



# **Kentucky Opioid Replacement Treatment Program Outcome Study**

**2018 ANNUAL REPORT**

# Executive Summary

Opioid treatment programs (OTPs) may play a unique and important role in addressing opioid abuse in Kentucky, where non-medical use of prescription opioids is a continuing health concern.<sup>1,2</sup> In 2007, Kentucky OTPs began collecting outcome data on opioid treatment programs. The outcome project is conducted in collaboration with the Kentucky Division of Behavioral Health and Narcotic Treatment Authority. The Kentucky Opioid Replacement Treatment Outcome Study (KORTOS) is a statewide evidence-based data collection system designed to examine opioid treatment outcomes over time. The goal of KORTOS is to

examine client satisfaction, recovery support, and program outcomes for several targeted factors including: (1) substance use, (2) mental health, physical health, and stress, (3) criminal justice involvement, (4) quality of life, (5) education, economic status, and living situation, and (6) recovery supports. This report describes outcomes for 184 clients who attended one of twelve Kentucky OTPs, completed an intake interview between January 1, 2016 and December 31, 2016, completed a follow-up interview about 6 months after the intake between July 1, 2016 and June 30, 2017, were still engaged in an OTP, and who agreed to do the follow-up (a follow-up rate of 82.9%).

they decided onto get help on their own and 37.5% reported that they were referred to OTP by a family member, partner, or friend.

## Substance Use

Results of KORTOS trends show that although the majority of clients report illicit use of prescription opioids when they entered the program, the percent of clients who reported using heroin in the 30 days before entering treatment has increased from 8.8% in 2011 to 53.8% in 2016. When examining client change from the time before intake and the 6-month follow-up period, clients report significant decreases in illicit drug use (98% to 31% respectively). Not only did clients' past-6-month use of opioids decrease significantly from intake to follow-up, but their use of non-opioid drugs (such as marijuana, tranquilizers, benzodiazepines, stimulants) and alcohol also decreased significantly. Overall, 75% of clients reported misuse of prescription opioids in the past 6 months at

<sup>1</sup> Substance Abuse and Mental Health Services Administration (SAMHSA). (2015). *2013-2014 National Survey on Drug Use and Health: Model-based prevalence estimates (50 states and the District of Columbia)*. Rockville, MD: Substance Abuse and Mental Health Services Administration, Center for Mental Health Statistics and Quality.

<sup>2</sup> World Health Organization (2004). *Substitution maintenance therapy in the management of opioid dependence and HIV/AIDS prevention*. Geneva, Switzerland: United Nations Office on Drugs and Crime.

Overall, in CY 2016, 514 clients from 12 participating Kentucky OTPs completed the KORTOS intake interview. Information from those intakes indicate that clients were an average of 36 years old ranging from 18 to 64 years old. More than half (55.3%) were male and 44.7% were female. Almost half of clients (49.4%) self-reported

## Four core components of the KORTOS evidence based assessment



Substance Use



Mental Health



Criminal Justice  
Involvement



Quality of Life

## Three supplemental components of the KORTOS evidence based assessment



Health Status



Economic and Living Conditions



Recovery Supports

intake, whereas only 6% of clients reported misuse of prescription opioids at follow-up. Over two-thirds of clients (69%) reported past-6-month heroin use at intake and that number decreased to 17% at follow-up. Use of non-prescribed methadone and buprenorphine-naloxone (bup-nx) also decreased significantly.

### Mental Health, Physical Health, and Stress

There were also improvements in clients' overall past-6-month mental health. Three-quarters of clients met study criteria for depression compared to 22% of clients at follow-up. Trends in depression, however, indicate that there has been an increase in clients meeting study criteria for past-6-month depression for 2018 at intake and follow-up. Over three-quarters of clients (78%) of clients met study criteria for generalized anxiety at intake compared to 25% at follow-up. In addition, there was a decrease in clients who met study criteria for both depression and generalized anxiety from intake (65%) to follow-up (17%). Further, 27% of clients reported suicidal ideation or attempts at intake compared to 4% at

follow-up. Trends, however, show that in this report year, a greater number of clients who reported suicidal ideation and attempts at intake and follow-up in this report year compared to previous years.

Further, stress and physical health were better for clients at follow-up. Specifically, clients reported significantly reduced stress-related health consequences, number of days of poor physical and mental health, and number of days their physical or mental health problems limited their daily activities at follow-up when compared to intake. However, the average number of days clients reported poor mental health has increased since report year 2016. Significantly fewer clients reported they had experienced chronic pain in the 6 months before follow-up; however, reports of chronic pain at intake and follow-up are higher this year compared to last year.

### Criminal Justice Involvement

A minority of KORTOS clients reported criminal justice system involvement. In the 6 months before the intake was completed, 19% of clients reporting being

arrested compared to only 4% at follow-up. Further, 15% of clients reported being incarcerated in the 6 months before treatment and 7% of clients reported being incarcerated in the past 6 months at follow-up. Trend analyses show that the number of clients who reported an arrest or spent at least one night in jail were consistent over the past 4 years at both intake and follow-up.

### Quality of and Satisfaction with Life

Clients rated their quality of life and their satisfaction with their lives as significantly higher after participating in the program. At follow-up, clients had significantly more positive feelings and decreased negative feelings. Trend analyses show that these high quality of life and satisfaction with life ratings at follow-up have been consistent over the past 4 years.

### Economic Status and Living Circumstances

KORTOS clients showed improvements in economic and living circumstances from intake to follow-up.

The average number of months clients reported working in the past 6 months increased significantly from 2.8 months at intake to 3.4 months at follow-up. Furthermore, about 42% of clients reported being employed full time at follow-up compared to 31% at intake. In addition, the number of clients who considered themselves homeless in the past 6 months decreased significantly from 24% at intake to 2% follow-up. At intake, 58% of clients reported having difficulty meeting basic living needs (e.g., food, shelter, utilities, and telephone) for financial reasons in the past 6 months. At follow-up, this number decreased to 33%. Trend reports from the past four reports indicate that while the number of clients reporting difficulty meeting basic living needs has remained steady at intake, it increased at follow-up for 2018. The number of clients who reported they had difficulty obtaining health

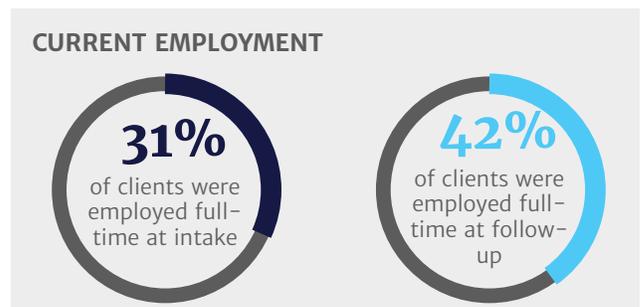
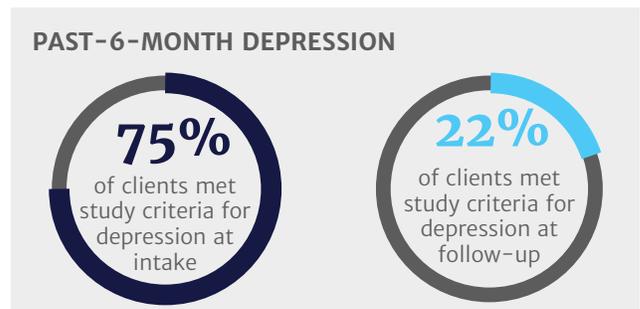
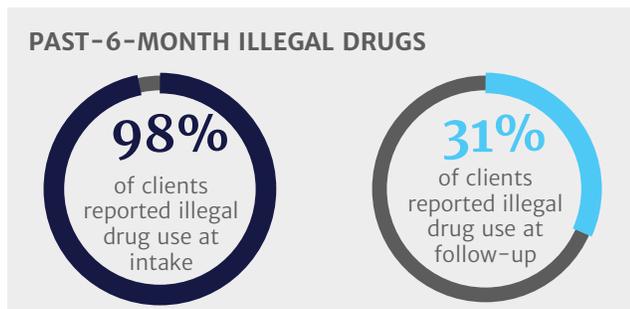
care (e.g., doctor visits, dental visits, and prescription medications) for financial reasons decreased from 45% at intake to 11% at follow-up. Although the number of clients reporting difficulty meeting basic health care needs at follow-up increased from the 2017 report, overall, it has decreased since 2015.

### Recovery Supports

At intake, 21% of clients reported going to mutual help recovery group meetings (e.g., AA, NA, or faith-based) in the past 30 days compared to 63% of clients at follow-up. Of those clients who attended meetings at intake (n = 38), 71% of clients also attended meetings in the 30 days before follow-up. In addition, of those who did not attend mutual health recovery group meetings at intake (79%, n = 145), 61% did attend at least one meeting in the past 30 days at follow-up.

### Treatment Program Satisfaction

Program clients reported high levels of satisfaction with their program experience. 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 88% of clients reported that even if given other choices, they would go to the same treatment program again if they needed to. In addition, clients reported many positive aspects of their participation in the program including reduced



substance use, improved mental health and their feelings about themselves, improved financial situation, and improved relationships with others.

Several findings suggest opportunities to provide or target additional support for clients. Continued drug use during medication assisted treatment has been associated with early program termination<sup>3, 4</sup> and longer treatment retention has been associated with more positive outcomes.<sup>5, 6</sup> Thirty-one percent of KORTOS clients reported using illegal drugs in the 6 months before follow-up. Additionally, smoking was very high for clients at intake (84%) and remained high at follow-up (77%). Smoking has been associated with increased mental health symptoms and physical health problems. Further, while the number of participants reporting having difficulty meeting basic needs for

financial reasons decreased from intake to follow-up, 33% of clients still reported having difficulty meeting basic living needs at follow-up. Similarly, while the number of clients reporting full-time employment increased significantly, 42% remained unemployed at follow-up.

There were several gender differences at intake and at follow-up which may warrant gender specific assessments and supports. Significantly more women met study criteria for generalized anxiety at follow-up and comorbid depression and anxiety at intake compared to men. In addition, women reported a higher average number of days of poor mental health at intake and follow-up. Despite more women reporting comorbid depression and anxiety and more days of poor mental health at intake, significantly more men reported substance use to reduce or manage stress at intake.

In the past 6 months at both intake and follow-up, men reported working a greater average number of months (3.3 and 3.9, respectively) compared to women (2.3 and 2.9, respectively). More women were unemployed at both intake and follow-up compared to men—a trend which has been consistent

over the past 4 years. Among individuals who were currently employed, men had a significantly higher median hourly wage than women at both intake and follow-up. At intake, employed women made only \$0.66 for every dollar employed men made and at follow-up, the gap in median hourly wages was still present although smaller, with employed women making \$0.91 for every dollar employed men made. Over the last 4 years, the pay gap between men and women has increased at intake and decreased at follow-up.

The 2018 KORTOS evaluation indicates that opioid treatment programs in Kentucky have been successful in facilitating positive changes in clients' lives in a variety of ways, including decreased substance use, decreased mental health symptoms, decreased involvement with the criminal justice system, improved quality of life, improved health status, decreased economic hardship, and more support for recovery.

<sup>3</sup> Davstad, I., Stenbacka, M., Leifman, A., Beck, O., Kormaz, S., & Romelsjö, A. (2007). Patterns of illicit drug use and retention in a methadone program: A longitudinal study. *Journal of Opioid Maintenance*, 3(1), 27–34.

<sup>4</sup> White, W., Campbell, M., Spencer, R., Hoffman, H., Crissman, B., & DuPont, R. (2014). Patterns of abstinence or continued drug use among methadone maintenance patients and their relation to treatment retention. *Journal of Psychoactive Drugs*, 46(2), 114–122.

<sup>5</sup> Hubbard, R., Craddock, S., & Anderson, J. (2003). Overview of 5-year followup outcomes in the drug abuse treatment outcome studies (DATOS). *Journal of Substance Abuse Treatment*, 25, 125–134.

<sup>6</sup> Gibson, A., Degenhardt, L., Mattick, R., Ali, R., White, J., & O'Brien, S. (2008). Exposure to opioid maintenance treatment reduces long-term mortality. *Addiction*, 103, 462–468.

**"The methadone helped me stay sober and my counselor was so great and great to talk to."**

—KORTOS Follow-up Client

# Table of Contents

<b>Executive Summary</b> .....	<b>2</b>
<b>Project Acknowledgments</b> .....	<b>8</b>
<b>Introduction and Overview</b> .....	<b>9</b>
<b>Section 1. KORTOS Client Characteristics</b> .....	<b>12</b>
Description of KORTOS Clients at Treatment Intake.....	12
KORTOS Follow-up Sample .....	17
<b>Section 2. Substance Use</b> .....	<b>19</b>
Alcohol and/or Drug Use .....	20
Any Illegal Drugs .....	22
Prescription Opioid Misuse .....	24
Non-prescribed Use of Methadone .....	25
Non-prescribed Use of Bup-nx .....	26
Heroin .....	28
Non-opioid Drug Use .....	30
Past-30-day Use of Non-opioid Drugs .....	31
Injection Drug Use.....	32
Alcohol Use.....	32
Self-reported Severity of Alcohol and Drug Use.....	35
Problems Experienced with Substance Use in the Past 30 Days.....	39
Readiness for Substance Abuse Treatment.....	40
Tobacco Use.....	41
<b>Section 3. Multivariate Analysis of Relapse</b> .....	<b>44</b>
<b>Section 4. Mental Health, Physical Health, and Stress</b> .....	<b>45</b>
Depression Symptoms .....	45
Anxiety Symptoms .....	46
Comorbid Depression and Anxiety Symptoms .....	48
Suicidal Ideation and/or Attempts.....	49
General Health Status .....	50
Chronic Pain .....	54
Stress-related Health Consequences.....	56
<b>Section 5. Criminal Justice System Involvement</b> .....	<b>59</b>
Arrests.....	59
Incarceration.....	60
Criminal Justice System Supervision .....	62
<b>Section 6. Quality of Life</b> .....	<b>63</b>
Quality of Life Ratings .....	63
Positive and Negative Feelings .....	64
Satisfaction with Life Rating.....	65
<b>Section 7. Education, Economic Status, and Living Circumstances</b> .....	<b>67</b>
Education .....	67
Employment .....	67
Living Circumstances .....	73
Difficulty Meeting Living and Health Care Needs for Financial Reasons .....	74
<b>Section 8. Recovery Supports</b> .....	<b>76</b>
Mutual Help Recovery Group Meeting Attendance .....	76
Number of People Client Can Count on for Recovery Support.....	77
What Will Be Most Useful in Staying Off Drugs/alcohol.....	78
Chances of Staying Off Drugs/alcohol.....	78

<b>Section 9. Client Satisfaction with Opioid Treatment Programs</b> .....	<b>80</b>
Overall Client Satisfaction.....	80
Client Ratings of Program Experiences .....	80
Positive and Negative Aspects of Program .....	82
<b>Section 10. Implications and Conclusions</b> .....	<b>84</b>
Areas of Success .....	84
Areas of Concern .....	86
Study Limitations .....	88
Conclusion .....	89
<b>Appendix A. Methods</b> .....	<b>90</b>
<b>Appendix B. Locating Efforts for the 2015 KORTOS Follow-up Study</b> .....	<b>92</b>
<b>Appendix C. Client Characteristics at Intake for Those Who Completed a Follow-up Interview and Those Who Did Not Complete a Follow-up Interview</b> .....	<b>94</b>
<b>Appendix D. Trends in Prescription Opioid, Methadone, Bup-nx, and Heroin Use Among KORTOS Clients with a Completed Follow-up Interview</b> .....	<b>102</b>

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The 2018 KORTOS report includes data from 184 clients at Kentucky opiate treatment programs (OTPs) who completed both an intake interview between January 1, 2016 and December 31, 2016 and a six-month follow-up interview targeted between July 2016 and June 2017.

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# Introduction and Overview

While prescription opioids are instrumental to reducing pain, misuse can lead to serious negative consequences such as addiction or even overdose. Non-medical use of prescription opioids is a continuing health concern in Kentucky where 4.1% of individuals 18 years and older report nonmedical use of pain relievers.<sup>2</sup> Since 2000, the rate of deaths from drug overdose involving opioids has increased 200%. In 2015, Kentucky was one of 19 states that had a statistically significant increase in age-adjusted drug overdose deaths per 100,000 population (21.1%) from 24.7 in 2014 to 29.9 in 2015, the 3rd highest in the United States.<sup>7</sup> Heroin and prescription opioids were the primary drug class involved in drug overdose deaths.<sup>8</sup> In 2015, among 52,404 drug overdose deaths that occurred in the U.S., 63.1% involved an opioid.<sup>9</sup>

One of the key methods for treating persons addicted to opioids who have not been successful in traditional substance abuse treatment programs is through medication assisted therapy (or treatment, MAT) primarily with methadone or buprenorphine-naloxone (bup-nx). One of three priority areas of the United States Health and Human Services' (HHS) launched initiative in 2015 to reduce prescription opioid- and heroin-related overdose, death, and dependence is to expand the use of medication-assisted therapy.<sup>10</sup> These federally regulated opioid treatment programs (OTPs) provide evidence-based, clinically monitored, medication-assisted therapy with methadone or bup-nx.<sup>9</sup> Research evidence supports the effectiveness of methadone maintenance and bup-nx maintenance in retaining clients in treatment and suppressing opioid use.<sup>11, 12, 13</sup> The number of persons receiving methadone in substance use treatment in Kentucky rose from 2009 to 2012, but decreased in 2013 while the number of persons receiving bup-nx multiplied by 5 from 2011 to 2013.<sup>14</sup>

In 2007, Kentucky OTPs began collecting state-specific outcome data on medication-assisted therapy. The outcome evaluation project is conducted in collaboration with the Kentucky Division of Behavioral Health, which is part of the Department of Behavioral Health, Developmental, and Intellectual Disabilities (DBHDID). The Kentucky Opioid Replacement Treatment Outcome Study (KORTOS) is conducted by the Behavioral Health Outcome Study team at the University of Kentucky Center on Drug and Alcohol Research (UK CDAR) and is an important part of the DBHDID Division of Behavioral Health's performance-based measurement of treatment outcomes in Kentucky's communities. The KORTOS project collects data from clients receiving medication-assisted treatment with methadone or bup-nx at licensed OTPs because they follow clinical monitoring protocols; thus this report does not include data from independent physicians who

<sup>7</sup> Rudd, R.A., Seth, P., David, F., & Scholl, L. (2016). Increased in drug and opioid-involved overdose deaths – United States, 2010–2015. *Morbidity and Mortality Weekly Report*, 65(50–51), 1445–1452.

<sup>8</sup> Slavova, S., Akers, D., & Rock, P. (2016). *Kentucky Resident Drug Overdose Deaths, 2015*. Lexington, KY: Kentucky Injury Prevention and Research Center.

<sup>9</sup> National Institute on Drug Abuse. (2011). *Prescription drugs abuse and addiction: research report series*. NIH Publication Number 05–4881. Retrieved from <http://drugabuse.gov/publications/research-reports/prescription-drugs>

<sup>10</sup> Office of the Assistant Secretary for Planning and Evaluation. (2015, March 26). *Opioid abuse in the U.S. and HHS actions to address opioid-drug related overdoses and deaths*. Washington, DC: U.S. Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation.

<sup>11</sup> Mattick, R., Breen, C., Kimber, J., & Davoli, M. (2009). Methadone maintenance therapy versus no opioid replacement therapy for opioid dependence. *Cochrane Database System Review*, Jul 8 (3).

<sup>12</sup> Kakko, J. Svanborg, K. D., Kreek, M J., & Heilig, M. (2003). 1-year retention and social function after buprenorphine-assisted relapse prevention treatment for heroin dependence in Sweden: A randomised, placebo-controlled trial. *Lancet*, 361, 662–668.

<sup>13</sup> Mattick, R. P., Kimber, J., Breen, C., & Davoli, M. (2008). Methadone maintenance therapy versus placebo or methadone maintenance for opioid dependence. *Cochrane Database of Systematic Reviews*, 2. CD002207.

<sup>14</sup> Substance Abuse and Mental Health Services Administration. (2015). *Mental health barometer: Kentucky, 2014*. HHS Publication No. SMA-15-4895KY. Rockville, MD: Substance Abuse and Mental Health Services Administration.

prescribe bup-nx outside of an OTP. In calendar year 2016, twelve Kentucky licensed OTPs submitted data for KORTOS.<sup>15</sup>

In this annual report, data are included for 184 clients from Kentucky OTPs who completed an intake interview between January 1, 2016 and December 31, 2016 and a follow-up interview about 6 months after the intake between July 1, 2016 and June 30, 2017 with clients who were still engaged in an OTP and who agreed to do the follow-up.

Results are reported within ten main sections for the overall sample and separately by gender where there were significant differences.

**Section 1. Overview and Description of KORTOS Clients.** This section briefly describes KORTOS including a description of clients who were involved in Kentucky's participating licensed OTPs in calendar year 2016 and who had completed an intake (n = 514) as well as clients who completed a 6-month follow-up interview (n = 184).

**Section 2. Substance Use.** This section examines change in substance use (illegal drugs, alcohol, and tobacco) for 6-month and 30-day periods at intake and follow-up. Specific classes of illegal drugs examined include misuse of prescription opioids, non-prescribed methadone, non-prescribed bup-nx, heroin, and other illegal drugs. In addition, self-reported severity of alcohol and drug use based on the DSM-5 criteria for severity of substance use disorder (SUD) 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 2018 KORTOS follow-up sample.

**Section 4. Mental Health, Physical Health, and Stress.** This section examines changes in self-reported mental health, physical health, and stress from intake to follow-up. Specifically, this section examines: (1) depression, (2) generalized anxiety, (3) comorbid depression and generalized anxiety, (4) suicide ideation and attempts, (5) general health status, (6) perceptions of physical and mental health, (7) chronic pain, and (8) stress related health consequences.

**Section 5. Criminal Justice System Involvement.** This section describes change in client involvement with the criminal justice system during the 6-month period before entering treatment and the 6-month period before the follow-up interview. Specifically, results include changes in: (1) any arrest, (2) the number of times arrested, among clients with any arrests, (3) any incarceration, (4) the number of nights incarcerated, among clients with any incarceration, and (5) criminal justice supervision status.

**Section 6. Quality of Life.** This section describes change in quality of life ratings from intake to follow-up including: (1) quality of life ratings, (2) clients' positive and negative feelings, and (3) satisfaction with life.

**Section 7. Education, Economic Status, and Living Circumstances.** This section examines changes in education, economic status, and living circumstances from intake to follow-up including: (1) highest level of education completed, (2) the number of months clients were employed full-time or part-time, (3) the percent of clients who worked full-time or part-time, (4) hourly wage, (5) homelessness, (6) living situation, and (7) economic hardship (i.e., difficulty meeting living and health care needs for financial reasons).

<sup>15</sup> In 2016, 12 OTPs submitted intake surveys for clients: Behavioral Health Group, Bluegrass.org/Narcotics Addiction Program, Center for Behavioral Health – Elizabethtown, Center for Behavioral Health – Frankfort, Center for Behavioral Health – Louisville, M.O.R.E. Center, Northern Kentucky Medical Clinic, Paducah Professional Associates, Pikeville Treatment Center, The Infinity Center – Ashland, Ultimate Treatment Center, and Western Kentucky Medical.

**Section 8. Change in Recovery Supports.** This section focuses on four main changes in recovery supports: (1) percent of clients attending mutual help recovery group meetings, (2) the number of people the client said they could count on for recovery support, (3) what will be most useful to the client in staying off drugs/alcohol, and (4) clients' perceptions of their chances of staying off drugs/alcohol.

**Section 9. Client Satisfaction with the Opioid Treatment Programs.** This section describes: (1) overall client satisfaction with the program, (2) clients' ratings of program experiences, and (3) positive and negative aspects of program participation.

**Section 10. Conclusion and Implications.** This section summarizes the highlights from the evaluation results and suggests implications from these findings for the state.

## Section 1.

# KORTOS Client Characteristics

*This section briefly describes the Kentucky Opioid Replacement Treatment Outcome Study (KORTOS) including how clients are selected into the outcome evaluation. In addition, this section describes characteristics of clients who participated in federally licensed Kentucky opioid treatment programs in calendar year 2016 and who had an intake assessment that was submitted to CDAR (n = 514), including clients who also completed a 6-month follow-up interview (n = 184).*

KORTOS includes a face-to-face interview with program staff at the beginning of a new medication-assisted treatment episode. The interview is an evidence based assessment<sup>16</sup> that asks about targeted factors such as substance use, mental health, involvement in the criminal justice system, quality of life, health status, and economic and living circumstances prior to entering treatment (submitted to UK CDAR from January 1, 2016 to December 31, 2016). In 2016, 514 adults completed an intake interview<sup>17</sup> that was submitted by 12 Kentucky licensed OTPs to UK CDAR.<sup>18</sup> The first section below describes characteristics for all clients from those programs with a completed and submitted intake assessment.

## Description of KORTOS Clients at Treatment Intake

### Demographics

Table 1.1 shows that over half of clients were male (55.3%) and most were White (97.3%). Clients were, on average, 36 years old, with the youngest client being 18 and the oldest being 64 years old. Overall, 40.3% of clients had never been married, 33.1% were separated or divorced, and 2.5% were widowed. Almost one-quarter of clients (24.1%) reported being married and close to 40% of clients reported they had at least one child under the age of 18 who was living with them at the time of intake.

<sup>16</sup> Logan, TK, Cole, J., Miller, J., Scrivner, A., & Walker, R. (2016). *Evidence Base for the Kentucky Opioid Replacement Treatment Outcome Study (KORTOS) Assessment and Methods*. Lexington, KY: University of Kentucky, Center on Drug and Alcohol Research.

<sup>17</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.

<sup>18</sup> In 2016, 12 OTPs submitted intake surveys for clients: Behavioral Health Group, Bluegrass.org/Narcotics Addiction Program, Center for Behavioral Health – Elizabethtown, Center for Behavioral Health – Frankfort, Center for Behavioral Health – Louisville, M.O.R.E. Center, Northern Kentucky Medical Clinic, Paducah Professional Associates, Pikeville Treatment Center, The Infinity Center – Ashland, Ultimate Treatment Center, and Western Kentucky Medical.

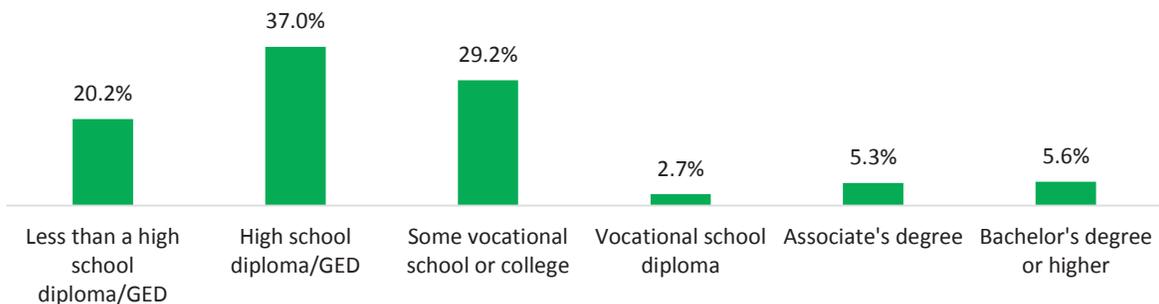
TABLE 1.1. DEMOGRAPHICS FOR ALL KORTOS CLIENTS AT INTAKE (N = 514)<sup>19</sup>

AGE	36.2 years (Min. = 18, Max. = 64)
GENDER	
Male	55.3%
Female	44.7%
RACE	
White/Caucasian	97.3%
Black/African American	0.8%
Other or multiracial	1.9%
MARITAL STATUS	
Never married	40.3%
Separated or divorced	33.1%
Married	24.1%
Widowed	2.5%
HAVE CHILDREN UNDER THE AGE OF 18 WHO LIVE WITH THEM	39.5%

## Education

Around 20% of clients had less than a high school diploma or GED at intake (see Figure 1.1). Thirty-seven percent of the sample had a high school diploma or GED and just over 29% of clients had completed some vocational/technical school or college. Only a minority of clients had completed vocational/technical school (2.7%), an associate's degree (5.3%), or a bachelor's degree or higher (5.6%).

FIGURE 1.1. HIGHEST LEVEL OF EDUCATION COMPLETED AT INTAKE (N = 514)



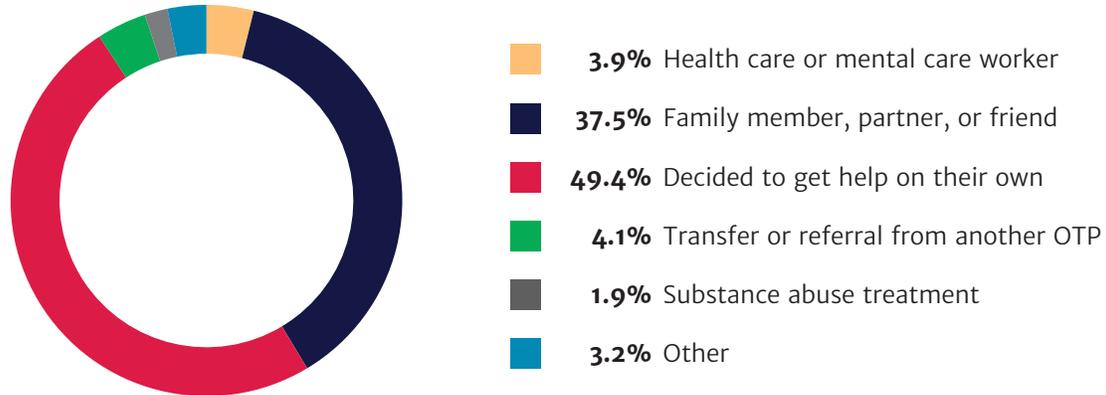
## Self-Reported Referral Source

Figure 1.2 shows the self-reported treatment referral source for all KORTOS clients. More than one-third of clients (37.5%) reported they were referred by a family member, partner or friend

<sup>19</sup> 9 clients had incorrect birthdates and, therefore, age could not be determined.

and 49.4% decided to get help on their own. A small percentage of clients (3.9%) were referred by a health care or mental health care worker, 4.1% were transferred or referred by another OTP, 1.9% were referred by a substance abuse treatment facility, and 3.2% were referred by other sources.

FIGURE 1.2 SELF-REPORTED REFERRAL SOURCE FOR ALL KORTOS CLIENTS AT INTAKE (N = 514)



## Employment

Almost half of clients (48.1%) reported they had not worked in the past 6 months, 12.6% had worked 1 to 3 months, and 39.3% had worked 4 or more months (not depicted in figure). Nearly one-third of individuals reported they were currently employed full-time (32.1%), 55.3% reported being unemployed, and 12.6% were employed part-time or had occasional or seasonal employment (see Figure 1.3). Among those who reported being employed full or part-time at intake (n = 214), the median hourly wage was \$12.00.

FIGURE 1.3. CURRENT EMPLOYMENT STATUS AT INTAKE (N = 514)

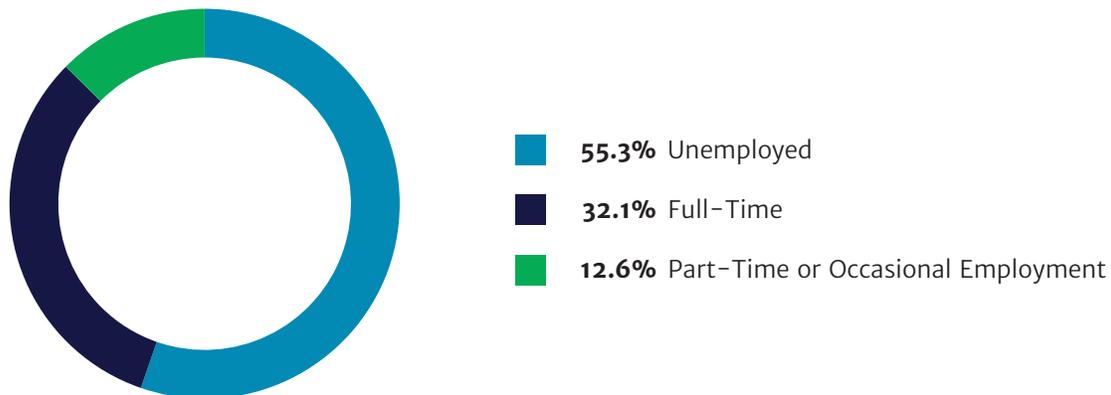
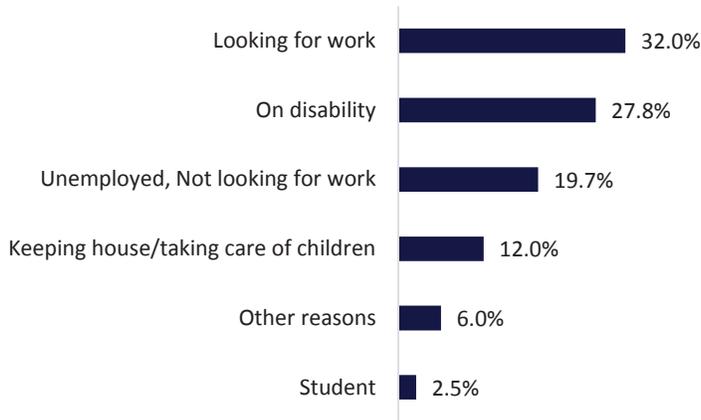


Figure 1.4 shows that of the individuals who were currently unemployed at intake (n = 284), almost one-third stated they were looking for work (32.0%), 27.8% were on disability, 19.7% were unemployed and not looking for work, 12.0% were keeping the house or taking care of children full-time at home, 2.5% were students, and the remaining 6.0% gave other reasons for not being employed (e.g., on furlough or temporarily laid off, retired, other health problems prevented them from work but they were not on disability, or in a controlled environment).

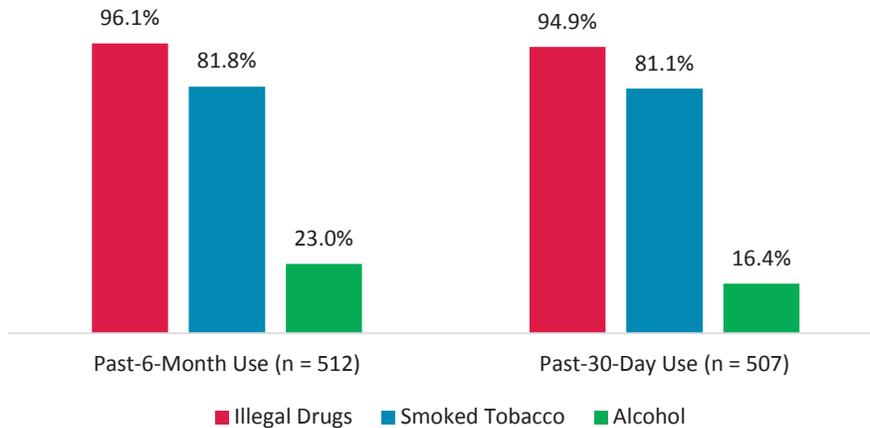
FIGURE 1.4. OF THOSE UNEMPLOYED, REASONS FOR BEING UNEMPLOYED (N = 284)



### Substance Use

The majority of KORTOS clients who completed an intake interview reported using illegal drugs (96.1%) and smoking tobacco (81.8%) while almost one-quarter of clients (23.0%) reported using alcohol in the 6 months before intake (see Figure 1.5). The drug classes reported by the greatest number of clients were prescription opioids/opiates<sup>20</sup> (74.6%), heroin (55.1%), marijuana (49.6%), and tranquilizers (35.4%). Similarly, 94.9% reported using illegal drugs, 81.1% reported smoking tobacco, and 16.4% reported using alcohol in the 30 days before entering treatment.

FIGURE 1.5 ALCOHOL, DRUG, AND TOBACCO USE 6 MONTHS AND 30 DAYS BEFORE TREATMENT<sup>21</sup>



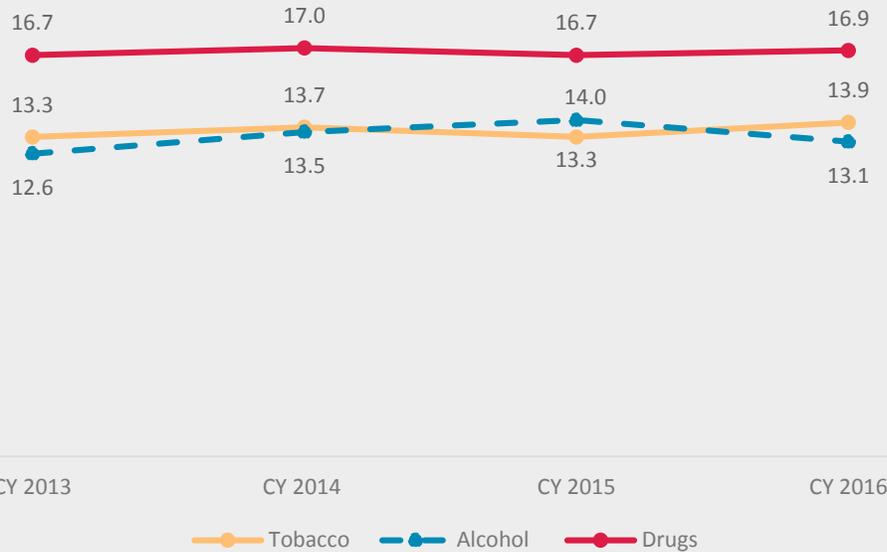
<sup>20</sup> For brevity's sake, the class of substances including prescription opiates and opioids will be referred to as opioids.

<sup>21</sup> Because being in a controlled environment reduces opportunities for substance use, only clients who were not incarcerated for the entire time period were included in the substance use analysis; therefore, 2 clients were excluded from the past-6-month substance use and 7 clients were excluded from the past-30-day use.

## 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 1.6). The age at which KORTOS clients reported initiating drug use was steady for the past 4 years (close to age 17). Clients generally reported having their first alcohol drink in their early teens (around 13 years old). The age of first regular smoking tobacco use was very similar to the age of alcoholic drink and remained steady for 4 years.

FIGURE 1.6. AGE OF FIRST USE REPORTED AT INTAKE



## Criminal Justice Involvement

Almost 17% of clients reported being arrested at least once and 13.0% reported being incarcerated at least one night in the 6 months before entering treatment (see Figure 1.7). Among those who were arrested ( $n = 86$ ), they were arrested an average of 1.7 times. Among those who were incarcerated ( $n = 67$ ), they were incarcerated an average of 29.4 nights (not depicted in the figure). In addition, 8.2% of clients reported being under supervision by the criminal justice system.

FIGURE 1.7. CRIMINAL JUSTICE INVOLVEMENT 6 MONTHS BEFORE TREATMENT AT INTAKE (N = 514)



## KORTOS Follow-up Sample

Follow-up interviews are targeted to be conducted with a selected sample of KORTOS clients about 6 months after the intake interview is completed. At the completion of the intake interview, program staff inform individuals about the KORTOS follow-up study and ask if they are interested in participating. Clients who agree to participate are asked to provide contact information. 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. All eligible individuals are then selected by the month in which they completed intake interviews.<sup>22</sup>

Of the 514 clients who completed an intake interview, 267 agreed to be contacted for the follow-up interview (51.9% agreement rate).<sup>23</sup> A total of 247 provided the required contact information at the end of the intake interview and were selected into the follow-up sample, and of these, 222 were eligible for the follow-up interview about 6 months later. In order to be eligible for the follow-up study, clients had to still be in an OTP at the time of the follow-up interview and not in a controlled environment.<sup>24</sup> Of these 222 eligible clients, UK CDAR interviewers completed follow-up assessments with 184 clients (82.9% follow-up rate).

This report describes outcomes for 184 adults who participated in a Kentucky OTP and who completed an intake interview and a follow-up telephone interview about 5–6 months (average of 156.7 days) after the intake interview was completed. Detailed information about the methods and follow-up efforts can be found in Appendices A and B.

<sup>22</sup> If a person has more than one intake interview in a given year, the interview with the earliest date will be selected into the follow-up sample.

<sup>23</sup> 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 selecting those clients by intake month.

<sup>24</sup> Of the 247 clients selected into the follow-up sample, 14 were no longer at the OTP, 10 were incarcerated, and 1 had died at the time of follow-up.

Follow-up procedures for the outcome study use several best practices. First, the follow-up assessments are conducted independently from the treatment programs by UK CDAR staff. Second, UK CDAR has over 20 years of extensive experience following up study participants and staff are extensively trained, supervised, and monitored. Third, the confidentiality of clients is protected through specific study procedures, UK human subjects' protections, and through a federal certificate of confidentiality. Clients are provided with full information about their rights as a research subject and the protections for confidentiality provided by the study. Clients must consent to the study twice: once at the completion of the intake interview and once when on the phone for the follow-up interview. In FY2017, no clients refused follow-up participation and there was a high follow-up rate (82.9%). This means that only roughly 17% of individuals included in the sample to be followed up were not successfully contacted within the targeted eligibility time period.<sup>25</sup>

<sup>25</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.

Of the 184 adults who completed a 6-month follow-up interview, half were female. Most follow-up clients were White (96.7%), 1.6% were African American and 1.6% were Hispanic, American Indian, or multiracial. They were an average of 36.0 years old. Less than half of the clients had never been married at intake (44.0%), 34.8% were separated or divorced, 19.6% were married, and 1.6% were widowed. About 40% of follow-up clients had at least one child under age 18 who was living with them.

TABLE 1.2. DEMOGRAPHICS FOR KORTOS FOLLOW-UP CLIENTS AT INTAKE (N = 184)<sup>26</sup>

AGE	36.0 years (range of 21 - 62)
GENDER	
Male	50.0%
Female	50.0%
RACE	
White/Caucasian	96.7%
Black/African American	1.6%
Other race or multiracial	1.6%
MARITAL STATUS	
Never married	44.0%
Separated or divorced	34.8%
Married	19.6%
Widowed	1.6%
HAVE CHILDREN UNDER THE AGE OF 18 WHO LIVE WITH THEM	40.2%

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, substance use, mental health, physical health, economic hardship, and criminal justice involvement.

More clients who completed a follow-up reported using heroin, CNS depressants, stimulants, other illicit drugs, and alcohol (including alcohol to intoxication and binge drinking) in the 6 months before entering treatment. More of the clients who completed a follow-up interview met study criteria for depression, generalized anxiety, a chronic medical problem, chronic pain, and had difficulty meeting basic living and health care needs for financial reasons when compared to clients who were not followed up. Furthermore, more clients who completed a follow-up considered themselves homeless at intake. In addition, clients who were followed up reported a higher number of arrests in the 6 months before entering treatment.<sup>27</sup>

<sup>26</sup> One client had an incorrect birthdate and, therefore, age could not be determined.

<sup>27</sup> See Appendix C for detailed comparisons of clients who completed a follow-up interview (n = 184) and clients who did not complete a follow-up interview (n = 330).

## Section 2.

# Substance Use

*This section describes change in illegal drug, alcohol, and tobacco use for adult clients from intake to follow-up. Past-6-month substance use is examined as well as past-30-day substance use for clients who were not in a controlled environment all 30 days before entering treatment or the follow-up interview. Results for each targeted factor are presented for the overall sample and by gender when there were significant gender differences.*

Changes in illegal drug, alcohol, and tobacco use before entering the program and during the 6-month follow-up period are presented in this section. In addition to examining the overall use of illegal drugs, several specific categories of illegal drugs were examined including: (a) prescription opioid misuse (including opioids such as morphine, Percocet, Oxycontin, Lortab), (b) non-prescribed methadone, (c) non-prescribed buprenorphine-naloxone (bup-nx), (d) heroin, and (e) non-opioid drugs other than those mentioned above (including marijuana, cocaine, amphetamines, tranquilizers, hallucinogens, inhalants, and barbiturates). Analysis is presented in detail for KORTOS study participants who were not in a controlled environment for the entire period of 6 months and/or 30 days before entering treatment. Changes in substance use from intake to follow-up are presented in 4 main subsections and organized by type of substance use:

- **Change in past-6-month substance use from intake to follow-up.** Comparison of any illegal drugs, prescription opioid misuse, non-prescribed methadone, non-prescribed bup-nx, heroin, other non-opioid drug use, alcohol, and tobacco in the 6 months before the client entered the program and use of these substances during the 6-month follow-up period (n = 182)<sup>28</sup> are presented.
- **Average number of months clients used substances at intake and follow-up.** For those who used any illegal drugs, alcohol, or tobacco, the average number of months of use before program entry and during the follow-up period are reported.
- **Change in 30-day substance use from intake to follow-up.** Comparison of any illegal drugs, prescription opioid misuse, non-prescribed methadone, non-prescribed bup-nx, heroin, other non-opioid drug use, alcohol, and tobacco use in the 30 days before the client entered the program and during the follow-up period (n = 180) is presented.<sup>29</sup>
- **Change in self-reported severity of alcohol and drug use from intake to follow-up.** There are two indices of substance use severity presented in this report. One way to examine overall change in degree of severity of substance use is to ask participants to self-report whether they met the 11 criteria included in the DSM-5 for diagnosing substance use disorder in the past 6 months. Under DSM-5 anyone meeting any two of the 11 criteria during the same 6-month period would receive a diagnosis of substance use disorder (SUD) as long as their symptoms were causing clinically significant impairments in functioning. The severity of the substance use disorder (i.e., none, mild, moderate, or severe) is based on the number of criteria met. The percent of individuals in each of the four categories at intake and follow-up is presented.

The Addiction Severity Index (ASI) composite scores are examined for change over time for illegal drugs (n = 172), alcohol (n = 44) and those with both alcohol and illegal drug use among clients who used drugs and/or alcohol (n = 172). The ASI composite score assesses self-reported addiction severity even among those reporting no substance use in the past 30

<sup>28</sup> Two individuals were incarcerated all 180 days before entering treatment and are not included in past-6-month analysis.

<sup>29</sup> Four individuals were in a controlled environment all 30 days before intake and were not included in past-30-day analysis.

days. The alcohol and drug composite scores are computed from items about 30-day alcohol (or drug) use and the number of days individuals used multiple drugs in a day, as well as the impact of substance use on the individual's life, such as money spent on alcohol, number of days individuals had alcohol (or drug) problems, how troubled or bothered individuals were by their alcohol (or drug) problems, and how important treatment was to them.

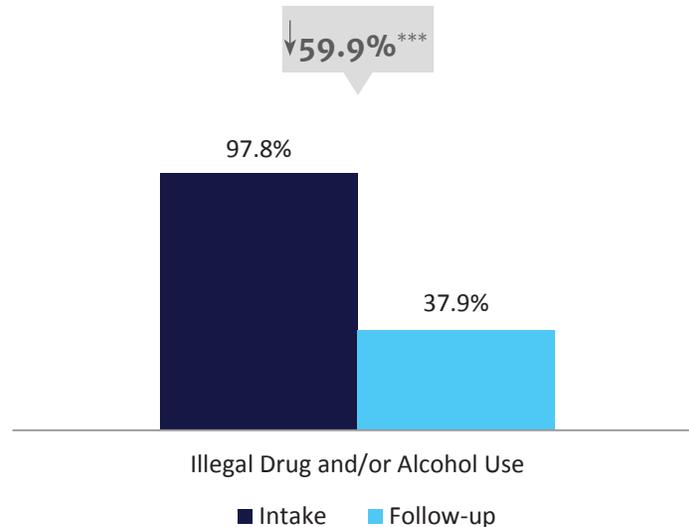
## Alcohol and/or Drug Use

### Past-6-month Alcohol and/or Drug Use

The majority of clients (97.8%) reported using alcohol and/or illegal drugs in the 6 months before entering the program, which decreased to 37.9% at follow-up. This was a 59.9% 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 60%

FIGURE 2.1. PAST 6-MONTH ALCOHOL AND/OR DRUG USE AT INTAKE AND FOLLOW-UP (N = 182)



\*\*\*p < .001.

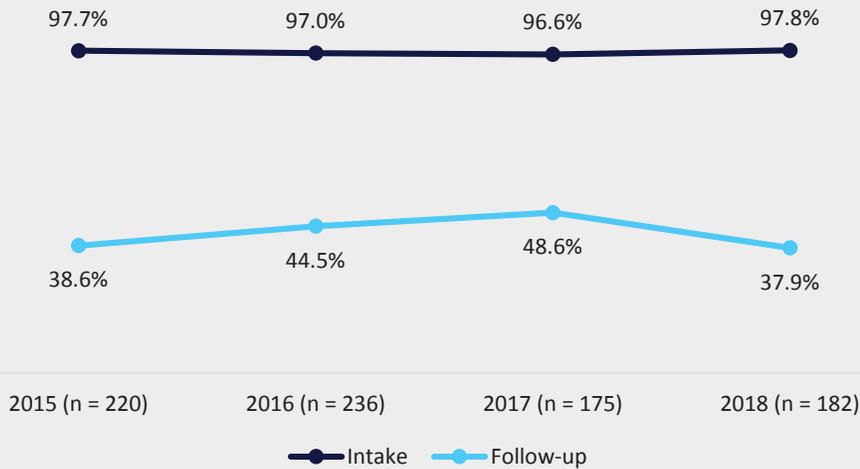
*"They are very professional. The counselors are well-educated with drug addiction. I love the classes."*

—KORTOS Follow-up Client

## Trends in Any Alcohol and/or Drug Use

The number of KORTOS clients reporting alcohol and/or drug use in the 6 months before treatment was consistently high (about 97%). At follow-up, less than half of clients reported any alcohol and/or drug use. In 2018, 37.9% of clients reported alcohol and/or drug use compared to 48.6% in 2017.

FIGURE 2.2. TRENDS IN ANY ALCOHOL AND/OR ILLEGAL DRUG USE AT INTAKE AND FOLLOW-UP, REPORTS 2015-2018<sup>30</sup>

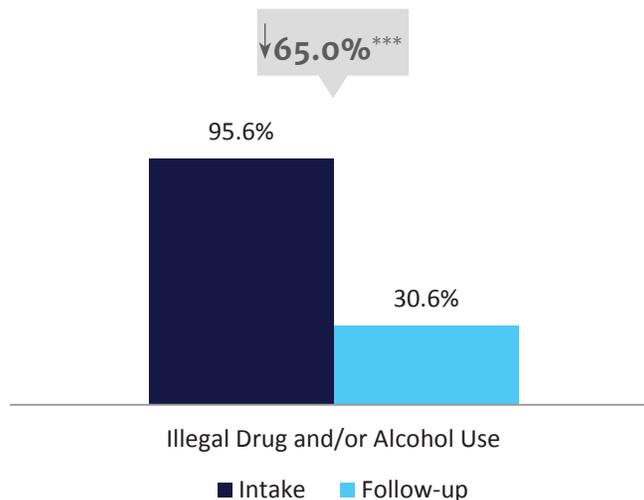


## Past-30-day Alcohol and/or Drug Use

The majority of clients (95.6%) reported using alcohol and/or illegal drugs in the 30 days before entering the program, which decreased to 30.6% at follow-up. This was a 65.0% significant decrease (see Figure 2.3).

The number of clients reporting alcohol and/or illegal drug use in the past 30 days decreased by 65%

FIGURE 2.3. PAST 30-DAY ALCOHOL AND/OR DRUG USE AT INTAKE AND FOLLOW-UP (N = 180)



\*\*\*p < .001.

<sup>30</sup> In 2015, 3 cases had missing data for drug use at intake.

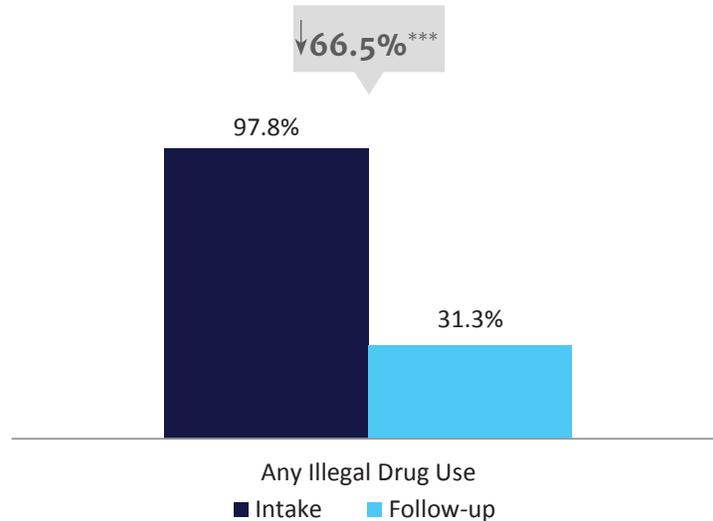
## Any Illegal Drugs

### Past-6-month Any Illegal Drug Use

Almost all clients (97.8%) reported using illegal drugs in the 6 months before entering the program, which decreased to 31.3% at follow-up. This was a 66.5% significant decrease in the number of clients reporting use of any illegal drugs (see Figure 2.4).

The number of clients reporting **illegal drug use decreased by 67%**

FIGURE 2.4. PAST-6-MONTH ILLEGAL DRUG USE AT INTAKE AND FOLLOW-UP (N = 182)

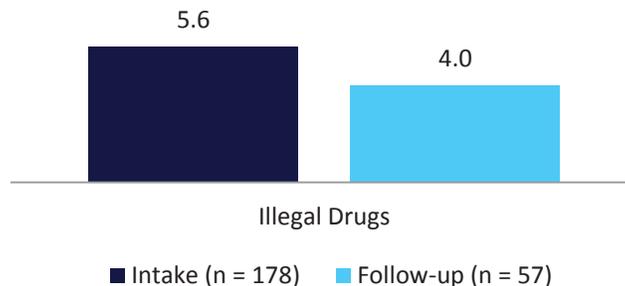


\*\*\*p < .001.

### Average Number of Months Used Any Illegal Drugs

Clients who reported any illegal drug use at intake (n = 178) reported an average maximum of 5.6 months of use. Among clients who reported any illegal drug use in the 6 months before follow-up (n = 57), the maximum number of months they reported using any drug was, on average, 4.0 months (see Figure 2.5).

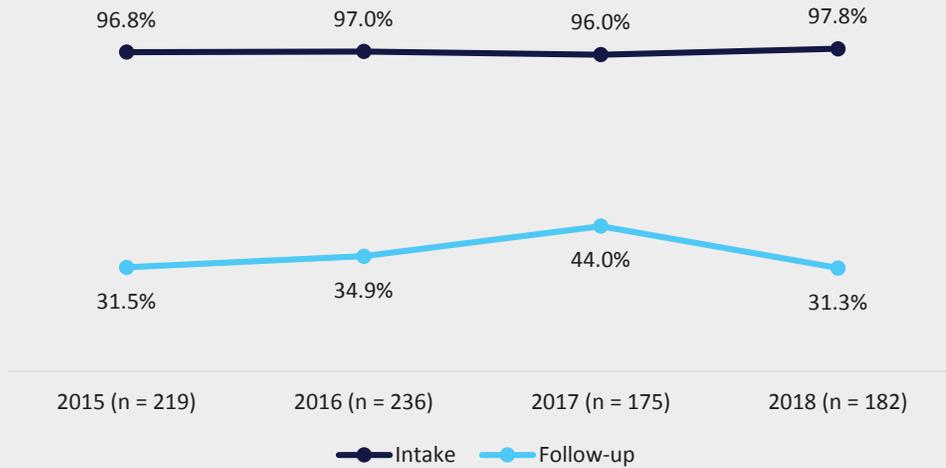
FIGURE 2.5. AVERAGE NUMBER OF MONTHS CLIENTS USED ILLEGAL DRUGS



## Trends in Past-6-month Illegal Drug Use

The number of KORTOS clients reporting any illegal drug use in the 6 months before treatment was consistently high (about 97%). The number of clients who reported any illegal drug use at follow-up increased from 31.5% in 2015 to 44.0% in 2017. In the current report, however, only 31.3% of clients reported any illegal drug use at follow-up.

FIGURE 2.6. TRENDS IN ILLEGAL DRUG USE AT INTAKE AND FOLLOW-UP, REPORTS 2015-2018<sup>31</sup>

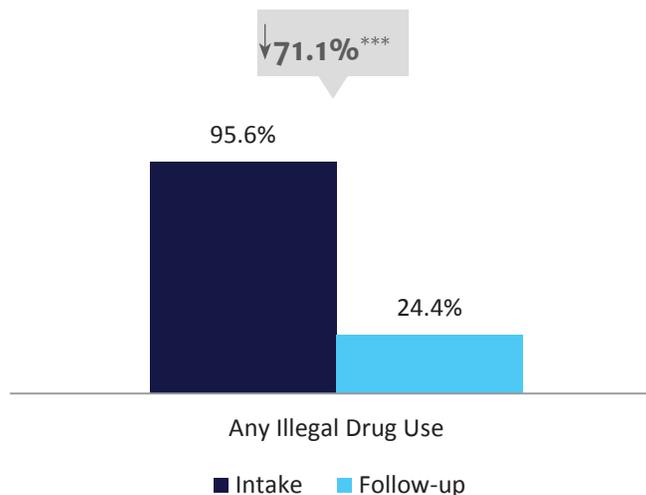


## Past-30-day Any Illegal Drug Use

There was a significant 71.1% decrease in past-30-day illegal drug use (see Figure 2.7). At intake, 95.6% of clients reported any illegal drug use in the 30 days before entering the program and at follow-up, 24.4% of clients reported any illegal drug use in the past 30 days.

There was a significant **reduction of 71% in the number of clients who reported past 30-day illegal drug use**

FIGURE 2.7. PAST-30-DAY USE OF ANY ILLEGAL DRUGS AT INTAKE AND FOLLOW-UP (N = 180)



\*\*\*p < .001.

<sup>31</sup> In 2015, 3 cases had missing data for drug use at intake.

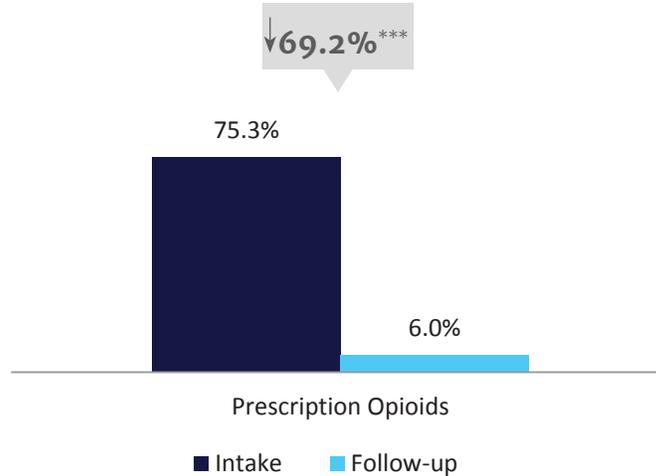
## Prescription Opioid Misuse

### Past-6-month Prescription Opioid Misuse

Three-fourths of clients reported misusing prescription opioids (such as morphine, Percocet, Oxycontin, Lortab) in the 6 months before program entry. At follow-up, 6.0% of clients reported misusing prescription opioids (see Figure 2.8). This means there was a 69.2% significant decrease in the number of clients reporting prescription opioid misuse.

The number of clients reporting **prescription opioid misuse decreased by 69%**

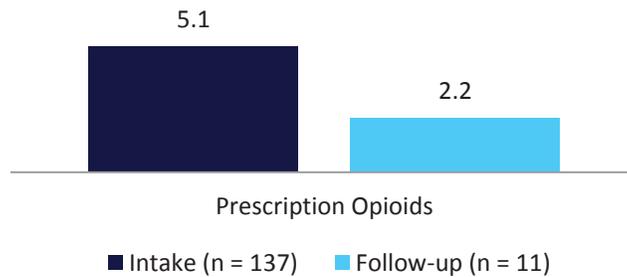
FIGURE 2.8. PAST-6-MONTH PRESCRIPTION OPIOID MISUSE AT INTAKE AND FOLLOW-UP (N = 182)



### Average Number of Months Misused Prescription Opioids

Figure 2.9 shows the average number of months prescription opioid users reported misusing prescription opioids at intake and during the 6-month follow-up. Among the clients who reported misusing prescription opioids before entering the program (n = 137), clients reported using prescription opioids an average of 5.1 of the 6 months. Among clients who reported misusing opioids at follow-up (n = 11), clients reported using an average of 2.2 of the 6 months before follow-up.

FIGURE 2.9. AVERAGE NUMBER OF MONTHS CLIENTS USED PRESCRIPTION OPIOIDS

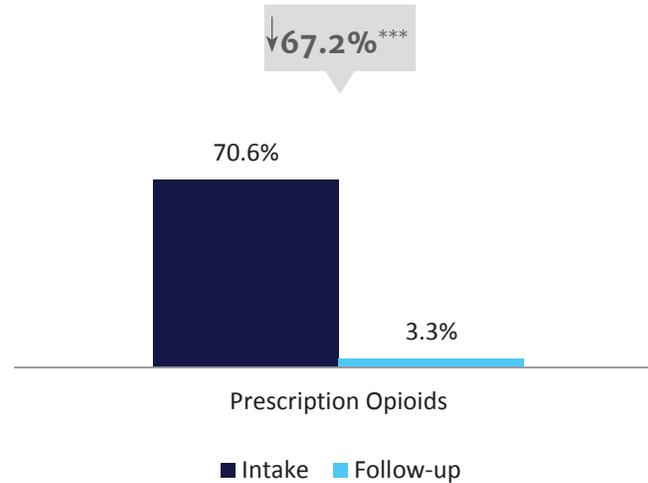


## Past-30-day Prescription Opioid Misuse

At intake, 70.6% of clients reported misuse of prescription opioids and at follow-up, 3.3% of clients reported misuse of prescription opioids (see Figure 2.10). This reflects a significant decrease of 67.2% in the number of clients reporting misuse of prescription opioids.

The number of clients who **misused opioids in the past 30 days** decreased significantly by **67%**

FIGURE 2.10. PAST-30-DAY PRESCRIPTION OPIOID MISUSE AT INTAKE AND FOLLOW-UP (N = 180)



\*\*\*p < .001.

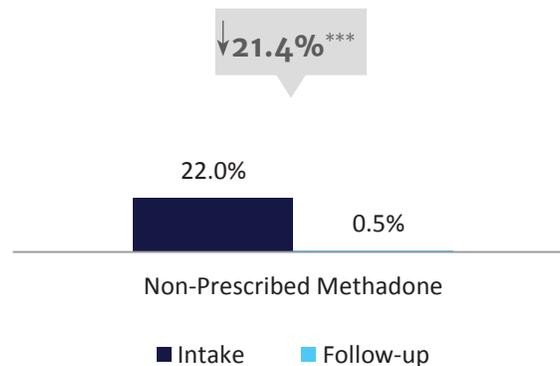
## Non-prescribed Use of Methadone

### Past-6-month Non-prescribed Use of Methadone

Almost one-quarter of clients (22.0%) reported using non-prescribed methadone in the 6 months before intake (see Figure 2.11). At follow-up, only 0.5% of clients reported non-prescribed use of methadone. This was a 21.4% significant decrease in the number of clients reporting non-prescribed use of methadone.

21% fewer clients reported non-prescribed methadone use at follow-up

FIGURE 2.11. PAST-6-MONTH NON-PRESCRIBED METHADONE USE AT INTAKE AND FOLLOW-UP (N = 182)

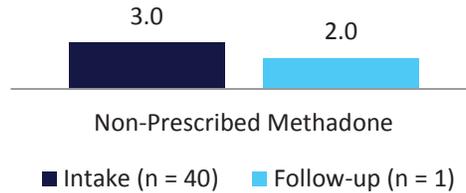


\*\*\*p < .001.

## Average Number of Months Used Non-prescribed Methadone

Among the clients who reported non-prescribed use of methadone in the 6 months before entering the program (n = 40), they reported using, on average, 3.0 months (see Figure 2.12). Among clients who reported non-prescribed use of methadone in the 6 months before follow-up (n = 1), the client reported using an average of 2 out of 6 months.

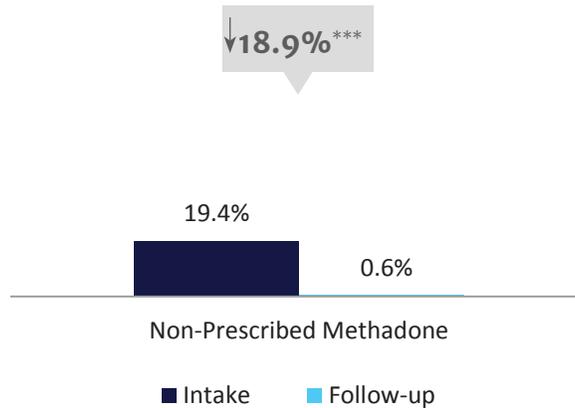
FIGURE 2.12. AVERAGE NUMBER OF MONTHS CLIENTS USED NON-PRESCRIBED METHADONE



## Past-30-day Non-prescribed Use of Methadone

About 19% of clients reported using non-prescribed methadone in the 30 days before entering the program (see Figure 2.13). At follow-up, only 0.6% of clients reported past-30-day use of non-prescribed methadone. This was a 18.9% significant decrease.

FIGURE 2.13. PAST-30-DAY NON-PRESCRIBED METHADONE USE AT INTAKE AND FOLLOW-UP (N = 180)



\*\*\*p < .001.

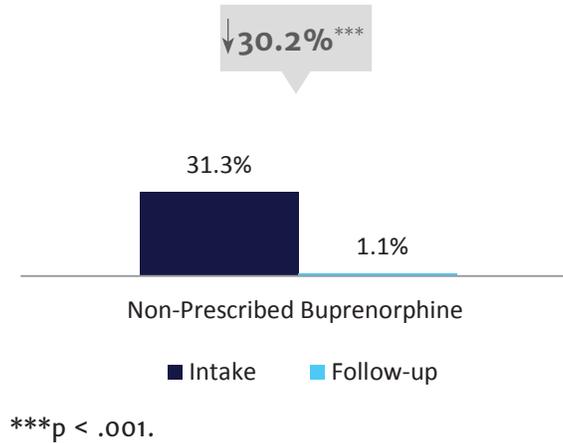
## Non-prescribed Use of Bup-nx

### Past-6-month Non-prescribed Use of Bup-nx

Figure 2.14 shows that less than one-third of clients (31.3%) reported using non-prescribed bup-nx in the 6 months before intake. At follow-up, only 1.1% of clients reported using non-prescribed bup-nx – a significant decrease of 30.2%.

**30% fewer clients reported non-prescribed bup-nx use at follow-up**

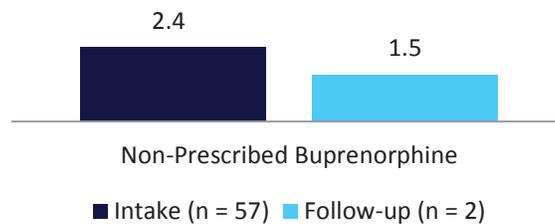
FIGURE 2.14. PAST-6-MONTH NON-PRESCRIBED USE OF BUP-NX AT INTAKE AND FOLLOW-UP (N = 182)



### Average Number of Months Used Non-prescribed Bup-nx

Among the clients who reported non-prescribed use of bup-nx in the 6 months before entering the program (n = 57), they used non-prescribed bup-nx, on average, 2.4 months (see Figure 2.15). At follow-up, those who reported non-prescribed bup-nx use (n = 2), reported using, on average, 1.5 months out of the past 6.

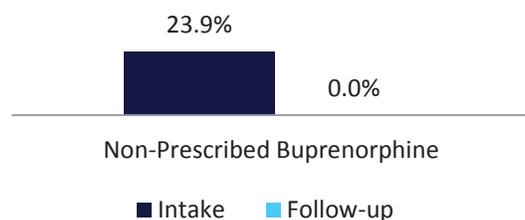
FIGURE 2.15. AVERAGE NUMBER OF MONTHS CLIENTS USED NON-PRESCRIBED BUP-NX



### Past-30-day Non-prescribed Use of Bup-nx

Less than one-quarter of clients (23.9%) reported using non-prescribed bup-nx in the 30 days before entering the program (see Figure 2.16). At follow-up, none of the clients reported past-30-day use of non-prescribed bup-nx.

FIGURE 2.16. PAST-30-DAY NON-PRESCRIBED BUP-NX USE AT INTAKE AND FOLLOW-UP (N = 180)



a – No measures of association could be computed for non-prescribed bup-nx because the value at follow-up was 0.

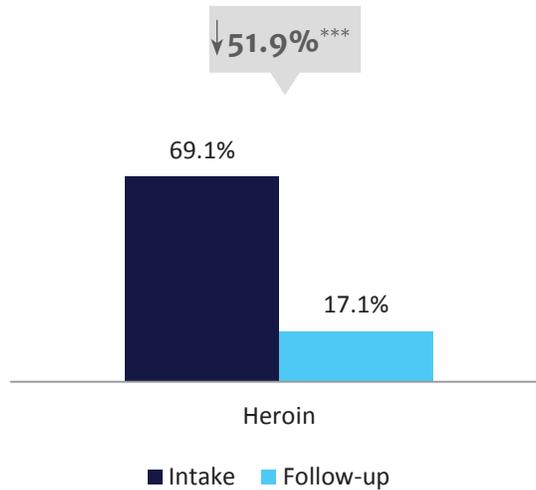
## Heroin

### Past-6-month Heroin Use

About 69% of clients reported using heroin in the 6 months before entering treatment, which significantly decreased 51.9% to 17.1% at follow-up (see Figure 2.17).

The number of clients reporting **heroin use in the past 6 months decreased by 52%**

FIGURE 2.17. PAST-6-MONTH HEROIN USE AT INTAKE AND FOLLOW-UP (N = 181)<sup>32</sup>

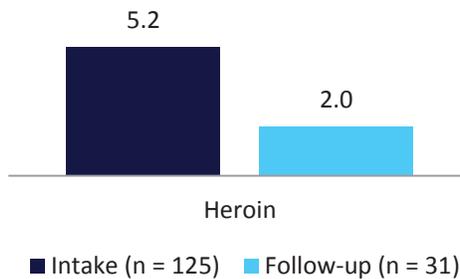


\*\*\*p < .001.

### Average Number of Months Used Heroin

Among the clients who reported using heroin in the 6 months before entering treatment (n = 125), they reported using heroin, on average, 5.2 months (see Figure 2.18). Among clients who reported using heroin in the 6 months before follow-up (n = 31), they reported using, on average, 2.0 months.

FIGURE 2.18. AVERAGE NUMBER OF MONTHS CLIENTS USED HEROIN

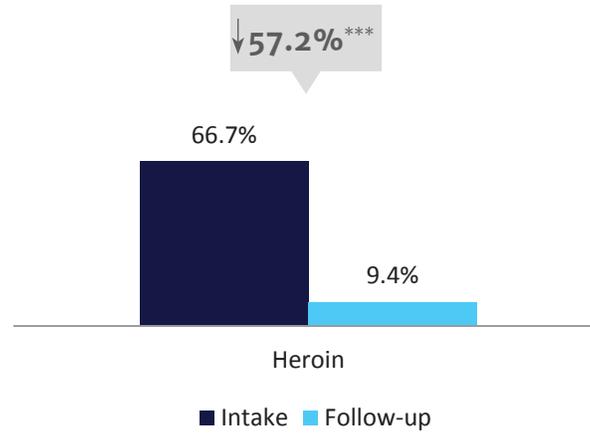


### Past-30-day Heroin Use

Two-thirds of clients (66.7%) reported using heroin in the 30 days before intake. At follow-up, 9.4% reported using heroin in the past 30 days, a significant decrease of 57.2% (see Figure 2.19).

<sup>32</sup> One person responded “don’t know” on heroin use at follow-up.

FIGURE 2.19. PAST-30-DAY HEROIN USE AT INTAKE AND FOLLOW-UP (N = 180)



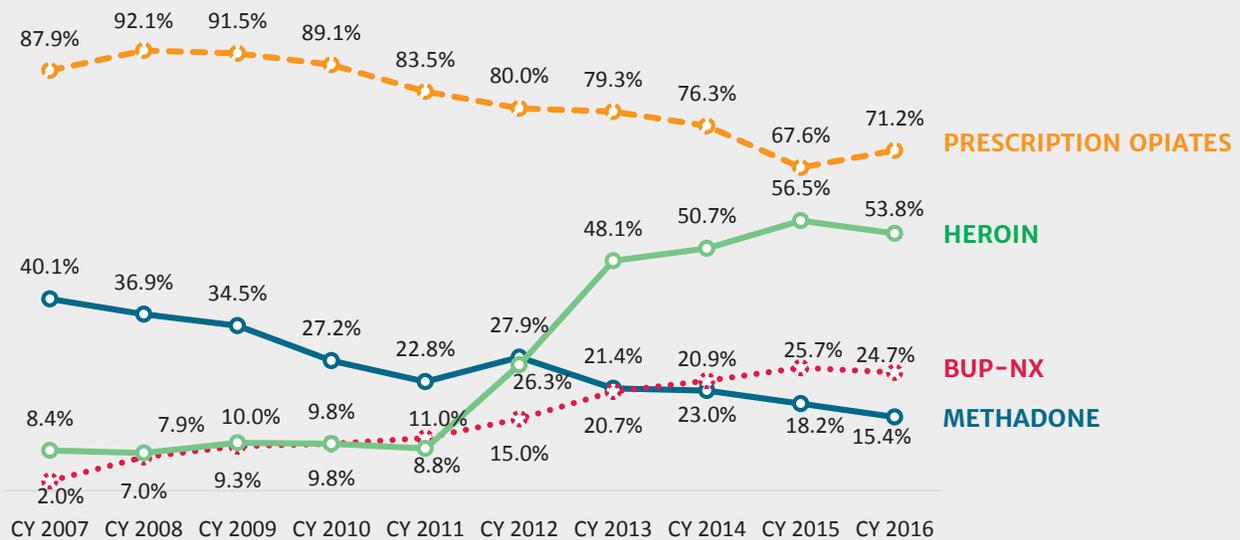
\*\*\*p < .001.

## Trend Report in Past-30-Day Opioid/Opiate Use

When looking at trends over time for all clients with completed intake interviews, the percent of clients using prescription opioids in the past 30 days peaked in calendar year 2008 and has steadily dropped. The percent of clients who reported using non-prescribed methadone before entering treatment showed a decline from calendar year 2007 to 2011 and again from 2012 to 2016. The percent of clients who reported using bup-nx slowly increased from 2007 through 2015 and then dropped slightly in 2016.

The most notable change in substance use among KORTOS clients, however, is for heroin. Small percentages of KORTOS clients reported using heroin from 2007 through 2011. Then in 2012, the percent tripled from 8.8% in 2011 to 26.3% and then nearly doubled from 26.3% in 2012 to 48.1% in 2013. The percent of KORTOS clients reporting heroin use at intake in 2014 increased again to 50.7%, further still to 56.5% in 2015. The percent of KORTOS clients reporting heroin use at intake in 2016 decreased slightly. These trends are very similar when examining only those clients who were followed-up (see Appendix D).

Figure 2.20. Percent of All Clients With a Completed Intake Interview Reporting Non-Prescribed Use of Prescription Opioids, Methadone, Bup-nx, and Heroin in the 30 Days Before Entering Treatment at the OTP (N = 8,060)<sup>33, 34</sup>



## Non-opioid Drug Use

### Past-6-month Use of Non-opioid Drugs

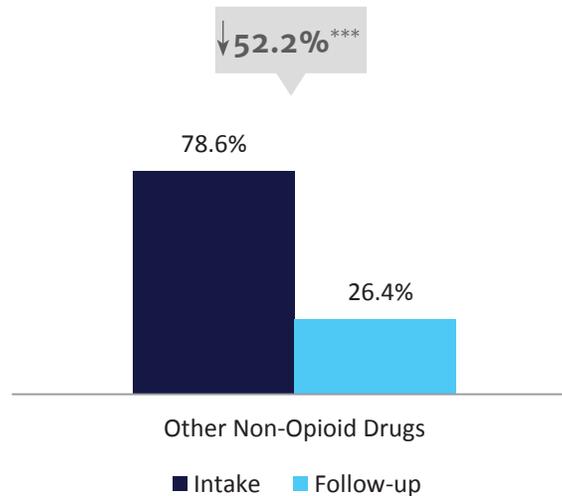
Over three-quarters of clients (78.6%) used illegal drugs other than prescription opioids, non-prescribed methadone, non-prescribed bup-nx, or heroin in the 6 months before entering the program (see Figure 2.21). Drugs in this category include marijuana, cocaine, amphetamines, tranquilizers, hallucinogens, inhalants, barbiturates, and synthetic drugs like synthetic marijuana or bath salts. The number of clients who reported use of non-opioid drugs decreased to 26.4% at follow-up (a significant decrease of 52.2%).

**Non-opioid drug use was reported by 52% fewer clients in the 6 months before follow-up**

<sup>33</sup> Clients who reported being in a controlled environment all 30 days before entering treatment (n = 76) were not included in this analysis.

<sup>34</sup> Two clients in CY 2015 had missing data for past-30-day heroin use at intake.

FIGURE 2.21. PAST-6-MONTH NON-OPIOID DRUG USE AT INTAKE AND FOLLOW-UP (N = 182)

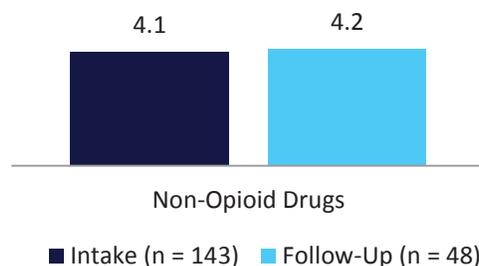


\*\*\*p < .001.

### Average Number of Months Used Non-opioid Drugs

Figure 2.22 shows the maximum number of months clients that used non-opioid drugs reported using these illegal drugs (e.g., marijuana, cocaine, amphetamine, tranquilizers, barbiturates, inhalants, hallucinogens, synthetic drugs).<sup>35</sup> Among the clients who reported using non-opioid drugs at intake (n = 143), the maximum number of months clients reported using any of these drugs was an average of 4.1 months. Among clients who reported using non-opioid drugs at follow-up (n = 48), the maximum average number of months clients reported using any of these drugs was 4.2 months.

FIGURE 2.22. AVERAGE MAXIMUM NUMBER OF MONTHS CLIENTS USED NON-OPIOID DRUGS

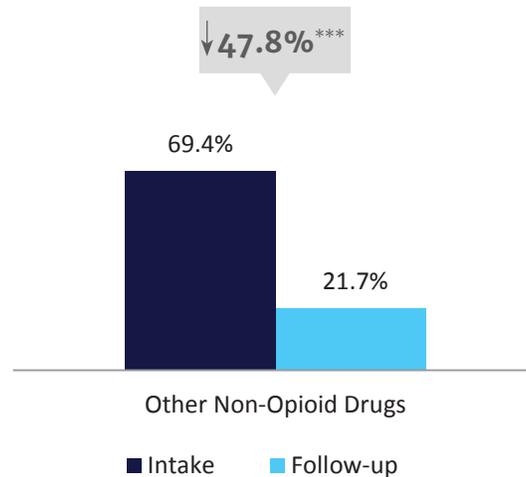


### Past-30-day Use of Non-opioid Drugs

Almost 70% of clients reported using non-opioid drugs in the 30 days before intake (see Figure 2.23). At follow-up, 21.7% of clients reported non-opioid drug use, which is a 47.8% significant decrease.

<sup>35</sup> Because number of months of use of each class of substance was measured separately (e.g., marijuana, cocaine, amphetamines, tranquilizers, barbiturates, inhalants, hallucinogens, synthetic drugs), the value is a calculation of the maximum number of months clients used any substance class.

FIGURE 2.23. PAST-30-DAY NON-OPIOID DRUG USE AT INTAKE AND FOLLOW-UP (N = 180)



\*\*\*p < .001.

## Injection Drug Use

At intake, 65.8% of clients reported having ever injected any drug. Of those clients (n = 121), 14.0% reported having ever used a Needle Exchange Program in Kentucky, all of which were in Jefferson County/Louisville. At follow-up, 12.0% of clients reported injecting drugs in the past 6 months. Of those clients (n = 22), 36.4% reported having used a Needle Exchange program in Kentucky, which were in Jefferson County and Fayette County.

## 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 the client was female) alcoholic drinks in a period of about 2 hours.<sup>36</sup>

### Past-6-month Alcohol Use

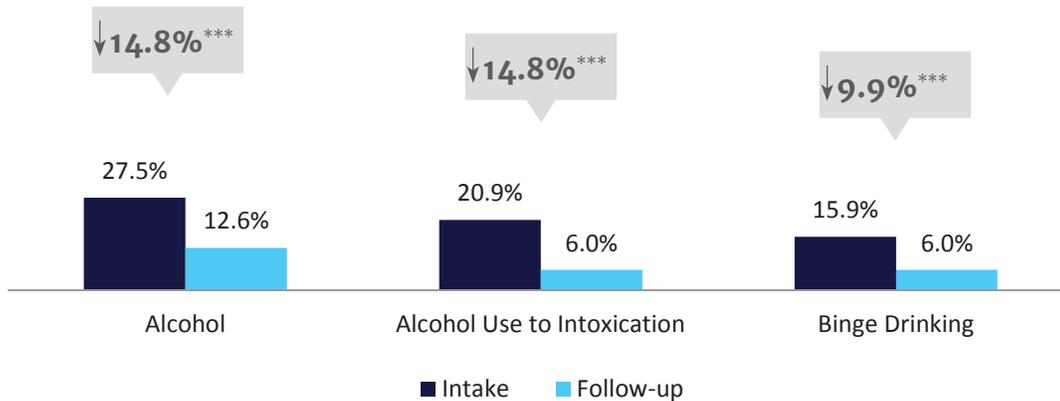
A little more than one-quarter of clients (27.5%) reported using alcohol in the 6 months before entering treatment while 12.6% of clients reported alcohol use in the 6 months before follow-up (see Figure 2.24). About 21% of clients reported using alcohol to intoxication and 15.9% of clients reported binge drinking at intake. There were significant decreases in those percentages by follow-up.

*"It's very personable, they remember your name and are super sweet. The counseling is very helpful."*

—KORTOS Follow-up Client

<sup>36</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.

FIGURE 2.24. PAST-6-MONTH ALCOHOL USE AT INTAKE AND FOLLOW-UP (N = 182)

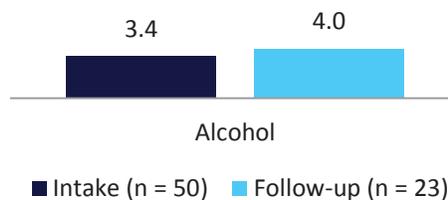


\*\*\*p < .001.

### Average Number of Months Used Alcohol

Figure 2.25 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 6 months before entering treatment (n = 50), they reported using alcohol, on average, 3.4 months. Among clients who reported using alcohol in the 6 months before follow-up (n = 23), they reported using an average number of 4.0 months.

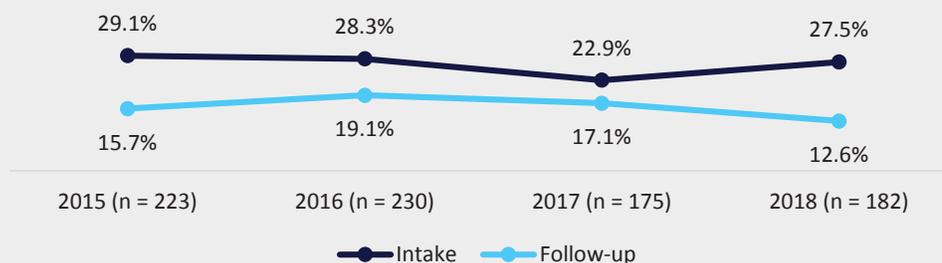
FIGURE 2.25. AVERAGE NUMBER OF MONTHS OF ALCOHOL USE



### Trends in Past-6-month Alcohol Use

Less than one-third of clients reported any alcohol use in the 6 months before entering treatment. The number of clients reporting alcohol use decreased to 22.9% in 2017, but increased to 27.5% at intake in 2018. At follow-up, the number of clients who reported alcohol use increased to 19.1% in 2016, but decreased to 12.6% by 2018.

FIGURE 2.26. TRENDS IN ALCOHOL USE AT INTAKE AND FOLLOW-UP, REPORTS 2015-2018<sup>37</sup>

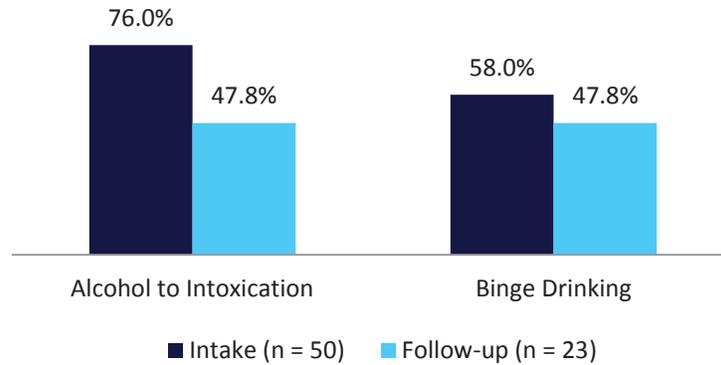


<sup>37</sup> In 2015, 5 cases had missing data for alcohol use at intake

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

Of the clients who used alcohol in the 6 months before entering treatment (n = 50), 76.0% used alcohol to intoxication and 58.0% reported binge drinking (see Figure 2.27). Of the clients who used alcohol in the 6 months before follow-up (n = 23), 47.8% reported alcohol use to intoxication and binge drinking.

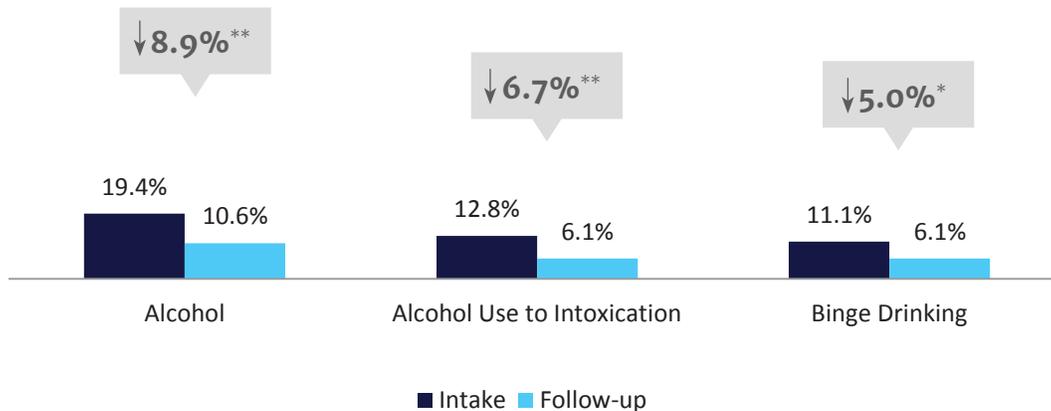
FIGURE 2.27. PAST-6-MONTH ALCOHOL USE TO INTOXICATION AND BINGE DRINKING AT INTAKE AND FOLLOW-UP, AMONG THOSE REPORTING ALCOHOL USE AT EACH POINT



### Past-30-day Alcohol Use

Small percentages of individuals reported using alcohol, alcohol use to intoxication, and binge drinking in the 30 days before intake and follow-up. There were significant differences from intake to follow-up (see Figure 2.28).

FIGURE 2.28. PAST-30-DAY ALCOHOL USE AT INTAKE AND FOLLOW-UP (N = 180)



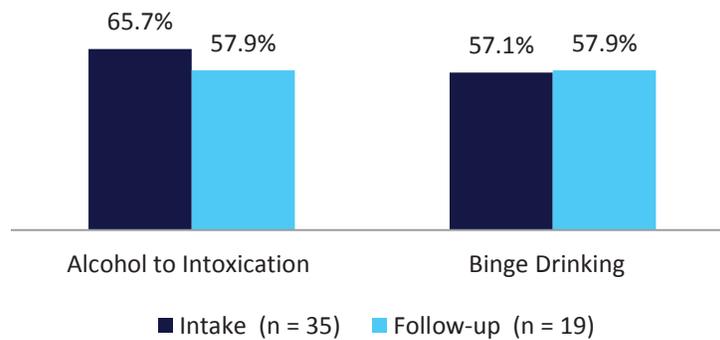
\*p < .05, \*\*p < .01

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

Of the 35 clients who used alcohol in the 30 days before intake, 65.7% used alcohol to intoxication and 57.1% binge drank in that time frame (see Figure 2.29).

Of the 19 clients who reported using alcohol in the 30 days before follow-up, 57.9% reported using alcohol to intoxication and binge drinking.

FIGURE 2.29. 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 Severity of Alcohol and Drug Use

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

One way to examine overall change in degree of severity of substance use is to ask participants to self-report whether they met the 11 criteria included in the DSM-5 for diagnosing substance use disorder (SUD) in the past 6 months. The DSM-5 diagnostic criteria for substance use disorders included in the KORTOS intake and follow-up interviews are similar to the criteria for DSM-IV, which has evidence of excellent test-retest reliability and validity.<sup>38, 39</sup> 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>40</sup> Under DSM-5 anyone meeting any two of the 11 criteria during the same 6-month period for either alcohol or drugs would receive a diagnosis of substance use disorder as long as their symptoms were causing clinically significant impairments in functioning. The severity of the substance use disorder (i.e., none, mild, moderate, or severe) is based on the number of criteria met. Clients who report 2 or 3 DSM-5 symptoms are considered to have a mild substance use disorder, 4 or 5 symptoms is considered a moderate substance use disorder, and 6 or more symptoms is considered severe.

Change in the severity of SUD in the prior 6 months was examined for clients at intake and follow-up.<sup>41, 42</sup> Figure 2.30 displays the change in the percent of individuals in each SUD severity classification, based on self-reported criteria in the preceding 6 months. At intake, 7.2% met criteria for no substance use disorder (meaning they reported 0 or 1 DSM-5 criteria for SUD), while at follow-up, more than two-thirds of clients (76.7%) met criteria for no SUD, a significant increase of 69.5%. At the other extreme of the continuum, the vast majority of clients (87.8%) met criteria for severe SUD at intake, while at follow-up, only 12.8% met criteria for severe SUD, a significant decrease of 75.0%.

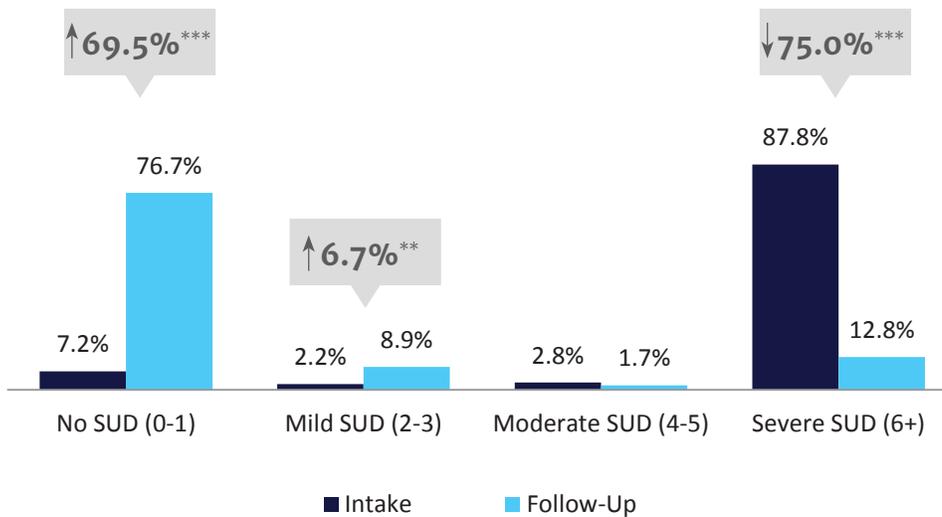
<sup>38</sup> Hasin, D., & Paykin, A. (1999). Alcohol dependence and abuse diagnoses: Concurrent validity in a nationally representative sample. *Alcoholism: Clinical and Experimental Research*, 23(1), 144-150.

<sup>39</sup> Hasin, D., Trautman, K., Miele, G., Samet, S., Smith, M., & Endicott, J. (1996). Psychiatric Research Interview for Substance and Mental Disorders (PRISM): Reliability for substance abusers. *American Journal of Psychiatry*, 153(9), 1195-1201.

<sup>40</sup> Malone, M., & Hoffmann, N. (2016). A comparison of DSM-IV versus DSM-5 substance use disorder diagnoses in adolescent populations. *Journal of Child & Adolescent Substance Abuse*, 25(5), 399-408.

<sup>41</sup> Because of when the DSM-5 questions were added to the KORTOS survey, 52 clients (4.1%) had missing data for all DSM-5 variables at intake and were not included in the analysis.

<sup>42</sup> Ten individuals had missing data for DSM-5 criteria at follow-up.

FIGURE 2.30. DSM-5 SUD SEVERITY AT INTAKE AND FOLLOW-UP (N = 180)<sup>a</sup>

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

### Addiction Severity Index Criteria for Substance Use Disorder, Past 30 Days

Another way to examine overall change in degree of severity of substance use is to calculate the Addiction Severity Index (ASI) composite scores for alcohol and drug use. These composite scores are computed based on self-reported severity of past 30-day alcohol and drug use, taking into consideration several issues including:

- The number of days of alcohol (or drug) use,
- Money spent on alcohol,
- The number of days individuals used multiple drugs (for drug use composite score),
- The number of days individuals experienced problems related to their alcohol (or drug) use,
- How troubled or bothered they are by their alcohol (or drug) use, and
- How important treatment is to them for their alcohol (or drug) problems (see sidebar).

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.

**Among clients who used drugs, the average ASI drug composite scores decreased significantly from intake to follow-up**

## ASI Alcohol and Drug Composite Scores and Substance Dependence

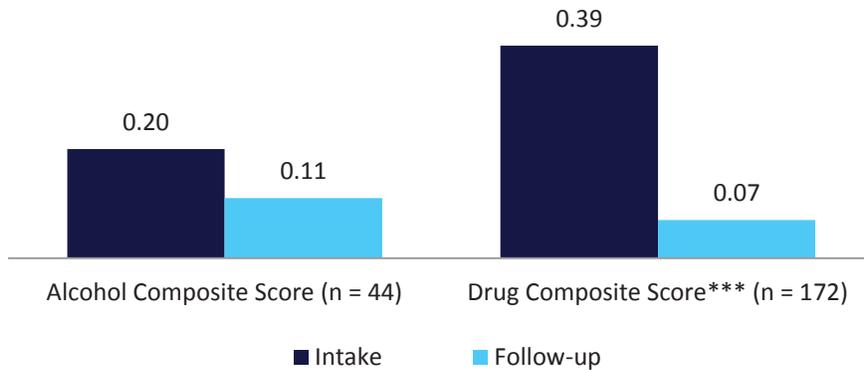
Rikoon et al. (2006) conducted two studies to determine the relationship between the ASI alcohol and drug use composite scores and DSM-IV substance dependence diagnosis. They identified alcohol and drug use composite score cutoffs that had 85% sensitivity and 80% specificity with regard to identifying DSM-IV substance dependence diagnosis: .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 percentage 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 (American Psychiatric Association, 2013), where we would have previously referred to them as meeting the threshold for dependence. Change from intake to follow-up in the severity rating has 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.

Figure 2.31 displays the change in average composite scores from intake to follow-up. The average for the alcohol composite score was 0.20 at intake and 0.11 at follow-up. The average for the drug composite score decreased significantly from 0.39 to 0.07.

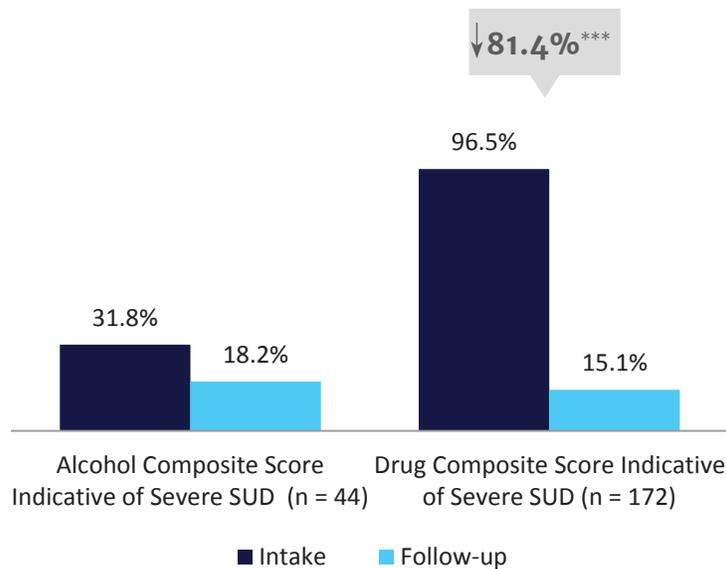
FIGURE 2.31. AVERAGE ASI ALCOHOL AND DRUG COMPOSITE SCORES OF THOSE WHO USED SUBSTANCES AT INTAKE AND/OR FOLLOW-UP



\*\*\*p < .001.

About 32% of clients met the cutoff for severe substance use disorder for alcohol at intake and 18.2% of clients met the cutoff for severe substance use disorder at follow-up (see Figure 2.32). ASI drug composite scores that met the cutoff for severe substance use disorder (SUD) decreased from 96.5% at intake to 15.1% at follow-up.

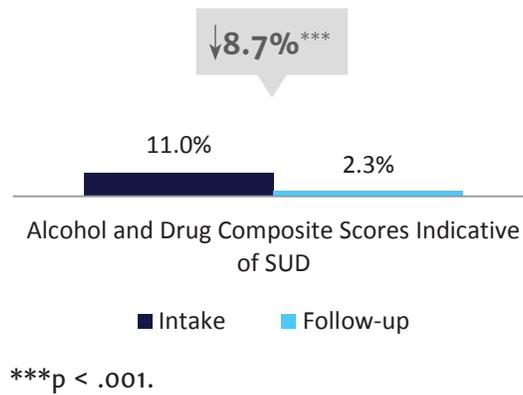
FIGURE 2.32. OF THOSE WHO USED SUBSTANCES, INDIVIDUALS WITH ASI COMPOSITE SCORES MEETING THE CUTOFF FOR SEVERE SUBSTANCE USE DISORDER AT INTAKE AND FOLLOW-UP



\*\*\*p < .001.

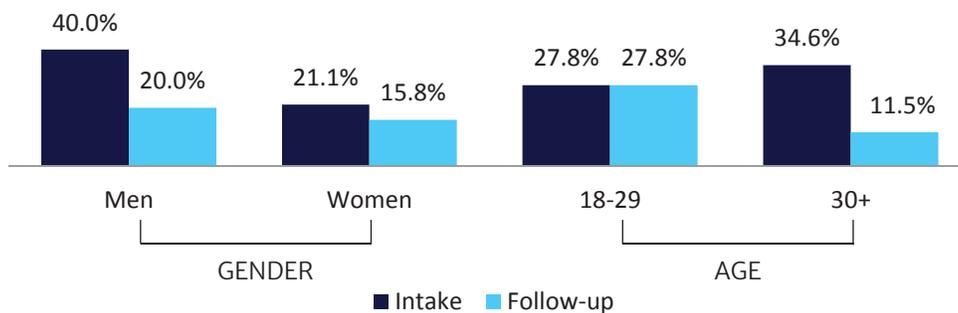
Among the individuals who were not in a controlled environment all 30 days before entering the program and who reported using alcohol and/or drugs at intake and/or follow-up, 11.0% of clients had alcohol and drug composite scores that met the cutoff for severe SUD at intake (see Figure 2.33). That percent decreased significantly to 2.3% at follow-up.

FIGURE 2.33. OF THOSE WHO USED SUBSTANCES, CLIENTS WITH ASI COMPOSITE SCORES MEETING THE CUTOFF FOR BOTH ALCOHOL AND DRUG SEVERE SUBSTANCE USE DISORDERS AT INTAKE AND FOLLOW-UP (N = 172)



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 and age (see Figure 2.34). There were no differences between genders or age groups at intake or follow-up.

FIGURE 2.34. ALCOHOL-USING CLIENTS WITH AN ALCOHOL COMPOSITE SCORE INDICATIVE OF SEVERE SUD AT INTAKE AND FOLLOW-UP BY DEMOGRAPHIC FACTORS (N = 44)<sup>43</sup>



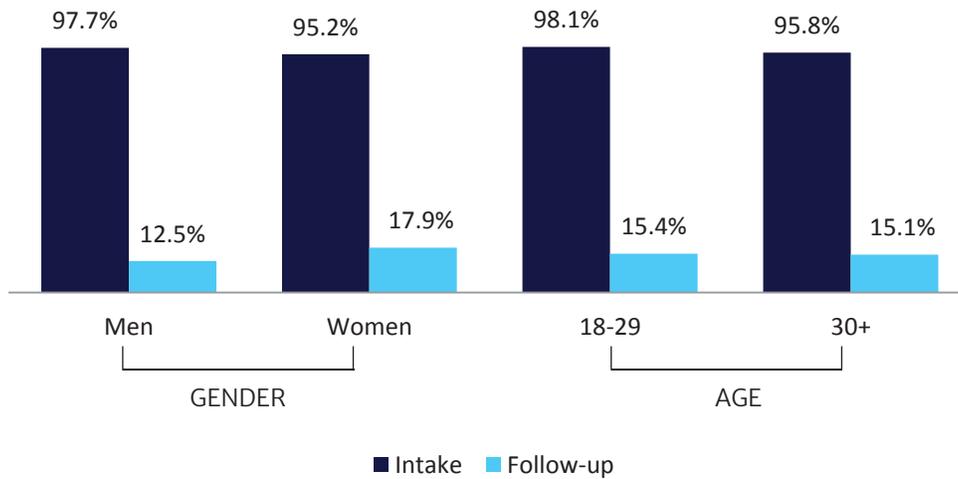
Analyses were also conducted to determine if clients who had a drug composite score indicative of severe SUD at intake and follow-up differed by gender or age (see Figure 2.35). There was no significant difference between men and women or between the age groups.

***"I love it because there is so much support there. The doctor is great and listens to me. Anything I need they help me."***

—KORTOS Follow-up Client

<sup>43</sup> Race/ethnicity was not included in the analysis because there was only 1 client who was considered non-white or multi-racial among alcohol-using clients.

FIGURE 2.35. DRUG-USING CLIENTS WITH A DRUG COMPOSITE SCORE INDICATIVE OF SEVERE SUD AT INTAKE AND FOLLOW-UP BY DEMOGRAPHIC FACTORS (N = 172)<sup>44, 45</sup>

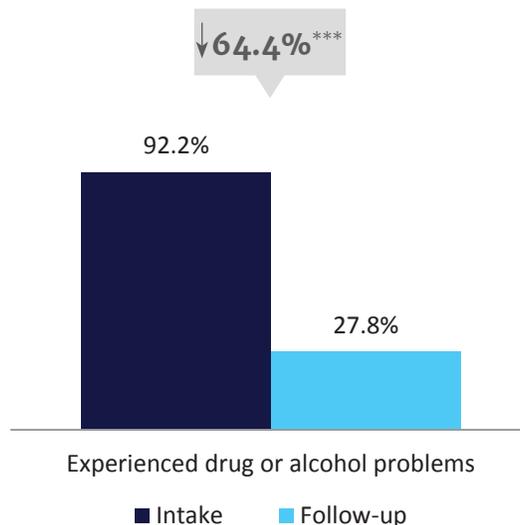


### Problems Experienced with Substance Use in the Past 30 Days

In the past 30 days at intake, 92.2% 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 2.36). In the past 30 days at follow-up, 27.8% of clients reported experiencing problems with drugs or alcohol (a significant decrease of 64.4%).

The number of clients reporting **experiencing problems with drugs or alcohol** decreased **64%**

FIGURE 2.36. CLIENTS EXPERIENCING PROBLEMS WITH ILLEGAL DRUGS OR ALCOHOL AT INTAKE AND FOLLOW-UP (N = 180)



\*\*\*p < .001.

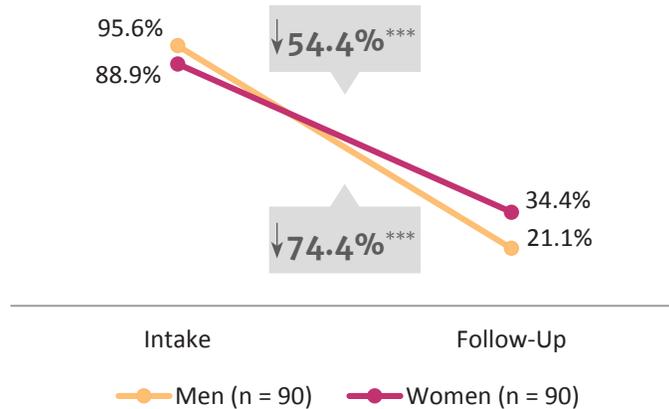
<sup>44</sup> Race/ethnicity was not included in the analysis because there were only 5 clients who was considered non-white or multi-racial among RUG-using clients.

<sup>45</sup> One client was missing information for age.

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

There were no significant differences between men (95.6%) and women (88.9%) on problems experienced with substance use in the past 30 days at intake. At follow-up however, significantly more women (34.4%) reported experiencing problems with substance use in the past 30 days compared to men (21.1%).

FIGURE 2.37. GENDER DIFFERENCES IN CLIENTS EXPERIENCING PROBLEMS WITH ILLEGAL DRUGS OR ALCOHOL AT INTAKE AND FOLLOW-UP<sup>a</sup>



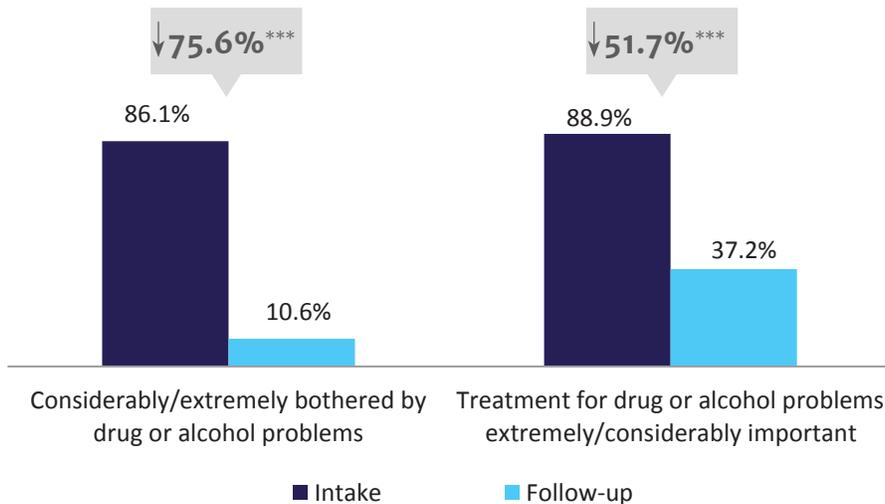
<sup>a</sup>—Significant difference by gender at follow-up ( $p < .05$ ).  
\*\*\* $p < .001$ .

## Readiness for Substance Abuse Treatment

Figure 2.38 shows that 86.1% 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, 10.6% of clients reported that they were considerably or extremely troubled or bothered by drug or alcohol problems (a significant decrease of 75.6%).

The figure below also shows that 88.9% of clients in the past 30 days at intake and 37.2% of clients in the past 30 days at follow-up reported that treatment for drug or alcohol problems was considerably or extremely important.

FIGURE 2.38. READINESS FOR TREATMENT FOR ILLEGAL DRUG OR ALCOHOL USE AT INTAKE AND FOLLOW-UP (N = 180)



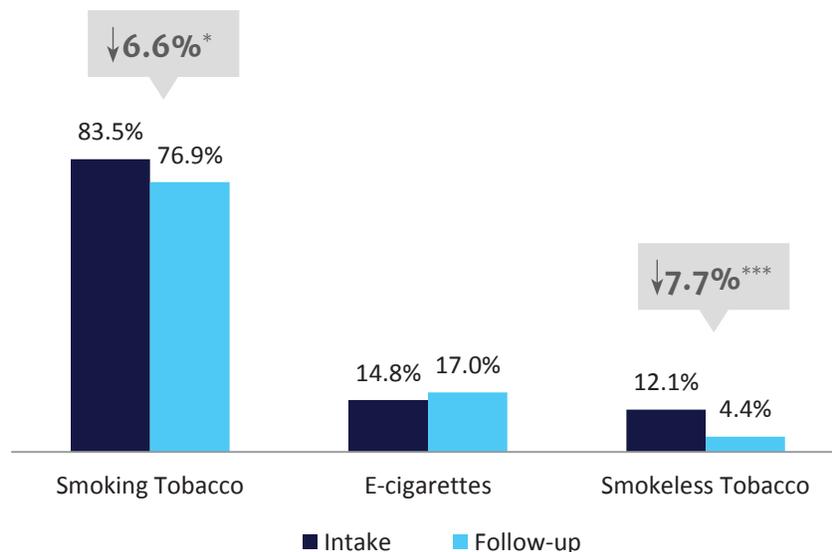
\*\*\* $p < .001$ .

## Tobacco Use

### Past-6-month Smoking, E-cigarettes, and Smokeless Tobacco Use

There was a significant change in both smoking and smokeless tobacco use from intake to follow-up (see Figure 2.39). Most clients reported smoking tobacco in the 6 months before entering the program (83.5%) and in the 6 months before follow-up (76.9%). About 15% of clients reported the use of e-cigarettes (e.g., battery-powered nicotine delivery devices that vaporize a liquid mixture consisting of propylene glycol, glycerin, flavorings, nicotine, and other chemicals) at intake and 17.0% of clients reported the use of e-cigarettes at follow-up. Around 12% of clients at intake and 4.4% of clients at follow-up reported using smokeless tobacco in the past 6 months.

FIGURE 2.39. PAST-6-MONTH SMOKING TOBACCO, E-CIGARETTE, AND SMOKELESS TOBACCO USE AT INTAKE AND FOLLOW-UP (n = 182)

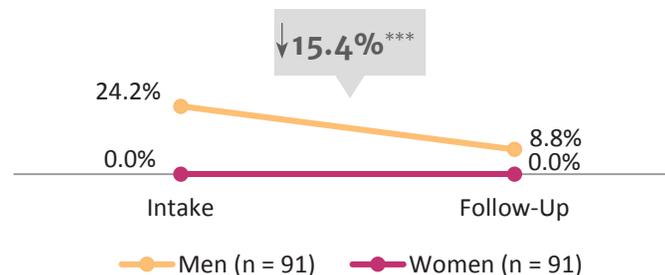


\*p < .05, \*\*\*p < .001.

### GENDER DIFFERENCES IN PAST-6-MONTH SMOKELESS TOBACCO USE

Even though only a small percentage of clients reported using smokeless tobacco at intake and follow-up, there was a significant difference by gender; all of the clients who reported using smokeless tobacco were men (see Figure 2.40).

FIGURE 2.40. GENDER DIFFERENCES IN PAST-6-MONTH SMOKELESS TOBACCO USE FROM INTAKE TO FOLLOW-UP<sup>a</sup>



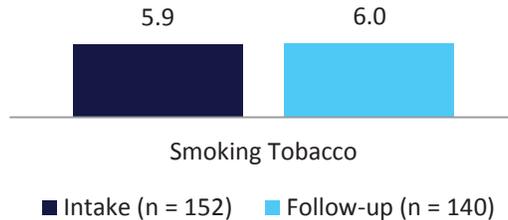
a—Significant difference by gender at intake (p < .001) and follow-up (p < .01).

\*\*\*p < .001.

## Average Number of Months of Smoking Tobacco

Figure 2.41 shows that among clients who reported smoking tobacco in the 6 months before entering treatment (n = 152), they reported smoking tobacco, on average, 5.9 months. There was no change in the average number of months clients who smoked tobacco reported smoking tobacco in the 6 months before follow-up (6.0 months; n = 140).

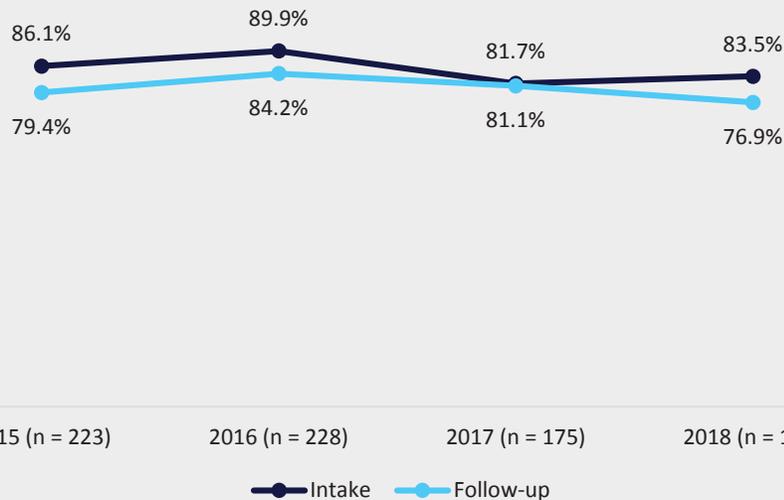
FIGURE 2.41. AVERAGE NUMBER OF MONTHS OF SMOKING TOBACCO USE



## Trends in Past-6-month Smoking Tobacco Use

The majority of KORTOS clients at intake and follow-up reported smoking tobacco. The only significant change in the use of smoking tobacco was in report year 2018 when 83.5% of clients reported smoking tobacco at intake and 76.9% of clients reported smoking tobacco at follow-up.

FIGURE 2.42. TRENDS IN SMOKING TOBACCO USE AT INTAKE AND FOLLOW-UP, REPORTS 2015-2018<sup>46</sup>

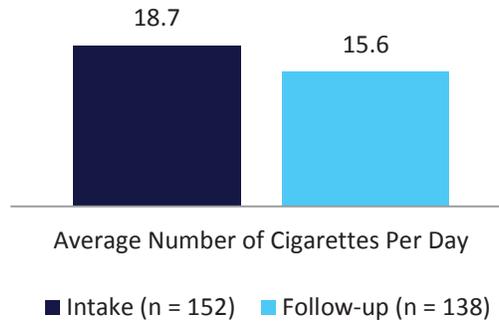


## Average Number of Cigarettes Smoked

The average number of cigarettes clients reported smoking decreased slightly over time (see Figure 2.43). Of those who smoked tobacco at intake, clients reported smoking an average of 18.7 cigarettes per day. At follow-up, among clients who reported smoking tobacco, they reported smoking an average of 15.6 cigarettes per day.

<sup>46</sup> In 2015, 5 cases had missing data for alcohol use at intake.

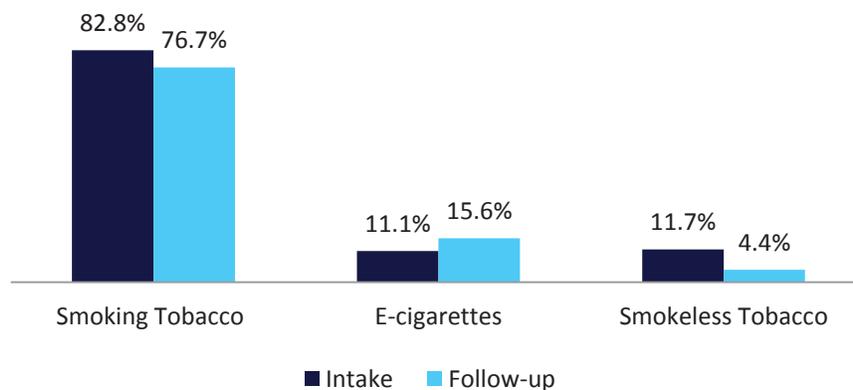
FIGURE 2.43. NUMBER OF CIGARETTES SMOKED IN AN AVERAGE DAY AMONG CLIENTS WHO SMOKED TOBACCO



### Past-30-day Use Smoking, E-cigarette, and Smokeless Tobacco Use

The number of clients who reported any smoking or smokeless tobacco use, or e-cigarette use in the past 30 days did not change significantly from intake to follow-up (see Figure 2.44).

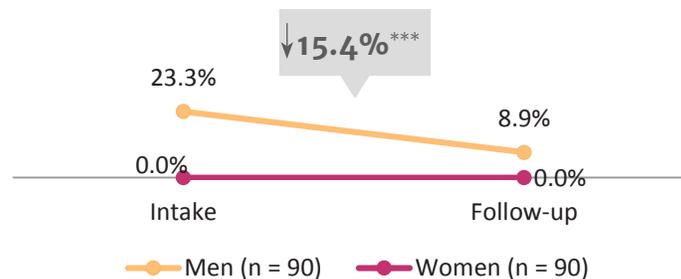
FIGURE 2.44. PAST-30-DAY SMOKING, E-CIGARETTE AND SMOKELESS TOBACCO USE AT INTAKE AND FOLLOW-UP (n = 180)



### GENDER DIFFERENCES IN PAST-30-DAY SMOKELESS TOBACCO USE

Only a small percentage of clients reported using smokeless tobacco, however, there was a significant difference by gender at intake and follow-up, with more men using smokeless tobacco (see Figure 2.45).

FIGURE 2.45. GENDER DIFFERENCES IN PAST-30-DAY SMOKELESS TOBACCO USE FROM INTAKE TO FOLLOW-UP<sup>a</sup>



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

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

## Section 3.

# Multivariate Analysis of Relapse

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

KORTOS clients who reported any illicit drug use in the 6 months before follow-up (n = 58) were compared to clients who did not report any illicit drug use in the 6 months before follow-up (n = 126). Logistic regression models were used to examine the association between targeted factors and illicit drug use at follow-up.

In comparing clients who did and did not report illicit drug use at follow-up on targeted factors used in the regression models, only one significant difference was found (Table 3.1). Clients who report illicit drug use at follow-up were younger (34.0) compared to clients who did not reported illicit drug use at follow-up (37.0). Clients who reported illicit drug use at follow-up, were not more likely to meet study criteria for depression in the past 6 months at intake, to meet study criteria for generalized anxiety in the past 6 months at intake, to report an arrest in the past 6 months at follow-up, or to report spending at least one night incarcerated in the past 6 months at follow-up. In addition, clients who reported illicit drug use at follow-up did not report a lower average quality of life rating or a lower average satisfaction with life rating compared to clients who did not report illicit drug use at follow-up.

TABLE 3.1. TARGETED FACTORS COMPARING CLIENTS WHO RELAPSED AND CLIENTS WHO DID NOT

	Did not use any illicit drug at follow-up (n = 126)	Reported illicit drug use at follow-up (n = 58)
Average age at intake*	37.0	34.0
Male	48.4%	53.4%
Maximum number of months client used illicit drugs in the 6 months before entering treatment	5.4	5.8
Met criteria for depression in the past 6 months at intake	73.0%	77.6%
Met criteria for generalized anxiety in the past 6 months at intake	79.4%	75.9%
Homeless at intake	26.2%	19.0%
Employed in the past 6 months at follow-up	59.5%	62.1%
Arrested in the past 6 months at follow-up	16.7%	24.1%
Incarcerated in the past 6 months at follow-up	13.5%	19.0%
Average quality of life rating	3.4	3.3
Average satisfaction with life rating	8.8	8.1

\*p< .05.

Each targeted factor in Table 3.1 was entered in the logistic regression as predictor variables and any drug use in the past 12 months at follow-up was entered as the dependent variable. Results of the analysis show that none of the predictor variables at intake remained significant.

## Section 4.

# Mental Health, Physical Health, and Stress

This section examines changes in mental health and health status from intake to follow-up. Specifically, this section examines: (1) depression, (2) generalized anxiety, (3) comorbid depression and generalized anxiety, and (4) suicidal ideation and attempts, (5) general health status, (6) chronic pain, and (7) stress-related health consequences. The mental and physical health questions on the KORTOS intake and follow-up interviews 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).

Three-quarters of clients met study criteria for depression in the 6 months before they entered treatment (see Figure 4.1). At follow-up, 22.3% met study criteria for depression—a significant decrease of 52.2%.

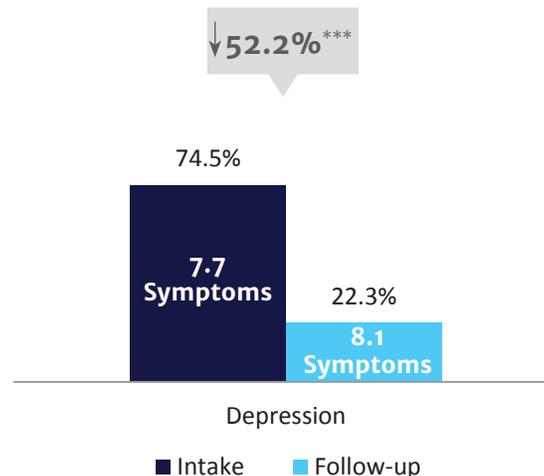
Of those who met study criteria at intake ( $n = 137$ ), they had an average of 7.7 symptoms out of 9. At follow-up, among those who met study criteria for depression ( $n = 41$ ), clients reported an average of 8.1 symptoms out of 9.

### 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 other 7 symptoms. Thus, minimum score to meet study criteria: 5 out of 9.

The percent of clients meeting study criteria for depression decreased significantly by 52% from intake to follow-up

FIGURE 4.1. MEETING STUDY CRITERIA FOR DEPRESSION AT INTAKE AND FOLLOW-UP (N = 184)

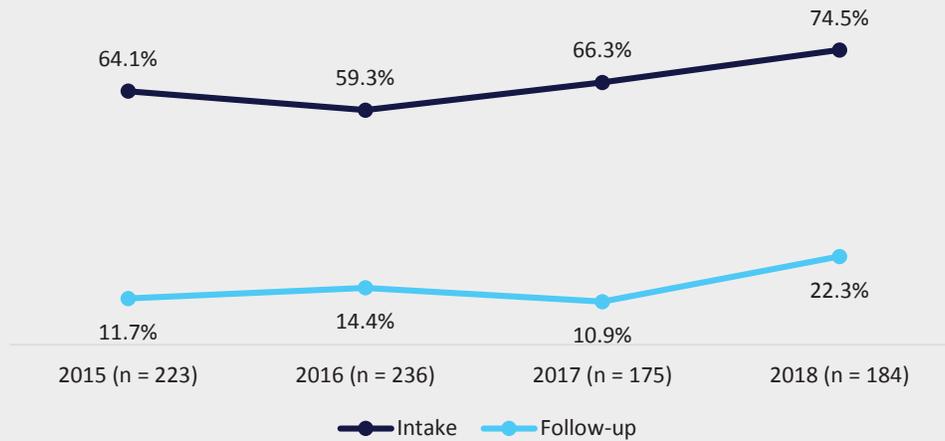


\*\*\* $p < .001$ .

## Trends in Past-6-month Depression

The number of clients who met criteria for depression at intake has increased from report year 2016 (59.3%) to 2018 (74.5%). The number of clients who met criteria for depression at follow-up has increased since 2017 (10.9%) compared to 22.3% in 2018.

FIGURE 4.2. TRENDS IN THE NUMBER OF CLIENTS WHO MET STUDY CRITERIA FOR DEPRESSION AT INTAKE AND FOLLOW-UP, REPORTS 2015-2018



## Anxiety Symptoms

To assess for generalized anxiety symptoms, participants were first asked:

“In the 6 months before you entered this program, did you worry excessively or were you anxious about multiple things on more days than not for all 6 months (like family, health, finances, school, or work difficulties)?”

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

In the 6 months before entering treatment, 78.3% of clients reported symptoms that met study criteria for generalized anxiety and 25.0% reported symptoms at follow-up – a significant decrease of 53.3% (see Figure 4.3).

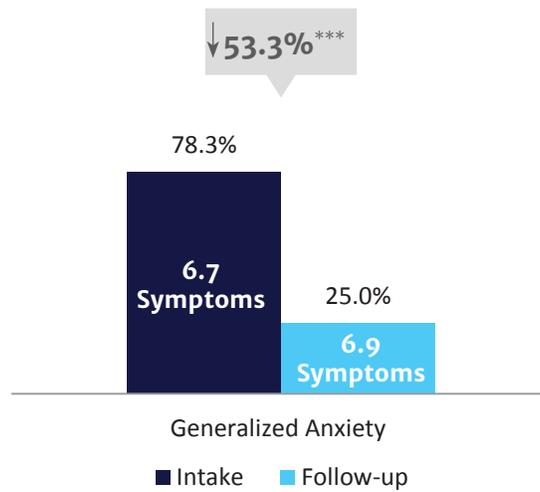
Of those who met study criteria for anxiety at intake (n = 144), they had an average of 6.7 symptoms out of 7. At follow-up, among those who met study criteria for anxiety (n = 46), clients reported an average of 6.9 symptoms out of 7.

### Study Criteria for Generalized Anxiety

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

The percent of clients meeting study criteria for **generalized anxiety decreased significantly by 53%** from intake to follow-up

FIGURE 4.3. CLIENTS MEETING STUDY CRITERIA FOR GENERALIZED ANXIETY AT INTAKE AND FOLLOW-UP (N = 184)

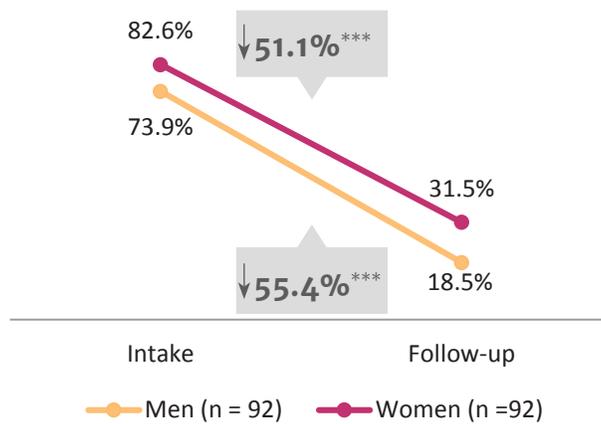


\*\*\*p < .001.

### Gender Differences in Anxiety Symptoms

At follow-up, significantly more women met study criteria for generalized anxiety. The number of both women and men meeting study criteria for anxiety significantly decreased by 51.1% and 55.4%, respectively (see Figure 4.4).

FIGURE 4.4. GENDER DIFFERENCES IN PERCENT OF CLIENTS MEETING STUDY CRITERIA FOR GENERALIZED ANXIETY<sup>a</sup>

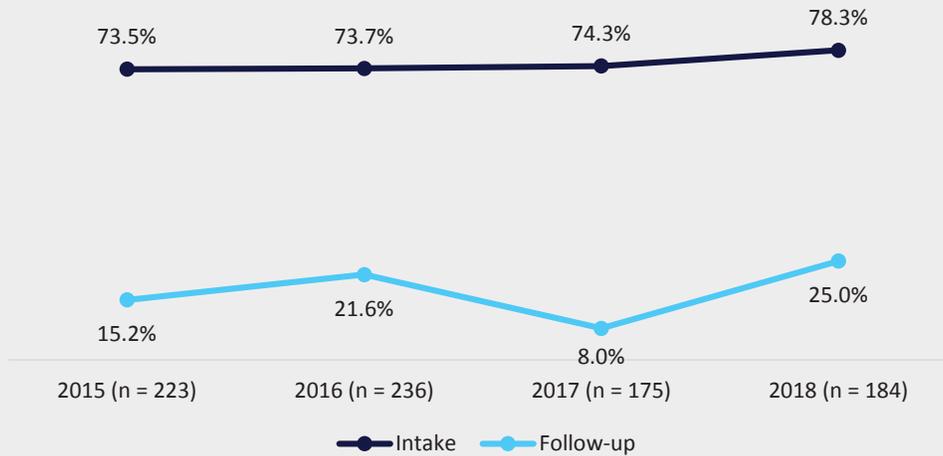


a—Statistical difference by gender at follow-up; p < .05.  
 \*\*\*p < .001.

## Trends in Past-6-month Generalized Anxiety

The number of clients who met criteria for generalized anxiety at intake has remained consistent over the past 4 years (around three-quarters each year). The number of clients who met criteria for generalized anxiety at follow-up has fluctuated over time. About 15% of clients in 2015 and 21.6% of clients met criteria for generalized anxiety at follow-up. In 2017, only 8.0% of clients met criteria for generalized anxiety at follow-up compared to 25.0% of clients in 2018.

FIGURE 4.5. TRENDS IN THE NUMBER OF CLIENTS WHO MET STUDY CRITERIA FOR GENERALIZED ANXIETY AT INTAKE AND FOLLOW-UP, REPORTS 2015-2018

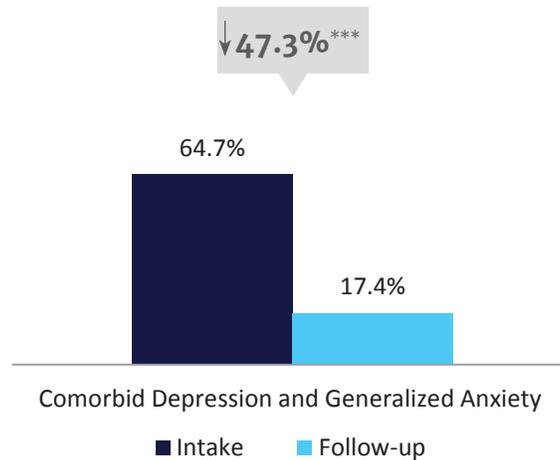


## Comorbid Depression and Anxiety Symptoms

Figure 4.6 shows that at intake, 64.7% of clients met study criteria for both depression and generalized anxiety. There was a significant decrease of 47.3% to 17.4% at follow-up.

The percent of clients meeting study criteria for **both depression and generalized anxiety** decreased 47%

FIGURE 4.6. CLIENTS MEETING STUDY CRITERIA FOR COMORBID DEPRESSION AND GENERALIZED ANXIETY AT INTAKE AND FOLLOW-UP (N = 184)

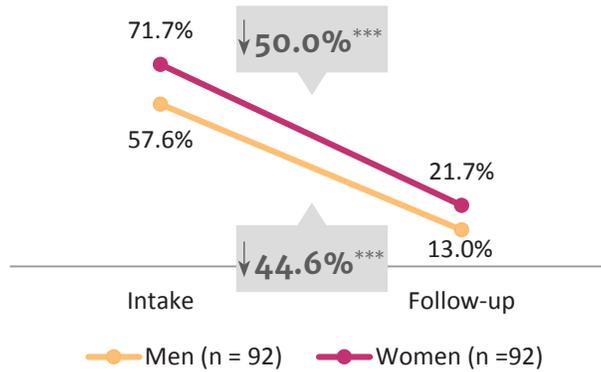


\*\*\*p < .001.

## Gender Differences in Comorbid Depression and Anxiety Symptoms

At intake, significantly more women met study criteria for comorbid depression and anxiety when compared to men (see Figure 4.7). At follow-up, the percent of women and men meeting study criteria for both depression and anxiety significantly decreased by 50.0% and 44.6%, respectively.

FIGURE 4.7. GENDER DIFFERENCES IN PERCENT OF CLIENTS MEETING STUDY CRITERIA FOR COMORBID DEPRESSION AND ANXIETY<sup>a</sup>



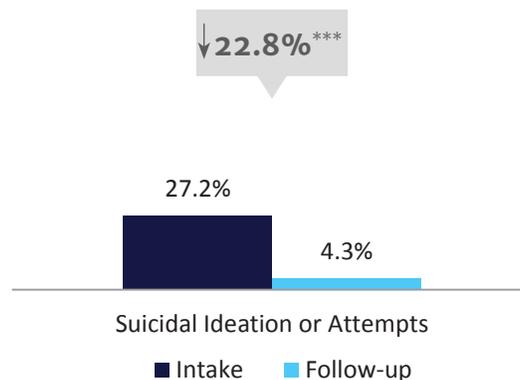
a—Statistical difference by gender at intake;  $p < .05$ .  
\*\*\* $p < .001$ .

## Suicidal Ideation and/or Attempts

Suicidal ideation and attempts were measured with self-reported questions about thoughts of suicide and actual attempts to commit suicide in the past 6 months. There was a significant 22.8% decrease in the number of clients reporting suicidal ideation or attempts from intake (27.2%) to follow-up (4.3%; see Figure 4.8).

The percent of clients reporting **suicidal ideation and/or attempts** decreased **23%** at follow-up

FIGURE 4.8. CLIENTS REPORTING SUICIDAL IDEATION AND/OR ATTEMPTS AT INTAKE AND FOLLOW-UP (N = 184)

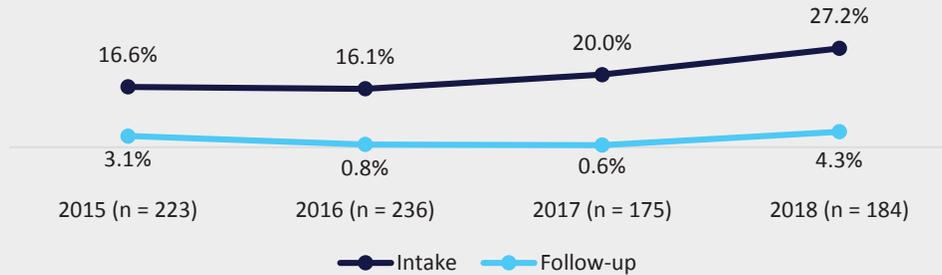


\*\*\* $p < .001$ .

## Trends in Past-6-month Suicide Ideation And/or Attempts

The number of clients who reported suicidal ideation and attempts at intake has increased over the past 4 years from 16.6% in 2015 to 27.2% in 2018. At follow-up, the number of clients reporting suicidal ideation and attempts has remained low but increased from 0.6% in 2017 to 4.3% in 2018.

FIGURE 4.9. TRENDS IN THE NUMBER OF CLIENTS REPORTING SUICIDAL IDEATION AND/OR ATTEMPTS AT INTAKE AND FOLLOW-UP, REPORTS 2015-2018

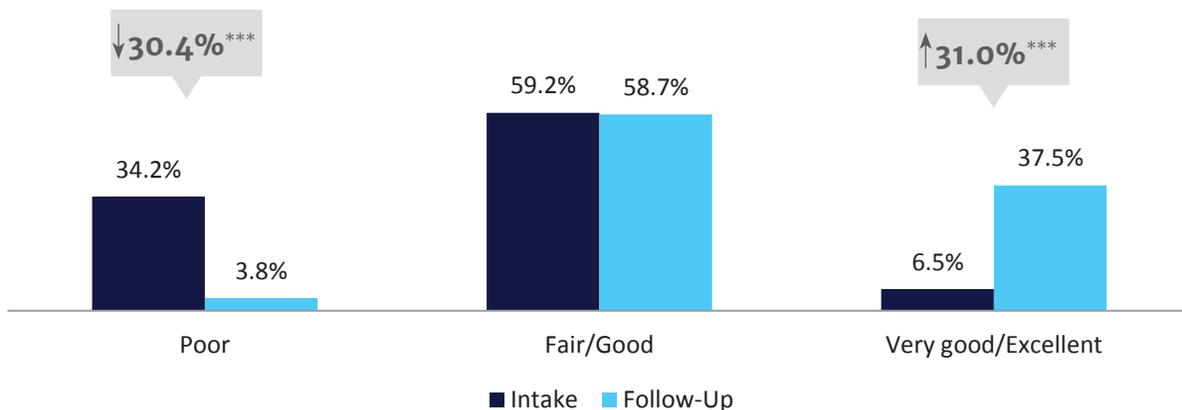


## General Health Status

### Overall Health

At both intake and follow-up, clients were asked to rate their overall health in the past 6 months from 1 = poor to 5 = excellent. Clients rated their health, on average, as 2.1 at intake and this significantly increased to 3.2 at follow-up (not depicted in figure). Figure 4.10 shows that significantly more clients rated their overall physical health as very good or excellent (37.5%) at follow-up when compared to intake (6.5%).

FIGURE 4.10. CLIENTS' SELF-REPORT OF OVERALL HEALTH STATUS AT INTAKE AND FOLLOW-UP (N = 184)<sup>a</sup>



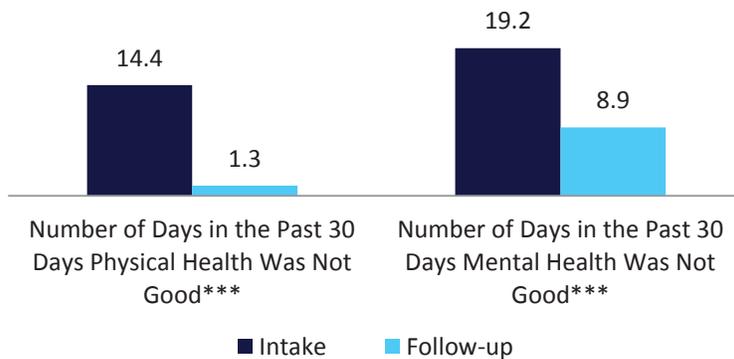
a – Significance tested with the Stuart-Maxwell Test for Marginal Homogeneity ( $p < .001$ ).  
 \*\*\* $p < .001$ .

## Perceptions of Physical and Mental Health

Clients were asked how many days in the past 30 days their physical and mental health were poor at intake and follow-up (see Figure 4.11). The number of days clients reported their physical health was poor decreased significantly from an average of 14.4 days to 1.3 days. The number of days clients' mental health was poor also decreased significantly from intake (19.2) to follow-up (8.9).

The average number of days clients' physical and mental health was poor decreased significantly

FIGURE 4.11. PERCEPTIONS OF POOR PHYSICAL HEALTH AND MENTAL HEALTH IN THE PAST 30 DAYS AT INTAKE AND FOLLOW-UP (N = 184)<sup>47</sup>

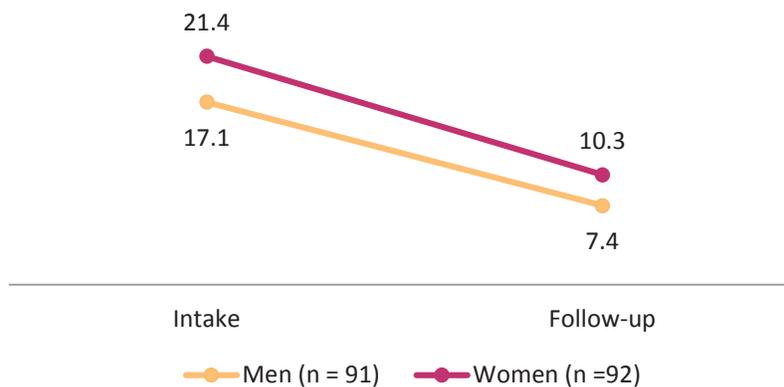


\*\*\*p < .001.

## GENDER DIFFERENCES IN PERCEPTIONS OF MENTAL HEALTH

When compared to men, women reported a significantly higher average number of days their mental health (21.4) was poor at intake (see Figure 4.12). By follow-up, there was no gender difference in the average number of days of poor mental health.

FIGURE 4.12. GENDER DIFFERENCES IN PERCEPTIONS OF MENTAL HEALTH AT INTAKE AND FOLLOW-UP<sup>a,b</sup>



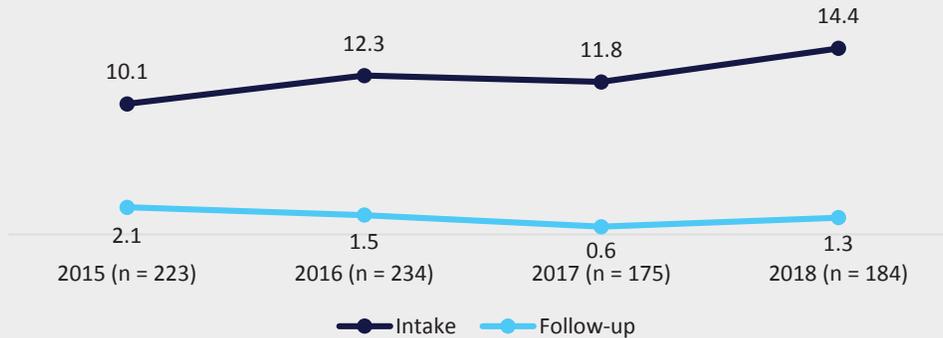
a— Statistical difference by gender at intake; p < .05.  
 b – Significant decrease from intake to follow-up for men and women as measured by paired t-test, p < .001.

<sup>47</sup> One client had missing information for the number of mental health days at follow-up.

## 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 10.1 days in 2015 to 14.4 days in 2018. The average number of days clients reported their physical health was poor in the past 30 days at follow-up has decreased from 2.1 days in 2015 to 1.3 days in 2018.

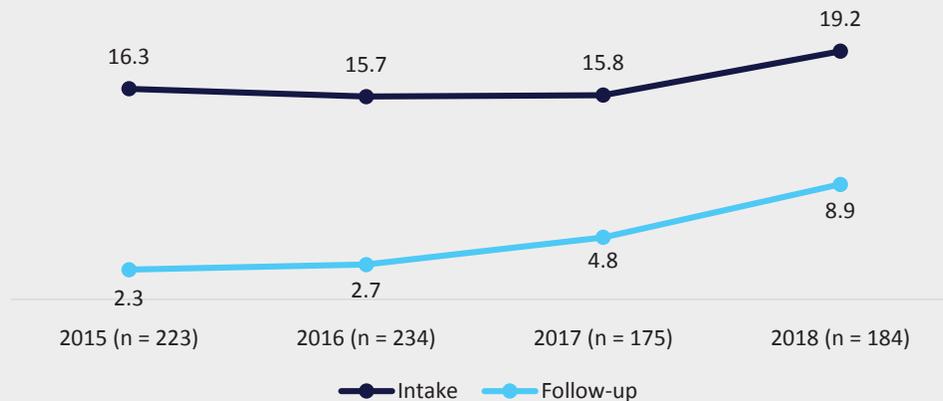
FIGURE 4.13. TRENDS IN PERCEPTIONS OF PHYSICAL HEALTH AT INTAKE AND FOLLOW, REPORTS 2015-2018



## 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 both intake and follow-up in the past few years. At intake in 2017, clients reported an average of 15.8 days their mental health was not good and in 2018 clients reported an average of 19.2 days. The average number of days clients reported their mental health was poor in the past 30 days at follow-up has increased from 2.3 days in 2015 to 8.9 days in 2018.

FIGURE 4.14. TRENDS IN PERCEPTIONS OF MENTAL HEALTH AT INTAKE AND FOLLOW, REPORTS 2015-2018<sup>48</sup>

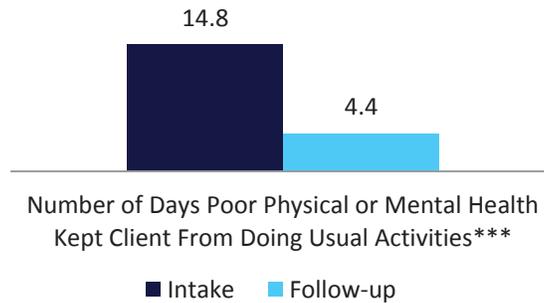


<sup>48</sup> In 2015, 3 cases had missing data for perceptions of mental health at intake.

## 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 14.8 days at intake to 4.4 days at follow-up (see Figure 4.15).

FIGURE 4.15. PERCEPTIONS OF POOR PHYSICAL HEALTH AND MENTAL HEALTH LIMITING ACTIVITIES IN THE PAST 30 DAYS AT INTAKE AND FOLLOW-UP (N = 184)



\*\*\*p < .001.

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

The average number of days in the past 30 days clients reported their poor physical or mental health kept them from doing their usual activities has gradually increased at both intake and follow-up. At intake in 2017, clients reported an average of 12.7 days that their poor physical or mental health kept them from doing their usual activities and in 2018 clients reported an average of 14.8 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 has increased from 1.8 days in 2015 to 4.4 days in 2018.

FIGURE 4.16. TRENDS IN THE NUMBER OF DAYS POOR PHYSICAL OR MENTAL HEALTH KEEP CLIENT FROM DOING USUAL ACTIVITIES AT INTAKE AND FOLLOW, REPORTS 2015-2018<sup>49</sup>

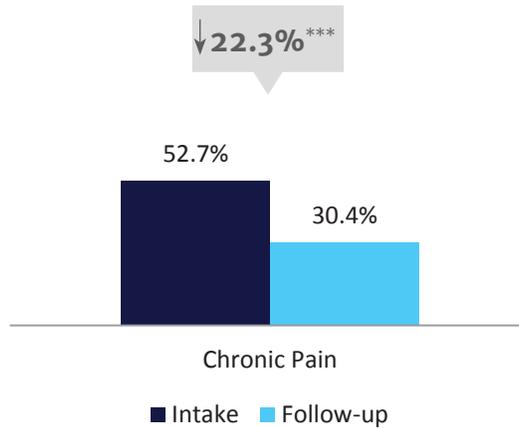


<sup>49</sup> In 2015, one case had a missing value for this item at follow-up.

## Chronic Pain

The percent of clients who reported chronic pain that was persistent and lasted at least 3 months decreased significantly from intake to follow-up by about 22% (see Figure 4.17). At intake, 52.7% of clients reported chronic pain and that number dropped to 30.4% by follow-up.

FIGURE 4.17. CLIENTS REPORTING CHRONIC PAIN AT INTAKE AND FOLLOW-UP (N = 184)

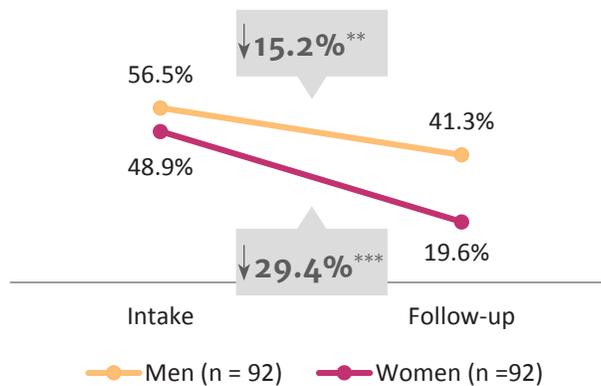


\*\*\*p < .001.

## Gender Differences in Chronic Pain

There were no significant differences for the number of men and women reporting chronic pain at intake (56.5% and 48.9%, respectively). At follow-up, however, significantly more men reported chronic pain (41.3%) compared to women (19.6%; see Figure 4.18).

FIGURE 4.18. GENDER DIFFERENCES IN PERCENT OF CLIENTS REPORTING CHRONIC PAIN AT INTAKE AND FOLLOW-UP<sup>a</sup>

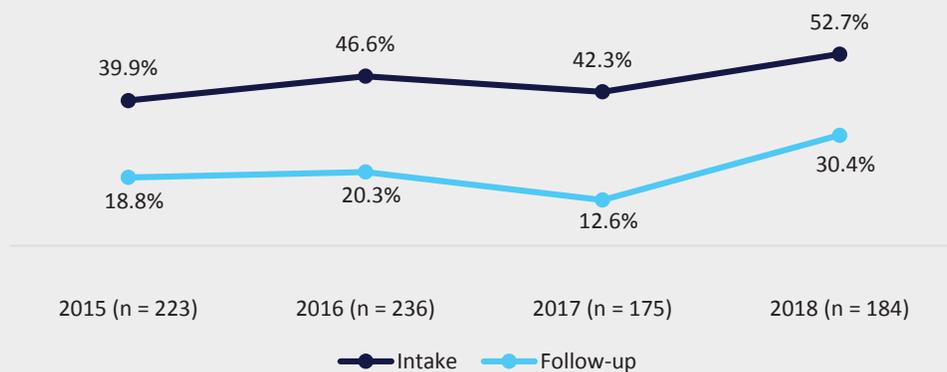


a—Statistical difference by gender at follow-up; p < .01.  
 \*\*p < .01, \*\*\*p < .001.

## Trends in Chronic Pain

The number of clients who reported chronic pain fluctuated over time at intake and follow-up. In the 2015 report, 39.9% of clients reported chronic pain compared to 46.6% in 2016. In 2017, the number of clients reporting chronic pain decreased slightly to 42.3% and then increased to 52.7% in 2018. At follow-up, 18.8% of clients reported chronic pain in 2015 and 20.3% of clients reported chronic pain in 2016. The number of clients reporting chronic pain at follow-up decreased to 12.6% in 2017, but more than doubled in 2018 with 30.4% of clients reporting chronic pain.

FIGURE 4.19. TRENDS IN THE NUMBER OF CLIENTS REPORTING CHRONIC PAIN AT INTAKE AND FOLLOW-UP, REPORTS 2015–2018



## Prescription Opioid Misuse and Chronic Pain

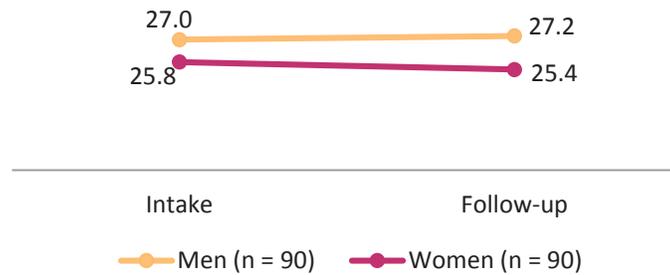
Of those who were not incarcerated all 80 days before entering the program and misused prescription opioids at intake (n = 137), 56.9% reported chronic pain in the 6 months before entering the program and 34.3% experienced chronic pain at follow-up, which was a significant decrease of 22.6%.

Additionally, of those clients who were not incarcerated all 180 days before entering the program, reported misusing prescription opioids, *and* experienced chronic pain at intake (n = 78), 52.6% (n = 41) reported chronic pain in the past 6 months at follow-up and only 6.4% (n = 5) reported past-6-month misuse of prescription opioids.

## Body Mass Index

Body mass index (BMI) was calculated from clients' self-reported height and weight at intake and follow-up (see Figure 4.20). Because their overall body size is larger, the BMI for men and women were examined separately to get a more accurate picture of the BMI of KORTOS clients. There was no significant difference in men's and women's average BMI from intake to follow-up.

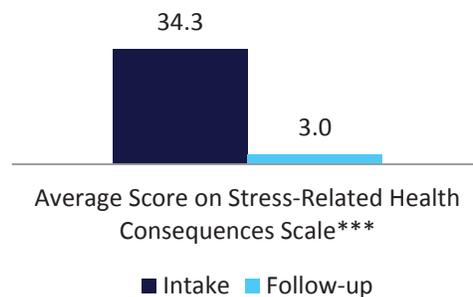
FIGURE 4.20. BODY MASS INDEX BASED ON SELF-REPORTED HEIGHT AND WEIGHT AT INTAKE AND FOLLOW-UP (N = 174)<sup>50</sup>



## Stress-related Health Consequences

Clients were asked about physiological symptoms often associated with higher stress with questions from the Stress-Related Health Consequences Scale. The scale contains 12 symptoms and clients indicated how often they experienced those symptoms 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 minimum score is 0 and the maximum score is 60. For the overall sample, scores decreased significantly from 34.3 at intake to 3.0 at follow-up (see Figure 4.21).

FIGURE 4.21. AVERAGE SCORES ON THE STRESS-RELATED HEALTH CONSEQUENCES SCALE AT INTAKE AND FOLLOW-UP (N = 184)

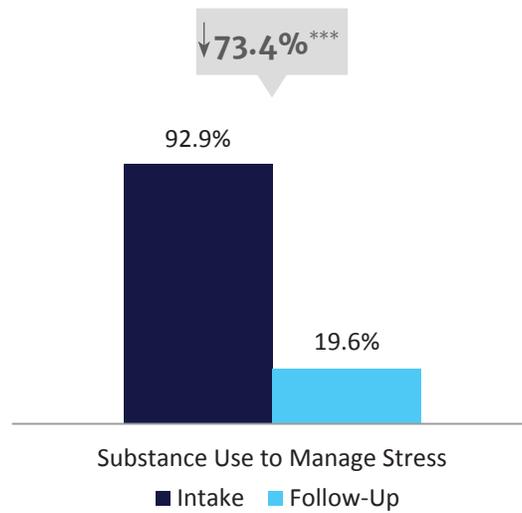


\*\*\*p < .001.

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 4.22 shows that 92.9% 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 19.6%.

<sup>50</sup> Four cases had missing data for one variable that goes into computing BMI at follow-up.

FIGURE 4.22. CLIENTS REPORTING SUBSTANCE USE TO REDUCE OR MANAGE STRESS AT INTAKE AND FOLLOW-UP (N = 184)

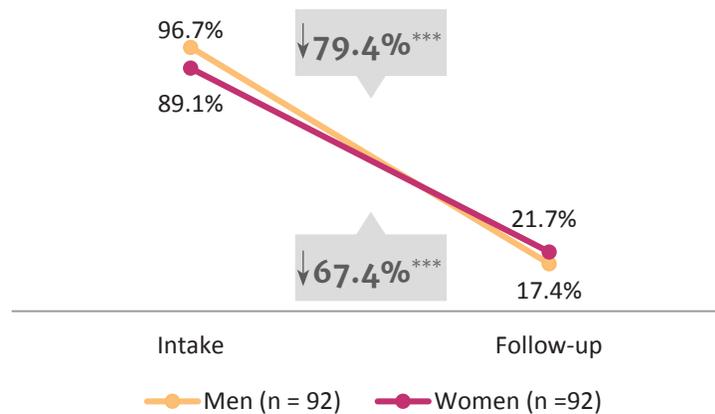


\*\*\*p < .001

### Gender Differences in Substance Use to Reduce or Manage Stress

There was a significant difference between men and women for the number of clients reporting substance use to reduce or manage their stress at intake (96.7% and 89.1% respectively). However, by follow-up, the number of men and women who reported substance use to reduce or manage their stress had decreased significantly by 79.4% and 67.4%, respectively.

FIGURE 4.23. GENDER DIFFERENCES IN PERCENTAGE OF CLIENTS REPORTING SUBSTANCE USE TO REDUCE OR MANAGE STRESS AT INTAKE AND FOLLOW-UP<sup>a</sup>



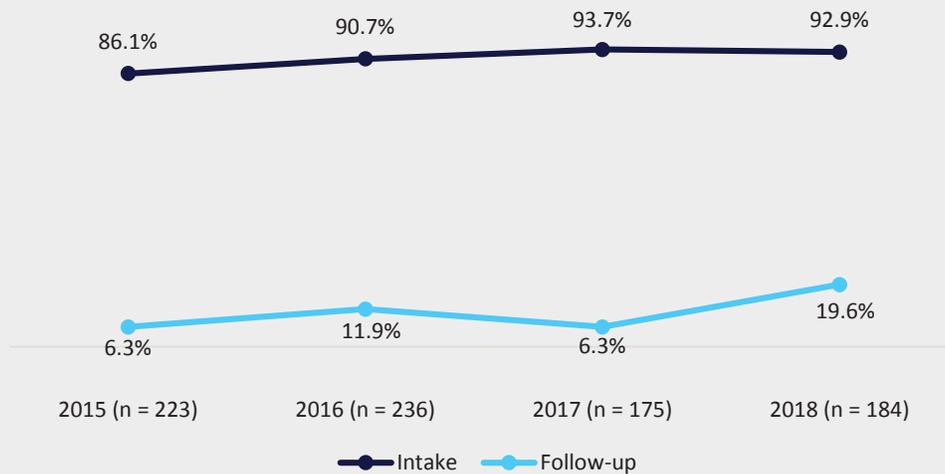
a—Statistical difference by gender at intake; p < .05.  
 \*\*\*p < .001.

## 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 report using substances to manage stress has steadily increased over the past 4 years. In the 2015 report, 86.1% of clients reported using substances to manage stress compared to 92.9% of clients in 2018.

At follow-up, the number of clients who reported using substances to reduce or manage stress fluctuated. In 2015 and 2017, only 6.3% of clients reported using substances to reduce or manage stress. About 12% of clients in 2016 and 19.6% of clients in 2018 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, REPORTS 2015-2018



***"I like the accountable counseling and it saved my life."***

—KORTOS Follow-up Client

## Section 5.

# Criminal Justice System Involvement

This section describes change in client involvement with the criminal justice system during the 6-month period before entering treatment and the 6-month period before the follow-up interview. Specifically, results include changes in: (1) any arrest, (2) the number of times arrested, among clients with any arrests, (3) any incarceration, (4) the number of days incarcerated among clients with any incarceration, and (5) criminal justice supervision status.

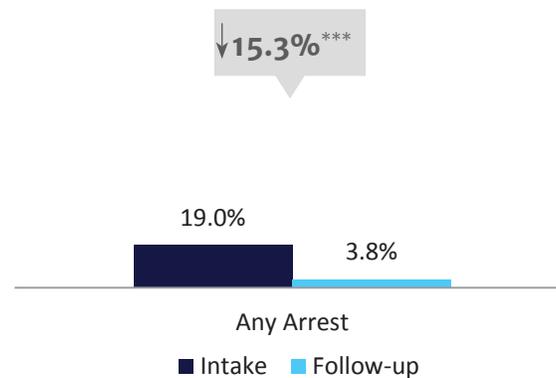
## Arrests

### Any Arrests in the Past 6 Months

Nineteen percent of clients reported any arrests in the 6 months before entering treatment and 3.8% of clients reported any arrests in the 6 months before follow-up (a significant decrease of 15.3%; see Figure 5.1).

The percent of clients reporting **any arrest significantly decreased 15%** at follow-up

FIGURE 5.1. PAST-6 MONTH ARRESTS AT INTAKE AND FOLLOW-UP (N = 183)<sup>51</sup>

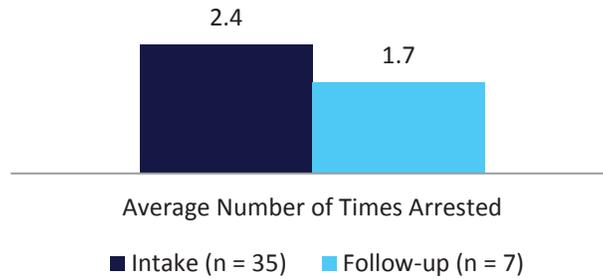


### Average Number of Arrests

Among clients who reported at least one arrest in the 6 months before entering the program (n = 35), the average number of times they were arrested was 2.4 (see Figure 5.2). Among clients who reported at least one arrest in the 6 months before follow-up (n = 7), the average number of times they were arrested was 1.7.

<sup>51</sup> One client refused to answer criminal justice system involvement questions at follow-up.

FIGURE 5.2. AVERAGE NUMBER OF TIMES ARRESTED AT INTAKE AND FOLLOW-UP, AMONG CLIENTS ARRESTED DURING EACH PERIOD



### Trends in Past-6-month Arrests

While the number of clients reporting an arrest in the past 6 months at intake has increased slightly over the past 4 years, the number of clients reporting an arrest in the past 6 months at follow-up has decreased slightly (see Figure 5.3).

FIGURE 5.3. TRENDS IN THE NUMBER OF CLIENTS REPORTING ANY ARRESTS IN THE PAST-6-MONTHS AT INTAKE AND FOLLOW-UP, REPORTS 2015-2018



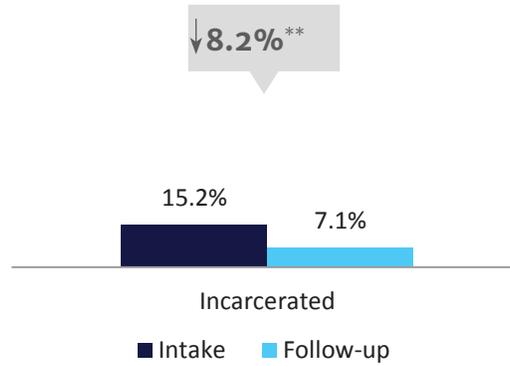
## Incarceration

### Incarceration in the Past 6 Months

About 15% of clients reported they had spent at least one night in jail or prison at intake. At follow-up, only 7.1% of clients reported they had spent at least one night in jail or prison in the past 6 months. The percent of clients reporting any incarceration decreased significantly by 8.2% (see Figure 5.4).

The number of clients who spent at least one day incarcerated decreased by 8%

FIGURE 5.4. CLIENTS REPORTING INCARCERATION AT INTAKE AND FOLLOW-UP (N = 184)

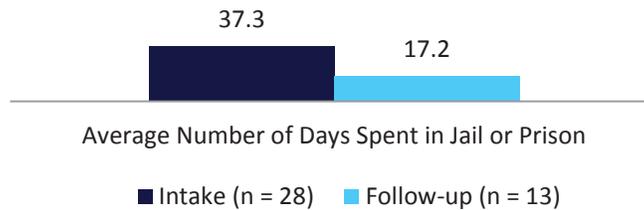


\*\*p < .01.

### Average Number of Days Spent Incarcerated, Among Clients Who Reported Incarceration

Figure 5.5 shows that among clients who reported incarceration, the average number of days incarcerated was 37.3 at intake (n = 28) and 17.2 at follow-up (n = 13).

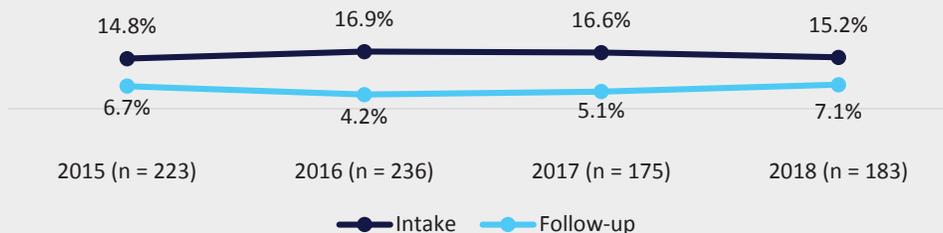
FIGURE 5.5. AVERAGE NUMBER OF DAYS INCARCERATED, FOR CLIENTS WHO WERE INCARCERATED AT EACH PERIOD



### Trends in Past-6-month Incarceration

The number of clients reporting spending at least one night in jail or prison has been relatively steady over the past 4 years with less than 2 in 10 clients reporting an incarceration at intake. At follow-up, relatively few clients reported being incarcerated in the 6 months before follow-up (see Figure 5.6).

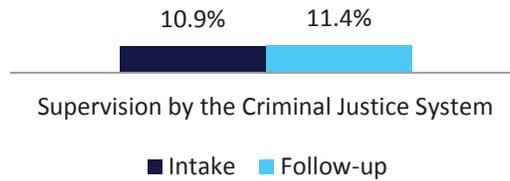
FIGURE 5.6. TRENDS IN THE NUMBER OF CLIENTS REPORTING ANY INCARCERATION IN THE PAST-6-MONTHS AT INTAKE AND FOLLOW-UP, REPORTS 2015-2018



## Criminal Justice System Supervision

The number of clients who self-reported they were under criminal justice system supervision (e.g., probation or parole) did not change significantly from 10.9% at intake to 11.4% at follow-up (see Figure 5.7).

FIGURE 5.7. CLIENTS REPORTING CRIMINAL JUSTICE SYSTEM SUPERVISION AT INTAKE AND FOLLOW-UP (N = 184)



## Section 6.

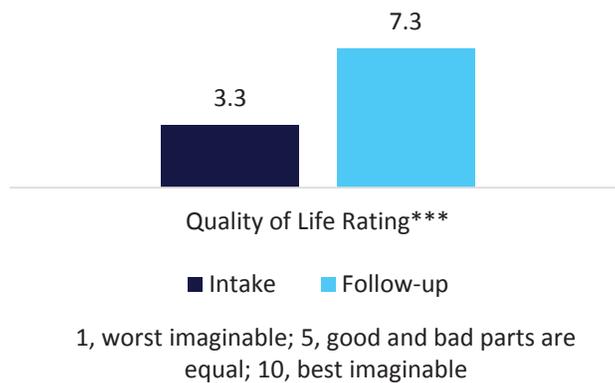
# Quality of Life

This section describes change in client quality of life and satisfaction with life during the 6-month period before entering treatment and the 6-month period before the follow-up interview. Specifically, results include changes in: (1) quality of life rating, (2) positive and negative feelings, and (3) satisfaction with life rating.

### 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'. KORTOS clients rated their quality of life as a 3.3 at intake (see Figure 6.1). The average quality of life rating significantly increased to 7.3 at follow-up.

FIGURE 6.1. PERCEPTION OF QUALITY OF LIFE AT INTAKE AND FOLLOW-UP (N = 184)



\*\*\*p < .001.

## Trends in Quality of Life Rating

Clients are asked to rank their overall quality of life on a scale from 1 (worst imaginable) to 10 (best imaginable) at both intake and follow-up. At intake, KORTOS clients have consistently rated their quality of life, on average, close to 4. At follow-up, that rating has significantly increased to an average of about a 7.5 (see Figure 6.2).

FIGURE 6.2. TRENDS IN QUALITY OF LIFE RATING AT INTAKE AND FOLLOW, REPORTS 2015–2018

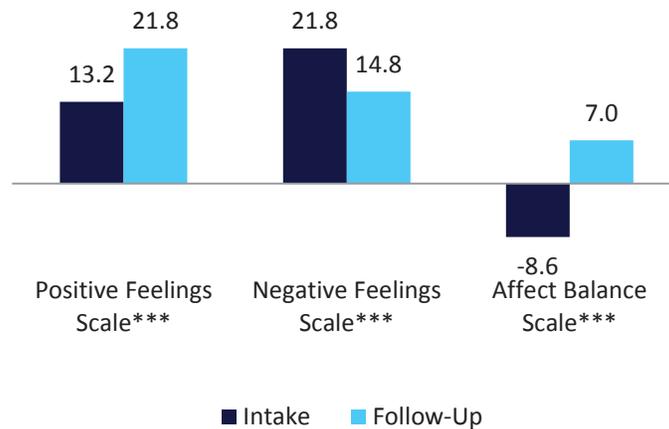


## Positive and Negative Feelings

At both time frames, clients were asked a set of questions about how often they experienced 6 positive and 6 negative emotions/states in the past month (Scale of Positive and Negative Experience [SPANE]<sup>52</sup>). Clients answered using a scale with 1 representing “Very rarely or never” to 5 “Very often or always.” The responses were then added for the 6 positive items, yielding a Positive Feelings Score, and the 6 negative items, for the Negative Feelings Score. The lowest possible score is 6 and the highest possible score is 30. Low scores on the Positive Feelings Scale indicate the client rarely or infrequently experienced the six positive emotions/states. A high score on the Positive Feelings Scale indicates the client very often or frequently experienced the six positive emotions/states. To determine the overall affect balance (or the balance of negative and positive feelings about one’s life), the score derived from the negative feelings score is subtracted from the positive feelings score (with -24 being the minimum and unhappiest to 24 being the happiest). Thus, a client with a high affect balance score reports that he/she rarely experiences negative feelings and very often has positive feelings.

Figure 6.3 shows that clients’ positive feelings increased significantly and their negative feelings decreased significantly from intake to follow-up. Further, the affect balance score also increased significantly from intake to follow-up.

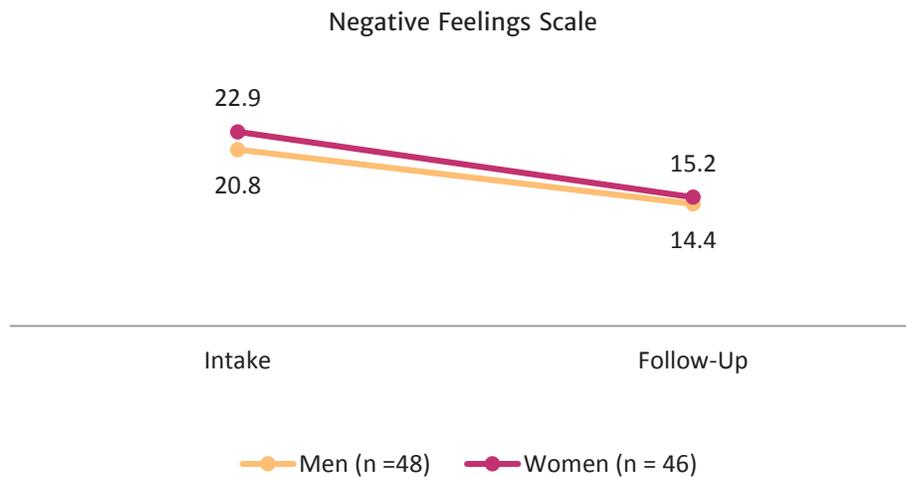
<sup>52</sup> Diener, E., Wirtz, D., Tov, W., Kim-Prieto, C., Choi, D., Oishi, S., & Biswas-Diener, R. (2009). New measures of well-being: Flourishing and positive and negative feelings. *Social Indicators Research*, 39, 247–266.

FIGURE 6.3. POSITIVE AND NEGATIVE FEELINGS AT INTAKE AND FOLLOW-UP (N = 94)<sup>53</sup>

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

## Gender Differences in Positive and Negative Feelings

At intake, women had higher average scores on the negative feelings scale. For both women and men, there was a significant decrease in average scores on the negative feelings scale over time.

FIGURE 6.4. GENDER DIFFERENCES IN NEGATIVE FEELINGS AT INTAKE AND FOLLOW-UP<sup>a,b</sup>

a – Significant difference by gender at intake; p &lt; .05.

b – Significant decrease for men and women from intake to follow-up; p &lt; .001.

## Satisfaction with Life Rating

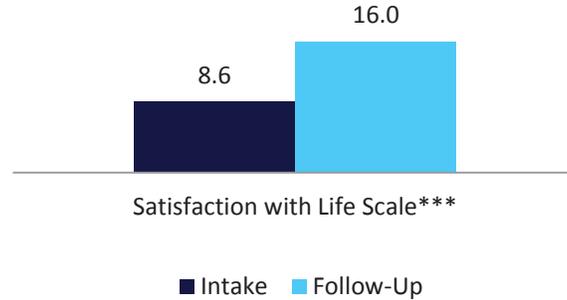
At both time frames, clients were presented with five statements and asked to respond how much they agreed or disagreed with each statement, using a scale with 1 representing “Strongly disagree” and 5 representing “Strongly agree”.<sup>54</sup> Each statement is a positively worded aspect of high satisfaction with one’s life. One statement, for example, is “In most ways my life is close

<sup>53</sup> These questions were removed from the survey in October 2016.

<sup>54</sup> Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment*, 49, 71-75.

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 6.5 shows that clients’ scores on the satisfaction with life scale increased significantly from intake (8.6) to follow-up (16.0).

FIGURE 6.5. SATISFACTION WITH LIFE AT INTAKE AND FOLLOW-UP (N = 184)



\*\*\*p < .001.

### Trends in Satisfaction with Life Rating

Average ratings of clients’ satisfaction with their lives has remained steady at both intake (about a 9) and at follow-up (about a 17).

FIGURE 6.6. TRENDS IN SATISFACTION WITH LIFE RATING AT INTAKE AND FOLLOW, REPORTS 2015–2018



*"It's really good, they care about you and want to help you."*

—KORTOS Follow-up Client

## Section 7.

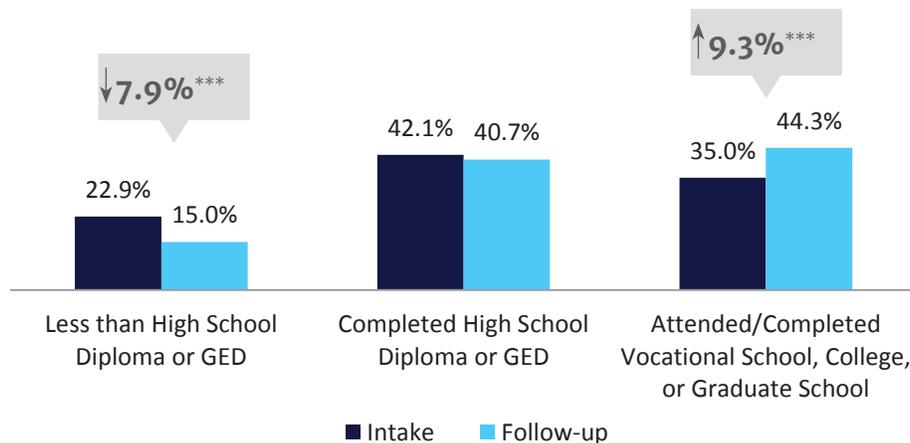
# Education, Economic Status, and Living Circumstances

This section examines changes in education, economic status, and living circumstances from intake to follow-up including: (1) highest level of education completed, (2) the number of months clients were employed full-time or part-time, (3) the percent of clients who worked full-time or part-time, (4) hourly wage, (5) homelessness, (6) living situation, and (7) economic hardship.

### Education

The average highest level of education increased significantly from intake (12.5) to follow-up (12.9), where 12 = High school diploma or GED (not depicted in a figure). Another way to examine change in education is to examine change in the number of clients who reported different levels of education. There was a significant increase in the percent of clients who reported attending or completing vocational school, college, or graduate school from intake to follow-up (see Figure 7.1).

FIGURE 7.1. HIGHEST LEVEL OF EDUCATION COMPLETED AT INTAKE AND FOLLOW-UP (n = 140)<sup>55</sup>



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

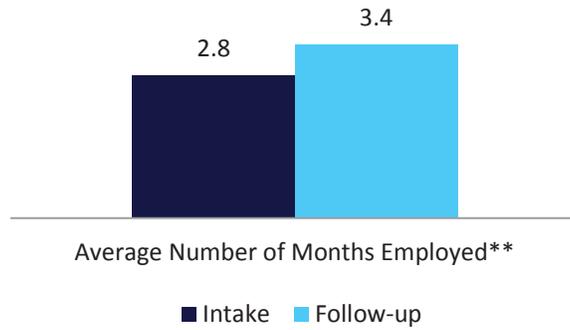
### Employment

#### Average Number of Months Employed in the Past 6 Months

At both intake and follow-up, clients were asked to report the number of months in the past 6 months they were employed at least part-time. Figure 7.2 shows there was a significant increase over time in the average number of months clients reported they were employed from intake (2.8) to follow-up (3.4).

<sup>55</sup> Thirty-four cases had missing values for education because of inconsistencies in data from intake to follow-up.

FIGURE 7.2. AVERAGE NUMBER OF MONTHS EMPLOYED IN THE PAST 6 MONTHS AT INTAKE AND FOLLOW-UP (N = 184)



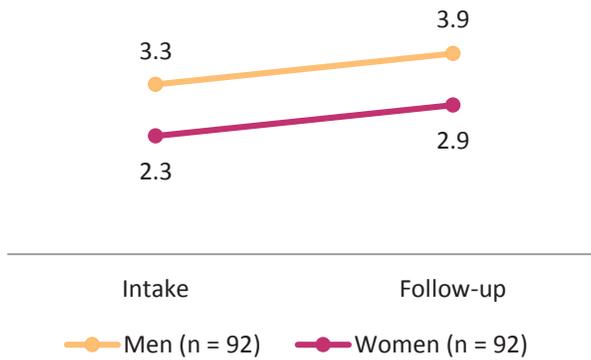
\*\*p < .01

**GENDER DIFFERENCES IN THE NUMBER OF MONTHS EMPLOYED**

Men reported working significantly more months at both periods compared to women (intake, 3.3 vs. 2.3 and follow-up, 3.9 vs. 2.9). There was a significant increase in the number of months employed from intake to follow-up for both men and women (see Figure 7.3).

**Men reported more months of employment than women at intake and follow-up**

FIGURE 7.3. GENDER DIFFERENCES IN NUMBER OF MONTHS EMPLOYED AT INTAKE AND FOLLOW-UP<sup>a, b</sup>



a—Significant difference in number of months worked at intake and follow-up (p < .05) by gender.  
 b – Significant increase for men and women from intake to follow-up; p < .05.

*"It got me off of heroin and I'm not sick anymore. I can hold a job now."*

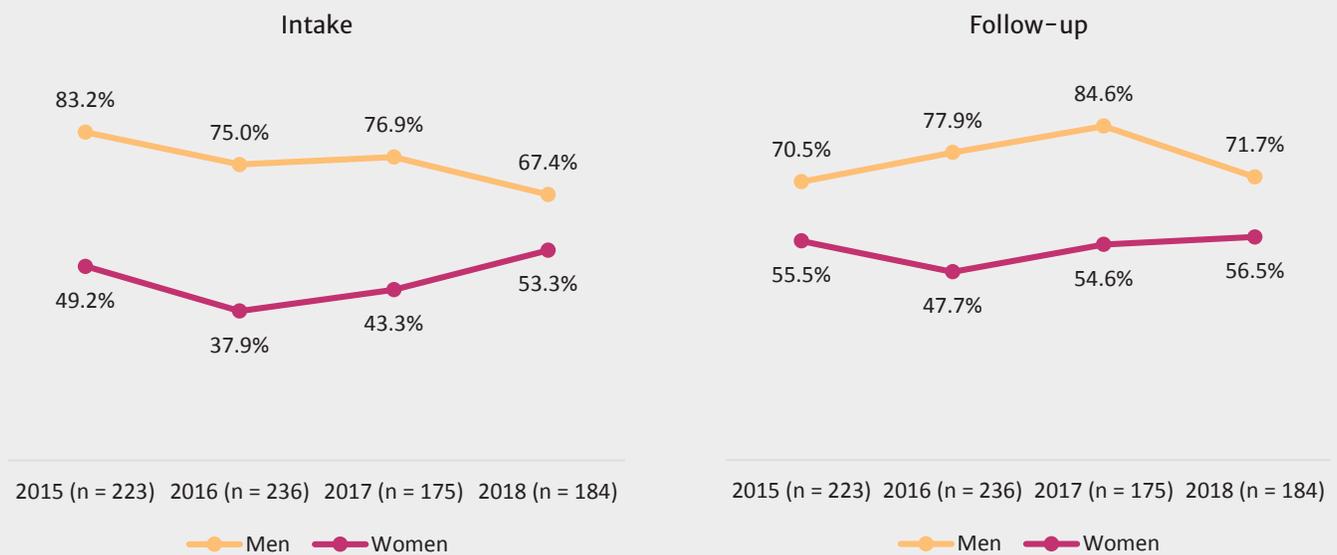
—KORTOS Follow-up Client

## Trends in Employment by Gender

For the past 4 years, significantly fewer women reported being employed (full- or part-time) at least one month in the past 6 months at intake compared to men. In 2018, however, the gap is narrowed with 67.4% of men reporting employment compared to 53.3% of women. In the 2016 report year, only 37.9% of women were employed at least one month in the past 6 months at intake while 75.0% of men reported employment.

By follow-up, on average, around half of women reported they were employed full-time or part-time at least one month in the past 6 months but significantly more men reported employment during that same time frame.

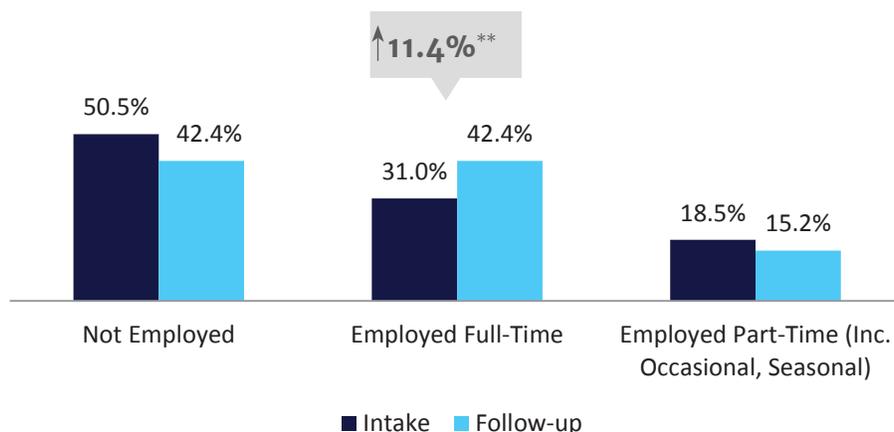
FIGURE 7.4. TRENDS IN GENDER DIFFERENCES IN CLIENTS EMPLOYED AT INTAKE AND FOLLOW-UP



## Current Employment Status

At intake, about half of clients were not employed (see Figure 7.5) in the 30 days before they entered the program and at follow-up, the percent of clients who were not employed was 42.4%. Additionally, the number of clients who were employed full-time significantly increased 11.4%, from 31.0% at intake to 42.4% at follow-up.

FIGURE 7.5. CURRENT EMPLOYMENT STATUS AT INTAKE AND FOLLOW-UP (N = 184)<sup>a</sup>

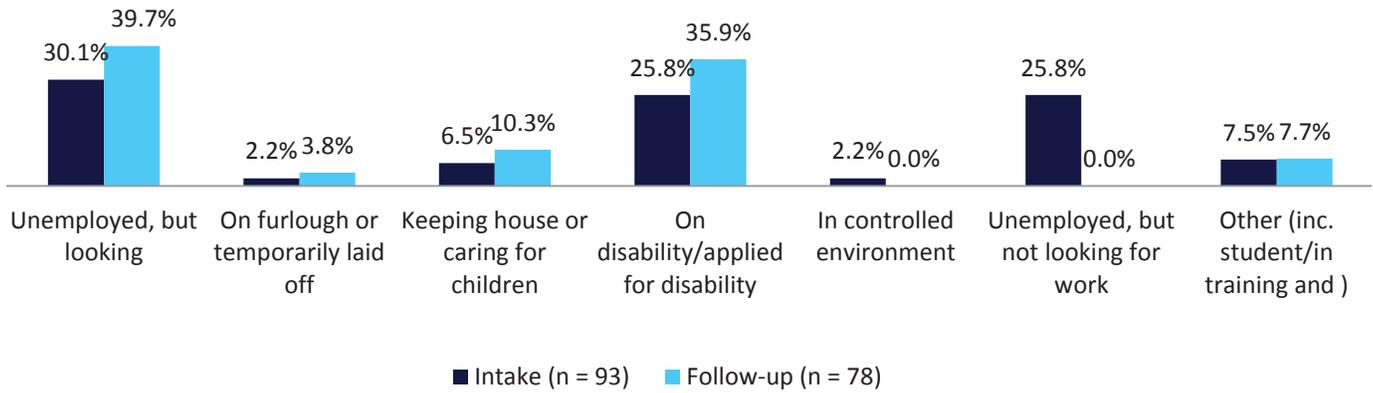


a – Significance tested with the Stuart-Maxwell Test of Overall Marginal Homogeneity ( $p < .01$ )

\*\*  $p < .01$ .

Of those not employed at each point, clients were asked why they were not currently employed. At intake (n = 93), 30.1% of clients reported they were unemployed, but looking for work, 25.8% were unemployed, but were not looking for a job, and 25.8% were also on disability or had applied for disability. Of clients not employed at follow-up (n = 78), 39.7% were unemployed, but looking for work and 35.9% reported they were on disability or had applied for disability.

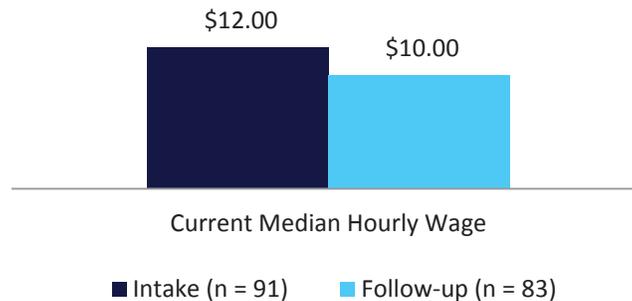
FIGURE 7.6. REASONS FOR UNEMPLOYMENT STATUS AT EACH POINT



### Hourly Wage

Of those clients who were employed at intake (n = 91), the median hourly wage was \$12.00 for those . Of those employed at follow-up and who reported their hourly wage (n = 83)<sup>56</sup>, the median hourly wage was \$10.00 (see Figure 7.7).

FIGURE 7.7. CURRENT MEDIAN HOURLY WAGE AT INTAKE AND FOLLOW-UP, AMONG EMPLOYED CLIENTS



### GENDER DIFFERENCES IN HOURLY WAGE

Among employed clients, there was a significant difference in median hourly wage between men and women at intake; employed women made \$0.66 for every \$1 men made (\$14.00 for men and \$9.25 for women). At follow-up, employed men again reported a significantly higher hourly wage than employed women (\$11.00 vs. \$10.00; see Figure 7.8).

At follow-up, **employed women made \$0.91 for every \$1 employed men made**

<sup>56</sup> While 106 clients were employed at follow-up, 23 clients either refused to report, or didn't know their hourly wage.

FIGURE 7.8. MEDIAN HOURLY WAGE EMPLOYED WOMEN MAKE FOR EVERY DOLLAR EMPLOYED MEN MAKE AT INTAKE AND FOLLOW-UP



a—Significant difference in median hourly wage at intake ( $p < .01$ ).

### Trends in the Gender Wage Gap

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

In both 2015 and 2016 at intake, employed women made more per hour compared to men than at follow-up. In 2017, while women were still being paid significantly less than men, the gap between what women were paid at intake (\$0.65 for every dollar men made) and follow-up (\$0.68 for every dollar men made) narrowed. In 2018 the numbers improved and women reported a higher hourly wage at follow-up compared to intake.

FIGURE 7.9. TRENDS IN THE GENDER WAGE GAP AT INTAKE AND FOLLOW, REPORTS 2015–2018<sup>57</sup>



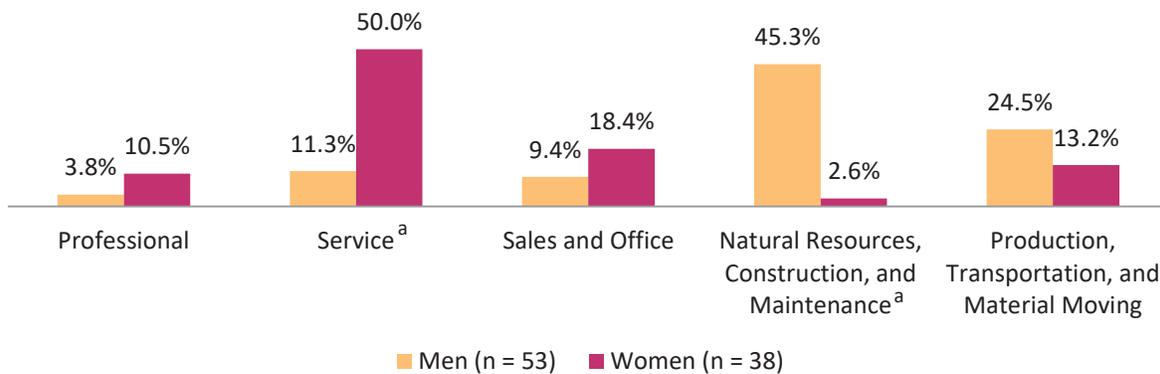
<sup>57</sup> Because 19 men had missing values for their hourly wage, the median was lower for men this year which made the women's appear higher compared to previous years.

## 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 by gender for employed individuals.<sup>58</sup> At intake, half of employed women reported having a service job (e.g., waiter/waitress, child care, housekeeping, hair stylist, etc.) while only 11.3% of employed men reported having a service job (see Figure 7.10a). Significantly more men reported working natural resources, construction, and maintenance jobs (e.g., mining, logging, farming, mechanic, heating/air conditioning tech, etc.) than women (45.3% vs. 2.6%), which tend to be higher paying than service jobs.

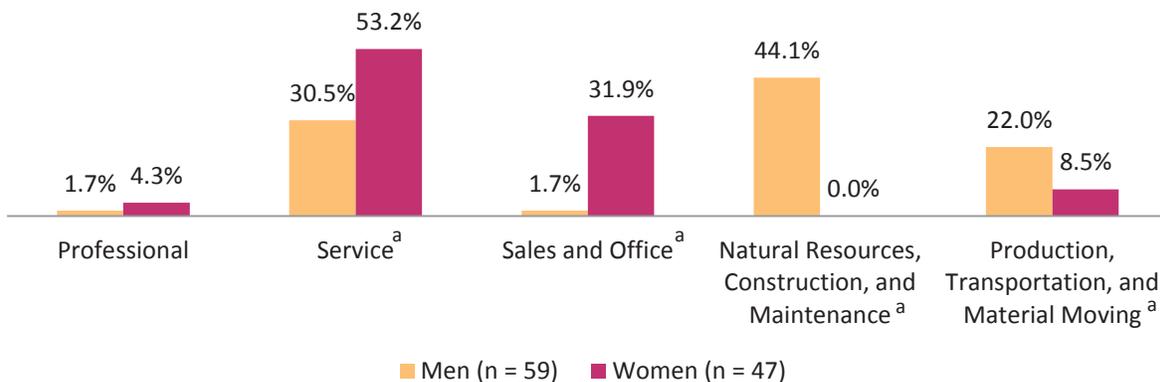
At follow-up, the difference in occupation type was similar. Over half of employed women (53.2%) reported having a service job whereas less than one-third (30.5%) of employed men had a service job (see Figure 7.10b). About 32% of women had sales and office jobs (e.g., administrative support, cashier, retail sales, telemarketer, bank teller, etc.) while only 1.7% of employed men reported working similar jobs. Similar to intake, more employed men reported having a natural resources, construction, or maintenance job compared to women (44.1% vs. 0.0%). Production, transportation, and material moving jobs (e.g., factory production line, power plant, bus driver, welder, sanitation worker, etc.) were reported by less than one-third of employed men (22.0%) and only 8.5% of employed women.

FIGURE 7.10a. AMONG EMPLOYED INDIVIDUALS, TYPE OF OCCUPATION BY GENDER AT INTAKE\*\*\*



a – Significant difference by gender.  
 \*\*\*p < .001

FIGURE 7.10B. AMONG EMPLOYED INDIVIDUALS, TYPE OF OCCUPATION BY GENDER AT FOLLOW-UP (N = 106)\*\*\*



a – Significant difference by gender.  
 \*\*\*p < .001

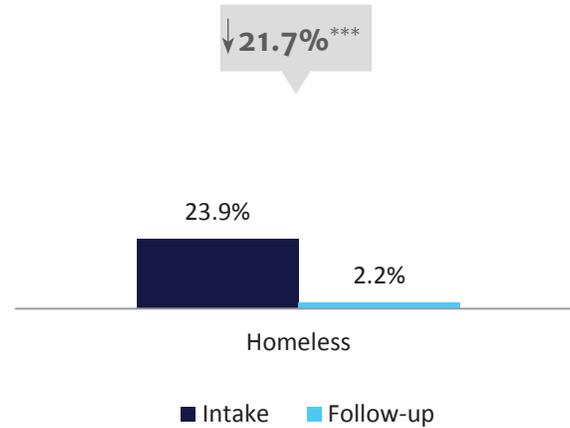
<sup>58</sup> Occupation type was asked only of individuals who reported they were currently employed at intake and at follow-up.

## Living Circumstances

### Homelessness

Almost one-quarter of clients (23.9%) reported at treatment intake they were homeless at some point in the past 6 months. At follow-up, only 2.2% of clients reported they had been homeless at some point in the past 6 months (see Figure 7.11).

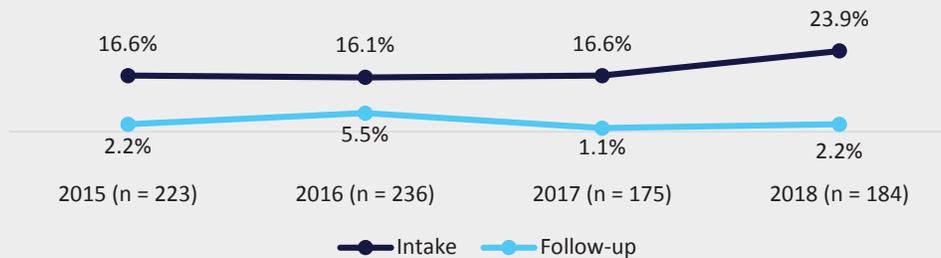
FIGURE 7.11. CLIENTS REPORTING HOMELESSNESS IN THE PAST 6 MONTHS AT INTAKE AND FOLLOW-UP (N = 184)



### Trends in Past-6-month Homelessness

From 2015 to 2017, the number of clients reporting that they considered themselves homeless in the past 6 months at intake remained steady at a little over 16% of clients. In 2018, the number of clients who considered themselves homeless at intake increased to 23.9%. At follow-up each year, very few clients reported that they considered themselves homeless. In both 2015 and 2018, only 2.2% of clients considered themselves homeless in the past 6 months at follow-up.

FIGURE 7.12. TRENDS IN THE NUMBER OF CLIENTS REPORTING HOMELESSNESS IN THE PAST-6-MONTHS AT INTAKE AND FOLLOW-UP, REPORTS 2015-2018

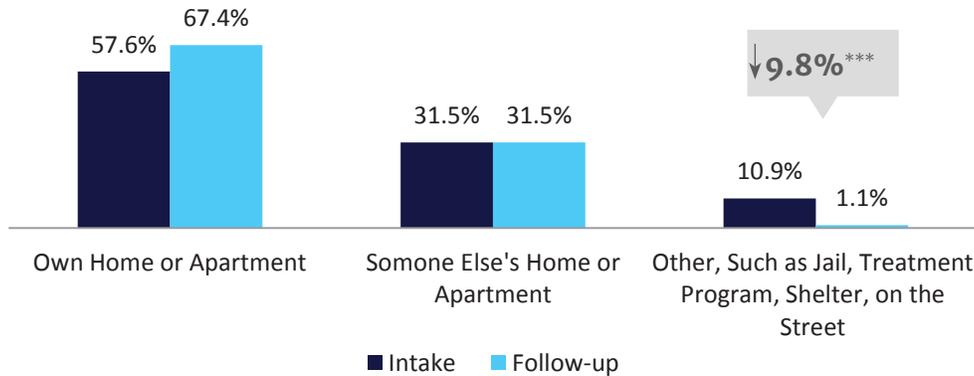


## Living Situation in the Past 6 Months

Figure 7.13 shows that over half of clients (57.6%) reported they were living in their own home or apartment in the past 6 months at intake and 67.4% reported they were living in their own home or apartment at follow-up. The number of clients who lived in jail, a treatment center, shelter, or on the street significantly decreased 9.8%, from 10.9% at intake to 1.1% at follow-up.

Significantly fewer clients reported they were living in jail, treatment program, shelter, or on the street at follow-up

FIGURE 7.13. TYPE OF TYPICAL RESIDENCE IN THE PAST 6 MONTHS AT INTAKE AND FOLLOW-UP (N = 184)<sup>a</sup>



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

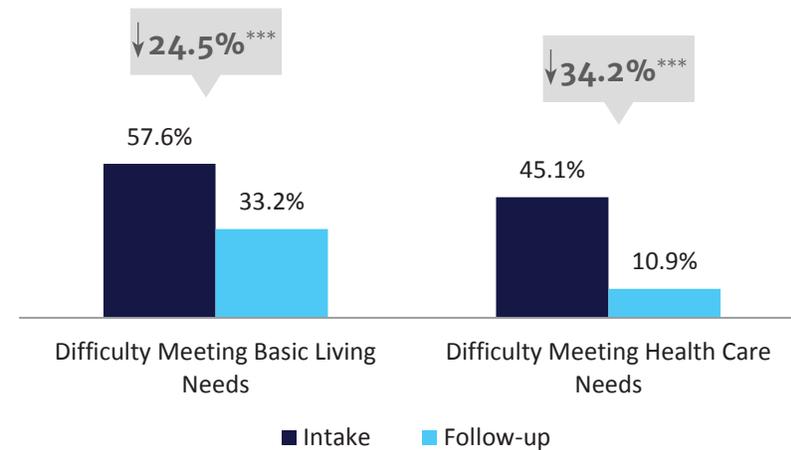
## Difficulty Meeting Living and Health Care Needs for Financial Reasons

Clients were asked eight items, five of which asked about the clients' difficulty meeting basic living needs such as food, shelter, utilities, and telephone, while three items asked about the clients' difficulty obtaining health care for financial reasons.

The number of clients reporting difficulty meeting basic living needs (e.g., shelter, utilities, phone, food) significantly decreased by 24.5% from 57.6% to 33.2% (see Figure 7.14). The number of clients who reported difficulty meeting health care needs (e.g., doctor visits, dental visits, and prescription medications) for financial reason decreased by 34.2% from 45.1% at intake to 10.9% at follow-up.

Percentage of clients reporting **difficulty meeting basic living needs decreased 25%**

FIGURE 7.14. DIFFICULTY MEETING BASIC LIVING NEEDS AND HEALTH CARE NEEDS FOR FINANCIAL REASONS AT INTAKE AND FOLLOW-UP (N = 184)



\*\*\*p < .001.

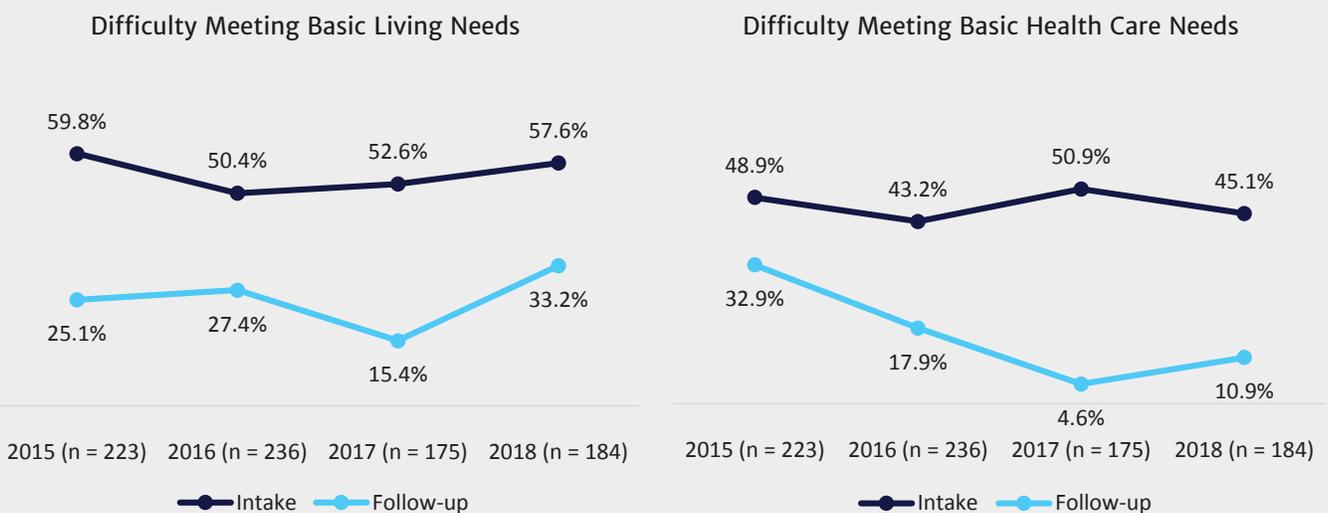
### Trends in Difficulty Meeting Living and Health Care Needs for Financial Reasons

For each of the past 4 years, there has been a significant decrease in the number of KORTOS clients who reported they had difficulty meeting basic living needs and health care needs in the past 6 months from intake to follow-up.

In general, well over half of clients reported having difficulty meeting basic living needs (e.g., shelter, utilities, phone, food) at intake. At follow-up, an average of 25% of clients reported having difficulty meeting basic living needs. In 2018, the number of clients who reported having difficulty meeting basic living needs increased to 33.2% from 15.2% in 2017.

Close to half of clients, at intake, reported having difficulty meeting basic health care needs (i.e., doctor visits, dental visits, and prescription medications) each year. For the past 4 years, the number of clients reporting having difficulty meeting basic health care needs in the past 6 months at follow-up has decreased dramatically (from 32.9% in 2015 to 4.6% in 2017).

FIGURE 7.15. TRENDS IN THE NUMBER OF CLIENTS REPORTING ECONOMIC DIFFICULTY IN THE PAST-6-MONTHS AT INTAKE AND FOLLOW-UP, REPORTS 2015-2018



Section 8.

# Recovery Supports

This section focuses on four main changes in recovery supports: (1) percent of clients attending mutual help recovery group meetings, (2) the number of people the client said they could count on for recovery support, (3) what will be most useful to the client in staying off drugs/alcohol, and (4) clients' perceptions of their chances of staying off drugs/alcohol.

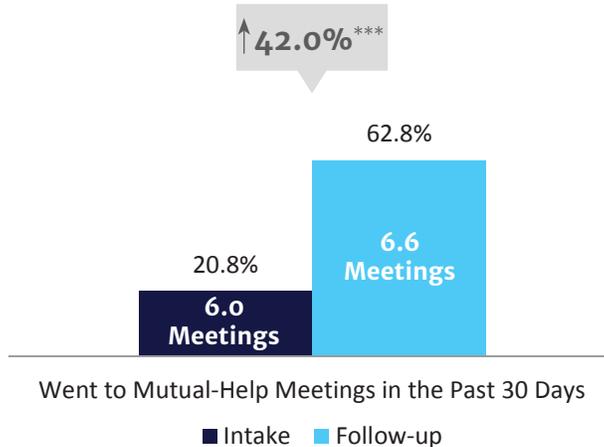
## Mutual Help Recovery Group Meeting Attendance

At intake, only 20.8% of clients reported going to mutual help recovery group meetings (e.g., AA, NA, or faith-based) in the past 30 days (See Figure 8.1). At follow-up, there was a significant increase of 42.0%, with 62.8% of clients reporting they had gone to mutual help recovery group meetings.

The number of clients who **attended mutual help recovery meetings increased by 42%**

Among clients who had attended mutual help recovery group meetings at intake (n = 39), they reported attending an average of 6.0 meetings. Among clients who attended mutual help recovery group meetings at follow-up (n = 115), they reported attending an average of 6.6 meetings.

FIGURE 8.1. CLIENTS REPORTING MUTUAL HEALTH RECOVERY GROUP ATTENDANCE AT INTAKE AND FOLLOW-UP (N = 183)<sup>59</sup>



\*\*\*p < .001.

*"I like everything, the groups, the hours. They're understanding and don't judge."*

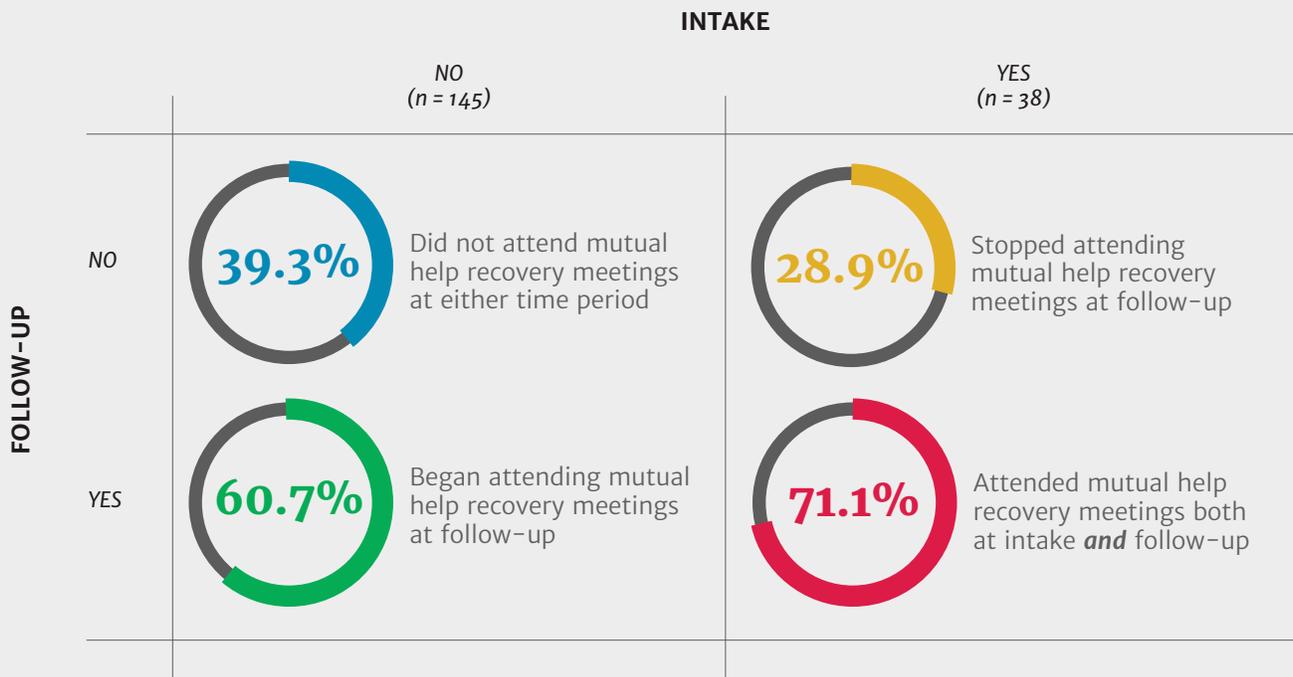
—KORTOS Follow-up Client

<sup>59</sup> One client had missing data for mutual help recovery group meeting attendance.

## TAKING A CLOSER LOOK AT RECOVERY SUPPORT

Less than one-third of clients reported attending mutual help recovery group meetings in the 30 days before entering treatment (20.8%, n = 38). Of those clients, 71.1% of clients also attended meetings in the 30 days before follow-up. In addition, of those who did not attend mutual help recovery group meetings at intake (79.2%, n = 145), 60.7% did attend at least one meeting in the past 30 days at follow-up.

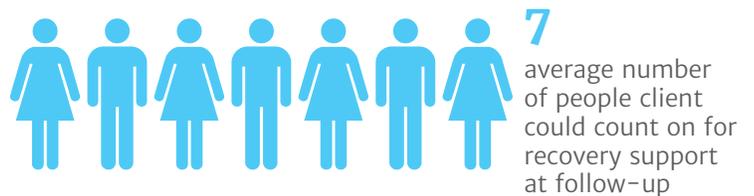
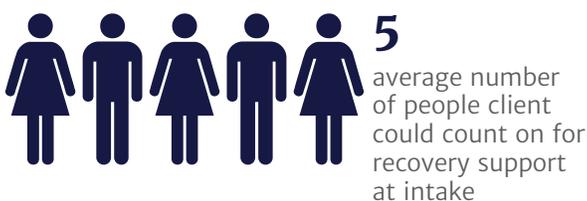
FIGURE 8.2. A CLOSER LOOK AT THE NUMBER OF CLIENTS WHO ATTENDED MUTUAL HELP RECOVERY GROUP MEETINGS AT INTAKE AND/OR FOLLOW-UP



## Number of People Client Can Count on for Recovery Support

The average number of people clients reported they could count on for recovery support significantly increased by from intake (5.0) to follow-up (6.7; see Figure 8.3).

FIGURE 8.3. AVERAGE NUMBER OF PEOPLE CLIENT COULD COUNT ON FOR RECOVERY SUPPORT AT INTAKE AND FOLLOW-UP (N=183)<sup>60\*</sup>



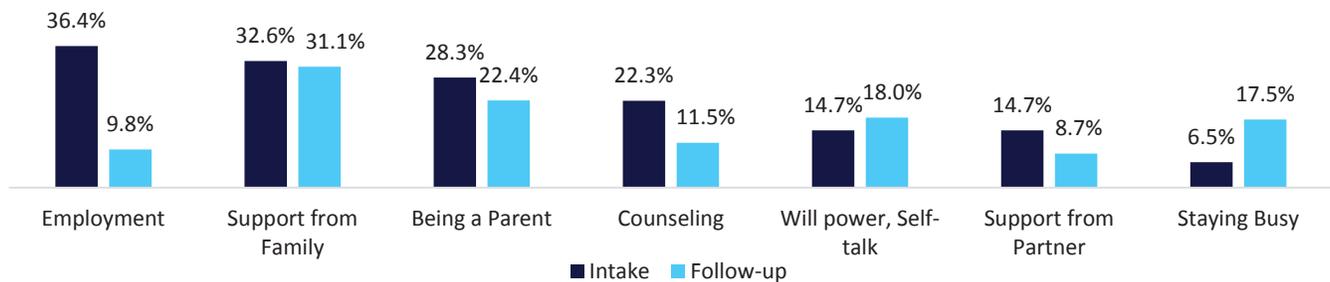
\*p < .05.

<sup>60</sup> One person had missing data at follow-up for number of people they could count on for recovery support.

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

At intake and follow-up, clients were asked what, other than medication-assisted therapy, 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 categories during each time period are presented for descriptive purposes in Figure 8.4. The most common responses at intake were employment, support from family, and being a parent. At follow-up, the most common responses were similar: support from family, being a parent, and will power.

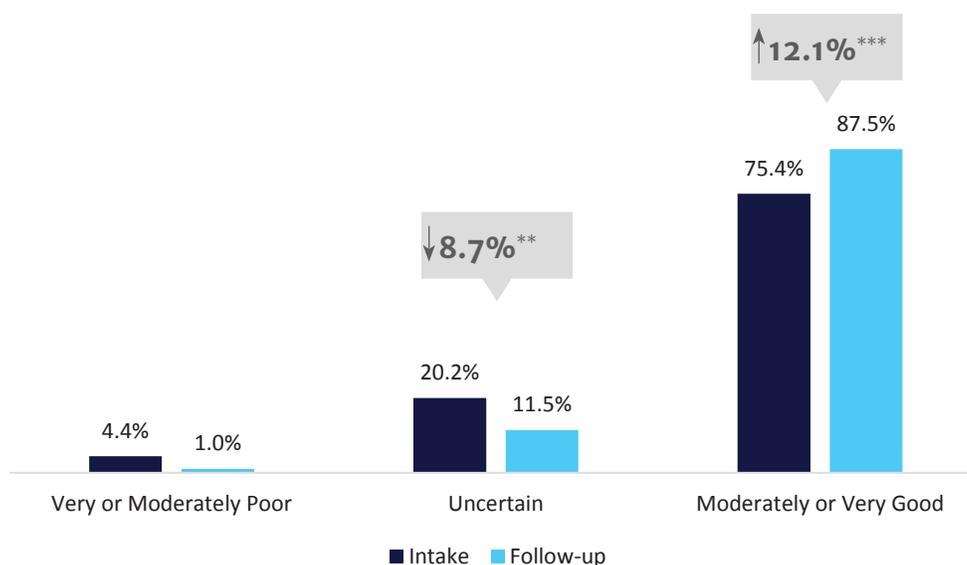
FIGURE 8.4. CLIENTS REPORTING WHAT WILL BE MOST USEFUL IN STAYING OFF DRUGS AND/OR ALCOHOL (N = 183)<sup>61</sup>



## 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 4.1 at intake and a 4.5 at follow-up, which was a significant increase (not depicted in figure). Overall, 75.4% of clients believed they had moderately or very good chances of staying off drugs/alcohol at intake with a significant increase of 12.1% at follow-up (87.5%; see Figure 8.5).

FIGURE 8.5. CLIENTS REPORTING THEIR CHANCES OF GETTING OFF AND STAYING OFF DRUGS/ALCOHOL AT INTAKE AND FOLLOW-UP (N = 183)<sup>62</sup>



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

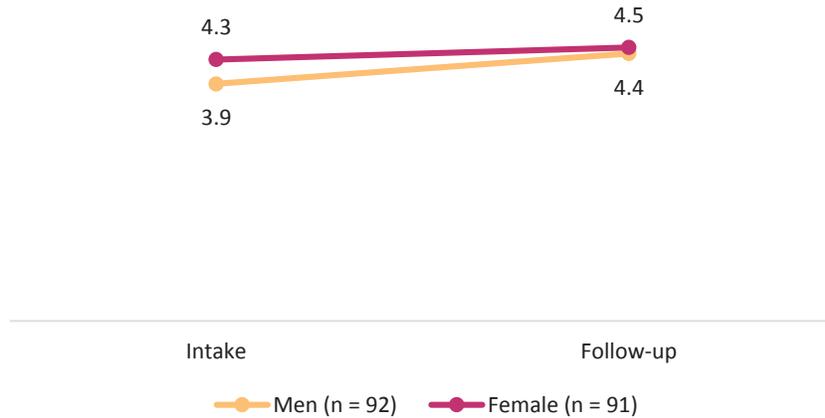
<sup>61</sup> One client refused to answer the question on what would be most useful in staying off drugs/alcohol at follow-up.

<sup>62</sup> One client refused to answer the question.

## Gender Differences in Chances of Staying Off Alcohol/drugs

At intake, women rated their chances of getting off drugs/alcohol higher than men (4.3 vs. 3.9, respectively). At follow-up, the average rating men reported for their chances of getting off drugs/alcohol increased significantly (see Figure 8.6)

FIGURE 8.6. GENDER DIFFERENCES IN CLIENTS REPORTING THEIR CHANCES OF GETTING OFF AND STAYING OFF DRUGS/ALCOHOL AT INTAKE AND FOLLOW-UP<sup>a, b</sup>



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

b— Significant change for men from intake to follow-up ( $p < .001$ ).

## Section 9.

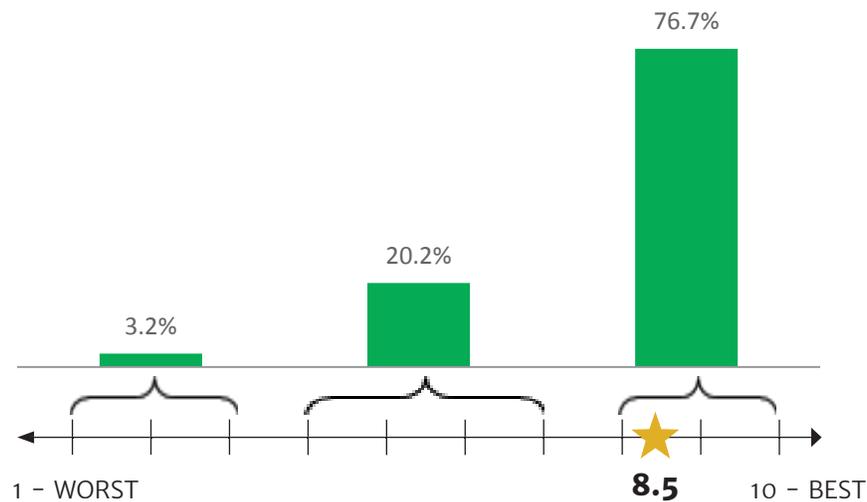
# Client Satisfaction with Opioid Treatment Programs

At the beginning of the follow-up interview, clients were asked to give their opinions and feedback regarding their program experience. The items measured in this report include: (1) overall client satisfaction with the program, (2) clients' ratings of program experiences, and (3) positive and negative aspects of program participation.

## Overall Client Satisfaction

At the beginning of the follow-up interview, clients were asked to rate their experience at the program on a scale from 1 representing the worst possible experience to 10 representing the best possible experience. The average rating given by clients in the follow-up sample was 8.5, with 76.7% of clients giving a highly positive rating of 8 through 10 (see Figure 9.1).

FIGURE 9.1. RATING OF EXPERIENCE AT THE PROGRAM (n = 184)



## Client Ratings of Program Experiences

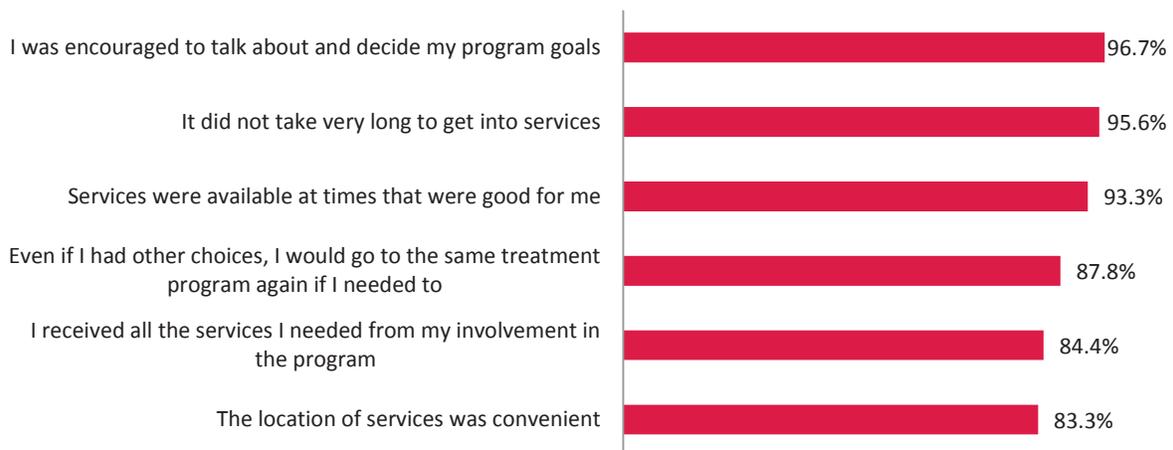
When asked a series of program satisfaction questions, most clients indicated each aspect of their experience was positive (see Figure 9.2). Clients reported that they understood their treatment plan, understood the expectations of the program, received the services needed to get better, and that staff explained their rights as a client.

*"I have a really great relationship with my counselor. I can be open and honest with her."*

—KORTOS Follow-up Client

FIGURE 9.2. PERCENT OF CLIENTS THAT AGREED OR STRONGLY AGREED WITH STATEMENTS ABOUT THEIR PROGRAM EXPERIENCE (n=94)<sup>63</sup>

Figure 9.3 shows that KORTOS clients were satisfied with the overall program services. In fact, almost all the clients reported that they were encouraged to talk about and decide their program goals, it didn't take very long to get into services, and the available times of the services was convenient. About 88% of clients agreed that, even if they had other choices, they would go to the same treatment program again if they needed to. About 84% reported they received all the services they needed from involvement in the program and 83.3% agreed that the location of the services was convenient.

FIGURE 9.3. SATISFACTION WITH TREATMENT SERVICES (N = 90)<sup>64</sup>

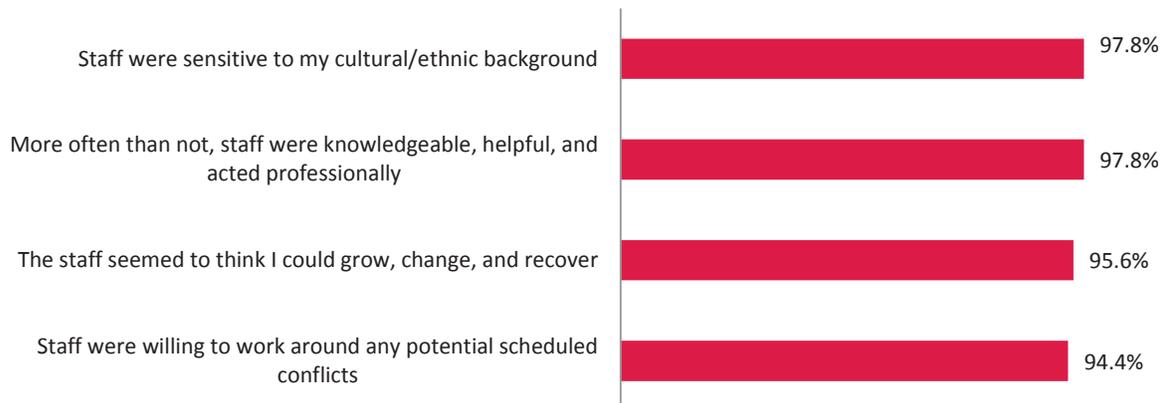
Almost all clients (97.8%) agreed that the treatment staff were sensitive to the clients' cultural/ethnic background, and reported that, more often than not, staff were knowledgeable, helpful, and acted professionally. The majority of clients (95.6%) agreed that the staff seemed to think the client could grow, change, and recover. In addition, 94.4% of clients agreed that the staff were

<sup>63</sup> In October 2016, program satisfaction questions were expanded and reworked, therefore in this report, only 94 clients were asked to rate the following program experiences.

<sup>64</sup> Ninety individuals were asked the expanded and reworked program satisfaction questions.

willing to work around any potential scheduled conflicts.

FIGURE 9.4. GENERAL SATISFACTION WITH TREATMENT STAFF (N = 90)



All clients reported that they felt safe while in the treatment program and that the staff sufficiently talked to the client about personal safety while in the program (see Figure 9.5). The majority of clients (98.9%) reported that and if they experienced harassment or had safety concerns while in the program that the client would have felt comfortable telling staff about it. Almost 97% of clients reported they were encouraged to use self-help programs like support groups. The majority of clients (95.5%) of clients also agreed they felt better about themselves as a result of treatment. About 95% of KORTOS clients believed that the staff helped them obtain information so they could take charge of managing their drug/alcohol problems.

FIGURE 9.5. SATISFACTION WITH PROGRAM ASPECTS ADDRESSING SAFETY AND SUBSTANCE ABUSE TREATMENT (N = 90)

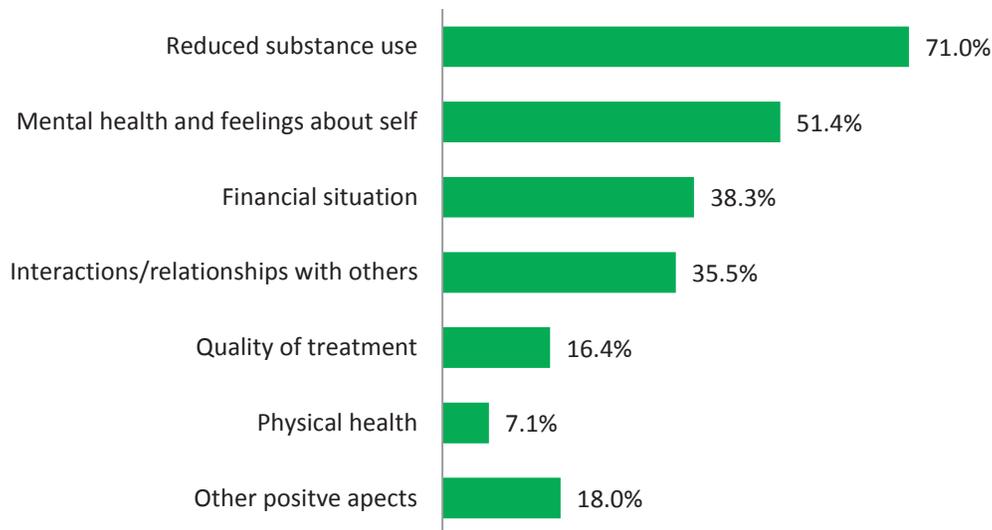


## Positive and Negative Aspects of Program

Clients were asked to identify the three most positive aspects of their participation in the program (Figure 9.6). Seventy-one percent of clients reported that reduction in substance use was a positive outcome and 51.4% stated that improved mental health and feelings about self was a positive aspect. About 38% of clients reported changes in their financial situation and employment while 35.5% said interactions and relationships with others was a positive aspect. Around 16% said the quality of treatment was a positive aspect. About 7% of clients reported that changes

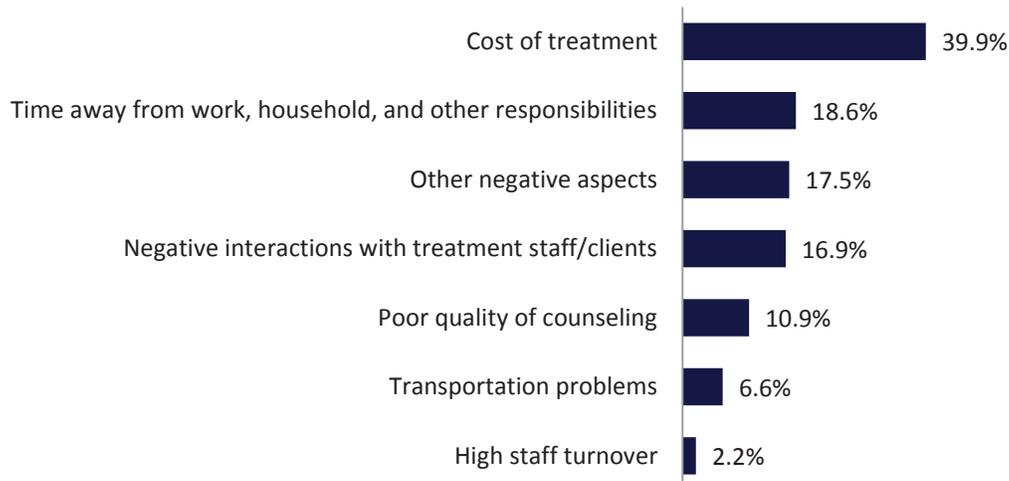
in physical health was a positive aspect. About 18.0% of clients reported other positive aspects including improved education, becoming a better parent or regaining custody of their children, and major positive life changes.

FIGURE 9.6. PERCENT OF CLIENTS REPORTING POSITIVE ASPECTS OF THE PROGRAM (N = 183)<sup>65</sup>



Aspects of treatment that clients identified as problematic or needing improvement are displayed in Figure 9.7. The negative aspects of the program suggest barriers that clients must overcome to participate in the program. Specifically, cost of the program (39.9%), time away from work, household, or other responsibilities (18.6%), other negative aspects such as medication problems and how the facility was run (17.5%), and negative interactions with staff or other clients (16.9%) were most frequently mentioned as negative aspects. Other areas of difficulty included the quality of counseling (e.g., not enough counseling; 10.9%), transportation problems (6.6%), and high staff turnover (2.2%).

FIGURE 9.7. PERCENT OF CLIENTS REPORTING NEGATIVE ASPECTS OF THE PROGRAM (N = 183)<sup>66</sup>



<sup>65</sup> One client responded “don’t know” to all questions regarding the most positive aspects of the program.

<sup>66</sup> One client responded “don’t know” to all questions regarding the most negative aspects of the program.

## Section 10.

# Implications and Conclusions

The KORTOS 2018 Annual Follow-Up Report describes characteristics of clients who participated in opioid treatment programs during calendar year 2016 had completed intake interviews (N = 514). In addition, outcomes are presented for 184 clients who completed a follow-up telephone interview 6 months after the intake interview and were still engaged in the treatment program.

Overall, of the clients with intake interviews (N = 514), over half were male and 44.7% were female with ages 18 to 64 (average age 36 years old). Most were White and 55.3% were unemployed in the six months before intake. About 17% had been arrested and 13.0% spent at least one night in jail six months before the intake was completed.

When looking at referral to treatment, the largest categories were self-referred (49.4%) and referred by a family member, partner or friend (37.5%), and not formal referrals through community agencies. The majority of adults who completed an intake interview reported using illegal drugs (96.1%) and smoked tobacco (81.8%) while less than one-quarter of clients reported using alcohol (23.0%) in the 6 months before intake. The drug classes reported by the greatest number of clients were prescription opioids (74.6%), heroin (55.1%), marijuana (49.6%), and tranquilizers (35.4%).

## Areas of Success

The 2018 evaluation findings indicated that Kentucky opioid treatment programs have been successful in facilitating substantial positive changes in clients' lives. Results for those who were followed-up (n = 184) show that clients made substantial improvements from intake to follow-up in all four core components, including significant reductions in illegal drug and alcohol use, mental health problems, criminal justice system involvement, and a significant increase in quality of life. Improvements were also found for three supplemental areas: health status, economic and living circumstances, and recovery supports.

### Substance Use

There was a significant decrease in clients reporting past-6-month illegal drug use with 97.8% of clients reporting any illegal drug use at intake compared to 31.3% at follow-up. Three-quarters of clients reported misusing prescription opioids at intake, whereas only 6.0% of clients reported prescription opioid misuse at follow-up. Seven out of 10 followed-up clients also reported heroin use at intake and that number significantly decreased to 17.1%. The percent of clients using non-prescribed methadone and bup-nx also decreased significantly. Not only did clients' use of opioids decrease significantly, but also their use of non-opioid drugs (such as marijuana, tranquilizers, benzodiazepines, stimulants) decreased by over half.

### Mental Health, Physical Health, and Stress

Clients' mental health also showed significant improvements. At follow-up, half as many clients had symptoms of depression, generalized anxiety, and comorbid depression and anxiety. In addition, the number of clients reporting suicidal ideation or attempts decreased from 27.2% at intake to 4.3% at follow-up.

Stress and physical health was better for clients at follow-up. Specifically, clients reported significantly reduced stress-related health consequences, number of days of poor physical and mental health, and number of days their physical or mental health problems limited their daily

activities at follow-up when compared to intake. In addition, significantly fewer clients reported they had experienced chronic pain in the 6 months before follow-up.

### Criminal Justice System Involvement

A minority of KORTOS clients reported criminal justice system involvement at intake and the number of clients reporting being arrested or incarcerated was significantly lower at follow-up. Specifically, 19.0% of clients reported having been arrested in the 6 months before entering treatment and, at follow-up, 3.8% of clients reported an arrest in the past 6 months. About 15% of clients reported spending at least one night in jail or prison in the past 6 months at intake compared to 7.1% of clients at follow-up. Past-4-year trend analysis shows that the number of clients reporting an arrest and clients reporting spending at least one night in jail have been relatively stable at both intake and follow-up.

### Quality of and Satisfaction with Life

Further, clients rated their quality of life as significantly higher after participating in the program. At follow-up, clients had significantly more positive feelings and fewer negative feelings and their satisfaction with life rating had significantly increased. These high quality of life and satisfaction with life ratings at follow-up have been consistent over the past 4 years.

### Economic Status and Living Circumstances

KORTOS clients showed improvements in economic and living circumstances from intake to follow-up. About 42% of clients reported being employed full time at follow-up compared to 31% at intake. Furthermore, the average number of months clients reported working in the past 6 months increased from 2.8 months at intake to 3.4 months at follow-up. In addition, the number of clients who considered themselves homeless in the past 6 months decreased significantly from 23.9% at intake to 2.2% 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.

### 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. In fact, 60.7% of clients who reported they had not attended mutual help recovery group meetings at intake, reported that they were attending at follow-up. Of the clients who reported they attended these meetings at intake, 71.1% reported they continued to go at follow-up. Also at follow-up, clients reported having significantly more people they could count on for recovery support. Almost 90% of clients stated they thought they had a moderately or very good chance of staying off drugs or alcohol at follow-up.

### Satisfaction with Opioid Treatment Program

Finally, clients reported high levels of satisfaction with their OTP experience. 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 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 88% of clients reported that even if given other choices, they

would go to the same treatment program again if they needed to. In addition, clients reported many positive aspects of their participation in the program including reduced substance use, improved mental health and their feelings about themselves, improved financial situation, and improved relationships with others.

## Areas of Concern

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

### Drug Use

When looking at trends over time in past-30-day use at intake, results show that while prescription opiate and methadone use has decreased gradually over the past 10 years, heroin use has sharply increased since 2011. Continued drug use during medication assisted treatment has been associated with early program termination<sup>67, 68</sup> and longer treatment retention has been associated with more positive outcomes.<sup>69, 70</sup> Thirty-one percent of KORTOS clients reported using illegal drugs in the 6 months before follow-up. Of those 57 clients, about 21% reported non-prescribed opioid use (including prescription opioids, methadone, and bup-nx) and 55.4% reported heroin use. White et al. found that screening positive for just one non-prescribed drug doubled a client's dropout rate and screening for multiple drugs quadrupled it. In addition, while the number of clients who reported substance use decreased from intake to follow-up, 27.8% of clients still reported experiencing problems associated with drugs and alcohol including cravings, withdrawal, wanting to quite but being unable, or worrying about relapse at follow-up. Similarly, 10.6% of clients reported that they were considerably or extremely troubled or bothered by drug or alcohol problems, and 37.2% of clients reported that treatment for drug or alcohol problems were still extremely/considerably important to them at follow-up.

### Smoking Rates

Smoking rates were high for clients at intake and remained high at follow-up. Smoking has been associated with increased mental health symptoms and physical health problems.<sup>71, 72</sup> 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 has been refuted by recent empirical research studies.<sup>73</sup> Voluntary smoking cessation during substance abuse treatment has been associated with lower relapse. Tobacco use is associated with increased mortality, and smoking cessation has been associated with lower alcohol and

<sup>67</sup> Davstad, I., Stenbacka, M., Leifman, A., Beck, O., Kormaz, S., & Romelsjö, A. (2007). Patterns of illicit drug use and retention in a methadone program: A longitudinal study. *Journal of Opioid Maintenance* 3(1), 27-34.

<sup>68</sup> White, W., Campbell, M., Spencer, R., Hoffman, H., Crissman, B., & DuPont, R. (2014). Patterns of abstinence or continued drug use among methadone maintenance patients and their relation to treatment retention. *Journal of Psychoactive Drugs*, 46(2), 114-122.

<sup>69</sup> Hubbard, R., Craddock, S., & Anderson, J. (2003). Overview of 5-year followup outcomes in the drug abuse treatment outcome studies (DATOS). *Journal of Substance Abuse Treatment*, 25, 125-134.

<sup>70</sup> Gibson, A., Degenhardt, L., Mattick, R., Ali, R., White, J., & O'Brien, S. (2008). Exposure to opioid maintenance treatment reduces long-term mortality. *Addiction*, 103, 462-468.

<sup>71</sup> Patton, G., Coffey, C., Carlin, J., Sawyer, S., & Wakefield, M. (2006). The course of early smoking: A population-based cohort study over three years. *Addiction*, 93, 1251-1260.

<sup>72</sup> Kalman, D., Morissette, S., & George, T. (2005). Co-morbidity of smoking in patients with psychiatric and substance use disorders. *American Journal of Addictions*, 14(2), 106-123

<sup>73</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.

drug relapse.<sup>74</sup>

## Mental and Physical Health

While there were significant reductions in clients meeting study criteria for depression and generalized anxiety, around one-quarter still reported experiencing symptoms of either at follow-up. In addition, of clients who met study criteria for depression or generalized anxiety at follow-up (n = 55), 43.6% reported using alcohol, prescription drugs, or illegal drugs at follow-up to reduce anxiety, worry, or fear. Further, at follow-up, clients still reported having an average of 9 days out of the past 30 days that their mental health was poor. Trend analysis shows that the number of clients meeting study criteria for depression, generalized anxiety, and suicidal ideation/attempts at both intake and follow-up have increased this year compared to previous years. In addition, the number of days in the past 30 days clients felt their mental health was poor at intake and follow-up was higher this year compared to previous years. Furthermore, the number of clients reporting they used alcohol, prescription drugs, or illegal drugs in the past 7 days to reduce or manage stress decreased significantly from intake to follow-up.

In addition, while chronic pain decreased significantly from intake to follow-up, over 30% of clients still reported chronic pain at follow-up. Trend results show reports of chronic pain were higher compared to previous years at both intake and follow-up.

## Economic Difficulties

Though the number of clients who reported they were homeless at some point in the past 6 months decreased significantly from intake to follow-up, trend reports show that the number of clients who were homeless at intake has increased to 1 in 4 clients in 2018. 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>75</sup> While the number of participants reporting a difficulty meeting basic needs for financial reasons decreased at follow-up, 33% of clients still reported at follow-up having difficulty meeting basic living needs. Similarly, while the number of clients reporting current full-time employment increased significantly, 42% 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>76</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. Significantly more men reported using smokeless tobacco at intake and chronic pain at follow-up.

While there were no significant gender differences for any particular substance, more women reported experiencing problems with drugs or alcohol such as craving, withdrawal, wanting to quit but being unable, or worrying about relapse at follow-up compared to men. In addition, more women met study criteria for generalized anxiety at follow-up and comorbid depression

<sup>74</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>75</sup> <http://blog.samhsa.gov/2012/03/23/definition-of-recovery-updated/>

<sup>76</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.

and anxiety at intake compared to men. In addition, women reported a higher average number of days of poor mental health at intake and follow-up. Despite more women reporting comorbid depression and anxiety and more days of poor mental health at intake, significantly more men reported substance use to reduce or manage stress at intake.

In the past 6 months at both intake and follow-up, men reported working a greater average number of months (3.3 and 3.9, respectively) compared to women (2.3 and 2.9, respectively). More women were currently unemployed at both intake and follow-up compared to men—a trend which has been consistent over the past 4 years. Among individuals who were currently employed, men had a significantly higher median hourly wage than women at both intake and follow-up. At intake, employed women made only \$0.66 for every dollar employed men made and at follow-up, the gap in median hourly wages was still present, with employed women making only \$0.91 for every dollar employed men made. Over the last 4 years, the pay gap between men and women has increased at intake and decreased at follow-up.

## Study Limitations

The study findings must be considered within the context of the study's limitations. First, because there is no appropriate group of opioid dependent individuals who would like treatment but do not receive it to compare with the KORTOS individuals who participate in treatment, one cannot attribute all changes from intake to follow-up to opioid replacement treatment. Second, because not all clients agree to participate in the 6-month follow-up interview, it is unclear how generalizable the findings are to the entire client population that completes an intake interview. Analysis comparing those individuals who completed a follow-up interview with those who did not complete a follow-up interview for any reason (for example, they did not agree to be in the follow-up study, they were not selected into the follow-up sample, or they were not successfully contacted for the follow-up interview) found some significant differences between the two groups. Although there were selected significant differences between those followed up, compared to those not followed up, the differences suggest those followed up had more challenges associated with more difficult recovery.

Third, data included in this report was 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>77, 78, 79, 80</sup> Earlier studies found that the context of the interview influences reliability.<sup>81</sup> During the informed consent process for the KORTOS follow-up study, interviewers tell participants that the research team operates independently from the opioid treatment programs, 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.

<sup>77</sup> Del Boca, F., & Noll, J. (2000). Truth or consequences: the validity of self-report data in health services research on addictions. *Addiction*, 95, 347-360.

<sup>78</sup> Harrison, L., Martin, 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>79</sup> Shannon, E., Mathias, C., Marsh, D., Dougherty, D., & 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*, 8(90), 288-291.

<sup>80</sup> Rutherford, M., Cacciola, J., Alterman, A., McKay, J., & Cook, T. (2000). *Contrasts between admitters and deniers of drug use*. *Journal of Substance Abuse Treatment*, 18, 343-348.

<sup>81</sup> Babor, T., Stephens, R., & Marlatt, A. (1987). Verbal report methods in clinical research on alcoholism: Response bias and its minimization. *Journal of Studies on Alcoholism*, 48, 410-424.

## Conclusion

The 2018 KORTOS evaluation indicates that opioid treatment programs in Kentucky have been successful in facilitating positive changes in clients' lives in a variety of ways, including decreased substance use, decreased severity of substance use, decreased mental health symptoms, decreased economic hardship, and decreased involvement with the criminal justice system. Results also show that clients appreciate and value their experiences in treatment programs, have an improved quality of life, and more support for recovery after participating in treatment. Overall, KORTOS clients had significant improvements in their lives that have been shown to be key factors that facilitate recovery: meeting basic needs, stable living arrangements, having a purpose with daily meaningful activities, and recovery community.<sup>82</sup> However, there were some areas of concern related to drug use, smoking rates, mental health, financial difficulties, and gender differences at follow-up.

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<sup>82</sup> <http://blog.samhsa.gov/2012/03/23/defintion-of-recovery-updated/>

## Appendix A.

# Methods

The KORTOS intake and follow-up interview instruments are modeled after the Kentucky Treatment Outcome Study (KTOS) assessment and are based on theory and research about substance use-related comorbidities relevant to substance use among clients in opioid treatment programs. The assessment's four core components (e.g., substance use, mental health, criminal justice involvement, and quality of life) and three supplemental components (e.g., health status, economic status and living circumstances, and recovery supports) have demonstrated validity and reliability<sup>83</sup> and have been developed in collaboration with key stakeholders to consider the context of Kentucky opioid treatment programs.

KORTOS intake interviews were conducted by a clinician or staff person at the OTP using a web-based interview tool, in which identifying data were encrypted and submitted to the master database on the UK CDAR secure server. At the end of the intake interview, clinicians explained the follow-up study to clients and gave them the opportunity to volunteer to participate. Clients who were interested gave electronic consent to be contacted by UK CDAR BHOS staff members about 6 months later. Follow-up interviews were conducted via telephone using a questionnaire with items and questions similar to the questions in the intake interview.

The target month for the follow-up interview was 6 months after the intake interview was completed. In other words, if a client completed an intake interview in December 2016, the target month for the follow-up interview was June 2017. The window for completing a follow-up interview with an individual selected into the follow-up sample began one month before the target month and spanned until two months after. Therefore, if the target month for a follow-up was June 2017, interviewers began working to locate and contact the individual in May and could work the file until the end of August.

Of the 514 clients who completed an intake interview in 2016, 267 (51.9%) 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 mailing address), and then selecting clients by intake month ( $n = 247$ ).

Of the 247 clients included in the follow-up sample, 25 were ineligible for participating in the follow-up interview, which left 222 clients eligible at the time of the follow-up. Of these clients, 184 completed a follow-up interview (see Table AA.1). Thus, the follow-up rate was 82.9%. The remaining clients were never successfully contacted, or if contacted they never completed the follow-up interview (17.1%).

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<sup>83</sup> Logan, TK, Cole, J., Miller, J., Scrivner, A., & Walker, R. (2016), *Evidence Base for the Kentucky Opioid Replacement Treatment Outcome Study (KORTOS) 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 = 247)

	Number of Records	Percent (n = 247)
Ineligible for follow-up interview	25	10.1%
<b>Number of cases eligible for follow-up (n = 222)</b>		
Completed follow-up interviews	184	
Follow-up rate is calculated by dividing the number of completed interviews by the number of eligible cases and multiplying by 100		82.9%
Expired cases (i.e., never contacted, did not complete the interview during the follow-up period)	38	
Expired rate ((the number of expired cases/eligible cases)*100)		17.1%
Refusal	0	
Refusal rate ((the number of refusal cases/eligible cases)*100)		0.0%
Cases accounted for (i.e., records ineligible for follow-up + completed interviews + refusals)	209	
Percent of cases accounted for ((# of cases accounted for/ total number of records in the follow-up sample)*100)		84.6%

Clients were considered ineligible for follow-up if they were living in a controlled environment during the follow-up period or were no longer in an OTP (see Table AA.2). Of the 25 cases that were ineligible for follow-up, the majority (56.0%) were ineligible because they were no longer receiving treatment at an OTP during the follow-up period. Forty percent of clients were ineligible because they were incarcerated at the time of follow-up and one client was ineligible because they were deceased (4.0%).

TABLE AA.2. REASONS CLIENTS WERE INELIGIBLE FOR FOLLOW-UP (N = 25)

	Number	Percent
Not in treatment at OTP	14	56.0%
Incarcerated	10	40.0%
Death	1	4.0%

Appendix B provides detailed information on the locating efforts for the 2015 KORTOS follow-up sample.

Appendix C 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 interview.

## Appendix B.

# Locating Efforts for the 2015 KORTOS Follow-up Study

Project interviewers documented their efforts (e.g., mailings, phone calls, Internet searches, etc.) to locate each participant included in the sample of individuals to be followed up from July 2013 to June 2014 ( $n = 350$ ), which is the follow-up period corresponding to the KORTOS 2015 report. All the locator files were examined and used to extract information about the efforts project interviewers made to locate and contact participants as well as the type of contact information provided by participants in the original locator information when the intake interview data was submitted to UK CDAR. A subsample of records was randomly selected and independently examined to check that the procedures for extracting data were reliable and valid. The extraction sheets were compared between the two raters for interrater reliability, which was high (96.1%). The following information is based on the data collected during this review of locator files.

For all 350 records, a total of 2,182 phone calls were made to client phone numbers and 773 calls to contact persons' phone numbers. As Table AB.1 shows, project interviewers made an average of about 6.2 calls to client phone numbers and 2.4 calls to contact persons' phone numbers. Fewer than 40% of clients called in at any point and only 4.3% called-in to complete the interview after receiving the initial mailing without project interviewers putting additional effort into contacting the clients. That means 95.7% of clients took considerable effort to try to locate, contact, and complete follow-up interviews.

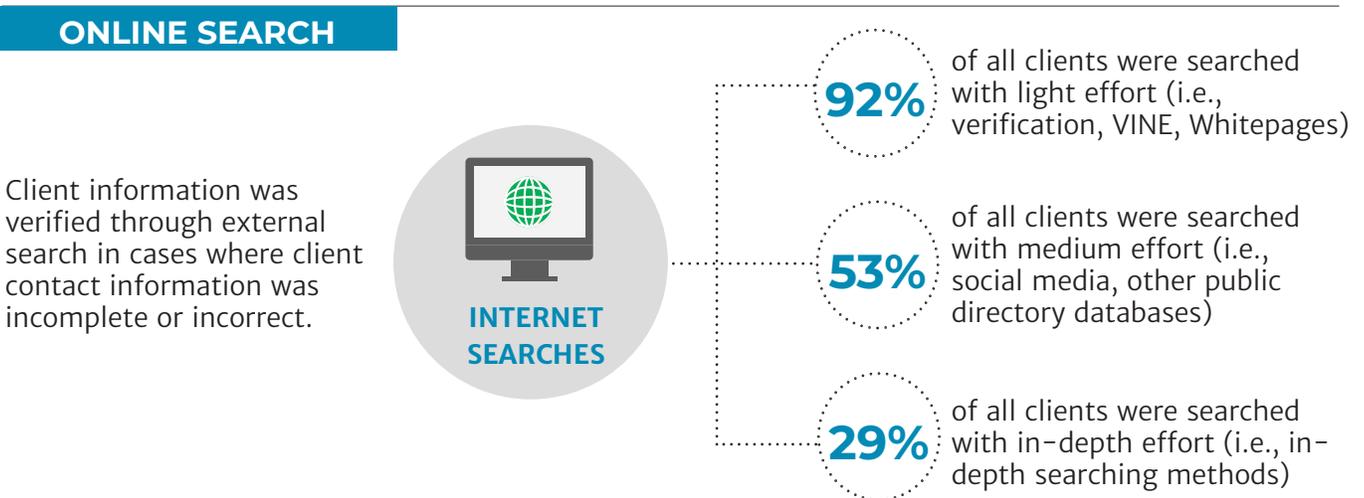
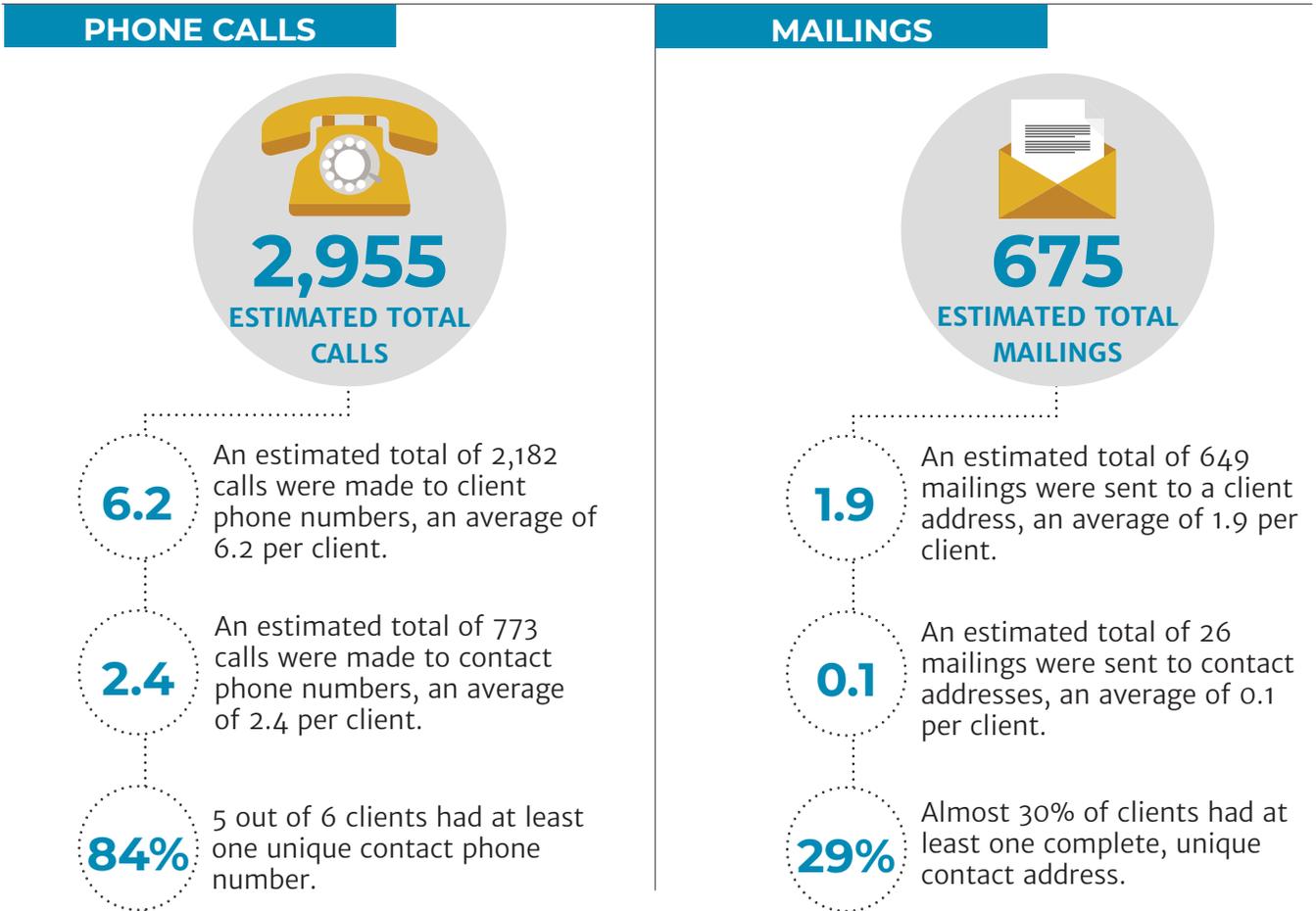
A total of 649 mailings were sent to client addresses and 26 mailings were sent to contact persons, an average of 1.9 mailings to clients and 0.1 mailings to contact persons. The research team received returned mail for 12.3% of clients that received mailings to client addresses and 1.4% of clients that received mailings to contact addresses.

In cases where the client contact information was incorrect (i.e., mail was returned, phone number was disconnected), online public directory databases were used to try to verify that we had correct or updated information for the client. Because it had been six months since they provided contact information, we would like to be sure we are not calling or sending mailings to someone other than the client. Therefore, verifying the correct contact information is a critical interim step in the follow-up process to protect confidentiality. For 92.3% of the clients, the interviewers used public searches/directories to verify contact information. If the client information could not be verified, interviewers also used social media and more detailed public directory databases to find updated contact information (52.9%). In cases where very little contact information was given or clients were not successfully located in the ways listed above, more in-depth searching methods were used (28.9%). As a last resort, in the few cases where the client was not successfully located in any of the ways described above, interviewers worked to reach client contacts provided by them at intake (6.7%).

## KORTOS 2015 Quality of Data and Locator Efforts

For the 2015 follow-up study, 350 participants were included in the sample of individuals to be followed up from July 2013 to June 2014. Efforts to locate and contact these participants were examined.

Of these clients, 223 completed a follow-up survey for a follow-up rate of 82.6%.



## Appendix C.

# Client Characteristics at Intake for Those Who Completed a Follow-up Interview 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 (e.g., did not agree to be contacted for the follow-up interview, not selected into the follow-up sample, ineligible for follow-up, not successfully located for the follow-up).

## Demographics

There were no significant differences on demographics between clients who completed a follow-up interview and those who did not. The average client age for both groups was around 36 and the majority of clients in both groups were White (see Table AC.1).

TABLE AC.1. COMPARISON OF DEMOGRAPHICS FOR CLIENTS WHO WERE FOLLOWED UP AND CLIENTS WHO WERE NOT FOLLOWED UP<sup>84</sup>

	FOLLOWED UP	
	NO n = 330	YES n = 184
AGE	36.2 years	36.0 years
GENDER		
Female	36.2%	55.4%
Male	63.6%	44.6%
RACE		
White	97.1%	94.9%
African American	0.9%	1.7%
Other or Multiracial	2.0%	3.4%
MARITAL STATUS		
Never married	45.5%	50.3%
Married	25.9%	21.1%
Separated or divorced	27.1%	25.7%
Widowed	1.5%	2.9%

<sup>84</sup> 9 clients had incorrect birthdates and, therefore, age could not be determined.

## Substance Use at Intake

Use of illegal drugs in the 6 months before entering treatment is presented by follow-up status in Table AC.2. The most frequently reported illegal drugs used in the 6 months before entering treatment were prescription opioids/opioids, heroin, and marijuana. Significantly more clients who were followed up reported using heroin (69.0% vs. 47.3%), marijuana (58.7% vs. 44.5%), CNS depressants (44.0% vs. 32.1%), stimulants (18.2% vs. 30.4%), non-prescribed methadone (21.7% vs. 14.2%), and other illicit drugs (10.9% vs. 5.5%) compared to clients who did not complete a follow-up interview.

TABLE AC.2. PERCENT OF CLIENTS REPORTING ILLEGAL DRUG USE IN THE 6 MONTHS BEFORE ENTERING TREATMENT

Substances	FOLLOWED UP	
	NO n = 330	YES n = 184
Any illegal drug	95.2%	97.8%
Prescription opioid/opiate (illegal use)	74.2%	75.5%
Heroin***	47.3%	69.0%
Marijuana**	44.5%	58.7%
CNS depressants**	32.1%	44.0%
Cocaine	20.0%	26.1%
Stimulants (amphetamines, methamphetamine, prescription stimulants)**	18.2%	30.4%
Non-prescribed bup-nx	27.6%	31.5%
Non-prescribed methadone*	14.2%	21.7%
Other illicit drugs (hallucinogens, inhalants, synthetic drugs)*	5.5%	10.9%

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

Significantly more clients who were followed up reported alcohol use (28.3% vs. 20.6%), alcohol to intoxication (21.7% vs. 13.3%), and binge drinking (16.8% vs. 10.0%; see Table AC.3).

TABLE AC.3. PERCENT OF CLIENTS REPORTING ALCOHOL USE IN THE 6 MONTHS BEFORE ENTERING TREATMENT

	FOLLOWED UP	
	NO n = 330	YES n = 184
Alcohol*	20.6%	28.3%
Alcohol to intoxication*	13.3%	21.7%
Binge drank alcohol (i.e., drank 5 or more [4 for women] drinks in 2 hours*)	10.0%	16.8%

\*p < .05

In the 6 months before entering the program, the majority of clients reported smoking tobacco products, with no difference between those who completed a follow-up interview and those who did not (see Table AC.4). There was also no difference between the two groups for the use

of e-cigarettes. Significantly more clients who were followed up, however, reported smokeless tobacco use at intake (12.0% vs. 6.7%).

TABLE AC.4. PERCENTAGE OF CLIENTS REPORTING TOBACCO USE IN THE 6 MONTHS BEFORE ENTERING TREATMENT

	FOLLOWED UP	
	NO n = 330	YES n = 184
Smoked tobacco	80.9%	83.7%
Smokeless tobacco*	6.7%	12.0%
E-cigarettes	10.3%	14.3%

\*p < .05

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 AC.5 for those clients who were not in a controlled environment all 30 days before entering treatment.<sup>85</sup> The highest composite score is 1.0 for each of the two substance categories.

The majority 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 no difference by follow-up status. The average score for the drug severity composite score was 0.34 for clients who did not complete a follow-up interview and 0.38 for followed up clients, which was a significant difference (see Table AC.5).

TABLE AC.5. SUBSTANCE ABUSE AND DEPENDENCE PROBLEMS AT INTAKE

Recent substance use problems among clients who were....	Not in a controlled environment all 30 days before entering treatment	
	FOLLOWED UP	
	NO n = 327	YES n = 180
Percentage of clients with ASI composite score equal to or greater than cutoff score for ...		
Severe alcohol or drug use disorder	91.7%	93.9%
Severe alcohol use disorder	10.7%	11.1%
Severe drug use disorder	90.8%	93.9%
Average composite score for alcohol use <sup>a</sup>	.05	.07
Average composite score for drug use <sup>**b</sup>	.34	.38

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.

Significantly more clients who were followed up reported having ever been in substance abuse treatment (76.6% vs. 64.8%; see Table AC.6). Among clients who reported a history of substance abuse treatment, the average number of lifetime treatment episodes was 3.0 for those who

<sup>85</sup> Clients who were in a controlled environment all 30 days before intake were not included in this analysis because being in a controlled environment limits one's access to substances.

did not complete a follow-up and 3.6 for those that did; however, this was not a statistically significant difference.

TABLE AC.6. HISTORY OF SUBSTANCE ABUSE TREATMENT IN LIFETIME

	FOLLOWED UP	
	NO n = 330	YES n = 184
Ever been in substance abuse treatment in lifetime**	64.8%	76.6%
Among those who had ever been in substance abuse treatment in lifetime,	(n = 214)	(n = 141)
Mean number of times in treatment	3.0	3.6

\*\*p<.01.

## Mental Health at Intake

The mental health questions included in the KORTOS intake and follow-up interviews are not clinical measures, but instead are research measures. A total of 9 questions were asked to determine if they met study criteria for depression, including 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: 74.5% vs. 46.7% (see Table AC.7).

A total of 7 questions were asked to determine if clients met study criteria for generalized anxiety, including the leading question: “In the 6 months before entering this program, did you worry excessively or were you anxious about multiple things on more days than not for all 6 months (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 criteria for generalized anxiety: 78.3% vs. 49.4%.

Two questions were included in the intake interview that asked about thoughts of suicide and attempted suicide in the 6 months before clients entered treatment. Significantly more clients who were followed up reported thoughts of suicide or suicide attempts (27.2% vs. 15.8%; see Table AC.7).

TABLE AC.7. PERCENT OF CLIENTS REPORTING MENTAL HEALTH PROBLEMS IN THE 6 MONTHS BEFORE ENTERING THE PROGRAM

	FOLLOWED UP	
	NO n = 330	YES n = 184
Depression***	46.7%	74.5%
Generalized Anxiety***	49.4%	78.3%
Suicidality (e.g., thoughts of suicide or suicide attempts)**	15.8%	27.2%

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

## Physical Health at Intake

To give an idea of the physical health of clients when they entered treatment, Table AC.8 presents the percent of the follow-up sample that reported health problems at intake. Significantly more clients who were followed up reported experiencing chronic pain (i.e., pain that lasted more than 3 months) at intake (52.7%) compared to clients who were not followed up (37.9%). 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 (63.0% vs. 45.8%). The most commonly reported chronic medical problems are presented in Table AC.8: Hepatitis C, arthritis, severe dental disease, asthma, and cardiovascular disease.

TABLE AC.8. PHYSICAL HEALTH STATUS AT INTAKE

	FOLLOWED UP	
	NO n = 330	YES n = 184
Chronic pain (lasting at least 3 months)**	37.9%	52.7%
Ever told by a doctor that client had one of the 12 chronic medical problems listed**	45.8%	63.0%
Hepatitis C*	17.9%	27.2%
Arthritis*	13.3%	21.7%
Severe dental disease*	9.4%	16.8%
Asthma	8.2%	10.3%
Cardiovascular disease	9.4%	13.6%

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

## Socioeconomic Indicators

Table AC.9 describes clients' level of education when entering treatment. There were no significant differences between groups: about 22% of clients who did not complete a follow up and 17.9% of clients who completed a follow up reported less than a high school diploma or GED at intake. Around two-fifths reported having a GED or high school diploma while 42.4% of those not followed-up and 43.5% of those who completed a follow-up attended vocational school or higher.

TABLE AC.9. CLIENTS' HIGHEST LEVEL OF EDUCATION COMPLETED AT INTAKE

	FOLLOWED UP	
	NO n = 330	YES n = 184
HIGHEST LEVEL OF EDUCATION COMPLETED		
Less than GED or high school diploma	21.5%	17.9%
GED or high school diploma	36.1%	38.6%
Vocational school to graduate school	42.4%	43.5%

Significantly more clients who were followed up were employed part-time compared to clients who were not followed up (see Table AC.10).

TABLE AC.10. EMPLOYMENT IN THE 30 DAYS BEFORE ENTERING TREATMENT

	FOLLOWED UP	
	NO n = 330	YES n = 184
EMPLOYMENT**		
Not currently employed	57.9%	50.5%
Full-time	32.7%	31.0%
Part-time	6.1%	15.8%
Occasional	3.3%	2.7%

\*\*p < .01

The majority of clients in both groups reported that their usual living arrangement in the 6 months before entering the program was living in their own home or apartment (see Table AC.11); however, there was a significant difference in living arrangements between clients who were followed up and clients who were not followed up. In addition, significantly more clients who were followed up reported that they considered themselves homeless (23.9%) compared to clients who were not followed up (16.4%).

TABLE AC.11. LIVING SITUATION OF CLIENTS BEFORE ENTERING TREATMENT

	FOLLOWED UP	
	NO n = 330	YES n = 184
USUAL LIVING ARRANGEMENT IN THE 6 MONTHS BEFORE ENTERING THE PROGRAM*		
Own home or apartment	69.4%	57.6%
Someone else's home or apartment	24.8%	31.5%
Institutional facility, hotel or on the street	5.8%	10.9%
HOMELESSNESS		
Consider themselves to be currently homeless*	16.4%	23.9%

\*p < .05

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 interview included several questions about clients' ability to meet expenses for basic needs and food insecurity (SIPP). Clients were asked eight items, five of which asked about difficulty meeting basic needs such as food, shelter, utilities, and telephone, and three items asked about difficulty obtaining needed health care for financial reasons.

Table AC.12 shows that there were significantly more clients who were followed up that had difficulty meeting basic living needs such as shelter, utilities, phone, and food. In addition, significantly more clients who were followed up reported they were unable to receive needed health care for financial reasons compared to those who were not followed-up (45.1% vs 29.4%).

TABLE AC.12. DIFFICULTY MEETING BASIC NEEDS IN THE 6 MONTHS BEFORE ENTERING TREATMENT

	FOLLOWED UP	
	NO n = 330	YES n = 184
Had difficulty meeting basic living needs (e.g. shelter, utilities, phone, food)**	41.8%	57.6%
Had difficulty obtaining needed health care for financial reasons***	29.4%	45.1%

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

## Criminal Justice System Involvement at Intake

About 11% of clients who completed a follow up interview and 6.7% of clients who did not complete a follow up interview were under supervision by the criminal justice system when they entered the program (e.g., probation, parole), with no significant difference by follow-up status (see Table AC.13).

There was no difference in the number of clients who were arrested for any charge in the 6 months before entering the program by follow up status (15.5% vs 19.0%). Of those who had been arrested, however, the clients who completed a follow-up interview reported a higher number of arrests (2.4) than those who did not complete a follow up interview (1.2).

There was no significant difference between the groups for the number of clients who were incarcerated at least one night in the 6 months before entering the program. Of those who had been incarcerated, there were also no significant differences in the average number of nights spent in jail with clients who completed a follow-up interview reporting an average of 37.3 nights and clients who did not complete a follow-up interview reporting an average of 23.7 nights.

TABLE AC.13. CRIMINAL JUSTICE SYSTEM INVOLVEMENT WHEN ENTERING TREATMENT

	FOLLOWED UP	
	NO n = 330	YES n = 184
Currently under supervision by the criminal justice system	6.7%	10.9%
Arrested for any charge in the 6 months before entering treatment	15.5%	19.0%
Of those arrested	n = 51	n = 35
Average number of arrests**	1.2	2.4
Incarcerated in the 6 months before the program	11.8%	15.2%
Of those incarcerated	n = 39	n = 28
Average number of nights in jail	23.7	37.3

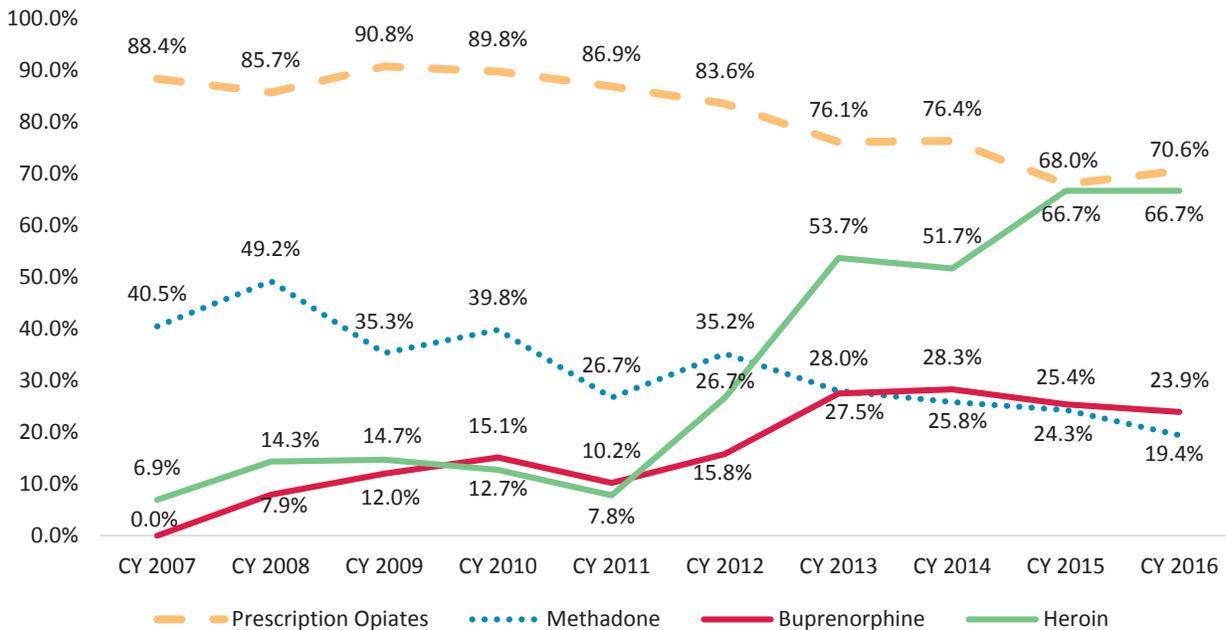
# Appendix D.

## Trends in Prescription Opioid, Methadone, Bup-nx, and Heroin Use Among KORTOS Clients with a Completed Follow-up Interview

Looking at trends over time for all clients with completed follow-up interviews, the percent of clients using prescription opioids peaked in calendar year 2009 and has steadily dropped. Similarly, the percent of clients who reported using non-prescribed methadone in the 30 days before entering treatment has declined since calendar year 2008. The percent of clients who reported using bup-nx slowly increased from 2007 through 2010, dipped slightly in 2011, and then dramatically increased in 2013 and has remained stable since.

The most notable change in substance use among KORTOS clients is for heroin. Small percentages of KORTOS clients reported using heroin in the 30 days before entering treatment from 2007 through 2011. The percentage tripled from 2011 (7.8%) to 2012 (26.7%) and then the percentage doubled from 26.7% in 2012 to 53.7% in 2013. While the number of clients reporting heroin use decreased slightly in 2014, it remained relatively high. In 2015 the number has increased again with two-thirds of KORTOS clients (66.7%) reporting heroin use in the 30 days before intake and remained there in 2016.

FIGURE AD.1. PERCENT OF FOLLOWED-UP CLIENTS REPORTING NON-PRESCRIBED USE OF PRESCRIPTION OPIOIDS, METHADONE, BUP-NX, AND HEROIN IN THE 30 DAYS BEFORE ENTERING TREATMENT AT THE PROGRAM (n = 1,757)<sup>86, 87</sup>



<sup>86</sup> Clients who reported being in a controlled environment all 30 days before entering treatment (n = 80) are not included in this analysis.

<sup>87</sup> One client who completed a follow-up interview had missing data for past-30-day heroin use at intake.