERPERSONAL VICTIMIZATION IN THE PAST 12 MONTHS



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

b—Significant decrease from intake to follow-up for women ( $p < .05$ ).

c – Significant decrease from intake to follow-up for men ( $p < .01$ ) and women ( $p < .001$ ).

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

## Section 5. Economic and Living Circumstances

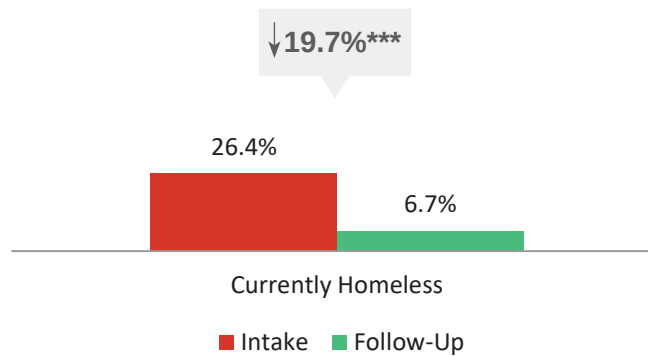
This section examines changes from intake to follow-up on: (1) living situation, (2) employment, and (3) economic hardship. Results for each targeted factor are presented for the overall sample and separately by gender when there were significant differences.

### Living Situation

#### Homelessness

About 1 in 4 clients (26.4%) reported at treatment intake they were currently homeless and at follow-up 6.7% of clients reported they were currently homeless – a significant decrease of 19.7% (see Figure 5.1).

FIGURE 5.1. CURRENT HOMELESSNESS AT INTAKE AND FOLLOW-UP (N=1,278)<sup>91</sup>

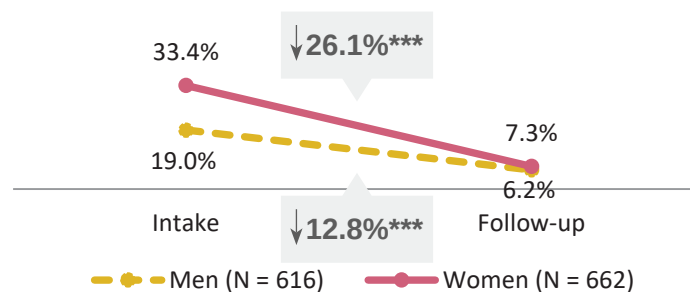


\*\*\*p < .001.

#### Gender Differences in Homelessness

Significantly more women reported being homeless at the time of intake when compared to men (see Figure 5.2). The percent of women and men reporting homelessness at follow-up significantly decreased (26.1% and 12.8%, respectively).

FIGURE 5.2. GENDER DIFFERENCES IN CLIENTS REPORTING HOMELESSNESS AT INTAKE AND FOLLOW-UP<sup>a</sup>



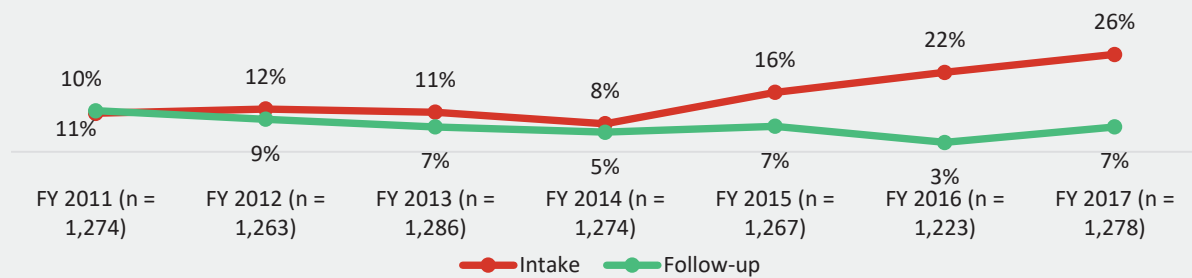
a—Statistical difference by gender at intake (p < .001).  
\*\*\*p < .001.

<sup>91</sup> One case had missing data for homelessness at follow-up.

## 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 2017 (26%).

FIGURE 5.3. TRENDS IN THE PERCENT OF CLIENTS REPORTING HOMELESSNESS AT INTAKE AND FOLLOW-UP, FY 2011-FY 2017



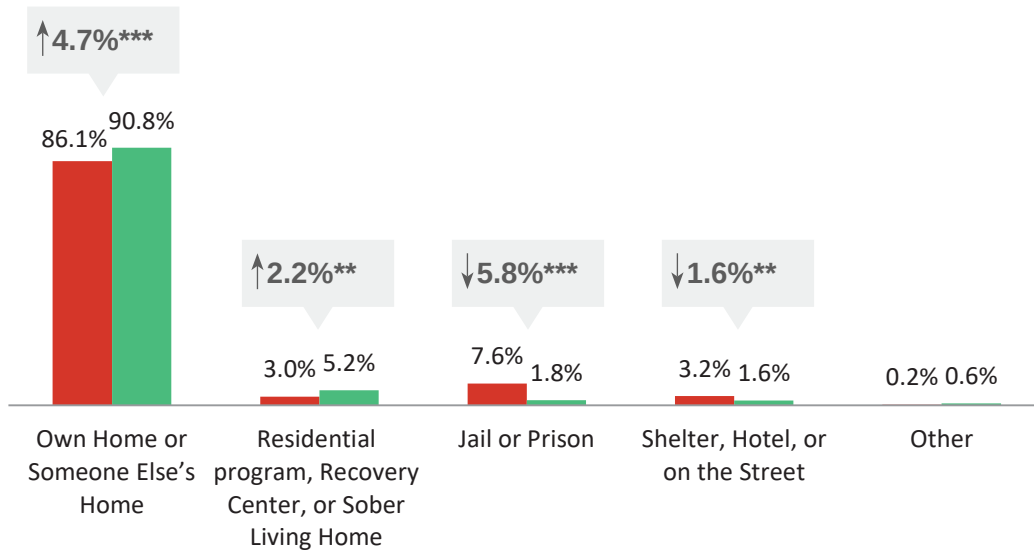
## Usual Living Situation

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 for the majority of the time in the 12 months before entering treatment and at follow-up clients were asked where they lived for the majority of the time in the 12 months before the follow-up interview.

The majority of clients reporting living in their own home or someone else's home for most of the past 12 months at intake and follow-up; nonetheless, there was a significant increase in the percent of individuals who lived in a private residence at follow-up (90.8%). A small percentage of clients reported their usual living situation was in a residential program, Recovery Center, or Sober Living Home at intake and 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: 7.6% vs. 1.8%. A very small percentage of clients reported living in a shelter or on the street at intake, with this percent decreasing significantly at follow-up.

*“They tried to work with me and my schedule. They genuinely cared about what I had going on.”*

- KTOS FOLLOW-UP CLIENT

FIGURE 5.4. USUAL LIVING SITUATION AT INTAKE AND FOLLOW-UP (N=1,277)<sup>92</sup>

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

## Employment

### Current Employment Status

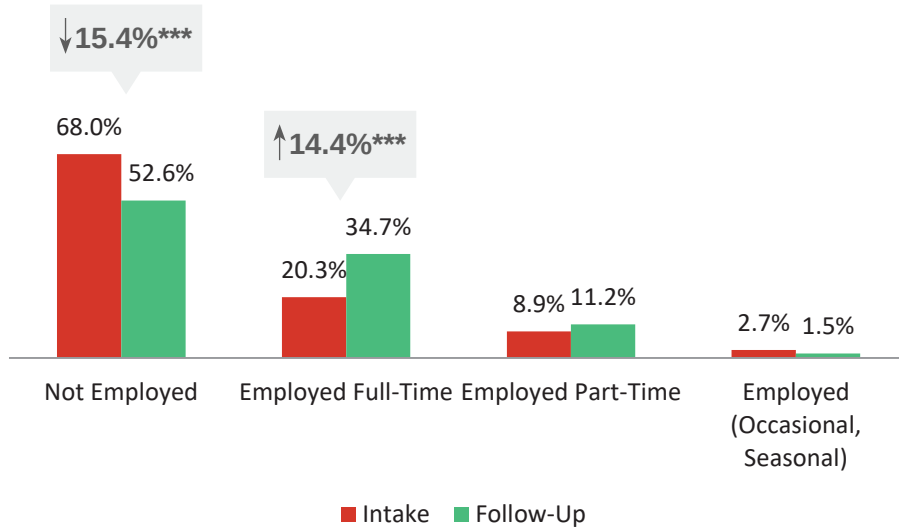
There were significant changes in current employment status from intake to follow-up (see Figure 5.5).<sup>93</sup> About two-thirds (68.0%) of clients reported they were not employed when they entered treatment, while just over half of clients (52.6%) reported they were unemployed at follow-up. This represents a 15.4% significant decrease in the number of clients who were currently unemployed. The number of clients who were employed full-time increased significantly by 14.4% from intake to follow-up (20.3% vs. 34.7%).

The percent of clients who were employed full-time increased by 14%

<sup>92</sup> Two cases had missing data for living situation at follow-up.

<sup>93</sup> Two cases had missing data for current employment at follow-up.

FIGURE 5.5. CHANGE IN CURRENT EMPLOYMENT STATUS (N = 1,275)<sup>a</sup>

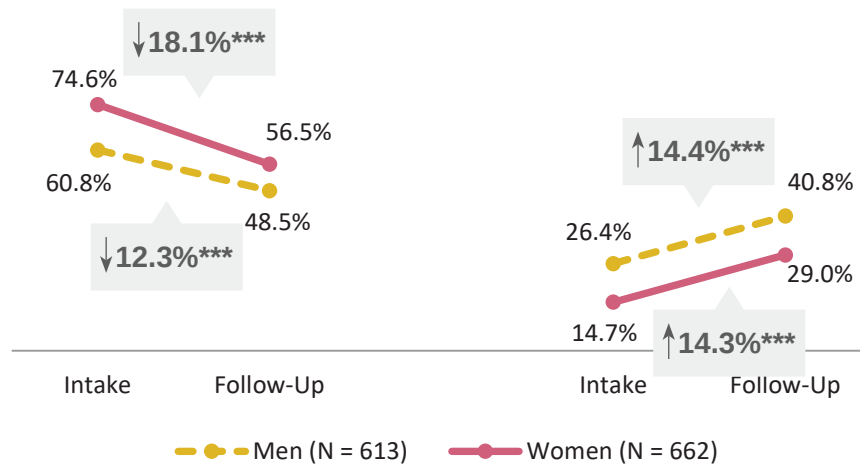


a – Significance tested with the Stuart-Maxwell Test for Marginal Homogeneity ( $p < .001$ ).  
 \*\*\* $p < .001$ .

### Gender Differences in Current Employment Status

Significantly more women reported at intake and follow-up that they were currently unemployed compared to men: 74.6% vs. 60.8% at intake and 56.5% vs. 48.5% at follow-up. The percent of clients who were currently unemployed decreased significantly for both women and men (see Figure 5.6). 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 (26.4% vs. 14.7%) and at follow-up (40.8% vs. 29.0%). Both genders, however, had significant increases in full-time employment from intake to follow-up (14.3% for women and 14.4% for men).

FIGURE 5.6. GENDER DIFFERENCES IN EMPLOYMENT STATUS AT INTAKE AND FOLLOW-UP<sup>a</sup>

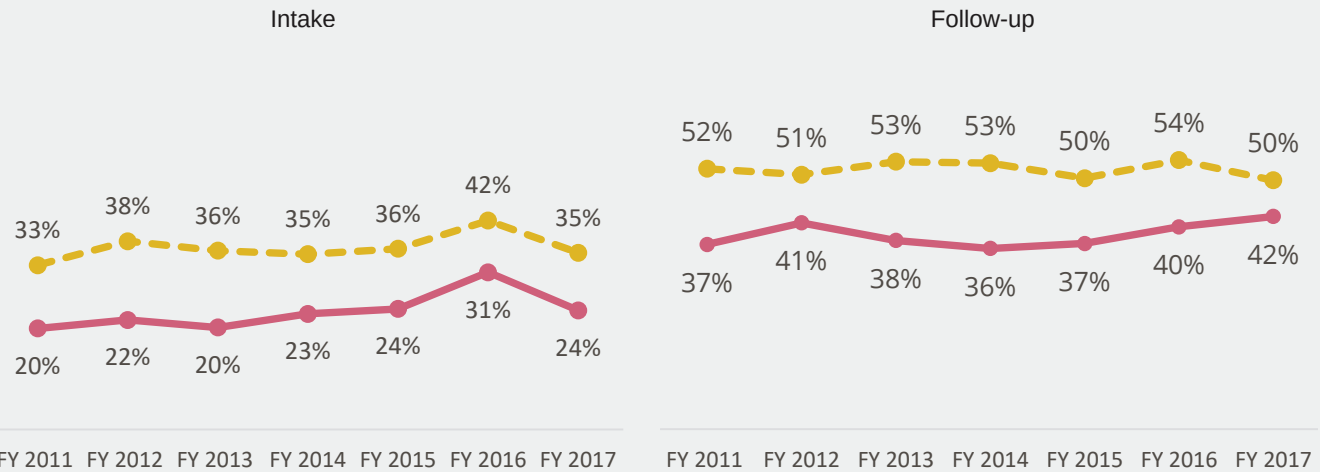


a – Significant difference by gender at intake and follow-up ( $p < .001$ ).  
 \*\*\* $p < .001$ .

## Trends in Employment

At intake in any year, less than one-third to less than one-fourth of women reported being employed (part- or full-time) compared to as much as 42% of men in FY 2016 and 35% in FY 2017. At follow-up, about half or a little over half of men reported being employed in any year compared to 42% of women, at the highest percentage, in FY 2017. While the employment gender gap at follow-up narrowed slightly in FY 2012, it increased again in FY 2013 and continued to widen in the following years until FY 2017.

FIGURE 5.7. TRENDS IN GENDER DIFFERENCES IN CLIENTS EMPLOYED AT INTAKE AND FOLLOW-UP, FY 2011-FY 2017

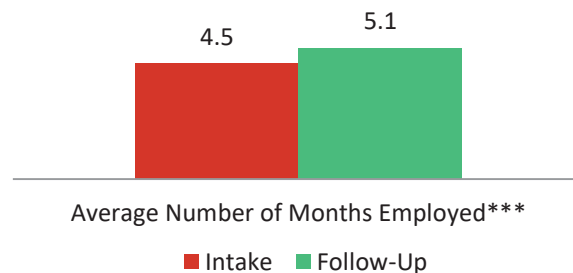


### Average Number of Months Employed

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 5.8, clients reported working significantly more months at follow-up (5.1) than at intake (4.5).

**Clients reported working significantly more months at follow-up than at intake**

FIGURE 5.8. AVERAGE NUMBER OF MONTHS EMPLOYED AT INTAKE AND FOLLOW-UP (N = 1,266)<sup>94</sup>



\*\*\*p < .001.

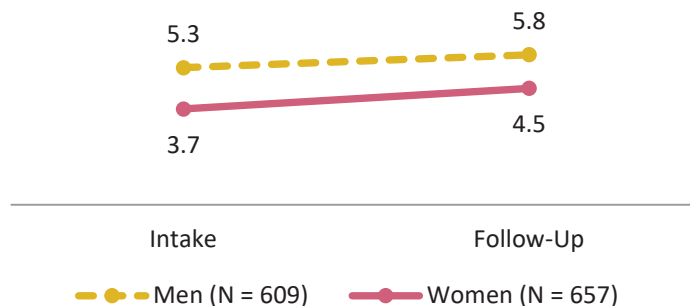
<sup>94</sup> Thirteen cases had missing data for number of months employed.



### Gender Differences in the Number of Months Employed

Men reported working significantly more months at both periods compared to women (intake, 5.3 vs. 3.7 and follow-up, 5.8 vs. 4.5). The average number of months both men and women worked increased significantly from intake to follow-up (see Figure 5.9).

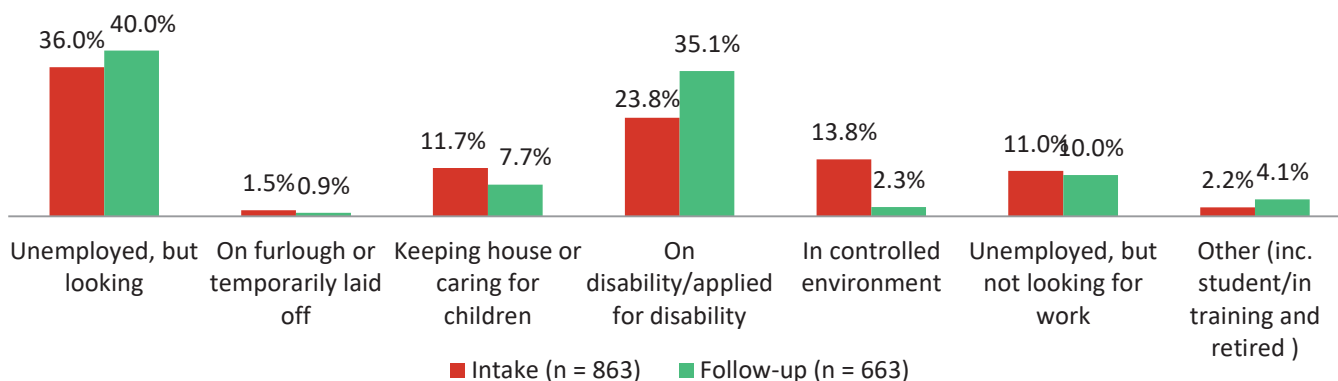
FIGURE 5.9. GENDER DIFFERENCES IN NUMBER OF MONTHS EMPLOYED AT INTAKE AND FOLLOW-UP<sup>a,b</sup>



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 ( $p < .05$ ) and women ( $p < .001$ ).

Among individuals not employed at each point, clients were asked why they were not currently employed. At intake ( $n = 863$ ), 36.0% of clients reported they were unemployed, but looking for work and 23.8% were on disability or had applied for disability. Of clients not employed at follow-up ( $n = 663$ ), 40.0% were unemployed, but looking for work and 35.1% reported they were on disability or had applied for disability.

FIGURE 5.10. REASONS FOR UNEMPLOYMENT STATUS AT EACH POINT



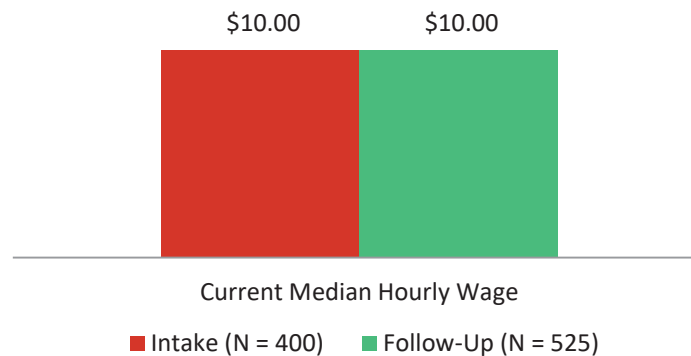
### Hourly Wage

Of those clients who were employed at intake ( $n = 410$ ),<sup>95</sup> the median hourly wage was \$10.00. Of

<sup>95</sup> Of the 410 individuals who reported being employed full-time, part-time, or seasonally at intake, 10 individuals had missing data on hourly wage because they did not know the answer, they declined to answer, or they gave a response that was an outlier ( $> \$200$  per hour).

those clients who were employed at follow-up (n = 604),<sup>96</sup> the median hourly wage was also \$10.00 (see Figure 5.11).

FIGURE 5.11. CURRENT MEDIAN HOURLY WAGE AT INTAKE AND FOLLOW-UP, AMONG THOSE WHO WORKED

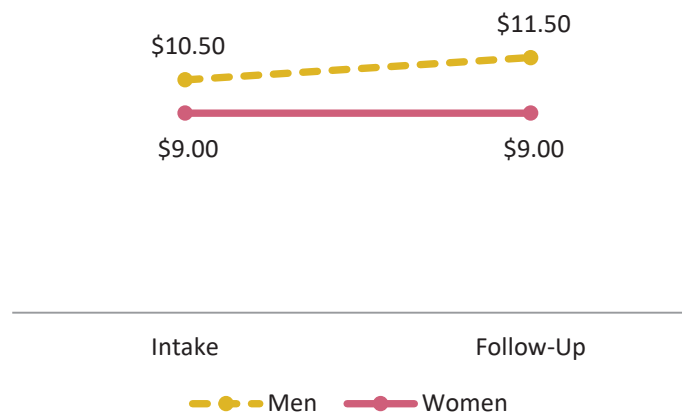


### Gender Differences in Hourly Wage

Of those clients who were employed at each period, men had significantly higher hourly wages than women (see Figure 5.12). At intake, employed women made \$0.86 for every dollar employed men made in this sample, while at follow-up, employed women made \$0.78 for every dollar that employed men made.

**At follow-up, employed women made only \$0.78 for every \$1 men made**

FIGURE 5.12. 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 ( $p < .001$ ).

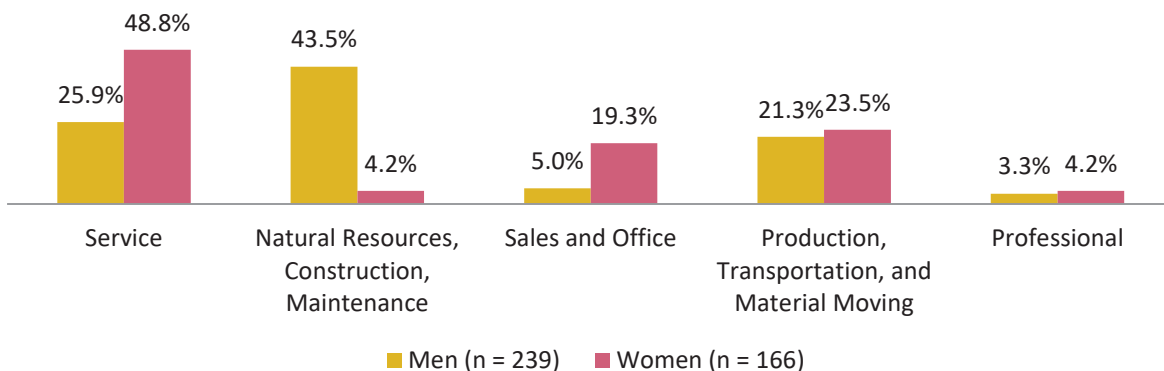
<sup>96</sup> Of the 604 individuals who reported being employed full-time, part-time, or seasonally at intake, 79 individuals had missing data on hourly wage because they did not know the answer, they declined to answer, or they gave a response that was an outlier (>\$200 per hour).

### 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.<sup>97</sup> At intake, nearly half of employed women (48.8%) had a service sector job, whereas only 25.9% of employed men had a service sector job (see Figure 5.13a). In addition, 43.5% of men reported having a job in the natural resources, construction, and maintenance sector, which has higher average wages than service sector jobs, when compared to women (4.2%). These patterns were also found at follow-up; more than half of employed women (54.4%) had a service sector job, whereas only 25.2% of employed men had a service sector job (see Figure 5.13b). Two men reported having military specific jobs at follow-up.

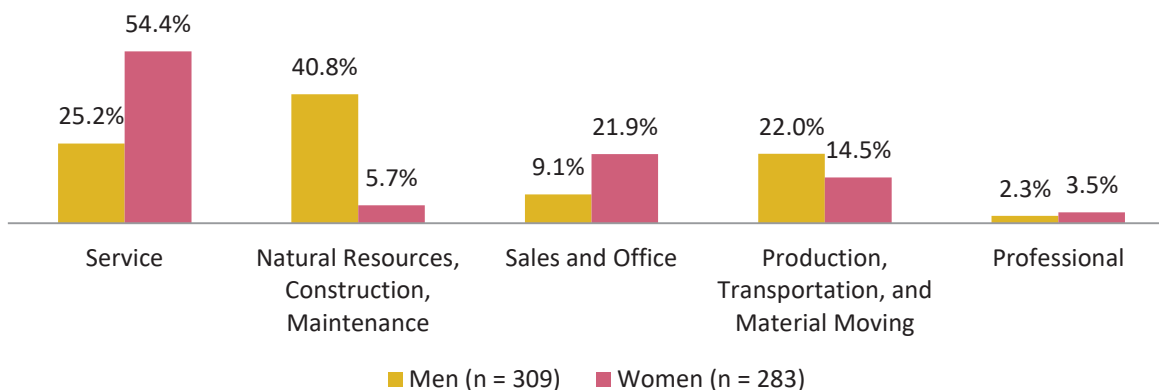
**At intake and follow-up, among employed individuals, more women had service jobs and more men had natural resources, construction, and maintenance jobs, which are typically higher paying than service jobs**

FIGURE 5.13a. AMONG EMPLOYED INDIVIDUALS, TYPE OF OCCUPATION BY GENDER AT INTAKE (N = 405)<sup>\*\*\*</sup>



<sup>\*\*\*</sup>p < .001.

FIGURE 5.13b. AMONG EMPLOYED INDIVIDUALS, TYPE OF OCCUPATION BY GENDER AT FOLLOW-UP (N = 592)<sup>\*\*\*</sup>



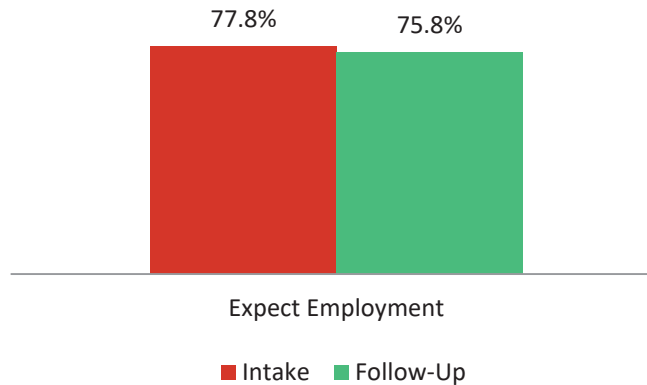
<sup>\*\*\*</sup>p < .001.

<sup>97</sup> Occupation type was asked only of individuals who reported they were currently employed at intake and at follow-up. Five individuals had missing data for occupation type at intake. Thirteen individuals had missing data on occupational type at follow-up, and two men reported having military specific jobs at follow-up (which is not presented in the graph).

## Expected Employment

Clients are asked if they expect to be employed in the next 12 months at intake and follow-up. At intake, 77.8% reported they expected to be employed, and at follow-up, 75.8% reported they expected to be employed in the next 12 months (see Figure 5.14).

FIGURE 5.14. CLIENTS WHO EXPECT TO BE EMPLOYED IN THE FUTURE AT INTAKE AND FOLLOW-UP (N=1,266)<sup>98</sup>



## Economic Hardship

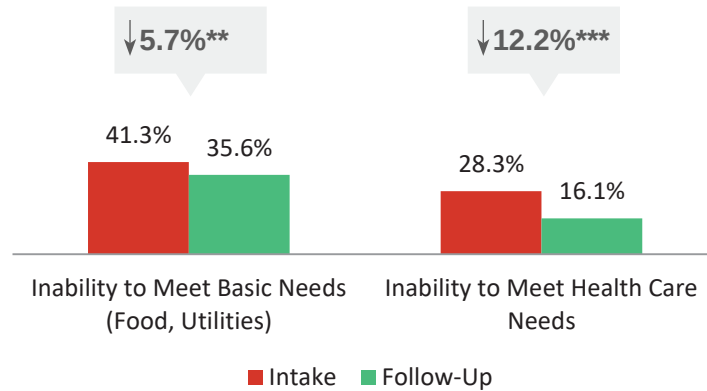
Economic hardship may be a better indicator of the actual day-to-day stressors clients face than a measure of income. Therefore, the intake and follow-up surveys included several questions about clients' ability to meet expenses for basic needs and food insecurity.<sup>99</sup> Clients were asked eight 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 (1.6; not depicted in figure).

About 2 in 5 clients (41.3%) reported at intake that they had difficulty meeting basic needs such as food, shelter or utilities (see Figure 5.15). A little more than one-quarter (28.3%) reported their household had difficulty meeting health care needs in the 12 months before clients entered treatment. The percent of individuals who reported having difficulty meeting basic needs and health care needs decreased significantly by 5.7% and 12.2%, respectively, from intake to follow-up (see Figure 5.17). Yet, at follow-up, more than one-third of clients stated they had difficulty meeting basic living needs and 16.1% stated they had difficulty meeting health care needs.

<sup>98</sup> Thirteen clients had missing data for expect employment at follow-up.

<sup>99</sup> She, P., & Livermore, G. (2007). Material hardship, poverty, and disability among working-age adults. *Social Science Quarterly*, 88(4), 970-989.

FIGURE 5.15. DIFFICULTY IN MEETING BASIC AND HEALTH CARE NEEDS FOR FINANCIAL REASONS (N = 1,273)<sup>100</sup>



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

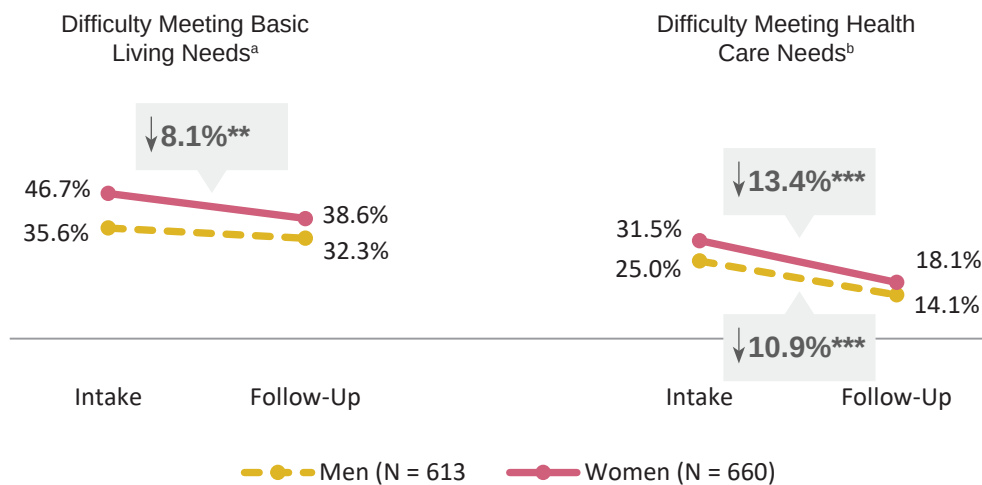
### Gender Differences in Economic Hardship

There were significant gender differences in clients' inability to meet basic living needs and health care needs at intake and follow-up (see Figure 5.16). More specifically, compared to men, more women reported having difficulty meeting their basic living needs (e.g., housing, utilities, telephone, and food) at intake and follow-up. Nearly 40% of women reported difficulty meeting basic living needs at follow-up compared to 32.3% of men. There was a significant decrease in the percent of women who reported having difficulty meeting basic living needs at follow-up.

Less than one-third of women (31.5%) reported difficulty meeting health care needs at intake compared to 25.0% of men; however, at follow-up, there was no difference by gender. The percent of women and men who reported difficulty meeting health care needs at follow-up was significantly lower than at intake.

**More women reported difficulty meeting basic living needs at intake and follow-up and more women reported difficulty meeting health care needs than men at intake**

FIGURE 5.16. GENDER DIFFERENCES IN DIFFICULTY MEETING BASIC LIVING NEEDS AND HEALTH CARE NEEDS FOR FINANCIAL REASONS



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

b – Significant difference by gender at intake (p < .05).

<sup>100</sup> Six cases had missing data on basic living needs and nine cases had missing data for health care needs items at follow-up.

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

## Trends in Difficulty Meeting Basic Living and Health Care Needs

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, 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.

FIGURE 5.17. TRENDS IN THE NUMBER OF CLIENTS REPORTING ECONOMIC DIFFICULTY IN THE PAST-12-MONTHS AT INTAKE AND FOLLOW-UP, FY 2011-FY 2017



## 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

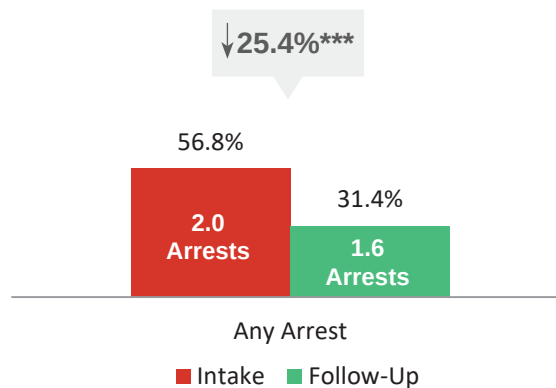
#### Arrested in the Past 12 Months

Clients were asked about their arrests in the 12 months before they entered treatment (at intake) and the past 12 months (at follow-up). Over half of clients (56.8%) reported at least one arrest in the 12 months before entering treatment (see Figure 6.1). At follow-up, 31.4% reported at least one arrest in the past 12 months.

Among those clients who reported at least one arrest in the 12 months before intake (n = 714), clients were arrested an average of 2.0 times. Among those clients who reported at least one arrest in the 12 months before follow-up (n = 395), the average number of arrests was 1.6.

**Percent of clients reporting any arrest significantly decreased 25% at follow-up**

FIGURE 6.1. CLIENTS REPORTING ARRESTS AT INTAKE AND FOLLOW-UP (N = 1,256)<sup>101</sup>



\*\*\*p < .001.

*“They were straightforward. They informed me on what was going on and what to expect. They were honest.”*

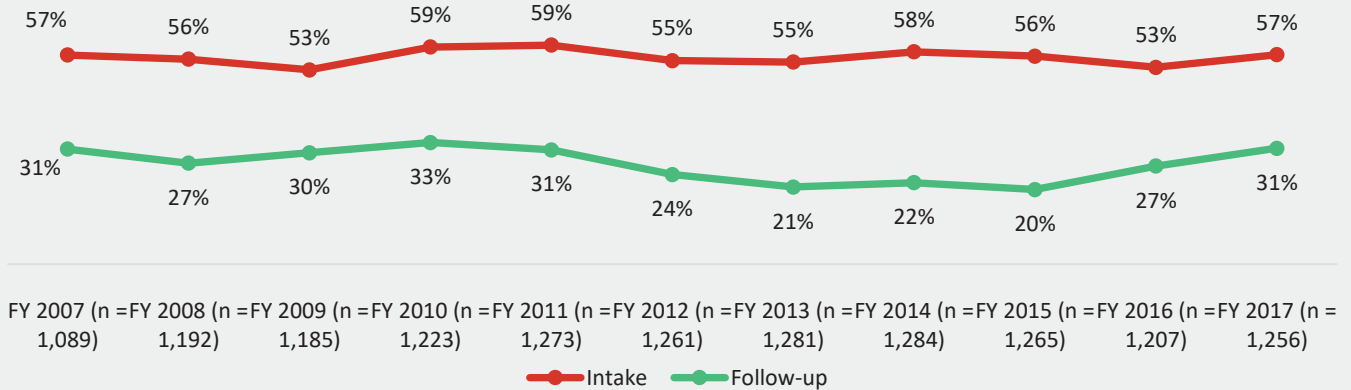
- KTOS FOLLOW-UP CLIENT

<sup>101</sup> Twenty-three cases had missing data on arrests in the 12 months before follow-up.

## Trends in Past-12-month Arrests

The percent of clients reporting an arrest in the past 12 months at intake has remained stable over the past 11 years with over half of clients reporting an arrest. Between one-quarter and one-third of clients reported an arrest at follow-up since FY 2007.

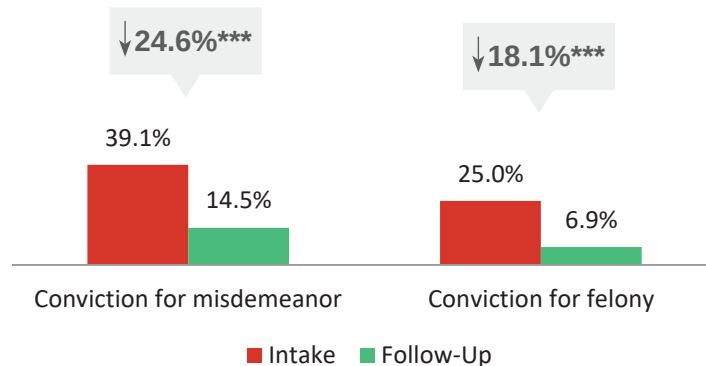
FIGURE 6.2. TRENDS IN THE PERCENT OF CLIENTS REPORTING AN ARREST IN THE PAST-12-MONTHS AT INTAKE AND FOLLOW-UP, FY 2007-FY 2017



## Convictions

Questions about the number of convictions for misdemeanors and felonies were added to the intake and follow-up surveys. Almost 2 in 5 individuals (39.1%) reported they had at least one conviction for a misdemeanor in the 12 months before entering treatment (see Figure 6.3). The percent of individuals with a conviction for a misdemeanor in the 12 months before follow-up was significantly lower at 14.5%. One-quarter of clients reported at least one felony conviction in the 12 months before intake. That percent decreased significantly to 6.9% in the 12 months before follow-up.

FIGURE 6.3. CONVICTIONS FOR MISDEMEANOR AND FELONY OFFENSES (N = 1,168)<sup>102</sup>



\*\*\*p < .001.

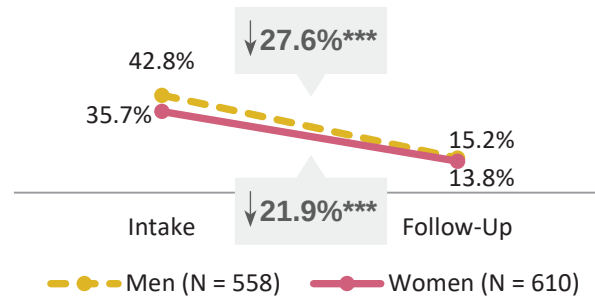
<sup>102</sup> Eighty-five cases had missing data on convictions for misdemeanor offenses at intake and 26 additional cases had missing data for convictions for misdemeanor offenses at follow-up. For convictions for felony offenses, 148 cases had missing data at intake and 27 additional cases had missing data for convictions for felony offenses at follow-up.



## Gender Differences in Convictions for Misdemeanor Offenses

Significantly more men reported having a conviction for a misdemeanor offense in the 12 months before entering treatment when compared to women (see Figure 6.4). There was a significant decrease in the percent of men and women who reported having at least one conviction for a misdemeanor offense. At follow-up, there was no difference by gender. There were no significant differences in the percent of men and women who reported having a conviction for a felony offense at intake and follow-up.

FIGURE 6.4. GENDER DIFFERENCES IN CONVICTIONS FOR MISDEMEANOR OFFENSES



a—Significant difference by gender at intake ( $p < .05$ )  
 \*\* $p < .01$ , \*\*\* $p < .001$ .

## Incarceration

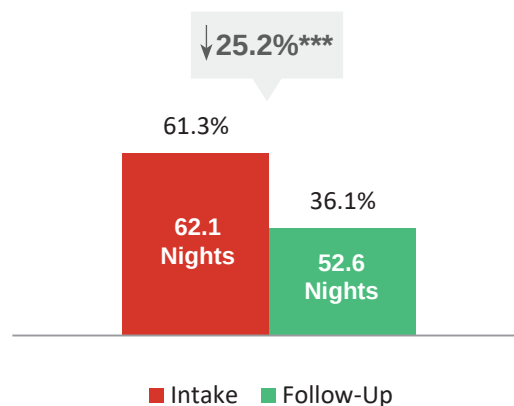
### Incarcerated in the Past 12 Months

Six in 10 clients reported spending at least one day in jail or prison in the 12 months prior to entering treatment (see Figure 6.5). At follow-up, 36.1% of clients reported spending at least one day incarcerated in the past 12 months; a significant decrease of 25.2%.

The number of clients who spent at least one day incarcerated decreased by 25%

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 ( $n = 457$ , 52.6 nights) when compared to intake ( $n = 776$ , 62.1 nights).

FIGURE 6.5. CLIENTS REPORTING BEING INCARCERATED AT INTAKE AND FOLLOW-UP (N = 1,265)<sup>103</sup>



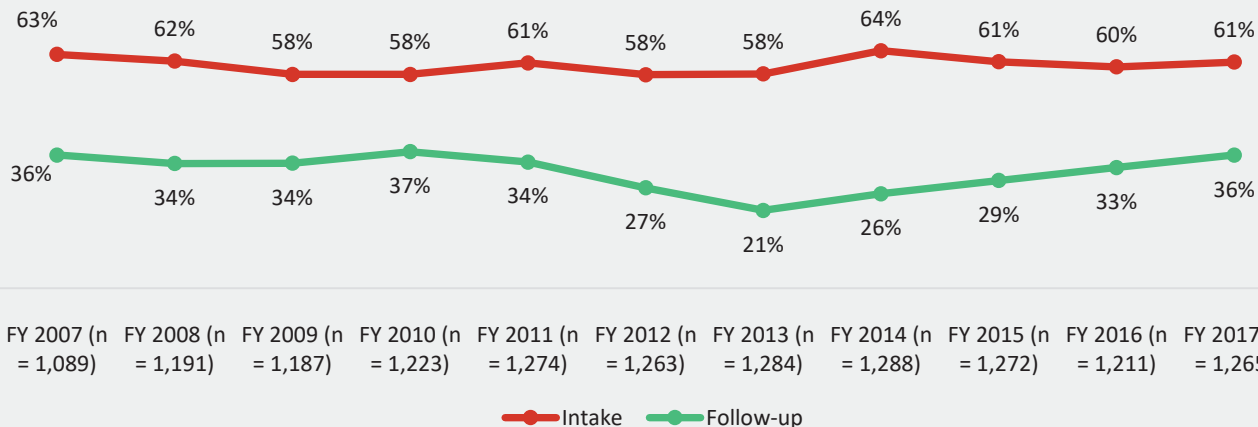
\*\*\* $p < .001$ .

<sup>103</sup> Fourteen cases 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 11 years with between 58% and 64% 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.

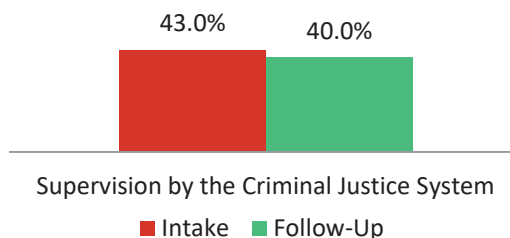
FIGURE 6.6. TRENDS IN THE PERCENT OF CLIENTS REPORTING BEING INCARCERATED IN THE PAST-12-MONTHS AT INTAKE AND FOLLOW-UP, FY 2007-FY 2017



## Criminal Justice System Supervision

The percent of clients that self-reported they were under criminal justice system supervision (e.g., probation or parole) did not change significantly from intake (43.0%) to follow-up (40.0%; see Figure 6.7).

FIGURE 6.7. CLIENTS REPORTING SUPERVISION BY THE CRIMINAL JUSTICE SYSTEM AT INTAKE AND FOLLOW-UP (N = 1,267)<sup>104</sup>



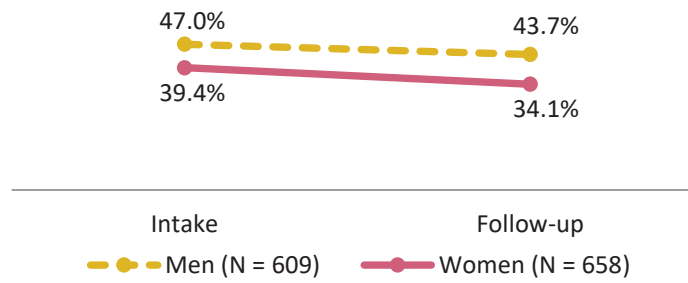
## Gender Differences in Criminal Justice Supervision

Significantly more men (47.0%) than women (39.4%) reported being under supervision by the criminal justice system in the 12 months before entering treatment (see Figure 6.8). The gender

<sup>104</sup> Twelve cases had missing data on criminal justice system supervision at follow-up.

difference remained at follow-up. The percent of men and women reporting supervision did not change significantly from intake to follow-up.

FIGURE 6.8. GENDER DIFFERENCES IN CLIENTS REPORTING CRIMINAL JUSTICE SUPERVISION<sup>a</sup>



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

## Section 7. Quality of Life

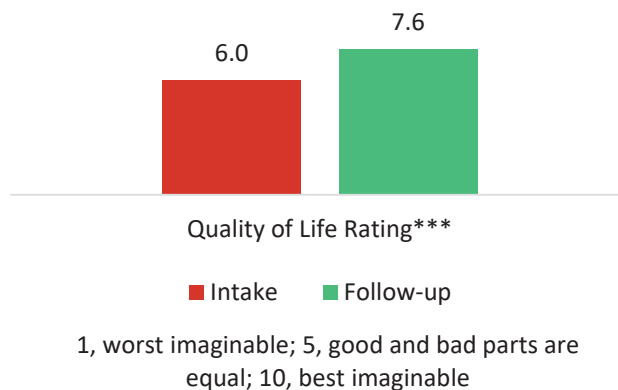
This section describes change in client quality of life and satisfaction with life during the 12-month period before entering treatment and the 12-month period before the follow-up interview. Specifically, results include changes in: (1) quality of life rating, and (2) satisfaction with life rating. 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 6.0 at intake (see Figure 7.1). The average quality of life rating significantly increased to 7.6 at follow-up.

**Average rating of quality of life significantly increased from 6.0 at intake to 7.6 at follow-up**

FIGURE 7.1. PERCEPTION OF QUALITY OF LIFE AT INTAKE AND FOLLOW-UP (N = 1,275)<sup>105</sup>



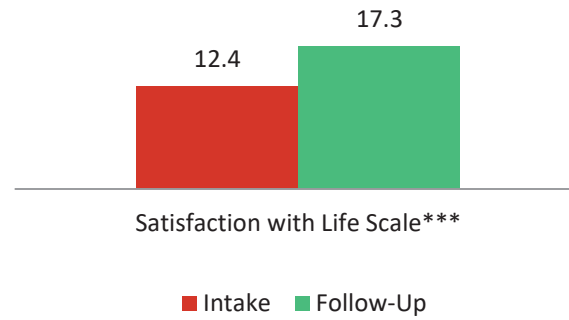
\*\*\*p < .001.

### Satisfaction with Life Rating

At both time frames, clients were presented with five statements and asked to respond how much they agreed or disagreed with each statement, using a scale with 1 representing "Strongly disagree" and 5 representing "Strongly agree".<sup>106</sup> Each statement is a positively worded aspect of high satisfaction with one's life. One statement, for example, is "In most ways my life is close to my ideal." The values assigned to each response are added to create a life satisfaction score. The lowest possible score is 5 and the highest possible score is 25. Lower scores indicate lower satisfaction and higher scores represent higher satisfaction. Figure 7.2 shows that clients' scores on the satisfaction with life scale increased significantly from intake (12.4) to follow-up (17.3).

<sup>105</sup> Four cases had missing data for the quality of life rating at follow-up.

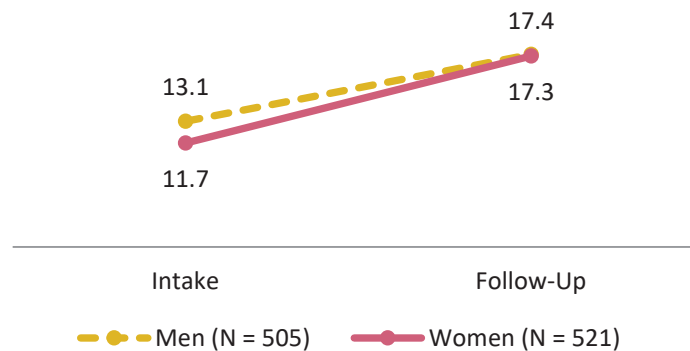
<sup>106</sup> Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment*, 49, 71-75.

FIGURE 7.2. SATISFACTION WITH LIFE AT INTAKE AND FOLLOW-UP (N = 1,026)<sup>107</sup>

\*\*\*p < .001.

### Gender Differences in Satisfaction with Life Rating

Men reported a higher rating on satisfaction with life at intake compared to women (13.1 vs. 11.7, respectively). At follow-up, ratings on satisfaction with life increased significantly for men (17.4) and women (17.3), such that there was no longer a significant difference by gender (see Figure 7.3).

FIGURE 7.3. GENDER DIFFERENCES IN SATISFACTION WITH LIFE AT INTAKE AND FOLLOW-UP<sup>a,b</sup>

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

b – Significant increase from intake to follow-up for men and women (p < .001).

*“The staff was excellent. they explained a lot and answered my questions and were understanding.”*

- KTOS FOLLOW-UP CLIENT

<sup>107</sup> In February 2018, the Satisfaction with Life Scale was omitted from the follow-up survey to accommodate other measures of quality of life. Thus, the score on the SWLS at follow-up is missing for 253 cases.

## Section 8. Client Global Functioning

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

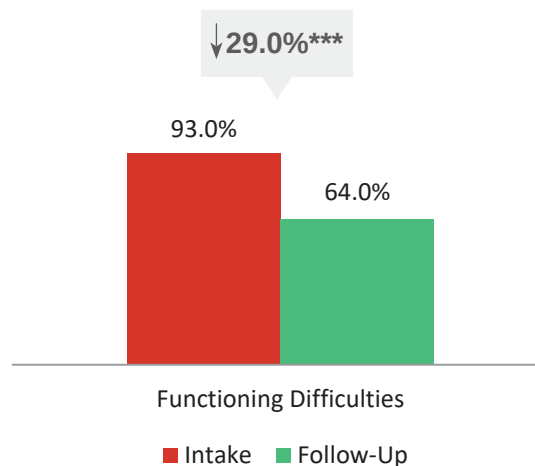
The index of global functioning is based on individuals' reports of substance use, employment, homelessness, criminal justice system involvement, suicide ideation, self-rating of overall health, recovery supports, and rating of quality of life. Table 8.1 describes the factors that compose the index.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

TABLE 8.1. ALTERNATE INDEX OF GLOBAL FUNCTIONING

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

At intake, as expected, the majority of the followed-up sample (93.0%) was classified as having functioning difficulties (see Figure 8.1). At follow-up, 64.0% had functioning difficulties—a significant decrease of 29.0%.

FIGURE 8.1. FUNCTIONING DIFFICULTIES AT INTAKE AND FOLLOW-UP (N = 1,263)<sup>108</sup>



\*\*\*p < .001

<sup>108</sup> Sixteen individuals had missing data for at least one of the variables that was used to compute the index of global functioning at follow-up and could not be assigned to a group.

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

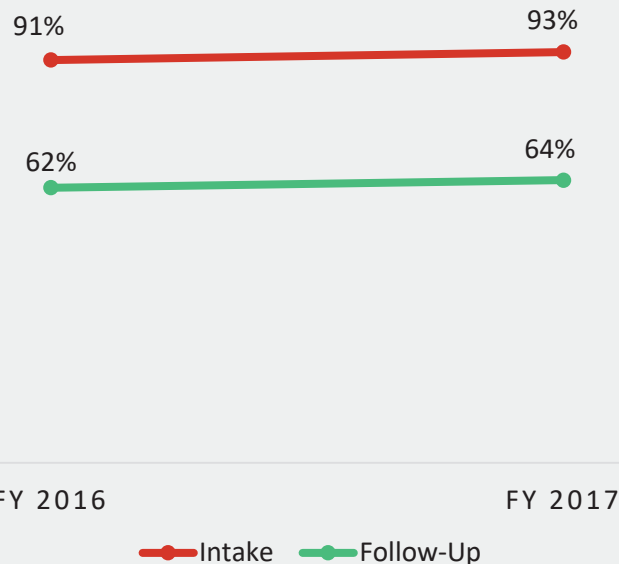
TABLE 8.2. PERCENT OF CLIENTS WITH INDICATORS OF WORSE FUNCTIONING AT FOLLOW-UP (n = 1,263)

Factor	No	Yes
Met DSM-5 criteria for moderate or severe SUD in the 12 months before follow-up ....	80.2%	19.8%
Usual employment was not employed in the 12 months before follow-up.....	69.8%	30.2%
Homeless at any point in the 12 months before follow-up.....	93.2%	6.8%
Arrested and/or incarcerated in the 12 months before follow-up.....	60.3%	39.7%
Had thoughts of suicide or attempted suicide in the 12 months before follow-up .....	92.2%	7.8%
Self-rating of overall health at follow-up was poor.....	94.6%	5.4%
Reported have no one he/she could count on for recovery support at follow-up .....	97.7%	2.3%

## Trends in Global Functioning Difficulties

Beginning in FY 2016 all of the measures that comprise the components of the global functioning index were included in the intake and follow-up surveys. There was a significant decrease from intake to follow-up each year in the percent of clients who reported they had global functioning difficulties in the past 12 months. The vast majority of individuals reported global functioning difficulties at intake. The percentage decreased to 62% in FY 2016 and 64% in FY 2017.

FIGURE 8.2. TRENDS IN FUNCTIONING DIFFICULTIES AT INTAKE AND FOLLOW-UP, FY 2016-FY 2017



To better understand which factors at entry to the program are associated with worse functioning at follow-up, each element that defined the global index of functioning at intake was entered as a predictor variable in a logistic regression model. Worse functioning at follow-up is the criterion (i.e., dependent)

variable. Four of the eight criterion variables were statistically significantly associated with worse functioning at follow-up (see Table 8.3). Specifically, controlling for the other factors, individuals who met criteria for moderate or severe SUD at intake, individuals who were not employed as their usual employment at intake, individuals who had been arrested and/or incarcerated in the 12 months before intake, and individuals with lower quality of life at intake had significantly greater odds of having worse functioning at follow-up.

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

Factors at intake	B	Wald	Odds ratio	95% CI	
				Lower	Upper
Met DSM-5 criteria for moderate or severe SUD in the 12 months before entering the program.....	.358	7.452	1.431**	1.106	1.850
Usual employment was not employed in the 12 months before entering the program .....	.384	5.673	1.468*	1.070	2.012
Homeless at any point in the 12 months before entering the program .....	.237	2.538	1.268	.947	1.698
Arrested and/or incarcerated in the 12 months before entering the program .....	.504	16.056	1.655***	1.293	2.117
Had thoughts of suicide or attempted suicide in the 12 months before entering the program.....	.095	.328	1.100	.794	1.524
Self-rating of overall health at intake was poor.....	.234	1.730	1.264	.891	1.792
Reported have no one he/she could count on for recovery support before entering the program.....	.242	.733	1.273	.732	2.214
Reported a lower quality of life before entering the program.....	.522	9.974	1.685**	1.219	2.328

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

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



## Section 9. Recovery 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.

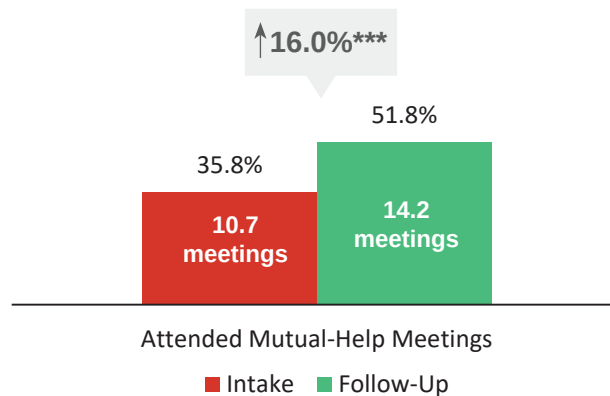
### Mutual Help Recovery Group Meeting Attendance

At intake, only 35.8% of clients reported going to mutual help recovery group meetings (e.g., AA, NA, or faith-based) in the past 30 days (see Figure 9.1). At follow-up, there was a significant increase of 16.0%, with 51.8% of clients reporting they had gone to mutual help recovery group meetings in the past 30 days.

Of those who attended self-help meetings at intake (n = 453), they reported attending an average of 10.7 meetings in the past 30 days. Those who attended self-help meetings at follow-up (n = 654) reported an average of 14.2 meetings attended in the past 30 days.

There was a 16% increase in the percent of clients reporting attending mutual help recovery groups

FIGURE 9.1. MUTUAL HELP RECOVERY GROUP ATTENDANCE AT INTAKE AND FOLLOW-UP (N=1,265)<sup>109</sup>



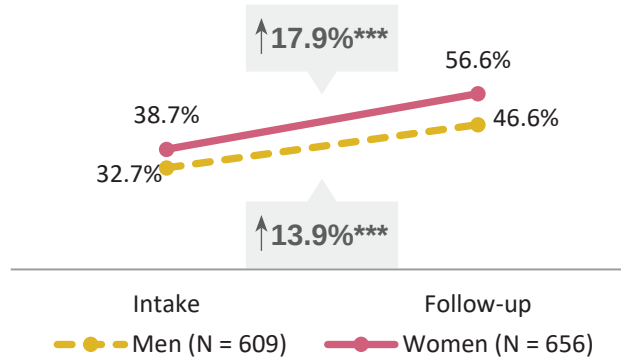
### Gender Differences in Mutual Help Recovery Group Meeting Attendance

Significantly more women than men reported attending mutual help recovery groups in the 12 months before intake and follow-up (see Figure 9.2). The percent of women and men who reported attending mutual help recovery meetings increased significantly from intake to follow-up (17.9% and 13.9% respectively).

Significantly more women than men reported attending mutual help meetings before intake and follow-up

<sup>109</sup> Fourteen cases had missing data for self-help meeting attendance at follow-up.

FIGURE 9.2. GENDER DIFFERENCES IN CLIENTS ATTENDING MUTUAL HELP MEETINGS<sup>a</sup>



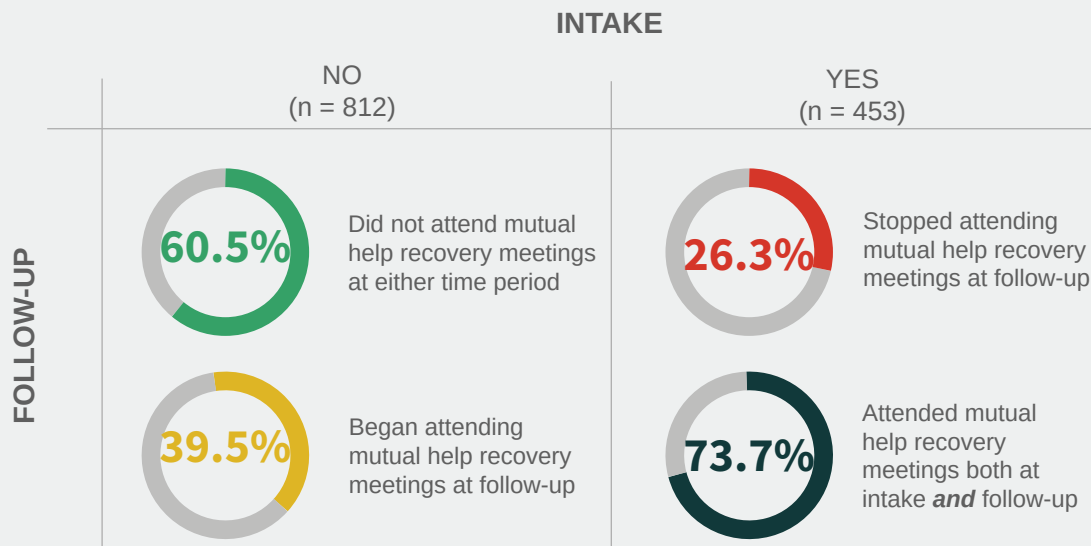
<sup>a</sup>— Significant difference by gender at intake ( $p < .05$ ) and follow-up ( $p < .001$ ).  
\*\*\* $p < .001$ .

## Taking a Closer Look at Recovery Support

A little more than one-third of clients reported attending mutual help recovery group meetings in the 30 days before entering treatment (35.8%;  $n = 453$ ). Of these clients who reported attending mutual help recovery group meetings at intake, 73.7% also attended mutual help recovery group meetings at follow-up (see Figure 9.3).

Alternatively, 39.5% of those who did not report attending mutual help recovery group meetings in the 30 days before entering treatment did attend meetings at follow-up.

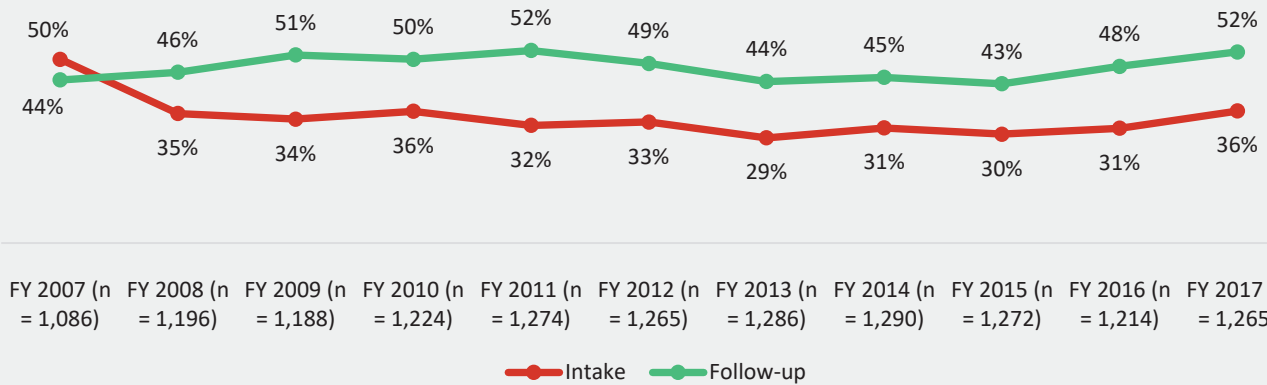
FIGURE 9.3. MUTUAL HELP RECOVERY GROUP MEETING ATTENDANCE AT INTAKE AND FOLLOW-UP BASED ON MEETING ATTENDANCE AT INTAKE



## Trends in Clients Attending Mutual Help Recovery Meetings

With the exception of FY 2007 when the number of clients reporting attending mutual help recovery group meetings was higher at intake than follow-up, more clients reported attending meetings like AA/NA at follow-up compared to intake. 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.

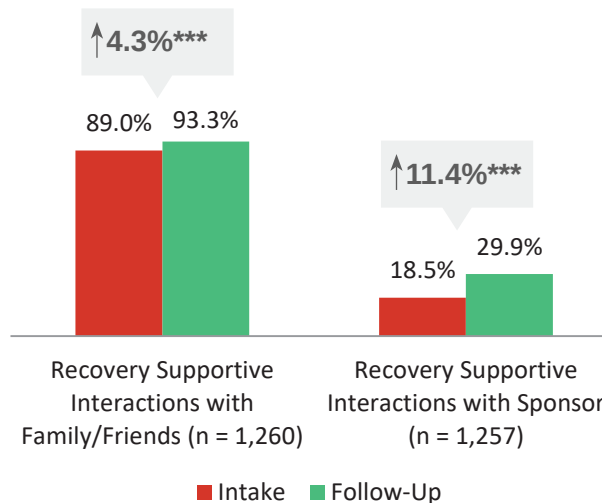
FIGURE 9.4. TRENDS IN THE PERCENT OF CLIENTS REPORTING PAST-30-DAY MUTUAL HELP RECOVERY GROUP MEETINGS AT INTAKE AND FOLLOW-UP, FY 2007-FY 2017



## 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 (see Figure 9.5). The percent of clients who reported having recovery supportive interactions with family or friends significantly increased from intake to follow-up. About 18% of clients reported being in contact with an AA/NA or other self-help group sponsor at intake. That number increased significantly to 29.9% at follow-up.

FIGURE 9.5. RECOVERY SUPPORTIVE INTERACTIONS IN THE PAST 30 DAYS<sup>110</sup>



\*\*\*p < .001.

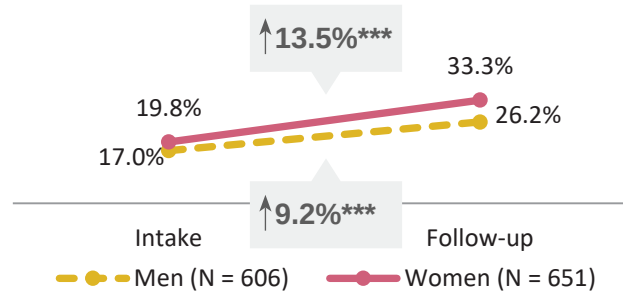
<sup>110</sup> Data on family/friends recovery supportive interactions was missing at follow-up for 19 cases and data on sponsor recovery supportive interactions was missing at follow-up for 17 cases.

## Gender Differences in Recovery Supportive Interactions with Sponsor

Significantly more women than men reported they had contact with a sponsor in the 30 days before follow-up (see Figure 9.6). The percent of women and men who had contact with a sponsor increased significantly from intake to follow-up (13.5% and 9.2% respectively).

**Significantly more women reported having contact with a sponsor at follow-up**

FIGURE 9.6. GENDER DIFFERENCES IN RECOVERY SUPPORTIVE INTERACTIONS WITH SPONSOR<sup>a</sup>



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

## 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 6.2 people at intake to 12.1 people at follow-up (see Figure 9.7).

FIGURE 9.7. AVERAGE NUMBER OF PEOPLE CLIENTS COULD COUNT ON FOR RECOVERY SUPPORT AT INTAKE AND FOLLOW-UP (N = 1,261)<sup>111</sup>



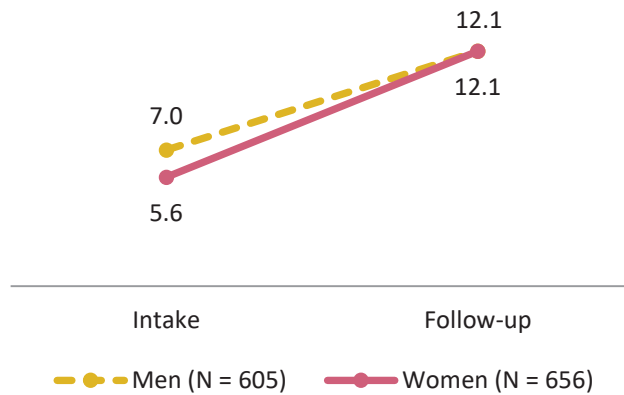
\*\*\* $p < .001$ .

## Gender Differences in Number of People Client Could Count on for Recovery Support

At intake, men reported having significantly more people they could count on for recovery support when compared to women (see Figure 9.8). The average number of people men and women said they could count on for recovery support increased from intake to follow-up.

<sup>111</sup> Data on the number of people the client could count on for recovery support at follow-up was missing for 18 cases.

FIGURE 9.8. GENDER DIFFERENCES IN AVERAGE NUMBER OF PEOPLE CLIENT COULD COUNT ON FOR RECOVERY SUPPORT<sup>a,b</sup>

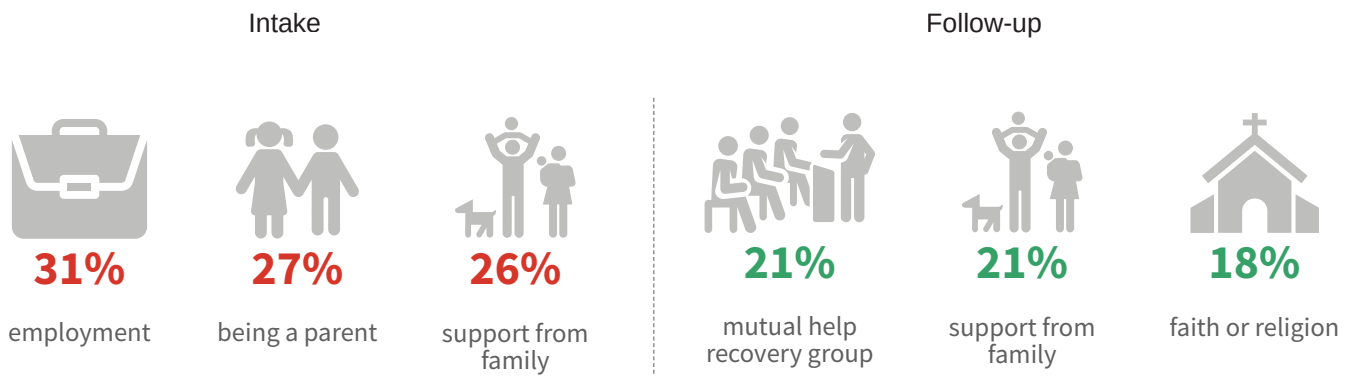


a— Significant difference by gender at intake ( $p < .01$ ).  
 b— Significant change from intake to follow-up for both men and women ( $p < .001$ ).

## 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 9.9. The most common responses at intake were employment, taking care of their children or dependents, and support from family. At follow-up, the most common responses were mutually supportive recovery groups (e.g., AA or NA or their sponsor), support from family, and their religion or faith.

FIGURE 9.9. TOP CATEGORIES CLIENTS REPORTED THAT WILL BE MOST USEFUL IN STAYING OFF DRUGS AND/OR ALCOHOL AT INTAKE AND FOLLOW-UP (N = 1,235)<sup>112</sup>



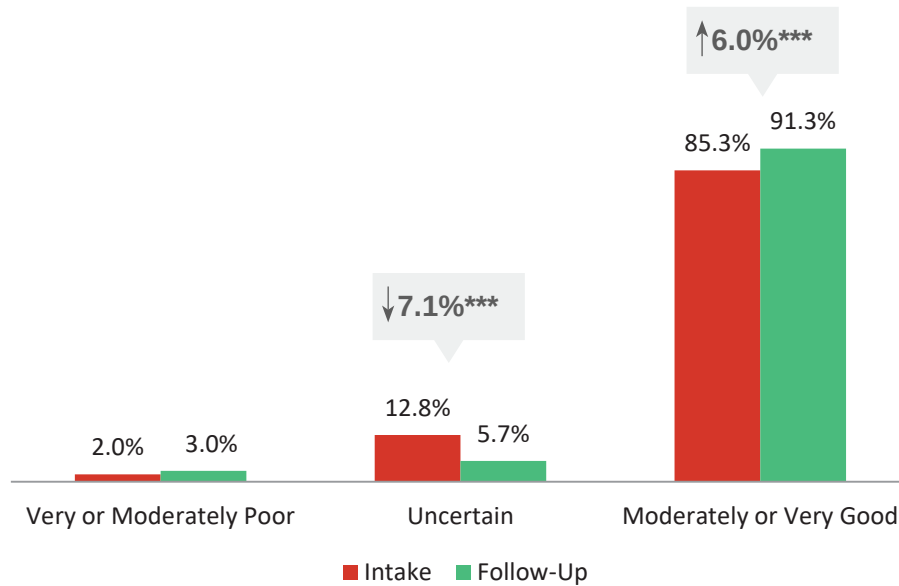
## Chances of Staying Off Drugs/alcohol

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 4.6 at follow-up, which was a significant increase (not depicted in figure). Overall, 85.3% of clients believed they had a moderately or very good chance of staying off drugs/alcohol at intake with a significant increase of 6.0% at follow-

<sup>112</sup> Forty-four individuals had missing data on what will be most useful in staying off drugs and/or alcohol at follow-up.

up (91.3%; see Figure 9.10).<sup>113</sup>

FIGURE 9.10. CLIENTS REPORTING THEIR CHANCES OF GETTING OFF AND STAYING OFF DRUGS/ALCOHOL AT INTAKE AND FOLLOW-UP (N = 1,262)<sup>a</sup>



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

<sup>113</sup> Seventeen individuals had missing data for chances of staying off drugs/alcohol at follow-up.

## Section 10. Client Satisfaction With Substance Abuse Treatment Programs

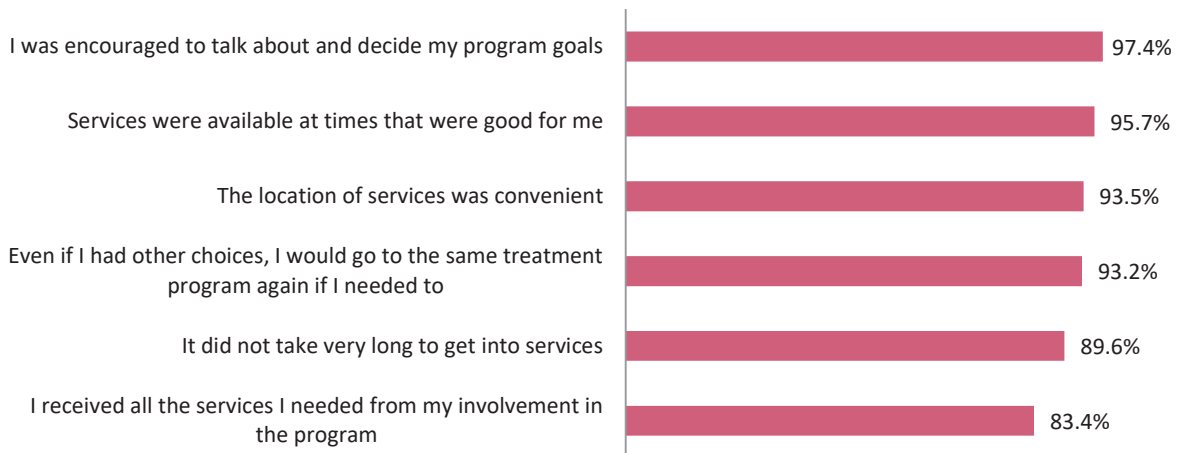
One of the important outcomes assessed during the follow-up interview is the client perception of the treatment program experience. This section describes two aspects of client satisfaction: (1) overall client satisfaction and (2) client ratings of program experiences.

### 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 (82.4%) gave a high positive rating between 8 and 10 of their satisfaction with the treatment program (not in a table).<sup>114</sup> The average rating was 8.7.

Figure 10.1 shows that KTOS clients were satisfied with the overall program services. In fact, the vast majority of clients agreed or strongly agreed that they were encouraged to talk about and decide their program goals, services were available at times that were good for them, the location of services was convenient, even if they had other choices, they would go to the same treatment program if they needed to, and it did not take very long to get into services. About 83% reported they received all the services they needed from involvement in the program.

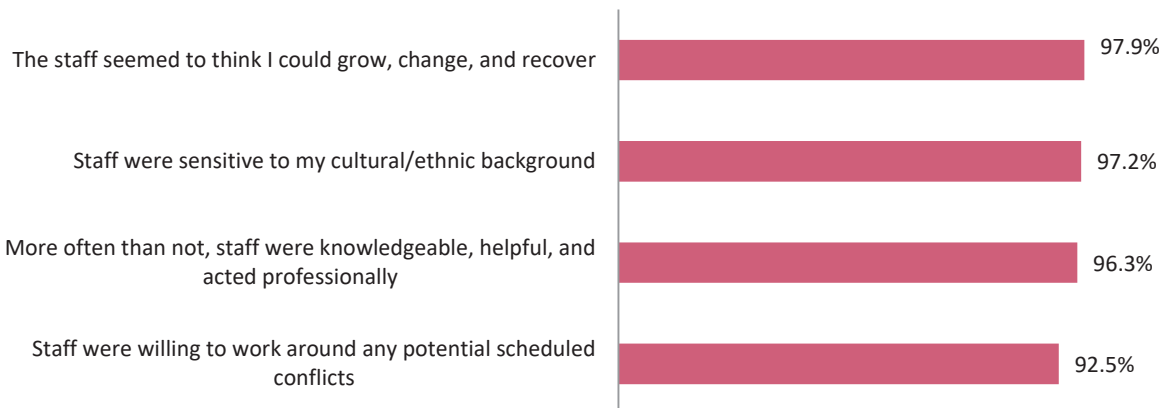
FIGURE 10.1. SATISFACTION WITH TREATMENT SERVICES (N = 1,025)



The vast majority of clients agreed that the treatment staff seemed to think they could grow, change, and recover (97.9%), were sensitive to their cultural/ethnic background (97.2%), and more often than not, staff were knowledgeable, helpful, and acted professionally (96.3%). The majority of clients (92.5%) reported that staff were willing to work around any potential scheduled conflicts (96.3%; see Figure 10.2).

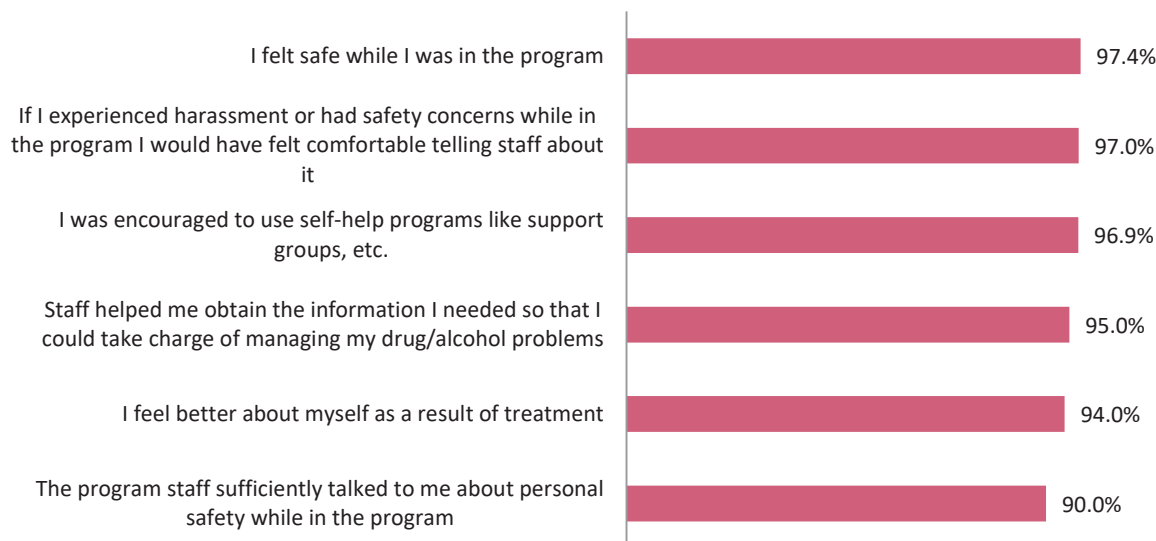
<sup>114</sup> Treatment engagement and satisfaction questions were changed toward the end of the follow-up period included in this report. Thus, for most of the items included in this section, 252 individuals were not asked these specific questions, but were asked questions that will be included in the KTOS 2020 Annual Report.

FIGURE 10.2. GENERAL SATISFACTION WITH TREATMENT STAFF (N = 1,025)



Almost all clients reported that they felt safe while they were in the program (97.4%) and that if they had experienced harassment or had safety concerns while in the program, they would have felt comfortable telling staff about it (97.0%; see Figure 10.3). The vast majority of clients reported that they were encouraged to use self-help programs like support groups, reported that staff helped them obtain information so they could take charge of managing their drug/alcohol problems, and reported they felt better about themselves as a result of treatment. Nine in ten (90.0%) clients also reported the staff sufficiently talked to them about personal safety while in the program.

FIGURE 10.3. SATISFACTION WITH PROGRAM ASPECTS ADDRESSING SAFETY AND SUBSTANCE ABUSE TREATMENT (N = 1,025)





## Section 11. Cost Savings Of Substance Abuse Treatment In Kentucky

*This section examines cost reductions or avoided costs to society after client 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. In order to accommodate these complexities at an aggregate level, data was extrapolated from a large federal study that was published in 1998 to give an estimate of the separate annual costs of alcohol abuse and drug abuse in the United States.<sup>115</sup> In 2000 the estimated costs of alcohol abuse in the United States was updated<sup>116</sup> and in 2011 the National Drug Intelligence Center updated the estimates of drug abuse in the United States for 2007.<sup>117</sup> 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. For this analysis, the national costs of alcohol abuse/dependence and the costs of drug abuse/dependence were updated from the original reports to 2017 dollars using Consumer Price Indexes (monthly data on the average change in prices paid over time in the market for goods and services released by the Bureau of Labor Statistics) from a federal reserve bank.<sup>118</sup> The estimate of the cost to society of alcohol use was \$277,616,610,024 after conversion to 2017 dollars. The estimate of the cost to society of drug use was \$228,263,034,354 after conversion to 2017 dollars.

Next, to calculate an estimate of the cost of alcohol and drug abuse per person, those updated national costs were divided by the 2017 federally derived estimates of the number of individuals (aged 12 or

<sup>115</sup> 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.

<sup>116</sup> Harwood, H. (2000). *Updating estimates of the economic costs of alcohol abuse in the United States: Estimates, update methods, and data*. Report prepared by The Lewin Group for the National Institute on Alcohol Abuse and Alcoholism.

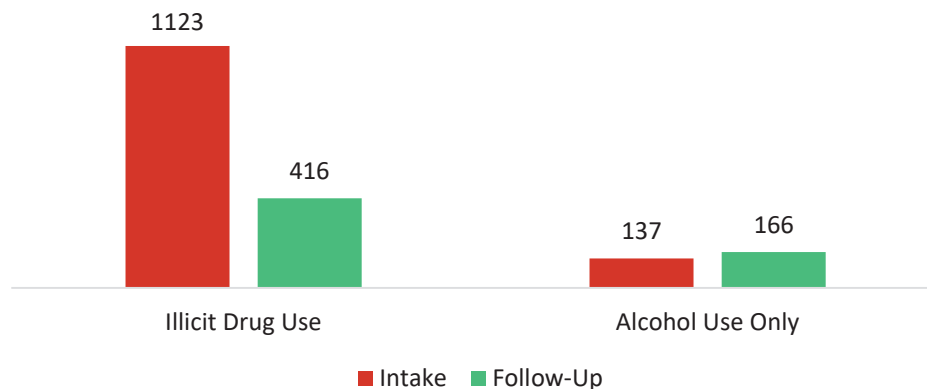
<sup>117</sup> National Drug Intelligence Center. (2011). *The economic impact of illicit drug use on American Society*. Washington, DC: United States Department of Justice.

<sup>118</sup> <http://www.minneapolisfed.org>

older) with alcohol use disorder (14.5 million) and drug use disorder (7.5 million) in the nation.<sup>119</sup> These per person costs were then applied to the follow-up sample used in this study to estimate the cost to society for the year before clients were in treatment and then for the same clients during the 12-month period after treatment intake. 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.<sup>120</sup> 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, 1,123 clients reported using illicit drugs and an additional 137 clients reported using alcohol only. At follow-up, 416 clients reported using illicit drugs and 166 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 = 1,270)



The average annual cost to society of an active drug abuser in 2017 dollars was \$30,435. The average annual cost to society of an active alcohol abuser was \$19,146. Thus, when this average annual cost per individual drug user was applied to the 1,123 clients who reported using illicit drugs at intake, the annual cost to society in 2017 was estimated at \$34,178,505. When the average annual cost per individual alcohol abuser was applied to the 137 clients who reported using alcohol only at intake, the estimated annual cost to Kentucky in 2016 was \$2,623,002. 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 \$36,801,507. By follow-up, the estimated cost of the 416 individuals who reported illicit drug use was \$12,660,960 and the estimated cost of the 166 individuals who reported using alcohol was \$3,178,236, for a total of \$15,839,196. Thus, as shown in Figure 12.2, after participation in publicly-funded substance abuse treatment, the gross cost to Kentucky taxpayers for these 1,270 clients was reduced by \$20,962,311.

<sup>119</sup> Substance Abuse and Mental Health Services Administration. (2017). Key substance use and mental health indicators in the United States: Results from the 2016 National Survey on Drug Use and Health (HHS Publication No. SMA 17-5044, NSDUH Series H-52). Rockville, MD: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration. Retrieved from <http://www.samhsa.gov/data/>.

<sup>120</sup> Seven cases had missing values for illicit drug use in the 12 months before follow-up and two additional cases had missing values for alcohol use in the 12 months before follow-up; thus, they were excluded from the cost savings analysis.

FIGURE 12.2. COST TO SOCIETY AT INTAKE AND FOLLOW-UP (AMOUNTS IN MILLIONS OF DOLLARS) (N=1,270)

$$\begin{array}{rcccl}
 \mathbf{\$36.8 \text{ million}} & - & \mathbf{\$15.8 \text{ million}} & = & \mathbf{\$21 \text{ million}} \\
 \text{COST TO SOCIETY AT} & & \text{COST TO SOCIETY AT} & & \text{GROSS DIFFERENCE IN} \\
 \text{INTAKE} & & \text{FOLLOW-UP} & & \text{COST TO SOCIETY}
 \end{array}$$

## 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 are 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,<sup>121, 122</sup> 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., 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 for those years, yielding an average cost of treatment of \$4,000 (in 2017 dollars). The average cost of \$4,000 was multiplied by 1,270, 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 \$5,080,000.

## Cost Savings

The 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: \$20,962,311/\$5,080,000, which equals \$4.13 (see Table 11.1). In other words, for every dollar spent on publicly-funded substance abuse treatment in FY 2016, there was an estimated savings of \$4.13 in costs to Kentucky taxpayers associated with alcohol and drug addiction.

<sup>121</sup> 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>.

<sup>122</sup> 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>.

TABLE 11.1. 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
<b>Drug use</b>		
Number of clients.....	1,123	416
<b>Alcohol use</b>		
Number of clients.....	137	166
<b>Total cost to society of drug and alcohol use .....</b>	<b>\$36,801,507</b>	<b>\$15,839,196</b>
<b>Gross cost difference from intake to follow-up.....</b>	<b>\$20,962,311</b>	
<b>Estimate of cost of treatment (based on average cost per client in 2012 – 2015) .....</b>	<b>\$5,080,000</b>	
<b>Off-set as net cost/benefit ratio.....</b>	<b>20,962,311/\$5,080,000</b>	
<b>Return on \$1.00 Investment.....</b>	<b>\$4.13</b>	

## Section 12. Conclusions and Implications

The KTOS 2019 Annual Follow-Up Report describes characteristics of clients who participated in state-funded substance abuse treatment programs in Kentucky in FY 2017 and completed intake interviews (N = 5,619). In addition, outcomes are presented for 1,279 clients who completed a follow-up telephone interview about 12 months later which was a 75.6% follow up rate for those selected into the statewide sample.

Overall, of the clients with intake interviews (N = 5,619), over half were male and 42.9% were female with ages 18 to 78 (average age 35 years old). Most were White and 62.5% were unemployed at intake. About 56% had been arrested and 62.7% 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 (59.4%) and self-referred (18.3%) to treatment. The majority of adults who completed an intake interview reported using illegal drugs (77.3%), alcohol (48.2%), and smoking tobacco (83.7%) in the 12 months before intake. On average, clients reported being about 15.5 years old when they first began using drugs, 14.5 years old when they had their first alcoholic drink (other than a sip) and 16 years old when they began smoking tobacco.

Of the 1,279 adults who completed a 12-month follow-up interview, 51.8% were female and the majority of follow-up clients were White. Clients in the follow-up sample were an average of 35 years old at the time of the intake interview and less than half (42.5%) reported they were married or cohabiting at intake. Over three-quarters of followed-up clients had at least one child. A little under one-quarter of follow-up clients had less than a high school diploma or GED at intake and two-thirds were unemployed. Well over half of clients who completed a follow-up interview reported having at least one chronic medical problem and 38.6% of clients reported chronic pain. In addition, only 5.9% of clients at intake had medical insurance through an employer (including spouse's employer, parent's employer, or self-employed) and 75.3% were on Medicaid. About one quarter of clients considered themselves homeless at intake.

Despite these treatment barriers, many clients showed significant improvements in substance use, health, mental health, criminal justice system involvement, employment, and satisfaction with life. 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

There was a significant decrease in self-reported illegal drug use over time, with 89.1% of clients reporting any illegal drug use at intake compared to 32.7% at follow-up. Trends in any illegal drug use show that the percent of clients reporting illegal drug use at follow-up has decreased over time with a slight increase in FY 2017.

Analysis of specific past-12-month drug use indicates more than half of clients (55.6%) reported misusing prescription opioids at intake, whereas 14.1% of clients reported prescription opioid misuse at follow-up. Nearly 1 in 5 followed-up clients also reported heroin use at intake and that number significantly decreased to 4.5%. Past-6-year trends in specific drug use at intake indicate that the percent of clients reporting non-prescribed opioid and methadone use have both decreased and 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 in the low 20s since FY 2016.

The percent of clients who met DSM-5 study criteria for no substance use (alcohol and/or drug use) disorder increased from intake to follow-up and 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.

## Mental Health

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, and suicidal thoughts or attempts decreased significantly from intake to follow-up. Both trends in depression and trends in anxiety show that the percent of clients reporting these mental health problems have increased at intake since the low of 40% for anxiety and 41% for depression in FY 2014. The percent of clients with depression at follow-up has fluctuated from 21% in FY 2014 to a high of 32% in FY 2017, whereas the percent of clients with anxiety has increased from 19% in FY 2014 to 30%-31% in FY 2015 through FY 2017.

KTOS clients' overall health and stress-related health consequences also significantly improved from intake to follow-up. Clients reported a significantly higher overall health rating and fewer days their physical health and mental health was not good in the past 30 days. The percent of clients reporting chronic pain decreased over time and clients reported significantly fewer stress symptoms at follow-up.

## Economic Status and Living Conditions

Overall, individuals' economic and living circumstances improved. Significantly fewer clients considered themselves homeless in the past 12 months before follow-up than in the 12 months before entering treatment. About 35% of clients reported being employed full-time at follow-up compared to 20% at intake. Furthermore, the average number of months clients reported working in the past 12 months increased from 4.5 months at intake to 5.1 months at follow-up. At follow-up, fewer clients reported having economic hardship in terms of difficulty meeting basic living needs (such as food, shelter, and utilities) and health care needs (i.e., doctor visits, dental visits, and prescription medications) because of financial problems.

## 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 (56.8%) reported an arrest at intake, which decreased significantly to 31.4% at follow-up. A trend report shows that the percent of clients reporting an arrest in the past 12 months has remained relatively stable at both intake (with a high of 59% in FY 2011 and a low of 53% in FY 2009) and follow-up (with a high of 33% in FY 2010 and a low of 20% in FY 2015). About 2 in 5 individuals reported they had a conviction for a misdemeanor in the 12 months before intake, and at follow-up, only 14.5% reported a conviction for a misdemeanor. One in 4 individuals reported a conviction for a felony in the 12 months before entering treatment, whereas at follow-up, only 6.9% of individuals had a conviction for a felony. The majority of clients (61.3%) reported being incarcerated at least one night in the past 12 months at intake compared to 36.1% 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 both intake (with a high of 64% in FY 2014 and a low of 58% in FY 2012) and follow-up (with a high of 36% in FY

2007 and FY 2017 and a low of 21% in FY 2013).

## Quality of and Satisfaction with Life

Clients rated their quality of life as significantly higher, on average, after participating in substance abuse treatment. In addition, clients reported being significantly more satisfied with their lives at follow-up compared to intake.

## Recovery Supports

Compared to intake (35.8%), significantly more individuals reported they had attended mutual help recovery group meetings in the past 30 days at follow-up (51.8%). Also at follow-up, clients reported having significantly more people they could count on for recovery support. Significantly more individuals reported they had recovery supportive interactions with a sponsor at follow-up than at intake. About 91% of clients stated they thought they had a moderately or very good chance of staying off drugs or alcohol at follow-up. Clients reported that mutual help recovery groups, support from their families, and their faith or religion would be most useful in staying off drugs/alcohol at follow-up.

## Global Functioning

The index of global functioning measures multiple domains of clients' functioning: substance use severity, employment, homelessness, criminal justice system involvement, suicide ideation, self-rating of overall health, recovery supports, and quality of life. The vast majority of clients had worse functioning at intake, with a significant decrease in the percent of clients with worse functioning at follow-up. The two greatest contributors to individuals being classified as having worse functioning at follow-up were unemployment and criminal justice system involvement. In a multivariate analysis, controlling for other factors, individuals who met criteria for moderate or severe SUD at intake, individuals who were not employed as their usual employment at intake, individuals who had been arrested and/or incarcerated in the 12 months before intake, and individuals with lower quality of life at intake had significantly greater odds of having worse functioning at follow-up.

## Program Satisfaction

Client ratings of the treatment services they received were high (an average of 8.7 out of 10). Specifically, the vast majority of clients agreed that treatment helped them get better and feel better about themselves, they were encouraged to talk about and decide their program goals, services were available at times that were good for them, the location of services was convenient, and they received all the services they needed from the program. Furthermore, the majority of clients reported positive beliefs about the program staff, such as staff seemed to think they could grow, change, and recover, staff were sensitive to their cultural/ethnic background, staff were knowledgeable, helpful, and acted professionally. Finally, the vast majority of individuals agreed or strongly agreed that safety concerns were addressed well by program staff.

## 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

When 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 5 years, the percent of clients reporting methamphetamine use has increased from 6% in FY 2012 to 34% in FY 2017. Furthermore, the percent of clients who reported at intake that they had ever injected drugs in their lifetime was 34.7% for the intake sample and 39.7% for the follow-up sample.

Even though there were significant decreases in substance use and severity of substance use problems, it is worth noting that nearly one-third of KTOS clients reported using illegal drugs and a little more than one-fourth of clients reported using alcohol in the 12 months before follow-up.

## Smoking

Smoking rates remained very high for KTOS clients with 86.2% reporting smoking in the 12 months before follow-up. 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.<sup>123</sup> 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.<sup>124</sup>

## 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.<sup>125</sup> Those with co-occurring substance use and mental health disorders often have medication noncompliance, relapse, homelessness, and suicidal behavior.<sup>126</sup> Overall, there was a significant decrease in mental health problems from intake to follow-up, however, about 1 in 3 individuals were still reporting symptoms of depression and almost one-third were still reporting symptoms of anxiety at follow-up. Further, trend reports show that the percent of clients reporting depression and anxiety at follow-up have been at similar levels for the past 3 years

## Chronic Pain

At follow-up, nearly one-quarter of KTOS clients reported persistent chronic pain that lasted at least 3 months. Individuals with persistent or chronic pain are more likely to report anxiety, depression, lower overall health ratings<sup>127</sup> and substance use disorders.<sup>128</sup> Self-medication can be problematic in

<sup>123</sup> Baca, C., & Yahne, C. (2009). Smoking cessation during substance abuse treatment: What you need to know. *Journal of Substance Abuse Treatment*, 36, 205-219.

<sup>124</sup> 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.

<sup>125</sup> <https://www.samhsa.gov/treatment#co-occurring>

<sup>126</sup> 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>

<sup>127</sup> 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

<sup>128</sup> Ballantyne, J. & LaForge, S. (2007). Opioid dependence and addiction during opioid treatment of chronic pain. *Pain*, 129(3), 235-255.



substance abuse treatment program participants who report chronic pain.<sup>129</sup> Of those KTOS clients who reported misusing prescription opioids and experiencing chronic pain at intake (n = 266), 43.6% (n = 116) reported chronic pain in the past 12 months at follow-up.

## 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.<sup>130</sup> In this year's report, there were significant decreases in the percent of individuals who reported having difficulty meeting basic living needs (such as paying for rent/mortgage, utilities, phone, or food) and health care needs for financial reasons from intake to follow-up. The finding of a significantly lower percentage of individuals who experienced economic hardship is good news. While the percent of participants reporting difficulty meeting basic needs for financial reasons decreased over time, 36% of clients still reported having difficulty meeting basic living needs at follow-up. Similarly, while the number of clients reporting current full-time employment increased significantly, 53% 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.<sup>131</sup> 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.

## Global Functioning

Even though there were significantly fewer individuals who had worse functioning at follow-up when compared to intake, the majority of individuals were still classified as having worse functioning. The greatest contributors to individuals being classified as having worse functioning were unemployment and arrests and/or incarceration in the follow-up period.

## Gender Differences on Targeted Factors

There were several gender differences in targeted factors found in this report.

Significantly more women than men reported using illegal drugs at intake. Specifically, significantly more women reported they had used opioids, heroin, CNS depressants, and cocaine in the past 12 months at intake. More women also reported opioid, heroin, CNS depressant, and other stimulant use in the past 30 days at intake. More men reported past-12-month alcohol use, alcohol use to intoxication, and binge drinking at both intake and follow-up compared to women. Significantly more women reported smoking tobacco at intake and follow-up while significantly more men reported using smokeless tobacco at intake and follow-up.

More women than men reported mental health symptoms at intake and follow-up including depression, generalized anxiety, and comorbid depression and anxiety. Of those who met study criteria for anxiety at intake, women reported a higher number of anxiety symptoms than men. Also, women rated their overall health status as lower, on average, at intake when compared to men. They reported their physical health was not good significantly more days than men at intake and their mental health was not good significantly more days than men at intake and follow-up. Furthermore, women reported

<sup>129</sup> 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.

<sup>130</sup> <http://blog.samhsa.gov/2012/03/23/definition-of-recovery-updated/>

<sup>131</sup> 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.

significantly more days their poor physical or mental health had kept them from doing their usual activities at intake. Women also reported more stress symptoms at intake and follow-up. Further, significantly more women than men reported they had used substances to reduce or manage stress at intake and follow-up. Women with co-occurring mental health and substance use disorders have poorer treatment outcomes and high rates of program dropout.<sup>101</sup> Men and women have been shown to use different coping styles and thus may benefit from separate groups to plan recovery support. Significantly more women than men reported being homeless at the time of intake. Significantly more women reported unemployment at both intake and follow-up while significantly more men reported they had full-time employment at intake and follow-up. Among individuals who were currently employed, men had significantly higher median hourly wages than women at both intake and follow-up. At intake, employed women made only \$0.86 for every dollar employed men made and by follow-up the gap in hourly wages remained large with employed women making only \$0.78 for every dollar employed men made. Significantly more women than men reported difficulty in accessing basic living needs for financial reasons at intake and follow up. In addition, significantly more women reported having difficulty meeting health care needs in the 12 months before intake.

Even though women made significant gains in their employment by follow-up, they still lagged behind men in their economic standing. 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 intake and follow-up, about half to more than half of employed women had a service sector job, whereas around than one-quarter of employed men had a service sector job. In addition, at intake and follow-up about 40% of employed men (43.5% and 40.8%, respectively) reported having a job in the natural resources, construction, and maintenance sector--which has higher average wages than service sector jobs--when compared to women (4.2% and 5.7%, respectively).

Overall, a higher percentage of men reported being involved with the criminal justice system in the 12 months before entering treatment compared to women. Specifically, more men reported they had a conviction for a misdemeanor and were under criminal justice supervision (e.g., probation or parole) at intake.

## 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 randomly 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, education, physical health, mental health problems, and substance use severity). When those 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, physical health, mental health, substance use, and severity of substance use. 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 economic situation, physical health, mental health, and substance use 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 with regard to sensitive topics, such as illegal behavior and stigmatizing issues such as mental health and substance use. However, recent research has supported findings about the reliability and accuracy of individuals' reports of their substance use.<sup>132, 133, 134, 135</sup> Earlier studies found that the context of the interview influences reliability.<sup>136</sup> 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.

Collecting all of 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 10 to help interpret the findings.

## Conclusion

This KTOS 2019 report provides a valuable examination of client 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 of 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, satisfaction with 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 taking into account the cost of publicly-funded treatment, showed a significant estimated cost savings.

<sup>132</sup> 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.

<sup>133</sup> 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.

<sup>134</sup> Rutherford, M. J., Cacciola, J. S., Alterman, A. I., McKay, J. R., & Cook, T. G. (2000). Contrasts between admitters and deniers of drug use. *Journal of Substance Abuse Treatment*, 18(4), 343-348.

<sup>135</sup> 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.

<sup>136</sup> 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.

## 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.<sup>137</sup> 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 5,619 clients who completed an intake survey, 2,897 (51.6%) agreed to be contacted for the follow-up study. 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 randomly selecting clients by intake month ( $n = 2,020$ ).

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 2,020 clients included in the follow-up sample, 329 were ineligible for participating in the follow-up survey for a variety of reasons (e.g., incarcerated, in residential treatment, deceased), which left 1,691 clients eligible for follow-up. Of these clients, 1,279 completed a follow-up survey (see Table AA.1). Thus, the follow-up rate was 75.6%. The remaining clients either (1) refused (0.8%) to complete the follow-up survey, or (2) were never successfully contacted, or if contacted they never completed the follow-up survey (23.6%).

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<sup>137</sup> Logan, TK, Cole, J., Miller, J., Scrivner, A., & Walker, R. (2016). *Evidence Base for the Kentucky Treatment Outcome Study (KTOS) Assessment and Methods*. Lexington, KY: University of Kentucky, Center on Drug and Alcohol Research.

TABLE AA.1. FINAL CASE OUTCOMES FOR FOLLOW-UP EFFORTS (N = 2,020)

	Number of Records	Percent
Ineligible for follow-up survey .....	329	16.3%
	<b>Number of cases eligible for follow-up (N = 1,691)</b>	
Completed follow-up surveys .....	1,279	
Follow-up rate ((the number of completed surveys/ the number of eligible cases)*100)..		75.6%
Expired cases (i.e., never contacted, did not complete the survey during the follow-up period) .....	399	
Expired rate ((the number of expired cases/eligible cases)*100).....		23.6%
Refusal .....	13	
Refusal rate (the number of refusal cases/eligible cases)*100) .....		0.8%
Cases accounted for (i.e., records ineligible for follow-up + completed surveys + refusals).....	1,621	
Percent of cases accounted for ((the number of cases accounted for/total number of records in the follow-up sample)*100 .....		80.2%

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 329 cases that were ineligible for follow-up, the majority (74.2%) were ineligible because they were incarcerated during the follow-up period. In other words, of the 2,020 individuals selected into the sample to be followed up, 12.1% were ineligible for participation at the time of follow-up because they were incarcerated. About 14.0% were ineligible because they were in residential treatment at the time of follow-up and 7.3% were ineligible because they were deceased. Other reasons a small number of clients were ineligible for follow-up were hospitalization, they did not remember participating in the intake interview, or had an unspecified health condition.

TABLE AA.2. REASONS CLIENTS WERE INELIGIBLE FOR FOLLOW-UP (N = 329)

	Number	Percent
Incarcerated.....	244	74.2%
In residential treatment.....	46	14.0%
Deceased .....	24	7.3%
Did not remember intake .....	5	1.5%
Hospitalized.....	3	0.9%
Recently in previous sample.....	3	0.9%
Health condition.....	2	0.6%

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<sup>138</sup> (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 clients who completed a follow-up survey were female compared to clients who 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. The average client age for both groups was in the mid-30s. 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 = 4,340	YES n = 1,279
<b>Age</b> .....	35.3 years	34.7 years
<b>Gender**</b>		
Male.....	59.8%	48.2%
Female.....	40.2%	51.8%
<b>Race</b>		
White .....	92.3%	92.3%
African American .....	5.7%	5.9%
Other or Multiracial .....	2.0%	1.8%
<b>Marital status</b>		
Never married.....	27.9%	27.8%
Married/ or cohabiting.....	43.4%	44.2%
Separated or divorced .....	26.6%	26.0%
Widowed.....	1.3%	2.1%

\*\*p < .001.

<sup>138</sup> Significance is reported for p < .01 because of the large sample size.

## Socioeconomic Indicators

The vast majority 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). Ten percent of clients who did not complete a follow-up reported their usual living arrangement was in jail or prison compared to 7.6% of clients who did complete a follow-up. A small number of clients reported their usual living situation was in a residential treatment, sober living home, or in a shelter or on the streets.

At the time of entering treatment, almost one-fourth of clients considered themselves to be homeless, with most saying they 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 (see Table AB.2).

TABLE AB.2 LIVING SITUATION OF CLIENTS BEFORE ENTERING TREATMENT

	FOLLOWED UP	
	NO n = 4,340	YES n = 1,279
<b>Usual living arrangement in the 12 months before entering the program</b>		
Own or someone else's home or apartment.....	84.3%	86.1%
Residential treatment, Recovery Center, sober living home, personal care home, hospital, school or work dormitory.....	2.3%	3.0%
Jail or prison .....	10.3%	7.6%
Shelter, hotel/motel, or on the street.....	3.0%	3.2%
Other.....	0.0%	0.2%
<b>Considers Self To Be Currently Homeless* .....</b>	22.0%	26.5%
Why the individual considers himself/herself to be homeless .....	(n = 955)	(n = 339)
Staying temporarily with friends or family .....	56.4%	57.5%
Staying on the street or living in car .....	27.8%	25.4%
Staying in a shelter .....	9.4%	9.4%
Staying in a hotel or motel.....	2.0%	2.4%
Incarcerated and does not have a place to stay after release.....	1.5%	1.2%
Staying in residential treatment, recovery center, or hospital .....	1.5%	1.5%
Other reason.....	1.5%	2.7%

\*p < .01.

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. There was no significant difference in

the number of clients who 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 by follow-up status. Significantly more clients who completed a follow-up interview reported they were unable to receive needed health care for financial reasons compared to clients who did not complete a follow-up interview.

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

	FOLLOWED UP	
	NO n = 4,340	YES n = 1,279
Had difficulty meeting basic living needs (e.g. shelter, utilities, phone, food).....	37.4%	41.3%
Had difficulty obtaining needed health care for financial reasons** .....	21.8%	28.2%

\*\*p < .001.

Table AB.4 describes clients' level of education when entering treatment. A higher percentage of clients who completed a follow-up interview reported they had some vocational school to higher levels of education at intake when compared to clients who did not complete a follow-up interview.

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

	FOLLOWED UP	
	NO n = 4,340	YES n = 1,279
<b>Highest level of education completed**</b>		
Less than GED or high school diploma .....	26.9%	23.9%
GED or high school diploma.....	42.7%	38.5%
Vocational school to graduate school.....	30.4%	37.5%

\*\*p < .001.

There were no differences in number of months clients were employed in the 12 months before entering treatment by follow-up status. Nearly 40% of clients reported working 0 months in the 12 months before entering treatment (see Table AB.5). About 20% of clients reported working 1 to 5 months and over one-third reported working 6 months or more. Of the clients who reported working at least one month either part-time or full-time in the 12 months before entering treatment, the average number of months worked was 7.5 for clients who were not followed up and 7.3 for clients who were followed up.

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

	FOLLOWED UP	
	NO n = 4,340	YES n = 1,279
<b>Employment</b>		
Percent of clients who reported working for:		
0 months .....	39.8%	38.8%
1 to 5 months .....	20.5%	21.7%
6 months or more.....	39.7%	39.5%
Among those who were employed:	n = 2,611	n = 783
Average # of months employed in the past 12 months .....	7.5 months	7.3 months



## Criminal Justice System Involvement

More than 40% of clients were under supervision by the criminal justice system when they entered treatment (e.g., probation or parole), with no significant difference by follow-up status (see Table AB.6).

Over half of clients in the followed-up and not followed-up groups reported they had been arrested in the 12 months before entering treatment. Of the clients who reported they were arrested, followed-up and non-followed up clients reported an average of 2.0 arrests in the 12 months before entering treatment. There were no significant differences in the number of clients who reported being incarcerated at least one day in the past 12 months before entering treatment (see Table AB.6). Among the clients who were incarcerated at least one night, the average incarceration time in the 12 months before entering treatment was 73.8 days for clients who were not followed up, which was significantly higher than the 61.7 average number of days for clients who were followed up.

TABLE AB.6. CRIMINAL JUSTICE SYSTEM INVOLVEMENT WHEN ENTERING TREATMENT

	FOLLOWED UP	
	NO n = 4,340	YES n = 1,279
Currently under supervision by the criminal justice system.....	44.2%	43.2%
Arrested for any charge in the 6 months before entering treatment.....	56.2%	57.1%
<b>Of those arrested</b>	n = 2,439	n = 730
Average number of arrests.....	2.0	2.0
Incarcerated in the 6 months before the program .....	63.0%	61.4%
<b>Of those incarcerated</b>	(n = 2,736)	(n = 785)
Average number of nights in jail .....	73.8	61.7

\*p < .01.

## Physical Health

Physical health measures were included in the intake survey (see Table AB.7). There were significant differences between those clients who were not followed-up and those that were followed-up. Significantly more clients who were in the follow-up sample (38.7%) reported they had chronic pain than clients who were not followed-up (34.2%).

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). Significantly more clients who were followed up reported they had been told by a doctor that they had at least one of the chronic medical problems compared to clients who were not followed up (55.8% vs. 51.3%).

TABLE AB.7. PHYSICAL HEALTH STATUS AT INTAKE

	FOLLOWED UP	
	NO n = 4,340	YES n = 1,279
Chronic pain (lasting at least 3 months)* .....	34.2%	38.7%
Ever told by a doctor that client had one of the 12 chronic medical problems listed* .....	51.3%	55.8%

\*p &lt; .01.

## 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.8). 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. 45.3%.

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: 51.4% 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.8. PERCENT OF CLIENTS REPORTING MENTAL HEALTH PROBLEMS IN THE 12 MONTHS BEFORE ENTERING TREATMENT

	FOLLOWED UP	
	NO n = 4,340	YES n = 1,279
Depression** .....	45.3%	54.7%
Generalized Anxiety** .....	43.9%	51.4%
Suicidality (e.g., thoughts of suicide or suicide attempts)** .....	14.6%	19.2%

\*\*p &lt; .001.

## Substance Use

Use of illegal drugs in the 12 months before entering treatment is presented by follow-up status in Table AB.9. Significantly more clients in the follow up sample reported using most of the illegal drug classes when compared to clients who were not followed up: marijuana, illicit use of prescription opioids,

stimulants, tranquilizers/sedatives/benzodiazepines, non-prescribed buprenorphine-naloxone (bup-nx), cocaine, heroin, non-prescribed methadone, hallucinogens, and barbiturates.

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

TABLE AB.9. PERCENT OF CLIENTS REPORTING ILLEGAL DRUG USE IN THE 12 MONTHS BEFORE ENTERING TREATMENT<sup>139</sup>

	FOLLOWED UP	
	NO n = 4,296	YES n = 1,265
Any illegal drug** .....	73.9%	88.9%
Marijuana** .....	46.6%	53.0%
Prescription opioids (illegal use)** .....	34.6%	48.2%
Stimulants** .....	33.4%	42.8%
Tranquilizers, sedatives, benzodiazepines** .....	20.2%	28.4%
Non-prescribed buprenorphine-naloxone (bup-nx)** .....	19.8%	27.7%
Cocaine** .....	14.8%	20.2%
Heroin** .....	13.4%	19.4%
Synthetic Drugs (synthetic marijuana, bath salts) .....	8.6%	10.8%
Non-prescribed methadone** .....	4.6%	9.6%
Hallucinogens** .....	3.4%	5.8%
Barbiturates** .....	2.3%	4.4%
Inhalants .....	1.5%	2.3%

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

There were significant differences in alcohol use in the 12 months before entering treatment by follow-up status (see Table AB.10). Over half of followed-up clients reported alcohol use in the 12 months before entering treatment, whereas 47.0% of clients who were not followed up reported using alcohol. Significantly more followed-up clients reported using alcohol to intoxication and binge drinking than clients who were not followed up.

TABLE AB.10. PERCENT OF CLIENTS REPORTING ALCOHOL USE IN THE 12 MONTHS BEFORE ENTERING TREATMENT

	FOLLOWED UP	
	NO n = 4,296	YES n = 1,265
Alcohol* .....	47.0%	52.5%
Alcohol to intoxication* .....	32.3%	37.5%
Binge drank alcohol (i.e., drank 5 or more [4 for women] drinks in 2 hours* .....	28.3%	33.0%

\*p < .01.

<sup>139</sup> 41 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.

Significantly more followed-up clients reported they had smoked tobacco products in the 12 months before entering treatment than those who did not complete a follow-up interview (see Table AB.11). In the 12 months before entering substance abuse treatment, the majority of the clients reported smoking tobacco products. For both groups, about one-fourth reported using vaporized nicotine products (i.e., e-cigarettes, juul) and about 15% reported smokeless tobacco use.

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

	FOLLOWED UP	
	NO n = 4,296	YES n = 1,265
Smoked tobacco** .....	82.6%	87.4%
Vaporized nicotine .....	23.8%	26.6%
Smokeless tobacco .....	15.5%	14.6%

\*\*p < .001.

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 separately for those clients who were not in a controlled environment all 30 days before entering treatment and clients who were in a controlled environment all 30 days. The lowest composite score is 0 and the highest composite score is 1.0.

Almost 40% of clients who were not in a controlled environment all 30 days met or surpassed the Addiction Severity Index (ASI) composite score cutoff for alcohol and/or drug severe SUD, with significantly more clients who were followed-up meeting or surpassing the cutoff (36.5% for not followed up and 46.5% for followed up; see Table AB.12). There was no significant difference between clients who were followed-up or not followed up for the cutoff score for severe alcohol use disorder however, more clients 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 on the alcohol composite score was significantly higher for those who were followed up than for those who did not complete a follow-up survey (.11 vs. .10). 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 0.15 for followed up clients, which was also significantly different (see Table AB.12).

Among clients who were in a controlled environment all 30 days before entering the program, the average score for the alcohol severity composite score was 0.10 for clients who did and clients who did not complete a follow-up interview. There was no significant difference in drug severity composite score by follow-up status (see Table AB.12).

TABLE AB.12. SUBSTANCE ABUSE AND DEPENDENCE PROBLEMS AT INTAKE

	Not in a controlled environment all 30 days before entering treatment		In a controlled environment all 30 days before entering treatment	
	FOLLOWED UP		FOLLOWED UP	
	NO n = 3,899	YES n = 1,133	NO n = 441	YES n = 146
<b>Percentage of clients with ASI composite score equal to or greater than cutoff score for</b>				
Severe alcohol or drug use disorder.....	36.5%	46.5%**	45.4%	43.2%
Severe alcohol use disorder .....	17.1%	19.9%	18.6%	21.2%
Severe drug use disorder .....	25.9%	35.7%**	35.8%	33.6%
Average composite score for alcohol use <sup>a</sup> .....	.10	.11*	.10	.10
Average composite score for drug use <sup>b</sup> .....	.11	.15**	.14	.16

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.

Significantly more clients in the follow-up group reported they had a history of prior substance abuse treatment in their lifetime when compared to clients who did not complete a follow-up (see Table AB.13). Among clients who reported a history of substance abuse treatment, the average number of lifetime treatment episodes was 2.6 for those not followed-up and 3.3 for those who completed a follow-up.

TABLE AB.13. HISTORY OF SUBSTANCE ABUSE TREATMENT IN LIFETIME

	FOLLOWED UP	
	NO n = 4,340	YES n = 1,279
Ever been in substance abuse treatment in lifetime** .....	54.3%	61.5%
<b>Among those who had ever been in substance abuse treatment in lifetime,</b>	(n = 2,357)	(n = 786)
Average number of times in treatment** .....	2.6	3.3

\*\*p < .001.

In summary, there were many significant differences between clients who were followed up and those who were not, and most of these significant differences suggest that followed-up clients are worse off than clients who were not followed up. First, significantly more women were followed up than were not followed up. Second, significantly more followed-up clients reported they were homeless and had difficulty meeting health care needs for financial reasons. Third, significantly more clients who were included in the follow-up sample reported they had chronic pain and a chronic medical problem when compared to clients who were not in the follow-up sample. Fourth, significantly more clients in the follow-up sample reported depression, generalized anxiety, and suicidality in the 12 months before treatment. Fifth, significantly more clients who were followed up reported using most classes of illegal drugs, alcohol, and smoking tobacco compared to clients who were not followed up. Sixth, 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, 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. Seventh, significantly more followed-up clients reported they had a history of

prior substance abuse treatment than clients who were not followed-up. Nonetheless, there were a couple statistically significant differences in which the followed-up clients had better indicators than the individuals who were not followed-up: education and the number of days incarcerated, among those who spent any time incarcerated in the 12 months before entering treatment.