

# Adult Kentucky Treatment Outcome Study

2018 ANNUAL REPORT

2018

# Project Acknowledgments

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The 2018 KTOS report includes data from 1,224 CMHC substance abuse treatment clients who completed both an intake interview between July 2015 and June 2016 and a 12-month follow-up interview between July 2016 and June 2017.

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# Executive Summary

This report summarizes client outcomes from a statewide evaluation of publicly-funded substance abuse treatment programs for adults (i.e., 18 years and older). The goal of the Kentucky Treatment Outcome Study (KTOS) is to examine client satisfaction, recovery support, 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, and (5) quality of life. 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.

This report presents outcomes for 1,224 men and women who participated in publicly-funded substance abuse treatment from July 2015 through June 2016 and then completed a follow-up interview about 12 months later (a follow-up rate of 76.5%).

## 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 74% at intake to 28% at follow-up. A trend report of illegal drug use at intake and follow-up over the past 10 years shows that around three-quarters of KTOS clients reported any illegal drug use in the 12 months before treatment each year. The number of individuals who reported using alcohol decreased from 51% at intake to 28% at follow-up. Overall, at follow-up, the percent of clients who met DSM-5 study criteria suggesting no substance use (alcohol and/or drug use) disorder increased from 29% intake to 73% 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

## Five core components of the KTOS evidence based assessment



SUBSTANCE  
USE



MENTAL  
HEALTH



VICTIMIZATION  
AND TRAUMA\*



CRIMINAL JUSTICE  
INVOLVEMENT



QUALITY OF  
LIFE

\* The victimization and trauma component is new and has not yet been analyzed for a report.

(ASI) drug composite scores that met the cutoff for severe drug use disorder decreased from just over half to 7% at follow-up. Among individuals who reported using alcohol in the 30 days before intake or follow-up, the number who had Addiction Severity Index (ASI) alcohol composite scores that met the cutoff for severe alcohol use disorder decreased from 50% at intake to 20% at follow-up.

Past-12-month and past-30-day rates of smoking tobacco use had a small but significant decrease from intake to follow-up.

### Mental Health, Physical Health, And Stress

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 26% of clients at follow-up. Trends in depression, however, indicate that there was an increase in clients meeting study

criteria for past-12-month depression in FY 2016 at intake, but a decrease in FY 2016 at follow-up. Over half of clients met study criteria for generalized anxiety at intake compared to 31% at follow-up. In addition, 18% of clients reported suicidal ideation or attempts at intake compared to 7% at follow-up.

Stress and physical health were also improved at follow-up. Specifically, clients reported a significantly higher rating of overall health and fewer days their physical and mental health were poor at follow-up compared to intake. Overall, while the number of days clients reported poor mental and physical health in the past 30 days have increased at intake over the past 6 years, clients have reported fewer days of poor mental and physical health at follow-up over the years. Significantly fewer clients also reported any chronic pain at follow-up; however, reports of chronic pain at intake and follow-up

are higher this year compared to last year. In addition, clients reported significantly fewer stress symptoms at follow-up compared to intake and fewer clients reported using substances to reduce or manage their stress at follow-up.

### Economic and Living Circumstances

KTOS clients showed improvements in economic and living circumstances from intake to follow-up. 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 37% of clients reported being currently employed full time at follow-up compared to 24% at intake. The average number of months clients

## Three supplemental components of the KTOS evidence based assessment



HEALTH AND STRESS-RELATED HEALTH CONSEQUENCES



ECONOMIC AND LIVING CONDITIONS



RECOVERY SUPPORTS

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 35%. The number of clients who reported they had difficulty obtaining health care (e.g., doctor visits, dental visits, and prescription medications) for financial reasons decreased from 26% at intake to 16% at follow-up.

### Criminal Justice Involvement

Involvement in the criminal justice system, in terms of being arrested or incarcerated, decreased

significantly from intake to follow-up. The number of individuals who reported they had been arrested in the past 12 months decreased from 53% at intake to 27% at follow-up and the number of individuals who reported they had been incarcerated in the past 12 months decreased from 60% at intake to 33% at follow-up. Trend analyses show that, overall, the number of clients who reported an arrest or spent at least one night in jail were consistent over the past 10 years at both intake and follow-up.

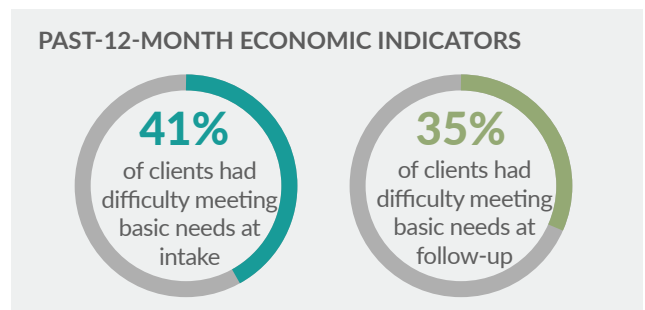
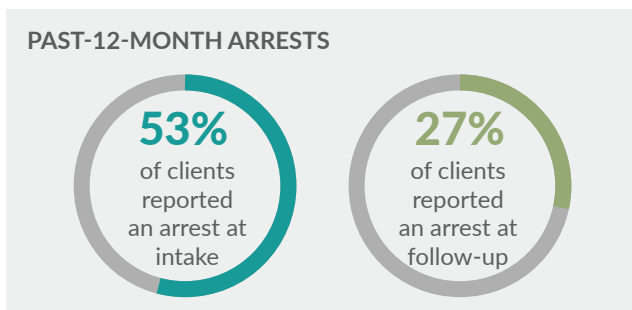
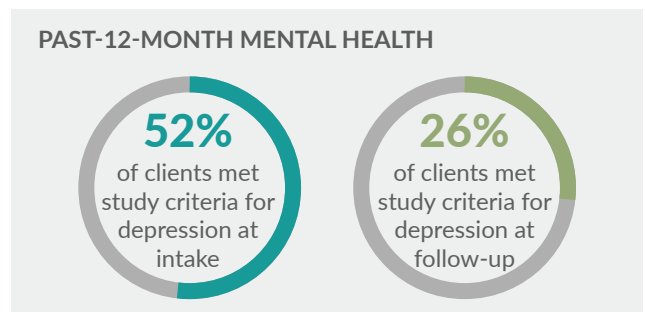
### Recovery Supports

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.

### Client Satisfaction with Treatment Experience

Program clients were largely satisfied with the treatment services they received at Kentucky’s community mental health care centers. Overall, clients rated their treatment experience as an 8.4 out of 10. Most clients felt they were highly satisfied with the treatment program, the services they received, and treatment staff. Ninety-two percent of clients said they felt better about themselves as a result of treatment.



## Significant Gender Differences

There were several important gender differences at treatment intake and follow-up. More women than men reported using any illegal drugs in the 12 months before intake and, specifically, more women reported using marijuana, opioids, CNS depressants, and cocaine at intake. More women than men also reported past-30-day heroin, CNS depressant, and cocaine use at intake and past-30-day marijuana use at follow-up. In contrast, significantly more men than women reported using alcohol in the 12 months and 30 days before both intake and follow-up. 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 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 reported homelessness at intake when compared to men. More women, however, reported living in their own or someone else's home at intake while more men lived in jail or prison at intake.

Overall, significantly more women were unemployed at intake and follow-up when compared to men. Likewise, significantly more men reported they had full-time employment at intake and follow-up when compared to women. Among individuals who were currently employed, men reported working significantly more months at both intake and follow-up. Employed men also had a significantly higher median hourly wage than

employed women at both intake and follow-up. At intake, employed women made only \$0.85 for every dollar employed men made and at follow-up, the gap in median hourly wages was similar, with employed women making only \$0.81 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 incarceration and criminal justice supervision (e.g., probation or parole) compared to women at intake. Men also reported a higher satisfaction with life rating at intake compared to women. More women reported attending self-help group meetings at follow-up compared to men.

*“It was a terrific program. The staff not only helped with addiction, but also provided help in seeing the mental addiction that comes along as well.”*

**KTOS FOLLOW-UP CLIENT**

## 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 \$3.46 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 2018 outcome evaluation 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 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 2018 Kentucky Treatment Outcome Study showed positive changes for individuals from the 12 months before treatment intake to the 12-month follow-up.

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# 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, 2015 and June 30, 2016 (N = 5,553). This section also describes characteristics of 1,224 clients who completed a 12-month follow-up interview between July 1, 2016 and June 30, 2017.

**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. Multivariate Analysis of Relapse.** This section focuses on a multivariate analysis examining factors related to relapse in the follow-up sample.

**Section 4. Mental Health, Physical Health, and Stress.** This section examines changes in mental health symptoms, physical health, and stress-related health consequences 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, and (7) stress-related health consequences.

**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 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 10. 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 11. 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, 2015 and June 30, 2016 (N = 5,553). This section also describes characteristics of 1,224 clients who completed a 12-month follow-up interview between July 1, 2016 and June 30, 2017.*

## 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 2016, 5,553 adults completed an intake survey between July 1, 2015 and June 30, 2016.<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 76.5% and a low refusal rate (0.1%) for participation in the interviews. That means that 23.5% of clients were not successfully contacted to complete the follow-up telephone interviews (see Appendix A for detailed information on study methods).

This report describes the sample of treatment clients in two main ways: (1) providing a description of characteristics for 5,553 adults who completed an intake interview in FY 2016 (July 1, 2015 – June 30, 2016), and (2) presentation of client characteristics for 1,224 adults

<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.

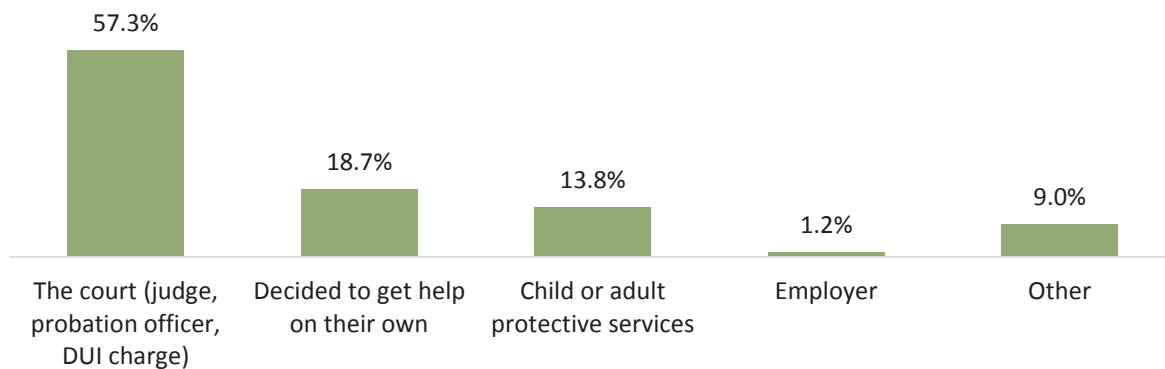
who completed an intake interview in FY 2016 and a 12-month follow-up telephone interview with a target date between July 1, 2016 and June 30, 2017.

## 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. About 57% 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. Almost 19% of clients self-reported they decided to get help on their own. A minority of clients reported they were referred to treatment by Child or Adult Protective Services (13.8%) or other referral sources (9.0%; 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 (1.2%).

FIGURE 1.1. SELF-REPORTED REFERRAL SOURCE FOR ALL KTOS CLIENTS AT INTAKE (N = 5,553)



### DEMOGRAPHICS

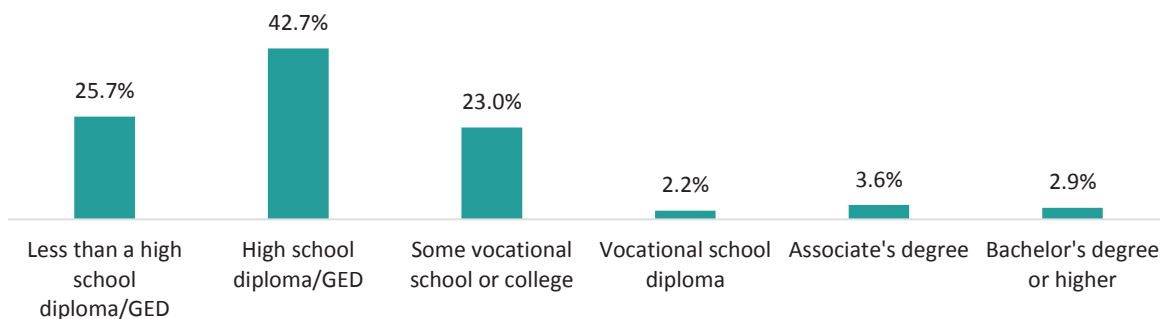
Table 1.1 shows that over half of clients with an intake survey completed in FY 2016 were male (58.5%) and the majority were White (92.7%). A minority of clients reported their race as African American/Black (5.4%) and 1.9% reported they were American Indian, Asian, Hispanic, or multiracial. Clients were, on average, 34.9 years old, ranging from 18 to 78 years old at intake. At intake 28.4% reported they had never been married (and were not cohabiting with a partner), 26.6% were separated or divorced, and 1.7% were widowed. Around 43% were married or cohabiting with a partner at intake. Three-quarters of clients reported they had at least one child. A small number of KTOS clients (3.7%) 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 = 5,553)

AGE	34.9 years (range of 18-78)
GENDER	
Male	58.5%
Female	41.4%
Transgender	0.1%
RACE	
White	92.7%
African American	5.4%
Other or multiracial	1.9%
MARITAL STATUS	
Married or cohabiting	43.4%
Never married	28.4%
Separated or divorced	26.6%
Widowed	1.7%
HAVE CHILDREN	75.0%
VETERAN OR CURRENTLY SERVING IN MILITARY	3.7%

A little more than one-fourth of clients (25.7%) had less than a high school diploma or GED at intake (see Figure 1.2). The highest level of education of 42.7% 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 (2.2%), an associate's degree (3.6%), or a bachelor's degree or higher (2.9%).

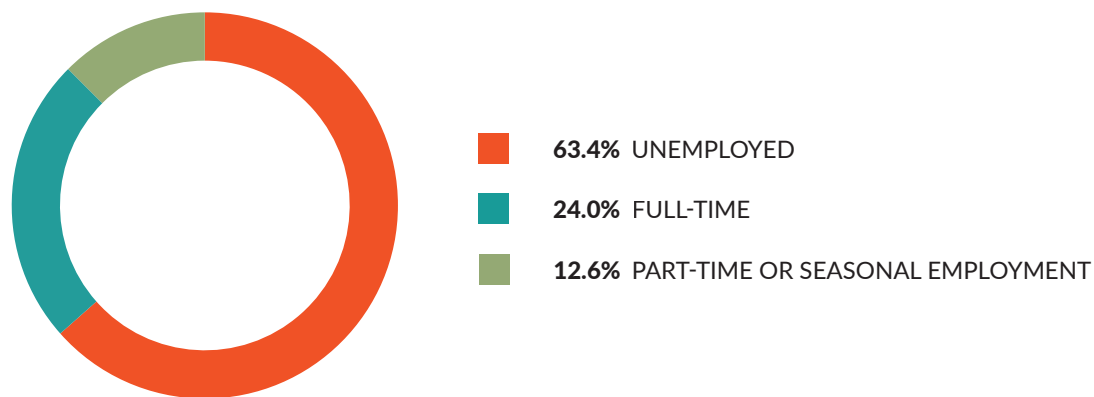
FIGURE 1.2. HIGHEST LEVEL OF EDUCATION COMPLETED AT INTAKE (N = 5,553)



At intake, 41.1% of clients reported they had worked 0 months in the past 12 months, 20.2% had worked 1 to 5 months, and 38.7% had worked 6 or more months (not depicted in a figure). Also, the majority of individuals reported they were currently unemployed (63.4%), with 24.0% being employed full-time, and 12.6% employed part-time or having occasional or seasonal

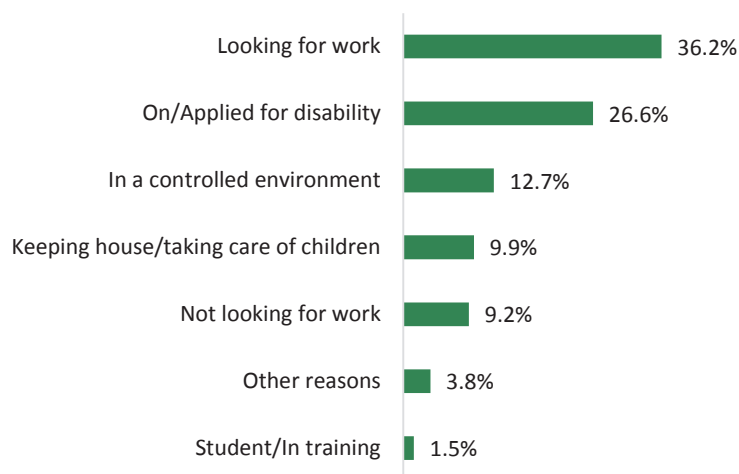
employment (see Figure 1.3). Among those who reported being employed full or part-time at intake, the median hourly wage was \$10.00.

FIGURE 1.3. CURRENT EMPLOYMENT STATUS AT INTAKE (N = 5,553)



Of the individuals who were currently unemployed at intake (n = 3,522), about 36% stated they were looking for work (see Figure 1.4). Over one-quarter (26.6%) were on disability (or had applied for disability), 12.7% were in a controlled environment that prohibited them from working, 9.9% were keeping the house or taking care of children full-time at home, 9.2% were unemployed but not looking for work, 1.5% were students or in training, and the remaining 3.8% 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).

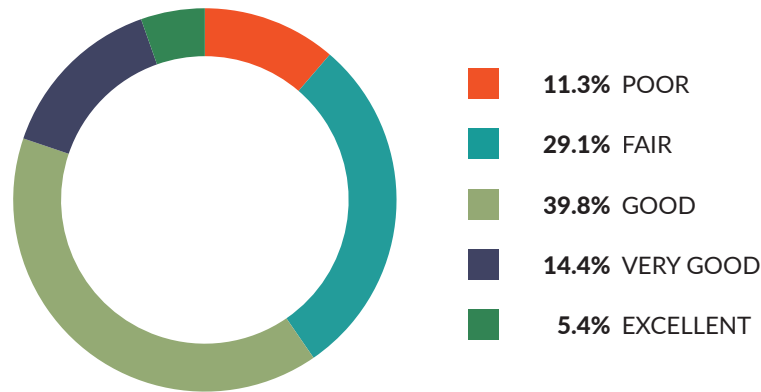
FIGURE 1.4. OF THOSE UNEMPLOYED, REASONS FOR BEING UNEMPLOYED (N = 3,522)



## PHYSICAL HEALTH

KTOS clients rated their overall health at intake (see Figure 1.5). Almost 4 in 10 clients (39.8%) said their health was good and 29.1% said their health was fair. About 14% percent rated their health as very good, 11.3% said their health was poor, and 5.4% reported their health was excellent.

FIGURE 1.5. OVERALL HEALTH RATING AT INTAKE (N = 5,553)



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-one percent of clients reported they had at least one chronic health problem. The most common medical problems clients reported were arthritis (17.3%), heart disease (15.2%), hepatitis C (11.5%), asthma (11.1%), and severe dental problems (10.3%).

A majority of KTOS clients reported they had insurance through Medicaid (69.3%) at intake. One in seven clients did not have any insurance (14.4%). Small numbers of clients had insurance through an employer, including through a spouse, parent, or self-employment (6.9%), through Medicare (6.1%), and through the Health Exchange (1.9%).

TABLE 1.2. HEALTH-RELATED CONCERNS FOR ALL KTOS CLIENTS AT INTAKE (N = 5,553)<sup>3</sup>

CHRONIC PAIN	35.1%
AT LEAST ONE CHRONIC MEDICAL PROBLEM	51.0%
Arthritis	17.3%
Cardiovascular/heart disease	15.2%
Hepatitis C	11.5%
Asthma	11.1%
Severe dental problems	10.3%
INSURANCE	
No insurance	14.4%
Medicaid	69.3%
Through employer (including spouse's employer, parents' employer, and self-employed)	6.9%
Medicare	6.1%
Through Health Exchange	1.9%

<sup>3</sup> Forty-seven clients had responses that were unable to be classified.

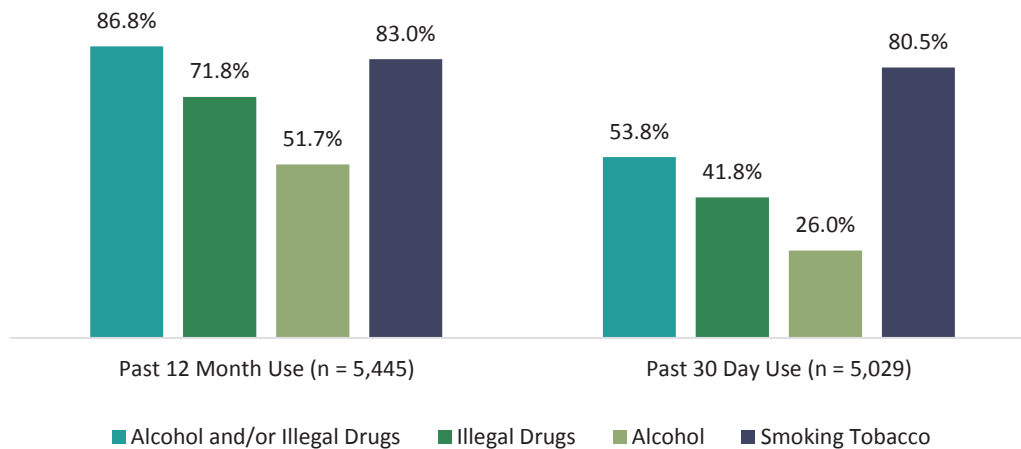


## SUBSTANCE USE

The majority of adults who completed an intake survey reported using alcohol and/or illegal drugs (86.8%) in the 12 months before entering treatment (see Figure 1.5).<sup>4</sup> The drug classes reported by the greatest number of clients were marijuana (44.2%), prescription opioids (37.2%), and non-prescribed buprenorphine-naloxone (21.9%; not depicted in a figure). Overall, a higher percentage of individuals reported using illegal drugs (71.8%) compared to the percent of individuals who reported using alcohol (51.7%) in the 12 months before entering treatment. The vast majority of clients reported smoking tobacco (83.0%) in the 12 months before intake.

Of the 5,029 individuals who were not in a controlled environment all 30 days,<sup>5</sup> over half (53.8%) reported using illegal drugs and/or alcohol in the past 30 days at intake. Specifically, 41.8% reported using illegal drugs and 26.0% reported using alcohol. Also, 80.5% 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<sup>6</sup>



## TRENDS IN AGE OF FIRST USE

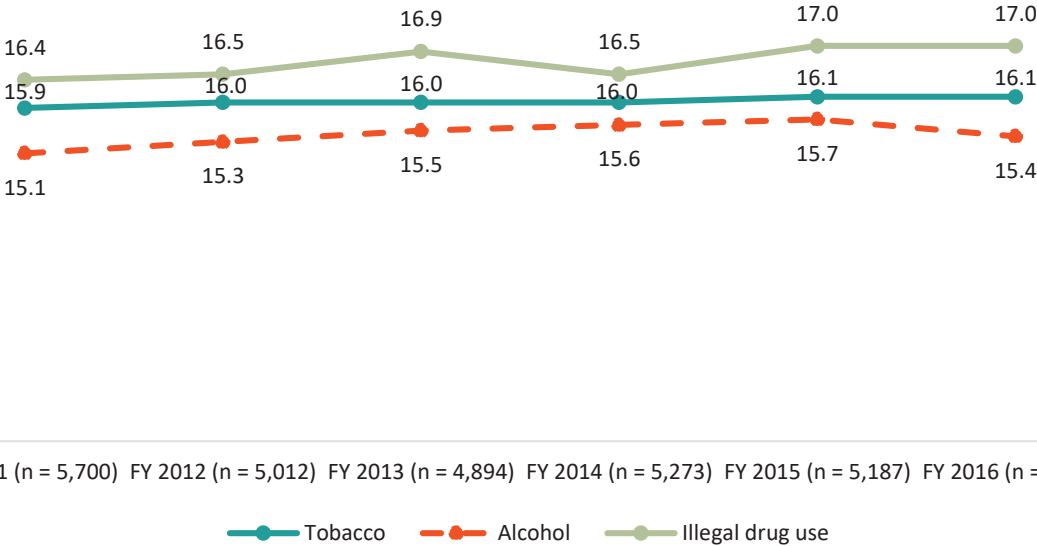
Clients were asked, at intake, how old they were when they first began to use illegal drugs, when they had their first alcoholic drink (more than just a sip), and when they began smoking cigarettes regularly (see Figure 1.7). The age at which KTOS clients reported drug use was steady for the past 6 years (close to age 17). Clients generally reported having their first alcohol drink around 15 years old. The age of first tobacco use was slightly older than the age of first alcoholic drink (about 16 years old) and remained steady for 6 years.

<sup>4</sup> 108 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>5</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 = 524) are not included in the analysis of substance use in the 30 days before entering treatment.

<sup>6</sup> One client had missing data for past-12-month alcohol use at intake.

FIGURE 1.7. TRENDS IN AGE OF FIRST USE REPORTED AT INTAKE, FY 2011-FY 2016

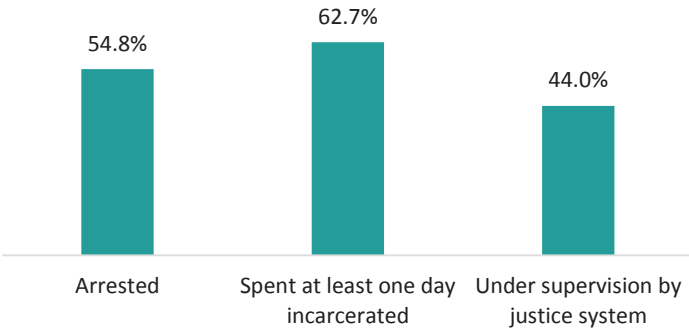


### CRIMINAL JUSTICE INVOLVEMENT

Over half of individuals reported being arrested at least once (54.8%) and 62.7% of clients reported being incarcerated at least one night in the 12 months before treatment (see Figure 1.8) Forty-four percent 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 = 3,044), they were arrested an average of 1.8 times. Among those who were incarcerated in the past 12 months (n = 3,483), they were incarcerated an average of 76.9 nights (not depicted in a figure).

FIGURE 1.8. CRIMINAL JUSTICE INVOLVEMENT 12 MONTHS BEFORE TREATMENT AT INTAKE (N = 5,553)



## Description of KTOS Follow-up Sample at Intake

*This report describes outcomes for 1,224 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 312.6 days) after the intake survey was completed.<sup>7</sup> Detailed information about the methods can be found in Appendix A.*

### DEMOGRAPHICS

Of the 1,224 adults who completed a 12-month follow-up interview, 52.9% were male and 47.1% were female (see Table 1.3). The majority of follow-up clients were White (93.1%). A minority were African American/Black (5.1%) and 1.9% were Hispanic, American Indian, or multiracial. Clients in the follow-up sample were an average of 35 years old at the time of the intake interview. Less than half (42.5%) reported they were married or cohabiting at intake, 29.2% were not married (and not cohabiting), 26.5% were separated or divorced, and 1.9% were widowed. Almost 78% of followed-up clients had at least one child. A small percentage of the follow-up sample (3.9%) reported they were a veteran or currently serving in the military, Reserves, or National Guard.

TABLE 1.3. DEMOGRAPHICS FOR KTOS CLIENTS WHO WERE FOLLOWED-UP AT INTAKE (n = 1,224)

AGE	35.1 years (range of 18-78)
GENDER	
Male	52.9%
Female	47.1%
Transgender	0.0%
RACE	
White	93.1%
African American	5.1%
Other or multiracial	1.9%
MARITAL STATUS	
Married or cohabiting	42.5%
Never married	29.2%
Separated or divorced	26.5%
Widowed	1.9%
HAVE CHILDREN	77.5%
VETERAN OR CURRENTLY SERVING IN MILITARY	3.9%

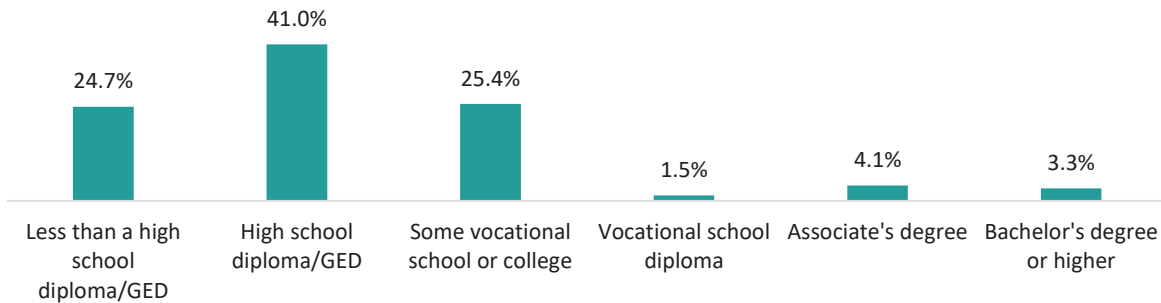
<sup>7</sup> The average number of days between when the baseline was submitted to UK CDAR and when the follow-up was completed was 310.0 days.

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 (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 (0.1%) and in the high follow-up rate (76.5%). This means that 23.5% of individuals included in the sample to be followed up were not successfully contacted.<sup>8</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.

<sup>8</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.

About one-quarter of follow-up clients (24.7%) had less than a high school diploma or GED at intake (see Figure 1.9). The highest level of education of 41.0% of the follow-up sample was a high school diploma or GED. About one-quarter of clients (25.4%) had completed some vocational/technical school or college. Only a small minority of clients had completed vocational/technical school (1.5%), an associate's degree (4.1%), or a bachelor's degree or higher (3.3%).

FIGURE 1.9. HIGHEST LEVEL OF EDUCATION COMPLETED BY FOLLOW-UP CLIENTS AT INTAKE (n = 1,224)



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, and severity of substance use. The differences that were found 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 = 1,224) and clients who did not complete a follow-up interview (n = 4,329).

Significantly more women were followed up than were not followed up (see Table 1.4). Significantly more clients who were followed up reported living in a private residence. Significantly more followed-up clients reported they had difficulty meeting basic living needs for financial reasons. Significantly more clients who were followed up reported they had chronic pain and a chronic medical problem when compared to clients who were not followed up. Significantly more clients in the follow-up sample met study criteria for depression, generalized anxiety, and suicidality in the 12 months before treatment. More clients who completed a follow-up and were not in a controlled environment all 12 months before intake reported marijuana and non-prescribed buprenorphine-naloxone use in the 12 months before entering treatment. Further, 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 substance use disorder (SUD). They also had a higher average composite score for drug use and for alcohol use when compared to clients who did not complete a follow-up.

TABLE 1.4. FOLLOWED-UP VERSUS NOT FOLLOWED-UP

	Followed Up	
	No (n = 4,329)	Yes (n = 1,224)
Demographic	More male	More female
Socio-economic status indicators (e.g., education, employment, living situation, inability to meet basic needs)		More had difficulty meeting basic living needs for financial reasons
Substance use, severity of alcohol and drug use		More reported marijuana and non-prescribed buprenorphine-naloxone use in the 12 months before entering treatment More met or surpassed the cutoff score for alcohol or drug use substance use disorder
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 study criteria for depression, generalized anxiety, and suicidality
Criminal justice involvement (e.g., arrested, incarcerated)		No differences
Treatment history		No differences

## 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]; (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 = 1,194)<sup>9</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 = 1,121)<sup>10</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-

<sup>9</sup> 17 cases were excluded from this analysis because they were incarcerated all 365 days before entering treatment and 13 cases were excluded because either the interviewer skipped the question (n = 9) or the client didn't know (n = 4).

<sup>10</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 = 95) or all 30 days before the follow-up (n = 7) from the change in past-30-day substance use analysis is that being in a controlled environment inhibits opportunities for alcohol and drug use. In addition, at follow-up 4 clients were not included because either the interviewer skipped the question (n = 3) or the client refused to answer the question (n = 1).

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 illegal drugs (n = 541), alcohol (n = 361) and those with alcohol and/or illegal drug use (n = 698) 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.

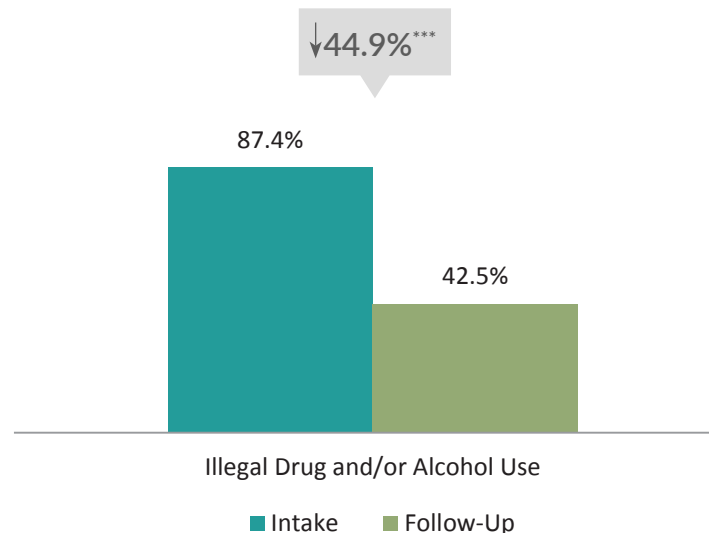
## Alcohol and/or Illegal Drug Use

### PAST-12-MONTH ALCOHOL AND/OR ILLEGAL DRUG USE

The majority of clients (87.4%) reported using alcohol and/or illegal drugs in the 12 months before entering substance abuse treatment, which decreased to 42.5% at follow-up. As a result, there was a 44.9% 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 45%**

FIGURE 2.1. PAST-12-MONTH ALCOHOL AND/OR DRUG USE AT INTAKE AND FOLLOW-UP (N = 1,194)



\*\*\*p < .001.

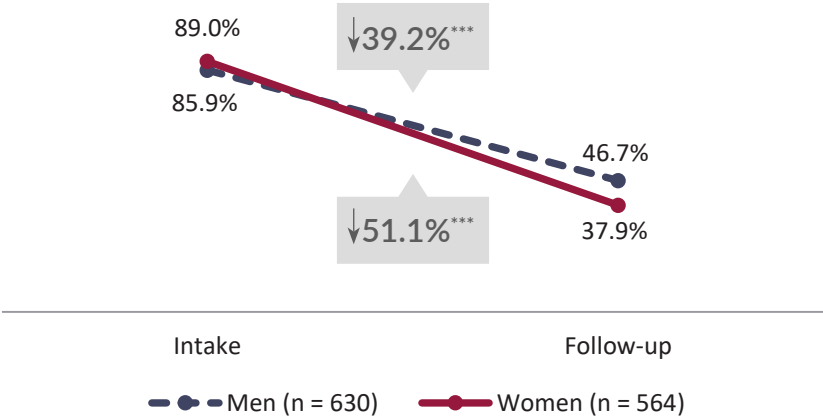
### GENDER DIFFERENCES IN PAST-12-MONTH ALCOHOL AND/OR ILLEGAL DRUG USE

At intake, there were no significant differences in the number of women (89.0%) and men (85.9%) reporting any alcohol and/or illegal drug use in the 12 months before they entered treatment (see Figure 2.2). The number of women and men who reported any past-12-month alcohol and/or illegal drug use significantly decreased from intake to follow-up by 51.1% and 39.2% respectively. At follow-up, significantly more men reported alcohol and/or illegal drug use in the past 12 months compared to women (46.7% vs. 37.9%, respectively).



**Significantly more men than women reported using alcohol and/or illegal drugs in the 12 months before intake**

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



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

*“I liked the friendly environment. I felt safe because of the confidentiality.”*

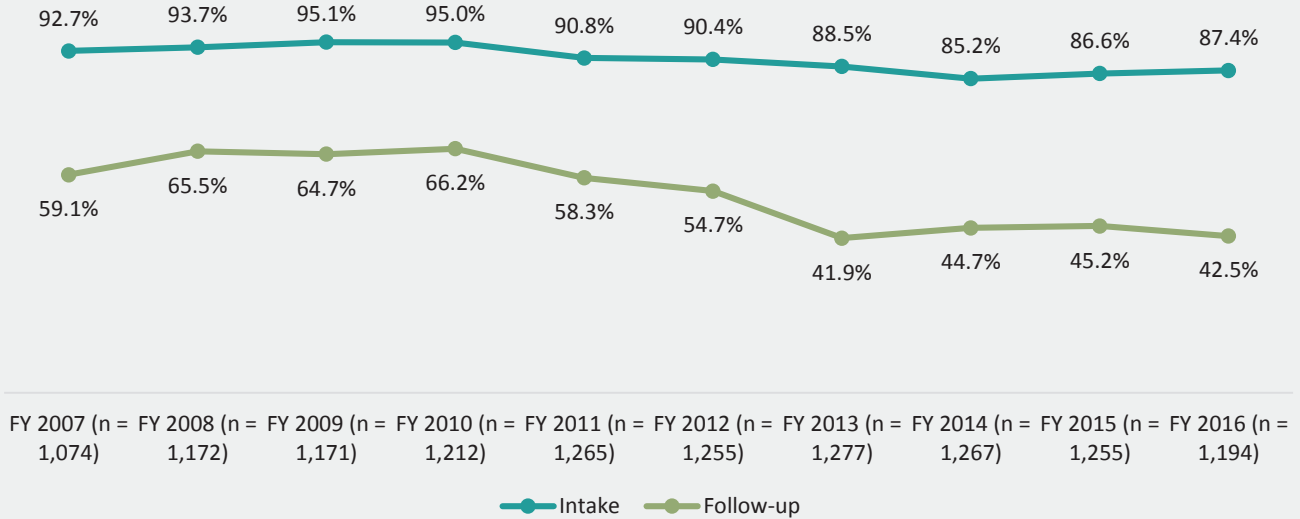
KTOS FOLLOW-UP CLIENT



### 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. Overall, at follow-up, the number of clients reporting alcohol and/or drug use has decreased over the years.

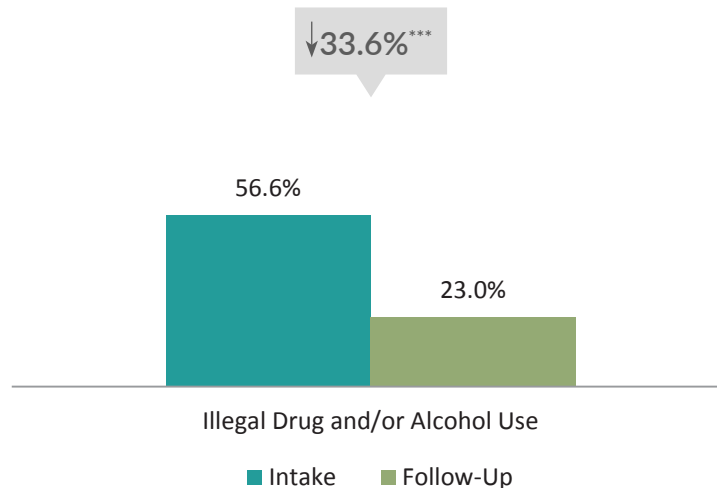
FIGURE 2.3. TRENDS IN ANY ALCOHOL AND/OR ILLEGAL DRUG USE AT INTAKE AND FOLLOW-UP, FY 2007-2016



### PAST-30-DAY ALCOHOL AND/OR ILLEGAL DRUG USE

Over half of clients (56.6%) reported using alcohol and/or illegal drugs in the 30 days before entering substance abuse treatment, which decreased to 23.0% at follow-up. As a result, there was a 33.6% 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 = 1,121)

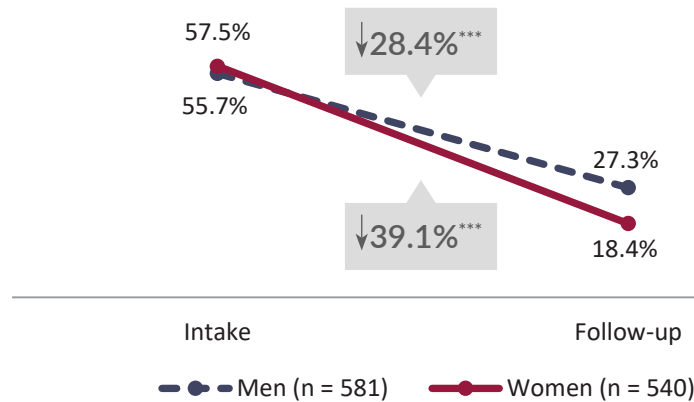


\*\*\*p < .001.

## GENDER DIFFERENCES IN PAST-30-DAY ALCOHOL AND/OR ILLEGAL DRUG USE

At intake, there were no significant differences in the number of women (57.5%) and men (55.7%) 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 39.1% and 28.4% respectively. At follow-up, significantly more men reported alcohol and/or illegal drug use in the past 30 days compared to women (27.3% vs. 18.4%, respectively).

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



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

## Any Illegal Drugs

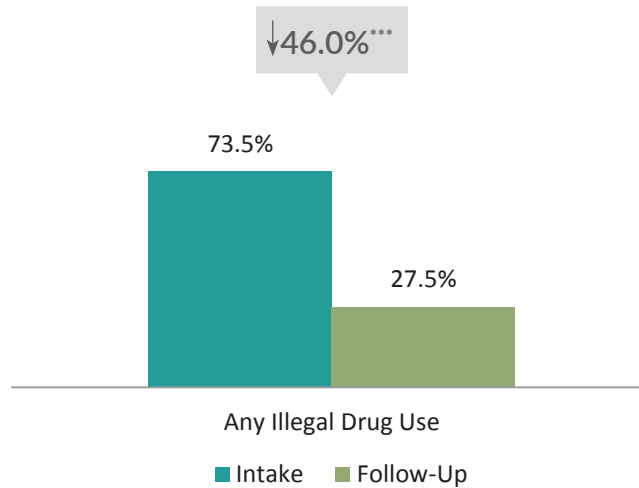
### PAST-12-MONTH ILLEGAL DRUG USE

At intake, clients were asked how old they were when they first began to use illicit drugs. On average, KTOS clients reported they were 17.2 years old when they first used illegal drugs (not depicted in figure).

Almost three-quarters of clients (73.5%) reported using illegal drugs in the 12 months before entering substance abuse treatment, which decreased to 27.5% at follow-up. Overall, for the KTOS follow-up sample, there was a 46.0% 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 **46%**

FIGURE 2.6. PAST-12-MONTH DRUG USE AT INTAKE AND FOLLOW-UP (N = 1,190)<sup>11</sup>

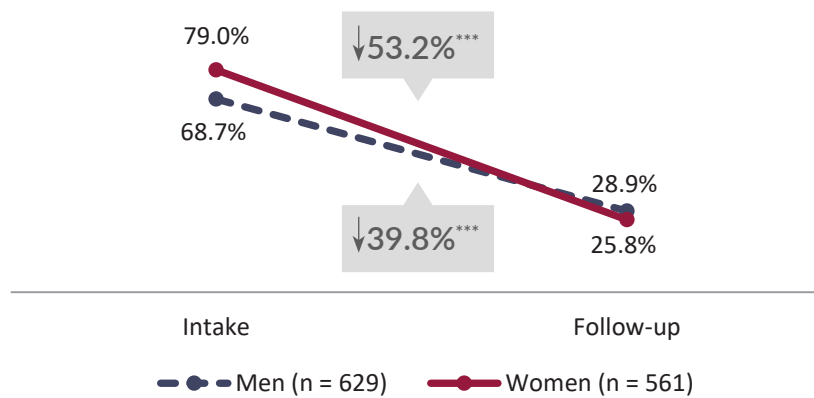


**GENDER DIFFERENCES IN PAST-12-MONTH OVERALL ILLEGAL DRUG USE**

At intake, significantly more women than men reported any past-12-month illegal drug use, 79.0% vs. 68.7% (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 53.2% and 39.8% respectively. At follow-up, there was no significant difference in the number of men and women who reported using any illegal drugs in the past 12 months.

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

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



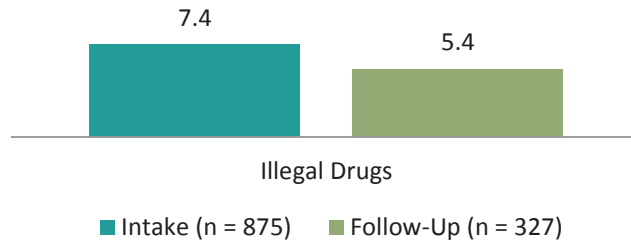
a—Significant difference by gender at intake, p < .001.  
 \*\*\*p < .001.

<sup>11</sup> Four clients were missing data for illegal drug use at follow-up.

### AVERAGE NUMBER OF MONTHS USED ANY ILLEGAL DRUGS

Among the clients who reported using illegal drugs in the 12 months before entering treatment (n = 875), they reported using illegal drugs an average of 7.4 months (see Figure 2.8).<sup>12</sup> Clients who reported using illegal drugs at follow-up (n = 327) reported using an average of 5.4 months.

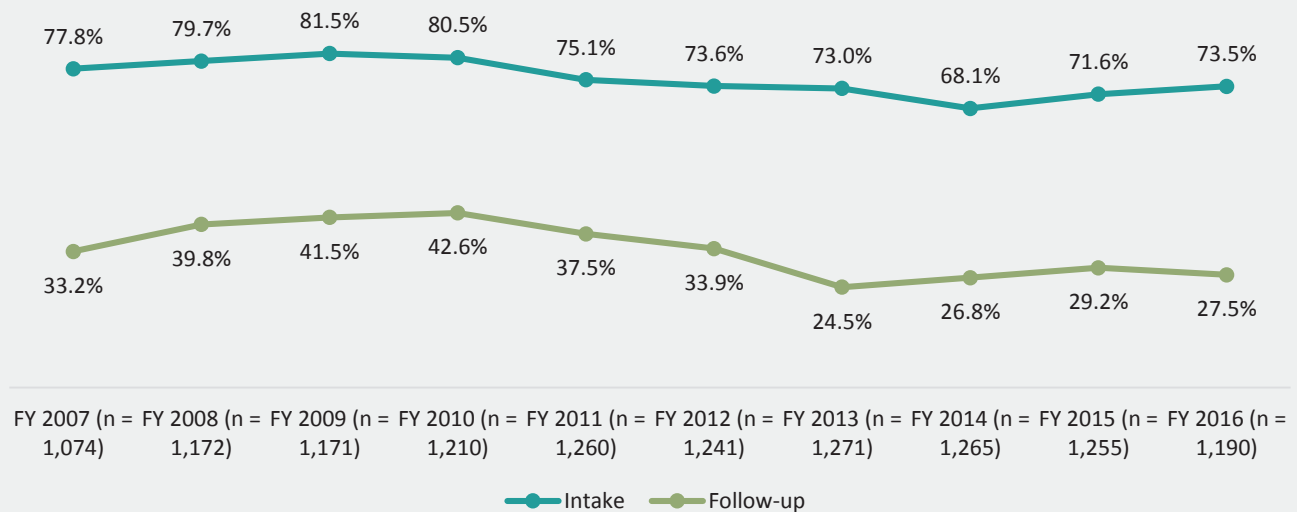
FIGURE 2.8. AVERAGE NUMBER OF MONTHS CLIENTS USED ILLEGAL DRUGS



### 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 each year. Overall, at follow-up, the number of clients reporting any illegal drug use has decreased over the years.

FIGURE 2.9. TRENDS IN ANY PAST-12-MONTH ILLEGAL DRUG USE AT INTAKE AND FOLLOW-UP, FY 2007-2016

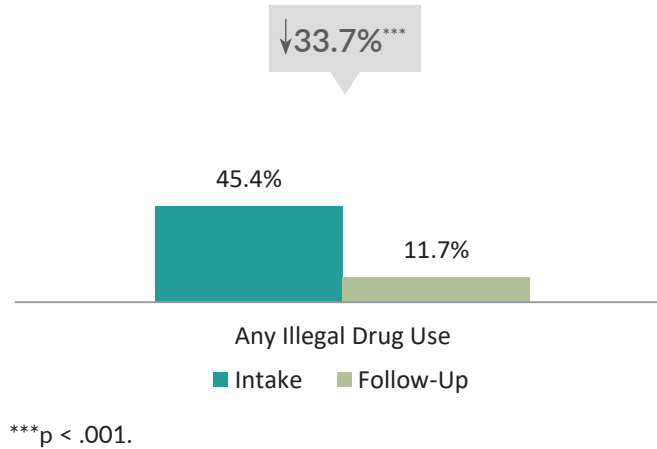


<sup>12</sup> Because number of months of illegal drugs was measured separately for each class of substance, the value is a calculation of the maximum number of months clients used any class of substance.

## PAST-30-DAY ILLEGAL DRUG USE

Less than half of clients (45.4%) 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 11.7% of clients reported they had used illegal drugs in the past 30 days—a significant decrease of 33.7%.

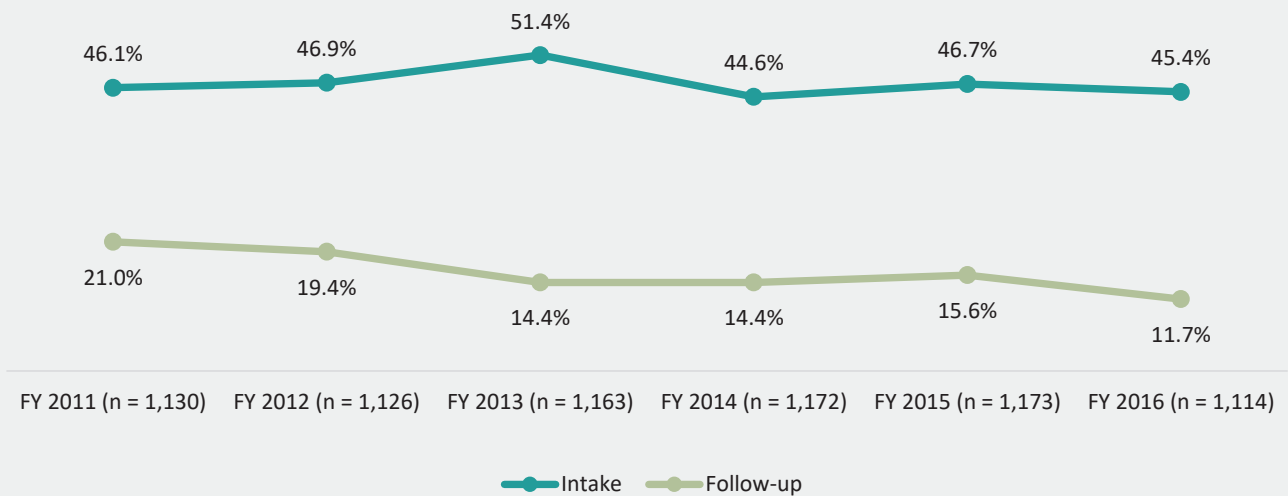
FIGURE 2.10. PAST-30-DAY USE OF ANY ILLEGAL DRUG AT INTAKE AND FOLLOW-UP (N = 1,114)<sup>13</sup>



### 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 reported using any illegal drug 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 21.0% in FY 2011 to 11.7% in FY 2016.

FIGURE 2.11. TRENDS IN PAST-30-DAY ILLEGAL DRUG USE AT INTAKE AND FOLLOW-UP, FY 2011-2016

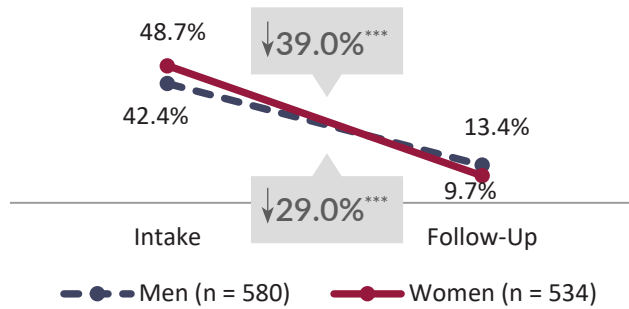


<sup>13</sup> Seven clients had missing data for past-30-day illegal drug use at follow-up.

### 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 (48.7% vs. 42.4%). The number of women and men who reported illegal drug use decreased significantly by 39.0% and 29.0% respectively. The difference between men and women who reported past-30-day illegal drug use was not significant at follow-up (see Figure 2.12).

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

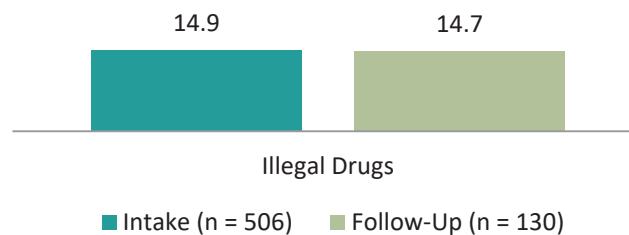


a—Significant difference by gender at intake,  $p < .05$ .  
 \*\*\* $p < .001$

### AVERAGE NUMBER OF DAYS USED ANY ILLEGAL DRUGS

Among the clients who reported using illegal drugs in the 30 days before entering treatment (n = 506), they reported using illegal drugs on average 14.9 days (see Figure 2.13). Clients who reported using illegal drugs at follow-up (n = 130) reported using, on average, 14.7 days.<sup>14</sup>

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



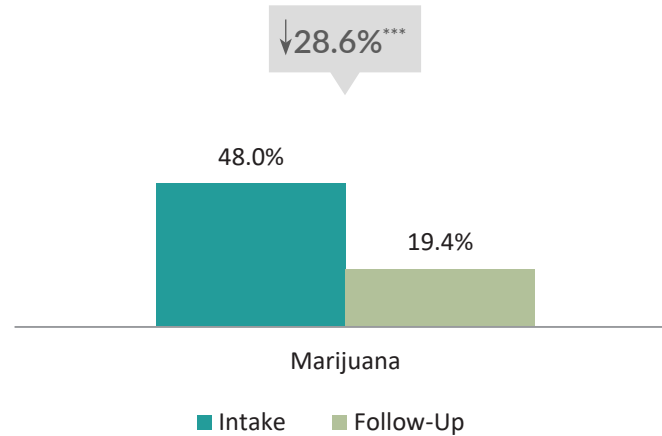
<sup>14</sup> Because number of days of illegal drugs was measured separately for each class of substance, the value is a calculation of the maximum number of days clients used any class of illegal drug.

## Marijuana

### PAST-12-MONTH MARIJUANA USE

Forty-eight percent of clients reported using marijuana in the 12 months before entering treatment, which decreased to 19.4% at follow-up. Overall, for the KTOS follow-up sample, there was a 28.6% significant decrease in the number of clients reporting marijuana use (see Figure 2.14).

FIGURE 2.14. PAST-12-MONTH MARIJUANA USE AT INTAKE AND FOLLOW-UP (N = 1,192)<sup>15</sup>



\*\*\*p < .001.

### GENDER DIFFERENCES IN PAST-12-MONTH MARIJUANA USE

At intake, significantly more women than men reported any marijuana use in the past 12 months, 52.2% vs. 44.2% (see Figure 2.15). The number of women and men who reported past-12-month marijuana use significantly decreased from intake to follow-up by 33.9% and 23.9% respectively. At follow-up, there was no significant difference in the number of men and women who reported using marijuana in the past 12 months.



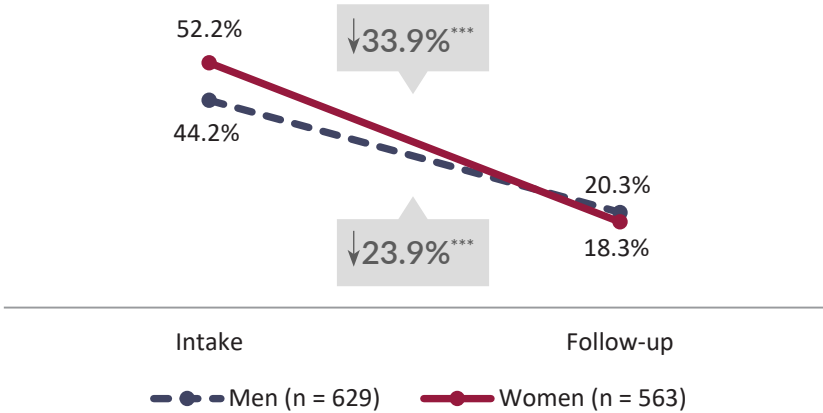
Significantly more women than men reported using marijuana 12 months before intake

*“The woman I talked to was really helpful, she was down to earth. The schedule worked with me. Everything was great there.”*

KTOS FOLLOW-UP CLIENT

<sup>15</sup> Two clients had missing data for past-12-month marijuana use.

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

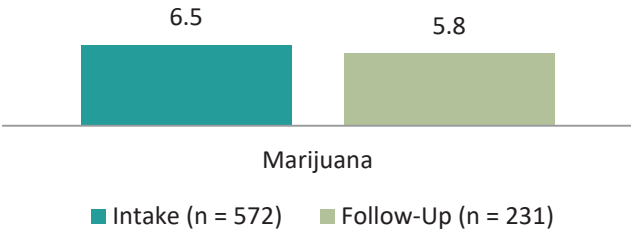


<sup>a</sup>—Significant difference by gender at intake,  $p < .01$ .  
\*\*\* $p < .001$ .

**AVERAGE NUMBER OF MONTHS USED MARIJUANA**

Among the clients who reported using marijuana in the 12 months before entering treatment (n = 572), they reported using marijuana, on average, 6.5 months (see Figure 2.16). Among clients who reported using marijuana at follow-up (n = 231), they reported using, on average 5.8 months.

FIGURE 2.16. AVERAGE NUMBER OF MONTHS CLIENTS USED MARIJUANA

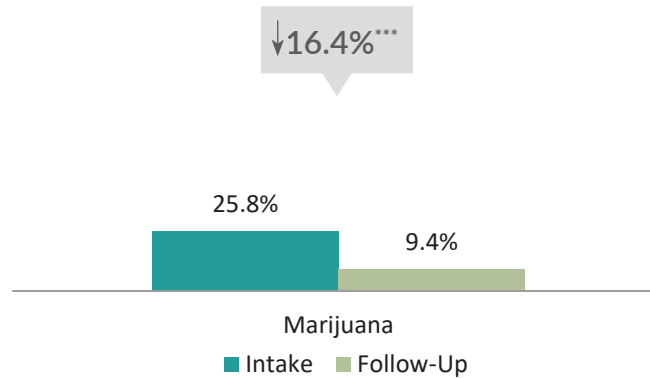


**PAST-30-DAY MARIJUANA USE**

The number of clients who reported using marijuana in the past 30 days decreased significantly by 16.4%, from 25.8% at intake to 9.4% at follow-up (see Figure 2.17).

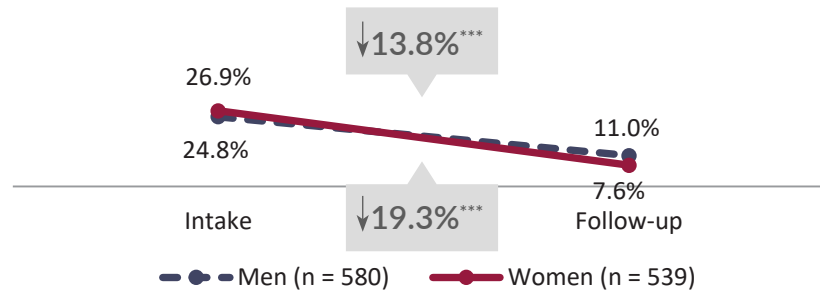
The number of clients who used marijuana in the past 30 days decreased significantly by 16%



FIGURE 2.17. PAST-30-DAY MARIJUANA USE AT INTAKE AND FOLLOW-UP (N = 1,119)<sup>16</sup>

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

At intake, similar numbers of women (26.9%) and men (24.8%) reported marijuana use in the past 30 days (see Figure 2.18). The number of women and men who reported marijuana use significantly decreased from intake to follow-up by 13.8% and 19.3% respectively. At follow-up, significantly more men (11.0%) reported marijuana use in the past 30 days compared to women (7.6%).

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

## Opioids

### PAST-12-MONTH OPIOID MISUSE

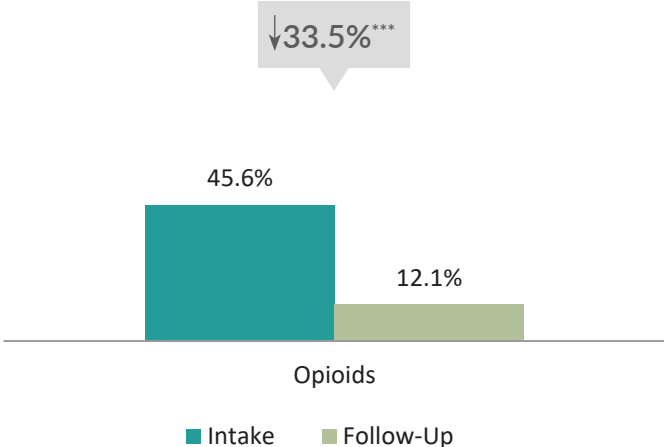
A little less than half of clients (45.6%) reported misusing opioids other than heroin, including prescription opioids, methadone, and buprenorphine-naloxone (bup-nx) in the 12 months before entering treatment, which decreased to 12.1% at follow-up. Overall, for the KTOS follow-up sample, there was a 33.5% decrease in the number of clients reporting past-

The number of clients reporting **past-12-month opioid misuse** decreased by **34%**

<sup>16</sup> Two clients had missing data on past-30-day marijuana use at follow-up.

12-month opioid misuse other than heroin (see Figure 2.19).

FIGURE 2.19. PAST-12-MONTH OPIOID MISUSE AT INTAKE AND FOLLOW-UP (N = 1,194)

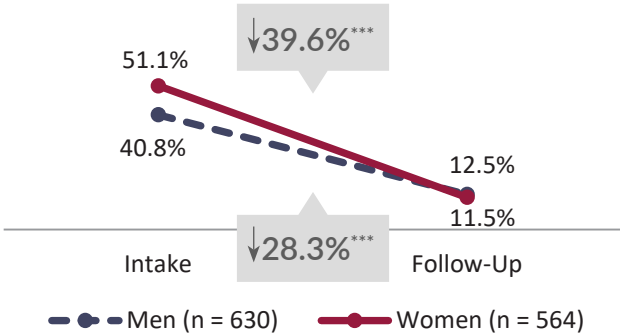


\*\*\*p < .001.

**GENDER DIFFERENCES IN PAST-12-MONTH OPIOID MISUSE**

Significantly more women than men reported opioid misuse in the 12 months before intake, 51.1% vs. 40.8%. The number 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 number of men (11.5%) and women (12.5%) 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>

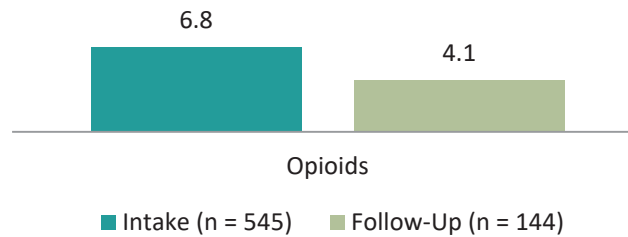


a—Significant difference by gender at intake; p < .001.  
\*\*\*p < .001

## AVERAGE NUMBER OF MONTHS MISUSED OPIOIDS

Among the clients who reported misusing opioids in the 12 months before entering treatment (n = 545), they reported misusing opioids on average 6.8 months (see Figure 2.21).<sup>17</sup> Among clients who reported misusing opioids at follow-up (n = 144), they reported misusing an average 4.1 months.

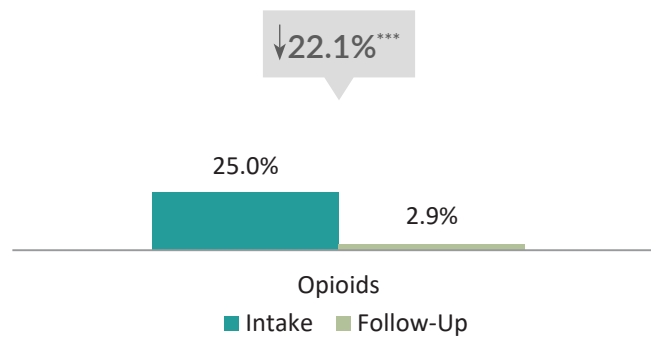
FIGURE 2.21. AVERAGE NUMBER OF MONTHS CLIENTS MISUSED OPIOIDS



## PAST-30-DAY OPIOID MISUSE

The number of clients who reported misusing opioids in the past 30 days decreased significantly by 22.1%, from 25.0% at intake to 2.9% at follow-up (see Figure 2.22).

FIGURE 2.22. PAST-30-DAY OPIOID MISUSE AT INTAKE AND FOLLOW-UP (N = 1,120)<sup>18</sup>



\*\*\*p < .001.

## Heroin

### PAST-12-MONTH HEROIN USE

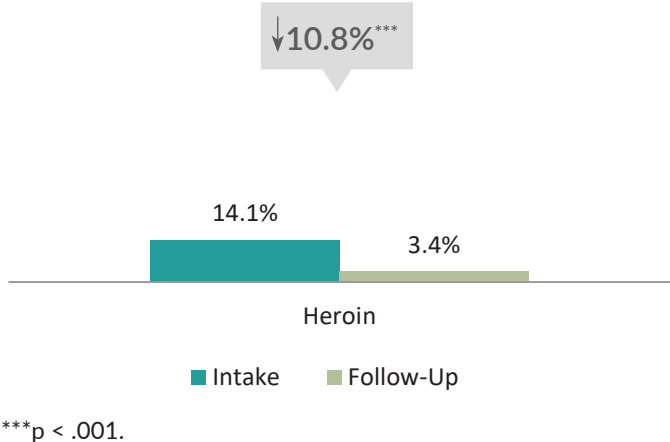
About 14% of clients reported using heroin in the 12 months before entering treatment, which decreased 10.8% to 3.4% at follow-up (see Figure 2.23).

The number of clients reporting **past-12-month heroin use decreased by 11%**

<sup>17</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.

<sup>18</sup> One case had missing values on past-30-day opioid misuse at follow-up.

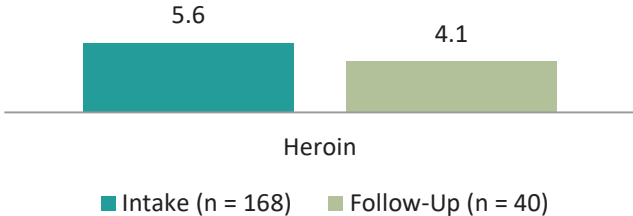
FIGURE 2.23. PAST-12-MONTH HEROIN USE AT INTAKE AND FOLLOW-UP (N = 1,193)<sup>19</sup>



**AVERAGE NUMBER OF MONTHS USED HEROIN**

Among the clients who reported using heroin in the 12 months before entering treatment (n = 168), they reported using heroin, on average, 5.6 months (see Figure 2.24). Among clients who reported using heroin at follow-up (n = 40), they reported using, on average, 4.1 months.

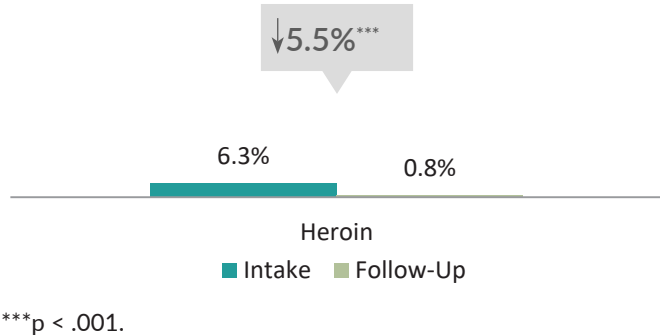
FIGURE 2.24. AVERAGE NUMBER OF MONTHS CLIENTS USED HEROIN



**PAST-30-DAY HEROIN USE**

A minority of clients (6.3%) reported using heroin in the 30 days before intake, with a significant decrease of 5.5% by follow-up to 0.8% (see Figure 2.25).

FIGURE 2.25. PAST-30-DAY HEROIN USE AT INTAKE AND FOLLOW-UP (N = 1,119)<sup>20</sup>



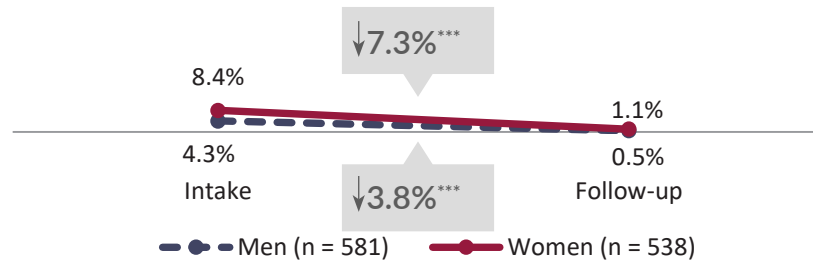
<sup>19</sup> One client had missing data for past-12-month heroin use at follow-up.

<sup>20</sup> Two clients had missing data for heroin use at follow-up.

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

At intake, significantly more women than men reported heroin use in the past 30 days, 8.4% vs. 4.3% (see Figure 2.26). 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 2.26. GENDER DIFFERENCES IN PAST-30-DAY HEROIN USE AT INTAKE AND FOLLOW-UP<sup>a</sup>



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

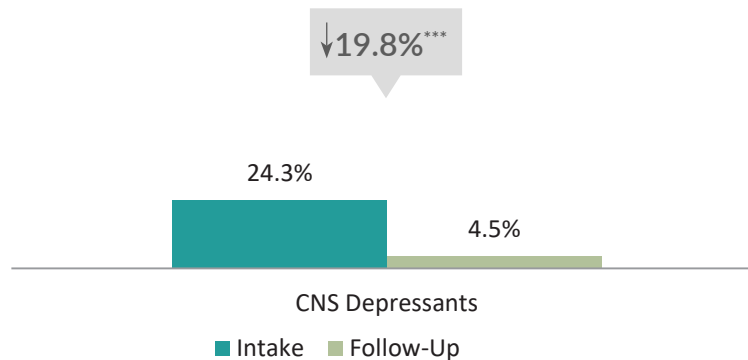
## CNS Depressants

### PAST-12-MONTH CNS DEPRESSANT USE

About one in four clients (24.3%) reported using CNS depressants, including tranquilizers, benzodiazepines, sedatives, and barbiturates in the 12 months before entering treatment, which decreased to 4.5% at follow-up. Overall, for the KTOS follow-up sample, there was a 19.8% decrease in the number of clients reporting CNS depressant use in the past 12 months (see Figure 2.27).

The number of clients reporting past-12-month CNS depressant use decreased by 20%

FIGURE 2.27. PAST-12-MONTH CNS DEPRESSANT USE AT INTAKE AND FOLLOW-UP (N = 1,192)<sup>21</sup>



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

<sup>21</sup> Two clients had missing values on past-12-month CNS depressant use at follow-up.

### GENDER DIFFERENCES IN PAST-12-MONTH CNS DEPRESSANT USE

Significantly more women than men reported CNS depressant use in the 12 months before intake, 30.1% vs. 19.2% (see Figure 2.28). The number of women and men who reported CNS depressant use significantly decreased from intake to follow-up by 25.3% and 14.9% respectively. At follow-up, there was no significant difference in the percent of women and men who reported using CNS depressants.


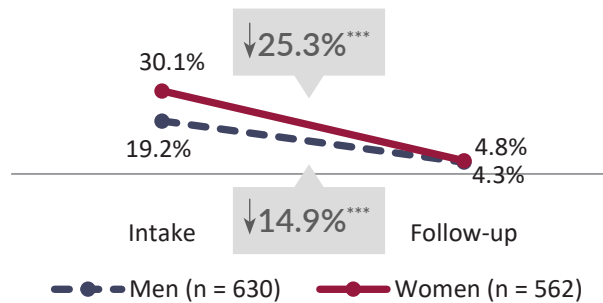
 Significantly more women than men reported CNS depressant use at intake

FIGURE 2.28. GENDER DIFFERENCES IN PAST-12-MONTH CNS DEPRESSANT USE FROM INTAKE TO FOLLOW-UP<sup>a</sup>

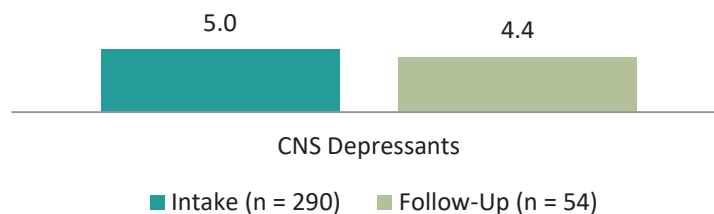


a—Significant difference by gender at intake;  $p < .001$ .  
 \*\*\* $p < .001$

### AVERAGE NUMBER OF MONTHS USED CNS DEPRESSANTS

Figure 2.29 shows the average maximum number of months clients who used CNS depressants reported using these illegal drugs.<sup>22</sup> Among the clients who reported using these substances in the 12 months before entering treatment (n = 290), they reported using CNS depressants an average 5.0 months. Among clients who reported using CNS depressants in the 12 months before follow-up (n = 54), they reported using an average of 4.4 months.

FIGURE 2.29. AVERAGE NUMBER OF MONTHS OF CNS DEPRESSANT USE

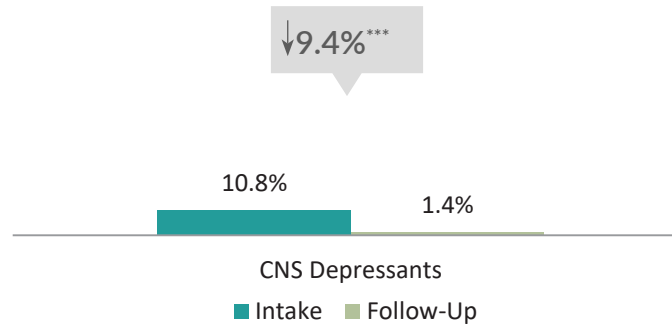


<sup>22</sup> Because number of months of use barbiturates and tranquilizers/sedatives/benzodiazepines were measured separately, the value is a calculation of the maximum number of months clients used any substance class.

## PAST-30-DAY CNS DEPRESSANT USE

The number of clients who reported using CNS depressants in the 30 days before intake decreased significantly by 9.4%, from 10.8% at intake to 1.4% at follow-up (see Figure 2.30).

FIGURE 2.30. PAST-30-DAY CNS DEPRESSANT USE AT INTAKE AND FOLLOW-UP (N = 1,119)<sup>23</sup>

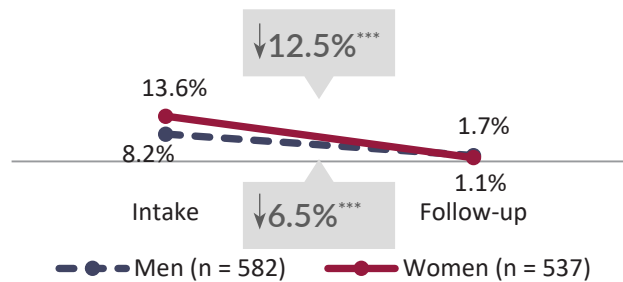


\*\*\*p < .001.

## GENDER DIFFERENCES IN PAST-30-DAY CNS DEPRESSANT USE

Significantly more women than men reported CNS depressant use in the 30 days before intake, 13.6% vs. 8.2% (see Figure 2.31). The number of women and men who reported CNS depressant use significantly decreased from intake to follow-up and at follow-up, there was no significant difference in past-30-day CNS depressant use at follow-up by gender.

FIGURE 2.31. 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 < .01.  
\*\*\*p < .001.

## Cocaine

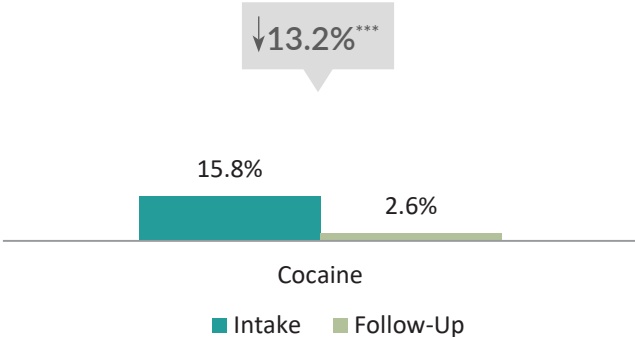
### PAST-12-MONTH COCAINE USE

About 16% of clients reported using cocaine in the 12 months before entering treatment, which decreased to 2.6% at follow-up. Overall, there was a 13.2% decrease in the number of clients reporting cocaine use (see Figure 2.32).

The number of clients reporting past-12-month cocaine use decreased by 13%

<sup>23</sup> Two cases had missing values on past-30-day CNS depressant use at follow-up.

FIGURE 2.32. PAST-12-MONTH COCAINE USE AT INTAKE AND FOLLOW-UP (N = 1,193<sup>24</sup>)

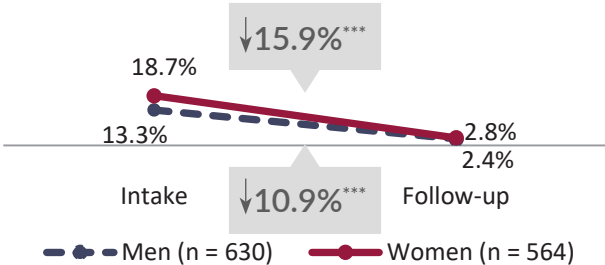


\*\*\*p < .001.

**GENDER DIFFERENCES IN PAST-12-MONTH COCAINE USE**

Significantly more women (18.7%) reported cocaine use in the 12 months before entering treatment when compared to men (13.3%; see Figure 2.33). The percent reporting cocaine use significantly decreased for both women and men, respectively (15.9% vs. 10.9%), and at follow-up there was no significant difference in the number of women and men reporting cocaine use in the past 12 months.

FIGURE 2.33. 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.

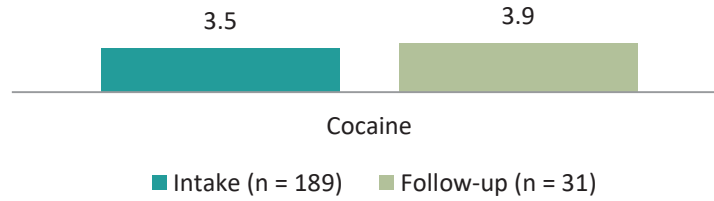
**AVERAGE NUMBER OF MONTHS USED COCAINE**

Among the clients who reported using cocaine in the 12 months before entering treatment (n = 189), they reported using cocaine an average of 3.5 months (see Figure 2.34). Clients who reported using cocaine in the 12 months before follow-up (n = 31) reported using cocaine, on average, 3.9 months.

<sup>24</sup> One client was missing data for past-12-month cocaine use at follow-up.



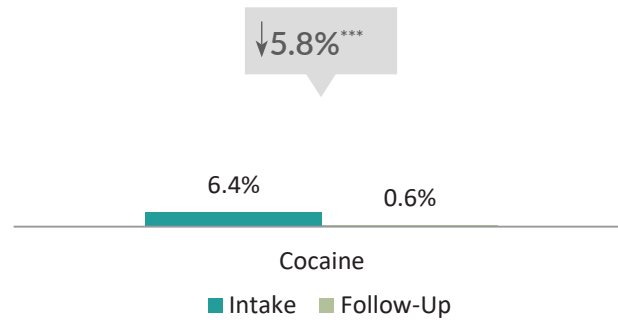
FIGURE 2.34. AVERAGE NUMBER OF MONTHS OF COCAINE USE



### PAST-30-DAY COCAINE USE

The number of clients who reported using cocaine in the past 30 days at intake decreased significantly by 5.8%, from 6.4% at intake to 0.6% at follow-up (see Figure 2.35).

FIGURE 2.35. PAST-30-DAY COCAINE USE AT INTAKE AND FOLLOW-UP (N = 1,120)<sup>25</sup>



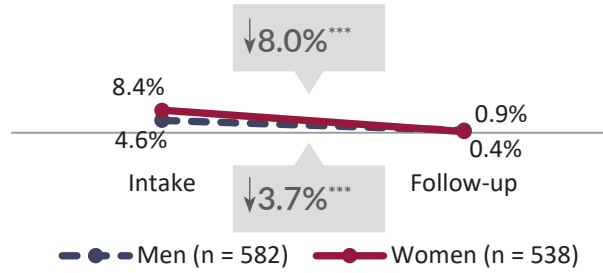
\*\*\*p < .001.

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

At intake, significantly more women (8.4%) reported past-30-day cocaine use compared to men (4.6%; see Figure 2.36). The number of women and men who reported cocaine use in the past 30 days decreased significantly over time and at follow-up, there was no significant difference in the number of women and men reporting past-30-day cocaine use.

<sup>25</sup> One client was missing data for past-30-day cocaine use at follow-up.

FIGURE 2.36. GENDER DIFFERENCES IN PAST-30-DAY COCAINE USE FROM INTAKE TO FOLLOW-UP<sup>a</sup>



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

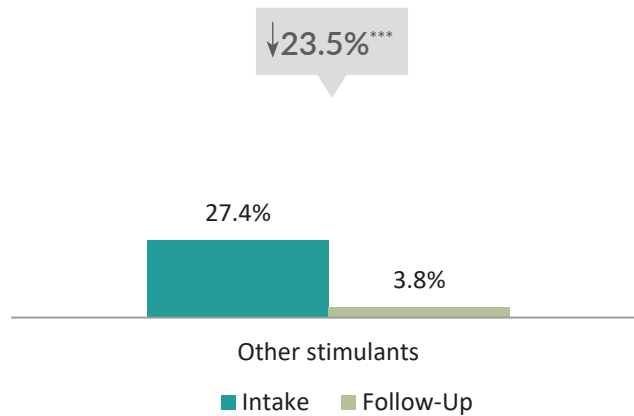
## Other Stimulants

### PAST-12-MONTH OTHER STIMULANT USE

More than one-quarter of clients (27.4%) 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 3.8% at follow-up. Overall, for the KTOS follow-up sample, there was a 23.5% decrease in the number of clients reporting other stimulant use (see Figure 2.37).

The number of clients reporting past-12-month stimulant use other than cocaine decreased by 24%

FIGURE 2.37. PAST-12-MONTH STIMULANT USE OTHER THAN COCAINE AT INTAKE AND FOLLOW-UP (N = 1,193)<sup>26</sup>



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

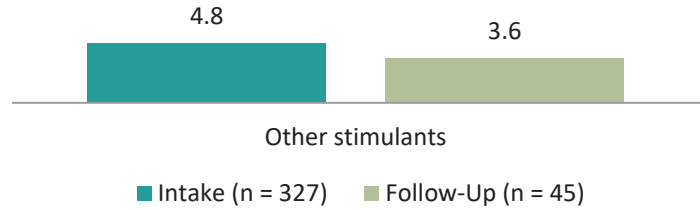
### AVERAGE NUMBER OF MONTHS USED OTHER STIMULANTS

Among the clients who reported using stimulants other than cocaine in the 12 months before entering treatment (n = 327), they reported using other stimulants an average of 4.8 months (see Figure 2.38). Clients who reported using other stimulants in the 12 months before follow-

<sup>26</sup> One case had missing values on past-12-month other stimulant use at intake and follow-up.

up (n = 45) reported using other stimulants, on average, 3.6 months.

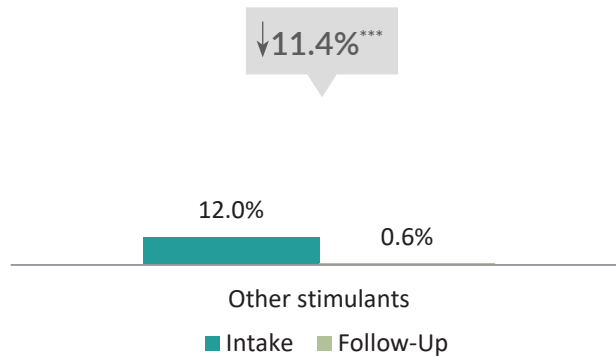
FIGURE 2.38. AVERAGE NUMBER OF MONTHS OF OTHER STIMULANT USE



### 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 11.4%, from 12.0% at intake to 0.6% at follow-up (see Figure 2.39).

FIGURE 2.39. PAST-30-DAY STIMULANT USE OTHER THAN COCAINE AT INTAKE AND FOLLOW-UP (N = 1,120)<sup>27</sup>

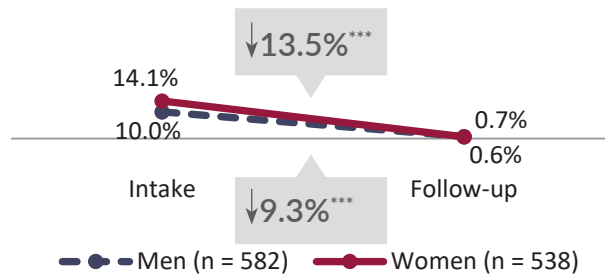


\*\*\*p < .001.

### GENDER DIFFERENCES IN PAST-30-DAY OTHER STIMULANT USE

At intake, significantly more women (14.1%) reported other stimulant use in the past 30 days when compared to men (10.0%; see Figure 2.40). 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.

<sup>27</sup> One case had missing values on past-30-day other stimulant use at intake and follow-up.

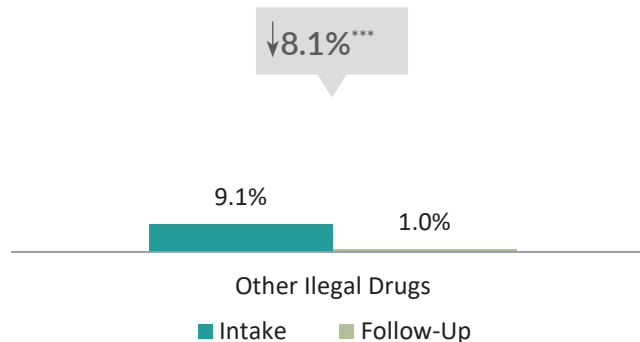
FIGURE 2.40. GENDER DIFFERENCES IN PAST-30-DAY OTHER STIMULANT USE FROM INTAKE TO FOLLOW-UP<sup>a</sup>

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

## Other Illegal Drugs

### PAST-12-MONTH OTHER ILLEGAL DRUGS

A small minority of KTOS clients (9.1%) 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 1.0% at follow-up – a significant decrease of 8.1% (see Figure 2.41).

FIGURE 2.41. PAST-12-MONTH USE OF OTHER ILLEGAL DRUGS AT INTAKE AND FOLLOW-UP (N = 1,193)<sup>28</sup>

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

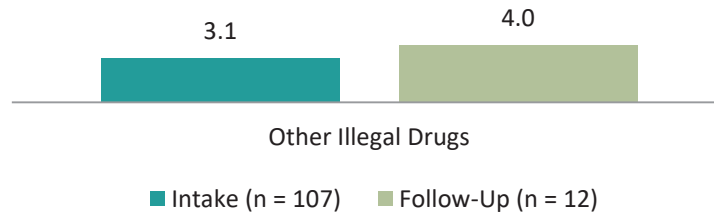
### AVERAGE NUMBER OF MONTHS USED OTHER ILLEGAL DRUGS

Figure 2.42 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>29</sup> in the past 12 months. Among the clients who reported using these drugs in the 12 months before entering treatment (n = 107), they reported using other illegal drugs an average of 3.1 months. Among clients who reported using other illegal drugs in the 12 months before follow-up (n = 12), they reported using an average of 4.0 months.

<sup>28</sup> One client had missing data for past-12-month other illegal drugs.

<sup>29</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.

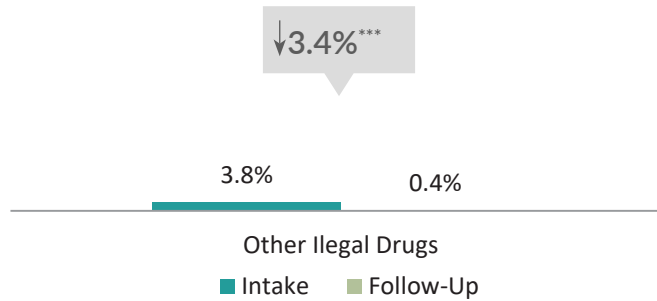
FIGURE 2.42. AVERAGE NUMBER OF MONTHS OF OTHER ILLEGAL DRUG USE



### PAST-30-DAY OTHER ILLEGAL DRUG USE

The number of clients who reported using other illegal drugs in the 30 days before the intake and follow-up interviews decreased significantly by 3.4%, from 3.8% at intake to 0.4% at follow-up (see Figure 2.43).

FIGURE 2.43. PAST-30-DAY USE OF OTHER ILLEGAL DRUGS AT INTAKE AND FOLLOW-UP (N = 1,120)<sup>30</sup>



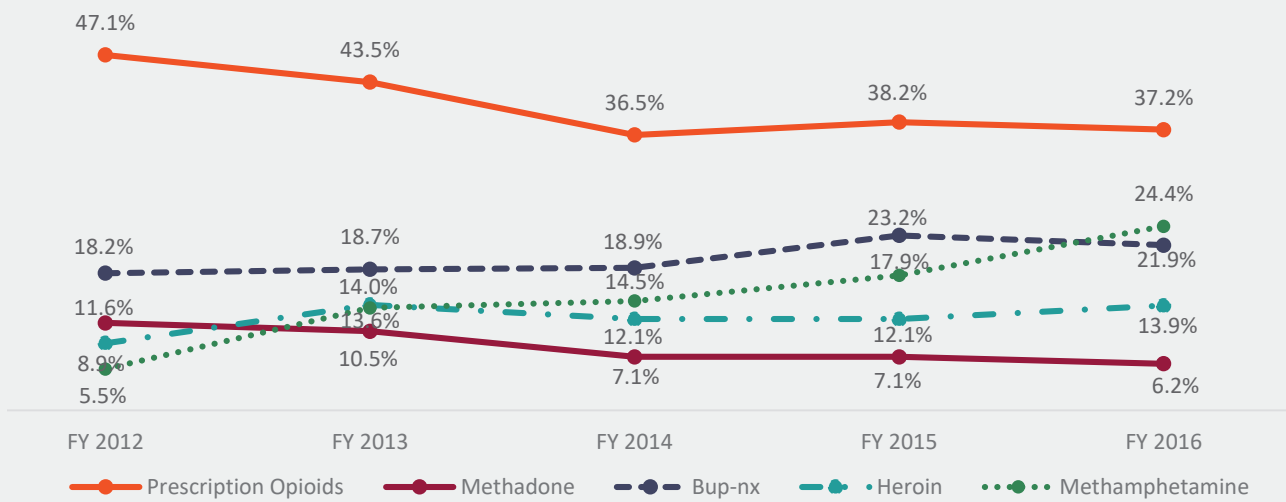
\*\*\*p < .001.

<sup>30</sup> One client had missing data for past-30-day other illegal drugs.

### 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, 38.2% of clients reported prescription opioid misuse at intake and that number remained steady in FY16. 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 (6.2%). The percent of clients who reported using buprenorphine-naloxone (bup-nx) remained stable from FY12 through FY14 but increased to 23.2% in FY15. In FY16 the percent of clients who reported using bup-nx decreased slightly to 21.9%. The percent of KTOS clients who reported using heroin increased from FY12 to FY13, remained stable in FY14 and FY15 (12.1%), and increased slightly in FY16. In FY12, the number of clients reporting methamphetamine use was relatively low (5.5%), but has steadily increased in the past 5 years to 24.4% in FY16.

FIGURE 2.44. 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 = 25,548)<sup>31</sup>



### Injection Drug Use

At intake, 33.8% of clients reported having ever injected any drug. Of those clients (n = 414), 2.7% reported having ever used a Needle Exchange Program in Kentucky. At follow-up, 3.8% of clients reported injecting drugs in the past 12 months. Of those clients (n = 46), 15.6% reported having used a Needle Exchange program in Kentucky.<sup>32</sup>

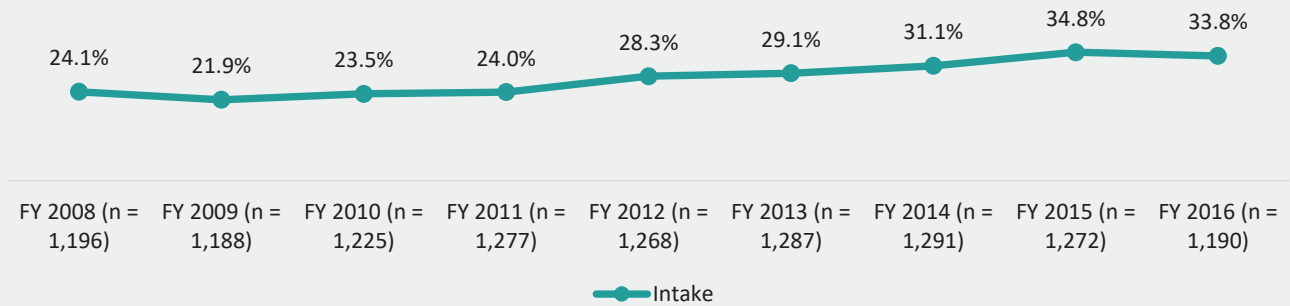
<sup>31</sup> Clients who reported being in a controlled environment all 365 days before entering treatment are not included in this analysis.

<sup>32</sup> One case had missing data for the needle exchange program at follow-up.

## 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 (24.1%) to FY 2016 (33.8%).

FIGURE 2.45. TRENDS CLIENTS REPORTING HAVING EVER INJECTED ANY DRUG AT INTAKE, FY 2008-2016



## 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>33</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 15.4 years old when they had their first alcoholic drink (not depicted in figure).<sup>34</sup>

A little more than half of clients (51.1%) reported using alcohol in the 12 months before entering treatment while 28.3% of clients reported alcohol use in the 12 months before follow-up (see Figure 2.46). Overall, for the KTOS follow-up sample, there was a 22.8% decrease in the number of clients reporting alcohol use in the past 12 months. More than one-third of clients (37.7%) reported using alcohol to intoxication at intake, with 13.7% reporting alcohol use to intoxication in the 12 months before follow-up—a significant decrease of 24.0%. Similarly, there was a significant decrease of 21.0% in the number of clients who reported past-12-month binge drinking from intake to follow-up (33.4% vs. 12.4%).<sup>35</sup>

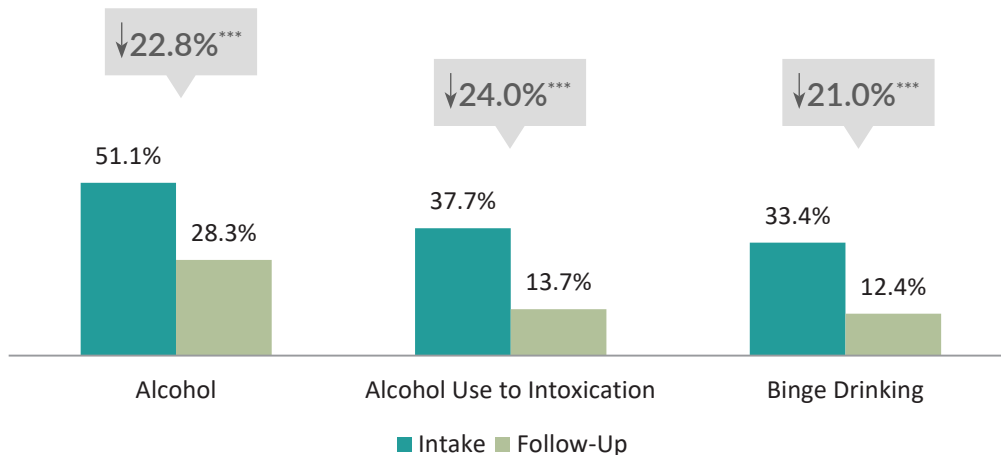
The number of clients reporting **past-12-month alcohol use** decreased by **23%**

<sup>33</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>34</sup> Of the individuals in the follow-up sample, 59 reported they have never had an alcoholic drink.

<sup>35</sup> Missing data on alcohol use, alcohol to intoxication, and binge drinking at follow-up for 1 case.

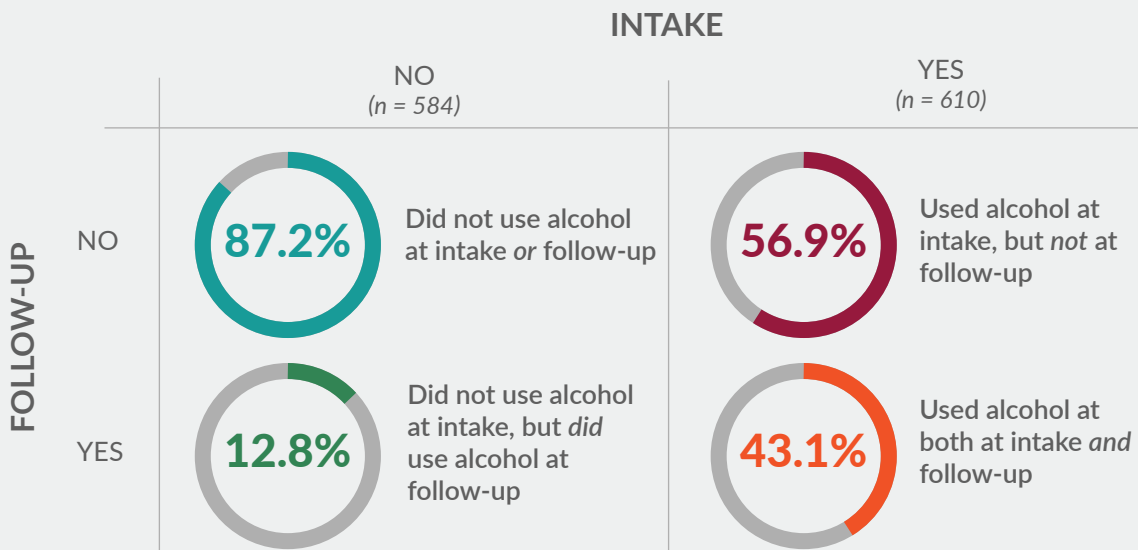
FIGURE 2.46. PAST-12-MONTH ALCOHOL USE AT INTAKE AND FOLLOW-UP (N = 1,194)<sup>36</sup>



\*\*\*p < .001.

### Taking a Closer Look at Alcohol Use

Over half of KTOS clients reported using alcohol in the 12 months before entering treatment (51.1%; n = 610). Of these clients who reported using alcohol in the past 12 months at intake, 56.9% did not use alcohol in the past 12 months at follow-up (see Table 2.1). However, about 43% of those who reported alcohol use at intake also reported use at follow-up.



<sup>36</sup> Twelve cases were missing data for alcohol use to intoxication, and 13 cases were missing for binge drinking at follow-up.



### GENDER DIFFERENCES IN PAST-12-MONTH ALCOHOL USE

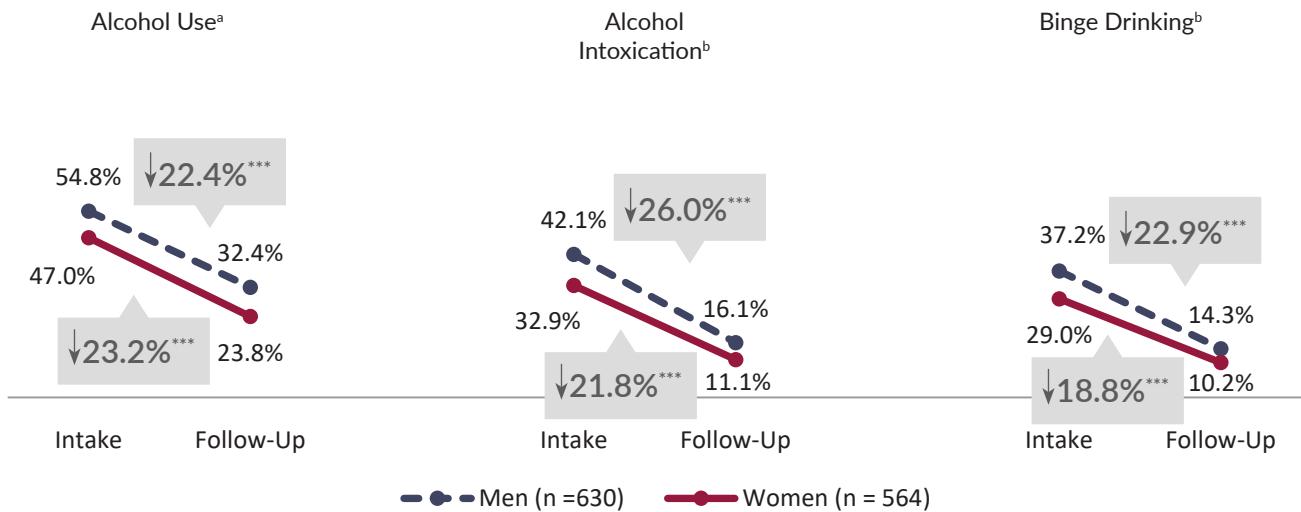
At intake, significantly more men (54.8%) reported alcohol use compared to women (47.0%; see Figure 2.48). The number of men and women reporting alcohol use decreased significantly from intake to follow-up, however, at follow-up, more men still reported using alcohol compared to women.



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

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

FIGURE 2.48. GENDER DIFFERENCES IN PAST-12-MONTH ALCOHOL USE AT INTAKE AND FOLLOW-UP

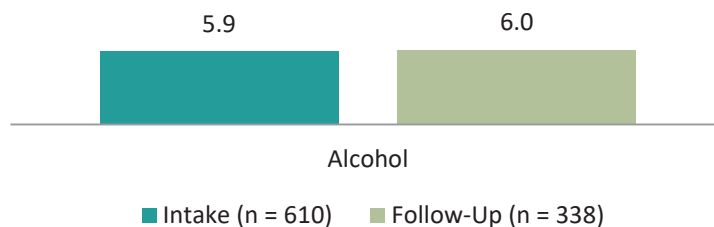


a—Significant difference by gender at intake and follow-up ( $p < .01$ ).  
 b—Significant difference by gender at intake ( $p < .01$ ) and follow-up ( $p < .05$ ).  
 \*\*\* $p < .001$ .

### AVERAGE NUMBER OF MONTHS USED ALCOHOL

Figure 2.49 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 ( $n = 610$ ), they reported using alcohol, on average, 5.9 months. Among clients who reported using alcohol in the 12 months before follow-up ( $n = 338$ ), they reported using, on average, 6.0 months.

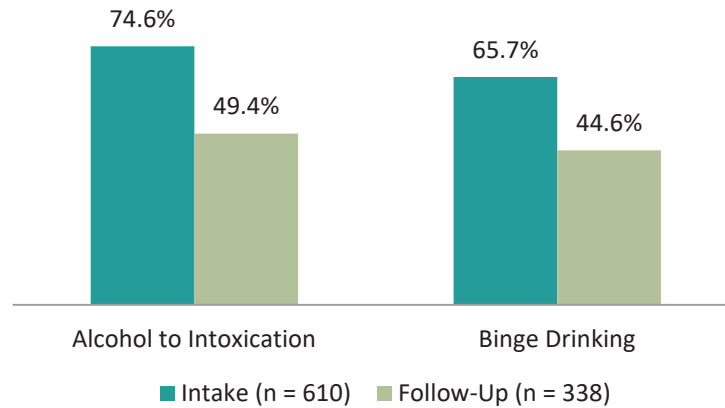
FIGURE 2.49. AVERAGE NUMBER OF MONTHS OF ALCOHOL USE



### 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 = 610), 74.6% used alcohol to intoxication in the 12 months before intake and 65.7% reported binge drinking (see Figure 2.50). Of the clients who used alcohol in the 12 months before follow-up (n = 338), 49.4% of clients reported alcohol use to intoxication<sup>37</sup> and 44.6% reported binge drinking.<sup>38</sup>

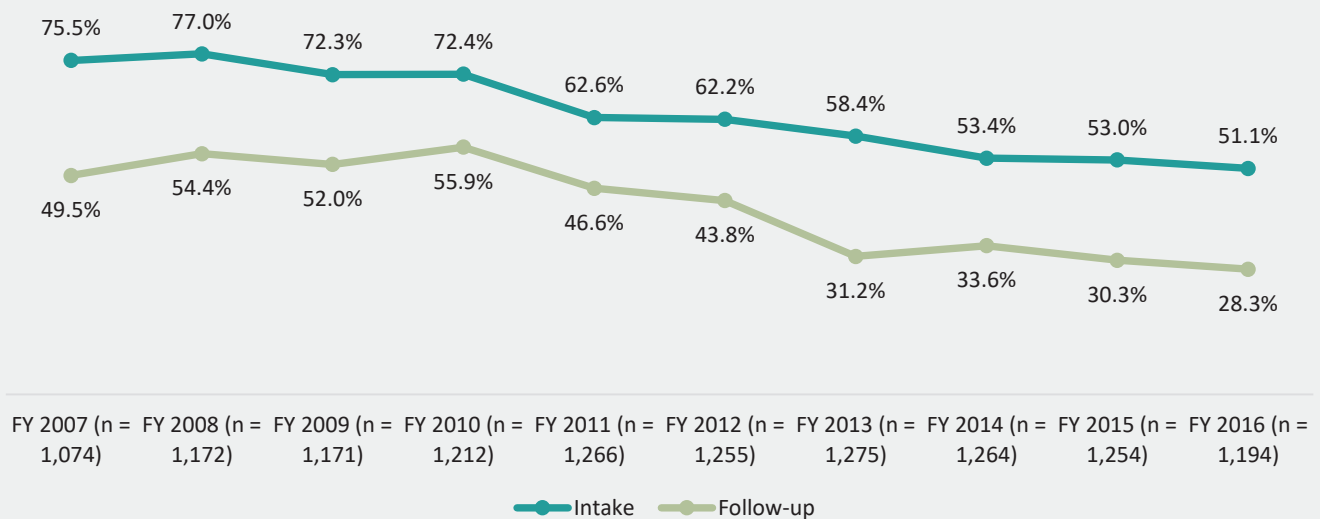
FIGURE 2.50. PAST-12-MONTH ALCOHOL USE TO INTOXICATION AND BINGE DRINKING AT INTAKE AND FOLLOW-UP, AMONG THOSE REPORTING ALCOHOL USE AT EACH POINT



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

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

FIGURE 2.51. TRENDS IN ALCOHOL USE AT INTAKE AND FOLLOW-UP, FY 2007-2018



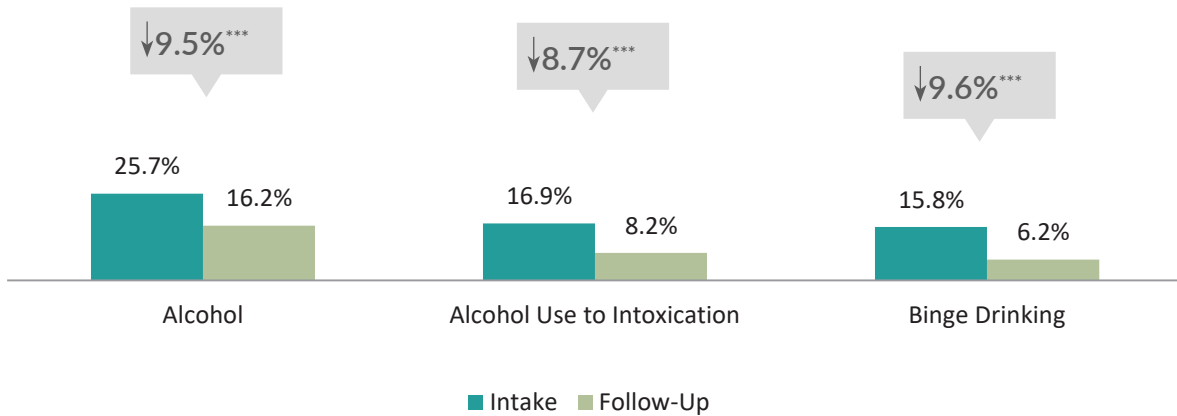
<sup>37</sup> 12 cases had missing data on past-12-month alcohol intoxication (therefore n = 326).

<sup>38</sup> 13 cases had missing data on past-12-month binge drinking at follow-up (therefore n = 325).

## PAST-30-DAY ALCOHOL USE

There was a 9.5% decrease in the percent of clients who reported using alcohol in the past 30 days from intake (25.7%) to follow-up (16.2%; see Figure 2.52). The decrease in the number of clients who reported using alcohol to intoxication was 8.7% and 9.6% for those who reported binge drinking in the 30 days before entering treatment.<sup>39</sup>

FIGURE 2.52. PAST-30-DAY ALCOHOL USE AT INTAKE AND FOLLOW-UP (N = 1,121)



\*\*\*p < .001.

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

Significantly more men (29.4%) than women (21.7%) reported using alcohol in the 30 days before entering the treatment program (see Figure 2.53). The number of men and women who reported alcohol use decreased significantly from intake to follow-up. At follow-up, significantly more men (19.6%) still reported past-30-day alcohol use when compared to women (12.6%).

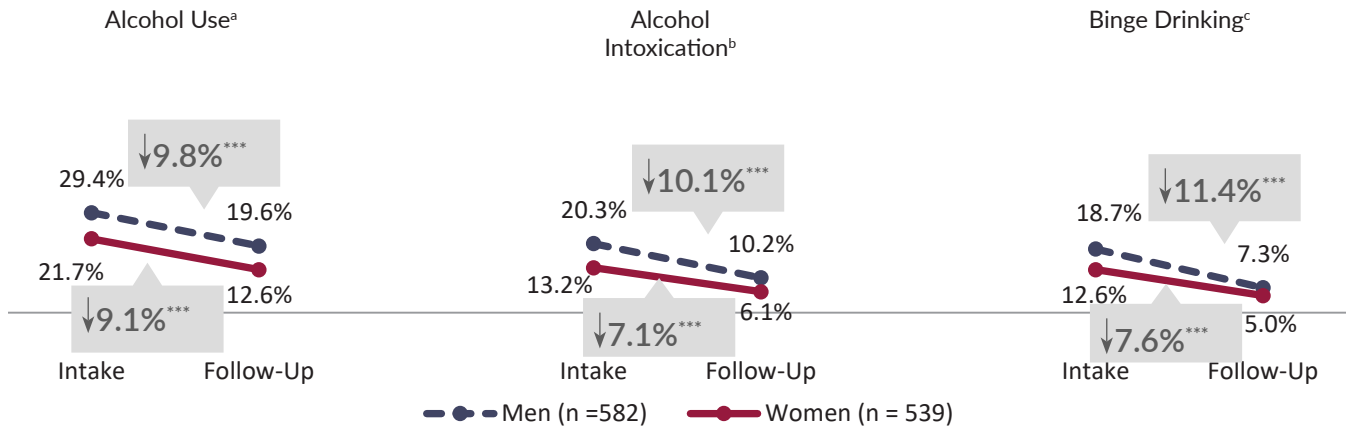
At intake, more men than women reported alcohol use to intoxication and binge drinking in the past 30 days. The number of men and women reporting past-30-day alcohol use to intoxication and binge drinking decreased significantly over time, however, more men (10.2%) still reported alcohol use to intoxication in the 30 days before follow-up compared to women (6.1%). There was no difference by gender for past-30-day binge drinking at follow-up.

*“They have 24/7 staff which is great, You have someone always there to help. They take you out and show you how to live without the drugs. They also talk about the mistakes and about your life. I learned a lot.”*

KTOS FOLLOW-UP CLIENT

<sup>39</sup> One case had missing data on 30-day alcohol use to intoxication and 5 cases had missing data on 30-day binge drinking at follow-up.

FIGURE 2.53. GENDER DIFFERENCES IN PAST-30-DAY ALCOHOL USE AT INTAKE AND FOLLOW-UP

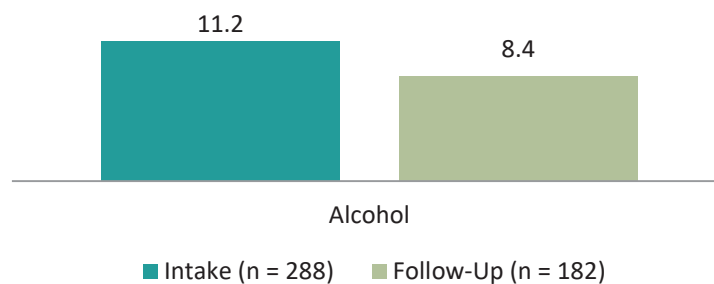


a—Significant difference by gender at intake and follow-up ( $p < .01$ ).  
 b—Significant difference by gender at intake ( $p < .01$ ) and follow-up ( $p < .05$ ).  
 c—Significant difference by gender at intake ( $p < .01$ ).  
 \*\*\* $p < .001$ .

### AVERAGE NUMBER OF DAYS USED ALCOHOL

Figure 2.54 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 ( $n = 288$ ), they reported using alcohol, on average, 11.2 days. Among clients who reported using alcohol in the 30 days before follow-up ( $n = 182$ ), they reported using, on average, 8.4 days.

FIGURE 2.54. AVERAGE NUMBER OF DAYS OF ALCOHOL USE



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

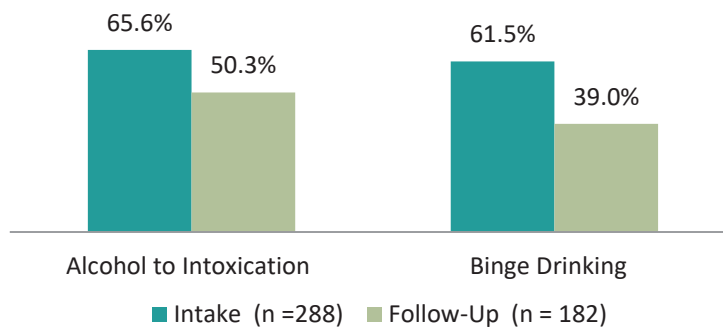
Of the 288 clients who used alcohol in the 30 days before intake, 65.6% used alcohol to intoxication and 61.5% binge drank in the 30 days before intake (see Figure 2.55).

Of the 182 clients who reported using alcohol in the 30 days before follow-up, 50.3% reported using alcohol to intoxication<sup>40</sup> and 39.0% reported binge drinking in the 30 days before follow-up.<sup>41</sup>

<sup>40</sup> One case was missing for past-30-day intoxication at follow-up ( $n = 181$ ).

<sup>41</sup>

FIGURE 2.55. 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>42</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) moderate SUD (4 or 5 criteria met), and (4) severe disorder (6 or more criteria met). Client self-reports of DSM-5 criteria suggest, but do not diagnose, a substance use disorder.

Change in the number of SUD symptoms reported in the prior 12 months was examined for clients at intake and follow-up.<sup>43, 44</sup> Figure 2.56 displays the change in the percent of individuals in each SUD severity classification. At intake, 29.0% met study criteria for no substance use disorder classification (meaning they reported 0 or 1 DSM-5 symptoms for SUD), while at follow-up, 73.1% met study criteria for no SUD classification, a significant increase of 44.1%. At the other extreme of the continuum, over half of individuals (53.6%) met study criteria for severe SUD (6 or more symptoms) at intake, while at follow-up, only 10.6% met study criteria for severe SUD, a significant decrease of 43.0%.

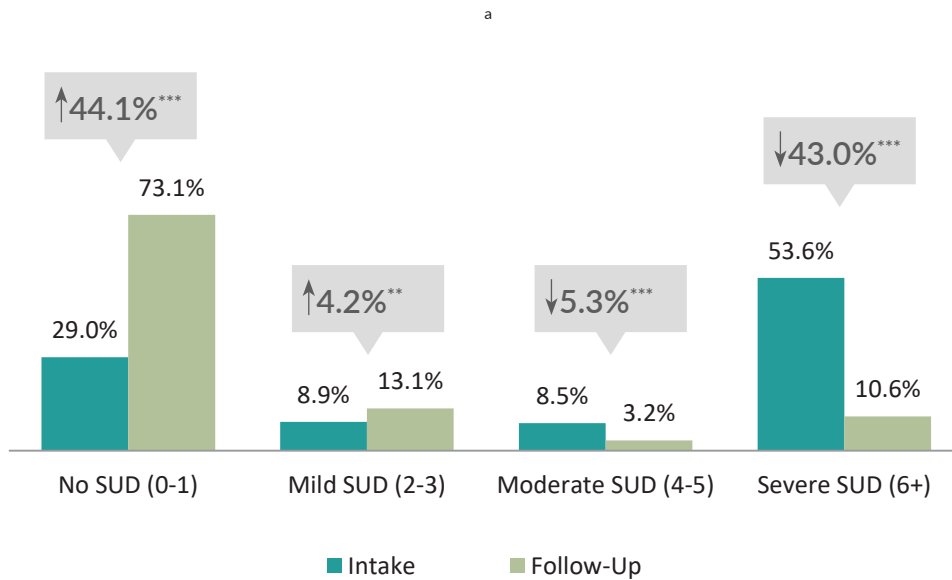
The number of individuals who met criteria for no SUD increased significantly from intake to follow-up

<sup>42</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.

<sup>43</sup> Ten clients (0.8%) had missing data for all DSM-5 variables at follow-up and were not included in the analysis.

<sup>44</sup> Ten individuals had missing data for DSM-5 criteria at follow-up.

FIGURE 2.56. DSM-5 SUD SEVERITY AT INTAKE AND FOLLOW-UP (N = 1,184)



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

### 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.

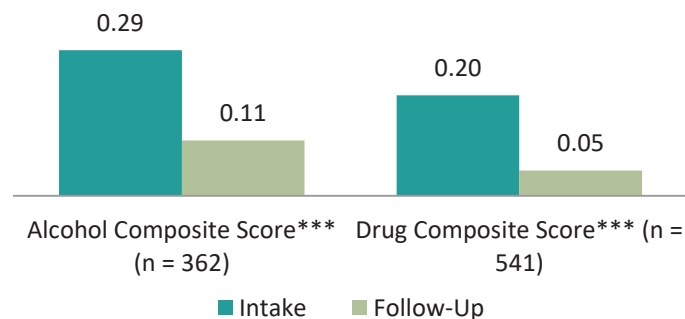
American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders (5th ed.)*. Arlington, VA: American Psychiatric Publishing.

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 2.57 displays the change in average composite scores.<sup>45</sup> The average for the alcohol composite score decreased significantly from 0.29 at intake to 0.11 at follow-up. The average for the drug composite score decreased significantly from 0.20 at intake to 0.05 at follow-up.

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

FIGURE 2.57. AVERAGE ASI ALCOHOL AND DRUG COMPOSITE SCORES AT INTAKE AND FOLLOW-UP

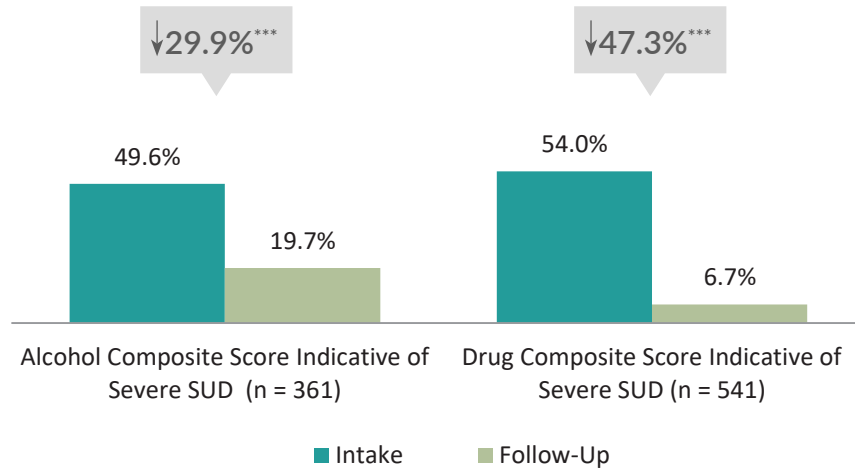


\*\*\*p < .001.

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 2.58). Around one half of individuals (49.6%) 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 19.7%. 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 (54.0%). At follow-up, less than 1 in 10 had drug composite scores indicative of severe SUD (6.7%).

<sup>45</sup> The following number of cases were not included in the analysis of change in alcohol composite score: 95 clients were in a controlled environment all 30 days before treatment; 7 additional individuals were in a controlled environment all 30 days before follow-up; 4 individuals had missing data for the number of days they were in a controlled environment before follow-up; an additional 450 clients reported abstaining from alcohol in the 30 days before intake and follow-up; and 19 individuals had missing data from items included in the calculation of the alcohol composite at follow-up. The following numbers were not included in the analysis of change in drug composite score: 95 clients were in a controlled environment all 30 days before treatment; 7 additional individuals were in a controlled environment all 30 days before follow-up; 4 individuals had missing data for the number of days they were in a controlled environment before follow-up; 566 clients reported abstaining from drugs in the 30 days before intake and follow-up, and 19 clients had missing data from items included in the calculation of the drug composite score at follow-up.

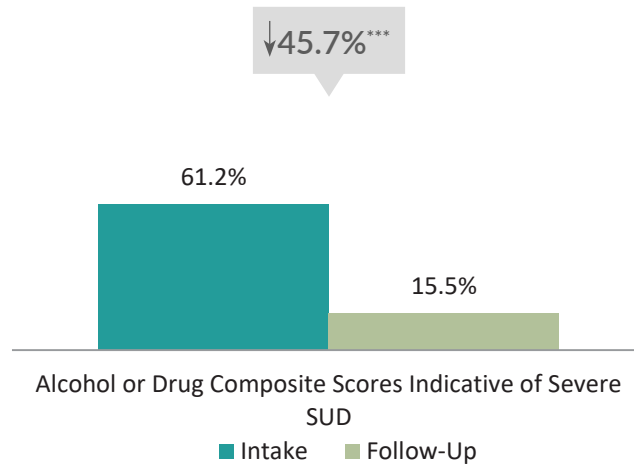
FIGURE 2.58. INDIVIDUALS WITH ASI COMPOSITE SCORES MEETING THE CUTOFF FOR SEVERE SUBSTANCE USE DISORDER AT INTAKE AND FOLLOW-UP<sup>46</sup>



\*\*\*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 2.59). The percent of clients who had composite scores that met the cutoff for severe SUD for either alcohol or drugs decreased by 45.7% at follow-up.

FIGURE 2.59. CLIENTS WITH ASI COMPOSITE SCORES MEETING THE CUTOFF FOR ALCOHOL OR DRUG SEVERE USE DISORDERS AT INTAKE AND FOLLOW-UP (N = 698)



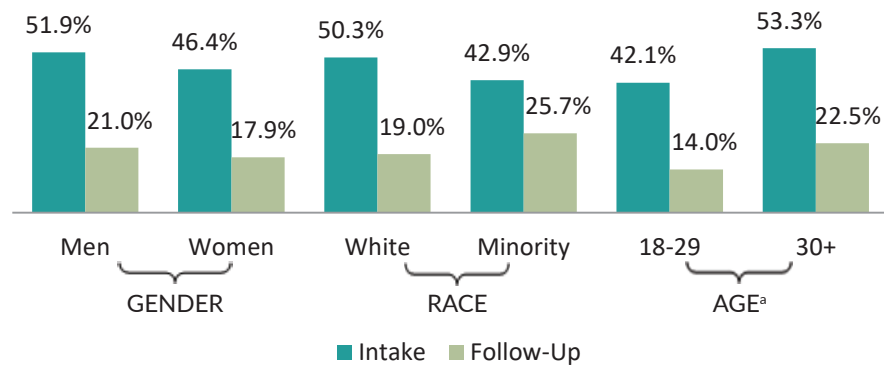
\*\*\*p < .001.

The data were 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 2.60). Significantly more clients 30 years of age and older had an alcohol composite score indicative of severe SUD compared to clients who were 18-29 years of age at intake.

<sup>46</sup> Seven clients had missing data for the alcohol score variables at follow-up and six clients had missing data for the drug composite score variables at follow-up.



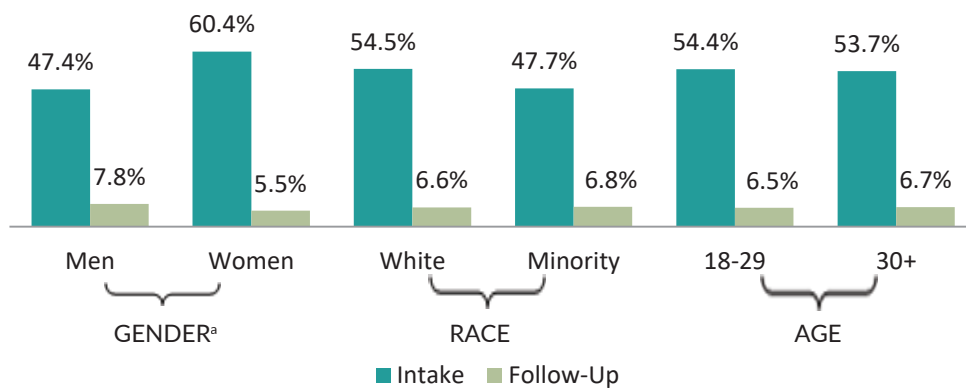
FIGURE 2.60. ALCOHOL-USING CLIENTS WITH AN ALCOHOL COMPOSITE SCORE INDICATIVE OF SEVERE SUD AT INTAKE AND FOLLOW-UP BY DEMOGRAPHIC FACTORS (N = 361)



a – Significant difference between age groups at intake ( $p < .05$ ).

Analyses were also conducted to determine if clients who had a drug composite score indicative of severe SUD at intake and follow-up differed by gender, race/ethnicity, or age (see Figure 2.61). At intake, significantly more women had a drug composite score indicative of severe SUD than men.

FIGURE 2.61. DRUG-USING CLIENTS WITH A DRUG COMPOSITE SCORE INDICATIVE OF SEVERE SUD AT INTAKE AND FOLLOW-UP BY DEMOGRAPHIC FACTORS (N = 541)

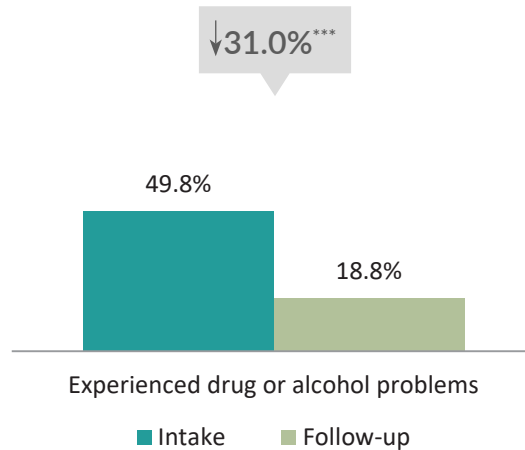


a – Significant difference between gender groups at intake ( $p < .01$ ).

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

In the past 30 days at intake, 49.8% 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 2.62). In the past 30 days at follow-up, 18.8% of clients reported experiencing problems with drugs or alcohol (a significant decrease of 31.0%).

FIGURE 2.62. CLIENTS EXPERIENCING PROBLEMS WITH ILLEGAL DRUGS OR ALCOHOL AT INTAKE AND FOLLOW-UP (N = 1,120)

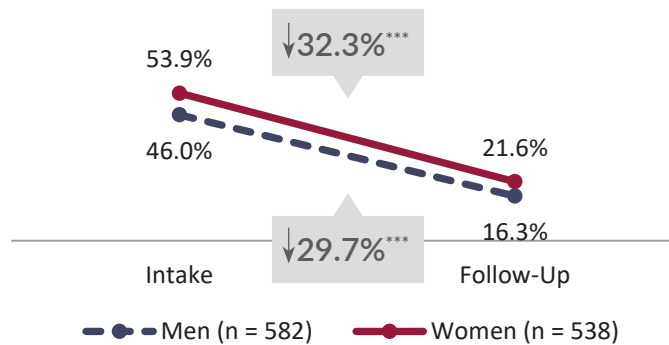


\*\*\*p < .001.

### GENDER DIFFERENCES IN PROBLEMS EXPERIENCED WITH SUBSTANCE USE IN THE PAST 30 DAYS

At intake, more women (53.9%) than men (46.0%) reported problems experienced with substance use in the past 30 days at intake. The number of women and men who reported experiencing problems with substance use decreased significantly from intake to follow-up. At follow-up however, significantly more women (21.6%) still reported experiencing problems with substance use in the past 30 days compared to men (16.3%).

FIGURE 2.63. GENDER DIFFERENCES IN CLIENTS EXPERIENCING PROBLEMS WITH ILLEGAL DRUGS OR ALCOHOL AT INTAKE AND FOLLOW-UP<sup>a</sup>



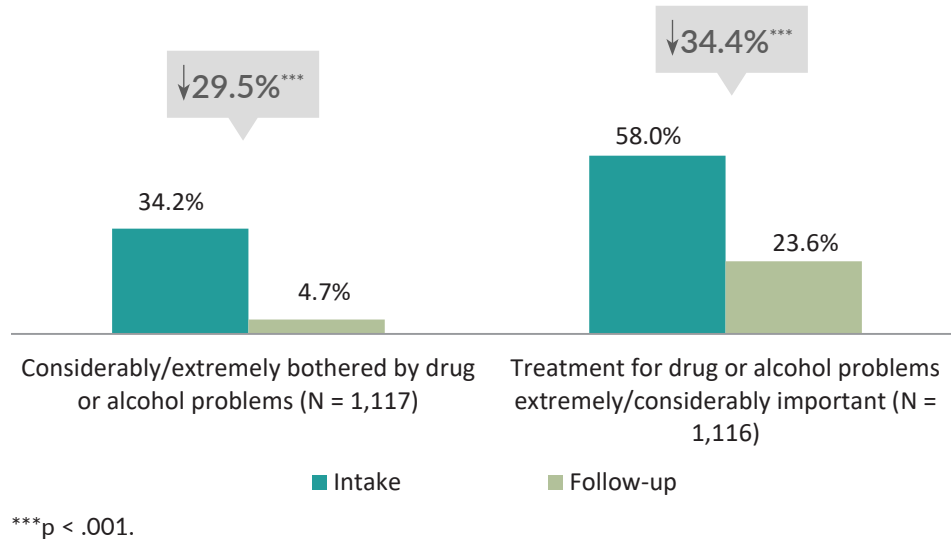
<sup>a</sup>—Significant difference by gender at intake (p < .01) follow-up (p < .05).  
\*\*\*p < .001.

### Readiness for Substance Abuse Treatment

Figure 2.64 shows that 34.2% 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, 4.7% of clients reported that they were considerably or extremely troubled or bothered by drug or alcohol problems (a significant decrease of 29.5%).

The figure below also shows that 58.0% of clients in the past 30 days at intake and 23.6% of clients in the past 30 days at follow-up reported that treatment for drug or alcohol problems was considerably or extremely important – a significant decrease of 34.4%

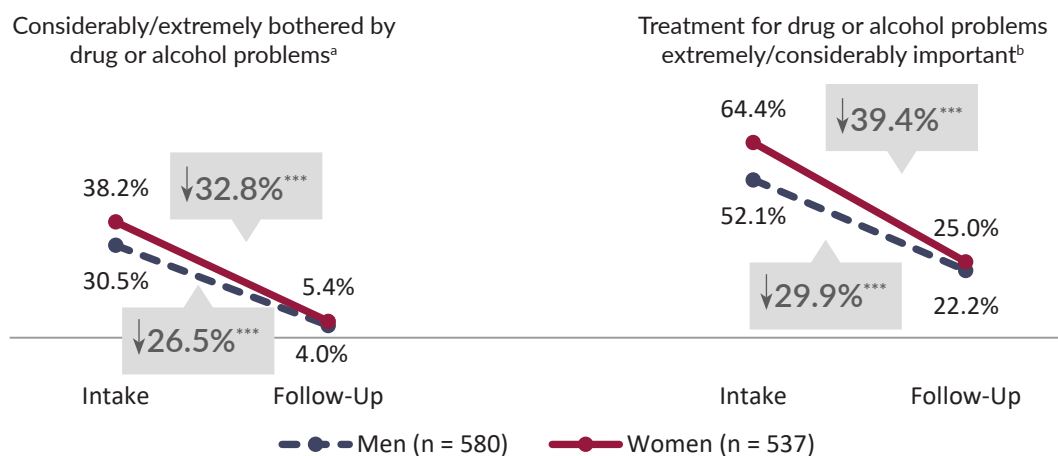
FIGURE 2.64. READINESS FOR TREATMENT FOR ILLEGAL DRUG OR ALCOHOL USE AT INTAKE AND FOLLOW-UP



### GENDER DIFFERENCES IN READINESS FOR TREATMENT IN THE PAST 30 DAYS

At intake, significantly more women (38.2%) reported experiencing problems with substance use in the past 30 days compared to men (30.5%; see Figure 2.65). More women than men also reported that treatment for drug or alcohol problems was considerably or extremely important. At follow up, there was no significant difference in the number of men and women who reported experiencing problems related to drug or alcohol use or the importance of treatment.

FIGURE 2.65. 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 < .01).  
 b—Significant difference by gender at intake (p < .001).  
 \*\*\*p < .001.

## Tobacco Use

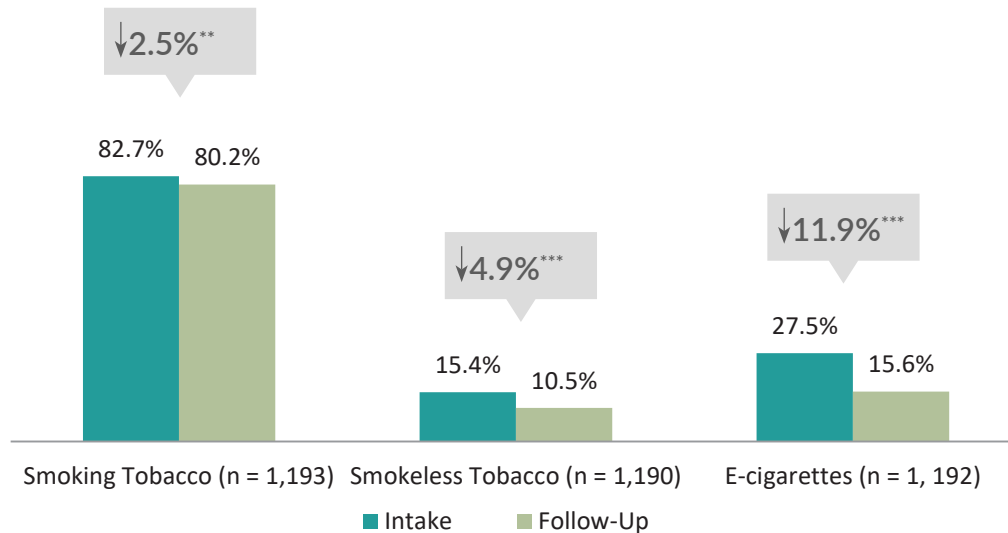
### PAST-12-MONTH SMOKING, SMOKELESS TOBACCO, AND E-CIGARETTE USE

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>47</sup>

Overall, there was a small but significant decrease in smoking tobacco use from intake to follow-up (2.5%; see Figure 2.66). Most clients reported smoking tobacco in the 12 months before entering treatment (82.7%) and in the 12 months before follow-up (80.2%). A minority of clients (15.4%) reported using smokeless tobacco in the 12 months before entering treatment and 10.5% reported using smokeless tobacco in the 12 months before follow-up, a 4.9% significant decrease. Over one-quarter of clients reported using e-cigarettes in the 12 months before entering treatment and 15.6% of clients reported using e-cigarettes in the 12 months before follow-up (a significant decrease of 11.9%).

Significantly fewer clients reported smoking tobacco in the past 12 months at follow-up

FIGURE 2.66. CHANGE IN PAST-12-MONTH TOBACCO USE FROM INTAKE TO FOLLOW-UP



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

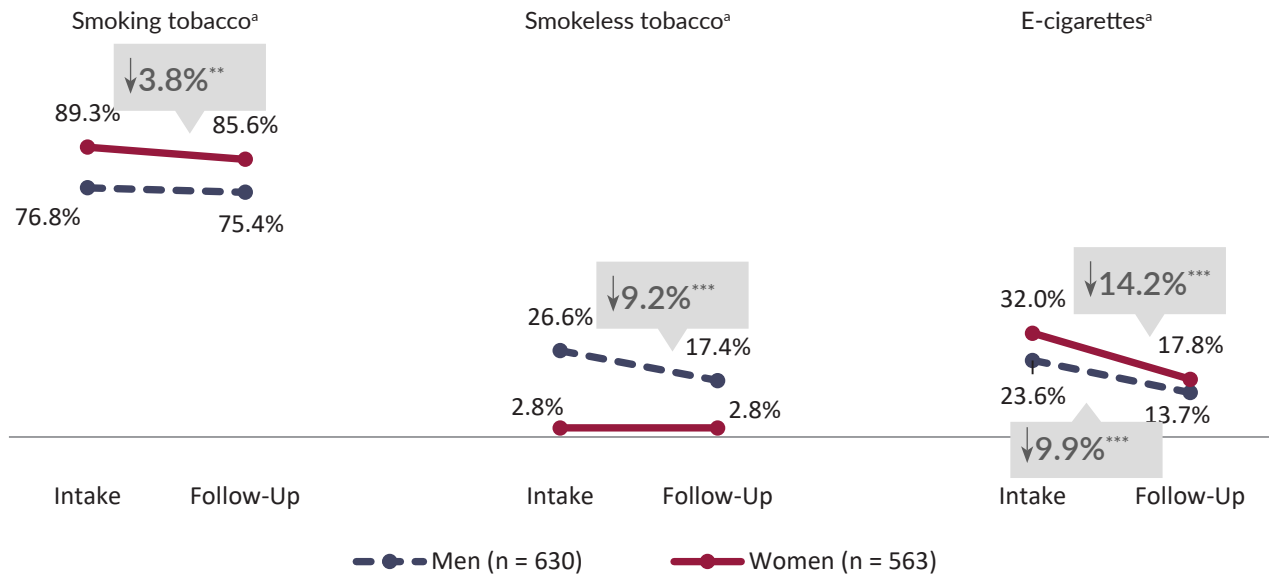
### GENDER DIFFERENCES IN PAST-12-MONTH SMOKING, SMOKELESS TOBACCO, AND E-CIGARETTE USE

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 2.67). The percent of women who reported smoking tobacco in the past 12 months significantly decreased from intake to follow-up. The number of men who reported

<sup>47</sup> Of those individuals in the follow-up sample, 176 reported they had never smoked regularly.

using smokeless tobacco in the past 12 months decreased significantly from intake to follow-up. Additionally, more women than men reported using e-cigarettes in the 12 months before entering treatment and the number of men and women who used e-cigarettes decreased from intake to follow-up.

FIGURE 2.67. GENDER DIFFERENCES IN PAST-12-MONTH SMOKING, SMOKELESS TOBACCO, AND E-CIGARETTE USE FROM INTAKE TO FOLLOW-UP



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

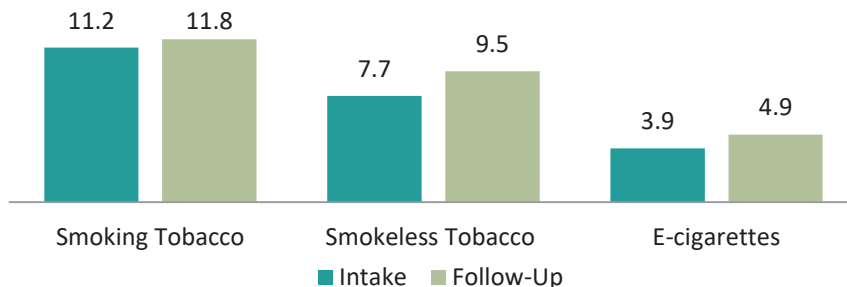
b—Significant difference by gender at intake ( $p < .01$ ).

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

### AVERAGE NUMBER OF MONTHS OF SMOKING, SMOKELESS TOBACCO, AND E-CIGARETTE USE

Figure 2.68 shows the average number of months clients who smoked tobacco or used smokeless tobacco or e-cigarettes reported using tobacco at intake and follow-up. Among the clients who reported using smoking tobacco in the 12 months before entering treatment ( $n = 987$ ), they reported using tobacco, on average, 11.2 months. Of the clients who reported using smoking tobacco in the 12 months before follow-up ( $n = 957$ ), they reported using, on average, 11.8 months. Among the clients who reported using smokeless tobacco in the 12 months before entering treatment ( $n = 183$ ), they reported using it, on average, 7.7 months. Of the clients who reported using smokeless tobacco in the 12 months before follow-up ( $n = 125$ ), they reported using it, on average, 9.5 months. Among the clients who reported using e-cigarettes in the 12 months before entering treatment ( $n = 328$ ), they reported using it, on average, 3.9 months. Of the clients who reported using e-cigarettes in the 12 months before follow-up ( $n = 186$ ), they reported using them, on average, 4.9 months.

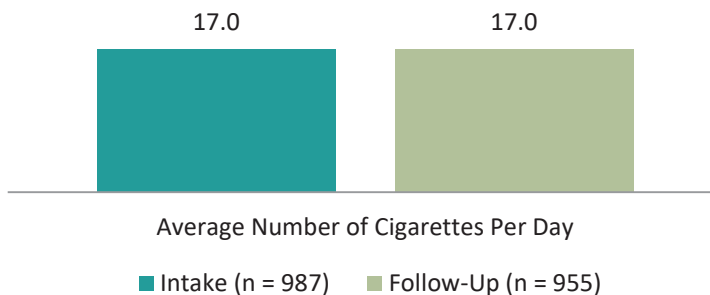
FIGURE 2.68. AVERAGE NUMBER OF MONTHS OF SMOKING, SMOKELESS TOBACCO, AND E-CIGARETTE USE



**AVERAGE NUMBER OF CIGARETTES SMOKED**

The average number of cigarettes clients reported smoking at intake and follow-up remained stable (see Figure 2.69). Of those who smoked tobacco in the 12 months before entering treatment, clients reported smoking an average of 17.0 cigarettes per day. At follow-up, among clients who reported smoking tobacco, they reported smoking an average of 17.0 cigarettes per day.

FIGURE 2.69. NUMBER OF CIGARETTES SMOKED IN AN AVERAGE DAY AMONG CLIENTS WHO SMOKED TOBACCO<sup>48</sup>

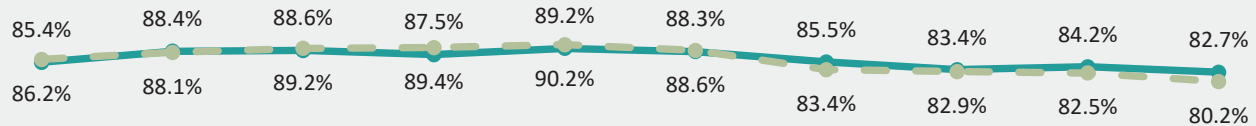


<sup>48</sup> Four cases had missing data for number of cigarettes smoked at follow-up.

## 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.

FIGURE 2.70. TRENDS IN SMOKING TOBACCO USE AT INTAKE AND FOLLOW-UP, FY 2007-FY 2016



FY 2007 (n = 1,074)   FY 2008 (n = 1,172)   FY 2009 (n = 1,171)   FY 2010 (n = 1,212)   FY 2011 (n = 1,266)   FY 2012 (n = 1,253)   FY 2013 (n = 1,277)   FY 2014 (n = 1,267)   FY 2015 (n = 1,255)   FY 2016 (n = 1,194)

● Intake   ● Follow-up

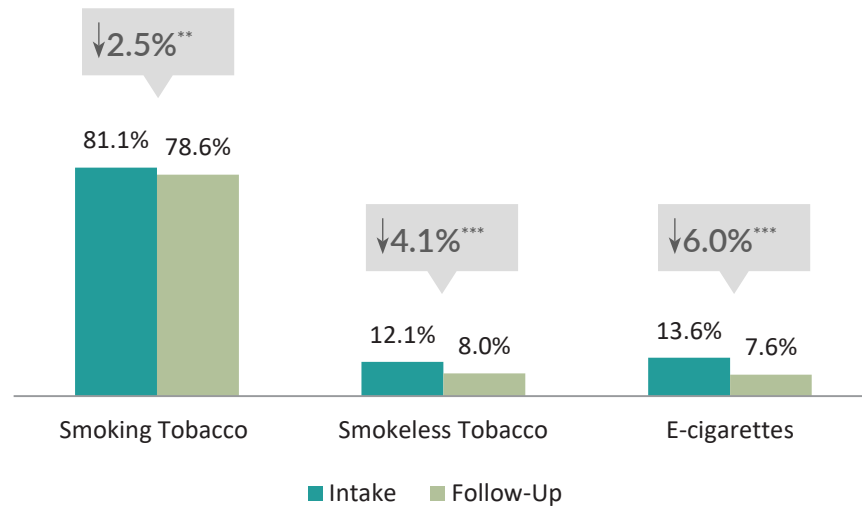
## PAST-30-DAY SMOKING, SMOKELESS TOBACCO, AND E-CIGARETTE USE

The number of clients who reported any past-30-day smoking tobacco decreased significantly from intake (81.1%) to follow-up (78.6%; see Figure 2.71). Past-30-day smokeless tobacco use also decreased from intake (12.1%) to follow-up (8.0%). Similarly, use of e-cigarettes in the past 30 days decreased from intake (13.6%) to follow-up (7.6%).

The percent of clients who reported **smoking tobacco in the past 30 days** decreased significantly from intake to follow-up

*“The counselor was generally concerned about all of her patients. I felt very comfortable talking to her.”*

KTOS FOLLOW-UP CLIENT

FIGURE 2.71. PAST-30-DAY SMOKING, SMOKELESS TOBACCO, AND E-CIGARETTE USE AT INTAKE AND FOLLOW-UP (n = 1,117)<sup>49</sup>

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

### GENDER DIFFERENCES IN PAST-30-DAY SMOKING, SMOKELESS TOBACCO, AND E-CIGARETTE 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 2.72). At follow-up, the number of women who reported smoking tobacco in the past 30 days had decreased significantly. More men than women reported using smokeless tobacco in the 30 days before intake and follow-up and the percent of men who reported smokeless tobacco use decreased from intake to follow-up. Additionally, more women than men reported e-cigarette use in the 30 days before entering treatment. The percent of women and men reporting past-30-day e-cigarette use decreased from intake to follow-up.

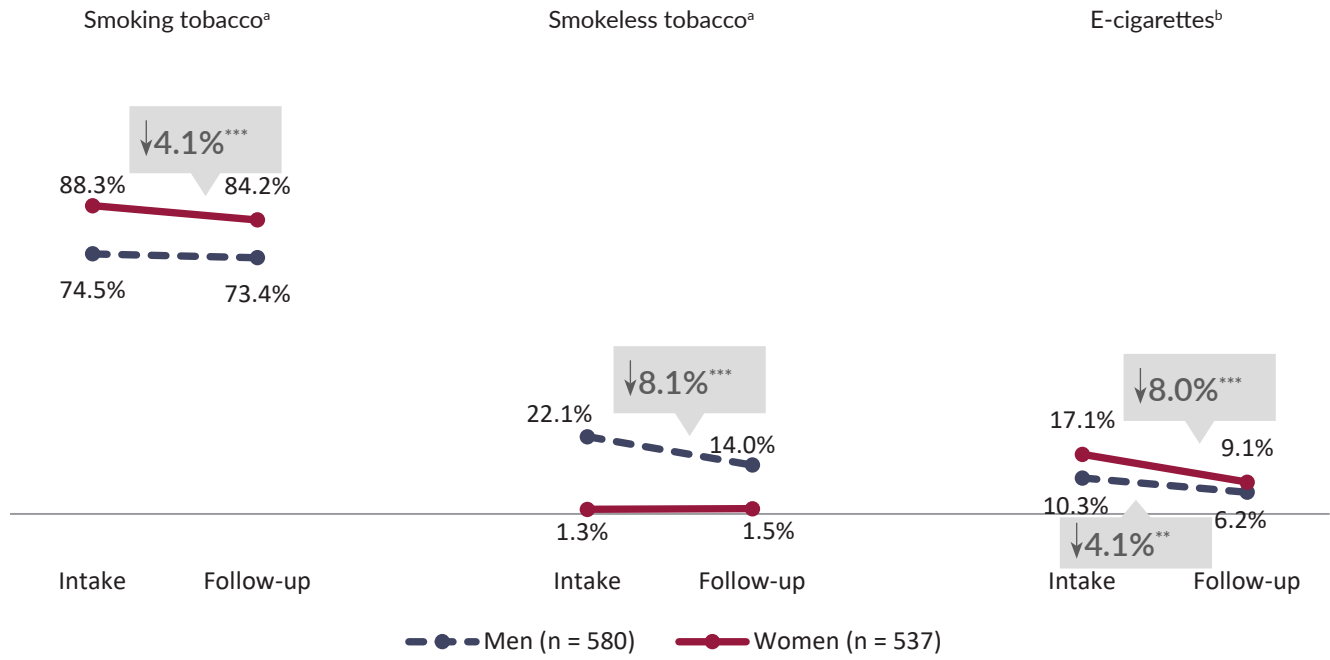


The percent of women who reported **smoking tobacco** in the past 30 days decreased significantly from intake to follow-up

<sup>49</sup> Four cases had missing data for past-30-day smoking and smokeless tobacco use at follow-up.



FIGURE 2.72. GENDER DIFFERENCES IN PAST-30-DAY SMOKING TOBACCO USE FROM INTAKE TO FOLLOW-UP<sup>a</sup>



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

b—Significant different by gender at intake (p < .01).

\*\*\*p < .001.

## SECTION 3.

## Multivariate Analysis of Relapse

This section focuses on a multivariate analysis examining factors related to relapse in the 2018 KTOS follow-up sample.

KTOS clients who reported any illicit drug use in the 12 months before follow-up (n = 332) were compared to clients who did not report any illicit drug use in the 6 months before follow-up (n = 888). A logistic regression was used to examine the association between selected targeted factors and use of illicit drugs during the follow-up time period.

In comparing clients who did and did not report illicit drug use at follow-up on targeted factors used in the regression models, significant differences were found (Table 3.1). Clients who reported illicit drug use at follow-up were significantly younger, reported more months of illicit drug use in the 12 months before intake, reported a lower average rating of their chances of getting off/stay off drugs/alcohol, were more likely to meet study criteria for depression in the past 12 months at intake, were likely to meet study criteria for generalized anxiety in the past 12 months at intake, and were more likely to report being homeless at intake. In addition, clients who reported illicit drug use at follow-up reported a lower average quality of life rating and a lower average satisfaction with life rating compared to clients who did not report illicit drug use at intake.

TABLE 3.1. TARGETED FACTORS COMPARING CLIENTS WHO RELAPSED AND CLIENTS WHO DID NOT<sup>50</sup>

	Did not use any illicit drug at follow-up (n = 888)	Reported illicit drug use at follow-up (n = 332)
Age**	35.7	33.4
Male	52.1%	55.1%
Maximum number of months client used illicit drugs in the 12 months before intake***	4.7	7.4
Average rating of the chances the client can get off and stay off drugs/alcohol at intake***	4.5	4.2
Met criteria for depression in the past 12 months at intake***	48.9%	62.0%
Met criteria for generalized anxiety in the past 12 months at intake**	48.9%	58.4%
Homeless at intake***	18.9%	28.6%
Employed in the past 12 months at intake	36.7%	36.4%
Arrested in the past 12 months at intake	53.6%	52.4%
Average number of nights spent in jail in the past 12 months at intake	43.8	36.9
Average quality of life rating at intake***	6.3	5.6
Average satisfaction with life rating at intake***	13.2	11.2

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

<sup>50</sup> Four clients had missing data for illegal drug use at follow-up.

Each targeted factor in Table 3.1 was entered into the logistic regression as predictor variables and any drug use in the past 12 months at follow-up (Yes/No) was entered as the dependent variable. Results of the analysis show that being younger, male, reporting more months of illicit drug use in the 12 months before intake, and rating their likelihood of getting off and staying off drugs/alcohol as lower were associated with relapse in the 12 months before follow-up. In addition, clients who were less satisfied with life at intake were more likely to have relapsed in the 12 months before follow-up.

TABLE 3.2. TARGETED FACTORS RELATED TO RELAPSE

	B	Standard Error	Odds ratio
<b>Age*</b>	<b>-.016</b>	<b>.007</b>	<b>.985</b>
<b>Gender**</b>	<b>-.437</b>	<b>.145</b>	<b>.646</b>
<b>Maximum number of months client used illicit drugs in the 12 months before intake***</b>	<b>.097</b>	<b>.015</b>	<b>1.102</b>
<b>Average rating of the chances the client can get off and stay off drugs/alcohol at intake*</b>	<b>-.169</b>	<b>.079</b>	<b>.845</b>
Met criteria for depression in the past 12 months at intake	.173	.172	1.189
Met criteria for generalized anxiety in the past 12 months at intake	-.130	.169	.878
Homeless at intake	.295	.161	1.343
Employed in the past 12 months at intake	.114	.147	1.120
Arrested in the past 12 months at intake	.213	.206	1.238
Average number of nights spent in jail in the past 12 months at intake	.000	.001	1.000
Average quality of life rating at intake	-.023	.045	.977
<b>Average satisfaction with life rating at intake**</b>	<b>-.072</b>	<b>.021</b>	<b>.931</b>

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

Note: Categorical variables were coded in the following ways: Reported any illicit drug use at follow-up (0 = No, 1 = Yes); Gender (1 = Male, 2 = Female); Met study criteria for depression in the 6 months before follow-up (0 = No, 1 = Yes); Met study criteria for generalized anxiety in the 12 months before follow-up (0 = No, 1 = Yes); Considered themselves homeless at follow-up (0 = No, 1 = Yes); Employed at follow-up (0 = No, 1 = Yes); Arrested in the 12 months before follow-up (0 = No, 1 = Yes); Spent at least one night incarcerated in the 12 months before follow-up (0 = No, 1 = Yes).

## SECTION 4.

## Mental Health, Physical Health, and Stress

This section examines changes in mental health symptoms, physical health, and stress-related health consequences 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, and (7) stress-related health consequences. Mental health and physical health questions in the KTOS intake and follow-up surveys were self-report measures.

### Depression Symptoms

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

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

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

More than half of clients (52.3%) met criteria for depression in the 12 months before they entered treatment (see Figure 4.1). At follow-up, 25.6% met criteria for depression—a significant decrease of 26.7%. Of those who met study criteria at intake (n = 641), they had an average of 7.4 symptoms out of 9. At follow-up, among those who met study criteria for depression (n = 312), clients reported an average of 7.8 symptoms out of 9.

#### STUDY CRITERIA FOR DEPRESSION

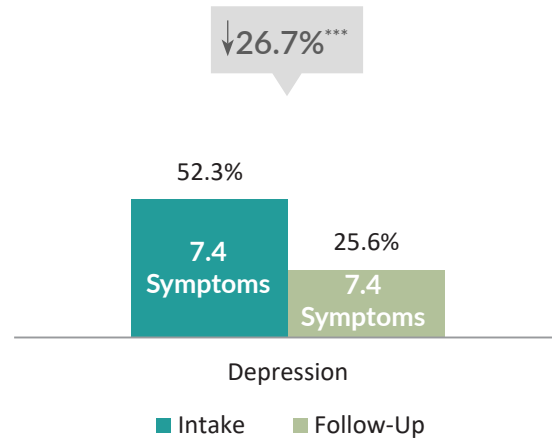
To meet study criteria for depression, clients had to say “yes” to at least one of the two screening questions and at least 4 of the 7 symptoms. Thus, the minimum score to meet study criteria: 5 out of 9.

The percent of clients meeting criteria for depression decreased significantly by 27% from intake to follow-up

*“I loved the program and the counselor was great. It was tough, but they helped me get through it.”*

KTOS FOLLOW-UP CLIENT

FIGURE 4.1. MEETING STUDY CRITERIA FOR DEPRESSION AT INTAKE AND FOLLOW-UP (N = 1,219)<sup>51</sup>



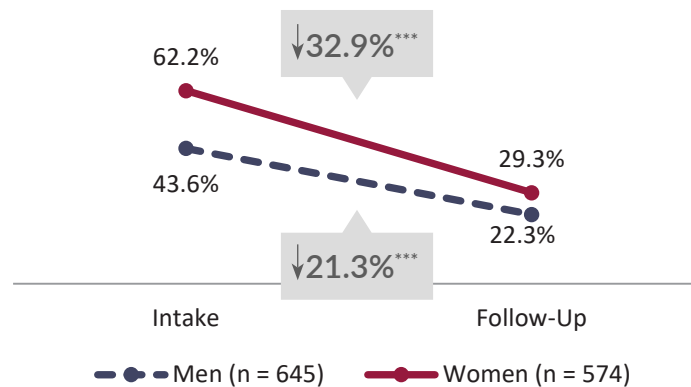
\*\*\*p < .001.

### GENDER DIFFERENCES IN DEPRESSION

Significantly more women met study criteria for depression at intake and follow-up compared to men. At intake, 62.2% of women met study criteria compared to 43.6% of men and at follow-up the percent of women who reported depression was 29.3% compared to 22.3% of men (see Figure 4.2). The number of women and men who met criteria for depression decreased significantly by 32.9% and 21.3%, respectively.

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>

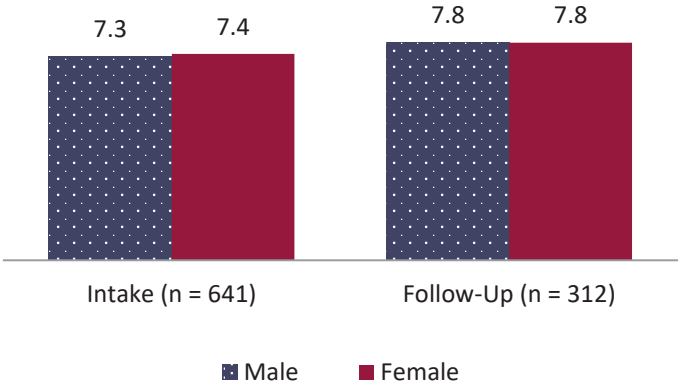


a—Statistical difference by gender at intake (p < .001) and follow-up (p < .01).  
\*\*\*p < .001.

Of those who met study criteria for depression at intake, women reported 7.4 depression symptoms and men reported 7.3 (see Figure 4.3). Of those who met study criteria for depression at follow-up, men reported 7.8 symptoms and women also reported 7.8 symptoms.

<sup>51</sup> Five individuals had missing data for depression criteria at follow-up.

FIGURE 4.3. GENDER DIFFERENCES IN NUMBER OF DEPRESSION SYMPTOMS REPORTED BY THOSE WHO MET STUDY CRITERIA FOR DEPRESSION AT INTAKE AND FOLLOW-UP<sup>a</sup>

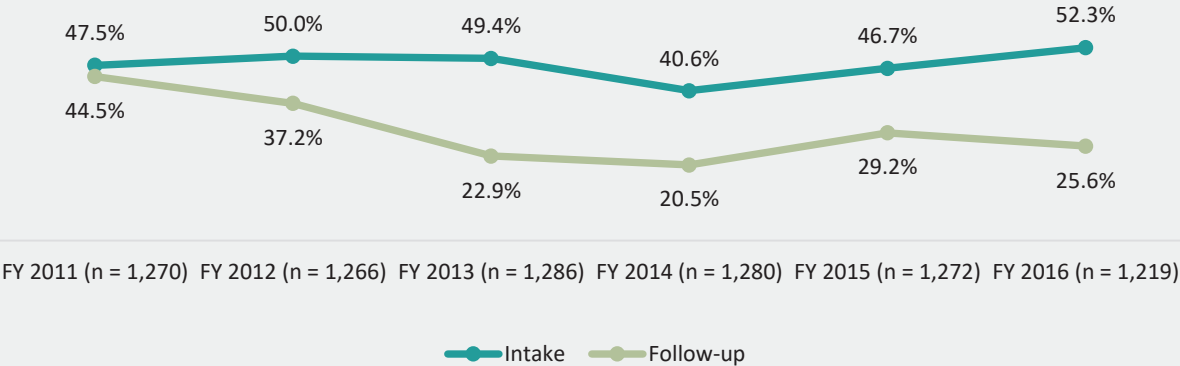


a – To meet study criteria, a client had to endorse at least 5 of 9 depression symptoms.

### Trends in Past-12-month Depression

The number of clients who met criteria for depression at intake has remained relatively steady over the past 6 years. The number of clients who met criteria for depression at follow-up has decreased from 44.5% in FY 2011 to 25.6% in FY 2016.

FIGURE 4.4. TRENDS IN THE NUMBER OF CLIENTS MEETING STUDY CRITERIA FOR DEPRESSION AT INTAKE AND FOLLOW-UP, FY 2011-FY 2016



## 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).

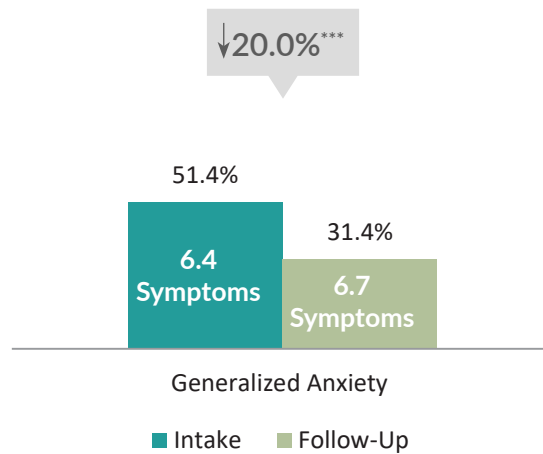
In the 12 months before entering treatment, about half of clients reported symptoms that met study criteria for generalized anxiety (51.4%; see Figure 4.5). By follow-up, the percent of clients meeting study criteria for generalized anxiety had decreased by 20.0% to 31.4%. At intake, among those who met study criteria for generalized anxiety (n = 629), clients reported an average of 6.4 symptoms out of 7. Among those who met study criteria for generalized anxiety at follow-up (n = 381), 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 4.5. CLIENTS MEETING STUDY CRITERIA FOR GENERALIZED ANXIETY AT INTAKE AND FOLLOW-UP (N = 1,218)<sup>52</sup>



\*\*\*p < .001.

<sup>52</sup> Missing data on generalized anxiety at follow-up for 6 cases.

### GENDER DIFFERENCES IN GENERALIZED ANXIETY SYMPTOMS

Significantly more women met criteria for generalized anxiety at intake and follow-up compared to men (see Figure 4.6). The number of women and men who met criteria for generalized anxiety decreased significantly from intake (58.7% vs. 44.9%) to follow-up (34.8% vs. 28.4%).

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


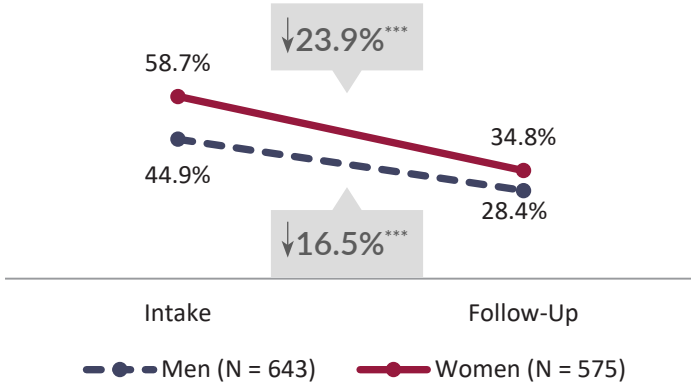


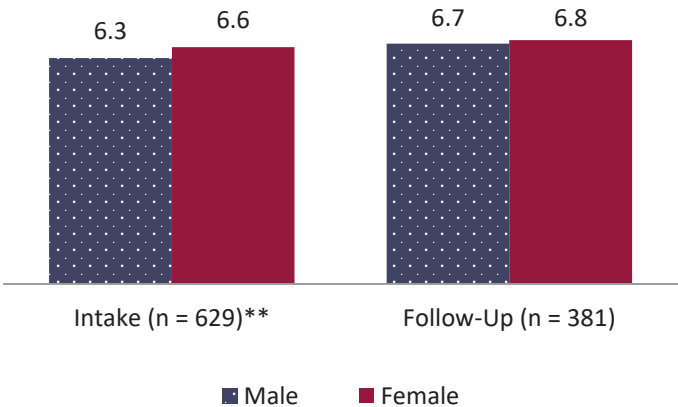
FIGURE 4.6. GENDER DIFFERENCES IN PERCENT OF CLIENTS MEETING STUDY CRITERIA FOR GENERALIZED ANXIETY<sup>a</sup>



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

Of those who met study criteria for generalized anxiety at intake, women (6.6) reported significantly more anxiety symptoms than men (6.3; see Figure 4.7). Of those who met study criteria for depression at follow-up, there was no difference in number of symptoms between men (6.7) and women (6.8).

FIGURE 4.7. 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>



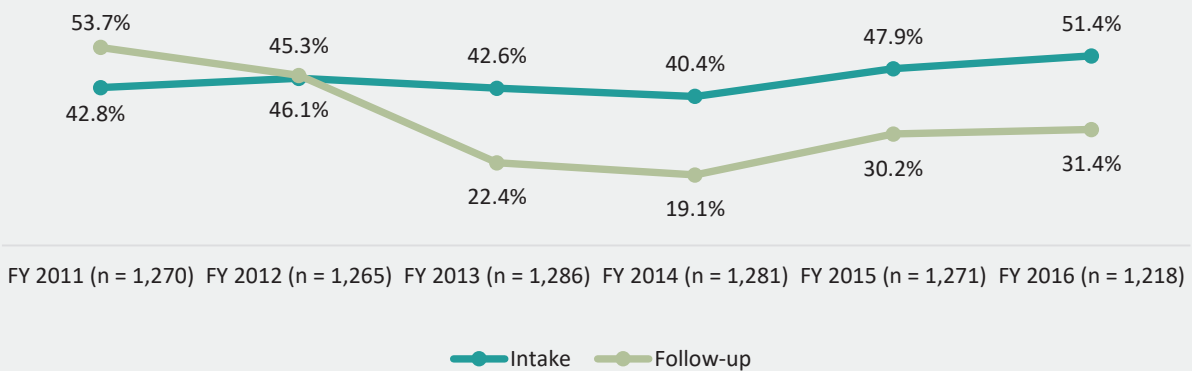
a - To meet study criteria, a client had to endorse at least 4 of 7 anxiety symptoms.  
\*\* $p < .01$ .



### 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 6 years. The number of clients who met study criteria for generalized anxiety at follow-up has fluctuated over time. In FY 2011, 53.7% of clients met study criteria for generalized anxiety at follow-up and this percentage decreased to 19.1% in FY 2014. In FY 2015, the number of clients meeting study criteria for generalized anxiety increased to 30.2% and again in FY 2016 to 31.4%. For the overall trend, however, the number of clients who met study criteria for generalized anxiety at follow-up has decreased.

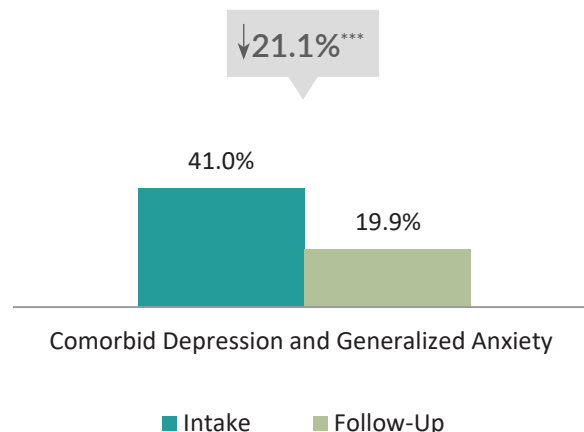
FIGURE 4.8. TRENDS IN THE NUMBER OF CLIENTS MEETING STUDY CRITERIA FOR GENERALIZED ANXIETY AT INTAKE AND FOLLOW-UP, FY 2011-FY 2016



### Comorbid Depression and Anxiety Symptoms

Figure 4.9 shows that at intake, 41% of clients met study criteria for both depression and generalized anxiety and there was a significant 21.1% decrease in the number of individuals who met study criteria for depression and generalized anxiety at follow-up (19.9%).

FIGURE 4.9. CLIENTS MEETING STUDY CRITERIA FOR COMORBID DEPRESSION AND GENERALIZED ANXIETY AT INTAKE AND FOLLOW-UP (N = 1,215)<sup>53</sup>



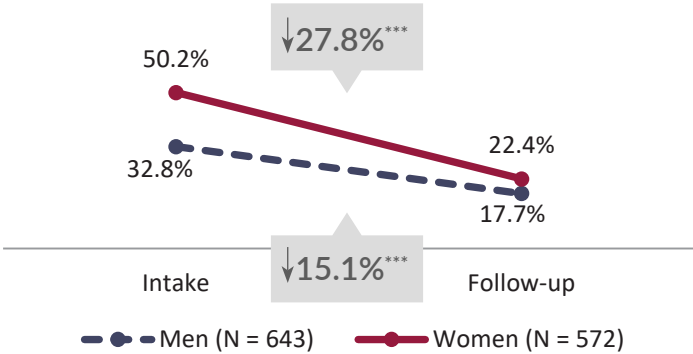
\*\*\*p < .001.

<sup>53</sup> Nine 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 4.10). The number of women and men who met criteria for depression and generalized anxiety decreased significantly by 27.8% and 15.1% respectively.

FIGURE 4.10. GENDER DIFFERENCES IN PERCENT OF CLIENTS MEETING STUDY CRITERIA FOR COMORBID DEPRESSION AND GENERALIZED ANXIETY AT INTAKE AND FOLLOW-UP<sup>a</sup>

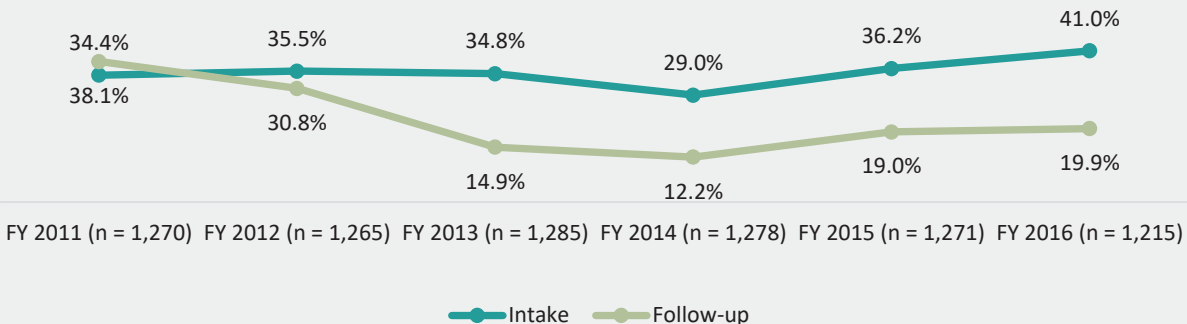


a—Statistical difference by gender at intake (p<.001) and follow-up (p < .05).  
\*\*\*p < .001.

### Trends in Comorbid Depression and Anxiety

Past-6-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 2016 (41.0%) than in FY 2011. At follow-up, however, fewer clients met study criteria for comorbid depression and anxiety in FY 2016 (19.9%) compared to FY 2011 (34.4%).

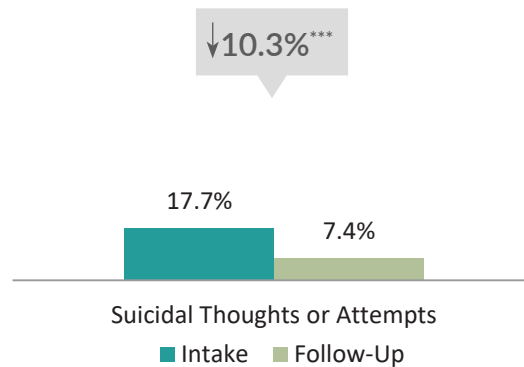
FIGURE 4.11. TRENDS IN THE NUMBER OF CLIENTS MEETING STUDY CRITERIA FOR COMORBID DEPRESSION AND ANXIETY AT INTAKE AND FOLLOW-UP, FY 2011-FY 2016



## 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 17.7% of clients reported thoughts of suicide or attempted suicide and 7.4% of clients reported thoughts of suicide or attempted suicide in the 12 months before follow-up. There was a 10.3% decrease from intake to follow-up in the number of clients reporting suicidal thoughts and attempts (see Figure 4.12).

FIGURE 4.12. CLIENTS REPORTING SUICIDAL THOUGHTS AND/OR ATTEMPTS AT INTAKE AND FOLLOW-UP (N = 1,224)

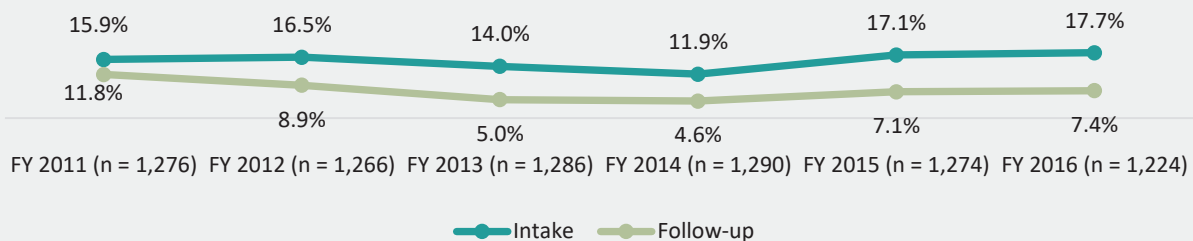


\*\*\*p < .001.

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

The number of clients who reported suicidal ideation and attempts at intake decreased slightly from 15.9% in FY 2011 to 11.9% in FY 2014 and then increased to 17.7% in FY 2016. The number of clients reporting suicidal ideation and attempts at follow-up also decreased slightly from 11.8% in FY 2011 to 4.6% in FY 2014 and then increased to 7.4% in FY 2016.

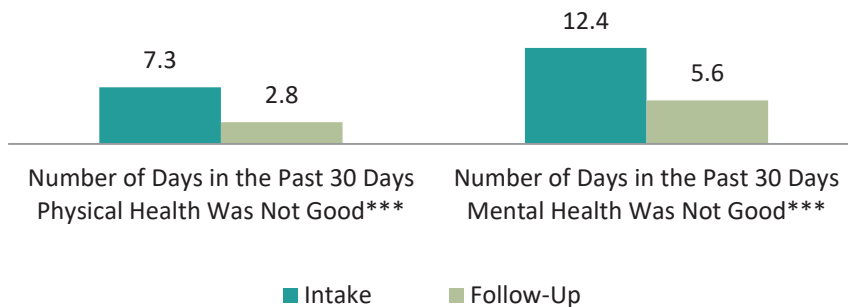
FIGURE 4.13. TRENDS IN THE NUMBER OF CLIENTS REPORTING SUICIDAL THOUGHTS AND/OR ATTEMPTS AT INTAKE AND FOLLOW-UP, FY 2011-2016




## Perceptions of Poor Physical and Mental Health

Clients were asked how many days in the past 30 days their physical and mental health were not good at intake and follow-up (see Figure 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 (7.3 vs. 2.8). The number of days clients' mental health was not good also decreased significantly from 12.4 at intake to 5.6 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 = 1,220)<sup>54</sup>



\*\*\*p < .001.



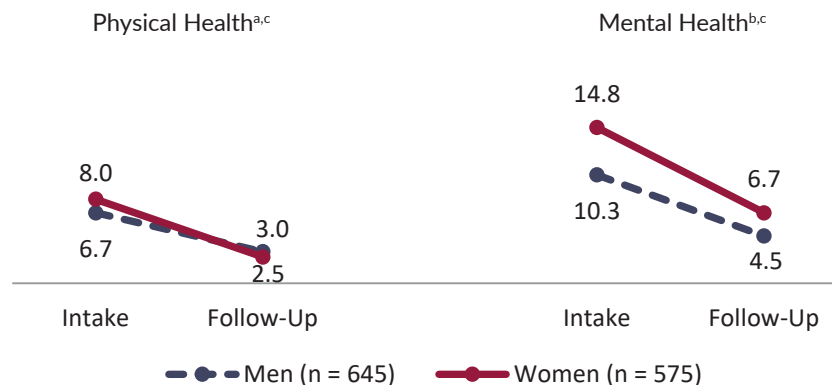
In 2016, Kentucky ranked 48th in the US for number of poor physical health days. Compared to the rest of the state, KTOS clients reported a higher number of poor physical health days (7.3 vs. 5.0) at intake. In 2016, Kentucky ranked 48th in the US for number of poor mental health days. Compared to the rest of the state, KTOS clients reported a higher number of poor mental health days (12.4 vs. 4.6) at intake and follow-up (5.6 vs. 4.6).

Source: <http://www.americashealthrankings.org/explore/2016-annual-report/measure/MentalHealth/state/KY>

## GENDER DIFFERENCES IN PERCEPTIONS OF PHYSICAL AND MENTAL HEALTH

Women's reported number of days physical health was not good was higher at intake and women's reported number of days mental health was not good was higher at intake and follow-up compared to men (see Figure 4.16).

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



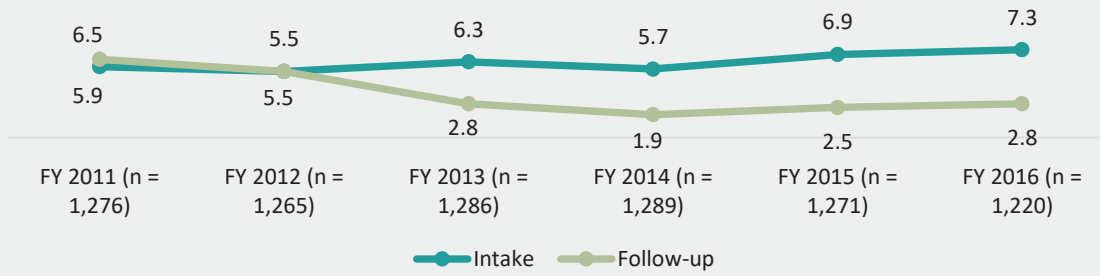
a—Statistical difference by gender at intake (p < .05).  
 b – Statistical difference by gender at intake and follow-up (p < .001).  
 c – Significant decrease from intake to follow-up for men and women (p < .001).

<sup>54</sup> Four clients had missing data for the physical health question, and four had missing data for the mental health question.

### 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. 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 2.8 days in FY 2016.

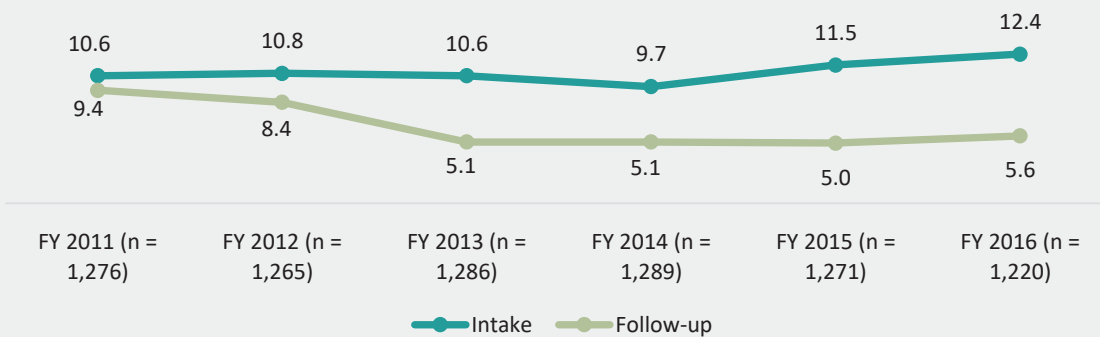
FIGURE 4.16. TRENDS IN PERCEPTIONS OF PHYSICAL HEALTH AT INTAKE AND FOLLOW, REPORTS FY 2011-FY 2016



### 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. At intake in FY 2011, clients reported an average of 10.6 days their physical health was not good and in FY 2016 clients reported an average of 12.4 days. 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 5.6 days in FY 2016.

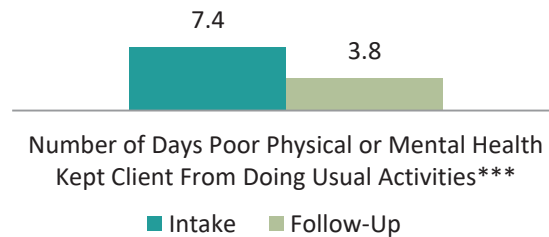
FIGURE 4.17. TRENDS IN PERCEPTIONS OF MENTAL HEALTH AT INTAKE AND FOLLOW, FY 2011 - FY 2016



## 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 7.4 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 = 1,214)<sup>55</sup>

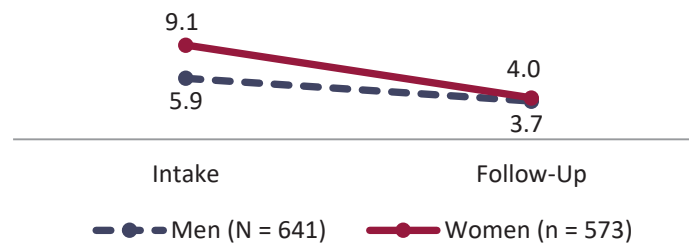


\*\*\*p < .001.

## GENDER DIFFERENCES IN PERCEPTIONS OF PHYSICAL OR MENTAL HEALTH

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).

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).

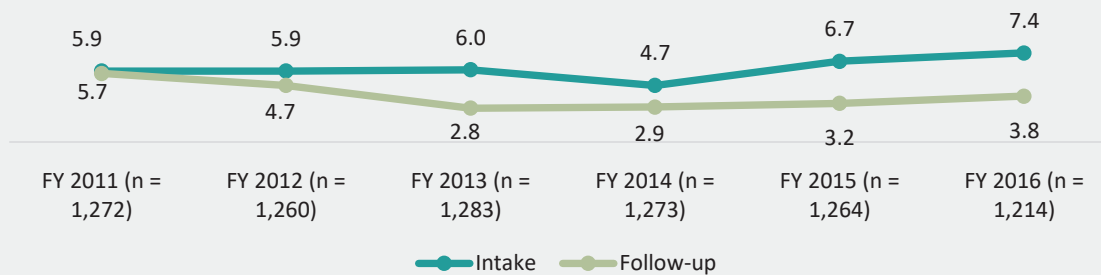
b – Significant decrease from intake to follow-up for men and women (p < .001).

<sup>55</sup> Ten clients had missing data for the perceptions of poor physical or mental health question.

## 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 2016 clients reported an average of 7.4 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 (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, REPORTS FY 2011-FY 2016

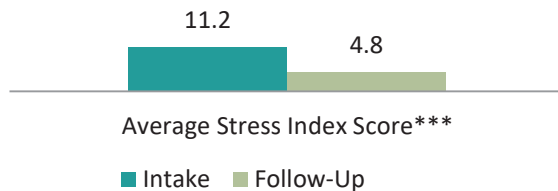


## Stress-related Health Consequences

Clients were also asked 12 items about physiological symptoms often associated with higher stress called the Stress-Related Health Consequences Scale.<sup>56</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 11.2 at intake to 4.8 at follow-up (see Figure 4.21).

<sup>56</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 = 1,224)

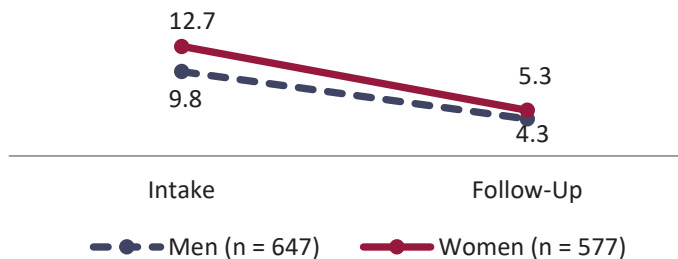


\*\*\*p < .001.

### 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.

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

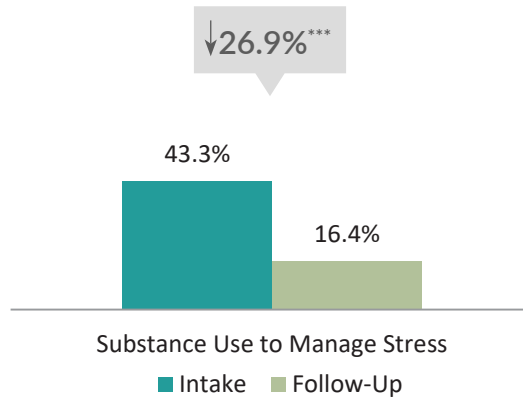


a—Statistical difference by gender at intake (p < .001) and follow-up (p < .01).  
 b - Significant decrease from intake to follow-up for men and women (p < .001).

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 43.3% 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 16.4%.



FIGURE 4.23. CLIENTS REPORTING SUBSTANCE USE TO REDUCE OR MANAGE STRESS AT INTAKE AND FOLLOW-UP (N = 1,223)<sup>57</sup>



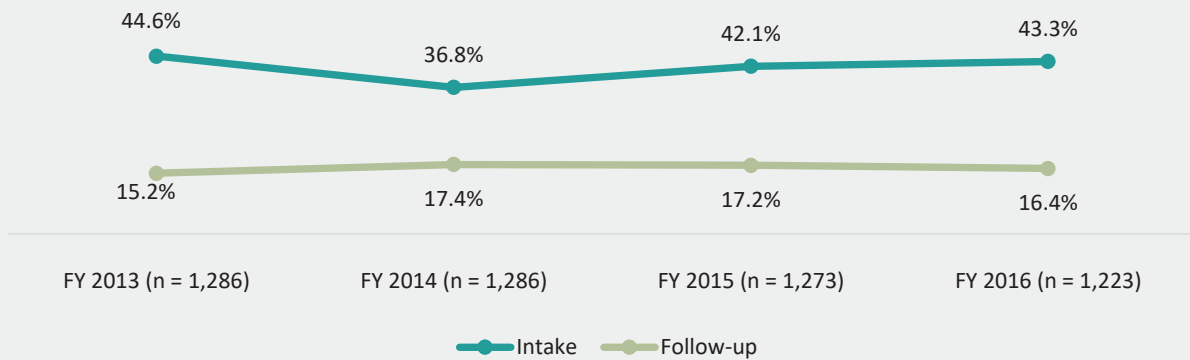
\*\*\*p < .001

### 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 number of clients at intake who reported using substances to manage stress remained steady over the past 4 years. In FY 2013, 44.6% of clients reported using substances to manage stress at intake compared to 43.3% of clients in FY 2016.

At follow-up, the number of clients who reported using substances to reduce or manage stress also remained relatively steady. In FY 2013, 15.2% of clients reported using substances to reduce or manage stress and in FY 2016 16.4% of clients reported using substances to reduce or manage stress.

FIGURE 4.24. TRENDS IN THE NUMBER OF CLIENTS REPORTING SUBSTANCE USE TO REDUCE OR MANAGE THEIR STRESS AT INTAKE AND FOLLOW-UP, FY 2013-FY 2016



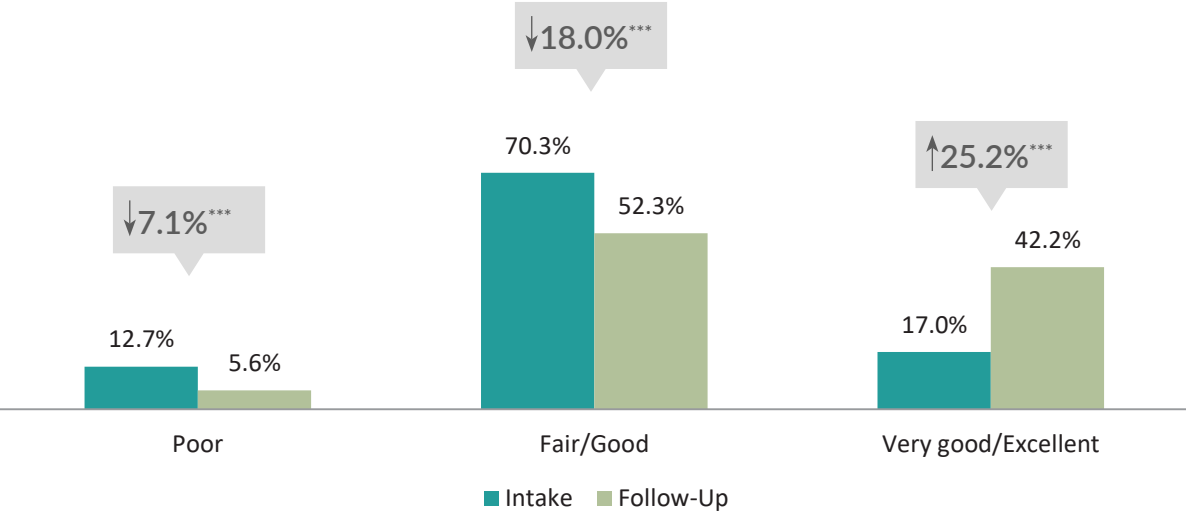
<sup>57</sup> One individual refused to answer all substance use to manage stress scale items at follow-up.

# 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 2.7 at intake and this significantly increased to 3.3 at follow-up (not depicted in figure). Figure 4.25 shows that significantly more clients rated their overall physical health as very good or excellent (42.2%) at follow-up when compared to intake.

FIGURE 4.25. CLIENTS’ SELF-REPORT OF OVERALL HEALTH STATUS AT INTAKE AND FOLLOW-UP (N = 1,224)<sup>a</sup>



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

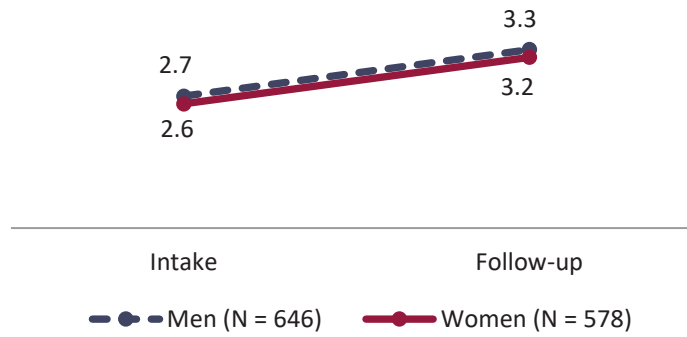
## GENDER DIFFERENCES IN OVERALL HEALTH STATUS

At intake, women rated their overall health significantly lower than men (2.6 vs. 2.7; see Figure 4.26). 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.

*“It was wonderful, I liked that it was small. The staff was on hand and ready for you. I liked the family-atmosphere. They really cared about you there.”*

KTOS FOLLOW-UP CLIENT

FIGURE 4.26. GENDER DIFFERENCES IN CLIENTS' SELF-REPORT OF OVERALL HEALTH STATUS AT INTAKE AND FOLLOW-UP<sup>a,b</sup>

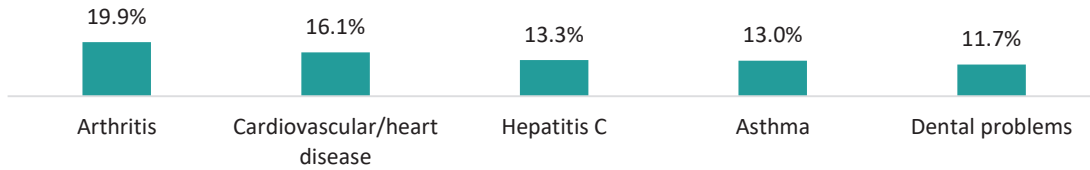


a—Statistical difference by gender at intake ( $p < .01$ ).  
 b – Significant increase from intake to follow-up for men and women ( $p < .001$ ).

### CHRONIC MEDICAL PROBLEMS

Well over half of clients (56.5%) reported they had at least one chronic health problem at program entry. Overall, the most common medical problems clients reported were arthritis (19.9%), heart disease (16.1%), hepatitis C (13.3%), asthma (13.0%), and severe dental problems (11.7%).

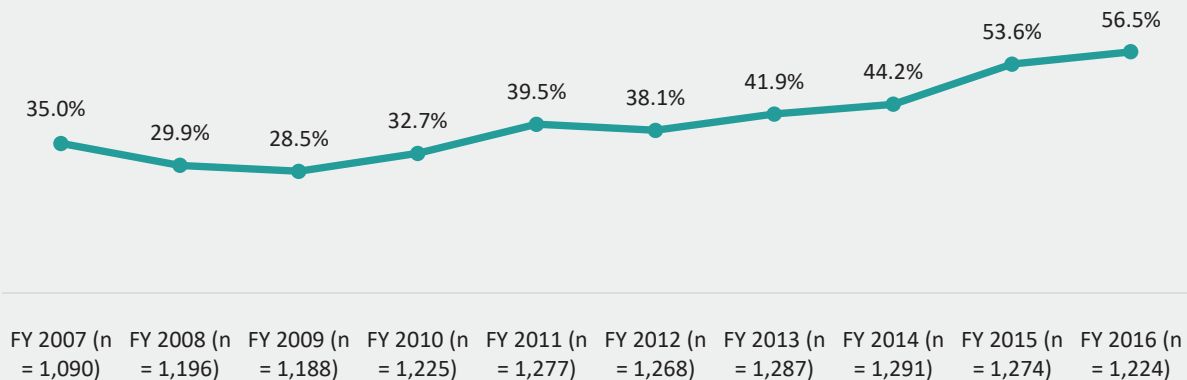
FIGURE 4.27. CHRONIC MEDICAL PROBLEMS REPORTED AT INTAKE (N = 1,224)



### Trends in Chronic Medical Problems

Overall, the trend shows that the number of clients reporting having at least one chronic medical problem at intake has increased over the past 10 years. In FY 2009, over one-quarter of clients (28.5%) reported having a chronic medical problem compared to 56.5% of clients in FY 2016.

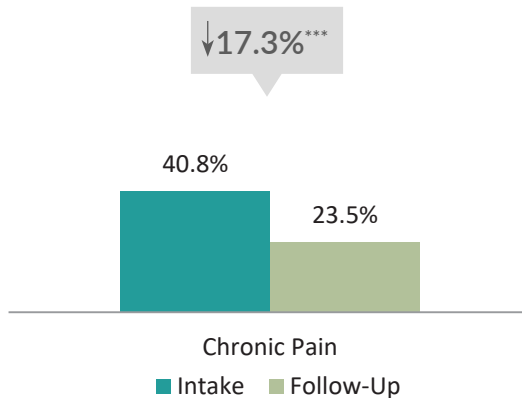
FIGURE 4.28. TRENDS IN THE CLIENTS REPORTING A CHRONIC MEDICAL PROBLEM AT INTAKE, FY 2007-2016



### CHRONIC PAIN

The percent of clients who reported chronic pain that was persistent and lasted at least 3 months decreased significantly from 40.8% at intake to 23.5% at follow-up (see Figure 4.29).

FIGURE 4.29. CLIENTS REPORTING CHRONIC PAIN AT INTAKE AND FOLLOW-UP (N = 1,176)<sup>58</sup>



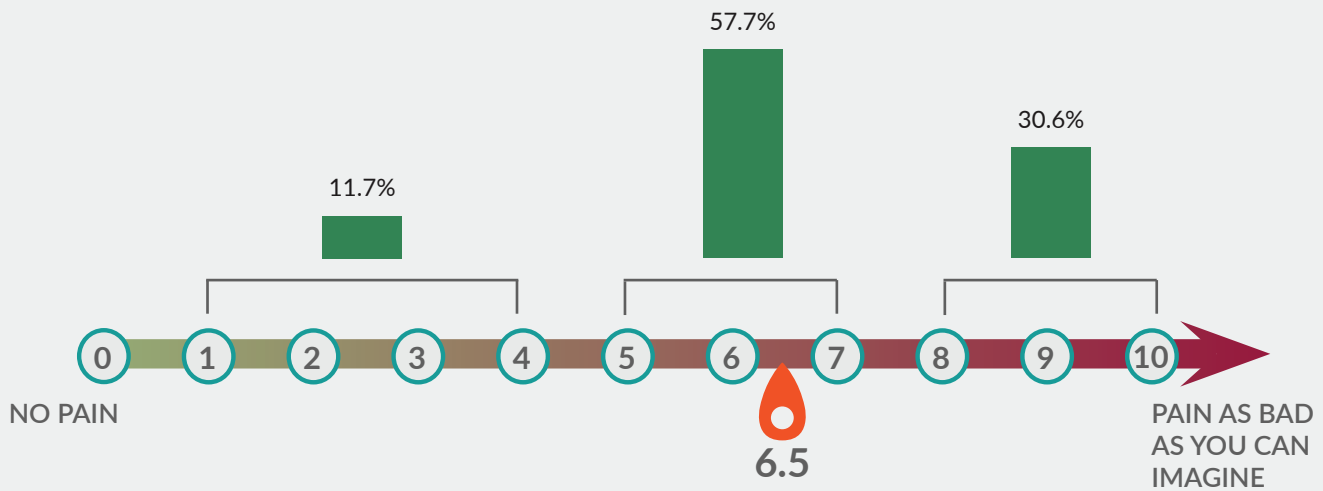
\*\*\*p < .001.

<sup>58</sup> Forty-eight individuals had missing data for chronic pain at follow-up.

## Taking a Closer Look at Chronic Pain

At intake, 40.9% of KTOS clients reported experiencing chronic pain for at least 3 months before entering treatment (n = 501). On average, clients reported their chronic pain began at age 27 (ranging from age 2 to age 60).<sup>59</sup> In the 30 days before entering treatment, clients experienced chronic pain, on average, 23.7 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).<sup>60</sup> At intake, clients rated their pain as an average of 6.5 with almost 31% of clients giving their pain the highest ratings of 8, 9, and 10 (see Figure 4.30).

FIGURE 4.30. INTENSITY RATING OF CHRONIC PAIN AT INTAKE (n = 461)



## Prescription Opioid Misuse and Chronic Pain

Of those who misused prescription opioids at intake (n = 484), 43.8% reported chronic pain in the 12 months before entering substance abuse treatment and 20.7% experienced chronic pain at follow-up<sup>61</sup>, which was a significant decrease of 23.1%.

Additionally, of those who reported misusing prescription opioids and experiencing chronic pain at intake (n = 205), 30.2% (n = 62) reported chronic pain in the past 12 months at follow-up and 16.6% (n = 34) reported past-12-month misuse of prescription opioids.

<sup>59</sup> Forty-four individuals had missing data for this question.

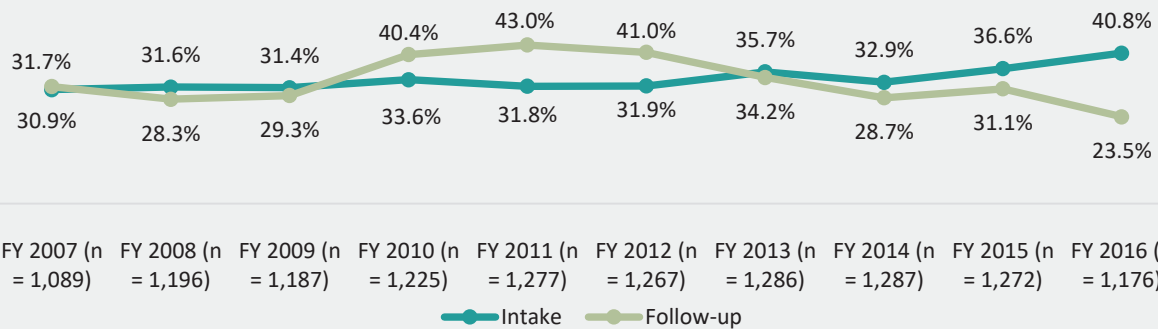
<sup>60</sup> Forty individuals had missing data for this question.

<sup>61</sup> Sixteen clients had missing data for chronic pain at follow-up.

### Trends Chronic Pain

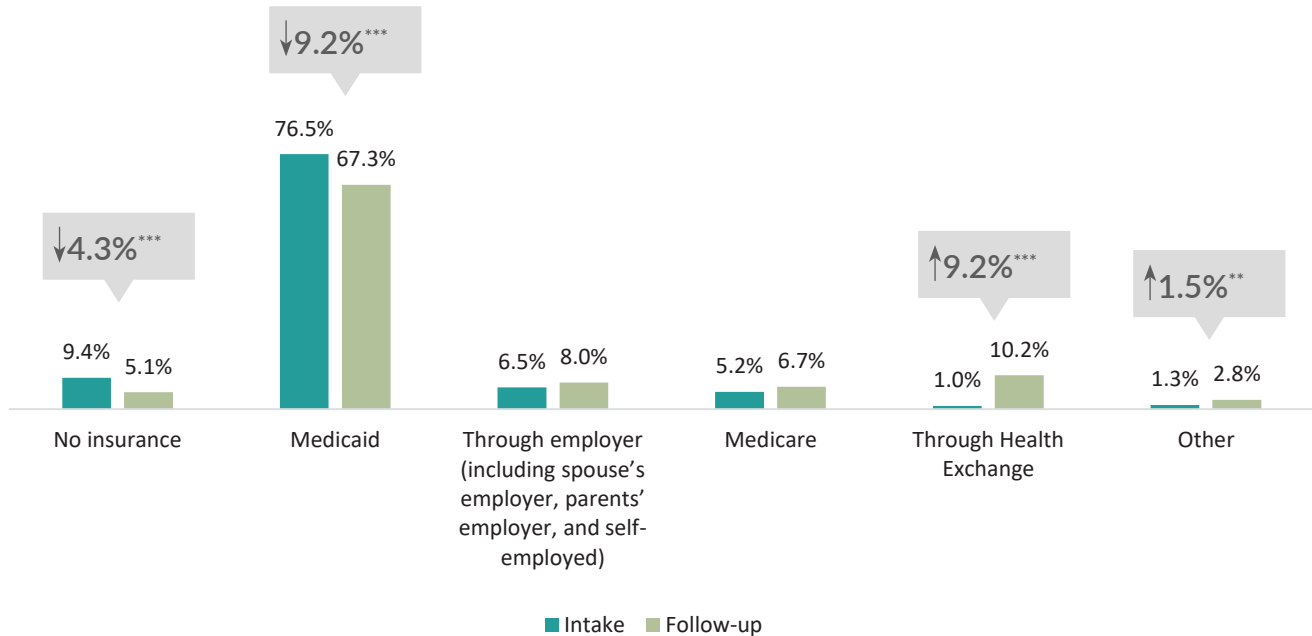
The number of clients who reported chronic pain fluctuated over time at intake and follow-up. In FY 2008 and 2009, more clients reported chronic pain at intake than at follow-up. Between FY 2010 and FY 2012, however, more clients reported chronic pain at follow-up than at intake. From FY 2014 to FY 2016 the number of clients reporting chronic pain was higher at intake than at follow-up.

FIGURE 4.31. TRENDS IN THE NUMBER OF CLIENTS REPORTING CHRONIC PAIN AT INTAKE AND FOLLOW-UP, FY 2007-FY 2016



### HEALTH INSURANCE

At intake, the majority of KTOS clients reported they had health insurance through Medicaid (76.5%; see Figure 4.32). Almost 10% did not have any insurance. Small numbers of clients had insurance through an employer, including through a spouse, parent, or self-employment (6.5%), through Medicare (5.2%), and through Health Exchange (1.0%). At follow-up, the number of clients reporting they had no insurance decreased significantly as did the number of clients reporting they had Medicaid. The number of clients who reported they had insurance through Health Exchange increased significantly to 10.2% at follow-up.

FIGURE 4.32 HEALTH INSURANCE FOR KTOS CLIENTS AT INTAKE AND FOLLOW-UP (N = 1,210)<sup>62</sup>

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

### A Closer Look at Insurance

Of those clients who were employed full-time at intake (n = 291), only 16.4% had insurance through an employer (including a spouse's or parent's employer). At follow-up, of those clients employed full-time (n = 444)<sup>63</sup>, only 17.0% had insurance through an employer.

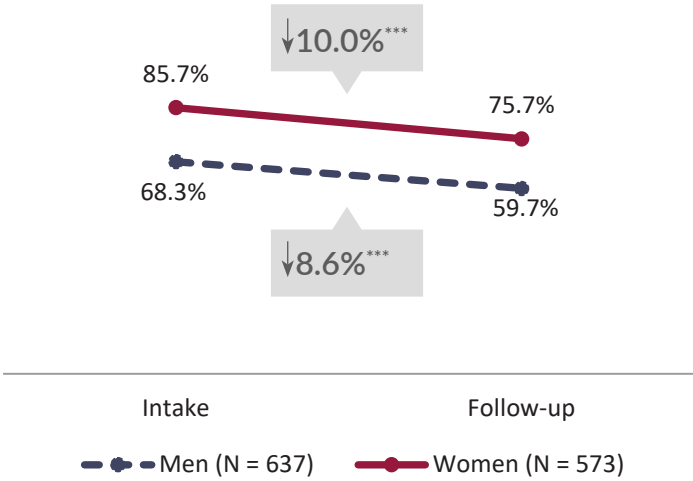
### GENDER DIFFERENCES IN MEDICAL INSURANCE

Significantly more women reported being insured by Medicaid at both intake and follow-up compared to men (see Figure 4.33). The percent of women and men reporting being insured by Medicaid at follow-up significantly decreased to 75.7% and 59.7%, respectively.

<sup>62</sup> Fourteen clients at follow-up had missing data for insurance at follow-up.

<sup>63</sup> Only 440 cases of the 444 clients employed full-time at follow-up had information on insurance at follow-up.

FIGURE 4.33. 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 ( $p < .001$ ).  
\*\*\*  $p < .001$ .



## 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.

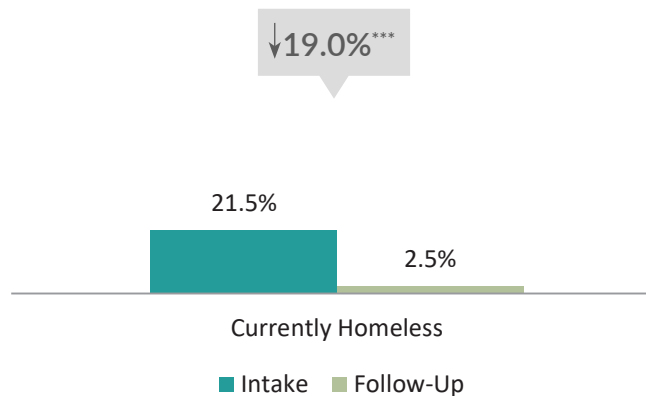
## Living Situation

### HOMELESSNESS

About 1 in 5 clients (21.5%) reported at treatment intake they were currently homeless and at follow-up 2.5% of clients reported they were currently homeless – a significant decrease of 19.0% (see Figure 5.1).

The percent of clients who considered themselves homeless decreased from 22% at intake to 3% at follow-up

FIGURE 5.1. CURRENT HOMELESSNESS AT INTAKE AND FOLLOW-UP (N=1,223)<sup>64</sup>



### GENDER DIFFERENCES IN HOMELESSNESS

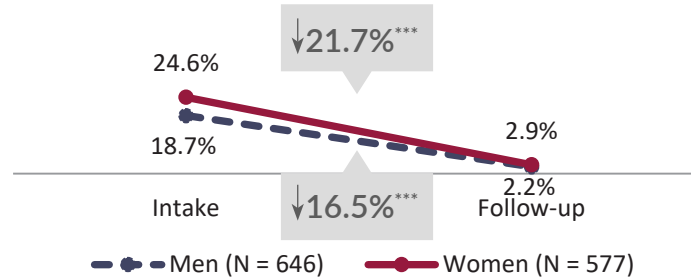
Significantly more women reported being homeless at the time of intake when compared to men (see Figure 5.2). The percent of women and men reporting homelessness at follow-up significantly decreased (21.7% and 16.5%, respectively).

*“It was 100% helpful in setting up a plan, they had good counseling. They weren’t judgmental and I felt free to talk.”*

KTOS FOLLOW-UP CLIENT

<sup>64</sup> One case had missing data for homelessness at follow-up.

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

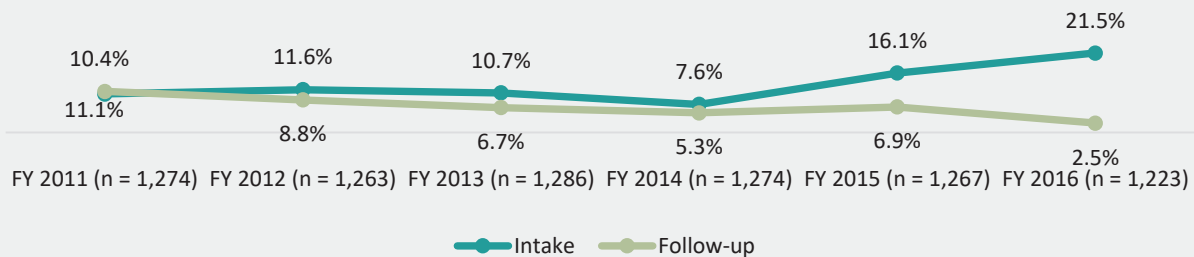


a—Statistical difference by gender at intake ( $p < .05$ ).  
 \*\*\*  $p < .001$ .

### Trends in Homelessness

From FY 2011 to FY 2014, the number of clients reporting being currently homeless was consistent at both intake and follow-up. At intake in FY 2015, however, the number of clients reporting homelessness increased to 16.1% and again to 21.5% in FY 2016.

FIGURE 5.3. TRENDS IN THE NUMBER OF CLIENTS REPORTING HOMELESSNESS AT INTAKE AND FOLLOW-UP, FY 2011-FY 2016

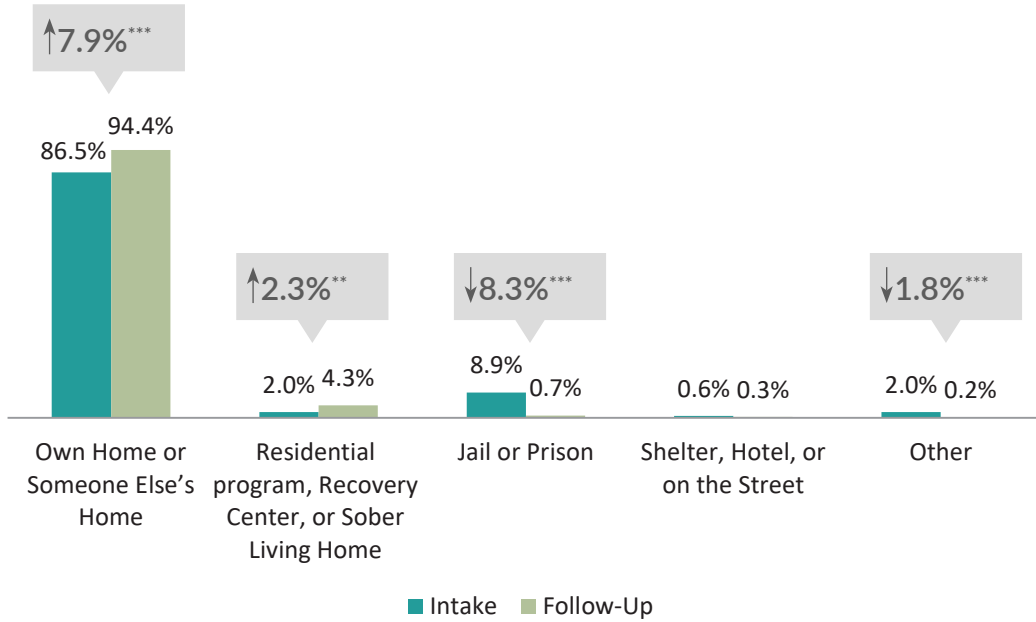


### USUAL LIVING SITUATION

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 number of individuals who lived in a private residence at follow-up (7.9%). 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: 8.9% vs. 0.7%. A very small percentage of clients reported living in a shelter or on the street at intake and follow-up.

FIGURE 5.4. USUAL LIVING SITUATION AT INTAKE AND FOLLOW-UP (N=1,223)<sup>65</sup>

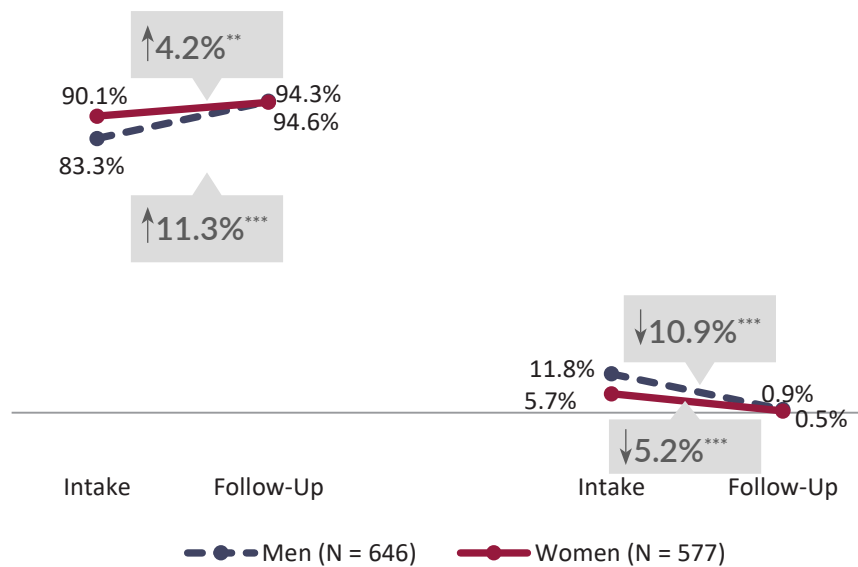


a – Significance tested with the Stuart-Maxwell Test for Marginal Homogeneity ( $p < .001$ ).  
 \*\* $p < .01$ , \*\*\* $p < .001$ .

### GENDER DIFFERENCES IN USUAL LIVING SITUATION

Significantly more women than men reported living in their own home or someone else's home in the 12 months before intake while more men reported living in jail or prison compared to women (see Figure 5.5). The number of men living in jail or prison decreased significantly (10.9%) while the number of men living in their own or someone else's home increased 11.3%.

FIGURE 5.5. GENDER DIFFERENCES IN LIVING SITUATION AT INTAKE AND FOLLOW-UP<sup>a</sup>



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

<sup>65</sup> One case had missing data for living situation at follow-up.

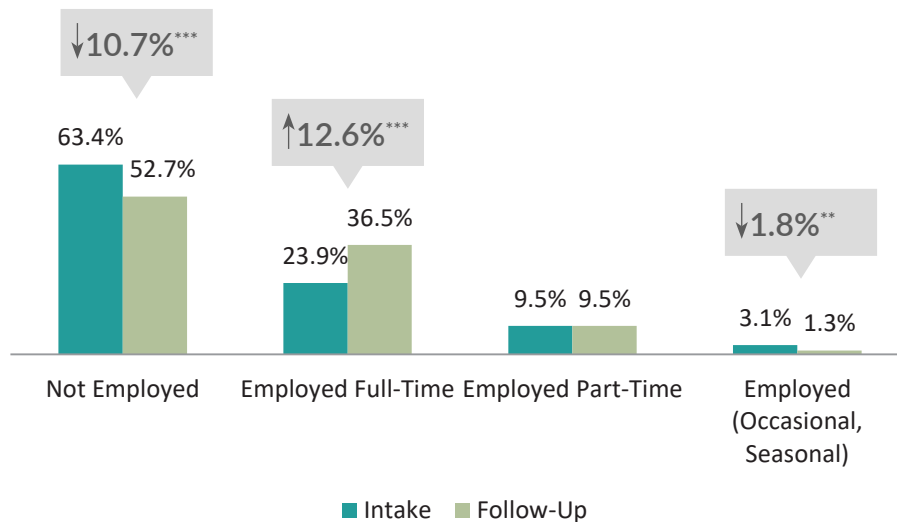
## Employment

### CURRENT EMPLOYMENT STATUS

There were significant changes in current employment status from intake to follow-up (see Figure 5.6).<sup>66</sup> About two-thirds (63.4%) of clients reported they were not employed when they entered treatment, while just over half of clients (52.7%) reported they were unemployed at follow-up. This represents a 10.7% significant decrease in the number of clients who were currently unemployed. The number of clients who were employed full-time increased significantly by 12.6% from intake to follow-up (23.9% vs. 36.5%).

The number of clients who were **employed full-time** increased by **13%**

FIGURE 5.6. CHANGE IN CURRENT EMPLOYMENT STATUS (N = 1,216)<sup>a</sup>



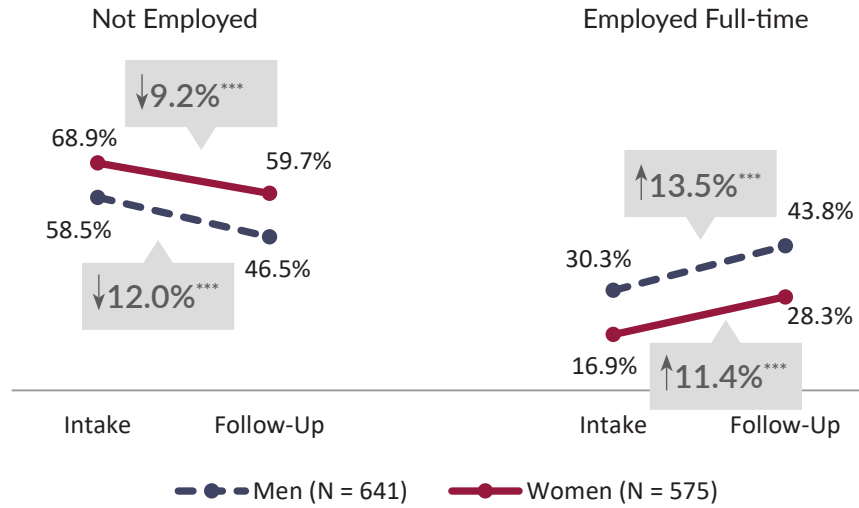
a – Significance tested with the Stuart-Maxwell Test for Marginal Homogeneity ( $p < .001$ ).  
 \*\* $p < .01$ , \*\*\* $p < .001$ .

### GENDER DIFFERENCES IN CURRENT EMPLOYMENT STATUS

Significantly more women reported at intake and follow-up that they were currently unemployed compared to men: 68.9% vs. 58.5% at intake and 59.7% vs. 46.5% at follow-up. The number of clients who were currently unemployed decreased significantly for both women and men (see Figure 5.7). The number of men who reported they were employed full-time was 1.5 times as high as the number of women at intake (30.3% vs. 16.9%) and at follow-up (43.8% vs. 28.3%). Both genders, however, had significant increases in full-time employment from intake to follow-up (11.4% for women and 13.5% for men).

<sup>66</sup> Eight cases had missing data for current employment at follow-up.

FIGURE 5.7. GENDER DIFFERENCES IN EMPLOYMENT STATUS AT INTAKE AND FOLLOW-UP<sup>a</sup>

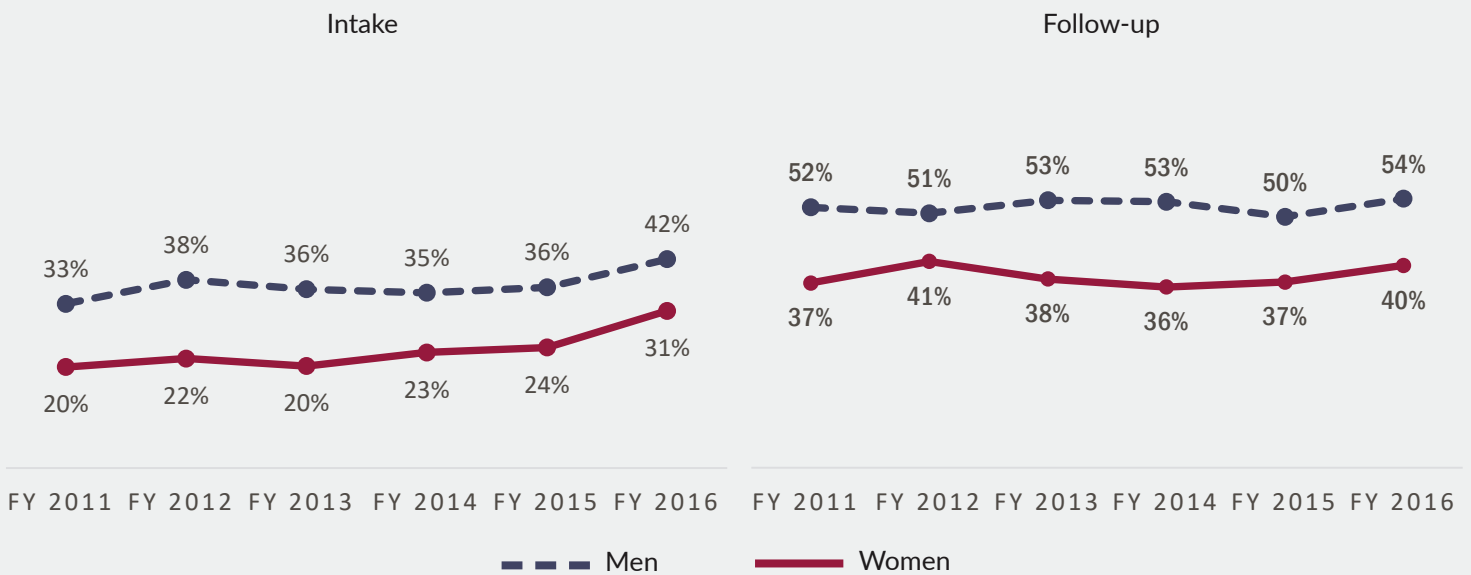


a - Significant difference by gender at intake and follow-up (p < .001).  
 \*\*\*p < .001.

### Trends in Employment

At intake in any year, less than one-third of women reported being employed (part- or full-time) compared to as much as 42% of men. At follow-up, over half of men reported being employed in any year compared to no more than 2 in 5 women. 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.

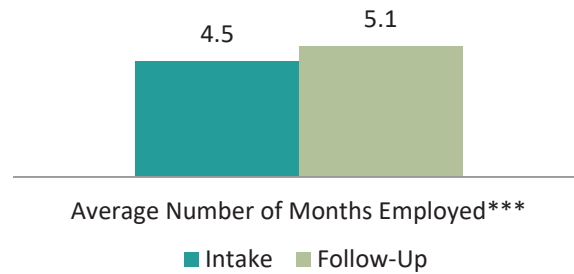
FIGURE 5.8. TRENDS IN GENDER DIFFERENCES IN CLIENTS EMPLOYED AT INTAKE AND FOLLOW-UP, FY 2011-FY 2016



## AVERAGE NUMBER OF MONTHS EMPLOYED

Clients were asked in the intake survey and follow-up survey to report the number of months they were employed full-time or part-time in the 12 months before they entered treatment (past 12 months at follow-up). As seen in Figure 5.9, clients reported working significantly more months at follow-up (5.1) than at intake (4.5).

FIGURE 5.9. AVERAGE NUMBER OF MONTHS EMPLOYED AT INTAKE AND FOLLOW-UP (N = 1,197)<sup>67</sup>

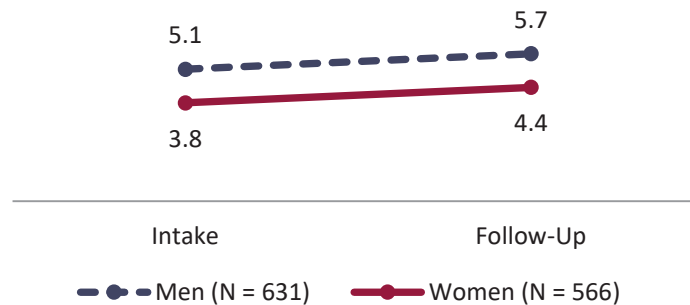


\*\*\*p < .001.

## GENDER DIFFERENCES IN THE NUMBER OF MONTHS EMPLOYED

Men reported working significantly more months at both periods compared to women (intake, 5.1 vs. 3.8 and follow-up, 5.7 vs. 4.4), however, the average number of months both men and women worked increased significantly from intake to follow-up (see Figure 5.10).

FIGURE 5.10. GENDER DIFFERENCES IN NUMBER OF MONTHS EMPLOYED AT INTAKE AND FOLLOW-UP<sup>a,b</sup>



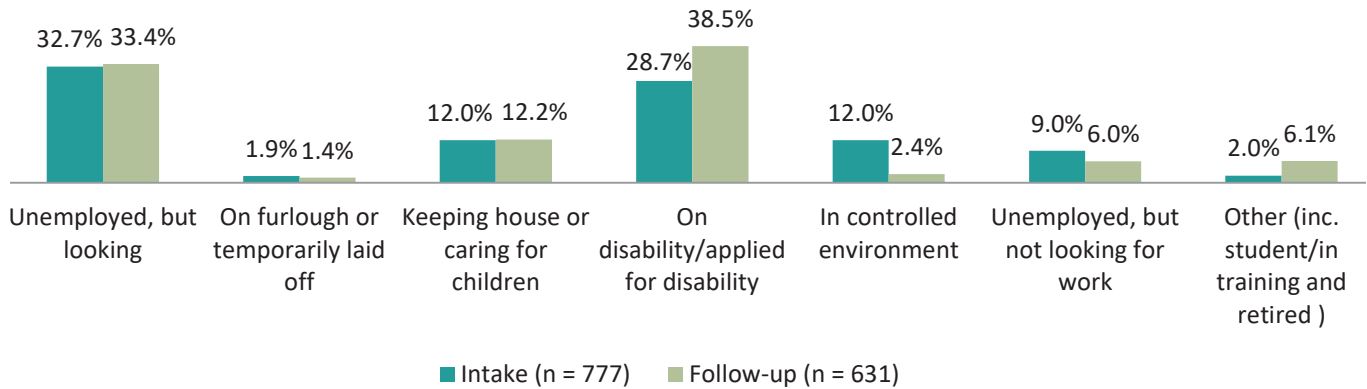
a—Significant difference by gender in number of months worked at intake and follow-up (p < .001).

b – Significant increase from intake to follow-up for men and women (p < .01).

Of those not employed at each point, clients were asked why they were not currently employed. At intake (n = 777), 32.7% of clients reported they were unemployed, but looking for work and 28.7% were also on disability or had applied for disability. Of clients not employed at follow-up (n = 631), 33.4% were unemployed, but looking for work and 38.5% reported they were on disability or had applied for disability.

<sup>67</sup> Twenty-seven cases had missing data for number of months employed.

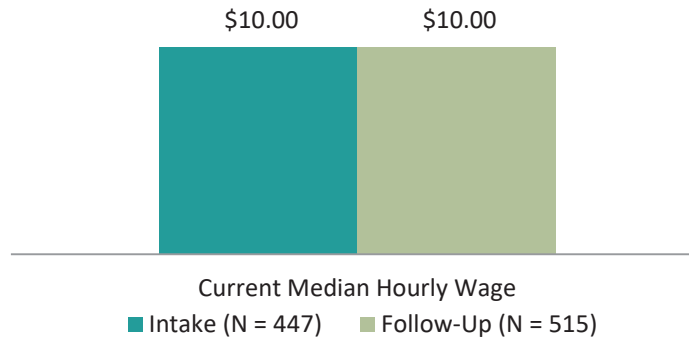
FIGURE 5.11. REASONS FOR UNEMPLOYMENT STATUS AT EACH POINT



### HOURLY WAGE


Of those clients who were employed at intake (n = 447), the median hourly wage was \$10.00. Of those clients who were employed at follow-up (n = 515)<sup>68</sup>, the median hourly wage was also \$10.00 (see Figure 5.12).

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



### GENDER DIFFERENCES IN HOURLY WAGE

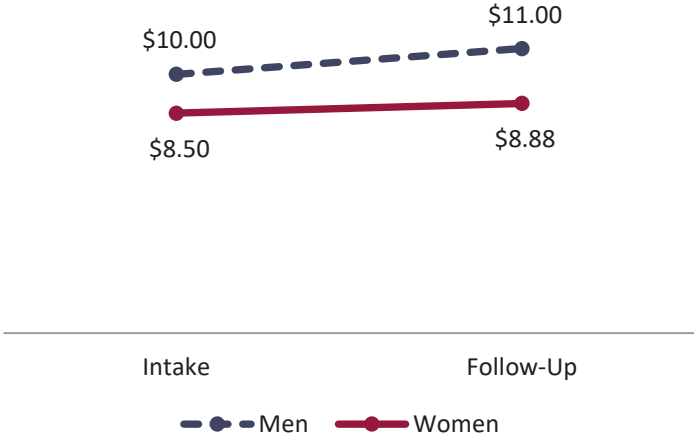
Of those clients who were employed at each period, men had significantly higher hourly wages than women (see Figure 5.13). At intake, employed women made \$0.85 for every dollar employed men made in this sample, while at follow-up, employed women made \$0.81 for every dollar employed men made.



At follow-up, employed women made only \$0.81 for every \$1 men made

<sup>68</sup> Of the 575 individuals who reported being employed full-time, part-time, or seasonally at follow-up, 60 individuals had missing data on hourly wage because they did not know the answer or they refused to answer.

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



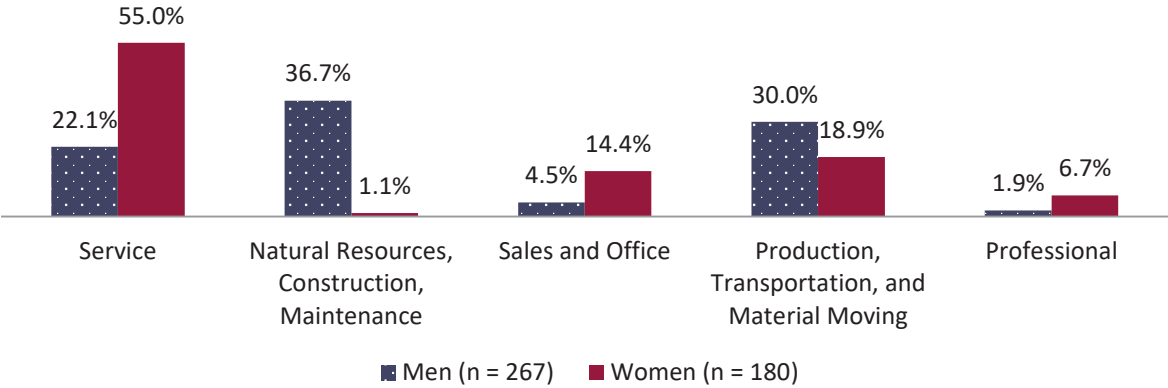
a—Significant difference in median hourly wage at intake and follow-up by gender, tested with Mann-Whitney U test ( $p < .001$ ).

**GENDER DIFFERENCES IN OCCUPATION TYPE**

At least part of the reason for the marked difference in hourly wages between men and women is due to the significant difference in occupation type for employed individuals by gender.<sup>69</sup> At intake, more than half of employed women (55.0%) had a service sector job, whereas only 22.1% of employed men had a service sector job (see Figure 5.14a). In addition, about one-third of employed men (36.7%) 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 (1.1%). These patterns were also found at follow-up; almost two-thirds of employed women (61.7%) had a service sector job, whereas only 25.5% of employed men had a service sector job (see Figure 5.14b).

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 5.14a. AMONG EMPLOYED INDIVIDUALS, TYPE OF OCCUPATION BY GENDER AT INTAKE (N = 447)<sup>\*\*\*</sup>

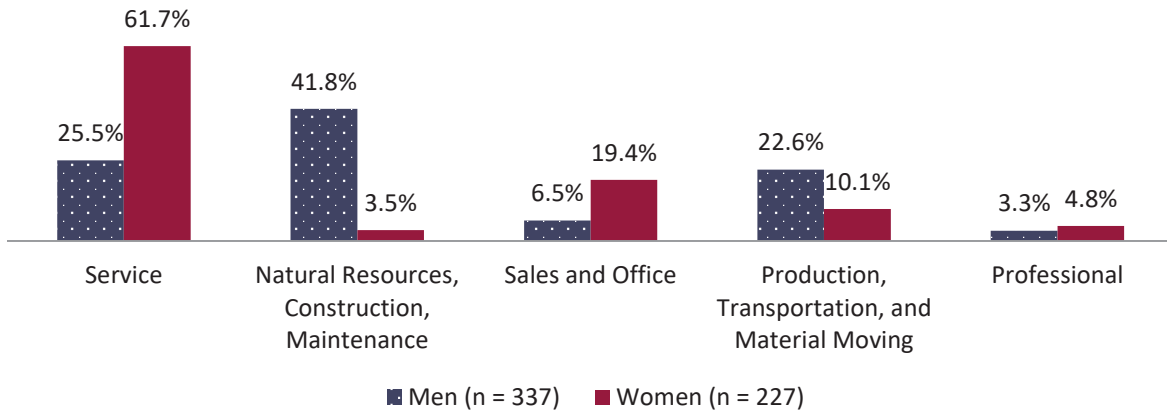


<sup>\*\*\*</sup> $p < .001$ .

<sup>69</sup> Occupation type was asked only of individuals who reported they were currently employed at intake and at follow-up.



FIGURE 5.14b. AMONG EMPLOYED INDIVIDUALS, TYPE OF OCCUPATION BY GENDER AT FOLLOW-UP (N = 564)<sup>\*\*\*</sup>

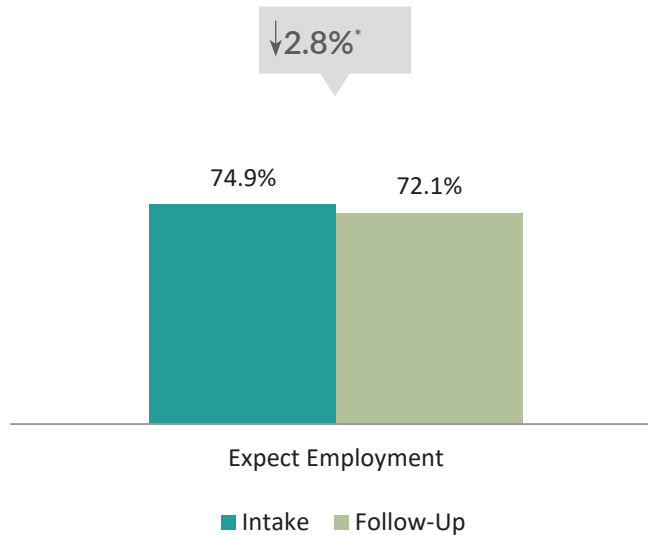


<sup>\*\*\*</sup>p < .001.

### EXPECTED EMPLOYMENT

Clients are asked if they expect to be employed in the next 12 months at intake and follow-up. At intake, 74.9% reported they expected to be employed in the future (see Figure 5.15). At follow-up, this number decreased significantly with only 72.1% reporting they expected employment in the next 12 months.

FIGURE 5.15. CLIENTS WHO EXPECT TO BE EMPLOYED IN THE FUTURE AT INTAKE AND FOLLOW-UP (N=1,206)<sup>70</sup>



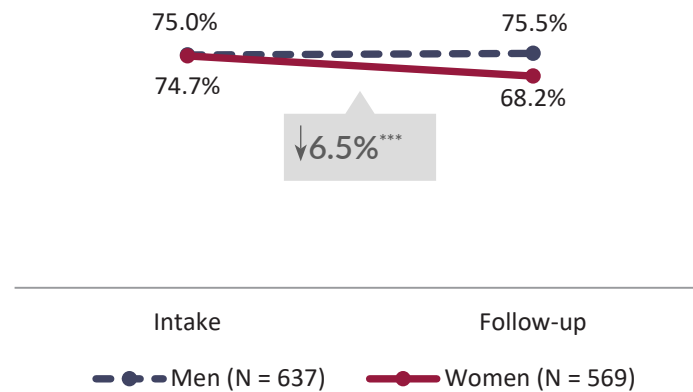
\*p < .05.

<sup>70</sup> Eighteen clients had missing data for expect employment at follow-up.

## GENDER DIFFERENCES IN EXPECTED EMPLOYMENT

Significantly more men (75.5%) than women (68.2%) expected to be employed in the next 12 months at follow-up (see Figure 5.16). The percent of women who expected employment in the future decreased significantly from intake while the number of men who expected employment in the future remained stable.

FIGURE 5.16. GENDER DIFFERENCES IN CLIENTS WHO EXPECT TO BE EMPLOYED IN THE FUTURE AT INTAKE AND FOLLOW-UP<sup>a</sup>



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

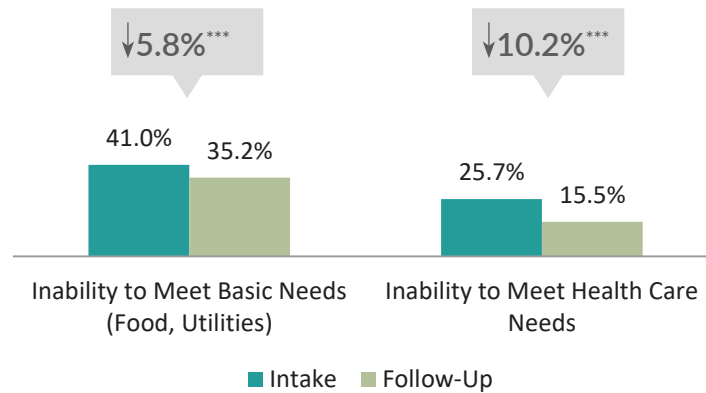
## Economic Hardship

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>71</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 (1.4; not depicted in figure).

Less than half of clients (41.0%) reported at intake that they had difficulty meeting basic needs such as food, shelter or utilities (see Figure 5.16). About one-quarter (25.7%) reported their household had difficulty meeting health care needs in the 12 months before clients entered treatment. The number of individuals who reported having difficulty meeting basic needs and health care needs decreased significantly by 5.8% and 10.2%, 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 almost 16% stated they had difficulty meeting health care needs.

<sup>71</sup> She, P., & Livermore, G. (2007). Material hardship, poverty, and disability among working-age adults. *Social Science Quarterly*, 88(4), 970-989.

FIGURE 5.17. DIFFICULTY IN MEETING BASIC AND HEALTH CARE NEEDS FOR FINANCIAL REASONS  
(N = 1,223)<sup>72</sup>



\*\*\*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 5.18). 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. About 40% of women reported difficulty meeting basic living needs at follow-up compared to 31.1% of men, however, there was a significant decrease in the number of women who reported having difficulty meeting basic living needs at follow-up.

Less than one-third of women (29.3%) reported difficulty meeting health care needs at intake compared to 22.4% of men; however, at follow-up, there was no difference by gender. The number of women and men who reported difficulty meeting health care needs at follow-up was significantly lower than at intake.



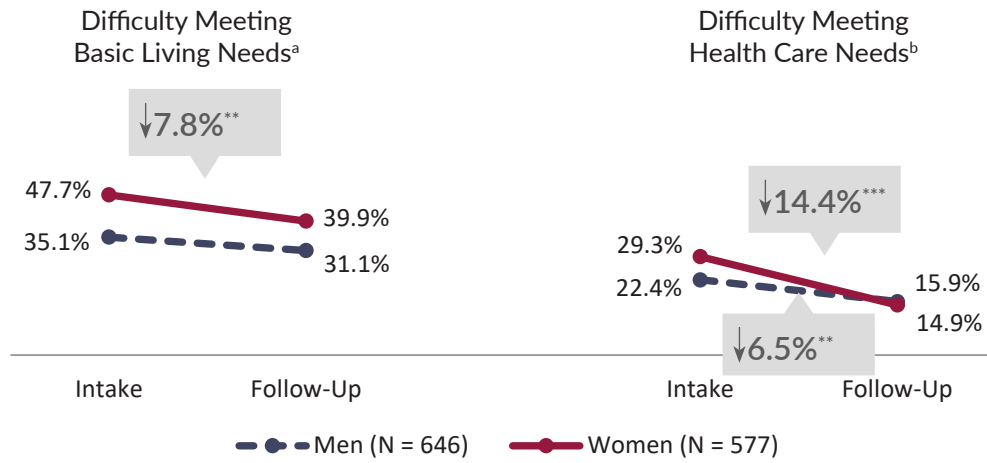
**More women reported difficulty meeting basic living needs at intake and follow-up and more women reported difficulty meeting health care needs than men and intake**

*"It was family style. I felt secure interacting with staff, comfortable and dependable people there. Individualization of counseling I liked and the meeting one on one at least three times a week."*

KTOS FOLLOW-UP CLIENT

<sup>72</sup> One case had missing data on basic needs and health care needs items.

FIGURE 5.18. 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 ( $p < .01$ ).

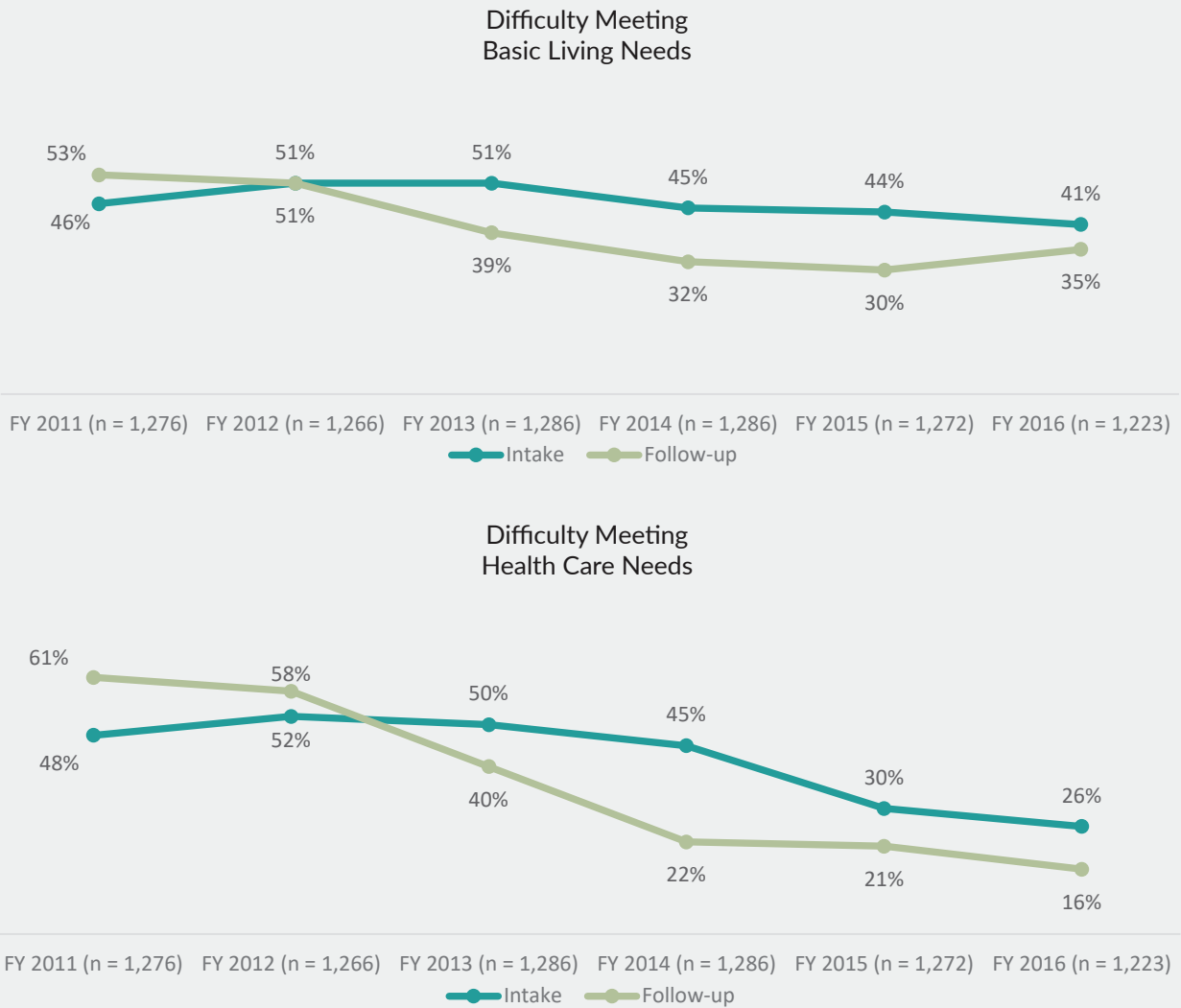
b – Significant difference by gender at intake ( $p < .01$ ).

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

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

The percent of KTOS clients who have reported difficulty meeting basic living needs and health care needs at follow-up has decreased over time. The percent of clients reporting difficulty meeting basic living needs at follow-up decreased from 53% in the KTOS FY 2011 report to 30% in the KTOS FY 2015. The percent of clients reporting difficulty meeting basic living needs at follow-up increased slightly to 35% in FY 2016. 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 2016.

FIGURE 5.19. TRENDS IN THE NUMBER OF CLIENTS REPORTING ECONOMIC DIFFICULTY IN THE PAST-12-MONTHS AT INTAKE AND FOLLOW-UP, FY 2011-FY 2016



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. Results for each targeted factor are presented for the overall sample and by gender when there were significant gender differences.

## Arrests

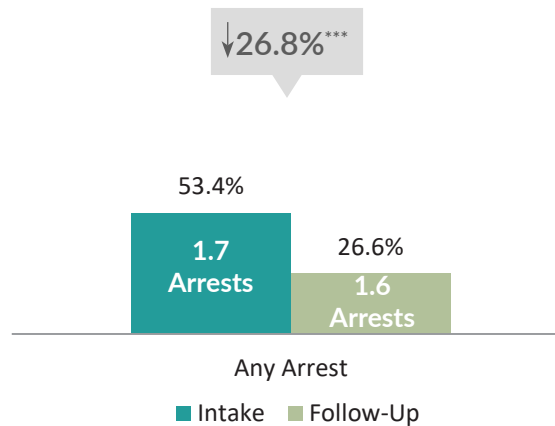
### ARRESTED IN THE PAST 12 MONTHS

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 (53.4%) reported at least one arrest in the 12 months before entering treatment (see Figure 6.1). At follow-up, 26.6% 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 = 645), clients were arrested an average of 1.7 times. Among those clients who reported at least one arrest in the 12 months before follow-up (n = 321), the average number of arrests was 1.6.

The number of clients reporting any arrest significantly decreased 27% at follow-up

FIGURE 6.1. CLIENTS REPORTING ARRESTS AT INTAKE AND FOLLOW-UP (N = 1,207)<sup>73</sup>



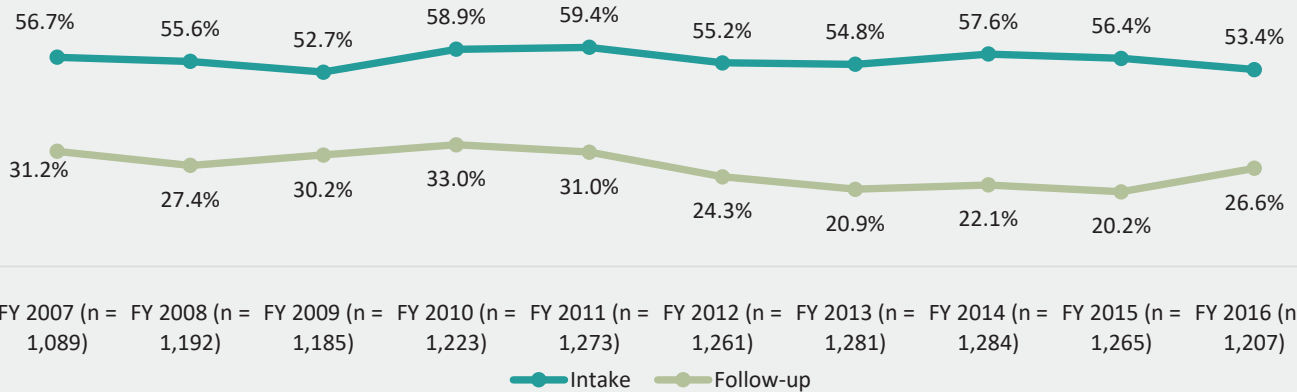
\*\*\*p < .001.

<sup>73</sup> Seventeen cases had missing data on arrests in the 12 months before follow-up.

## Trends in Past-12-month Arrests

The number of clients reporting an arrest in the past 12 months at intake has remained stable over the past 10 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 NUMBER OF CLIENTS REPORTING AN ARREST IN THE PAST-12-MONTHS AT INTAKE AND FOLLOW-UP, FY 2007-FY 2016



## Incarceration

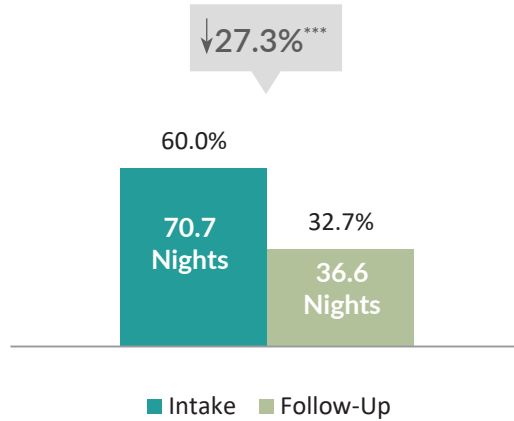
### INCARCERATED IN THE PAST 12 MONTHS

Six in 10 clients reported spending at least one day in jail or prison in the 12 months prior to entering treatment (see Figure 6.3). At follow-up, 32.7% of clients reported spending at least one day incarcerated in the past 12 months; a significant decrease of 27.3%.

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 = 396, 36.6 nights) when compared to intake (n = 727, 70.7 nights).

The number of clients who spent at least one day incarcerated decreased by 27%


FIGURE 6.3. CLIENTS REPORTING BEING INCARCERATED AT INTAKE AND FOLLOW-UP (N = 1,211)<sup>74</sup>



\*\*\*p < .001.

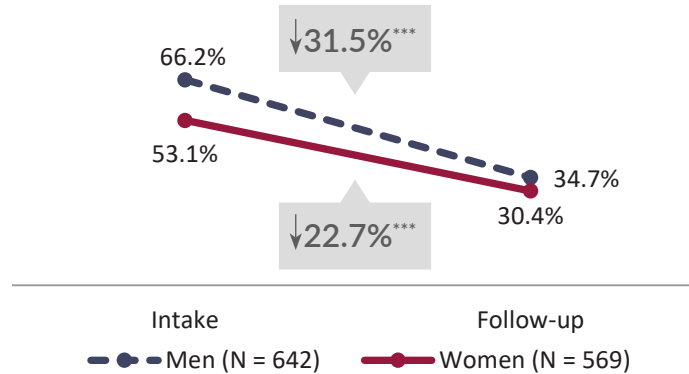
### GENDER DIFFERENCES IN BEING INCARCERATED

Significantly more men than women reported being incarcerated in the 12 months before entering treatment; however, at follow-up, there was no difference between men and women in the percentage reporting incarceration in the past 12 months (see Figure 6.4). The number of men and women who reported being incarcerated decreased significantly from intake to follow-up.



Significantly more men than women reported being incarcerated before intake

FIGURE 6.4. GENDER DIFFERENCES IN CLIENTS REPORTING INCARCERATION (N = 1,211)<sup>a</sup>



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

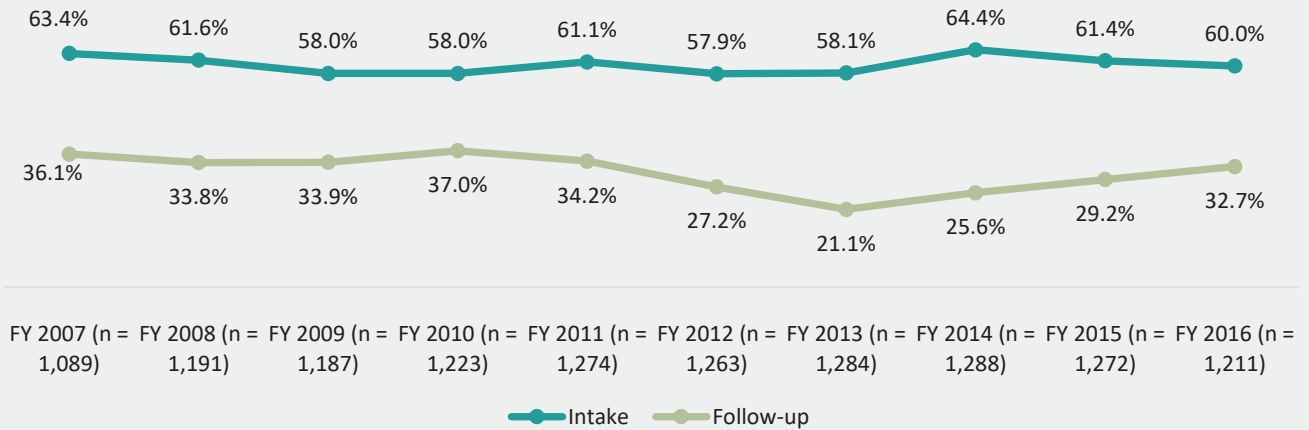
<sup>74</sup> Thirteen cases had missing data for incarceration at follow-up.



### Trends in Past-12-month Incarceration

The number of clients reporting spending at least one night in jail or prison has been relatively steady over the past 10 years with between 58% and 64% of clients reporting an incarceration at intake. At follow-up, an average of 31% of clients reported spending at least one night in jail or prison in the past 12 months (a range of 21.1% to 37.0%).

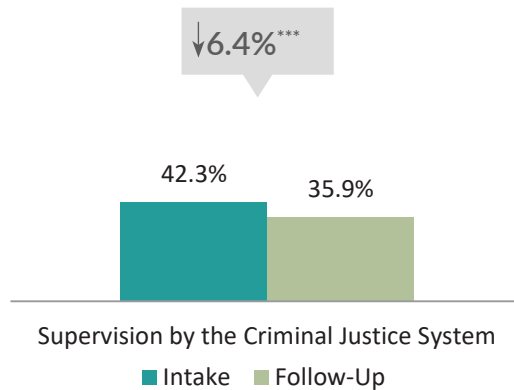
FIGURE 6.5. TRENDS IN THE NUMBER OF CLIENTS REPORTING BEING INCARCERATED IN THE PAST-12-MONTHS AT INTAKE AND FOLLOW-UP, FY 2007-FY 2016



### Criminal Justice System Supervision

The number of clients that self-reported they were under criminal justice system supervision (e.g., probation or parole) decreased significantly from intake (42.3%) to follow-up (35.9%; see Figure 6.6).

FIGURE 6.6. CLIENTS REPORTING SUPERVISION BY THE CRIMINAL JUSTICE SYSTEM AT INTAKE AND FOLLOW-UP (N = 1,214)<sup>75</sup>



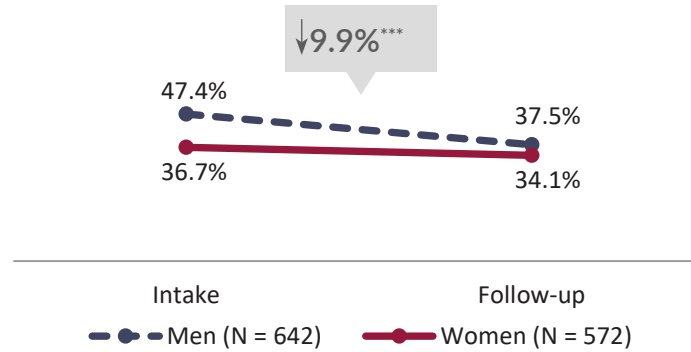
\*\*\*p < .001.

<sup>75</sup> Ten cases had missing data on criminal justice system supervision at follow-up.

## GENDER DIFFERENCES IN CRIMINAL JUSTICE SUPERVISION

Significantly more men (47.4%) than women (36.7%) reported being under supervision by the criminal justice system in the 12 months before entering treatment (see Figure 6.7). The number of men who reported being under supervision decreased significantly from intake to follow-up, however, the percent of women reporting supervision did not change.

FIGURE 6.7. GENDER DIFFERENCES IN CLIENTS REPORTING CRIMINAL JUSTICE SUPERVISION<sup>a</sup>



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

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

## SECTION 7.

# Quality of Life

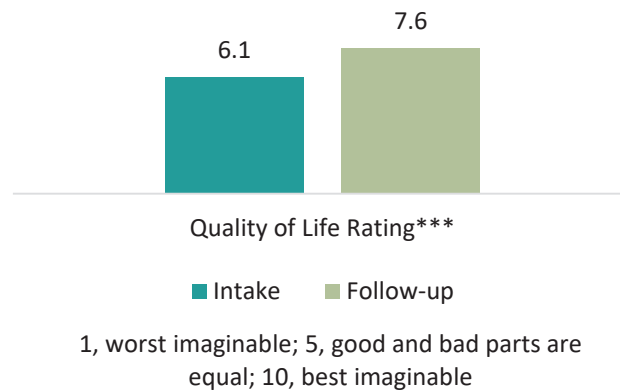
This section describes change in client quality of life and satisfaction with life during the 12-month period before entering treatment and the 12-month period before the follow-up interview. Specifically, results include changes in: (1) quality of life rating and (2) satisfaction with life rating. Results 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 6.1 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 6.1 at intake to 7.6 at follow-up**

FIGURE 7.1. PERCEPTION OF QUALITY OF LIFE AT INTAKE AND FOLLOW-UP (N = 1219)<sup>76</sup>



\*\*\*p < .001.

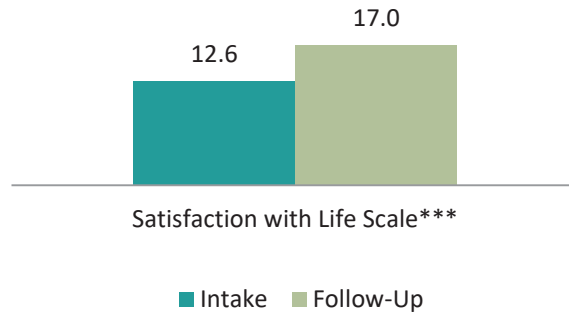
## Satisfaction with Life Rating

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>77</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 (12.6) to follow-up (17.0).

<sup>76</sup> Five cases had missing data for the quality of life rating at follow-up.

<sup>77</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 = 1,224)

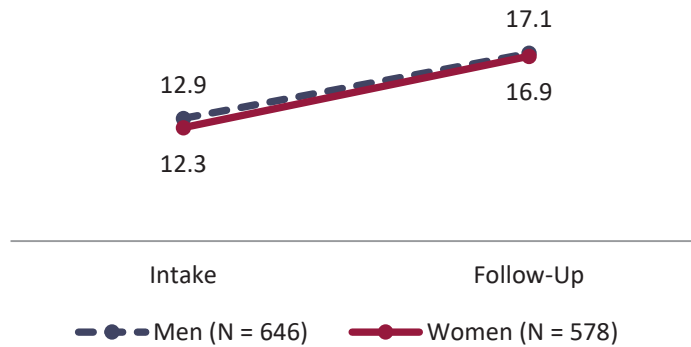


\*\*\*p < .001.

### GENDER DIFFERENCES IN SATISFACTION WITH LIFE RATING

Men reported a higher rating on satisfaction with life at intake compared to women (12.9 vs. 12.3, respectively). At follow-up, ratings on satisfaction with life increased significantly for men (17.1) and women (16.9).

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 < .05).

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

*“I was in pieces, mentally. The staff and materials helped me. They helped me with my suicide ideation. They were compassionate and I hope the funding continues.”*

KTOS FOLLOW-UP CLIENT

## SECTION 8.

# Recovery Supports

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 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.

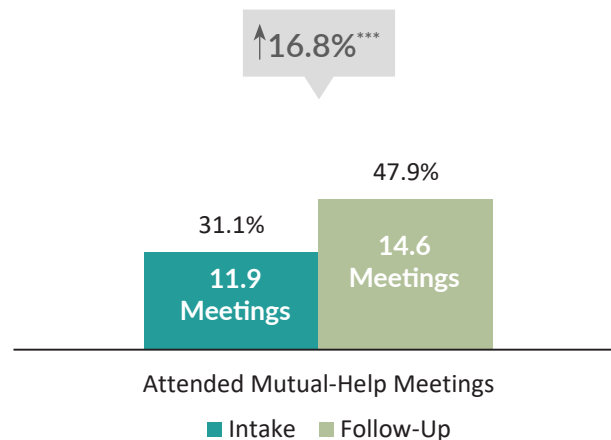
## Mutual Help Recovery Group Meeting Attendance

At intake, only 31.1% of clients reported going to mutual help recovery group meetings (e.g., AA, NA, or faith-based) in the past 30 days (see Figure 8.1). At follow-up, there was a significant increase of 16.8%, with 47.9% 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 ( $n = 378$ ), they reported attending an average of 11.9 meetings in the past 30 days. Those who attended self-help meetings at follow-up ( $n = 581$ ) reported an average of 14.6 meetings attended in the past 30 days.

There was a 17% increase in the percent of clients reporting attending mutual help recovery groups

FIGURE 8.1. MUTUAL HELP RECOVERY GROUP ATTENDANCE AT INTAKE AND FOLLOW-UP (N=1,214)<sup>78</sup>



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

### 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 follow-up (see Figure 8.2). The number of women and men who

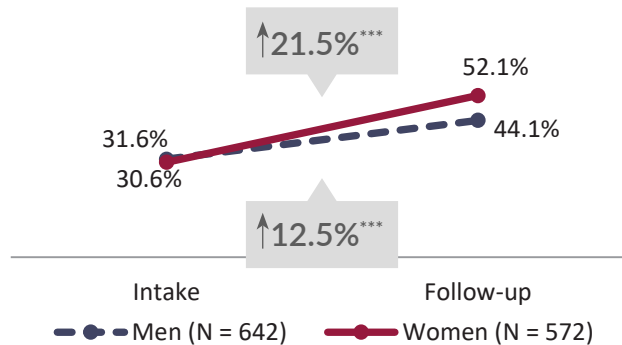


Significantly more women than men reported attending mutual help meetings before follow-up

<sup>78</sup> Ten cases had missing data for self-help meeting attendance.

reported attending mutual help recovery meetings increased significantly from intake to follow-up (21.5% and 12.5% respectively).

FIGURE 8.2. GENDER DIFFERENCES IN CLIENTS ATTENDING MUTUAL HELP MEETINGS<sup>a</sup>



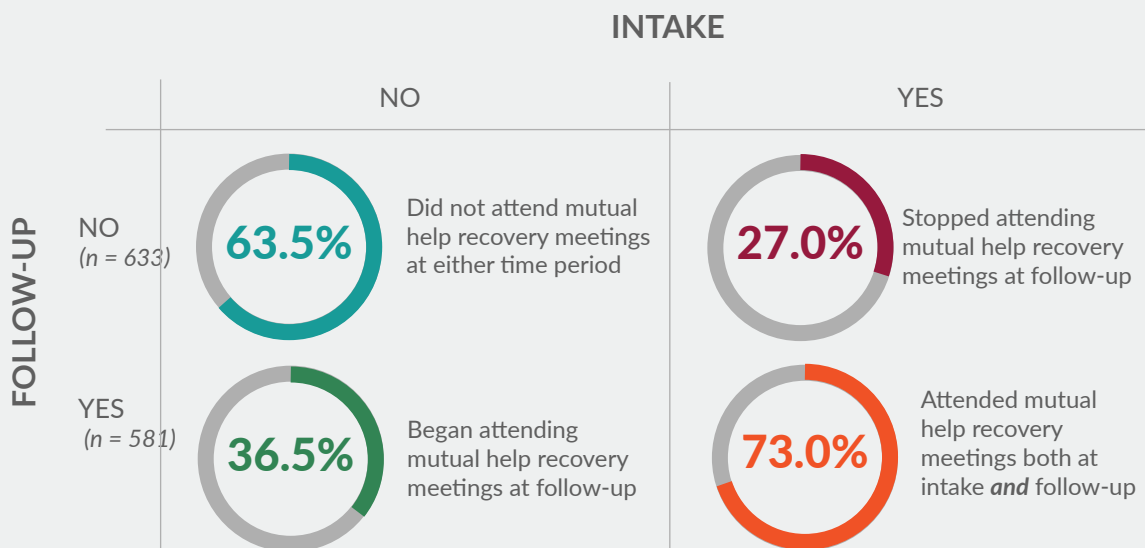
a— Significant difference by gender at follow-up ( $p < .01$ ).  
 \*\*\* $p < .001$ .

### Taking a Closer Look at Recovery Support

One in three clients reported attending mutual help recovery group meetings in the 30 days before entering treatment (31.1%;  $n = 581$ ). Of these clients who reported attending mutual help recovery group meetings at intake, 73.0% also attended mutual help recovery group meetings at follow-up (see Table 8.1).

Alternatively, 36.5% 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.

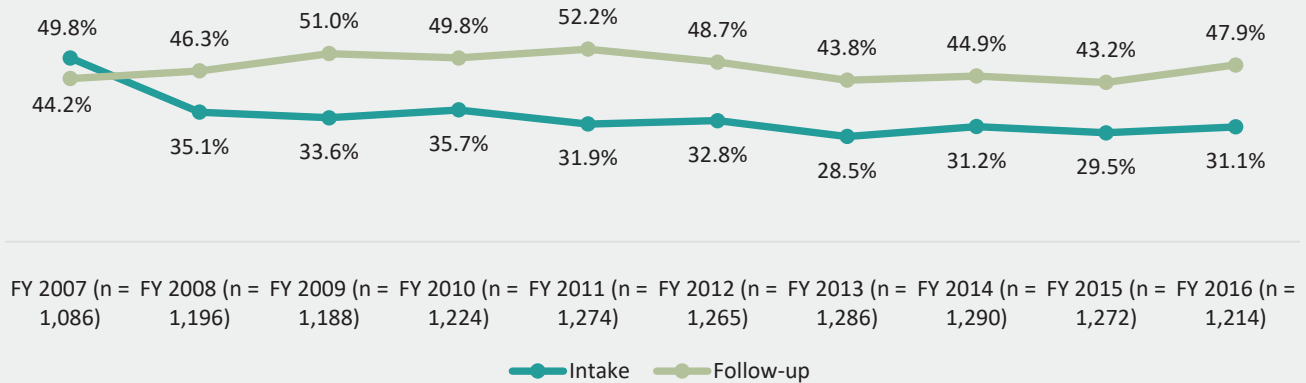
FIGURE 8.3. MUTUAL HELP RECOVERY GROUP MEETING ATTENDANCE AT INTAKE AND FOLLOW-UP BASED ON MEETING ATTENDANCE AT INTAKE



## 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 around half reported attending meetings at follow-up.

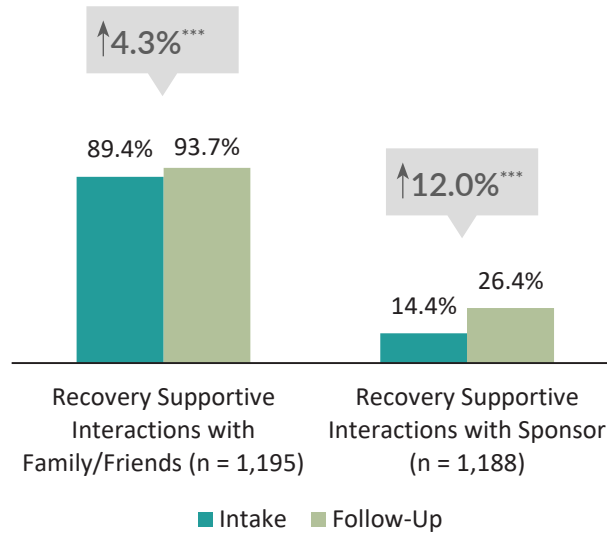
FIGURE 8.4. TRENDS IN THE NUMBER OF CLIENTS REPORTING PAST-30-DAY MUTUAL HELP RECOVERY GROUP MEETINGS AT INTAKE AND FOLLOW-UP, FY 2007-FY 2016



## 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 8.5). The number of clients who reported having recovery supportive interactions with family or friends significantly increased from intake to follow-up. About 14% of clients reported being in contact with an AA/NA or other self-help group sponsor at intake. That number increased significantly to 26.4% at follow-up.

FIGURE 8.5. RECOVERY SUPPORTIVE INTERACTIONS IN THE PAST 30 DAYS<sup>79</sup>

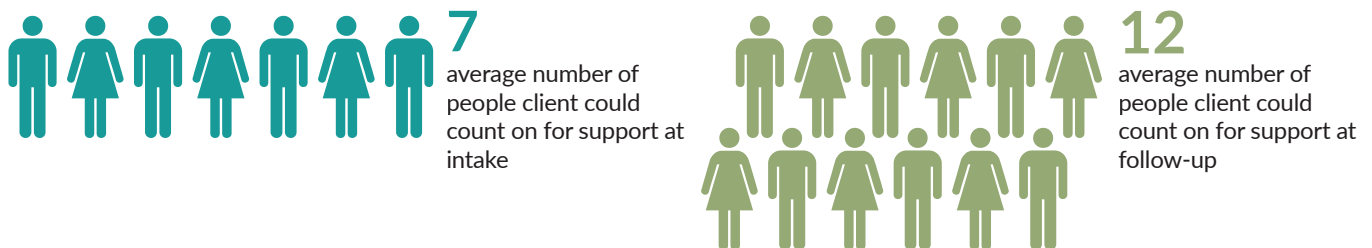


\*\*\*p < .001.

## 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 6.9 people at intake to 12.4 people at follow-up (see Figure 8.6).

FIGURE 8.6. AVERAGE NUMBER OF PEOPLE CLIENTS COULD COUNT ON FOR RECOVERY SUPPORT AT INTAKE AND FOLLOW-UP (N = 1,202)<sup>\*\*80</sup>



\*\*\*p < .001.

<sup>79</sup> Data on family/friends recovery supportive interactions was missing at follow-up for 29 cases and data on sponsor recovery supportive interactions was missing at follow-up for 17 cases.

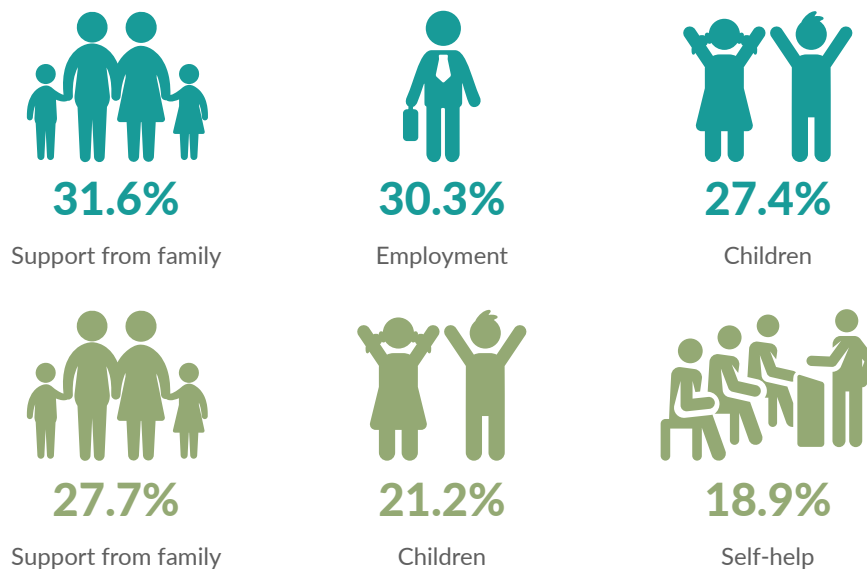
<sup>80</sup> Data on the number of people the client could count on for recovery support at follow-up was missing for 22 cases.



## What Will Be Most Useful in Staying Off Drugs/alcohol

At intake and follow-up, clients were asked what they believed would be most useful in helping them quit or stay off drugs/alcohol. Rather than conduct analysis on change in responses from intake to follow-up, the top responses that were reported by clients are presented for descriptive purposes in Figure 8.7. The most common responses at intake were support from family, employment, and taking care of their children or dependents. At follow-up, the most common responses were support from family, taking care of children, and self-help (e.g., AA or NA, their sponsor).

FIGURE 8.7. TOP CATEGORIES CLIENTS REPORTED THAT WILL BE MOST USEFUL IN STAYING OFF DRUGS AND/OR ALCOHOL AT INTAKE AND FOLLOW-UP (N = 1224)<sup>81</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, 86.9% of clients believed they had a moderately or very good chance of staying off drugs/alcohol at intake with a significant increase of 4.6% at follow-up (91.5%; see Figure 8.8).<sup>82</sup>

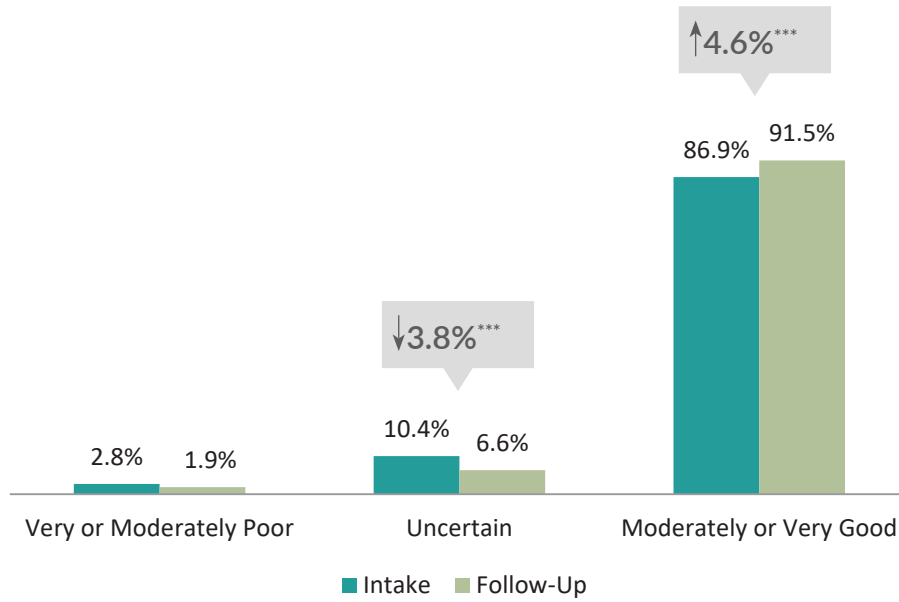
*"I loved the staff and how they had been through the same recovery process and knew first hand about addiction."*

KTOS FOLLOW-UP CLIENT

<sup>81</sup> One individual had missing data for the variables at intake and 46 had missing data at follow-up.

<sup>82</sup> Thirty individuals had missing data for chances of staying off drugs/alcohol at follow-up.

FIGURE 8.8. CLIENTS REPORTING THEIR CHANCES OF GETTING OFF AND STAYING OFF DRUGS/ALCOHOL AT INTAKE AND FOLLOW-UP (N = 1,194)<sup>a</sup>



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

**SECTION 9.**

# 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 (78.8%) gave a high positive rating between 8 and 10 of their satisfaction with the treatment program (not in a table).<sup>83</sup> The average rating was 8.4.

## Client Ratings of Program Experiences

When asked about specific aspects of their treatment program, the overwhelming majority of clients reported they either agreed or strongly agreed with each aspect of the program that was assessed (see Figure 9.1).<sup>84</sup> The majority of clients indicated the facility was clean (98.8%) and 96.7% said the staff explained their rights as a client. About 96% also said they understood their treatment plan (96.3%), they were treated with respect (96.1%), and understood what staff expected of them (96.1%). Ninety-two percent of clients felt better about themselves as a result of treatment and 91.6% indicated that they had received the services they needed to help them get better.

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<sup>83</sup> Data for one case was missing for this question.

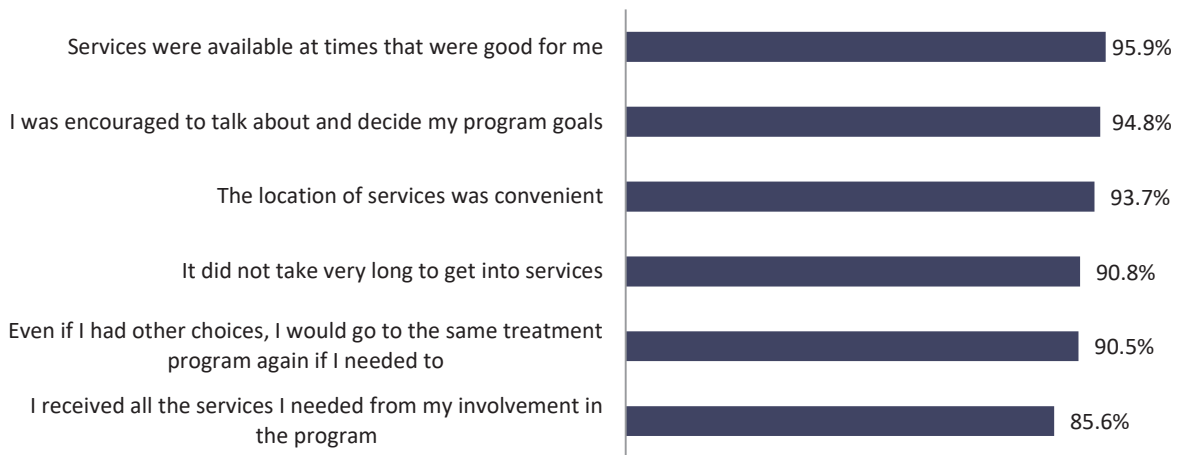
<sup>84</sup> Answers of don't know/don't remember were treated as missing on these items. The number of missing values ranged from 0 to 3 on the items represented in the above figure.

FIGURE 9.1. PERCENT OF CLIENTS WHO AGREED/STRONGLY AGREED WITH THE FOLLOWING STATEMENTS ABOUT THE TREATMENT PROGRAM AT FOLLOW-UP (N = 490)<sup>85</sup>



Figure 9.2 shows that KTOS clients were satisfied with the overall program services. In fact, 95.9% the clients reported that the available times of services was convenient, 94.8% were encouraged to talk about and decide their program goals, and 93.7% said the location of the services was convenient. About 91% of clients agreed that it did not take very long to get into services and 90.5% said that, even if they had other choices, they would go to the same treatment program again if they needed to. About 86% reported they received all the services they needed from involvement in the program.

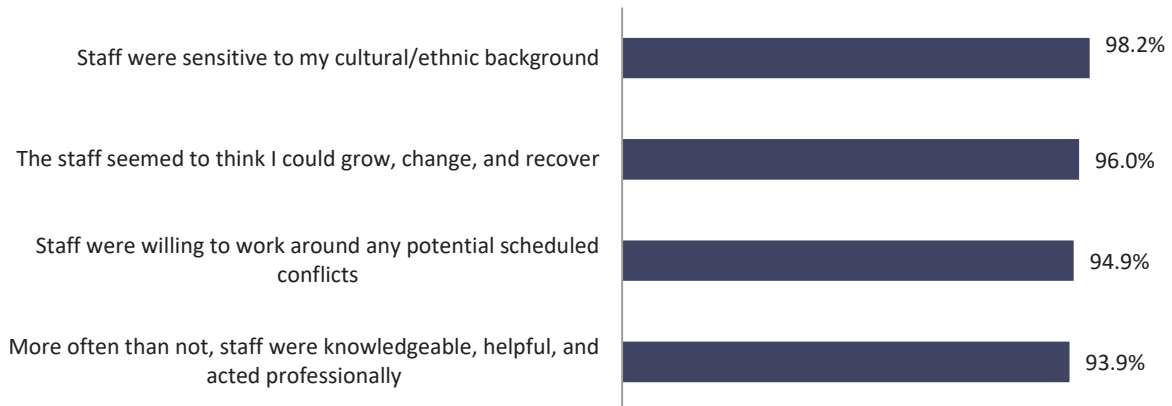
FIGURE 9.2. SATISFACTION WITH TREATMENT SERVICES (N = 729)



<sup>85</sup> In October 2016, program satisfaction questions were expanded and reworked, therefore in this report, only 495 clients were asked to rate the following program experiences. In addition, these questions were skipped for 5 cases at follow-up.

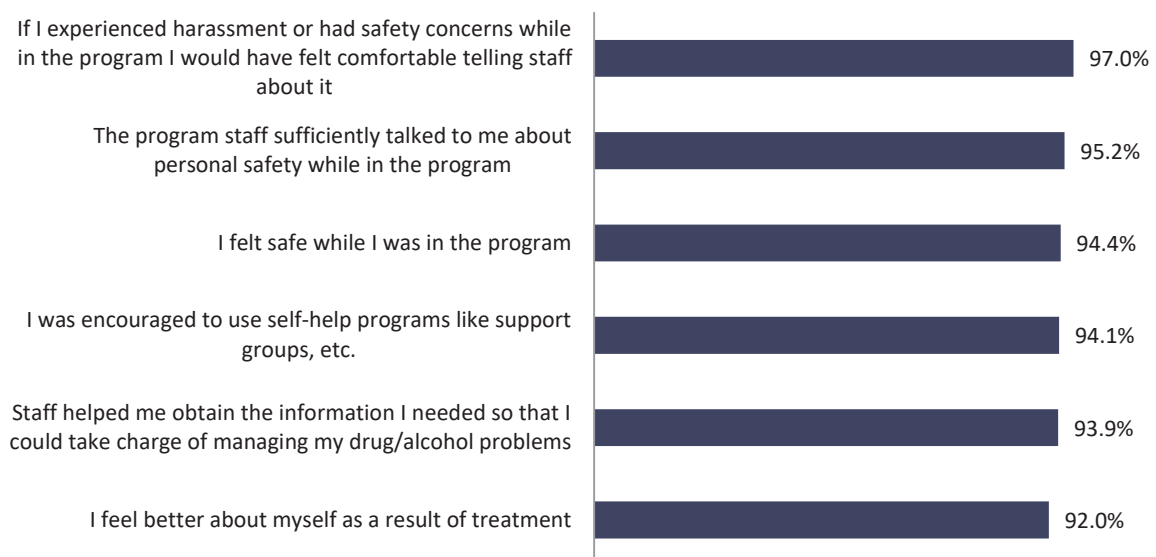
The majority of clients agreed that the treatment staff were sensitive to the clients' cultural/ethnic background (98.2%) and that the staff seemed to think the client could grow, change, and recover (96.0%). In addition, 94.9% clients agreed that the staff were willing to work around any potential scheduled conflicts. The majority of clients (93.9%) reported that, more often than not, staff were knowledgeable, helpful, and acted professionally.

FIGURE 9.3. GENERAL SATISFACTION WITH TREATMENT STAFF (N = 729)



Almost all clients reported that if they experienced harassment or had safety concerns while in the program that the client would have felt comfortable telling staff about it (97.0%; see Figure 9.4). The majority of clients (95.2%) also reported the staff sufficiently talked to the client about personal safety while in the program and 94.4% said they felt safe while in the program. The majority of clients (94.1%) reported that they were encouraged to use self-help programs like support groups. About 94% of clients (93.9%) believed that the staff helped them obtain information so they could take charge of managing their drug/alcohol problems. Ninety-two percent of clients also agreed they felt better about themselves as a result of treatment.

FIGURE 9.4. SATISFACTION WITH PROGRAM ASPECTS ADDRESSING SAFETY AND SUBSTANCE ABUSE TREATMENT (N = 729)



## SECTION 10.

# 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>86</sup> In 2000 the estimated costs of alcohol abuse in the United States was updated<sup>87</sup> and in 2011 the National Drug Intelligence Center updated the estimates of drug abuse in the United States for 2007.<sup>88</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 Abuse and Dependence

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 2016 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

<sup>86</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>87</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.

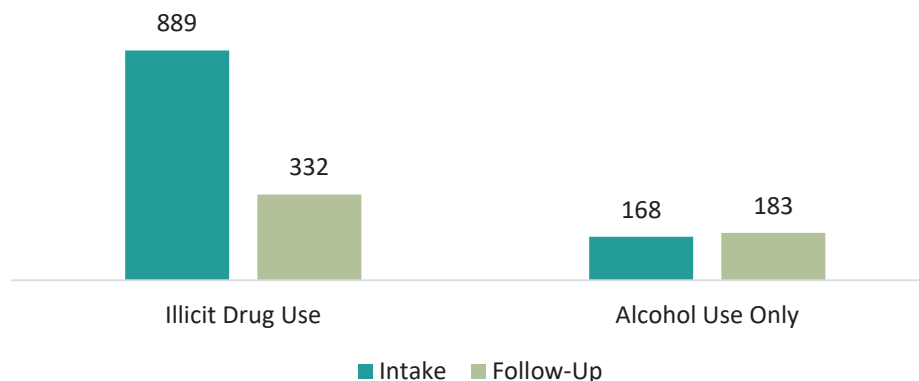
<sup>88</sup> National Drug Intelligence Center. (2011). *The economic impact of illicit drug use on American Society*. Washington, DC: United States Department of Justice.

reserve bank.<sup>89</sup> The estimate of the cost to society of alcohol use was \$271,840,009,815 after conversion to 2016 dollars. The estimate of the cost to society of drug use was \$223,513,375,133 after conversion to 2016 dollars.

Next, to calculate an estimate of the cost of alcohol and drug abuse per person, those updated national costs were divided by the 2016 federally derived estimates of the number of individuals (aged 12 or older) with alcohol use disorder (15.1 million) and drug use disorder (7.4 million) in the nation.<sup>90</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 10.1 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>91</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, 889 clients reported using illicit drugs and an additional 168 clients reported using alcohol only. At follow-up, 332 clients reported using illicit drugs and 183 clients reported using any alcohol.

FIGURE 10.1 THE NUMBER OF CLIENTS WHO REPORTED USING ILLICIT DRUGS AND/OR ALCOHOL IN THE 12 MONTHS BEFORE INTAKE AND FOLLOW-UP (N = 1,220)



The average annual cost to society of an active drug abuser in 2016 dollars was \$30,205. The average annual cost to society of an active alcohol abuser was \$18,003. Thus, when this average

<sup>89</sup> <http://www.minneapolisfed.org>

<sup>90</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>91</sup> Four cases had missing values for illicit drug use in the 12 months before follow-up; thus, they were excluded from the cost savings analysis.

annual cost per individual drug user was applied to the 889 clients who reported using illicit drugs at intake, the annual cost to society in 2016 was estimated at \$26,852,245. When the average annual cost per individual alcohol abuser was applied to the 168 clients who reported using alcohol only at intake, the estimated annual cost to Kentucky in 2016 was \$3,024,504. 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 \$29,876,749. By follow-up, the estimated cost of the 332 individuals who reported illicit drug use was \$10,028,060 and the estimated cost of the 183 individuals who reported using alcohol was \$3,294,549, for a total of \$13,322,609. Thus, as shown in Figure 10.2, after participation in publicly-funded substance abuse treatment, the gross cost to Kentucky taxpayers for these 1,220 clients was reduced by \$16,554,140.

FIGURE 10.2. COST TO SOCIETY AT INTAKE AND FOLLOW-UP (AMOUNTS IN MILLIONS OF DOLLARS)  
(N=1,220)

$$\begin{array}{rcccl}
 \mathbf{\$29.9 \text{ million}} & - & \mathbf{\$13.3 \text{ million}} & = & \mathbf{\$16.6 \text{ million}} \\
 \text{COST TO SOCIETY AT INTAKE} & & \text{COST TO SOCIETY AT FOLLOW-UP} & & \text{GROSS DIFFERENCE IN COST} \\
 & & & & \text{TO SOCIETY}
 \end{array}$$

## Cost of Treatment

The clinical service event data described in Section 8 was matched to the KTOS survey data 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>92, 93</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. 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). The number of cases included the follow-up sample with no service data in the IPOP data has increased over the past couple years. 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 \$3,917 (in 2016 dollars). The average cost of \$3,917 was multiplied by 1,220, which was the number of individuals in the

<sup>92</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/BHandSUFeeScheduleIPFrev612016r1.pdf>.

<sup>93</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/BHandSUFeeScheduleOPNrev612016.pdf>.



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 \$4,778,740.

## 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: \$16,554,140/\$4,778,740, which equals \$3.46 (see Table 10.1). In other words, for every dollar spent on publicly-funded substance abuse treatment in FY 2016, there was an estimated savings of \$3.46 in costs to Kentucky taxpayers associated with alcohol and drug addiction.

TABLE 10.1. 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
DRUG USE		
Number of clients		
ALCOHOL USE	889	332
Number of clients	168	183
TOTAL COST TO SOCIETY OF DRUG AND ALCOHOL USE	\$29,876,749	\$13,322,609
GROSS COST DIFFERENCE FROM INTAKE TO FOLLOW-UP		\$16,554,140
ESTIMATE OF COST OF TREATMENT (BASED ON AVERAGE COST PER CLIENT IN 2012 - 2015)		\$4,778,740
OFF-SET AS NET COST/BENEFIT RATIO		\$16,554,140/\$4,778,740
RETURN ON \$1.00 INVESTMENT		\$3.46

## SECTION 11.

# Conclusions and Implications

The KTOS 2018 Annual Follow-Up Report describes characteristics of clients who participated in state-funded substance abuse treatment programs in Kentucky in FY 2016 and completed intake interviews (N = 5,553). In addition, outcomes are presented for 1,224 clients who completed a follow-up telephone interview about 12 months later which was a 76.5% follow up rate for those selected into the statewide sample. 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, and severity of substance use. Significantly more women were followed up than were not followed up. Significantly more clients who were followed up reported living in a private residence. Significantly more followed-up clients reported they had difficulty meeting basic living needs for financial reasons. Significantly more clients who were followed up reported they had chronic pain and a chronic medical problem when compared to clients who were not followed up. Significantly more clients in the follow-up sample met study criteria for depression, generalized anxiety, and suicidality in the 12 months before treatment. More clients who completed a follow-up and were not in a controlled environment all 12 months before intake reported marijuana and non-prescribed buprenorphine-naloxone use in the 12 months before entering treatment. Further, 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 substance use disorder (SUD). They also had a higher average composite score for drug use and for alcohol use when compared to clients who did not complete a follow-up.

Overall, of the clients with intake interviews (N = 5,553), over half were male and 41.4% were female with ages 18 to 78 (average age 35 years old). Most were White and 63.4% were unemployed at intake. About 55% 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 (57.3%) and self-referred (18.7%) to treatment. The majority of adults who completed an intake interview reported using illegal drugs (71.8%), alcohol (51.7%), and smoking tobacco (83.0%) in the 12 months before intake. On average, clients reported being about 17 years old when they first began using drugs, 15 years old when they had their first alcoholic drink (other than a sip) and 16 years old when they began using tobacco.

Of the 1,224 adults who completed a 12-month follow-up interview, over half were male 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. About one-quarter of follow-up clients had less than a high school diploma or GED at intake and almost two-thirds were unemployed. Well over half of clients who completed a follow-up interview reported having at least one chronic medical problem and over 40% of clients reported chronic pain. In addition, only 6.5% of clients at intake had medical insurance through an employer (including spouse's employer, parent's employer, or self-employed) and 76.5% were on Medicaid. Almost 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 73.5% of clients reporting any illegal drug use at intake compared to 27.5% at follow-up. Trends in any illegal drug use show that, overall, for the past 10 years, the number of clients reporting illegal drug use at intake and follow-up has decreased slightly.

Analysis of specific drug use indicates that almost half of clients (45.6%) reported misusing prescription opioids at intake, whereas 12.1% of clients reported prescription opioid misuse at follow-up. Fourteen percent of followed-up clients also reported heroin use at intake and that number significantly decreased to 3.4%. Past-5-year trends in specific drug use at intake indicate that the number of clients reporting non-prescribed opioid and methadone use have both decreased and the number of clients reporting heroin use has remained relatively stable although it increased slightly in FY 2016. The use of bup-nx has decreased although it is slightly higher in FY 2016 (21.9%) compared to FY 2012 (18.2%). The number 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. Past-12-month and past-30-day smoking tobacco use saw a small but significant decrease from intake to follow-up.

### MENTAL HEALTH

Clients' mental health showed significant improvements over the study period. The number 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 number of clients reporting these mental health problems have increased at intake over the past 6 years, but have decreased over the years for follow-up.

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 more individuals reported their usual living situation was in a private residence (i.e., their own home or someone else's home) in the 12 months before follow-up (94.4%) compared to the 12 months before

intake (86.5%). In addition, the number of clients who considered themselves homeless in the past 12 months decreased significantly from 21.5% at intake to 2.5% follow-up. About 37% of clients reported being employed full time at follow-up compared to 23.9% 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 reported an arrest in the past 12 months, which decreased significantly to 26.6% at follow-up. A trend report shows that the number of clients reporting an arrest in the past 12 months has remained relatively stable at both intake and follow-up. Sixty percent of clients reported being incarcerated at least one night in the past 12 months at intake compared to one-third 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 stable at both intake and follow-up.

## QUALITY OF AND SATISFACTION WITH LIFE

Clients rated their quality of life as significantly higher 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, significantly more individuals reported they had attended mutual help recovery group meetings in the past 30 days at follow-up. Also at follow-up, clients reported having significantly more people they could count on for recovery support. Almost 92% 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 support from their families, taking care of and keeping their children, and self-help groups would be most useful in staying off drugs/alcohol at follow-up.

## PROGRAM SATISFACTION

Client ratings of the treatment services they received were high (an average of 8.4 out of 10). Specifically, the majority of clients agreed that treatment helped them get better and feel better about themselves, program staff treated them with respect, and clients understood their treatment plan and what staff expected of them in the program. Furthermore, the majority of clients reported that they were encouraged to talk about and decide their program goals, that it did not take long to get into services and that the services were available at times that were convenient for the client. About 91% of clients reported that even if given other choices, they would go to the same treatment program again if they needed to.

## 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 opiate and methadone use has decreased gradually over the past 5 years, the number of clients reporting methamphetamine use has increased from 5.5% in FY 2012 to 24.4% in FY 2016. Over one-quarter of KTOS clients reported using illegal drugs and 28.3% of clients reported using alcohol in the 12 months before follow-up.

### SMOKING

Despite a small significant decrease in smoking tobacco rates from intake to follow-up, smoking rates remained very high for these clients with 80.2% 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>94</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>95</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>96</sup> Those with co-occurring substance use and mental health disorders often have medication noncompliance, relapse, homelessness, and suicidal behavior.<sup>97</sup> Overall, there was a significant decrease in mental health problems from intake to follow-up, however, 1 in 4 clients 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 number of clients reporting either depression or anxiety have been increasing over the past 6 years at intake.

### CHRONIC PAIN

At follow-up, one-quarter KTOS clients reported persistent chronic pain that lasted at

<sup>94</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>95</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>96</sup> <https://www.samhsa.gov/treatment#co-occurring>

<sup>97</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>

least 3 months. Individuals with persistent or chronic pain are more likely to report anxiety, depression, lower overall health ratings<sup>98</sup> and substance use disorders.<sup>99</sup> Self-medication can be problematic in substance abuse treatment program participants who report chronic pain.<sup>100</sup> Of those KTOS clients who reported misusing prescription opioids and experiencing chronic pain at intake (n = 205), 30.2% (n = 62) 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>101</sup> In this year's report, there were significant decreases in the number 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 number of individuals who experienced economic hardship is good news. While the number of participants reporting difficulty meeting basic needs for financial reasons decreased over time, 35% 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>102</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.

## 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 marijuana, opioids, CNS depressants, and cocaine in the past 12 months at intake. More women also reported heroin, CNS depressant, cocaine, 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, comorbid depression and anxiety, and suicidality. Of those who met study criteria for anxiety at intake, women reported a higher number of anxiety symptoms

<sup>98</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>99</sup> Ballantyne, J. & LaForge, S. (2007). Opioid dependence and addiction during opioid treatment of chronic pain. *Pain*, 129(3), 235-255.

<sup>100</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>101</sup> <http://blog.samhsa.gov/2012/03/23/definition-of-recovery-updated/>

<sup>102</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.

than men. Also, women rated their overall health status lower at intake 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 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. 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 reported being homeless at the time of intake when compared to men. 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 \$0.85 for every dollar employed men made and by follow-up the gap in hourly wages remained large with employed women making only \$0.81 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, 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 (36.7% and 41.8%, 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 (1.1% and 3.5%, 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. More men reported incarceration and criminal justice supervision (e.g., probation or parole).

## 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). However, 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>103, 104, 105, 106</sup> Earlier studies found that the context of the interview influences reliability.<sup>107</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 2018 report provides a valuable examination of client outcomes for adults in publicly-funded substance abuse treatment. 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, arrests and incarceration, and a significant increase in full-time employment and recovery supports. Moreover, an estimate of the cost to

<sup>103</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>104</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>105</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>106</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>107</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.



Kentucky for alcohol and drug dependence 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.

## 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>108</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 consent process clients are informed 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 5,553 clients who completed an intake survey, 3,008 (54.2%) 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 then randomly selecting clients by intake month (n = 2,019).

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 2,019 clients included in the follow-up sample, 418 were ineligible for participating in the follow-up survey for a variety of reasons (e.g., incarcerated, in residential treatment, deceased), which left 1,601 clients eligible for follow-up. Of these clients, 1,224 completed a follow-up survey (see Table AA.1). Thus, the follow-up rate was 76.5%. The remaining clients either (1) refused (0.1%) to complete the follow-up survey, or (2) were never successfully contacted, or if contacted they never completed the follow-up survey (23.5%).

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<sup>108</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	418	20.7%
Number of cases eligible for follow-up (N = 1,601)		
Completed follow-up surveys	1,224	
Follow-up rate ((the number of completed surveys/ the number of eligible cases)*100)		76.5%
Expired cases (i.e., never contacted, did not complete the survey during the follow-up period)	376	
Expired rate ((the number of expired cases/eligible cases)*100)		23.5%
Refusal	1	
Refusal rate (the number of refusal cases/eligible cases)*100)		0.1%
Cases accounted for (i.e., records ineligible for follow-up + completed surveys + refusals)	1,643	
Percent of cases accounted for ((the number of cases accounted for/total number of records in the follow-up sample)*100)		81.4%

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 418 cases that were ineligible for follow-up, the majority (74.9%) were ineligible because they were incarcerated during the follow-up period. Over 16% were ineligible because they were in residential treatment at the time of follow-up and 7.7% 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 = 418)

	Number	Percent
Incarcerated	313	74.9%
In residential treatment	68	16.3%
Deceased	32	7.7%
Hospitalized	2	0.5%
Did not remember intake	2	0.5%
Health condition	1	0.2%

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>109</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 and male (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.

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

	FOLLOWED UP	
	NO n = 4,329	YES n = 1,224
AGE	34.8 years	35.1 years
GENDER***		
Male	60.2%	52.8%
Female	39.8%	47.2%
Transgender	0.1%	0.0%
RACE		
White	92.5%	93.1%
African American	5.5%	5.1%
Other or Multiracial	2.0%	1.9%
MARITAL STATUS		
Never married	28.2%	29.1%
Married or cohabiting	43.6%	42.5%
Separated or divorced	26.6%	26.6%
Widowed	1.6%	1.9%

\*\*\*p < .001.

<sup>109</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 home or apartment (see Table AB.2). Nine percent of clients who completed a follow-up reported their usual living arrangement was in jail or prison compared to 11.2% of clients who did not 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 clients entered treatment, around 20% 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 = 4,329	YES n = 1,224
<b>USUAL LIVING ARRANGEMENT IN THE 12 MONTHS BEFORE ENTERING THE PROGRAM**</b>		
Own or someone else's home or apartment	83.1%	86.4%
Residential treatment, Recovery Center, sober living home, personal care home, hospital, school or work dormitory	2.4%	2.0%
Jail or prison	11.2%	9.0%
Shelter, hotel/motel, or on the street	1.5%	0.6%
Other	1.8%	2.0%
<b>CONSIDERS SELF TO BE CURRENTLY HOMELESS</b>		
Why the individual considers himself/herself to be homeless	(n = 868)	(n = 263)
Staying temporarily with friends or family	61.5%	58.9%
Staying on the street or living in car	20.7%	18.6%
Staying in a shelter	7.8%	8.7%
Other reason	9.9%	13.7%

\*\*p < .001.

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

Table AB.3 presents the percent of clients who reported inability to meet basic living needs (e.g., food, shelter, utilities, telephone), and any of their health care needs. Significantly more clients

who were followed up reported that in the 12 months before they entered treatment their household had difficulty meeting the basic living needs of food, shelter, utilities, or telephone because of financial reasons. There was no significant difference in the percent of clients in the follow-up sample and those who were not followed-up who reported they were unable to receive needed health care for financial reasons.

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

	FOLLOWED UP	
	NO n = 4,329	YES n = 1,224
Had difficulty meeting basic living needs (e.g. shelter, utilities, phone, food)*	36.6%	41.1%
Had difficulty obtaining needed health care for financial reasons (e.g., doctor visit, dental care, or fill prescription)	22.2%	25.7%

\*p < .01

Table AB.4 describes clients' level of education when entering treatment. About one-quarter of clients in both samples had less than a high school diploma or GED. Over 40% of both groups had a GED or high school diploma. About one-third of clients in both samples completed at least one year of college, vocational school, or a higher level of education.

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

	FOLLOWED UP	
	NO n = 4,329	YES n = 1,224
HIGHEST LEVEL OF EDUCATION COMPLETED**		
Less than GED or high school diploma	25.9%	24.8%
GED or high school diploma	43.2%	41.0%
Some vocational school to graduate school	30.9%	34.2%

There were no differences in number of months clients were employed in the 12 months before entering treatment by follow-up status. Around 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 both clients not followed up and clients who were followed up.

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

	FOLLOWED UP	
	NO n = 4,329	YES n = 1,224
<b>EMPLOYMENT</b>		
Percent of clients who reported working for:		
0 months	41.4%	40.0%
1 to 5 months	19.7%	21.9%
6 months or more	38.9%	38.1%
Among those who were employed:	n = 2,536	n = 734
Average # of months employed in the past 12 months	7.5 months	7.5 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 follow-up sample and 55.2% of those not followed up reported they had been arrested in the 12 months before entering treatment. Of the clients who reported being arrested, followed-up and non-followed up clients reported an average of 1.7 and 1.8 arrests, respectively, 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 78.6 days for clients who were not followed up and 70.6 days for clients who were followed up.

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

	FOLLOWED UP	
	NO n = 4,329	YES n = 1,224
Currently under supervision by the criminal justice system	44.4%	42.5%
Arrested for any charge in the 12 months before entering treatment	55.2%	53.4%
Of those with an arrest,	n = 2,390	n = 654
Average number of arrests	1.8	1.7
Incarcerated at least one day	63.5%	60.0%
Of those incarcerated	(n = 2,748)	(n = 735)
Average number of days incarcerated in the past 12 months	78.6	70.6

## 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. About one third (33.4%) of clients who were not followed-up experienced chronic pain, which was significantly less than those who were in the follow-up sample (41.0%).

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 (56.5% vs. 49.5%).

TABLE AB.7. PHYSICAL HEALTH STATUS AT INTAKE

	FOLLOWED UP	
	NO n = 4,329	YES n = 1,224
Chronic pain (lasting at least 3 months)**	33.4%	41.0%
Ever told by a doctor that client had one of the 12 chronic medical problems listed**	49.5%	56.5%

\*\*p < .001.

## 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: 52.5% vs. 42.0%.

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. 42.8%.

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 = 4,329	YES n = 1,224
Depression**	42.0%	52.5%
Generalized Anxiety Disorder**	42.8%	51.4%
Suicidality (e.g., thoughts of suicide or suicide attempts)**	15.2%	17.7%

\*\*p < .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 marijuana and non-prescribed buprenorphine-naloxone (bup-nx) use in the 12 months before entering treatment when compared to those not followed up.

The most frequently reported illegal drugs used in the 12 months before entering treatment were marijuana, non-prescribed use of prescription opioids, non-prescribed buprenorphine-naloxone (bup-nx), and sedatives/tranquilizers. More than 1 in 4 clients reported using amphetamines (e.g., methamphetamine, Adderall, Ritalin). More than 1 in 8 clients in both groups reported using cocaine or heroin. Less than 10% of clients used non-prescribed methadone, synthetic drugs (including synthetic marijuana and bath salts) and an even smaller percentage of clients used hallucinogens, barbiturates, and inhalants.

TABLE AB.9. PERCENT OF CLIENTS REPORTING ILLEGAL DRUG USE IN THE 12 MONTHS BEFORE ENTERING TREATMENT<sup>110</sup>

	FOLLOWED UP	
	NO n = 4,238	YES n = 1,207
Any illegal drug	71.4%	73.3%
Marijuana*	43.1%	48.0%
Prescription opioids (illegal use)	36.4%	39.9%
Non-prescribed buprenorphine-naloxone (bup-nx)*	21.1%	24.7%
Tranquilizers, sedatives, benzodiazepines	21.5%	23.9%
Amphetamines	26.0%	27.3%
Cocaine	13.3%	15.7%
Heroin	13.9%	14.1%
Non-prescribed methadone	6.0%	7.2%
Synthetic Drugs (synthetic marijuana, bath salts)	6.8%	7.9%
Hallucinogens	2.8%	3.4%
Barbiturates	2.3%	2.8%
Inhalants	1.3%	1.5%

\*p < .01.

There were no differences in alcohol use in the 12 months before entering treatment by follow-up status (see Table AB.10). Over half of clients reported alcohol use in the 12 months before entering treatment. Less than 40% of clients in both groups reported alcohol use to intoxication in the same period. About one-third of clients reported binge drinking in the 12 months before entering treatment.

TABLE AB.10. PERCENT OF CLIENTS REPORTING ALCOHOL USE IN THE 12 MONTHS BEFORE ENTERING TREATMENT

	FOLLOWED UP	
	NO n = 4,238	YES n = 1,207
Alcohol	51.9%	51.0%
Alcohol to intoxication	36.7%	38.0%
Binge drank alcohol (i.e., drank 5 or more (4 for women) drinks in 2 hours)	31.4%	33.6%

There was no difference in tobacco use between those who completed a follow-up interview and those who did not (see Table AB.11). In the 12 months before entering substance abuse treatment, the majority of the clients reported smoking tobacco products and for both groups,

<sup>110</sup> 91 clients who were not followed up and 17 clients who were followed up were not included in the substance use comparison.

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 = 4,238	YES n = 1,207
Smoked tobacco	83.0%	82.9%
Used smokeless tobacco	15.4%	15.2%

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 (34.8% for not followed up and 43.0% 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 drug use disorder.

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 (.12 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 0.12 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 not complete a follow-up interview and 0.06 for followed up clients, which was a significant difference (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 = 3,900)	YES (n = 1,129)	NO (n = 429)	YES (n = 95)
Percent of clients with ASI composite score equal to or greater than cutoff score for ...				
Severe alcohol or drug use disorder	34.8%	43.0%**	39.4%	31.6%
Severe alcohol use disorder	18.1%	20.4%	18.4%	9.5%
Severe drug use disorder	26.6%	29.4%	29.4%	27.4%
Average composite score for alcohol use <sup>a</sup>	.10	.12*	.10	.06*
Average composite score for drug use <sup>b</sup>	.11	.12*	.12	.12

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.

There were no significant differences in lifetime substance abuse treatment attendance (see Table AB.13). Among clients who reported a history of substance abuse treatment, the mean number of lifetime treatment episodes was 2.6 for those not followed-up and 2.8 for those who completed a follow-up.

TABLE AB.13. HISTORY OF SUBSTANCE ABUSE TREATMENT IN LIFETIME

	FOLLOWED UP	
	NO n = 4,329	YES n = 1,224
Ever been in substance abuse treatment in lifetime	57.7%	60.3%
Among those who had ever been in substance abuse treatment in lifetime,	(n = 2,498)	(n = 738)
Average number of times in treatment	2.6	2.8

In summary, there were some significant differences between clients who were followed up and those who were not. First, significantly more women were followed up than were not followed up. Second, significantly more followed-up clients reported they had difficulty meeting basic living 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 marijuana and non-prescribed buprenorphine-naloxone in the 12 months before entering treatment compared to clients who were not followed up. Finally, 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. Nonetheless, there were no significant differences between followed up clients and clients who were not followed up on other demographic variables, employment, criminal justice system involvement, and the majority of substance use. The differences that were found indicate that followed-up individuals were worse off in several key domains compared to those who were not followed up.

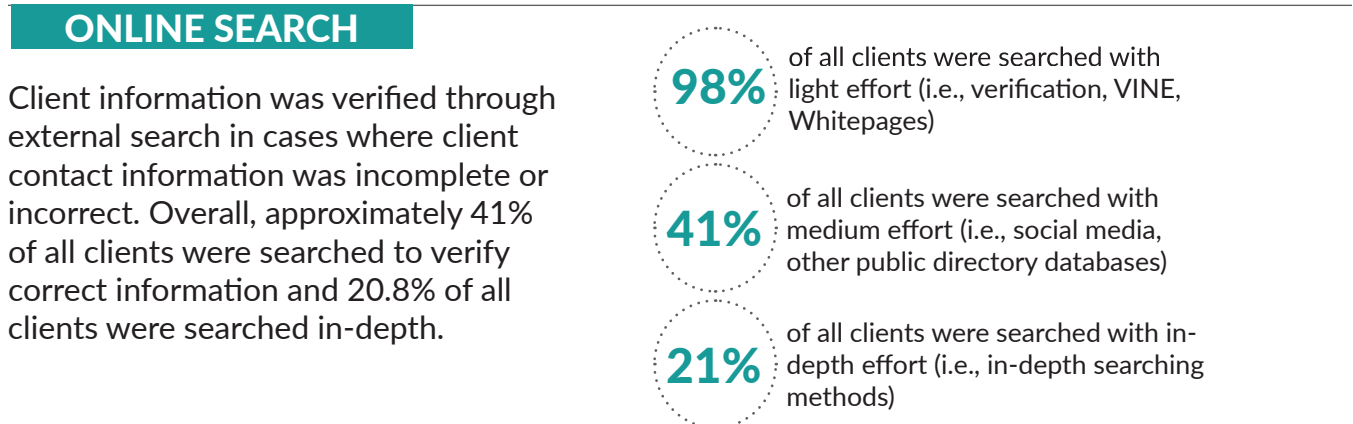
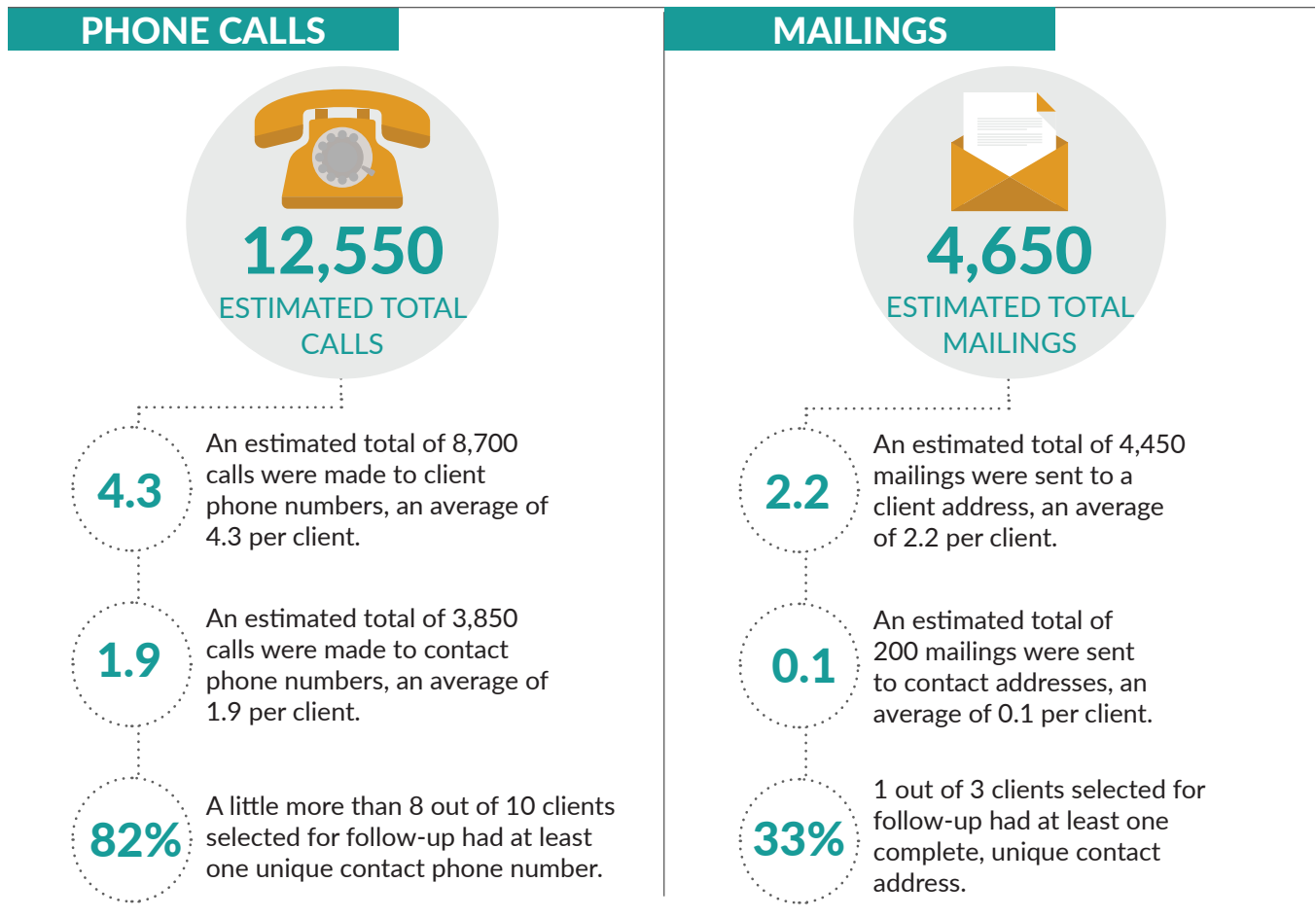
APPENDIX C.

# Adult KTOS 2016 Locating Efforts

For the 2016 follow-up study, 2,028 participants were included in the sample of individuals to be followed up from July 2013 to June 2014.<sup>a</sup> Of these clients, 1,690 clients were eligible for follow-up and 1,291 completed a follow-up survey for a follow-up rate of 76.4%.

**76.4%**  
FOLLOW-UP RATE

Of the 2,028 participants included in the follow-up sample, **523 were randomly selected to examine efforts in locating and contacting participants.**



<sup>a</sup> 38 were ineligible for participating in the follow-up survey for a variety of reasons, which left 1,690 clients eligible for follow-up.