



KY-Moms MATR:
*Maternal Assistance
Towards Recovery (MATR)*

2019 ANNUAL REPORT

Project Acknowledgments

Presented by:

Kentucky Department for Behavioral Health, Developmental and Intellectual Disabilities, Division of Behavioral Health

275 E. Main Street 4W-F
Frankfort, KY 40621
(502) 564-4527

Wendy Morris

Commissioner, Department for Behavioral Health, Developmental and Intellectual Disabilities

Koleen Slusher

Director, Behavioral Health Division

Maggie Schroeder

Program Manager, Substance Use Treatment and Recovery Services

Katie Stratton

KY-Moms MATR Program Administrator

Prepared by:

University of Kentucky Center on Drug and Alcohol Research

333 Waller Avenue, Suite 480
Lexington, KY 40504

Postnatal assessments completed between July 2017 and June 2018 for women who gave birth between December 2016 and December 2017.

Suggested citation: Logan, T., Scrivner, A., Cole, J., & Miller, J. (2019). *KY-Moms: Maternal Assistance Towards Recovery (MATR) 2019 Annual Outcome Report*. Lexington, KY: University of Kentucky, Center on Drug and Alcohol Research.

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Executive Summary

KY-Moms MATR is a state-funded prevention and case management program aimed at reducing substance use and increasing positive birth outcomes for Kentucky women who are at risk for negative birth outcomes.

Evaluation Methods

The KY-Moms MATR outcome evaluation includes a face-to-face evidence-based assessment by program staff from Community Mental Health Centers (CMHCs) to assess substance use, mental health symptoms, intimate partner violence, and other factors such as education, employment status, and living situation prior to pregnancy and while involved in the program.¹

This report summarizes the KY-Moms MATR program evaluation results by examining: (1) pregnant mothers when they enter the program, (2) birth and infant outcomes, (3) changes in targeted risk factors such as substance use, mental health, intimate partner violence, and quality of life, and (4) client satisfaction with their program experience. Specifically, this report describes pregnant clients who participated in the KY-Moms MATR program, completed a face-to-face evidence-based baseline interview with program

¹ For more information, see: Scrivner, A., Logan, T., Cole, J., & Miller, J. (2016). *Evidence Base for the KY-Moms MATR Evaluation Assessment and Methods*. Lexington, KY: University of Kentucky, Center on Drug and Alcohol Research.

staff, and were eligible for a postnatal follow-up interview between July 2017 and June 2018 after the birth of their baby.

Who Does the KY-Moms MATR Program Serve?

Overall, 177 pregnant women participated in the KY-Moms MATR program and completed a baseline assessment.² The majority of clients reported they were referred to the KY-Moms MATR program by either the KY-Moms MATR prevention program or from a counselor at a community mental health agency. The majority of clients coming into the program were White, about 25 years old, and either married or cohabiting with a partner. Of the clients who were married or cohabiting, nearly all (94%) reported that their current partner was the father of the baby.

² Clients who completed a prenatal baseline (n = 177) entered the KY-Moms MATR program between May 2016 and December 2017 and were eligible for follow-up between July 2017 and June 2018. There was an average of 20 days between when the client entered the program and when the baseline assessment was completed.

About one-quarter of clients had less than a high school diploma/GED and the vast majority were unemployed.

Overall, clients were an average of 23 weeks pregnant when they completed a prenatal baseline assessment and almost three-quarters reported that they had been pregnant before. While the majority of clients reported that their pregnancies were unplanned, clients' scores on maternal-fetal attachment indicated that the mothers had a high attachment to their babies. At baseline, clients reported an average of 6 prenatal visits with a health care professional. Over half of clients were planning to breastfeed their babies.

KY-Moms MATR clients reported behavioral health risks associated with negative birth outcomes before becoming involved in the program including high rates of smoking, alcohol use, illegal drug use, depression or anxiety, and intimate partner violence. In the six months before pregnancy, 74% of clients reported illegal drug use, 18% reported alcohol use, and 79.7% reported smoking tobacco. In the past 30 days at baseline (while pregnant), 18% of clients reported illegal drug use, 17% reported alcohol use, and 59% reported smoking tobacco. Clients

“They were extra supportive and helped me throughout difficulties. They gave information and gas cards.”

- KY-MOMS MATR FOLLOW-UP CLIENT

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. Trend outcomes show, of those clients who used substances regularly, the age for having their first alcoholic drink, first illegal drug use, and first tobacco use was between 15 and 16 years old.

At baseline, clients were asked ten items regarding adverse childhood experiences from the Adverse Childhood Experiences Study (ACE). Results indicated that

17% of clients reported no maltreatment or household dysfunction experiences and the greatest percent was the 29% who reported experiencing 4-6 ACE. Specifically, almost half (47%) reported emotional abuse and/or neglect and 38% reported physical abuse and/or sexual abuse. The vast majority (68%) reported that their parents were divorced or separated and 53% reported that they had a household member with a substance abuse problem.

At prenatal baseline, clients were also asked about situations in which the client may have ever been the victim of a crime, harmed by someone else, or felt unsafe by someone other than a parent or guardian. Half of clients reported they had ever been attacked or assaulted, and 49% reported they had been sexually assaulted/raped or had been the victim of partner violence by a dating or intimate partner.

In the six months before

pregnancy, 57% of clients met study criteria for depression and/or anxiety and 31% met study criteria for co-morbid depression and anxiety. In addition, among clients who reported any crime or interpersonal victimization in their lifetime or in the 6 months before pregnancy, 31% had post-traumatic stress disorder (PTSD) scores that indicated risk of PTSD in the 6 months before the birth of the baby. Further, 32% of clients reported in the 6 months before pregnancy and 14% reported in the past 30 days that they had experienced any intimate partner violence (including psychological abuse, control, physical abuse, and sexual abuse) perpetrated by a current or ex-partner.

Positive birth outcomes for KY-Moms MATR clients compared to the general population of mothers^a



GESTATIONAL AGE

38.1 | **38.3**
Average weeks | Average weeks



BIRTH WEIGHT

7lbs, 0oz | **7lbs, 3oz**
Average birth weight | Average birth weight



APGAR SCORE

8.8 | **8.8**
Average score | Average score



PRENATAL VISITS

11.4 | **11.8**
Average number of visits | Average number of visits

^a Each birth outcome was entered as the dependent variable in a separate binary logistic regression model with KY-Moms MATR participation as the predictor variable and the covariates of mother's age, education (i.e., high school diploma or higher), area of residence (metropolitan vs. non-metropolitan county), marital status, and smoking at the time of the birth. The alpha level was set at $p < .01$.

Birth Events and Outcomes of KY-Moms MATR Clients Compared to the General Population of Mothers in Kentucky

Even with increased risk factors for negative birth outcomes the KY-Moms MATR mothers had before participating in the program, their birth outcomes were very positive overall, and were nearly identical to the overall general population of mothers and babies. After controlling for factors such as mother’s age, education, marital status, area of residence, and smoking status at birth, the two groups of mothers had similar birth outcomes for the percent of babies born premature, babies’ average birth weight, average APGAR scores, percent of mothers experiencing birthing problems, percent of babies taken to the neonatal intensive care unit, percent of women breastfeeding, and the number of prenatal visits with a health care provider.

Change in Targeted Factors from Intake to Follow-up

At baseline, clients are given the opportunity to participate in the follow-up portion of the study and to be contacted by the University of Kentucky Center on Drug and Alcohol Research (UK CDAR) for a follow-up assessment approximately 6 months after the birth of the baby. When UK CDAR staff contact KY-Moms MATR clients, they must determine additional

eligibility criteria before completing the follow-up interview: (1) the baby must be living with the client; and (2) the client must not be in a jail or controlled environment. During FY18, 118 postnatal follow-up assessments were completed (an 81.9% follow-up rate).³

Clients were asked how their baby was doing at postnatal follow-up and all the mothers indicated the baby was “great” or “good.” In addition, scores in maternal attachment increased significantly from baseline to follow-up indicating the mothers are emotionally engaged with the baby.

At postnatal follow-up, there were significant reductions in substance use as well as significant improvements in mental health symptoms, intimate partner violence, physical health, economic and living conditions, stress and quality of life.

Substance Use

Fewer pregnant mothers reported substance use while in the program compared to before being pregnant. These reductions were sustained six months after the birth of their baby. A trend analysis from report year 2015 to the present shows a steady increase in clients reporting illegal drug use at prenatal

³ Clients who completed a postnatal follow-up assessment (n = 118) were admitted to the KY-Moms MATR program and completed baseline assessments between June 2016 and October 2017.

Overall, evaluation results indicate that the KY-Moms MATR case management program has been successful in facilitating positive changes in clients in a variety of inter-related risk factors including



REPORTED PAST-6-MONTH ILLEGAL DRUG USE

61% at intake | **13%** at follow-up



MET STUDY CRITERIA FOR PAST-6-MONTH DEPRESSION AND/OR ANXIETY

55% at intake | **36%** at follow-up



REPORTED ANY PAST-6-MONTH INTIMATE PARTNER VIOLENCE

25% at intake | **11%** at follow-up



REPORTED DIFFICULTY MEETING HEALTH CARE NEEDS

29% at intake | **16%** at follow-up

baseline. While the number of clients reporting illegal drug use decreased for each year at follow-up compared to baseline, over the years the number of clients reporting illegal drug use at follow-up has increased slightly.

Smoking rates were also reduced (from 79.3% of clients in the 6 months prior to pregnancy to 68.1% of clients in the past 6 months at follow-up) as was smoking frequency among those who did smoke. Specifically, clients who reported smoking prior to pregnancy reported an average of 7.9 cigarettes in the 30 days before their baby was born compared to 15.5 cigarettes the 30 days before their pregnancy.

Mental Health

Among mothers with any mental health symptoms, there was a reduction in the number of reported depression and anxiety symptoms after participation in the KY-Moms MATR program. These improvements in mental health problems were sustained after the

birth of the baby. A trend analysis shows that rates of depression and/or anxiety at baseline were fairly consistent over 5 years, but increased this year.

Intimate partner violence

The number of mothers who reported intimate partner violence significantly decreased after becoming involved in the KY-Moms MATR program. A five-year trend analysis shows that the number of clients who reported any form of intimate partner violence at prenatal baseline was fairly consistent. Around one-quarter to one-third of clients reported any form of intimate partner violence in the six months before pregnancy. Overall, the number of clients who reported intimate partner violence at follow-up was also fairly consistent with 11% to 15% of clients reporting intimate partner violence in the 6 months since the birth of the baby.

Physical Health

Overall, clients reported improved general health status at postnatal follow-up compared to prenatal baseline. Over one-quarter of clients reported experiencing chronic pain at baseline compared to 16.2% at follow-up. In addition, the average number of days clients reported their physical health was not good in the past 30 days decreased from 5.0 days to 1.4 days.

Stress and Quality of Life

Clients' reported stress-related health consequences decreased significantly from prenatal baseline (20.6) to postnatal follow-up (8.2). Clients also reported a significantly higher quality of life after the program and an overall greater satisfaction with life at postnatal follow-up compared to prenatal baseline.

Economic Hardship, Living Situation, and Criminal Justice Involvement

Women in the KY-Moms MATR program reported improved economic conditions with significantly fewer clients reporting they had difficulty obtaining health care for financial reasons (e.g., doctor, dental, and prescription medications) in the past 6 months at follow-up compared to the 6 months before pregnancy. While there was no significant change in living situation at follow-up, the majority of clients at prenatal baseline (89.8%) and postnatal follow-up (98.2%) reported living in a private residence (i.e., their own or someone else's home or apartment) before the birth of their baby and after. Though relatively few clients reported involvement with the criminal justice system, there was a significant decrease in the number of clients both reporting an arrest and clients who reported being incarcerated in the past 6 months at follow-up compared to

“I like how she helped me explore my options and resources and come up with a plan.”

- KY-MOMS MATR FOLLOW-UP CLIENT

baseline.

Client Satisfaction with Program Experience

Program clients were overwhelmingly satisfied with the KY-Moms MATR case management services they received. In particular, clients reported they learned about their health and pregnancy, the staff was knowledgeable, they felt safe while in the program, and the location and times of the services were convenient. In addition, clients reportedly felt comfortable telling staff about any safety concerns and they felt like staff believed they could grow, change, and recover. Also, almost all of the clients indicated they would recommend the program to a friend. The majority of clients had someone to turn to for emotional support both during pregnancy and after the birth of the baby.

the KY-Moms MATR program to serve more high-risk pregnant women across the state.

Summary

Overall, evaluation results indicate that the KY-Moms MATR program has been successful in facilitating positive changes in clients in a variety of inter-related risk factors including substance use, mental health symptoms, and intimate partner violence. Results also indicate clients appreciate their experiences in the program and have a better quality of life after participation. These changes suggest there would be significant benefit in sustaining and expanding

Overview of the Report

This report presents the results of an outcome evaluation of the KY-Moms MATR program. This outcome evaluation was conducted by the Behavioral Health Outcome Study team at the University of Kentucky Center on Drug and Alcohol Research (UK CDAR) at the request of the Division of Behavioral Health in the Department for Behavioral Health, Developmental and Intellectual Disabilities. The evaluation results are organized into 6 main sections as outlined below.

Part I: Introduction and Evaluation Method. This section briefly describes the KY-Moms MATR program and how cases are selected into the analysis for the outcome evaluation.

Part II: Who is Served by the KY-Moms MATR program? Description of KY-Moms MATR Program Clients at Baseline. This section describes the KY-Moms MATR client characteristics for 177 women who participated in the KY-Moms MATR program, completed a baseline assessment between May 2016 and December 2017, and were eligible for follow-up in FY 2018. Characteristics examined include: (1) demographics, (2) self-referral status, (3) information about the pregnancy, (4) risk status, (5) substance use, (6) adverse childhood experiences and victimization, (7) mental health, and (8) intimate partner violence.

Part III: Birth Events and Outcomes: KY-Moms MATR Case Management Clients Compared to the General Population of Mothers. This section uses the Kentucky Vital Statistics birth data to examine (1) general risk factors; (2) targeted risk factors available from the Vital Statistics data set; and (3) birth events and outcomes of 114 KY-Moms MATR case management clients and their babies compared to mothers in the state who had babies during the same period (between December 2016 and December 2017) but who did not participate in the KY-Moms MATR Case Management study (n = 53,641).⁴

Part IV: Change in Targeted Factors from Intake to Follow-up for Clients in the Postnatal Follow-up Sample. This section examines change in: (1) information about the baby, (2) substance use, (3) mental health, (4) intimate partner violence, (5) economic and living circumstances, economic hardship, and criminal justice involvement, (6) physical health, and (7) stress, quality of life, and emotional support. Past-30-day and past-6-month substance use are examined separately where applicable.

Part V: Client Satisfaction with KY-Moms MATR Case Management. This section describes three aspects of client satisfaction assessed by clients who completed a postnatal follow-up: (1) overall satisfaction with the program, (2) ratings of program experiences, and (3) if the client would recommend the program to a friend.

Part VI: Conclusion and Study Limitations. This section summarizes the report findings, discusses limitations, and describes implications of the main findings.

⁴ Section 4 compares birth events and outcomes of KY-Moms MATR mothers to the general population of mothers who also gave birth during the same time period. Appendix D compares birth events and outcomes for three mutually exclusive groups including: (1) mothers involved in KY-Moms MATR case management services; (2) a comparison group of mothers matched on selected characteristics (race, age, education, metropolitan/non-metropolitan residence, marital status, and smoking status); and (3) a randomly selected group of mothers from the general population.

Part I: Introduction and Evaluation Method

This section briefly describes the KY-Moms MATR program and how clients were selected into the outcome evaluation.

KY-Moms: Maternal Assistance Towards Recovery (MATR) is a state-funded prevention, outreach, and case management program aimed at reducing substance use risk during pregnancy. Alcohol, tobacco, and illicit drug use during pregnancy have been shown to negatively influence fetal development (including significantly decreased birth weight and shorter gestational age) and women's health.^{5,6,7,8,9} In addition, substance use is often related to mental health problems and an increased risk of partner abuse and sexual assault.^{10,11} All three of these interrelated risk factors increase the likelihood of negative birth outcomes.^{12,13} Additionally, risks of negative birth outcomes are increased when women using alcohol and illegal drugs avoid obtaining prenatal care due to access, fear of losing custody of their babies, or fear of being arrested.¹⁴

The overall goal of the KY-Moms MATR program is to increase positive birth outcomes for pregnant women in Kentucky who are at risk for negative birth outcomes by reducing risk of substance use, poor mental health status, and victimization that impact the health of the pregnant mother, fetal development, and birth outcomes. The program is part of the Governor's Office of Early Childhood's Kentucky Invests in Developing Success NOW (KIDS NOW) and is administered by the Division of Behavioral Health in the Department for Behavioral Health, Developmental and Intellectual Disabilities.¹⁵ The program has two components including providing: 1) substance abuse prevention education to pregnant women at all risk levels, and 2) client-centered intensive case management services to pregnant and parenting women who are diagnosed with a substance use disorder (referred to in this report as KY-Moms MATR program). This report focuses on outcomes for mothers who are involved with the intensive case management services component of the program.

⁵ Bailey, B. A., McCook, J. G., Hodge, A., & McGrady, L. (2012). Infant birth outcomes among substance using women: why quitting smoking during pregnancy is just as important as quitting illicit drug use. *Maternal and Child Health Journal, 16*(2), 414-422.

⁶ Gouin, K., Murphy, K., & Shah, P. S. (2011). Effects of cocaine use during pregnancy on low birth weight and preterm birth: systematic review and meta-analyses. *American Journal of Obstetrics and Gynecology, 204*(4), 340-e1-12.

⁷ Behnke, M., Smith, V. C., Levy, S., Ammerman, S. D., Gonzalez, P. K., Ryan, S. A., ... & Watterberg, K. L. (2013). Prenatal substance abuse: short-and long-term effects on the exposed fetus. *Pediatrics, 131*(3), e1009-e1024.

⁸ Pinto, S. M., Dodd, S., Walkinshaw, S. A., Siney, C., Kakkar, P., & Mousa, H. A. (2010). Substance abuse during pregnancy: effect on pregnancy outcomes. *European Journal of Obstetrics & Gynecology and Reproductive Biology, 150*(2), 137-141.

⁹ Young, N.K., Gardner, S., Otero, C., Dennis, K., Chang, R., Earle, K., & Amatetti, S. (2007). *Substance-Exposed Infants: State Responses to the Problem*. National Center on Substance Abuse and Child Welfare.

¹⁰ Logan, T., Walker, R., Jordan, C. & Leukefeld, C. (2006). *Women and victimization: contributing factors, interventions, and implications*. Washington, DC: American Psychological Association Press.

¹¹ Kessler, R., McGonagle, K., Zhao, S., Nelson, C. Hughes, M., Eshleman, S., Wittchen, H., & Kendler, K. (1994). Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States: Results from the National Comorbidity Survey. *Archives of General Psychiatry, 51*, 8-19.

¹² Shah, P. S., & Shah, J. (2010). Maternal exposure to domestic violence and pregnancy and birth outcomes: a systematic review and meta-analyses. *Journal of Women's Health, 19*(11), 2017-2031.

¹³ Schetter, C. D., & Tanner, L. (2012). Anxiety, depression and stress in pregnancy: implications for mothers, children, research, and practice. *Current Opinion in Psychiatry, 25*(2), 141-148.

¹⁴ Roberts, S.C & Nuru-Jeter, A. (2010). Women's perspectives on screening for alcohol and drug use in prenatal care. *Women's Health Issues, 3*, 193-200.

¹⁵ Since 2015, all of Kentucky's regional community mental health centers except Bluegrass participate in the KY-Moms MATR program.

The KY-Moms MATR program case managers provide support, referrals, information, and other needed services (e.g., transportation) based on a client-centered format. This intervention focuses on meeting clients' needs as they evolve over time, as different risks manifest, and needs change as the pregnancy progresses.¹⁶ By focusing on clients' needs, client-centered intensive case management encourages continued engagement in clinical services and helps with a variety of practical needs.^{17, 18} KY-Moms MATR case managers use evidence-based practices, including Motivational Interviewing, to promote engagement in vital services such as substance abuse and mental health treatment, partner violence services, and to encourage consistent prenatal care.^{19, 20}

Pregnant women who are referred to the KY-Moms MATR program are first screened for eligibility. Typically, women are referred by community organizations such as health departments, private OB/GYN providers, child welfare caseworkers, pregnancy crisis centers, domestic violence shelters and community mental health center clinicians. The screening tool used by KY-Moms MATR referral sources is the "Pregnancy Behavioral Health Risk Assessment Screening" tool which assesses a variety of risks including substance use, mental health, and intimate partner violence, any of which make a woman eligible for prevention education services. Women that screen in for substance use risk factors are referred to a therapist for a substance use assessment for a diagnosis. Once a diagnosis is reached (mild, moderate, or severe substance use disorder), the women would be eligible for case management services. Adolescents (under age 18) are also eligible regardless of other risk factors.

Evaluation Method

The KY-Moms MATR outcome evaluation includes a face-to-face evidence-based assessment by program staff from CMHCs to assess substance use, mental health symptoms, intimate partner violence, and other factors such as education, employment status, and living situation prior to pregnancy and while involved in the program.²¹ Overall, a total of 177 baselines were completed between June 2016 and December 2017 with women who had due dates that would result in target months for a follow-up interview between July 2017 and June 2018 (see appendix A for details on these clients at prenatal baseline).

At prenatal baseline, clients are offered the opportunity to be contacted for a postnatal follow-up interview. If the client gives consent to be contacted for a follow-up, an interviewer at UK CDAR contacts the client about 6 months after the birth of their baby (based upon estimated due date reported by the client at prenatal baseline). In addition to consent, KY-Moms MATR clients are eligible to be included in the sample to be followed up if: (1) the prenatal baseline is submitted to UK CDAR within 30 days of completion, (2) the baby does not have a plan for adoption or foster

¹⁶ Austin, L. (2013). Treatment Planning and Case Management in Community. *The Praeger Handbook of Community Mental Health Practice: Working in the local community*, 1, 83.

¹⁷ Center for Substance Abuse Treatment. Comprehensive Case Management for Substance Abuse Treatment. Rockville (MD): Substance Abuse and McLaughlin, C. P., & Kaluzny, A. D. (2000). Building client centered systems of care: choosing a process direction for the next century. *Health Care Management Review*, 25(1), 73-82.

¹⁸ Sheedy C. K., and Whitter M. (2009). *Guiding Principles and Elements of Recovery-Oriented Systems of Care: What Do We Know from the Research?* HHS Publication No. (SMA) 09-4439. Rockville, MD: Center for Substance Abuse Treatment, Substance Abuse and Mental Health Services Administration.

¹⁹ Ingersoll, K. S., Ceperich, S. D., Hetteema, J. E., Farrell-Carnahan, L., & Penberthy, J. K. (2013). Preconceptional motivational interviewing interventions to reduce alcohol-exposed pregnancy risk. *Journal of Substance Abuse Treatment*, 44(4), 407-416.

²⁰ May, P. A., Marais, A. S., Gossage, J. P., Barnard, R., Joubert, B., Cloete, M., et al. (2013). Case management reduces drinking during pregnancy among high-risk women. *The International Journal of Alcohol and Drug Research*, 2(3), 61-70.

²¹ For more information, see: Scrivner, A., Logan, T., Cole, J., & Miller, J. (2016). *Evidence Base for the KY-Moms MATR Evaluation Assessment and Methods*. Lexington, KY: University of Kentucky, Center on Drug and Alcohol Research.

care following birth, (3) the client is in the program at least 30 days before the birth of the baby, and (4) the minimal acceptable amount of contact information is provided so that the follow-up staff can locate the client to conduct the interview. If any of these criteria were not met, the client was not included in the sample to be followed up.²²

The UK CDAR team begins their efforts to locate and conduct follow-up interviews with women who are eligible for follow-up one month before their target month (i.e., six months after the due date of their baby) and continues their efforts until the women have completed the follow-up interview or for two months after the target month, whichever comes first. When the follow-up team contacts women, they must determine additional eligibility criteria before completing the follow-up interview: (1) the baby must be living with the client, and (2) the client must not be in a jail or controlled environment.²³ UK CDAR interviewers obtain verbal consent to complete the follow-up interview. Client responses to the follow-up interviews are kept confidential to facilitate accurate reporting of client outcomes and satisfaction with program services. During FY18, 118 postnatal follow-up assessments were completed (an 81.9% follow-up rate).²⁴ See Appendix B for more details about follow-up methods and eligibility.

To be included in the analysis for the birth event outcome section of this report, clients had to have given permission to access and to have had matching information from the Kentucky Vital Statistics birth event data set in order to compare birth outcomes. With this criterion in mind, although 118 clients completed a postnatal follow-up assessment, two clients did not give permission to use their birth data, one client had a missing response, and one client did not have a match in the birth event data set which could be due to an incorrect social security number, name, birth date, or out of state birth. This left a final sample for the birth event data of 114 women who met analysis criteria, gave birth between December 2016 and December 2017, and completed a postnatal follow-up assessment between July 2017 and June 2018 (an average of 5.6 months after giving birth).

²² As a result of the prenatal baseline criteria, 20 clients were not eligible for the follow-up sample.

²³ 13 clients were not eligible for the follow-up sample based upon the postnatal follow-up criteria.

²⁴ Clients who completed a postnatal follow-up assessment (n = 118) were admitted to the KY-Moms MATR program and completed baseline assessments between June 2016 and October 2017.

A Closer Look at Clients Who Did and Did Not Have a Postnatal Follow-up Interview

When those with a postnatal follow-up interview (n = 118) were compared with those who did not have a postnatal follow-up interview (n = 59)²⁵ on a variety of prenatal baseline variables, clients who were not included in the follow-up sample were less likely to be married or cohabiting at baseline. In addition, a greater number of clients who were not followed up reported their usual living arrangement in the past 30 days at baseline as a residential program, hospital, recovery center, or halfway house. Significantly more clients who were not followed up reported illegal drug use in the 30 days prior to pregnancy compared to clients who were followed up. More clients who were followed up, however, reported alcohol use in the 6 months before pregnancy and in the 30 days prior to pregnancy. Among those clients who met criteria for depression in the 6 months before pregnancy, clients who were not followed up reported significantly more depression symptoms. Finally, significantly more clients who were not followed up reported any type of intimate partner violence as well as, specifically, verbal abuse and coercive control in the 6 months before pregnancy (see Appendix C).

	Followed up (n = 118)	Not followed up (n = 59)
Demographics	More clients were married/cohabiting	
Living situation		More clients were living in a residential program, hospital, recovery center, or halfway house
Employment	No difference	
Physical health	No difference	
Illegal drug use		More illegal drug use in the 30 days before pregnancy
Alcohol use	More alcohol use in the 6 months before pregnancy and the 30 days before pregnancy	
Mental health		Clients reported more depression symptoms in the 6 months before pregnancy
Intimate partner violence		More clients experienced any intimate partner violence, verbal abuse, and coercive control in the 6 months before pregnancy

²⁵ See Appendix D for details reasons why client did not complete a follow-up interview.

Part II: Who is Served by the KY-Moms MATR Program? A Description of All KY-Moms MATR Clients at Baseline

The KY-Moms MATR outcome evaluation includes a face-to-face baseline interview by program staff to assess targeted factors such as substance use, mental health symptoms, intimate partner violence, and other factors such as education, employment status, and living situation prior to pregnancy and while involved in the program. Between June 2016 and December 2017, 177 pregnant women completed a prenatal baseline interview and were eligible for a six-month postnatal follow-up within FY 18.^{26, 27}

Demographics

Table II.1 shows that the majority of clients were White (88.1%) and were an average of 25.7 years old. In addition, the majority (59.9%) were married or cohabiting at baseline and 9.0% of the KY-Moms MATR mothers reported at prenatal baseline they were currently homeless. Of those who indicated they were homeless (n = 16), 43.8% were staying temporarily with friends/family, and 18.8% reported they perceived themselves to be homeless because they were staying in a shelter.

TABLE II.1. DEMOGRAPHICS FOR ALL KY-MOMS MATR CLIENTS AT BASELINE (N = 177)²⁸

Age	25.7 years (range of 15-47)
Race	
White	88.1%
African American.....	6.8%
Other or multiracial.....	5.1%
Marital Status	
Married or cohabiting.....	59.9%
Never married	25.4%
Separated or divorced.....	14.1%
Widowed	0.6%
Homeless	9.0%

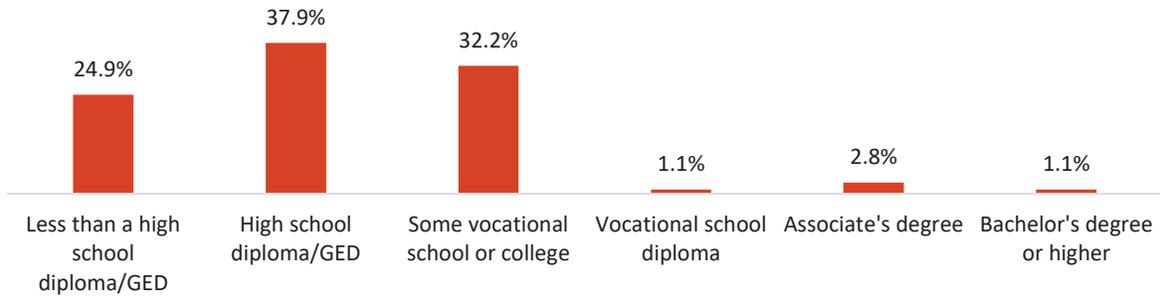
About one-quarter of clients had less than a high school diploma or GED at baseline (see Figure II.1). The highest level of education of 37.9% of the sample was a high school diploma or GED. Approximately 32% of clients had completed some vocational/technical school or college. Only a small minority of clients had completed vocational/technical school (1.1%), an associate's degree (2.8%), or a bachelor's degree or higher (1.1%).

²⁶ Clients who completed a prenatal baseline (n = 177) entered the KY-Moms MATR program between May 2016 and December 2017 and were eligible for follow-up between July 2017 and June 2018. There was an average of 20 days between when the client entered the program and when the baseline assessment was completed.

²⁷ Because the KY-Moms MATR evaluation only analyzes clients who completed an intake, it is not known how many women were served by the KY-Moms MATR program but did not complete an intake assessment.

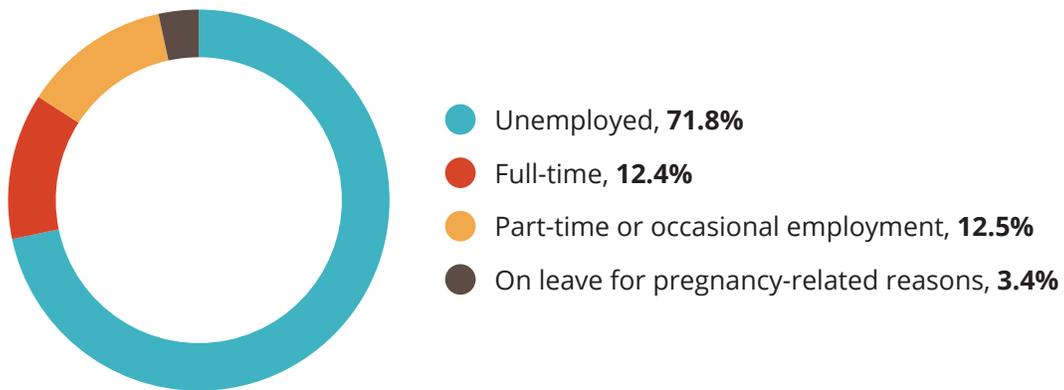
²⁸ Six clients had incorrect birthdates; therefore, age could not be calculated.

FIGURE II.1. HIGHEST LEVEL OF EDUCATION COMPLETED AT INTAKE (N = 177)



The majority of women who entered KY-Moms MATR case management were unemployed (71.8%) at the time of the baseline interview. About 12% were employed full-time and 12.5% either worked part-time or had occasional/seasonal work. A little over 3% reported they were currently on leave from their job due to pregnancy-related reasons.

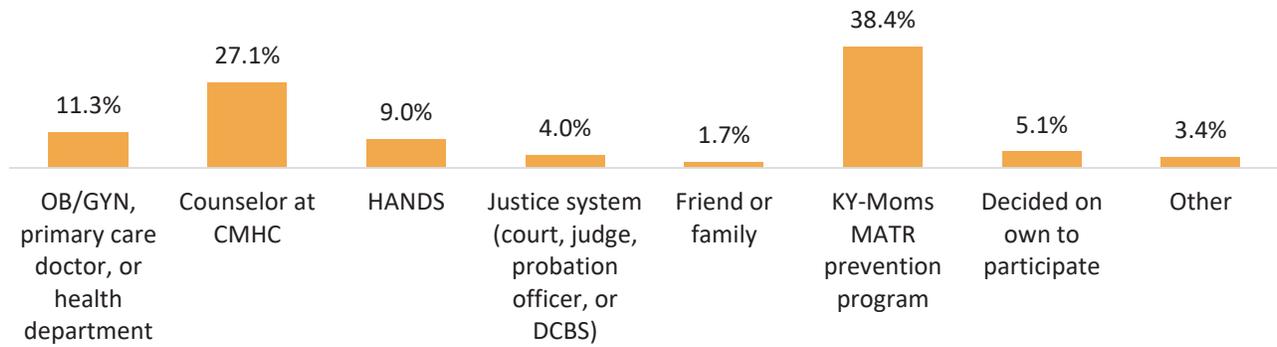
FIGURE II.2. CURRENT EMPLOYMENT STATUS AT BASELINE (N = 177)



Self-reported Referral Status

Figure II.3 shows the self-reported referral source for all KY-Moms MATR clients at baseline. Around 11% reported they were referred to the program by their obstetrician/gynecologist, primary care doctor, or the health department. Over one-quarter (27.1%) reported they were referred to the program by a counselor at one of the community mental health agencies and 9.0% were referred by the Health Access Nurturing Development Services (HANDS). Only 4.0% of clients reported they were referred to the program by the justice system (e.g., judge, court, probation officer, or DCBS) and 1.7% reported that a family member or friend referred them. About 38% of clients reported that they were referred to the KY-Moms MATR program by the prevention program and 5.1% decided on their own to participate.

FIGURE II.3. SELF-REPORTED REFERRAL SOURCE FOR ALL KTOS CLIENTS AT INTAKE (N = 177)



Information About the Pregnancy

Overall, at the time clients completed the prenatal baseline, they were an average of 23 weeks pregnant (ranging from women who were 7 weeks pregnant to women who were 40 weeks pregnant). Although 79.5% of the clients asked indicated their pregnancy was unplanned, only 1.7% reported they were not sure about maintaining custody of the baby.

At the time of prenatal baseline, clients had been to an average of 6.3 visits (range of 0-33 visits) with their prenatal health care provider and 56.8% reported they were planning on breastfeeding. Overall, 74.0% of clients reported they had been pregnant before.

TABLE II.2. PREGNANCY STATUS FOR ALL KY-MOMS MATR CLIENTS AT BASELINE (N = 177)²⁹

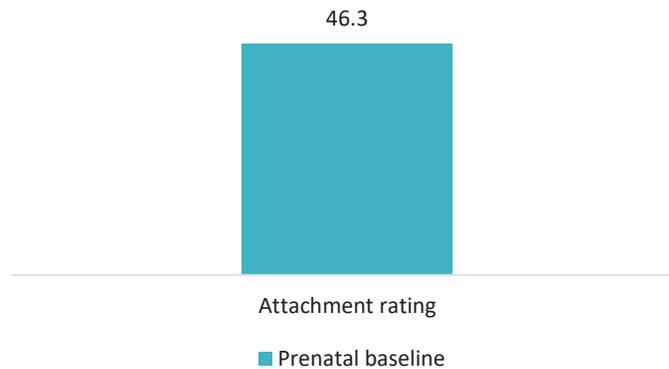
Average weeks pregnant	23.0 weeks (range of 7-40)
	(n = 44)
Pregnancy was unplanned	79.5%
Plan to maintain custody of the baby	98.3%
Average number of visits with a healthcare professional	6.3 (range 0-33)
Plan to breastfeed	56.8%
Been pregnant previously.....	74.0%

²⁹ Question regarding if the pregnancy was planned was removed in later versions of the baseline; therefore, only 44 clients answered this question.

Maternal-fetal Attachment/Maternal-infant Attachment

Clients were asked 14 items about the extent to which the KY-Moms MATR client is emotionally engaged in her pregnancy³⁰ (e.g., “I wonder what the baby looks like now”, “I imagine calling the baby by name”, and “I imagine what part of the baby I’m touching”) at baseline. Items are scored on a 4-point Likert scale from 1 = ‘Almost never’ to 4 = ‘Almost always’. Total scores range from 14 to 56 with higher scores indicative of a higher level of attachment. Clients’ average fetal attachment score was 46.3 at baseline indicating a relatively high attachment to their unborn baby.

FIGURE II.4. LEVEL OF MATERNAL-FETAL ATTACHMENT (N = 133)³¹



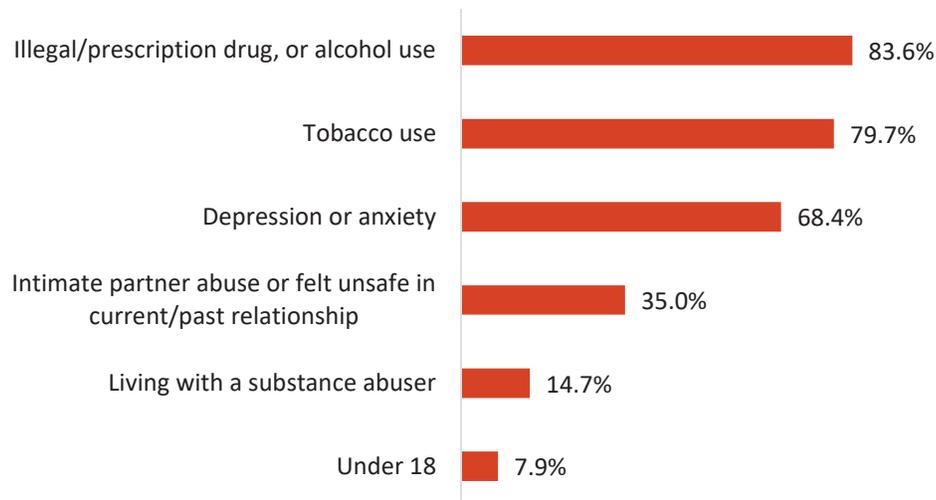
Risk Status

Figure II.5 shows that of the 177 clients who completed a KY-Moms MATR prenatal baseline, 97.2% (n = 172 clients) fit into at least one of the major risk factor categories assessed in the baseline interview. Overall, 83.6% reported drug or alcohol use at baseline, 79.7% of clients reported tobacco use (cigarettes, e-cigarettes, or smokeless tobacco), 68.4% met study criteria for depression or anxiety, 35.0% reported intimate partner violence and/or feeling unsafe in either their current relationship or because of a partner from a previous relationship, 14.7% of clients reported currently living with someone who had drug or alcohol problems, and 7.9% were under the age of 18.

³⁰ To measure maternal-fetal attachment, the KY-Moms MATR assessment uses an adapted version of the Prenatal Attachment Inventory (PAI; Müller, 1993) in which consists of 21 items. For the purposes of KY-Moms MATR and to reduce the time burden on program staff, the PAI was reduced to 14 items.

³¹ This measure was added to the assessments in April 2017; therefore, not all clients had the opportunity to answer this question at baseline.

FIGURE II.5. PERCENT OF CLIENTS FALLING INTO AT LEAST ONE TARGETED RISK FACTOR (N = 177)



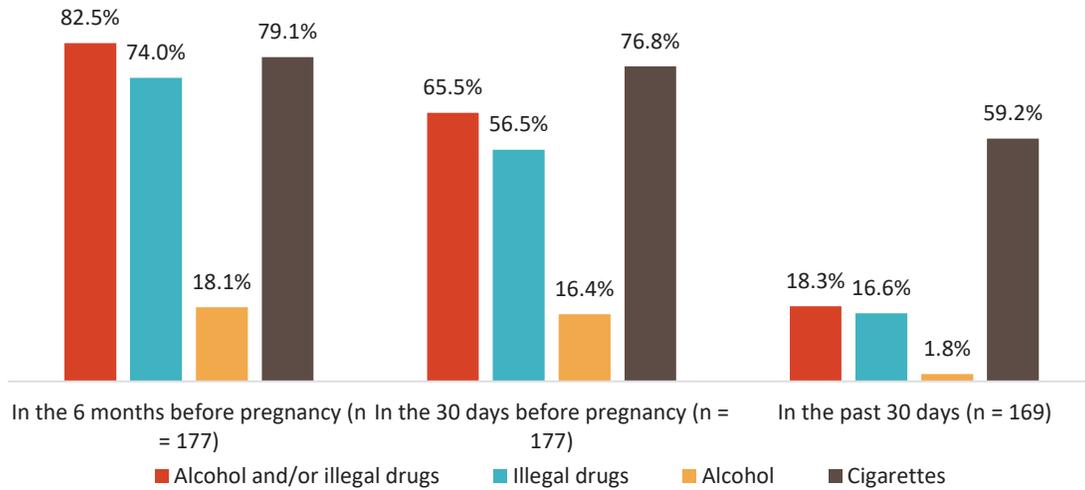
Substance Use

The majority of clients who completed a baseline assessment reported using alcohol and/or illegal drugs (82.5%) in the 6 months before pregnancy. Overall, a higher percentage of individuals reported using illegal drugs (74.0%) compared to the percent of individuals who reported using alcohol (18.1%) in the 6 months before pregnancy. The vast majority of clients reported smoking tobacco (79.1%) in the 6 months before pregnancy. In the 30 days before pregnancy, 65.5% of clients reported using alcohol and/or illegal drugs, 56.5% reported illegal drug use, 16.4% reported alcohol use, and 76.8% of clients reported smoking tobacco.

Of the 169 clients who were not in a controlled environment all 30 days before baseline,³² 18.3% reported using alcohol and/or illegal drugs. Specifically, 16.6% reported illegal drug use and 1.8% reported alcohol use. Also, 59.2% reported smoking tobacco in the 30 days before baseline (see Figure II.6)

³² Because being in a controlled environment decreases opportunities for substance use, individuals who were in a controlled environment all 30 days before entering the program (n = 8) are not included in the analysis of substance use in the 30 days before entering treatment.

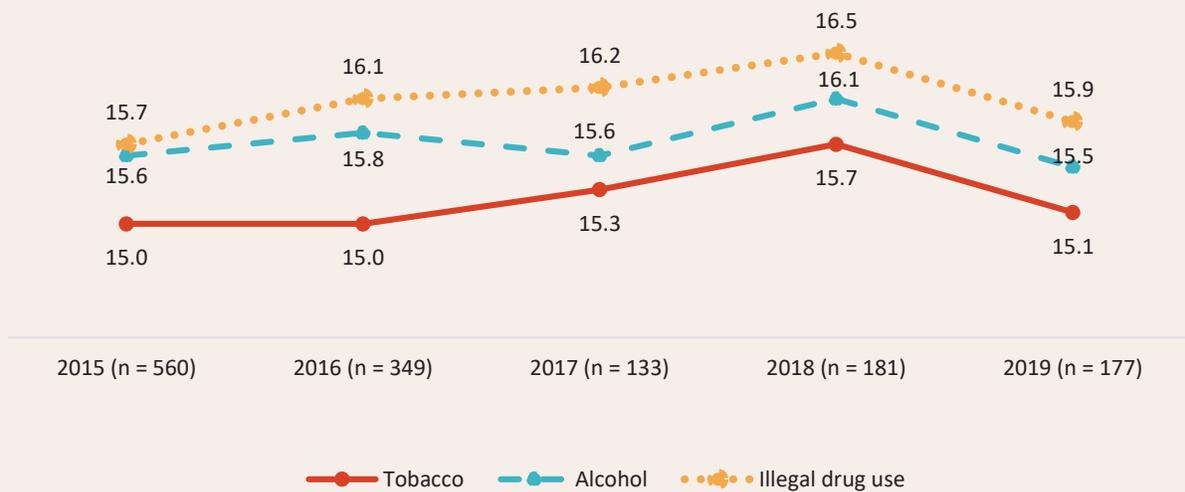
FIGURE II.6. PERCENT OF CLIENTS REPORTING ILLEGAL DRUGS, ALCOHOL, AND SMOKING TOBACCO AT BASELINE



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 II.7). The age at which KY-Moms MATR clients reported regular illegal drug use increased in 2018 before decreasing in 2019 (close to age 16). Clients generally reported having their first alcohol drink around 16 years old. The age of first tobacco use was slightly younger than the age of first alcoholic drink (about 15 years old).

FIGURE II.7. TRENDS IN AGE OF FIRST USE REPORTED AT BASELINE, 2015-2019³³

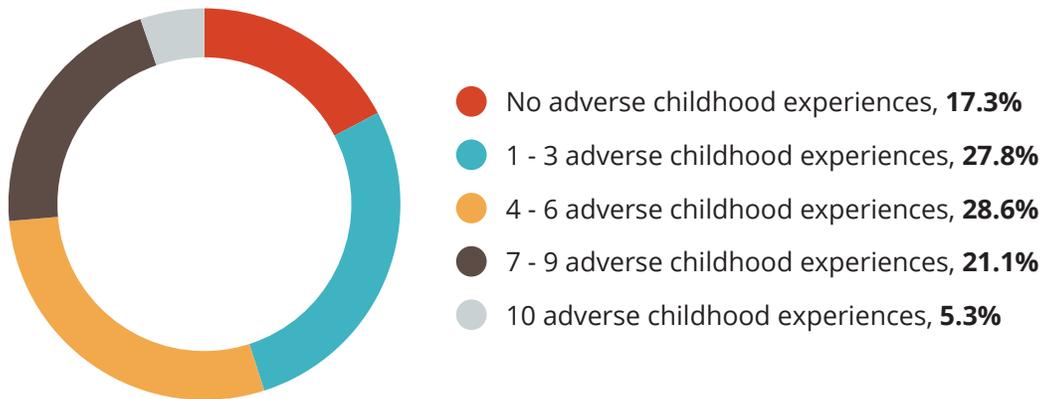


³³ Because age of use for each substance each year was so similar, the axes reflects ages 14-18 so all of the ages can easily be viewed.

Adverse Childhood Experiences and Victimization Experiences

At baseline, clients were asked ten items regarding adverse childhood experiences from the Adverse Childhood Experiences Study (ACE).^{34, 35, 36} In addition to providing the percent of women who reported each of the ten types of adverse childhood experiences before the age of 18 years old captured in ACE, the number of types of experiences was computed such that items clients answered affirmatively were added to create a score equivalent to the ACE score. A score of 0 means the client answered “No” to the five abuse and neglect items and the five household dysfunction items in the intake interview. A score of 10 means the client reported all five forms of child maltreatment and neglect, and all 5 types of household dysfunction before the age of 18. Figure II.8 shows that 17.3% reported they did not experience any of the ACE included in the assessment. Over one-quarter (27.8%) reported experiencing 1 to 3 ACE, 28.6% reported experiencing 4 – 6 ACE, and 21.1% reported experiencing 7 – 9 ACE. Only 5.3% of clients reported experiencing all 10 types of adverse childhood experiences.

FIGURE II.8. NUMBER OF TYPES OF ADVERSE CHILDHOOD EXPERIENCES REPORTED AT BASELINE (N = 133)³⁷



Almost half of KY-Moms MATR clients (46.6%) reported that they had experienced emotional abuse (e.g., insults, put down, humiliation, parent acted in a way that made the child believe they would be physically hurt) and 46.6% reported they had experienced emotional neglect (e.g., felt that no one in the family loved them, or they weren't special/important, or did not feel close to each other or supported) in childhood. Almost 38% of clients reported experiencing physical abuse (e.g., being pushed/grabbed/slapped, or being hit so hard that it left marks) and 31.6% experienced physical neglect (e.g., didn't have enough to eat as a child, had no one to protect

³⁴ Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., Koss, M. P., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine*, 14(4), 245-258.

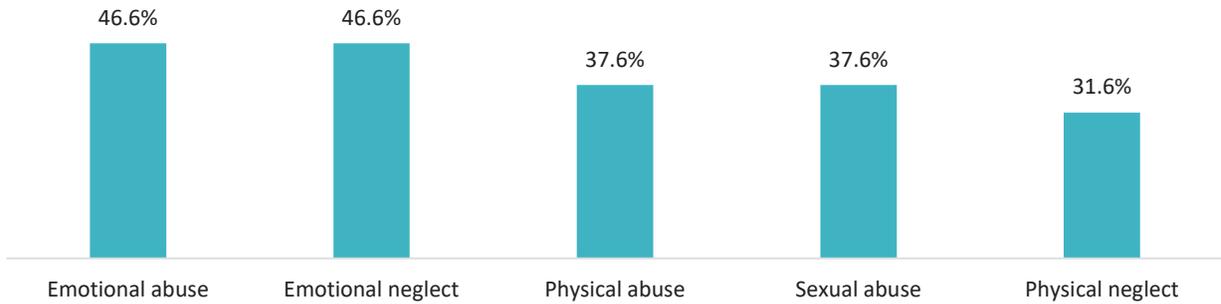
³⁵ Centers for Disease Control and Prevention. (2014). Prevalence of individual adverse childhood experiences. Atlanta, GA: National Center for Injury Prevention and Control, Division of Violence Prevention. <http://www.cdc.gov/violenceprevention/acestudy/prevalence.html>.

³⁶ The intake assessment asked about 10 major categories of adverse childhood experiences: (a) three types of abuse (e.g., emotional maltreatment, physical maltreatment, and sexual abuse), (b) two types of neglect (e.g., emotional neglect, physical neglect), and (c) five types of family risks (e.g., witnessing partner violence victimization of parent, household member who was an alcoholic or drug user, a household member who was incarcerated, a household member who was diagnosed with a mental disorder or had committed suicide, and parents who were divorced/separated).

³⁷ ACE measure was added to the intake assessment in April 2017; therefore, not all clients had the opportunity to answer the items.

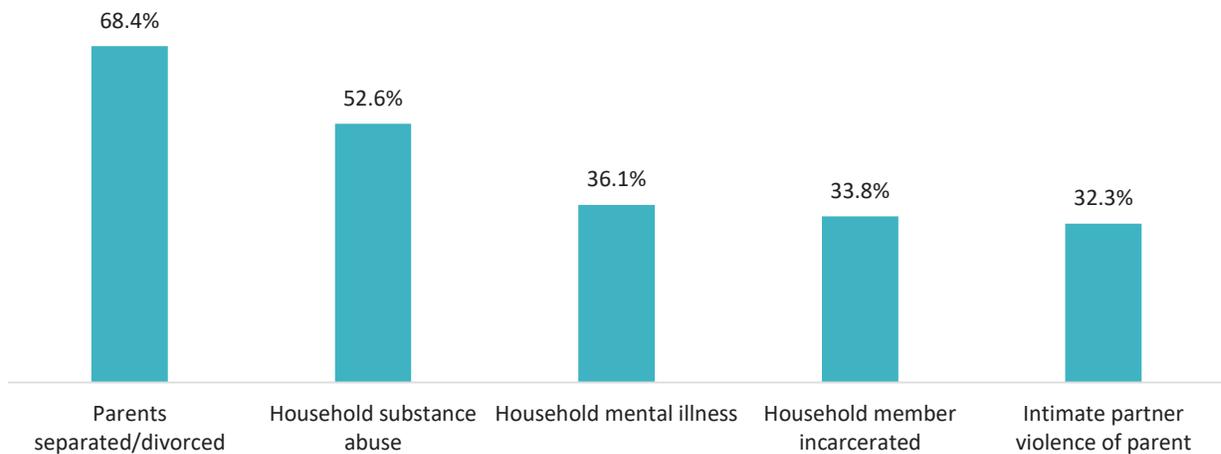
them, parents too high /drunk to take care of them). Almost 38% of clients reported experiencing sexual abuse as a child (e.g. touched inappropriately by someone at least 5 years or older, or someone 5 years or older tried to or actually had sex with client).

FIGURE II.9. SPECIFIC MALTREATMENT AND ABUSE EXPERIENCES IN CHILDHOOD (N = 133)



Over two-thirds of clients (68.4%) reported their parents were divorced or lived separately and 52.6% had a household member with a substance abuse problem (see Figure II.10). About 36% of clients reported they had a household member with a mental illness or had committed suicide, 33.8% reported a household member had been incarcerated, and 32.3% witnessed intimate partner violence of a parent.

FIGURE II.10. HOUSEHOLD RISKS IN CHILDHOOD (N = 133)

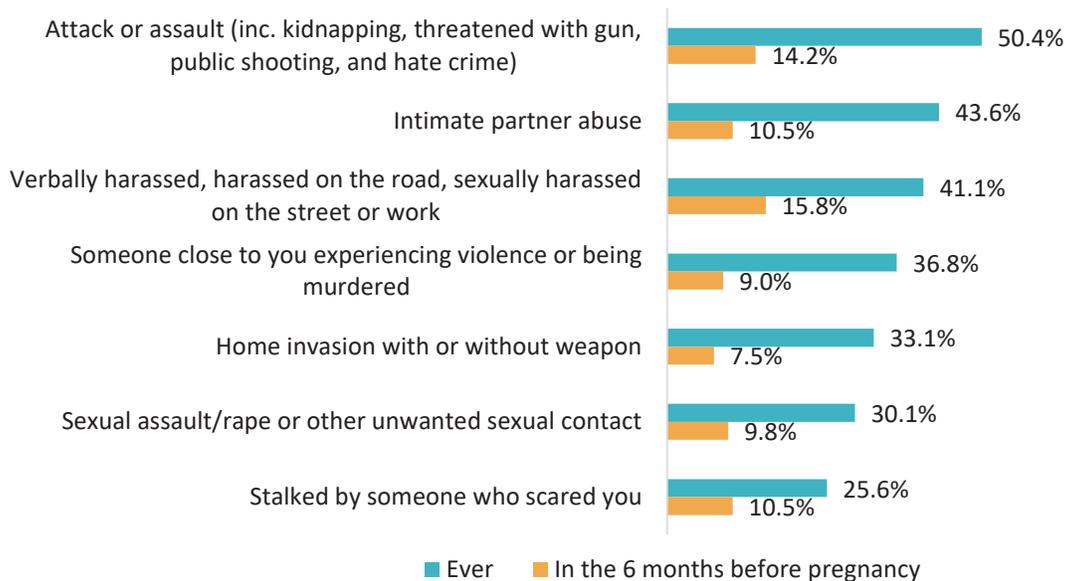


Victimization Experiences

At prenatal baseline, clients were also asked about situations in which the client may have been the victim of a crime, harmed by someone else, or felt unsafe by someone other than a parent or guardian. Figure II.11. shows that 50.4% of clients reported having ever been assaulted or attacked by someone. Almost 44% reported having ever been a victim of intimate partner abuse (partner physically assaulted, controlled, or emotionally abused the client). About 41% reported having ever been verbally harassed, harassed on the road, or sexually harassed on the street or at work. Close to 37% reported that someone close to them experienced a violent victimization or was murdered. One-third of clients reported having been mugged or been a victim of a home invasion. Almost one-third reported having ever been a victim of sexual assault, rape, or other unwanted sexual contact. Finally, one-quarter reported having been stalked by someone who scared them.

In the 6 months before pregnancy, 15.8% of clients reported being verbally or sexually harassed and 14.2% reported having been assaulted or attacked. Close to 1 in 10 women reported being stalked.

FIGURE II.11. PERCENT OF CLIENTS HAVING EVER EXPERIENCED VICTIMIZATION (N = 133)^{38, 39}



Mental Health

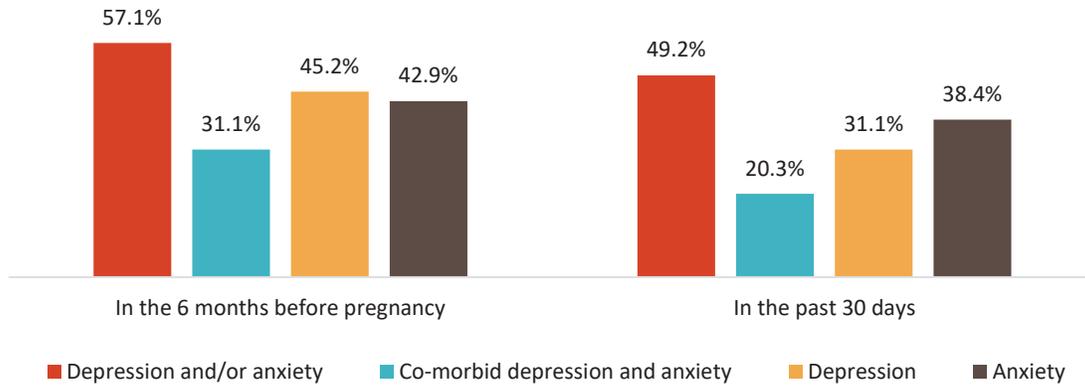
In the 6 months before pregnancy, 57.1% of clients met study criteria for depression and/or anxiety and 31.1% of clients met criteria for co-morbid depression and anxiety. About 45% of clients met study criteria for depression and 42.9% met criteria for anxiety (see Figure II.12).

In the past 30 days at baseline, almost half of clients met criteria for depression and/or anxiety and 20.3% met criteria for both depression and anxiety.

³⁸ Victimization measures were added to the assessment April 2017, therefore, data is available for only 133 clients.

³⁹ With the exception of intimate partner abuse, victimization experiences could be with a partner, ex-partner, acquaintance or family member, or stranger.

FIGURE II.12. PERCENT OF CLIENTS MEETING STUDY CRITERIA FOR DEPRESSION AND/OR ANXIETY AT BASELINE (N = 177)

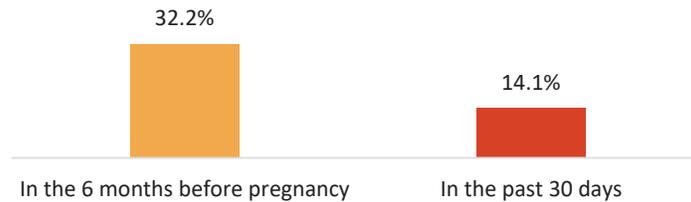


Among clients who reported any crime or interpersonal victimization (n = 98), 30.6% had post-traumatic stress disorder (PTSD) scores that indicated risk of PTSD in the 6 months before the birth of the baby (not represented in a figure).⁴⁰

Intimate partner violence

Figure II.13 shows that in the 6 months before pregnancy, 32.2% of clients reported experiencing any type of abuse⁴¹ (including psychological abuse, control, physical abuse, and sexual abuse) perpetrated by a current or ex-partner and 14.1% of clients reported experiencing abuse in the past 30 days.

FIGURE II.13. ANY TYPE OF ABUSE IN THE 6 MONTHS BEFORE PREGNANCY AND IN THE PAST 30 DAYS (N = 177)



Summary

Most clients reported they were referred to the KY-Moms MATR program by either the KY-Moms MATR prevention program or from a counselor at a community mental health agency. The majority of clients coming into the program were White, about 25 years old, and either married or cohabiting with a partner. Of the clients who were married or cohabiting, nearly all (94%) reported that their current partner was the father of the baby. About one-quarter of clients had less than a high school diploma/GED and the vast majority were unemployed.

⁴⁰ The victimization items were added in mid-October 2016, therefore, 98 clients who completed a baseline assessment during the time period of analysis answered these questions.

⁴¹ Any abuse was defined in this study as a client indicating “yes” to any of the partner abuse questions asked in the survey (e.g., verbal and psychological abuse, extreme jealousy and control, threats of violence towards client and others close to them, physical violence, stalking, partner purposely damaging or destroying property, sexual assault/threats of assault) at each period.

Overall, clients were an average of 23 weeks pregnant when they completed a prenatal baseline assessment and almost three-quarters reported that they had been pregnant before. While the majority of clients reported that their pregnancies were unplanned, clients' scores on maternal-fetal attachment indicated that the mothers had a high attachment to their babies. At baseline, clients reported an average of 6 prenatal visits with a health care professional. Over half of clients were planning to breastfeed their babies.

KY-Moms MATR clients reported behavioral health risks associated with negative birth outcomes before becoming involved in the program including high rates of smoking, alcohol and illegal drug use, depression or anxiety, and intimate partner violence. In addition, the majority of clients reported adverse childhood experiences and among the clients who reported any crime or interpersonal victimization, almost one-third had PTSD scores that indicated risk of PTSD in the 6 months before they became pregnant.

Part III. Birth Events and Outcomes: KY-Moms MATR Program Clients Compared to the General Population of Mothers

This section uses the Kentucky Vital Statistics birth data⁴² to examine (1) general risk factors, (2) targeted risk factors available from the Vital Statistics data set, and (3) birth events and outcomes of 114⁴³ KY-Moms MATR case management clients and their babies compared to others in the state who had babies during the same time period (between December 2016 and December 2017) but who did not participate in the KY-Moms MATR Case Management study (n = 53,641).^{44, 45}

In the data set 971 mothers from the general population and three mothers in KY-Moms MATR had more than one baby (i.e., twins, triplets, quadruplets, or siblings born in the same year of analysis). As a result, there were 117 babies born to 114 women in the KY-Moms MATR sample and 54,633 babies born to the 53,641 women in the general population sample.⁴⁶ The information in this section is limited to data from the Kentucky Vital Statistics data set for both groups and describes demographic information (age, race, and metropolitan/non-metropolitan area of residence), socio-economic status indicators (education and source of payment for birth of the baby), physical health status (average weight gained during pregnancy and maternal health problems), patterns of cigarette smoking, and birth outcomes.

General Risk Factors

Demographics

Table III.1 shows the demographic differences between KY-Moms MATR mothers and mothers from the general population of Kentucky at the time of the baby's birth.

Compared to the general population of mothers, KY-Moms MATR clients were younger on average (25.5) and were more likely to be White (91.2%). In addition, more KY-Moms MATR clients lived in very rural communities compared to the general population and were less likely to be married (32.5%).⁴⁷

⁴² In the Kentucky Vital Statistics birth event data set, each case is one baby paired with the mother's information collected at the time of the birth. There could potentially be multiple babies (cases) attached to one mother in the instance of multiple births or multiparous births in the same year. For that reason, the number of cases in the file does not equal the number of mothers in the file.

⁴³ Out of the 118 follow-ups, 2 clients did not give permission to use their birth data, one client had a missing response, and one client could not be matched to the birth event data file.

⁴⁴ Out of the 56,852 cases in the Vital Statistics data set from December 2016 to December 2017 after cleaning, 2,025 cases had the mother's residence as out-of-state or not entered, 3 cases were removed because they corresponded to KY-Moms MATR clients who did not give permission to use the birth event data, 23 cases were removed because they matched last year's outcome report, and 51 cases were removed because they corresponded to women in KY-Moms MATR that did not have a follow-up. A total of 54,750 cases, therefore, remained in the analysis.

⁴⁵ See Appendix D for further birth data comparisons between KY-Moms MATR clients and a sample of mothers with matching characteristics.

⁴⁶ More detailed description of the birth data methods can be found in Appendix B.

⁴⁷ This number differs from the percent married in part 2 since this data is from the birth event data set which is captured around the time of the baby's birth compared to the baseline assessment.

TABLE III.1. DEMOGRAPHIC INFORMATION OF BIRTH DATA GROUPS^a

	KY-Moms MATR (n = 114)	General Population (n = 53,641)
Average age**	25.5	27.3
Race*		
White	91.2%	83.4%
Non-white	8.8%	16.6%
Type of community***		
Metropolitan.....	46.5%	59.7%
Nonmetropolitan	28.9%	32.3%
Very rural	24.6%	8.0%
Married***	32.5%	57.1%

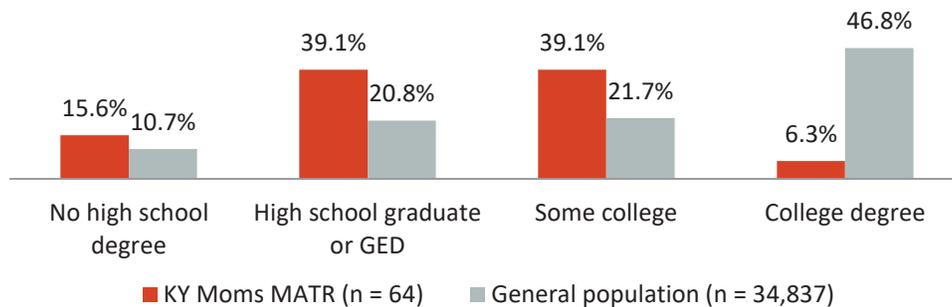
*p < .05, **p < .01, *** p < .001

a—Race was unknown for 164 women in the general population; type of community was missing for 37 women in the general population; marital status was missing for 41 women in the general population.

Socioeconomic Status Indicators

It is important to compare education rates only for those who had sufficient time to finish high school or a GED. The 2012-2016 Census estimates that of Kentuckians ages 25 and older, 87.0% had high school degrees.⁴⁸ Overall, among women 25 years of age and older, education differed significantly between the two groups. Close to 16% of KY-Moms MATR mothers and 10.7% of mothers in the general population had less than a high school degree. In addition, 46.8% of mothers in the general population, which was slightly older than the KY-Moms MATR mothers, received a college degree compared to 6.3% of mothers in KY-Moms MATR (see Figure III.1).

FIGURE III.1. LEVEL OF EDUCATION ACROSS GROUPS, AMONG WOMEN 25 YEARS OLD OR OLDER***

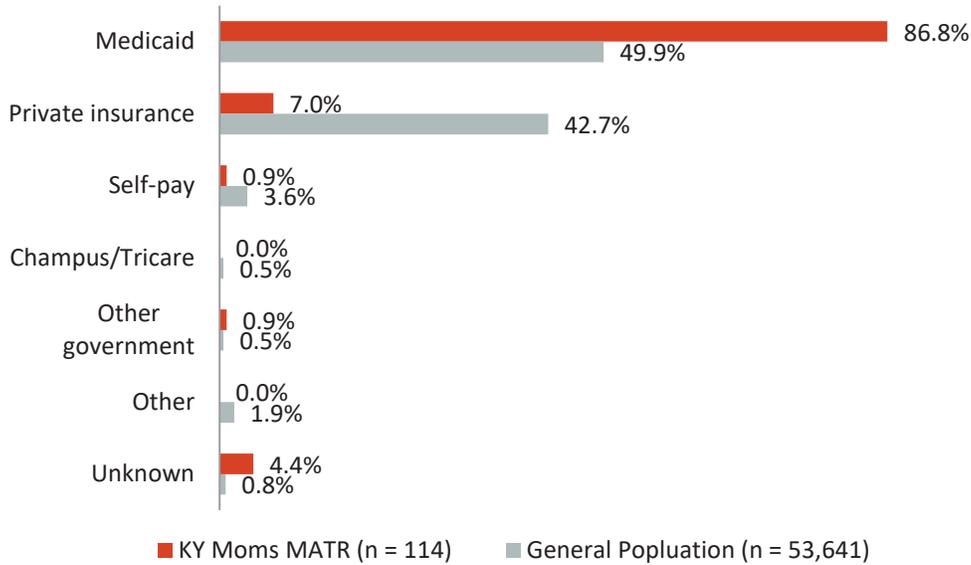


***p < .001.

⁴⁸ <https://www.census.gov/quickfacts/fact/table/US/PST045217?#PST045217>

Figure III.2 shows that KY-Moms MATR clients were significantly more likely to have Medicaid as their source of payment for the birth of the baby (86.8%) whereas the general population was more likely to have private insurance (42.7%) compared to the KY-Moms MATR clients (7.0%).

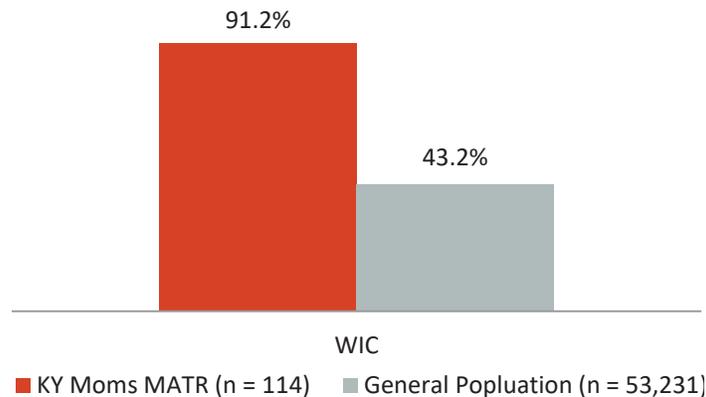
FIGURE III.2. SOURCE OF PAYMENT FOR DELIVERY COSTS ACROSS GROUPS***



Significance tested with Chi-square test; ***p < .001

WIC provides nutrition education, breastfeeding promotion and education, a monthly food allotment to use toward nutritious foods, and access to maternal, prenatal and pediatric health-care services for high-risk women. The majority of KY-Moms MATR clients (91.2%) received support from WIC compared to 43.2% of mothers who were not in KY-Moms MATR which may suggest lower incomes and/or greater effort by KY-Moms MATR caseworkers to connect women with this service (see Figure III.3).

FIGURE III.3. PERCENT OF WOMEN ENROLLED IN WIC PROGRAM COMPARED TO THE GENERAL POPULATION OF MOTHERS***



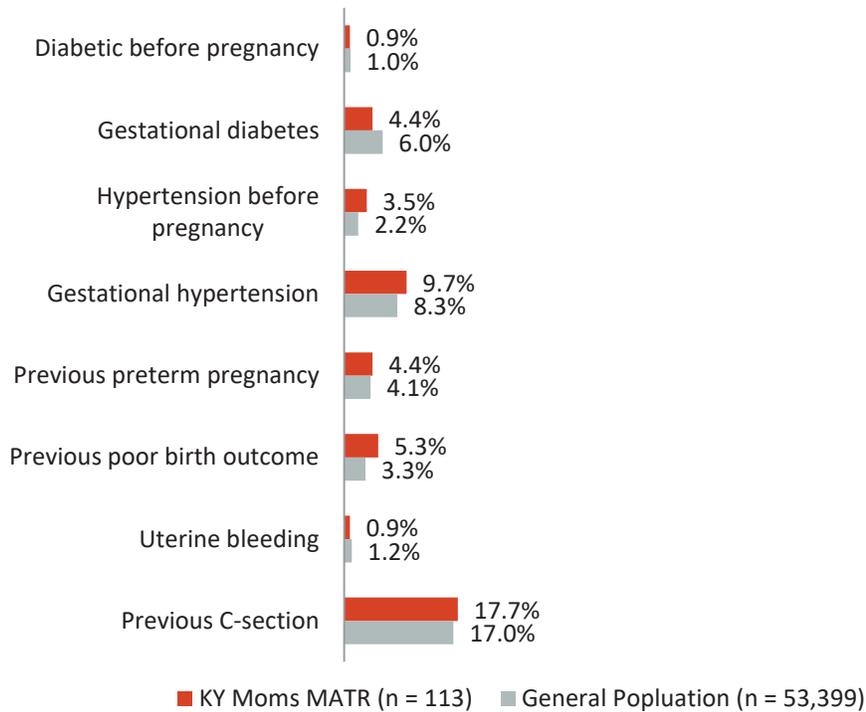
a - Information on WIC was labeled "unknown" for 410 mothers in the general population.

Significance tested with Chi-square test; *** p < .001

Physical Health Status

General health conditions of pregnancy that could cause harm to the baby or the mother were collected from the Kentucky Vital Statistics data set. KY-Moms MATR mothers were not significantly more or less likely than the general population of mothers to experience most of the maternal health conditions such as diabetes, gestational diabetes, hypertension, gestational hypertension, uterine bleeding, or a previous C-section (see Figure III.4).

FIGURE III.4. OTHER MATERNAL HEALTH FACTORS ACROSS GROUPS^a



a—1 KY-Moms MATR client and 237 mothers in the general population had missing information on maternal health questions.

While not represented in a figure, KY-Moms MATR clients were not significantly more likely to have sexually transmitted infections such as gonorrhea, syphilis, herpes, or chlamydia compared to the general population (8.2% vs. 5.3%, respectively).⁴⁹ KY-Moms MATR clients were, however, significantly more likely to have Hepatitis B or C (10.0%) compared to the general population of mothers (2.4%, not shown in a figure).

Targeted Risk Factors

Smoking Patterns

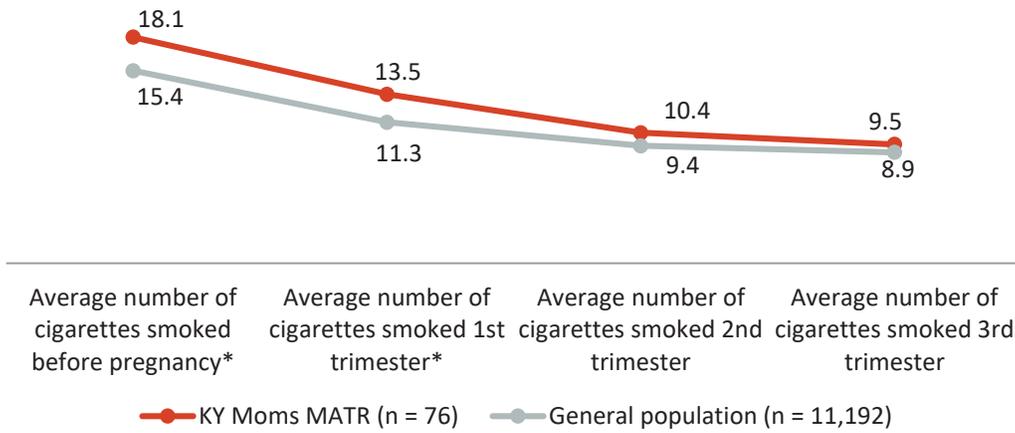
A significantly greater percentage of KY-Moms MATR mothers (66.7%) reported smoking compared to the general population of mothers (21.0%; not depicted in a figure).⁵⁰ Among mothers who reported they smoked, KY-Moms MATR mothers reported, on average, smoking more cigarettes

⁴⁹ 280 mothers in the general population and four women in KY-Moms MATR were missing data on sexually transmitted infections.

⁵⁰ 430 mothers in the general population were missing data about whether or not she was a smoker.

before pregnancy and in the first trimester compared to women in the general population (see Figure III.5).

FIGURE III.5. AVERAGE NUMBER OF CIGARETTES SMOKED PER TRIMESTER

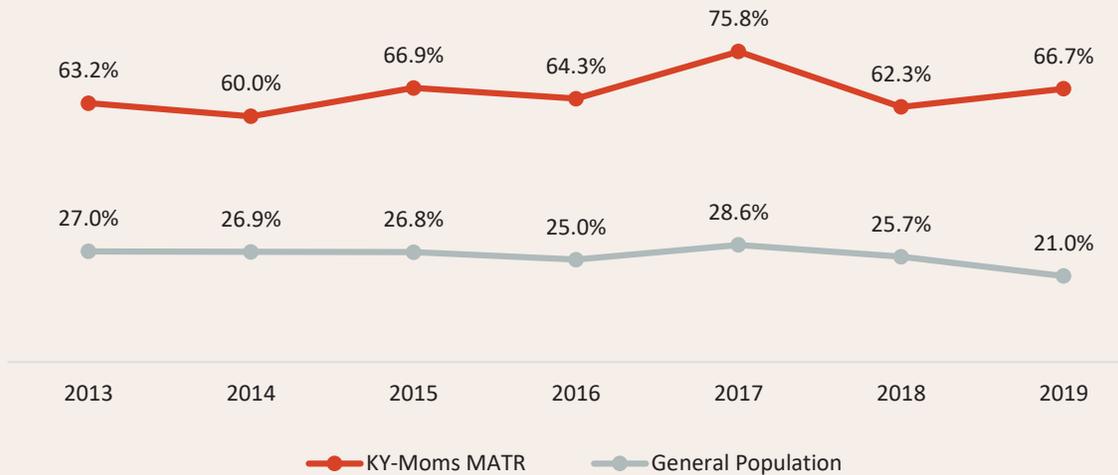


a—From the general population, 22 mothers were missing information on the number of cigarettes before pregnancy, 20 were missing the number of cigarettes in the first trimester, 18 were missing the number of cigarettes in the second trimester and 12 were missing the number of cigarettes in the last trimester.
 *p < .05

Trends in Smoking for KY-Moms MATR Clients Compared to the General Population of Mothers

Over the last 7 years, significantly more KY-Moms MATR clients have reported smoking compared to the general population of mothers. In general, around two-thirds of KY-Moms MATR clients reported smoking compared to around one-quarter of mothers in the general population.

FIGURE III.6. TRENDS IN MOTHERS REPORTING SMOKING



Alcohol Use

KY-Moms MATR clients were not more or less likely to report alcohol use (0.0%) compared to the general population of mothers (0.3%; not depicted in a figure).

Birth Events and Outcomes

Multivariate Analysis of Birth Outcomes

Using the Kentucky Vital Statistics data, the birth outcomes of children born to mothers who participated in KY-Moms MATR program (n = 117) were compared to the outcomes of children born to mothers who did not participate in the KY-Moms MATR program (n = 54,633). Logistic regression models were used to examine the association between KY-Moms MATR participation and birth outcomes while adjusting for key factors.⁵¹

Each birth outcome in Table III.2 was entered as the dependent variable in a separate binary logistic regression model with KY-Moms MATR participation as the predictor variable and the covariates of mother's age, education (i.e., less than high school diploma/high school diploma or higher), area of residence (metropolitan vs. non-metropolitan county), marital status (married vs. not married), and smoking at the time of the birth (Yes/No).⁵²

Results of the analysis show that KY-Moms MATR clients had similar birth outcomes compared to the general population for: (1) giving birth to a baby prematurely (the adjusted average⁵³ weeks gestation of 38.1 to 38.3, respectively), (2) having a child with low birth weight (the adjusted average of 7lbs, 0oz and 7lbs, 3oz, respectively), (3) having birthing problems (17.1% and 12.9%, respectively), (4) having their baby taken to the neonatal intensive care unit (NICU; 12.0% and 9.5%, respectively), or (5) breastfeeding (50.9% and 70.8%, respectively).

“I was homeless and on the street at the beginning and they helped me out a lot. Everything I got for my son was from them.”

- KY-MOMS MATR FOLLOW-UP CLIENT

⁵¹ The alpha level was set at $p < .01$.

⁵² Because race was highly associated with metropolitan vs. non-metropolitan residence for KY-Moms MATR clients, such that only 10 non-White KY-Moms MATR clients lived in a non-metropolitan community, to avoid the problem of multicollinearity in the models, race was excluded as a covariate while mother's residence in a metropolitan vs. non-metropolitan community was included.

⁵³ An ANCOVA was used to estimate adjusted means using the same covariates used in the multivariate models and included mother's age, education (i.e., high school diploma or higher), area of residence (metropolitan vs. non-metropolitan county), marital status, and smoking at the time of the birth.

TABLE III.2. EFFECT OF KY-MOMS MATR PARTICIPATION ON BIRTH OUTCOMES^a

	b	Adj. Odds ratio	99% Confidence Intervals
Premature.....	.202	1.224	.620-2.416
Low birth weight054	1.055	.503-2.212
Any birthing problems (other than the baby being taken to the NICU).....	.273	1.314	.695-2.483
Baby taken to NICU.....	.084	1.088	.519-2.278
Breastfeeding.....	-.268	.765	.463-1.263

Note: Categorical variables were coded in the following ways: KY-Moms MATR participation (0 = General population, 1 = KY-Moms MATR client); Type of community in which mother resided (0 = Non-metropolitan, 1 = Metropolitan); Mother’s education (0= Less than a high school diploma/GED, 1 = High school diploma/ GED or higher); Mother reported being a smoker (0=No, 1=Yes); Mother’s marital status (0 = Not married, 1 = Married); Premature (0 = Fullterm, 1 = Premature); Any birthing problems other than the baby being taken to the NICU (0 = No, 1 = Yes); Baby taken to NICU (0 = No, 1 = Yes); Breastfeeding (0 = No, 1 = Yes).

a—The number of cases with missing values on at least one of the covariates or dependent variable for the 5 logistic models were: premature (n = 21), low birth weight (n = 4), any birth problems (n = 65), baby taken to NICU (n = 489), and breastfeeding (n = 339).

The highest APGAR score⁵⁴ was entered as the dependent variable in a linear regression model with KY-Moms MATR participation as the predictor variable and the covariates of mother’s age, education, area of residence, marital status, and smoking status at birth. As shown in Table III.3, average highest APGAR scores were similar for KY-Moms MATR and the general population (adjusted average score of 8.8 for both groups), after adjusting for the selected covariates.

TABLE III.3. EFFECT OF PARTICIPATION IN KY-MOMS MATR ON BABY’S HIGHEST APGAR SCORE (N = 53,742)^a

	β	t	df	p
Highest APGAR score.....	.000	-.046	6	.963

R2 = .001, R2adj. = .001, F(6, 53736) = 10.177, p < .001.

Note: Categorical variables were coded in the following ways: KY-Moms MATR participation (0 = General population, 1 = KY-Moms MATR client); Type of community in which mother resided (0=Non-metropolitan, 1=Metropolitan); Mother’s education (0=Less than a high school diploma/ GED, 1=High school diploma or higher); Mother reported being a smoker (0=No, 1=Yes); Mother’s marital status (0 = Not married, 1 = Married).

a-- 222 cases had missing values for the highest APGAR score and 786 cases had missing values on at least one of the covariates.

The number of prenatal visits was also entered as the dependent variable in a linear regression model with KY-Moms MATR participation as the predictor variable and the covariates of mother’s age, education, area of residence, marital status, and smoking status at birth (see Table III.4). There was no significant difference in the number of prenatal visits for KY-Moms MATR mothers

⁵⁴ Most babies had one APGAR (5-minute) recorded in the file, but for a smaller number of babies a 10-minute APGAR was recorded. A new variable was computed that took the highest value APGAR (if 2 scores were recorded) or the only score.

(adjusted average of 11.4 visits) compared to mothers in the general population (adjusted average of 11.8 visits), after adjusting for the selected covariates.

TABLE III.4. EFFECT OF PARTICIPATION IN KY-MOMS MATR ON THE NUMBER OF PRENATAL VISITS (N = 51,574)^a

	β	t	df	p
Average number of prenatal visits	-.005	-1.054	6	.292

R2 = .038, R2adj. = .038, F(6, 51567) = 335.982, p < .001.

Note: Categorical variables were coded in the following ways: KY-Moms MATR participation (0 = General population, 1 = KY-Moms MATR client); Type of community in which mother resided (0 = Non-metropolitan, 1 = Metropolitan); Mother’s education (0 = Less than a high school diploma/GED, 1 = High school diploma or higher); Mother reported being a smoker (0 = No, 1 = Yes); Mother’s marital status (0 = Not married, 1 = Married).

a—2,498 cases had missing values for the number of prenatal visits and 678 cases had missing values on at least one of the covariates.

Summary

Compared to the general population of mothers in Kentucky who gave birth during the same period of time as KY-Moms MATR clients, KY-Moms MATR clients were younger, more likely to live in non-metropolitan or rural areas, were less likely to be married, and had less education. In addition, KY-Moms MATR mothers were more likely to have Medicaid as their source of payment for the birth of the baby and receive support from WIC compared to the general population of mothers. While they were not more likely to have maternal health problems such as gestational diabetes and hypertension, they were more likely to have Hepatitis B and/or C. Significantly more KY-Moms MATR mothers were also smokers compared to the general population of mothers. Despite these characteristics, multivariate analysis showed that birth events and outcomes were very similar between groups.

A Closer Look at Birth Event Outcomes

Further analysis of birth data outcomes can be found in Appendix D in which KY-Moms MATR clients were compared to a sample of mothers matched on selected factors (i.e., age, race, education, marital status, metropolitan/non-metropolitan residence, and smoking status) along with a randomly selected comparison group from the general population. Overall, results of the comparison analysis parallel the results of the multivariate analysis with KY-Moms MATR birth events and outcomes being very similar to the general population.

Part IV: Change in Targeted Factors from Intake to Follow-up for Clients in the Postnatal Follow-up Sample

This section examines change in: (1) information about the baby, (2) substance use, (3) mental health, (4) intimate partner violence, (5) economic and living circumstances, economic hardship, and criminal justice involvement, (6) physical health, and (7) stress, quality of life, and emotional support. Past-30-day and past-6-month substance use are examined separately where applicable.

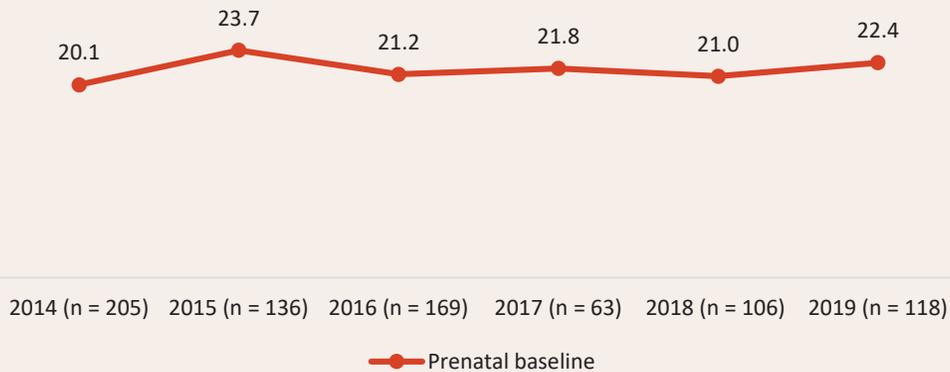
Information on the Pregnancy/Baby

When followed-up clients completed a prenatal baseline they were an average of 22.4 weeks pregnant (Min. = 7 weeks, Max. = 39 weeks).⁵⁵ Followed-up clients were in the program an average of 18.6 weeks (Min. = 2 weeks, Max. = 36 weeks). After the baby was born, clients reported remaining in the KY-Moms MATR program an average of 5.6 weeks (Min. = 0 weeks, Max. = 25 weeks).⁵⁶

Trends in Average Number of Weeks Pregnant at Baseline by Report Year

The average number of weeks in pregnancy when a client completed a prenatal baseline assessment was relatively stable over the past 6 years. In report year 2014, clients were an average of 20.1 weeks into their pregnancies and in 2019 clients were an average of 22.4 weeks into their pregnancies when they completed a prenatal baseline.

FIGURE IV.1. AVERAGE NUMBER OF WEEKS CLIENT WAS PREGNANT AT BASELINE AMONG CLIENTS IN THE FOLLOW-UP SAMPLE, 2014-2019



⁵⁵ In order to be included in the analysis, there must be at least 30 days between the date of program entry and the birth of the baby. The average number of days between program entry and baseline completion was 23 (Min. = 0 and Max. = 160). Therefore, even though a client was at 40 weeks in her pregnancy when the baseline was completed, she entered the program more than 30 days before the due date.

⁵⁶ The number of weeks clients remained in KY-Moms MATR after the birth of the baby was missing for 11 clients.

General Information Regarding the Pregnancy/baby

Clients were asked how their baby was doing at postnatal follow-up and all the mothers indicated the baby was “great” or “good.”

At prenatal baseline, KY-Moms MATR clients reported an average of 5.9 doctor visits about the pregnancy and at postnatal follow-up clients reported an average of 6.5 visits to the pediatrician or nurse since giving birth.⁵⁷ About 1 in 5 mothers (21.7%) at baseline indicated they were told by a doctor that there were special health care needs that would directly impact the pregnancy or the baby at baseline.⁵⁸ Similarly at postnatal follow-up, 20.3% (24 clients) reported their doctor told them their baby had special health care needs. More specifically, 8 clients reported their babies had minor health care needs such as allergies or acid reflux. However, 16 mothers (or 13.6% of the postnatal follow-up sample) reported various and potentially serious problems such as heart problems, birth defects, and breathing problems. In comparison, for all babies born in the United States, approximately 3.0% of babies are born with a birth defect (such as cleft palate, spina bifida, or neural tube defects)⁵⁹ and about 1.0% of babies will be born with a congenital heart defect.⁶⁰ In addition, 20% of children in the United States and 26% of children in Kentucky are considered to have special health care needs as defined by the federal Maternal and Child Health Bureau’s definition.⁶¹

Maternal-fetal Attachment/Maternal-infant Attachment

Clients were asked 14 items measuring the extent to which the KY-Moms MATR client was emotionally engaged in her pregnancy⁶² (e.g., “I wonder what the baby looks like now”, “I imagine calling the baby by name”, and “I imagine what part of the baby I’m touching”) at baseline. At follow-up, clients were asked 14 items measuring the extent to which the KY-Moms MATR client was emotionally engaged with her infant⁶³ (e.g., “I know my baby needs me”, “It’s fun being with my baby”). Items are scored on a 4-point Likert scale from 1 = ‘Almost never’ to 4 = ‘Almost always’. Total scores range from 14 to 56 with higher scores indicative of a higher level of attachment. Scores in attachment increased significantly from 47.3 at baseline to 53.5 at follow-up.

Average scores of attachment **increased significantly** from 47.3 to 53.5 at follow-up

⁵⁷ Four clients did not know how many doctor visits and 3 clients had missing data at follow-up.

⁵⁸ 3 clients indicated they had not seen a doctor yet.

⁵⁹ Centers for Disease Control and Prevention. Update on overall prevalence of major birth defects --- Atlanta, Georgia, 1978--2005. *Morbidity and Mortality Weekly Report* 2008, 57(1), 1-5.

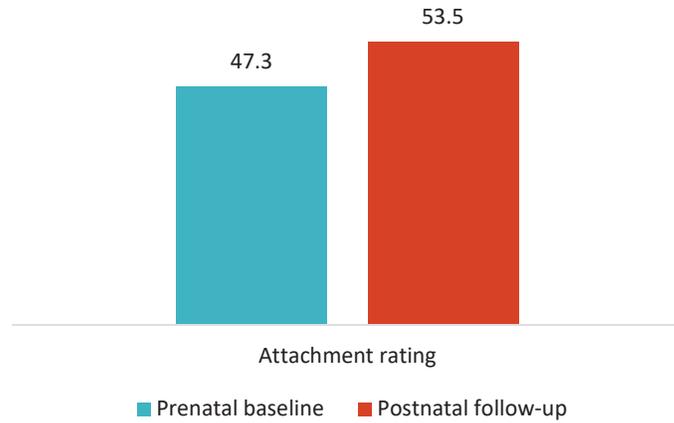
⁶⁰ <http://www.marchofdimes.com/baby/congenital-heart-defects.aspx#>

⁶¹ KIDS COUNT Data Center. (2013). Children with special health care needs 2011-2012. Retrieved from <http://datacenter.kidscount.org/data/tables/29-children-with-special-health-care-needs?loc=19&loct=2#detailed/2/19/false/1021,18,19,12/any/298,299> and <http://datacenter.kidscount.org/data/tables/29-children-with-special-health-care-needs?loc=1&loct=1#detailed/1/any/false/1021,18,19,12/any/298,299> on October 18, 2018.

⁶² To measure maternal-fetal attachment, the KY-Moms MATR assessment uses an adapted version of the Prenatal Attachment Inventory (PAI; Müller, 1993) which consists of 21 items. For the purposes of KY-Moms MATR and to reduce the time burden on program staff, the PAI was reduced to 14 items.

⁶³ Mother-infant attachment is measured in the KY-Moms MATR assessment with the Maternal Attachment Inventory (MAI; Müller, 1994) which consists of 26 items. In order to reduce time burden, the MAI was reduced to 14 items.

FIGURE IV.2. LEVEL OF MATERNAL-FETAL ATTACHMENT/MATERNAL-INFANT ATTACHMENT (N = 83)⁶⁴ ***



***p < .001

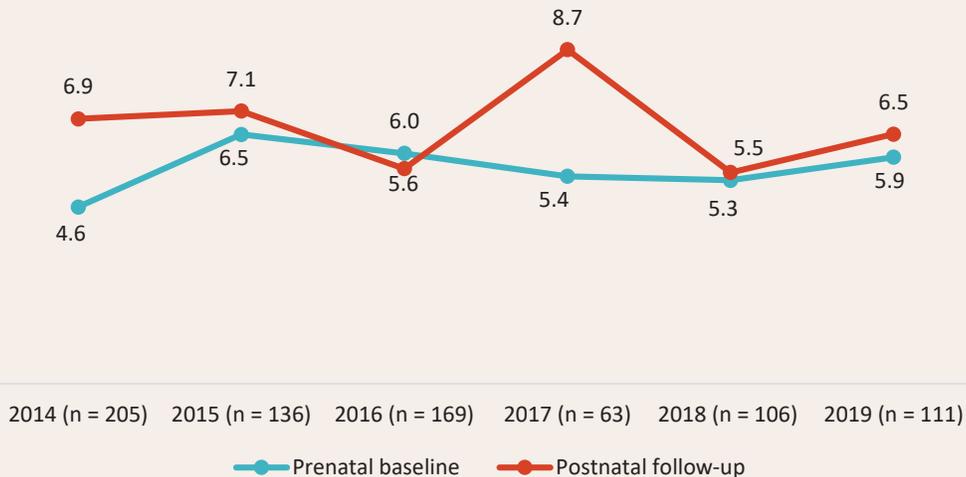
Emergency Room Visits for the Baby at Postnatal

At postnatal follow-up, 39.8% of clients reported they had taken their baby to the emergency room since giving birth (not depicted in a figure). Of those clients (n = 47), they reported taking their baby to the emergency room an average of 1.4 times (range of 1 to 4 times).

Trends in Average Number of Visits with a Health Care Provider at Baseline and Follow-up

In 2014, clients reported an average of 4.6 doctor visits about the pregnancy and at postnatal follow-up clients reported an average of 6.9 visits to the pediatrician or nurse since giving birth. In the 2017 outcomes report, clients reported an average of 5.4 prenatal visits, but an average of 8.7 doctor visits after the baby was born. In 2019, clients reported 5.9 doctor visits at prenatal baseline and 6.5 visits at postnatal follow-up.

FIGURE IV.3. AVERAGE NUMBER OF DOCTORS VISITS AT BASELINE AND FOLLOW-UP AMONG CLIENTS IN THE FOLLOW-UP SAMPLE, 2014-2019



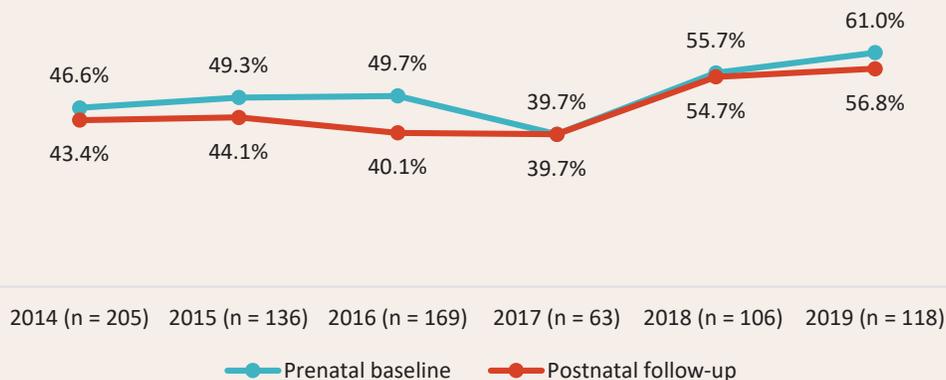
⁶⁴ This measure was added to the assessments in April 2017; therefore, not all clients had the opportunity to answer this question at baseline. Only clients who were asked at both baseline and follow-up are included in the analysis.

Sixty-one percent of clients reported at prenatal baseline that they planned on breastfeeding their baby and at postnatal follow-up, 56.8% of clients reported having breastfed their baby for any period. Of the 72 women who reported planning on breastfeeding at prenatal baseline, 77.8% (n = 56) reported having breastfed their baby at postnatal follow-up and of those 56, 11 reported still breastfeeding. Of the 46 clients who reported at prenatal baseline they were not planning on breastfeeding or had not decided yet, 23.9% (or 11 clients) reported having breastfed at follow-up but none were still breastfeeding.

Trends in Breastfeeding at Prenatal Baseline and Postnatal Follow-up

The percent of KY-Moms MATR clients who reported at prenatal baseline that they were planning on breastfeeding was fairly similar to the percent of clients at postnatal follow-up who reported that they had breastfed their babies. In 2014, 46.6% of clients reported at prenatal baseline they planned on breastfeeding their babies and, at follow-up, 43.4% of clients reported that they had breastfed. In 2019, 61.0% of clients planned at baseline on breastfeeding their babies and 56.8% of clients reported breastfeeding their babies at follow-up.

FIGURE IV.4. CLIENTS IN THE FOLLOW-UP SAMPLE REPORTING BREASTFEEDING AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP, 2014-2019



Summary

Clients were a little over halfway through their pregnancies when they completed a prenatal baseline interview and reported at follow-up they had spent about 22 weeks in the program. Clients remained in the program, on average, almost 6 weeks after the baby was born. All the mothers in the follow-up sample reported their babies were “great” or “good” and had taken their babies to see a doctor an average of 6.5 times since the baby had been born, which is an average of a little over once per month. In addition, at baseline over half of mothers reported they were planning on breastfeeding their babies and 57% of mothers reported at postnatal follow-up they had breastfed their babies. Further, clients’ level of attachment significantly increased from when their child was a fetus (at baseline) to after their child was born (at follow-up).

Substance Use

This subsection examines change in: (1) overall substance use (illegal drug and alcohol use), (2) use of illegal drugs, alcohol, and cigarettes, (3) problems experienced with substance use, (4) readiness for substance abuse treatment, (5) substance abuse treatment and self-help meetings, and (6) medication-assisted treatment. Past-30-day and past-6-month substance use are examined separately where applicable.

Change in targeted risk factors were examined for two different trends over time:⁶⁵

Six month trends

- **6 months before pregnancy.** Information collected from the client at prenatal baseline regarding the six months before she found out she was pregnant.
- **6 months since the birth of the baby.** Information collected at postnatal follow-up regarding the 6 months since the baby was born.

30 day trends⁶⁶

- **30 days before pregnancy.** Information collected from the client at prenatal baseline regarding the 30 days before she found out she was pregnant.
- **30 days at prenatal baseline.** Information collected from the client at prenatal baseline regarding the past 30 days she has been pregnant.
- **30 days before the baby was born.** Information collected from the client at postnatal follow-up regarding the 30 days before giving birth while she was involved in KY-Moms MATR case management services.
- **30 days at postnatal follow-up.** Information collected at postnatal follow-up regarding the past 30 days.

Overall Substance Use (Illegal Drug and Alcohol Use)

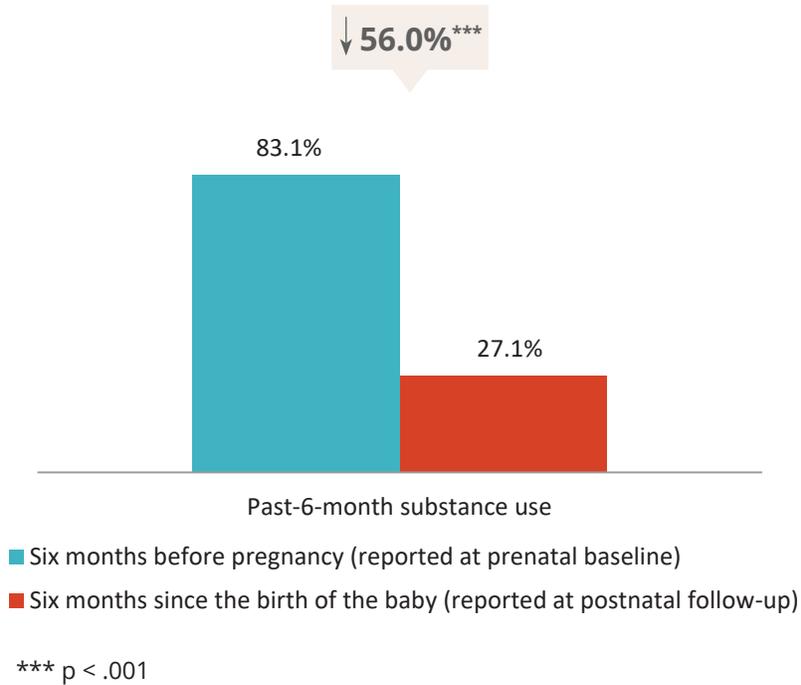
PAST-6-MONTH ILLEGAL DRUGS AND/OR ALCOHOL USE

In the 6 months before pregnancy, 83.1% of clients reported using illegal drugs and/or alcohol. In the 6 months before the follow-up interview, over one-quarter (27.1%) of clients reported using illegal drugs and/or alcohol (a significant decrease of 56.0%; see Figure IV.5).

⁶⁵ Significance was determined by McNemar's test for substance use, mental health problems and intimate partner violence unless otherwise indicated.

⁶⁶ Because some clients were in a controlled environment (e.g., prison, jail, or residential facility) all 30 days before prenatal baseline changes in drug, alcohol, and tobacco use from baseline to follow-up were analyzed for only clients who were not in a controlled environment all 30 days before prenatal baseline. The assumption for excluding clients who were in a controlled environment all 30 days before entering treatment (n = 3) or all 30 days before the follow-up (n = 1) from the change in past-30-day substance use analysis is that being in a controlled environment inhibits opportunities for alcohol and drug use. In addition, at follow-up 2 clients were not included because the interviewer skipped the questions.

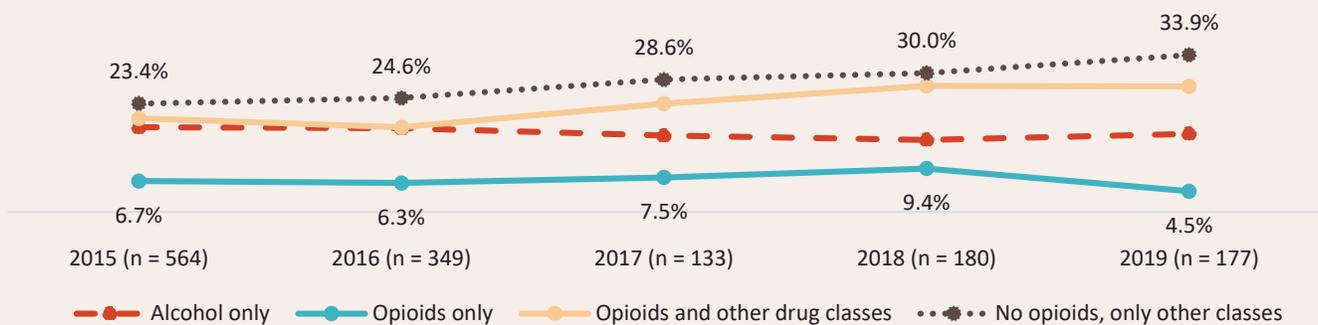
FIGURE IV.5. PAST-6-MONTH SUBSTANCE USE FROM PRENATAL BASELINE TO POSTNATAL FOLLOW-UP (N = 118)



Trends in Alcohol and Drug Use Classes⁶⁷ in the 6 Months Before Pregnancy at Intake

In each report year, more clients with a baseline reported not using opioids, but other classes of drugs in the 6 months before pregnancy. The percent of clients reporting using other classes of drugs in the 6 months before pregnancy also has increased from 23.4% in the 2015 report to 33.9% in the current report year. In addition, each year, more clients reported using alcohol only compared to opioids only.

FIGURE IV.6. TRENDS IN CLASSES OF SUBSTANCES USED IN THE SIX MONTHS BEFORE PREGNANCY



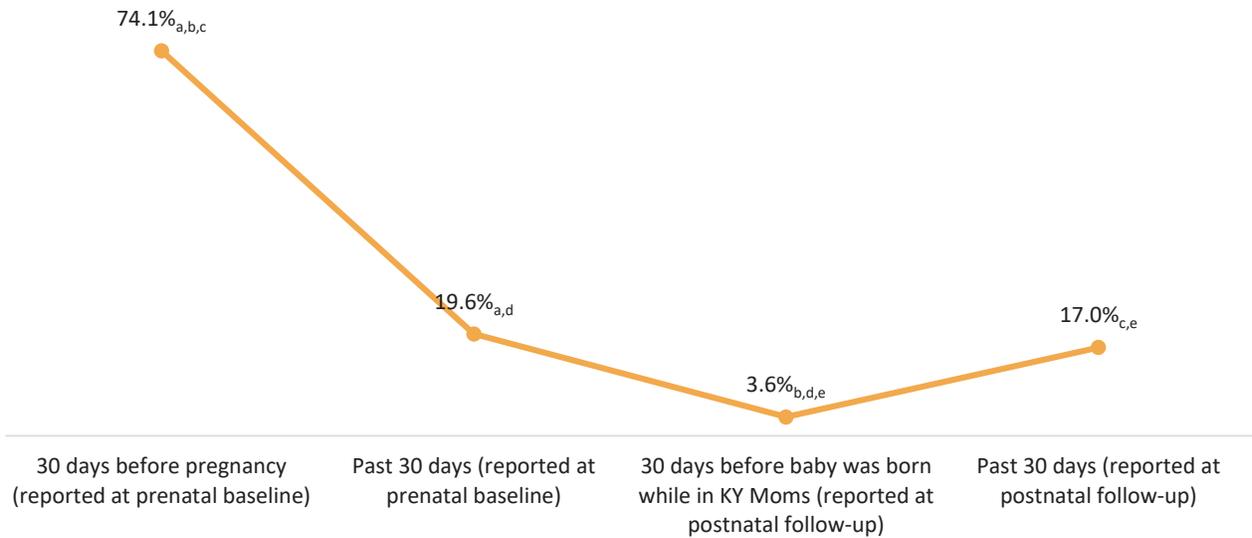
⁶⁷ Five classes: 1. Marijuana, 2. Opioids (prescription opiates, Suboxone, heroin, methadone), 3. Stimulants (amphetamines, methamphetamine, prescription stimulants, cocaine), 4. CNS depressants (barbiturates, tranquilizers), 5. Other illegal drugs (inhalants, hallucinogens, synthetic drugs).

PAST-30-DAY ILLEGAL DRUGS AND/OR ALCOHOL USE

Figure IV.7 shows the results for overall illegal drug and/or alcohol use across all four past-30-day periods. In the 30 days before pregnancy, 74.1% of clients reported using illegal drugs and/or alcohol. In the past 30 days at baseline, 19.6% of clients reported using illegal drugs and/or alcohol.

At postnatal follow-up, 3.6% of clients reported using illegal drugs and/or alcohol in the 30 days before the baby was born compared to 74.1% of clients in the 30 days before pregnancy and 19.6% in the past 30 days at prenatal baseline. Finally, 17.0% of clients reported illegal drug and/or alcohol use in the past 30 days at postnatal follow-up. Thus, the period when the smallest percentage of women reported using illegal drugs and/or alcohol was the 30 days before the baby was born while the clients were pregnant and involved in KY-Moms MATR.

FIGURE IV.7. PAST-30-DAY SUBSTANCE USE FROM PRENATAL BASELINE TO POSTNATAL FOLLOW-UP (N = 112)



a, b, c, d, e- Values sharing the same subscript differ at $p < .01$

Illegal Drug Use

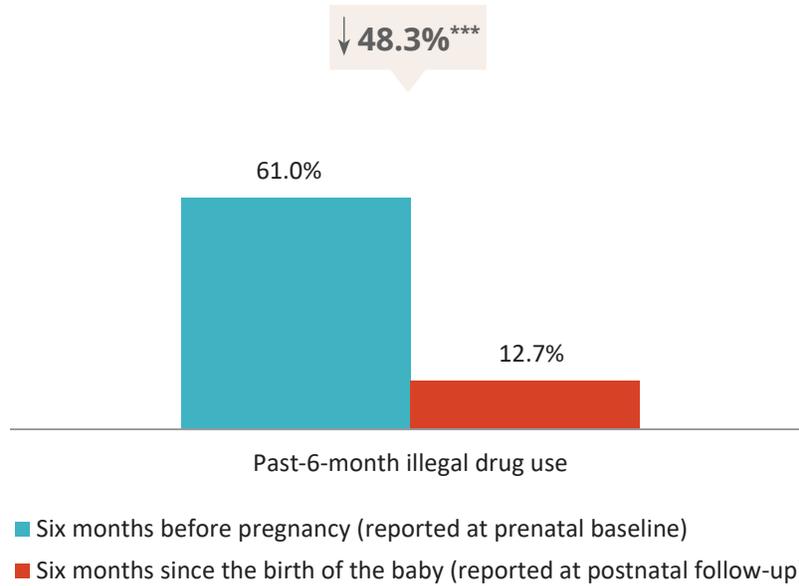
PAST-6-MONTH ILLEGAL DRUG USE

Figure IV.8 shows that in the 6 months before pregnancy, 61.0% of clients reported using illegal drugs and in the past 6 months at follow-up 12.7% of clients reported illegal drug use (a significant decrease of 48.3%). Clients reported being an average of 15.6 years of age when they first began using illicit drugs.⁶⁸

Sixty-one percent of clients reported illegal drug use in the 6 months before pregnancy compared to 13% in the past 6 months at postnatal follow-up

⁶⁸ Among the clients who reported an age of first use greater than 0, n = 103.

FIGURE IV.8. PAST-6-MONTH ILLEGAL DRUG USE FROM PRENATAL BASELINE TO POSTNATAL FOLLOW-UP (N = 118)

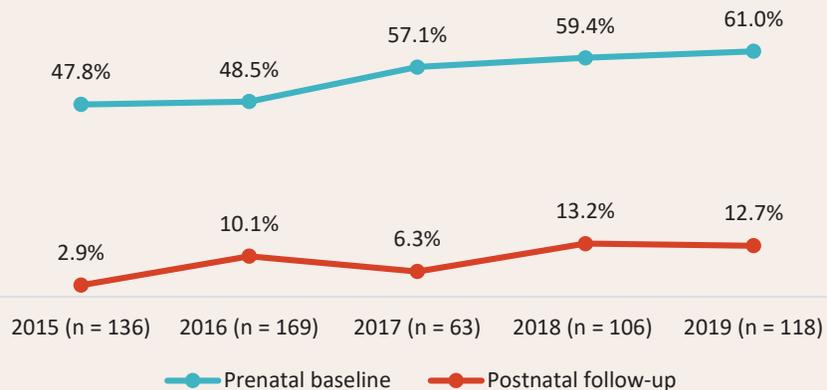


*** p < .001

Trends in Illegal Drug Use at Prenatal Baseline and Postnatal Follow-up

Among clients who were in the follow-up sample each report year, the percent of women who reported illegal drug use in the 6 months before pregnancy has increased since 2015 from 47.8% to 61.0% in 2019. The percent of women who reported illegal drug use in the past 6 months at postnatal follow-up generally increased as well from 2.9% in 2015 to 12.7% in 2019.

FIGURE IV.9. CLIENTS IN THE FOLLOW-UP SAMPLE REPORTING ILLEGAL DRUG USE AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP, 2015-2019



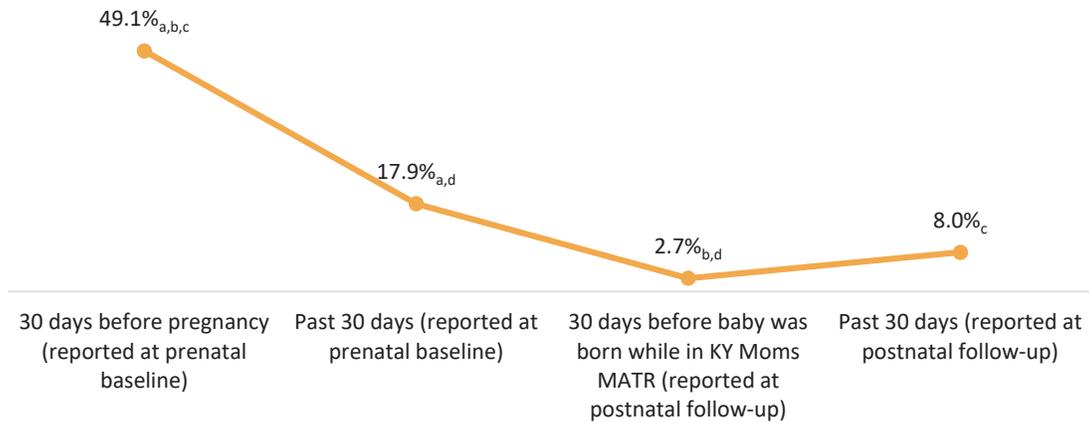
PAST-30-DAY ILLEGAL DRUG USE

Close to half (49.1%) of clients reported illegal drug use⁶⁹ in the 30 days prior to becoming pregnant (see Figure IV.10). A national survey of women indicated that 11.4% of non-pregnant women age 15-44 reported using illegal drugs in the past month.⁷⁰ About 18% of clients reported using illegal drugs in the past 30 days at baseline. In comparison, nationally, 8.5% of pregnant women aged 15-44 reported using illegal drugs in the past month.⁷¹

At postnatal follow-up, 2.7% of clients reported using illegal drugs in the 30 days before the baby was born and 8.0% reported using illegal drugs 30 days before the follow-up assessment.

The number of clients who reported **illegal drug use decreased significantly in the past 30 days at prenatal baseline and again in the 30 days before the baby was born**

FIGURE IV.10. PAST-30-DAY ILLEGAL DRUG USE FROM PRENATAL BASELINE TO POSTNATAL FOLLOW-UP (N = 112)



a, b, c, d- Values sharing the same subscript differ at $p < .01$

Injection Drug Use

At prenatal baseline, 23.2% of clients reported ever injecting any drugs and 2.7% of clients reported injecting a drug in the past 30 days. At postnatal follow-up, none of the clients reported injecting drugs since they began KY-Moms MATR or in the past 30 days.

⁶⁹ Illegal drug use includes marijuana, sedatives, barbiturates, prescription opiates, cocaine, heroin, hallucinogens, inhalants, methadone, and non-prescribed buprenorphine.

⁷⁰ Substance Abuse and Mental Health Services Administration. *Results from the 2013 National Survey on Drug Use and Health: Summary of National Findings, NSDUH Series H-48, HHS Publication No. (SMA) 14-4863*. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2014.

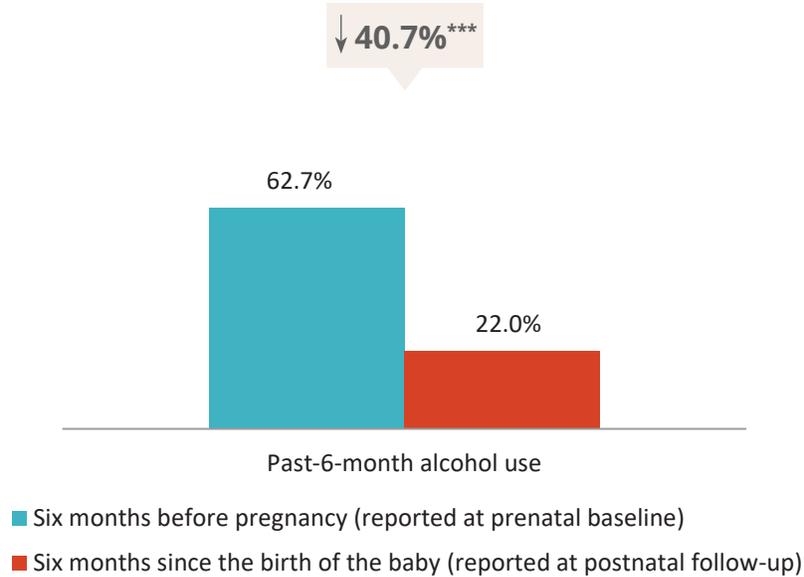
⁷¹ Substance Abuse and Mental Health Services Administration. *Results from the 2017 National Survey on Drug Use and Health: Summary of National Findings, NSDUH Series H-48, HHS Publication No. (SMA) 14-4863*. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2014.

Alcohol Use

PAST-6-MONTH ALCOHOL USE

Figure IV.11 shows that in the six months before pregnancy 62.7% of clients reported alcohol use and after the baby was born, 22.0% of clients reported alcohol use in the past 6 months (a significant decrease of 40.7% from the six months before pregnancy). Clients reported being an average of 15.6 years of age when they had their first alcoholic drink (other than a few sips).⁷²

FIGURE IV.11. PAST-6-MONTH ALCOHOL USE FROM PRENATAL BASELINE TO POSTNATAL FOLLOW-UP (N = 118)



“I just loved it. Still learned new things even though it was my 3rd kid.”

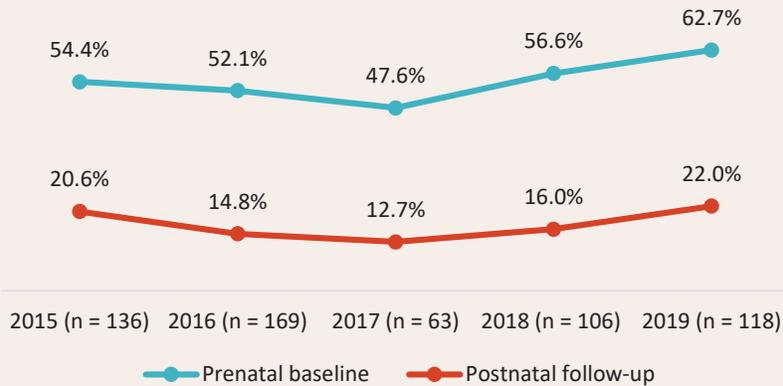
- KY-MOMS MATR FOLLOW-UP CLIENT

⁷² Among the clients who reported an age of first use greater than 0, n = 103.

Trends in Alcohol Use at Prenatal Baseline and Postnatal Follow-up

Prior to 2019, around half of clients reported alcohol use in the 6 months before pregnancy. In addition, prior to 2018, alcohol use at follow-up decreased since 2015. In 2019, however, about 63% of clients reported alcohol use in the 6 months before pregnancy and 22.0% of clients reported alcohol use in the 6 months since having the baby.

FIGURE IV.12. CLIENTS IN THE FOLLOW-UP SAMPLE REPORTING ALCOHOL USE AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP, 2015-2019



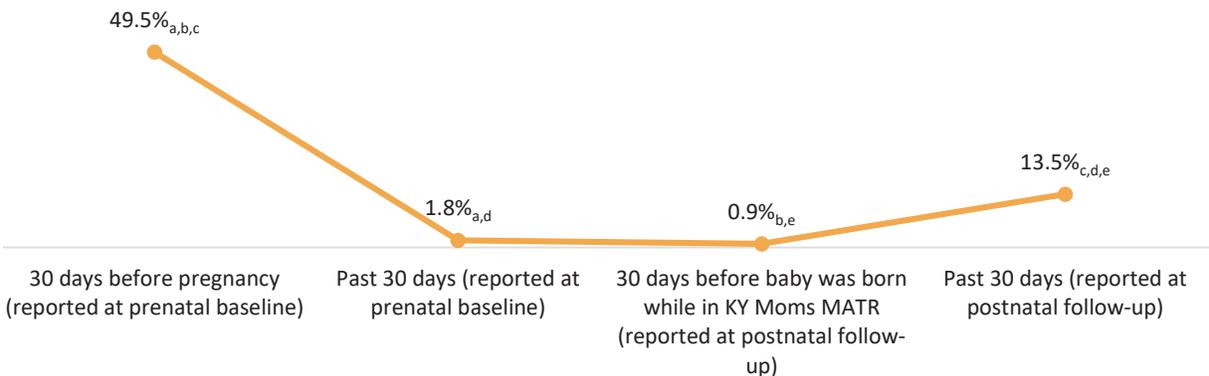
PAST-30-DAY ALCOHOL USE

Figure IV.13 shows that 49.5% of clients reported alcohol use in the 30 days prior to becoming pregnant. At the national level, 55.4% of non-pregnant women aged 15-44 reported drinking alcohol in the past 30 days. In the past 30 days at prenatal baseline, 1.8% of clients reported using alcohol. Nationally, 11.2% of women aged 15-44 reported using alcohol during pregnancy.

Only one KY-Moms MATR client reported any alcohol use in the 30 days before the baby was born

At postnatal follow-up, 0.9% of the clients (only 1 client) reported using alcohol in the 30 days before the baby was born while they were involved in KY-Moms MATR. Six months after the baby was born, 13.5% of clients reported alcohol use in the past 30 days.

FIGURE IV.13. PAST-30-DAY ALCOHOL USE FROM PRENATAL BASELINE TO POSTNATAL FOLLOW-UP (N = 111)⁷³



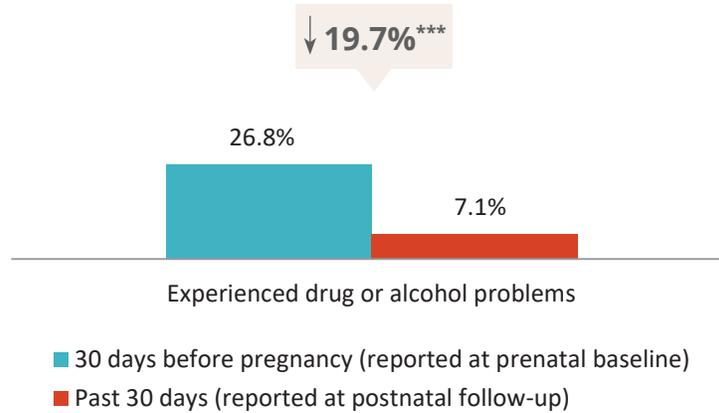
a, b, c, d, e- Values sharing the same subscript differ at $p < .01$

⁷³ One client was missing information on past-30-day alcohol use at follow-up.

Problems Experienced with Substance Use

In the 30 days before pregnancy, 26.8% of clients reported they experienced problems with drugs or alcohol such as craving, withdrawal, wanting to quit but being unable, or worrying about relapse (see Figure IV.14). In the past 30 days at follow-up, 7.1% of clients reported experiencing problems with drugs or alcohol (a significant decrease of 19.7%).

FIGURE IV.14. CLIENTS EXPERIENCING PROBLEMS WITH ILLEGAL DRUGS OR ALCOHOL USE AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP (N = 112)

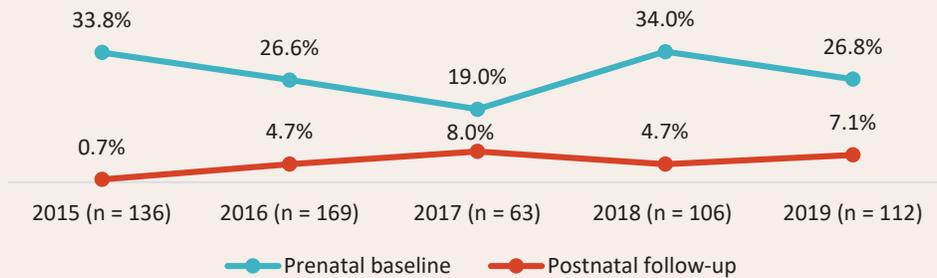


***p < .001.

Trends in Experiencing Problems with Substance Use at Prenatal Baseline and Postnatal Follow-up

In report year 2015, 33.8% of clients reported they experienced problems with drugs or alcohol in the 30 days before pregnancy and in the past 30 days at follow-up, 0.7% of clients experienced problems. In 2017, 19.0% of clients experienced problems with drugs or alcohol in the 30 days before pregnancy compared to 8.0% in the past 30 days at follow-up. In report year 2019, a little more than one-quarter of clients experienced problems with drugs or alcohol in the 30 days before pregnancy compared to 7.1% of clients in the past 30 days at the postnatal follow-up.

FIGURE IV.15. CLIENTS IN THE FOLLOW-UP SAMPLE EXPERIENCING PROBLEMS WITH SUBSTANCE USE AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP, 2015-2019

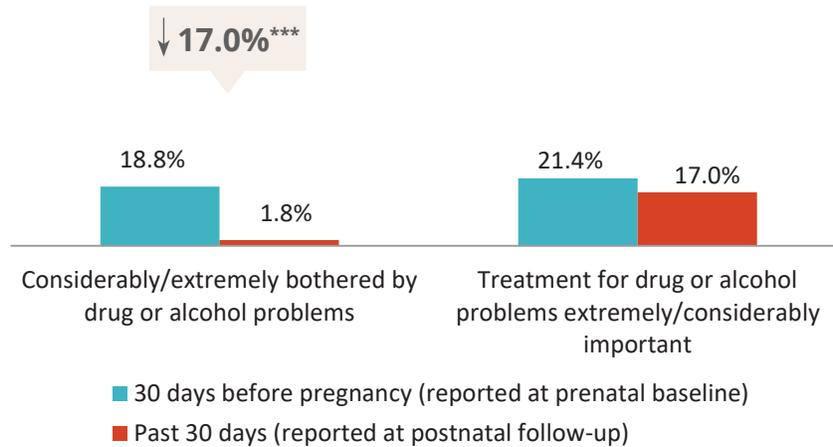


Readiness for Substance Abuse Treatment

Figure IV.16 shows that 18.8% of clients reported they were considerably or extremely troubled or bothered by drug or alcohol problems in the 30 days before pregnancy. In the past 30 days at postnatal follow-up 1.8% of clients reported that they were considerably or extremely troubled or bothered by drug or alcohol problems, which was a significant decrease of 17.0%.

The figure below also shows that 21.4% of clients in the 30 days before pregnancy and 17.0% of clients in the past 30 days at postnatal follow-up reported that treatment for drug or alcohol problems was considerably or extremely important, which was not a significant decrease.

FIGURE IV.16. READINESS FOR TREATMENT FOR ILLEGAL DRUG OR ALCOHOL USE AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP (N = 112)

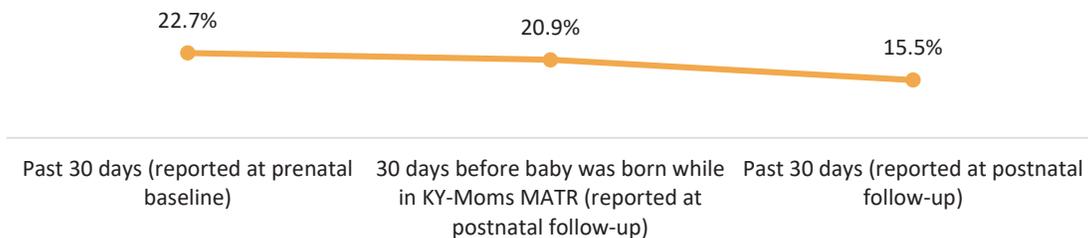


*** p < .001

Substance Abuse Treatment

At prenatal baseline, 19.5% of clients reported receiving services for substance abuse (including detox, drug court, and recovery programs; not included in a figure). Figure IV.17 shows that in the past 30 days at baseline, 22.7% of clients reported being treated for substance abuse. At postnatal follow-up, 20.9% of clients reported being treated for substance abuse in the 30 days before the baby was born and 15.5% of clients reported being treated for substance abuse in the past 30 days.

FIGURE IV.17. CLIENTS REPORTING SUBSTANCE ABUSE TREATMENT AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP (N = 110)⁷⁴

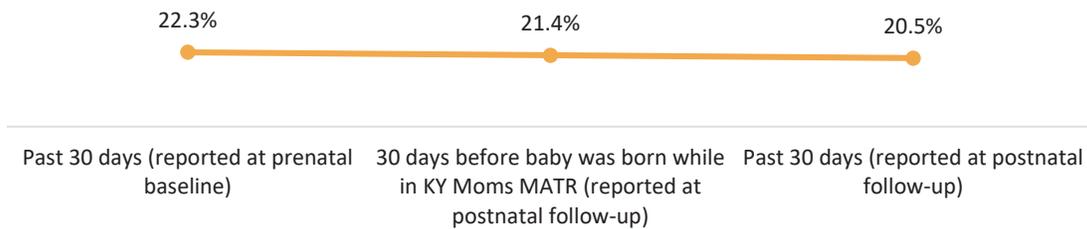


⁷⁴ Two clients were missing information on if the client received services for substance abuse.

Self-help Meetings

At prenatal baseline, 16.9% of clients reported attending a self-help recovery meeting (such as AA, NA, or MA) in the 6 months before pregnancy (not depicted in a figure). The number of clients who reported attending a self-help recovery meeting declined slightly, but not significantly, from the past 30 days at prenatal baseline to the past 30 days at follow-up. In the past 30 days at prenatal baseline, 22.3% of clients reported attending a self-help meeting (see Figure IV.18). At follow-up, 21.4% of clients reported attending a self-help meeting in the 30 days before the baby was born and 20.5% of clients reported attending a self-help meeting in the past 30 days at follow-up.

FIGURE IV.18. CLIENTS REPORTING ATTENDING A SELF-HELP GROUP AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP (N = 112)



Medication-assisted Treatment

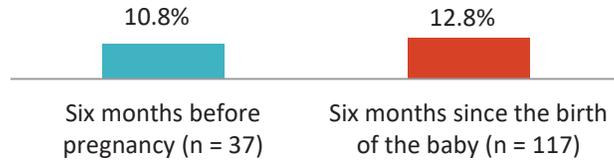
At baseline (n = 37),⁷⁵ 10.8% of clients reported participating in medication-assisted treatment (MAT) in the 6 months before pregnancy. Of those clients who reported participating in MAT at baseline (n = 4), half reported receiving Suboxone/Subutex (buprenorphine), and half reported methadone. On average, these clients reported using these medications 4 out of the 6 months before pregnancy, and for 27.5 days in the last 30 days at baseline. All of these clients at baseline reported the MAT helped treat their drug problems.

At follow-up (n = 117), 12.8% of clients reported participating in MAT in the 6 months since the baby was born.⁷⁶ Of those clients (n = 15), 73.3% reported Suboxone/Subutex (buprenorphine), and 26.7% reported methadone. Clients reported using the medications for an average of 5.7 months in the 6 months since the baby was born and 26 days in the last 30 days at follow-up. All of these clients at follow-up who used MAT reported it helped treat their drug problems.

⁷⁵ MAT questions were added to the baseline in December 2016. The timeframe of the question changed slightly in April 2017; therefore, only the most recent version is included in analysis.

⁷⁶ One client was missing data for the MAT questions at follow-up.

FIGURE IV.19. PAST-6-MONTH PARTICIPATED IN MEDICATION-ASSISTED TREATMENT AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP



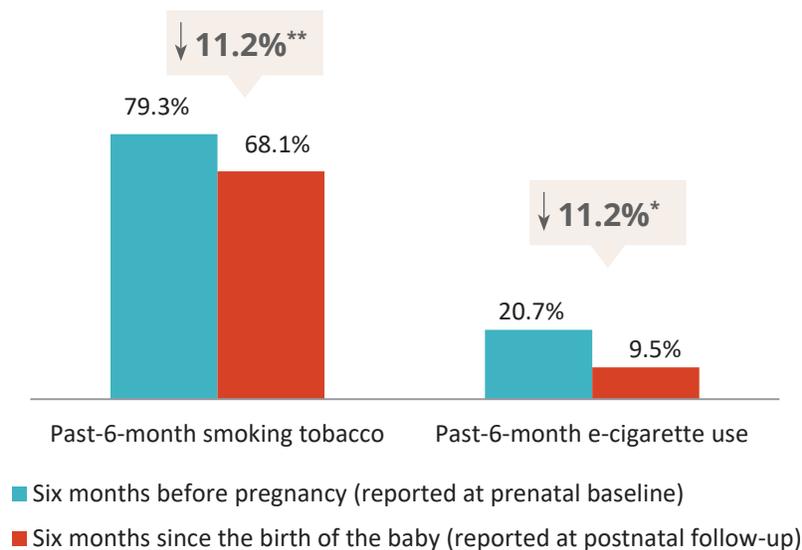
Tobacco Use

PAST-6-MONTH TOBACCO USE

At prenatal baseline, 79.3% of clients reported smoking tobacco in the 6 months prior to pregnancy (Figure IV.20). At postnatal follow-up, 68.1% of clients reported smoking tobacco in the past 6 months, which is a significant decrease of 11.2%. Clients reported being an average of 15 years of age when they began smoking regularly (on a daily basis).⁷⁷

About 21% of clients reported using e-cigarettes (e.g., battery-powered nicotine delivery devices that vaporize a liquid mixture consisting of propylene glycol, glycerin, flavorings, nicotine, and other chemicals) compared to 9.5% of clients in the past 6 months at follow-up (a significant decrease of 11.2%).

FIGURE IV.20. PAST-6-MONTH SMOKING TOBACCO AND E-CIGARETTE USE AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP (N = 116)⁷⁸



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

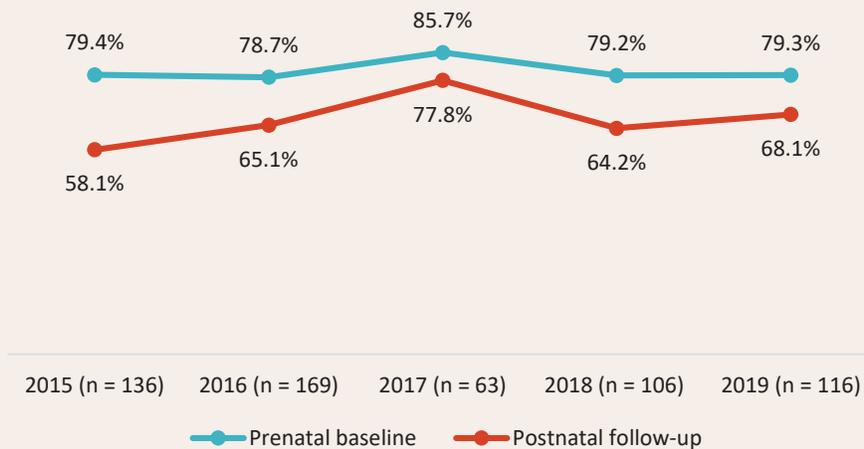
⁷⁷ Among the clients who reported an age of first use greater than 0, n = 91.

⁷⁸ Two clients were missing data on past-6-month tobacco use at follow-up.

Trends in Cigarette Use at Prenatal Baseline and Postnatal Follow-up

Cigarette use was high at prenatal baseline each year with well over three-quarters of women reporting smoking cigarettes in the six months before pregnancy. At follow-up, a large number of women continued to smoke cigarettes. From 2015 to 2017, the number of women reporting smoking cigarettes at follow-up increased and in 2018 the number of women reporting cigarette use decreased slightly. While the number of women reporting smoking cigarettes at baseline in 2019 was similar to 2018, the number of women reporting smoking cigarettes in the past 6 months increased at follow-up.

FIGURE IV.21. CLIENTS IN THE FOLLOW-UP SAMPLE REPORTING CIGARETTE USE AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP, 2015-2018



PAST-30-DAY TOBACCO USE

At prenatal baseline, 75.7% of clients reported smoking tobacco products in the 30 days prior to pregnancy (Figure IV.22). This percentage is considerably higher than either the national estimate of 27.9% of non-pregnant women aged 18-44 who are self-reported smokers or the estimate of Kentucky women who report smoking (29.7%).⁷⁹ Almost 6 in 10 clients (58.6%) also reported smoking tobacco in the past 30 days at prenatal baseline compared to almost 20% of pregnant women in Kentucky who reported smoking cigarettes and 7.8%, nationally.⁸⁰

“They were very sweet. They walked me through everything and were very informative.”

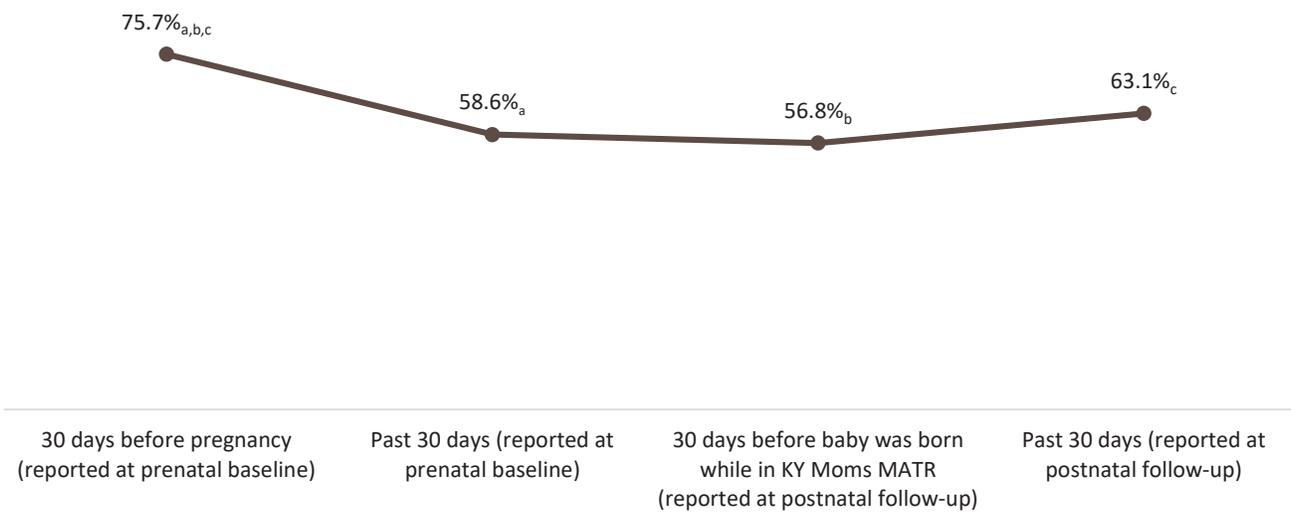
- KY-MOMS MATR FOLLOW-UP CLIENT

At postnatal follow-up, in the 30 days before the baby was born, 56.8% of clients reported smoking tobacco products. The percent of women who reported cigarette use in the past 30 days at postnatal follow-up increased slightly with 63.1% of clients reporting cigarette use (still a decrease from prior to pregnancy).

⁷⁹ America's Health Rankings Health of Women and Children Report found at https://www.americashealthrankings.org/explore/health-of-women-and-children/measure/Smoking_women/state/KY

⁸⁰ https://www.americashealthrankings.org/explore/health-of-women-and-children/measure/Smoking_pregnancy/state/KY

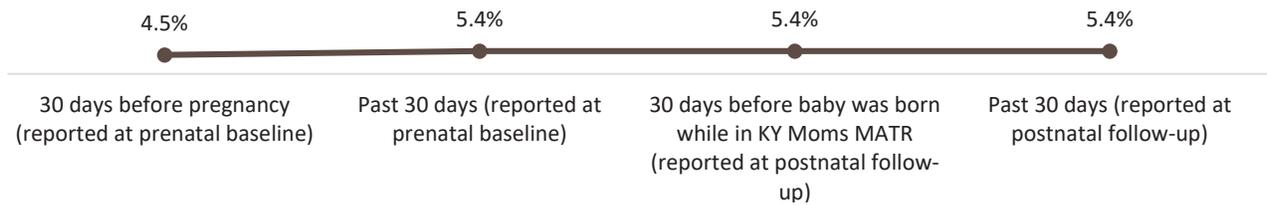
FIGURE IV.22. PAST-30-DAY SMOKING TOBACCO AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP (N = 111)⁸¹



a, b, c – Values sharing the same subscript differ at $p < .01$

The number of women reporting e-cigarette use in the past 30 days did not change significantly from before pregnancy to postnatal (see Figure IV.23).

FIGURE IV.23. PAST-30-DAY E-CIGARETTE USE AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP (N = 112)



AVERAGE NUMBER OF CIGARETTES SMOKED IN THE PAST 30 DAYS

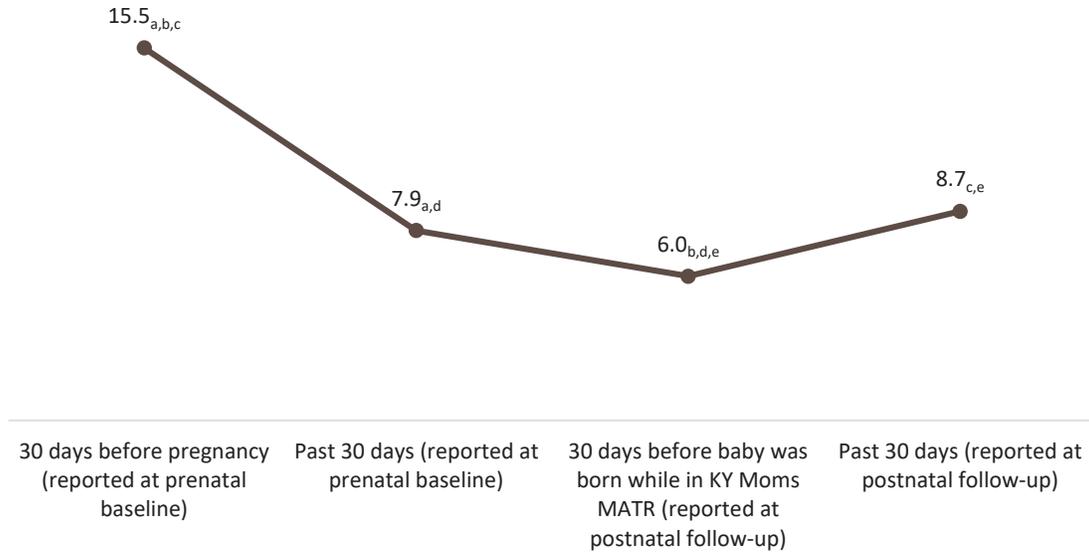
Figure IV.24 shows that for women who reported smoking tobacco in the 30 days prior to pregnancy (n = 87), the average number of cigarettes smoked declined from prior to pregnancy to after the client became involved in KY-Moms MATR and remained low after the birth of the baby. At prenatal baseline, women who smoked reported that in the 30 days before they found out they were pregnant they smoked an average of 15.5 cigarettes per day (less than one pack) and an average of 7.9 cigarettes per day in the past 30 days at prenatal baseline. At postnatal follow-up, in the 30 days before the baby was born when the client was in the KY-Moms MATR program, the average number of cigarettes decreased further to 6.0. While there was an increase to 8.7 cigarettes after the baby was born compared to the 30 days before the baby was

KY-Moms clients sustained a **decrease in the average number of cigarettes smoked** after the baby was born compared to before pregnancy

⁸¹ One client was missing information on past-30-day tobacco use at follow-up.

born, they still smoked significantly fewer cigarettes compared to before pregnancy suggesting positive changes in smoking.

FIGURE IV.24. AVERAGE NUMBER OF CIGARETTES SMOKED AMONG WOMEN REPORTING CIGARETTE USE IN THE 30 DAYS PRIOR TO PREGNANCY (N = 85)⁸²



a, b, c, d, e – Values sharing the same subscript differ at $p < .01$

Summary

KY-Moms MATR clients reported significant reductions in substance use in the past 30 days of pregnancy at prenatal baseline and further reductions after beginning participation in KY-Moms MATR. Specifically, 49.1% of clients reported illegal drug use in the 30 days before pregnancy compared to 2.7% of clients in the 30 days before the baby was born and 8.0% of clients in the past 30 days at postnatal follow-up. While 49.5% of clients reported alcohol use in the 30 days before pregnancy, only 0.9% of clients reported alcohol use in the 30 days before the baby was born. In addition, in the 30 days before the baby was born, significantly fewer clients experienced or were bothered by substance use problems (such as craving, withdrawal, wanting to quit but being unable, or worrying about relapse).

The number of women who reported smoking cigarettes in the 30 days before the baby was born decreased significantly compared to the 30 days prior to pregnancy as did the average number of cigarettes clients reported smoking. These decreases in smoking, compared to before pregnancy, were sustained even after the baby was born. Compared to pregnant women, nationally, however, more KY-Moms MATR mothers smoked cigarettes before, during and after pregnancy.

⁸² Two clients who reported smoking cigarettes in the 30 days before pregnancy at baseline were missing the number of cigarettes at follow-up.

Mental Health

This section examines changes in self-reported mental health for the following factors: (1) depression, (2) generalized anxiety, (3) comorbid depression and anxiety, and (4) number of days physical and mental health were poor. Past-6-month and past-30-day mental health symptoms are examined separately where applicable.

Depression Symptoms

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

“Did you have two weeks in a row (or more) when you were consistently depressed or down, most of the day, nearly every day?” and

“Did you have two weeks in a row (or more) when you were much less interested in most things or much less able to enjoy the things you used to enjoy most of the time?”

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

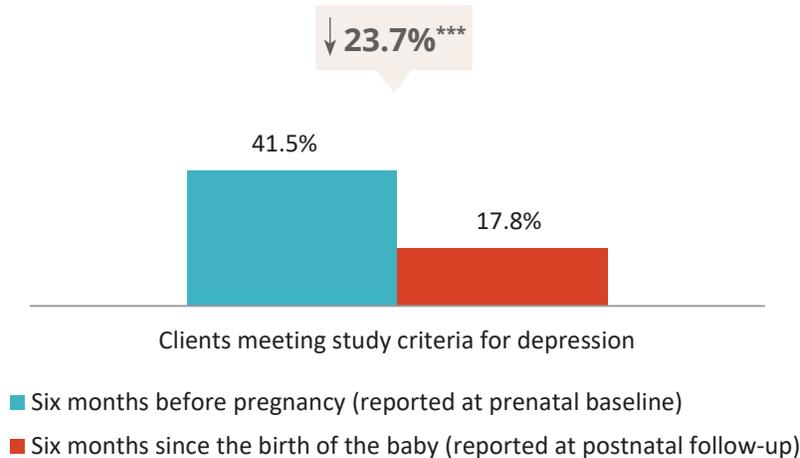
STUDY CRITERIA FOR DEPRESSION

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

CLIENTS MEETING STUDY CRITERIA FOR DEPRESSION IN THE PAST 6 MONTHS

In the 6 months before they became pregnant, 41.5% of the women met study criteria for depression. In the past 6 months at postnatal follow-up, 17.8% of KY-Moms MATR clients met study criteria for depression, which is a 23.7% significant decrease from baseline.

FIGURE IV.25. MEETING STUDY CRITERIA FOR DEPRESSION IN 6 MONTHS BEFORE PREGNANCY AND PAST 6 MONTHS AT POSTNATAL FOLLOW-UP (N = 118)

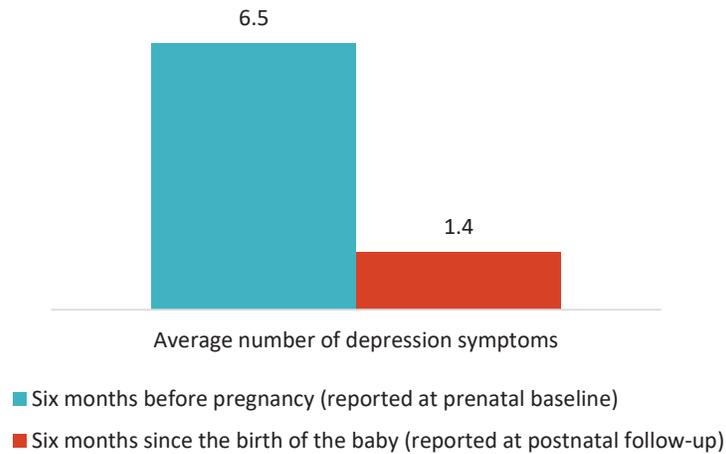


***p < .001

AVERAGE NUMBER OF DEPRESSION SYMPTOMS IN THE PAST 6 MONTHS

Of the clients who met study criteria for depression in the 6 months before pregnancy (n = 49), they reported an average of 6.5 symptoms. In the past 6 months at postnatal follow-up, these same clients reported significantly fewer symptoms (average of 1.4 symptoms) indicating that the reduction in depressive symptoms was sustained after KY-Moms MATR participation.

FIGURE IV.26. AVERAGE NUMBER OF DEPRESSION SYMPTOMS AMONG THOSE CLIENTS WHO MET STUDY CRITERIA FOR DEPRESSION IN THE 6 MONTHS BEFORE PREGNANCY AT PRENATAL BASELINE (N = 49)***

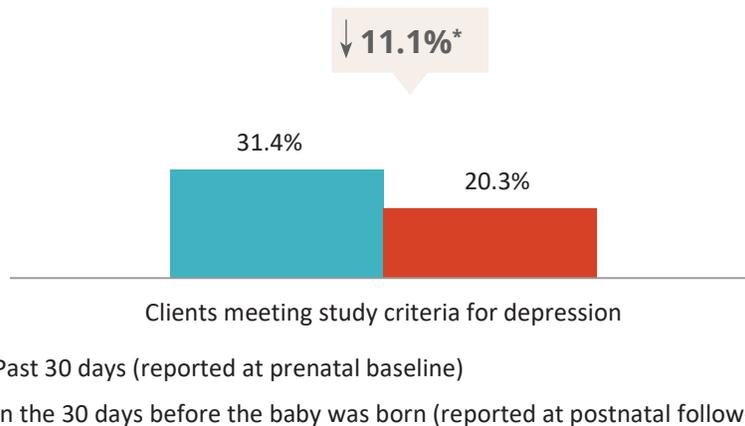


*** p < .001; Significance tested with paired sample t-test

CLIENTS MEETING STUDY CRITERIA FOR DEPRESSION IN THE PAST 30 DAYS

In the past 30 days at prenatal baseline, 31.4% of the women met study criteria for depression (see Figure IV.27). At postnatal follow-up, 20.3% of clients met study criteria for depression in the 30 days before the baby was born, a significant decrease of 11.1%.

FIGURE IV.27. MEETING STUDY CRITERIA FOR DEPRESSION IN THE 30 DAYS BEFORE PRENATAL BASELINE AND 30 DAYS BEFORE THE BABY WAS BORN (N = 118)

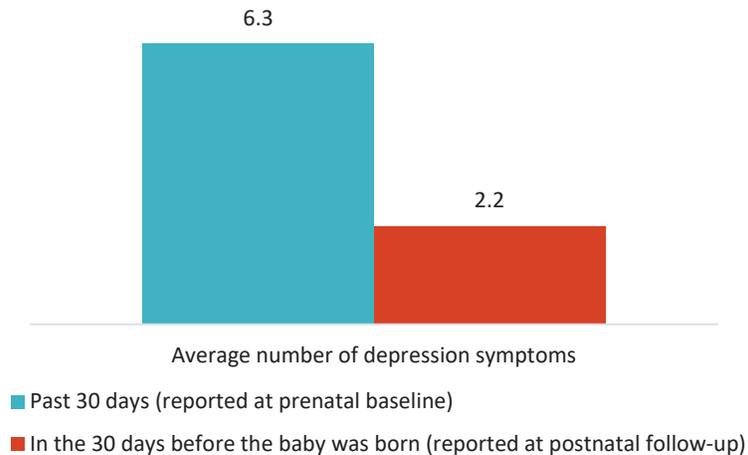


*p < .05

AVERAGE NUMBER OF DEPRESSION SYMPTOMS IN THE PAST 30 DAYS

Clients who met study criteria for depression in the past 30 days at baseline (n = 37) reported an average of 6.3 symptoms in the past 30 days at prenatal baseline and an average of 2.2 symptoms in the 30 days before the baby was born (a significant decrease).

FIGURE IV.26. AVERAGE NUMBER OF DEPRESSION SYMPTOMS AMONG THOSE CLIENTS WHO MET STUDY CRITERIA FOR DEPRESSION IN THE PAST 30 DAYS AT PRENATAL BASELINE (N = 37)***



*** p < .001; Significance tested with paired sample t-test

Generalized Anxiety Symptoms

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

“In the 6 months before pregnancy, did you have a period lasting 6 months or longer where you worried excessively or were anxious about multiple things on more days than not (like family, health, finances, school, or work difficulties)?”

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

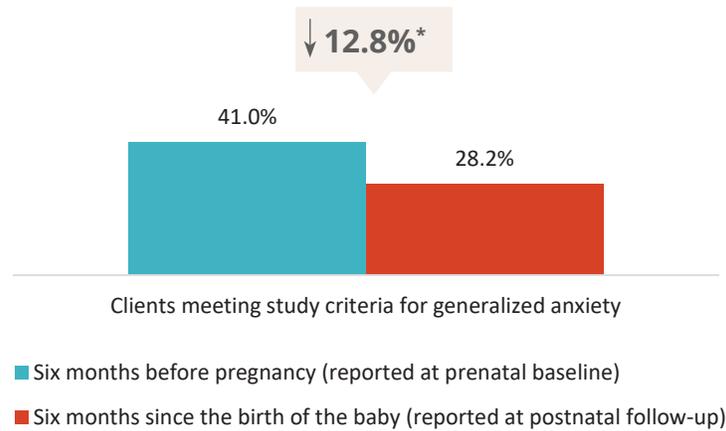
STUDY CRITERIA FOR GENERALIZED ANXIETY

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

CLIENTS MEETING STUDY CRITERIA FOR GENERALIZED ANXIETY IN THE PAST 6 MONTHS

In the 6 months before pregnancy, 41.0% of clients reported symptoms that met study criteria for generalized anxiety (see Figure IV.29). In the past 6 months at postnatal follow-up, 28.2% of clients met study criteria for generalized anxiety, which is a significant decrease of 12.8% from baseline.

FIGURE IV.29. MEETING STUDY CRITERIA FOR GENERALIZED ANXIETY IN 6 MONTHS BEFORE PREGNANCY AND PAST 6 MONTHS AT POSTNATAL FOLLOW-UP (N = 117)⁸³

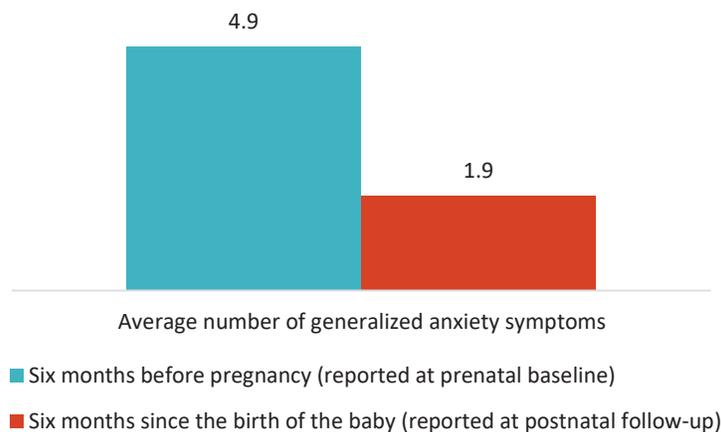


*p < .05

AVERAGE NUMBER OF GENERALIZED ANXIETY SYMPTOMS IN THE PAST 6 MONTHS

Of the clients who met study criteria for generalized anxiety in the 6 months before pregnancy (n = 48), they reported an average of 4.9 symptoms. In the past 6 months at postnatal follow-up, clients reported an average of 1.9 symptoms, a significant decrease compared to before pregnancy.

FIGURE IV.30. AVERAGE NUMBER OF ANXIETY SYMPTOMS AMONG THOSE CLIENTS WHO MET STUDY CRITERIA FOR GENERALIZED ANXIETY IN THE 6 MONTHS BEFORE PREGNANCY AT PRENATAL BASELINE (N = 48)^{***}



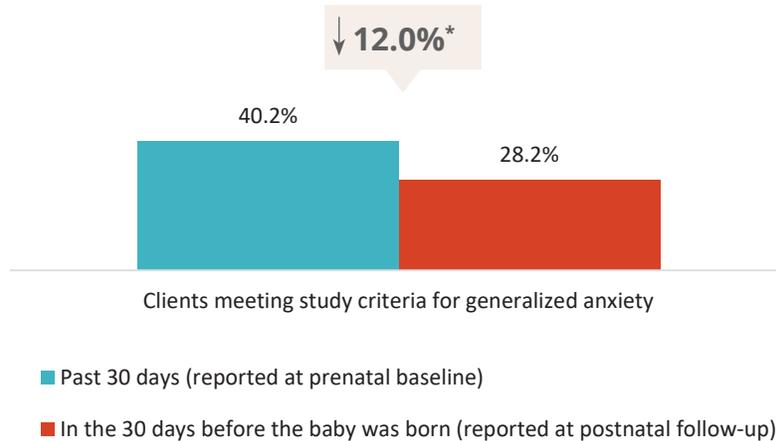
*** p < .001; Significance tested with paired sample t-test

CLIENTS MEETING STUDY CRITERIA FOR ANXIETY IN THE PAST 30 DAYS

At prenatal baseline, 40.2% of clients reported symptoms that met study criteria for generalized anxiety in the past 30 days (see Figure IV.31). In the 30 days before the baby was born, 28.2% of KY-Moms MATR clients met criteria for generalized anxiety (a significant decrease of 12.0% from baseline).

⁸³ One client was missing data for past-6-month generalized anxiety at follow-up.

FIGURE IV.31. MEETING STUDY CRITERIA FOR GENERALIZED ANXIETY IN THE 30 DAYS BEFORE PRENATAL BASELINE AND 30 DAYS BEFORE THE BABY WAS BORN (N = 117)⁸⁴

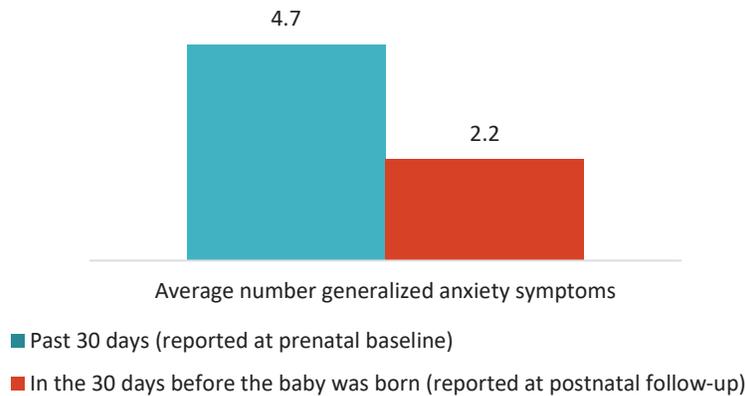


*p < .05

AVERAGE NUMBER OF ANXIETY SYMPTOMS IN THE PAST 30 DAYS

Clients who met study criteria for anxiety in the past 30 days at baseline (n = 47) reported an average of 4.7 symptoms in the past 30 days at prenatal baseline and an average of 2.2 symptoms in the 30 days before the baby was born, a significant decrease.

FIGURE IV.32. AVERAGE NUMBER OF ANXIETY SYMPTOMS AMONG THOSE CLIENTS WHO MET STUDY CRITERIA FOR GENERALIZED ANXIETY IN THE PAST 30 DAYS AT PRENATAL BASELINE (N = 47)^{***}



^{***} p < .001; Significance tested with paired sample t-test

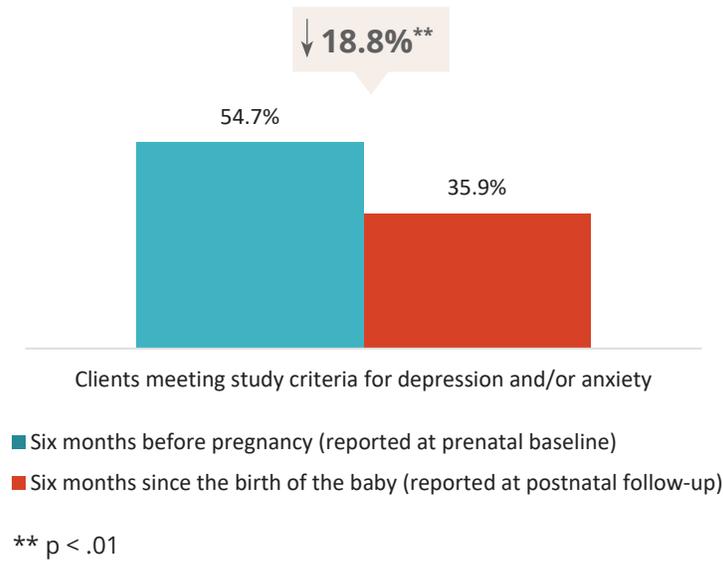
Depression and Anxiety Symptoms

CLIENTS MEETING STUDY CRITERIA FOR DEPRESSION AND/OR ANXIETY IN THE PAST 6 MONTHS

Figure IV.33 shows that 54.7% met study criteria for either depression or anxiety (or both) in the 6 months before pregnancy. In the past 6 months at postnatal follow-up, 35.9% of clients met criteria for depression and/or anxiety (a significant decrease of 18.8%).

⁸⁴ One client was missing data for past-30-day generalized anxiety at follow-up.

FIGURE IV.33. MEETING STUDY CRITERIA FOR DEPRESSION AND/OR ANXIETY IN THE PAST 6 MONTHS AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP (N = 117)⁸⁵

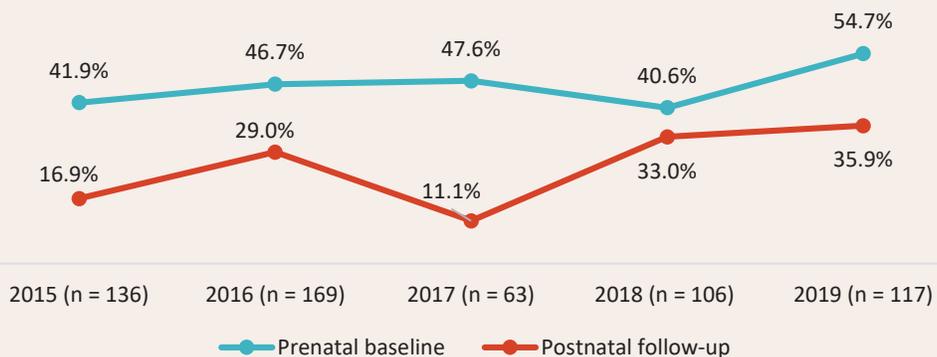


Trends in Depression and/or Anxiety at Prenatal Baseline and Postnatal Follow-up

The number of clients who met study criteria for depression and/or anxiety at prenatal baseline was fairly constant from 2015 to 2018. In 2019, however, the percent of clients who met study criteria for depression and/or anxiety at prenatal baseline increased to 54.7% from 40.6% in 2018.

At follow-up, while the number of women who met study criteria for depression and/or anxiety decreased compared to baseline, the degree to which the number decreases fluctuates over the years. In 2015, for example, 16.9% of clients met criteria for depression and/or anxiety compared to 29.0% in 2016. In 2018, there was no significant difference in the number of women who met criteria for depression and/or anxiety from baseline and follow-up. In 2019, however, there was a significant decrease in clients who met criteria for depression and/or anxiety from baseline to follow-up.

FIGURE IV.34. CLIENTS IN THE FOLLOW-UP SAMPLE WHO MET STUDY CRITERIA FOR DEPRESSION AND/OR ANXIETY AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP, 2015-2019

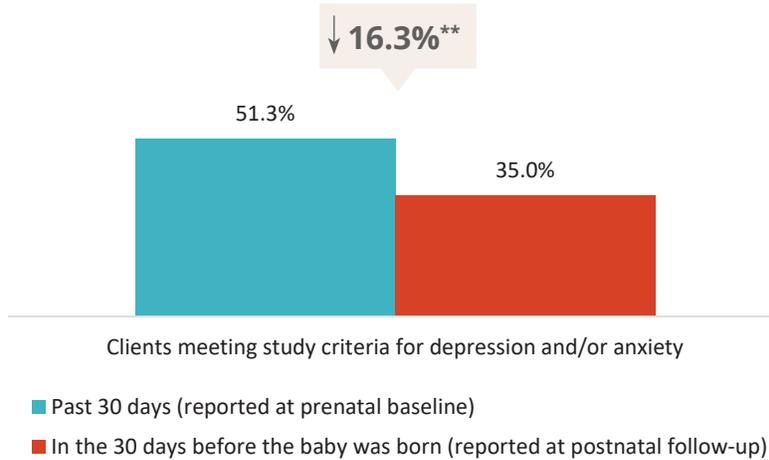


⁸⁵ One client was missing data for past-6-month generalized anxiety at follow-up.

CLIENTS MEETING STUDY CRITERIA FOR DEPRESSION AND/OR ANXIETY IN THE PAST 30 DAYS

In the past 30 days at prenatal baseline, 51.3% of clients met study criteria for either depression or anxiety (or both) and in the 30 days before the baby was born, 35.0% of the women met study criteria for depression and/or anxiety (a significant decrease of 16.3% from the past 30 days at prenatal baseline).

FIGURE IV.35. MEETING STUDY CRITERIA FOR DEPRESSION AND/OR ANXIETY IN THE 30 DAYS BEFORE PRENATAL BASELINE AND 30 DAYS BEFORE THE BABY WAS BORN (N = 117)⁸⁶

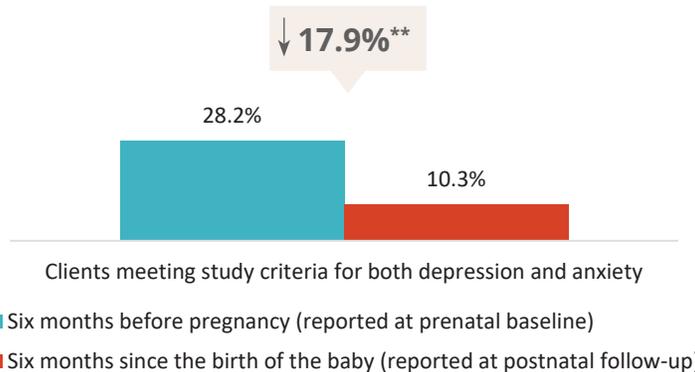


** p < .01

CLIENTS MEETING STUDY CRITERIA FOR COMORBID DEPRESSION AND ANXIETY IN THE PAST 6 MONTHS

Over one-quarter of clients (28.2%) met criteria for comorbid anxiety and depression in the 6 months before they became pregnant and at postnatal follow-up, 10.3% of clients reported comorbid anxiety and depression (a significant decrease of 17.9%; see Figure IV.36).

FIGURE IV.36. MEETING STUDY CRITERIA FOR COMORBID DEPRESSION AND GENERALIZED ANXIETY IN THE PAST 6 MONTHS AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP (N = 117)⁸⁷



**p < .01

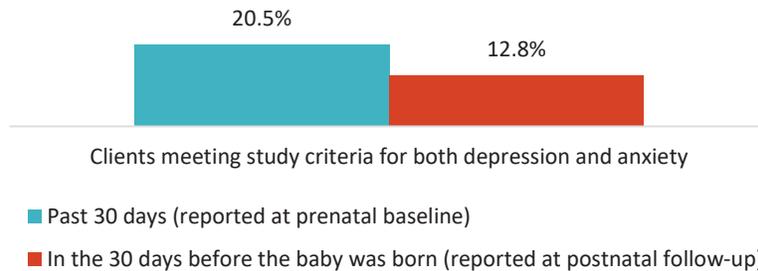
⁸⁶ One client was missing data for past-30-day generalized anxiety at follow-up.

⁸⁷ One client was missing data for past-6-month generalized anxiety at follow-up.

CLIENTS MEETING STUDY CRITERIA FOR COMORBID DEPRESSION AND ANXIETY IN THE PAST 30 DAYS

Almost 20.5% of clients in the past 30 days at prenatal baseline and 12.8% of clients in the 30 days before the baby was born met study criteria for both depression and anxiety (see Figure IV.37).

FIGURE IV.37. MEETING STUDY CRITERIA FOR COMORBID DEPRESSION AND GENERALIZED ANXIETY IN THE 30 DAYS BEFORE PRENATAL BASELINE AND THE 30 DAYS BEFORE THE BABY WAS BORN (N = 117)⁸⁸



Summary

The number of clients who met study criteria for depression or the number of clients who met study criteria for anxiety decreased significantly from prenatal baseline to postnatal follow-up. In addition, the number of depression symptoms and the number of anxiety symptoms clients reported decreased significantly from before pregnancy to 6 months after the birth of the baby and in the past 30 days. In the past 6 months at follow-up, over one-third of clients still reported depression and/or anxiety and 10% of clients still met criteria for both depression and anxiety in the past 6 months at follow-up.

Intimate partner violence

This section examines changes in intimate partner violence and violence such as: (1) any form of intimate partner violence, (2) psychological abuse, (3) coercive control, (4) physical abuse, and (5) sexual assault from prenatal baseline to postnatal follow-up. Past 6-month and past 30-day partner abuse measures are examined separately where applicable.

Felt Unsafe in Current or Past Relationship

Including fear of a current or ex-partner, 6.2% (n = 7)⁸⁹ of clients reported they felt unsafe at baseline and 3.5% reported they felt unsafe at follow-up. Of the 7 clients that reported at prenatal baseline that they felt unsafe, 2 clients also felt unsafe at follow-up.

Intimate partner violence

ANY FORM OF INTIMATE PARTNER VIOLENCE IN THE PAST 6 MONTHS

Figure IV.38 shows that in the 6 months before pregnancy, 25.6% of clients reported experiencing

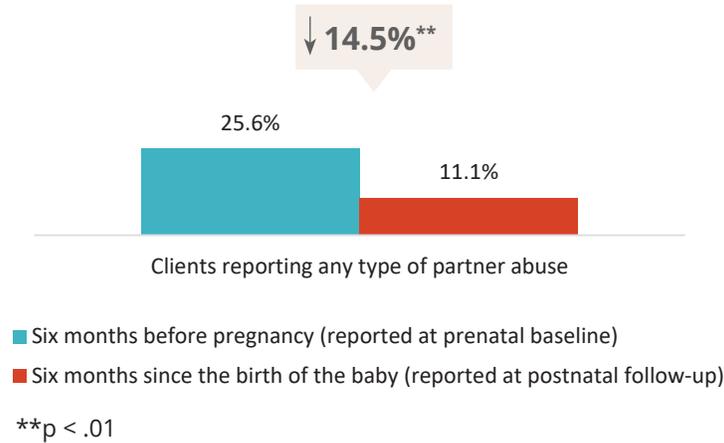
⁸⁸ One client was missing data for past-30-day generalized anxiety at follow-up.

⁸⁹ Five clients were missing data for safety concerns at follow-up.

any form of intimate partner violence⁹⁰ (including psychological abuse, control, physical abuse, and sexual abuse) perpetrated by a current or ex-partner and 11.1% of clients reported experiencing partner violence in the past 6 months at postnatal follow-up (significant decrease of 14.5%).

The number of clients who reported **any form of intimate partner violence decreased significantly** from baseline to follow-up

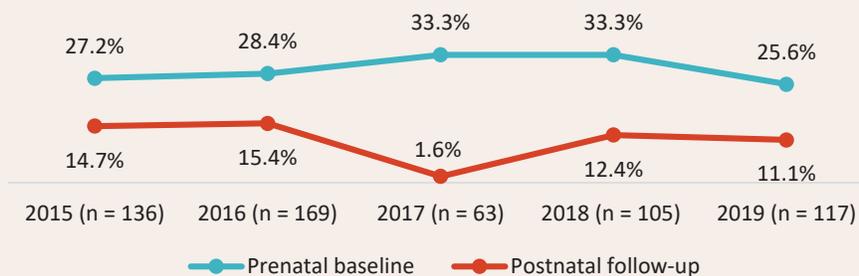
FIGURE IV.38. ANY TYPE OF INTIMATE PARTNER VIOLENCE IN THE 6 MONTHS BEFORE PREGNANCY AND THE PAST 6 MONTHS AT POSTNATAL FOLLOW-UP (N = 117)⁹¹



Trends in Any Partner Abuse at Prenatal Baseline and Postnatal Follow-up

The number of clients who reported any partner abuse at prenatal baseline was fairly consistent over the past 5 years. Overall, the number of clients who reported partner abuse at follow-up was also fairly consistent with 14.7% to 11.1% of clients reporting partner abuse in the 6 months since the birth of the baby.

FIGURE IV.39. CLIENTS IN THE FOLLOW-UP SAMPLE REPORTING ANY PARTNER ABUSE AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP, 2015-2019



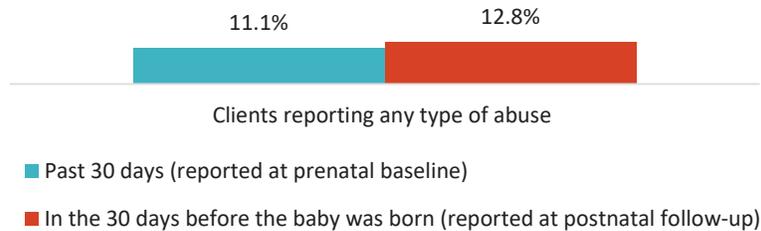
⁹⁰ Any intimate partner violence was defined in this study as a client indicating “yes” to any of the partner violence questions asked in the survey (e.g., verbal and psychological abuse, extreme jealousy and control, threats of violence towards client and others close to them, physical violence, stalking, partner purposely damaging or destroying property, sexual assault/threats of assault) at each period.

⁹¹ One client was missing data for at least one partner abuse measure at follow-up.

ANY ABUSE IN THE PAST 30 DAYS

In the past 30 days at prenatal baseline, 11.1% of KY-Moms MATR clients reported experiencing any type of abuse. In the 30 days before the baby was born, 12.8% of clients reported any type of partner abuse (see Figure IV.40).

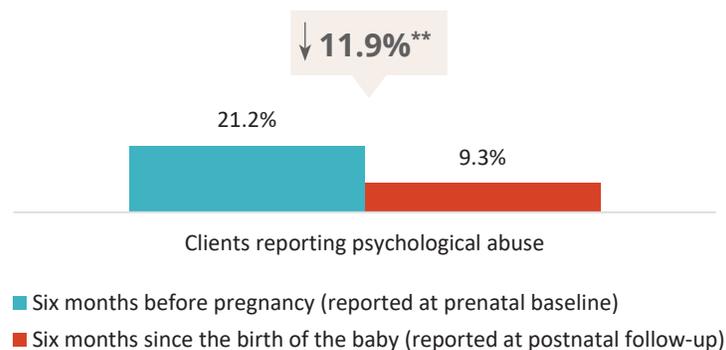
FIGURE IV.40. ANY TYPE OF ABUSE IN THE 30 DAYS BEFORE PRENATAL BASELINE AND THE 30 DAYS BEFORE THE BABY WAS BORN (N = 117)⁹²



PSYCHOLOGICAL ABUSE IN THE PAST 6 MONTHS

A little more than one-fifth of clients (21.2%) reported at prenatal baseline that a partner psychologically abused them (e.g., insulted the client, shouted, criticized them, criticized them in front of others, treated them like an inferior, tried to make them feel crazy, or told them their feelings were irrational or crazy) in the 6 months before pregnancy and 9.3% of clients reported psychological abuse in the past 6 months at postnatal follow-up. Compared to the 6 months before they were pregnant, there was a significant 11.9% decrease in reports of psychological abuse in the 6 months after clients had their baby (see Figure IV.41).

FIGURE IV.41. PSYCHOLOGICAL ABUSE IN THE 6 MONTHS BEFORE PREGNANCY AND THE PAST 6 MONTHS AT POSTNATAL FOLLOW-UP (N = 118)



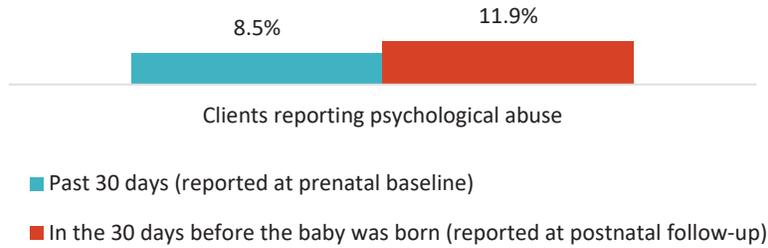
** $p > .01$

⁹² One client was missing data for at least one partner abuse measure at follow-up.

PSYCHOLOGICAL ABUSE IN THE PAST 30 DAYS

Almost 9% of clients in the past 30 days at prenatal baseline and 11.9% of clients in the 30 days before the baby was born reported psychological abuse.

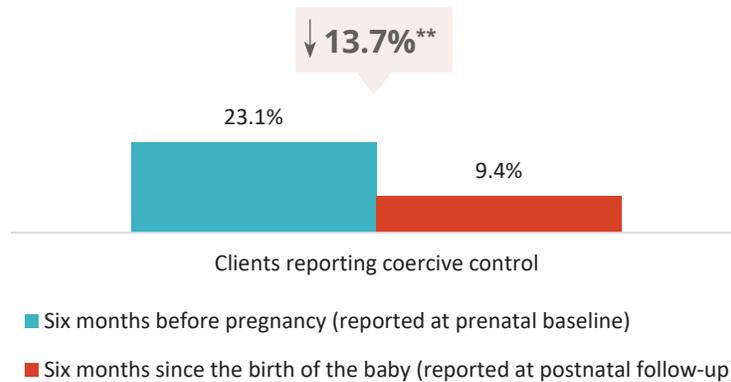
FIGURE IV.42. PSYCHOLOGICAL ABUSE IN THE 30 DAYS BEFORE PRENATAL BASELINE AND THE 30 DAYS BEFORE THE BABY WAS BORN (N = 118)



COERCIVE CONTROL IN THE PAST 6 MONTHS

For this study, coercive control is described as abuse by a partner wherein the partner threatened the client or a family member in order to frighten her, was extremely jealous and controlling, interfered with other relationships, stalked her, or purposely destroyed property that belonged to her or a close friend/family member. In the 6 months before becoming pregnant, 23.1% of clients reported being a victim of coercive control and 9.4% of clients in the past 6 months at postnatal follow-up reported experiencing coercive control from their partner (a significant decrease of 13.7%; see Figure IV.43).

FIGURE IV.43. COERCIVE CONTROL BY A PARTNER IN THE 6 MONTHS BEFORE PREGNANCY AND THE 6 MONTHS BEFORE POSTNATAL FOLLOW-UP (N = 117)⁹³



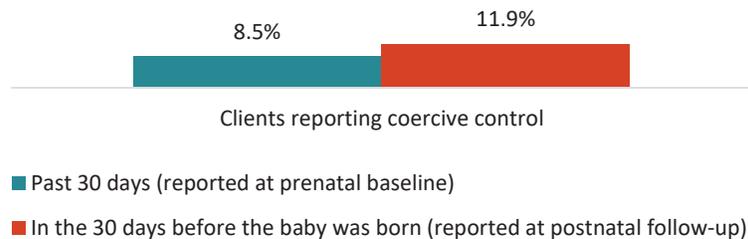
** p < .01

COERCIVE CONTROL IN THE PAST 30 DAYS

In the past 30 days at prenatal baseline, 8.5% reported coercive control occurred while they were pregnant. Almost 12% reported experiencing coercive control from their partner in the 30 days before the baby was born (see Figure IV.44).

⁹³ One client was missing data on measures of coercive control at follow-up.

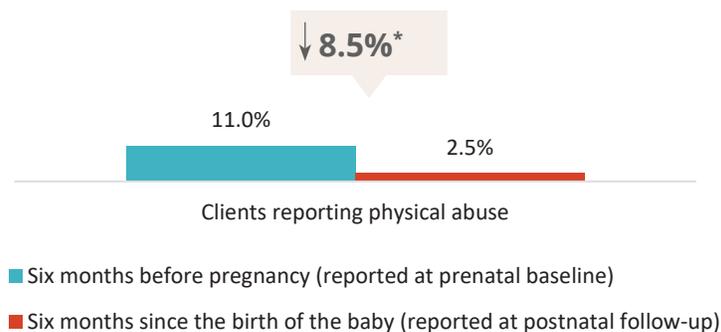
FIGURE IV.44. COERCIVE CONTROL BY A PARTNER IN THE 30 DAYS BEFORE PRENATAL BASELINE AND THE 30 DAYS BEFORE THE BABY WAS BORN (N = 118)



PHYSICAL ABUSE IN THE PAST 6 MONTHS

Eleven percent of women reported that a partner physically abused them (e.g., pushing, shoving, kicking, beating up, choking, burning, attacking with a weapon) in the 6 months before they became pregnant (see Figure IV.45). In the past 6 months at postnatal follow-up, 2.5% of clients reported physical abuse by a partner (a significant decrease of 8.5%).

FIGURE IV.45. PHYSICAL ABUSE IN THE 6 MONTHS BEFORE PREGNANCY AND THE PAST 6 MONTHS AT POSTNATAL FOLLOW-UP (N = 118)

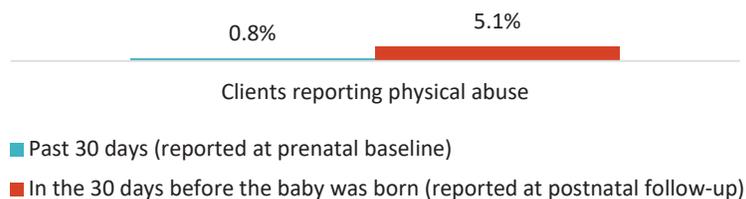


*p < .05

PHYSICAL ABUSE IN THE PAST 30 DAYS

One client (0.8%) in the past 30 days at prenatal baseline and 5.1% of the clients in the 30 days before the birth of the baby reported a partner physically abused them (see Figure IV.46).

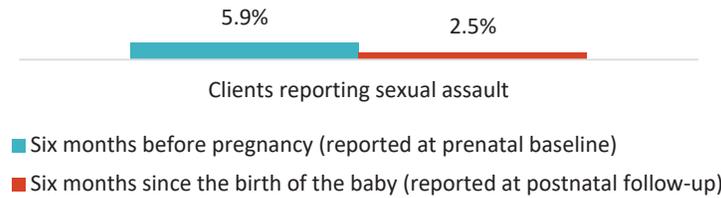
FIGURE IV.46. PHYSICAL ABUSE IN THE 30 DAYS BEFORE PRENATAL BASELINE AND THE 30 DAYS BEFORE THE BABY WAS BORN (N = 118)



SEXUAL ASSAULT IN THE PAST 6 MONTHS

About 6% of clients reported at prenatal baseline that they had been sexually assaulted by a partner (e.g., partner made them do sexually degrading things, caused them to have sex because they were afraid of what would happen if they didn't, made the client have sex by threatening to harm them or someone close to them, or physically forcing them to have sex) in the 6 months before pregnancy. In the past 6 months at postnatal follow-up, 2.5% of clients indicated they had been sexually assaulted by a partner (see Figure IV.47).

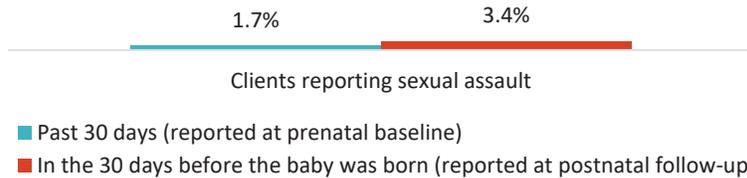
FIGURE IV.47. PARTNER SEXUALLY ASSAULTED CLIENT IN THE 6 MONTHS BEFORE PREGNANCY AND THE 6 MONTHS BEFORE POSTNATAL FOLLOW-UP (N = 118)



SEXUAL ASSAULT IN THE PAST 30 DAYS

In the past 30 days at prenatal baseline, 1.7% of clients reported being a victim of sexual assault by a partner and in the 30 days before the baby was born, 3.4% of clients reported sexual assault by a partner.

FIGURE IV.48. PARTNER SEXUALLY ASSAULTED CLIENT IN THE 30 DAYS BEFORE PRENATAL BASELINE AND THE 30 DAYS BEFORE THE BABY WAS BORN (N = 118)



Summary

Clients' experiences of several forms of partner violence were examined from prenatal baseline to postnatal follow-up. One-quarter of KY-Moms MATR clients reported experiencing some type of abuse in the 6 months before pregnancy. At postnatal follow-up, over 11% of clients reported experiencing some type of abuse in the past 6 months since the baby was born. About 11% of clients reported experiencing at least one of the types of abuse asked about on the survey in the past 30 days at prenatal baseline and 12.8% of clients reported some type of abuse from an intimate partner in the 30 days before the baby was born. The number of clients reporting psychological abuse, coercive control, and physical abuse decreased significantly from before pregnancy to the past 6 months at postnatal follow-up. Relatively few clients reported experiencing a sexual assault by a partner or other type of perpetrator at any period.

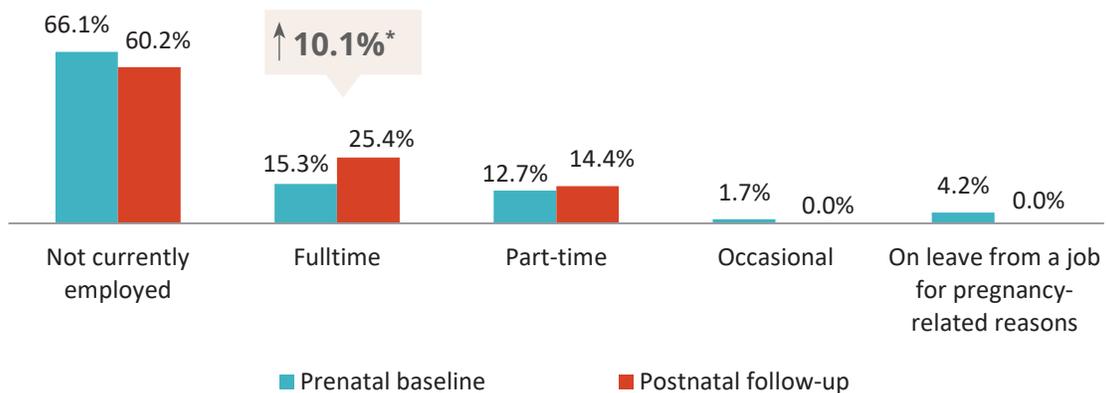
Economic and Living Circumstances, Economic Hardship, and Criminal Justice Involvement

This subsection examines changes in employment, economic hardship, living situation, and criminal justice involvement from baseline to follow-up. Specifically, this section examines: (1) current employment status, (2) hourly wage, among employed individuals, (3) public assistance, (4) economic hardship, (5) living situation, and (6) criminal justice involvement. Past-6-month and past-30-day measures are examined separately where applicable.

Current Employment Status

Overall, clients' current employment status changed significantly from prenatal baseline to postnatal follow-up. About 34% of clients were employed in some capacity (full-time, part-time, occasional, or on leave) at prenatal baseline and 39.8% were employed at follow-up (not represented in a figure). At prenatal baseline, 66.1% of clients reported being unemployed and at postnatal follow-up, this percent was 60.2% (see Figure IV.49). In addition, the percent of women who reported being employed full-time increased significantly from 15.3% at prenatal baseline to 25.4% at postnatal follow-up.

FIGURE IV.49. CURRENT EMPLOYMENT STATUS AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP (N = 118)

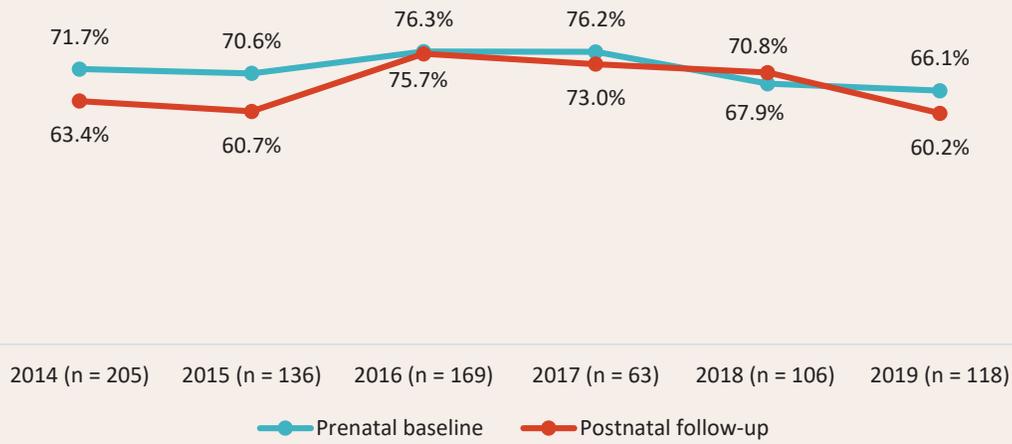


* $p < .05$.

Trends in Current Unemployment Status Prenatal Baseline and Postnatal Follow-up

The majority of women at both prenatal baseline and postnatal follow-up were unemployed. Furthermore, from 2016 to 2018, the number of clients who reported being unemployed changed only minimally from baseline to follow-up. In fact, in 2018, the percent of clients reporting being unemployed at follow-up is slightly greater than the percent of clients reporting being unemployed at baseline. In 2019, the percent of clients who reported being unemployed was slightly greater at baseline compared to follow-up.

FIGURE IV.50. CLIENTS IN THE FOLLOW-UP SAMPLE REPORTING CURRENT UNEMPLOYMENT STATUS PRENATAL BASELINE AND POSTNATAL FOLLOW-UP, 2015-2019



For clients who were employed (full- or part-time) at each point, the average hourly wage clients reported increased slightly from \$8.29 at prenatal baseline (n = 33) to \$9.00 at postnatal follow-up (n = 43⁹⁴; not depicted in a figure). About 7% of clients who were employed at baseline (including clients on leave for pregnancy-related reasons) and 20% of clients who were employed at follow-up⁹⁵ reported they were also in school or receiving additional vocational training.

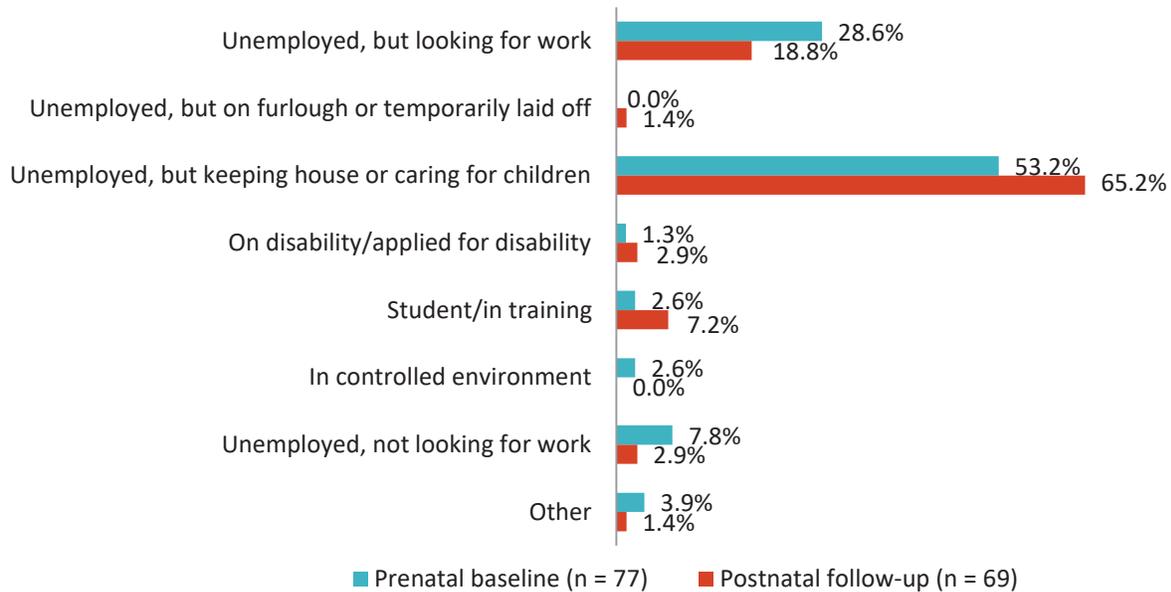
Of the clients who reported they were not currently employed at each point, fewer clients indicated they were looking for work at postnatal follow-up compared to prenatal baseline (see Figure IV.51). In addition, 65.2% reported they were keeping house or caring for children full-time compared to 53.2% of clients at prenatal baseline.

“The worker for class was super understanding and supportive. They taught us things really well. It was lots of fun and they were nice and caring.”

- KY-MOMS MATR FOLLOW-UP CLIENT

⁹⁴ Two clients reported they didn't know what their hourly wage was and data was missing for two clients at follow-up.

⁹⁵ Two clients were missing data on school attendance at follow-up.

FIGURE IV.51. REASON FOR UNEMPLOYMENT AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP⁹⁶

About 71% of clients at prenatal baseline and 68.4% of clients at postnatal follow-up expected to be employed in the next 12 months.⁹⁷

Public Assistance

Clients were asked at postnatal follow-up what type of public assistance they received during their pregnancy.

The vast majority of clients (93.1%) reported receiving public assistance while they were pregnant and involved in KY-Moms MATR and 87.9% reported currently receiving public assistance at postnatal follow-up (not depicted in a figure).

The majority of clients who received public assistance reported receiving Supplement Nutrition Assistance Program (SNAP; 55.2% during pregnancy and 61.8% after the birth of their baby) and Women, Infants and Children (WIC; 85.3% during pregnancy and 84.3% after the birth of their baby).

Economic Hardship

Economic hardship may be a better indicator of the actual day-to-day stressors clients face than a measure of income. Therefore, the prenatal baseline and postnatal follow-up surveys included several questions about clients' difficulty meeting expenses for basic needs and food insecurity.⁹⁸ Clients were asked eight items, five of which asked about difficulty meeting basic living needs such as food, shelter, utilities, and telephone, and three items asked about difficulty receiving medical care for financial reasons.

⁹⁶ One client at baseline and two clients at follow-up were missing information on why they were unemployed.

⁹⁷ One client had missing data for employment expectations at follow-up.

⁹⁸ SIPP; She, P., & Livermore, G. (2007). Material hardship, poverty, and disability among working-age adults. *Social Science Quarterly*, 88(4), 970-989.

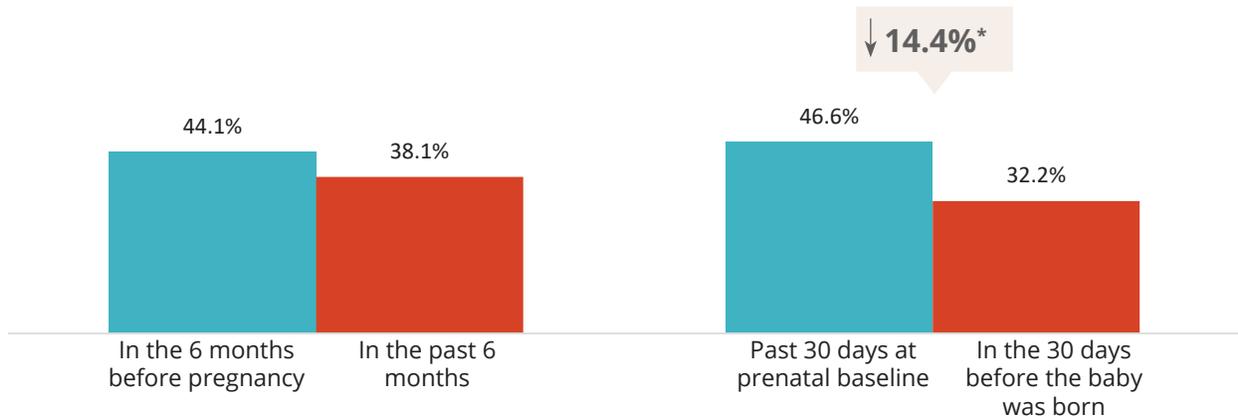
In the 6 months before becoming pregnant, 44.1% of clients reported they had difficulty meeting at least one of the basic living needs for financial reasons and 38.1% of clients reported difficulty meeting basic living needs in the past 6 months at postnatal follow-up (see Figure IV.52).

About 47% of clients reported having difficulty meeting basic living needs in the past 30 days at prenatal baseline. In the 30 days before the baby was born, 32.2% of clients had difficulty meeting basic needs such as food, shelter or utilities (a significant decrease of 14.4%).

A Closer Look at Clients Difficulty Meeting Basic Needs at Follow-up

At follow-up, 33.1% of KY-Moms MATR clients reported having difficulty paying rent/mortgage, 17.8% of clients reported they were unable to pay their gas/electric bill, and 14.4% were unable to pay their phone bills.

FIGURE IV.52. DIFFICULTY IN MEETING BASIC LIVING NEEDS FOR FINANCIAL REASONS AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP (N = 118)

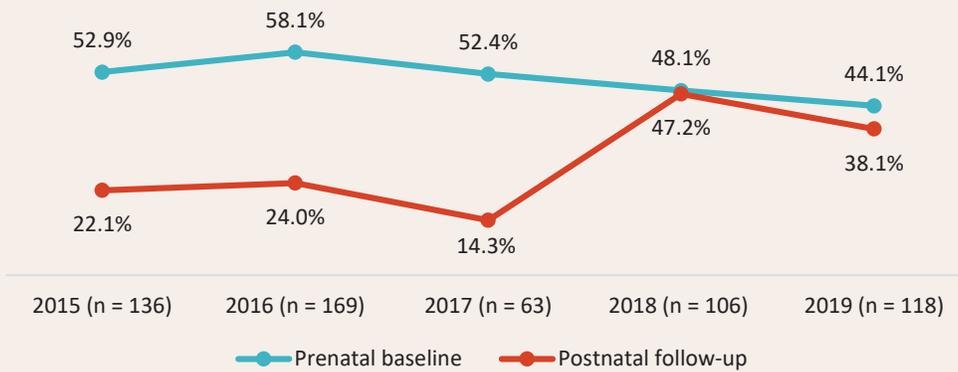


*p < .05

Trends in Difficulty Meeting Basic Living Needs at Prenatal Baseline and Postnatal Follow-up

The number of clients who reported having difficulty meeting basic living needs in the six months before pregnancy remained fairly consistent over the past 5 years at baseline. From 2015 to 2017, the number of clients who reported difficulty meeting basic living needs at follow-up significantly decreased from baseline. In 2018, however, the number of clients who reported difficulty at follow-up sharply increased from 2017 and there was very little change from baseline to follow-up.

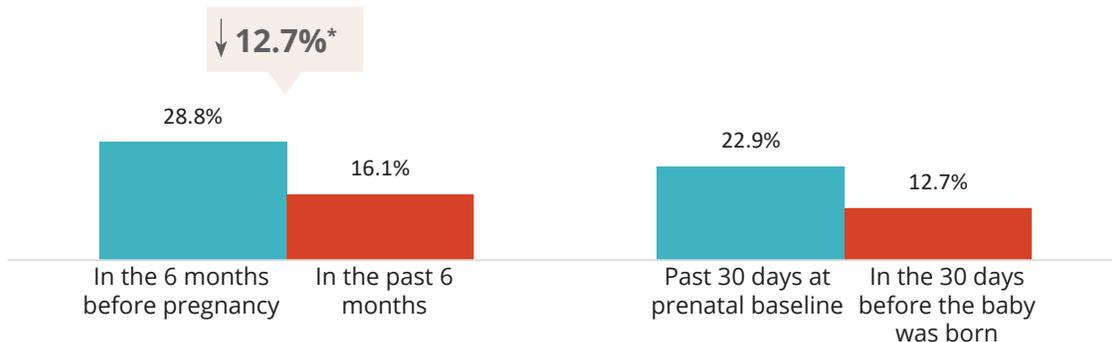
FIGURE IV.53. CLIENTS IN THE FOLLOW-UP SAMPLE REPORTING DIFFICULTY MEETING BASIC HOUSEHOLD NEEDS AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP, 2015-2019



Over one-quarter of clients (28.8%) reported their household had difficulty meeting health care needs (such as not going to the doctor, not having a prescription filled, or not going to the dentist because of financial reasons) in the 6 months before pregnancy (see Figure IV.54). About 16% of clients reported they had difficulty meeting health care needs in the past 6 months at follow-up (a 12.7% significant decrease compared to the 6 months before the client was pregnant).

In the past 30 days at prenatal baseline, 22.9% of clients reported their household had difficulty meeting health care needs because of financial reasons. In the 30 days before the baby was born, 12.7% of clients reported difficulty meeting health care needs.

FIGURE IV.54. DIFFICULTY IN MEETING HEALTH CARE NEEDS FOR FINANCIAL REASONS AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP (N = 118)

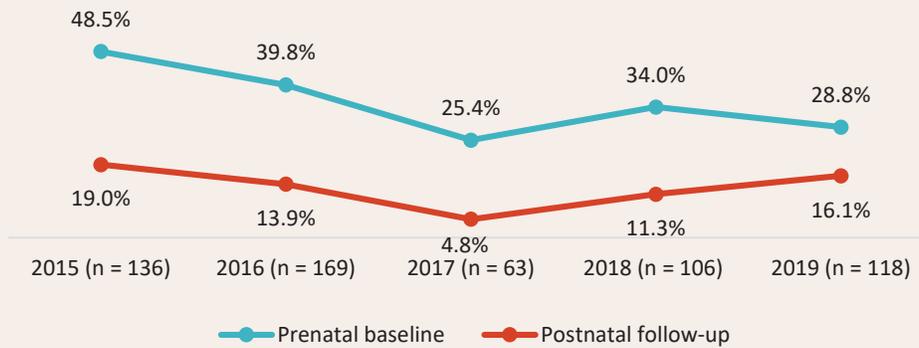


* p < .05

Trends in Difficulty Meeting Basic Health Care Needs at Prenatal Baseline and Postnatal Follow-up

From 2015 to 2017, the number of clients who reported difficulty meeting basic health care needs in the six months before pregnancy and in the past 6 months at follow-up decreased. In 2018, however, the number of clients reporting difficulty increased at both baseline and follow-up compared to 2017. In 2019, the number of clients reporting difficulty at baseline decreased, but increased at follow-up compared to 2018.

FIGURE IV.55. CLIENTS IN THE FOLLOW-UP SAMPLE REPORTING DIFFICULTY MEETING HEALTH CARE NEEDS AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP, 2015-2019



Living Situation

The number of clients reporting being homeless declined from 8.5% at prenatal baseline to 2.6% at postnatal follow-up (not depicted in a figure).⁹⁹ Of those clients who considered themselves homeless at baseline (n = 10), 40.0% reported they were staying temporarily with family or friends, 30.0% reported staying on the street or living in their car, 10.0% of clients reported they were staying in a shelter, and 20.0% reported other reasons (staying in a sober living home and staying in a recovery center).

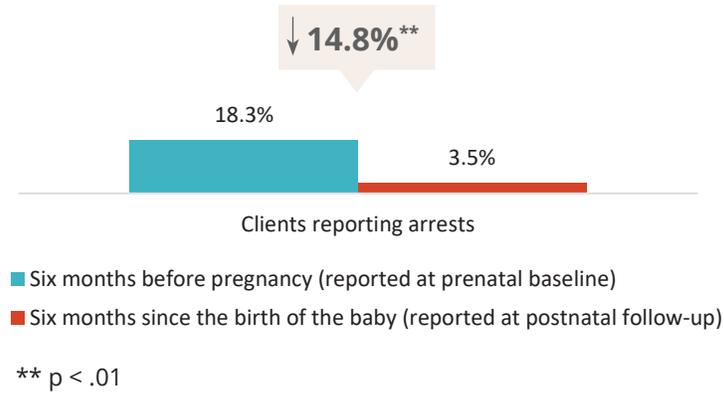
There were no significant changes in the type of situation clients reported living, with the majority of clients at prenatal baseline (89.8%) and postnatal follow-up (98.2%) living in a private residence (i.e., their own or someone else’s home or apartment) before the birth of their baby and after.

Criminal Justice Involvement

ARRESTS

Clients were asked about their arrests in the 6 months before pregnancy (at baseline) and since the baby was born (at postnatal follow-up). In the 6 months before pregnancy, 18.3% of clients reported an arrest (see Figure IV.56). At follow-up, this percent had decreased significantly by 14.8% to 3.5%.

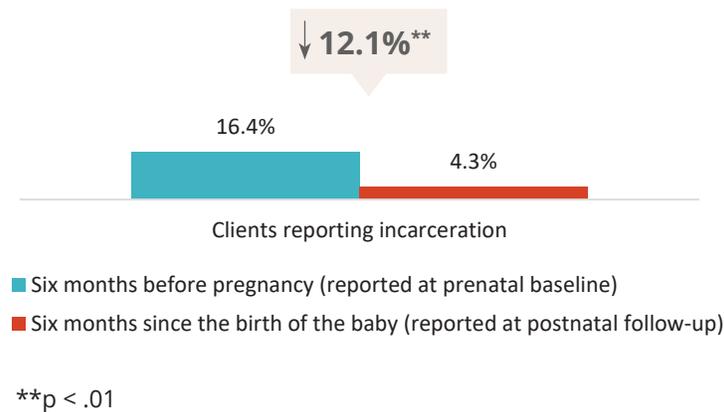
⁹⁹ One client was missing data on homelessness at follow-up.

FIGURE IV.56. CLIENTS REPORTING ARRESTS IN THE 6 MONTHS BEFORE PREGNANCY AND THE 6 MONTHS BEFORE POSTNATAL FOLLOW-UP (N = 115)¹⁰⁰

Among those clients who reported being arrested in the 6 months before pregnancy (n = 21), the average number of times clients reported being arrested was 1.6. Among those clients who reported being arrested in the 6 months since the baby was born (n = 4), the average number of times clients reported being arrested was 1.0 (not depicted in a figure).

INCARCERATION

At baseline, 16.4% of clients reported spending at least one day in jail or prison in the 6 months before pregnancy (Figure IV.57). At follow-up, 4.3% of clients reported spending at least one day in jail or prison since the baby was born, which is a significant decrease of 12.1%.

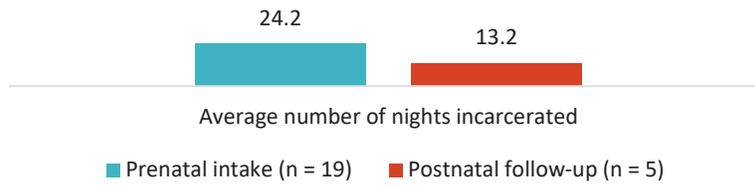
FIGURE IV.57. CLIENTS REPORTING BEING INCARCERATED IN THE 6 MONTHS BEFORE PREGNANCY AND THE 6 MONTHS BEFORE POSTNATAL FOLLOW-UP (N = 116)¹⁰¹

Among those clients who reported being incarcerated in the 6 months before pregnancy (n = 19), the average number of nights incarcerated was 24.2 (see Figure IV.58). Among those clients who reported being incarcerated since the baby was born (n = 5), the average number of nights incarcerated was 13.2.

¹⁰⁰ Three clients were missing data for arrests at follow-up.

¹⁰¹ Two clients had missing data for incarceration at follow-up.

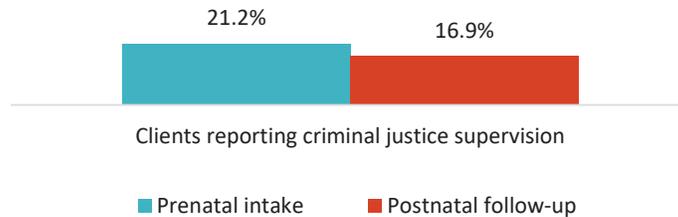
FIGURE IV.58. AVERAGE NUMBER OF NIGHTS SPENT INCARCERATED AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP



CRIMINAL JUSTICE SUPERVISION

At prenatal baseline, 21.2% of clients reported they were currently under criminal justice system supervision (e.g., probation, or parole; Figure IV.59). At follow-up, 16.9% were currently under criminal justice system supervision.

FIGURE IV.59. CLIENTS REPORTING SUPERVISION BY THE CRIMINAL JUSTICE SYSTEM AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP (N = 118)



Summary

The percent of clients who reported full-time employment increased significantly at postnatal follow-up, and the number of clients who reported being unemployed, but caring for their children at home increased to 65% at follow-up. Most clients were able to receive public assistance (mainly SNAP and WIC) while pregnant and in KY-Moms MATR and after the birth of the baby. The number of clients who reported having difficulty meeting health care needs for financial reasons decreased significantly in the past 6 months at postnatal follow-up compared to prenatal baseline. There were also significant decreases in the number of clients reporting both arrests and incarceration from prenatal baseline to postnatal follow-up.

Physical Health

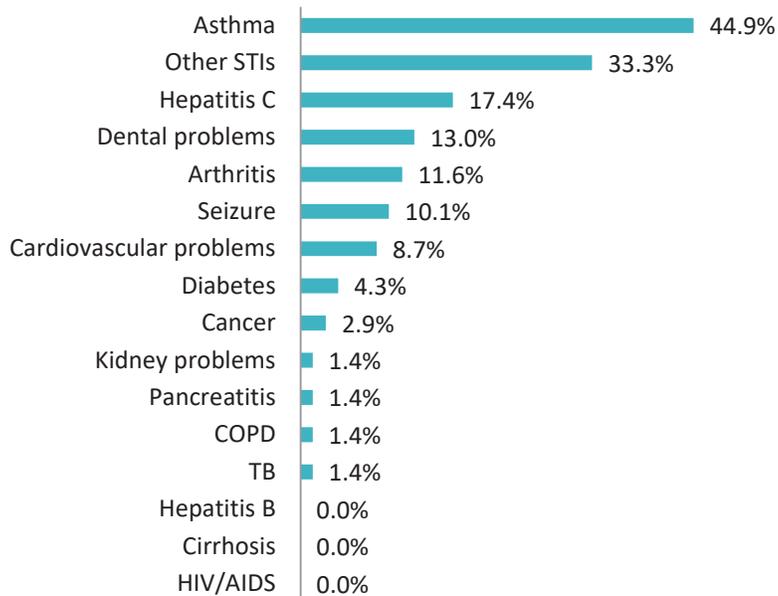
This subsection describes chronic health problems reported at prenatal baseline and change in physical health status of clients from prenatal baseline to postnatal follow-up including: (1) chronic health problems at baseline, (2) current health, (3) chronic pain, and (4) perceptions of poor physical and mental health.

Chronic Health Problems Reported at Prenatal Baseline

At prenatal baseline, 41.5% of clients reported no health problems, 35.6% reported having one chronic health problem, and 22.9% of clients had two or more chronic health problems.

As Figure IV.60 shows, among the clients who reported at least one physical health problem at prenatal baseline (n = 69), 44.9% of KY-Moms MATR clients reported asthma, 33.3% reported a sexually transmitted infection (STI), 17.4% reported Hepatitis C, 13.0% reported dental problems, 11.6% reported arthritis, and 10.1% reported seizures.

FIGURE IV.60. CHRONIC HEALTH PROBLEMS REPORTED BY CLIENTS AT PRENATAL BASELINE (N= 69)



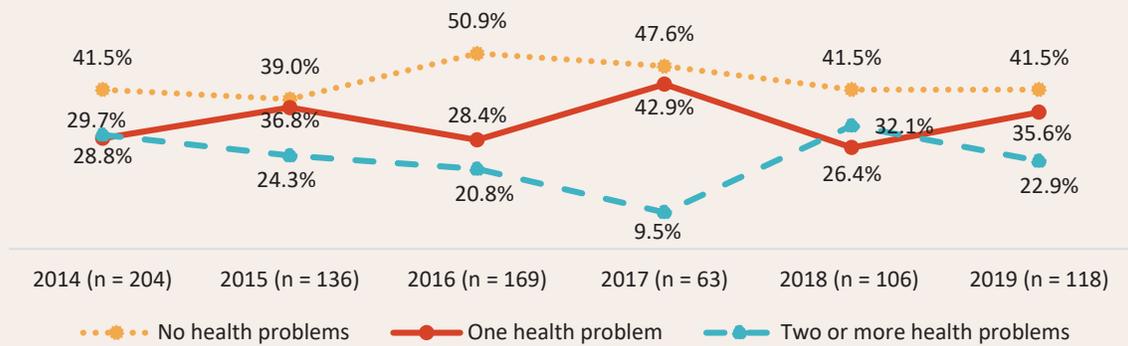
“I loved my case manager. I learned really helpful information about babies I didn’t know before.”

- KY-MOMS MATR FOLLOW-UP CLIENT

Trends in Chronic Health Problems at Prenatal Baseline and Postnatal Follow-up

In general, for each year, most clients reported no health problems at prenatal baseline. In 2016, for example, a little over half of clients (50.9%) reported they had no health problems. The number of clients who reported one health problem and multiple health problems were similar over the past 5 years with the exception of 2017 when only 9.5% of clients reported multiple health problems (compared to 42.9% of clients reporting only one health problem). In 2019, there was an increase in the number of clients reporting one health problem (35.6%) and a decrease in the number of clients with multiple health problems (22.9%) compared to 2018.

FIGURE IV.61. CLIENTS IN THE FOLLOW-UP SAMPLE REPORTING CHRONIC HEALTH PROBLEMS AT PRENATAL BASELINE, 2014-2019

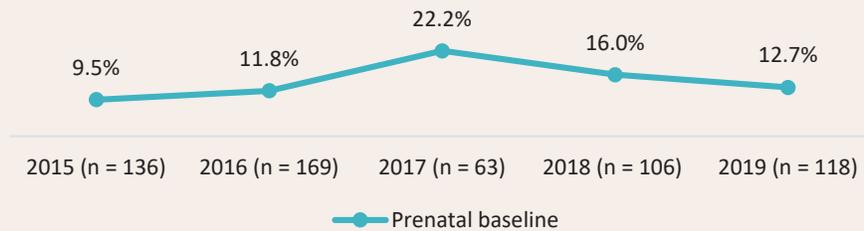


Overall, at prenatal baseline, 12.7% reported they had major health problems that were not currently being treated. Of those clients who indicated they had major health problems that were not being treated (n = 15), 20.0% reported their Hepatitis C and the remaining clients mentioned various responses such as heart murmur, seizures, and a herniated disk. At postnatal follow-up, 5.1% of clients reported major health problems that were not currently being treated. Of those clients (n = 6), they mentioned heart failure, Hepatitis B, kidney stones, migraines, and seizures.

Trends in Health Problems Not Being Treated at Prenatal Baseline

Less than one-quarter of clients each year reported having major health problems that were not currently being treated at baseline. In 2015, 9.5% of clients reported having a health problem that was not being treated and in 2017 22.2% of clients reported having a major health problem that was not being treated. After 2017, the number of clients who reported having major health problems that were not currently being treated decreased to 16.0% in 2018 and 12.7% in 2019.

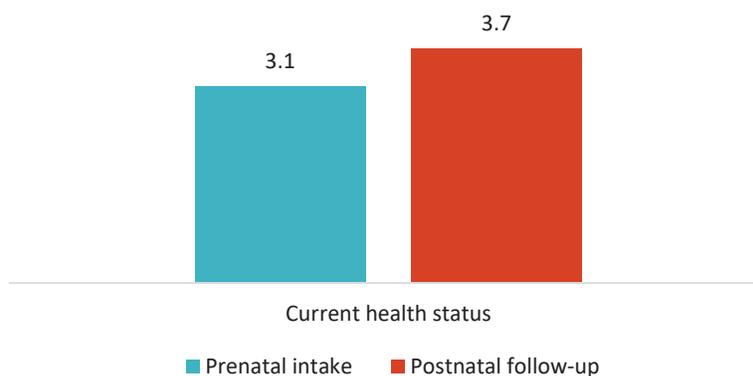
FIGURE IV.62. CLIENTS IN THE FOLLOW-UP SAMPLE REPORTING HEALTH PROBLEMS THAT WERE NOT BEING TREATED AT PRENATAL BASELINE, 2015-2019



Current Health Status

At prenatal baseline, clients reported their current health as an average of 3.1 on a scale of 1 being “poor” and 5 being “excellent.” At postnatal follow-up, clients reported that their current health was an average of 3.7, which is significantly higher compared to prenatal baseline (see Figure IV.63).

FIGURE IV.63. AVERAGE OVERALL HEALTH RATING FROM PRENATAL BASELINE TO POSTNATAL FOLLOW-UP (N = 118)***

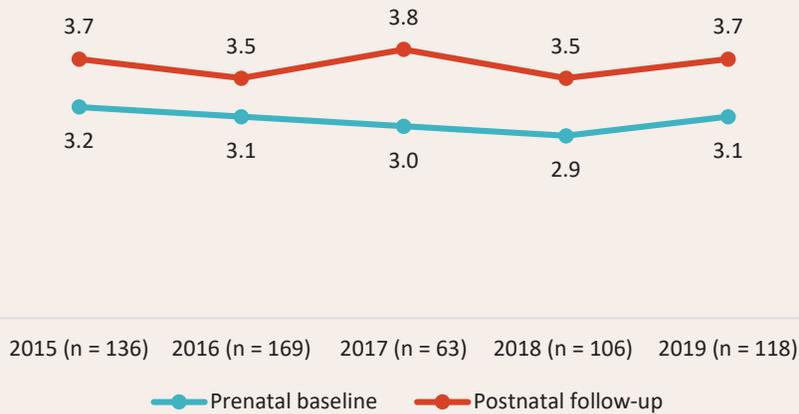


*** $p < .001$
Significance tested with paired sample t-test

Trends in Current Health Rating at Prenatal Baseline and Postnatal Follow-up

Average current health ratings steadily declined at baseline from 2015 (3.2) to 2018 (2.9). In 2019, clients reported an average rating of 3.1 compared to 2018 in which clients reported an average health rating of 2.9. At follow-up, the average health rating was significantly higher at each year compared to baseline. The average client health rating was highest in 2017 with a 3.8 rating.

FIGURE IV.64. CLIENTS IN THE FOLLOW-UP SAMPLE REPORTING AVERAGE HEALTH RATING AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP, 2015-2019

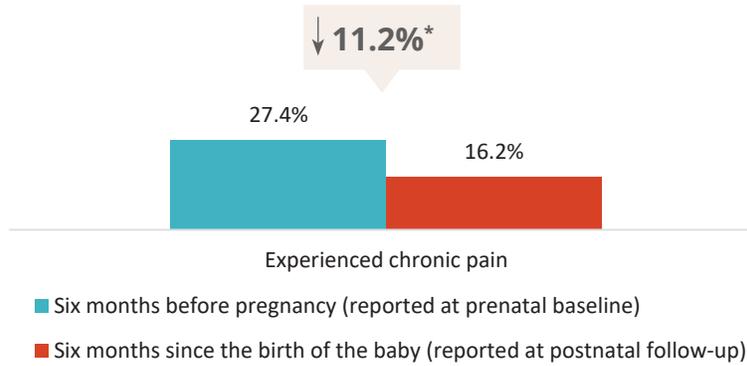


Chronic Pain

At prenatal baseline, 27.4% of women reported experiencing chronic pain in the 6 months before pregnancy and, of those clients (n = 32), they reported experiencing pain an average of 21 days in the 30 days before pregnancy. All of these clients reported that this chronic pain continued into their pregnancy with those clients reporting experiencing an average of 20 days of chronic pain in the past 30 days at prenatal baseline.

Approximately 16% of clients reported experiencing chronic pain in the past 6 months at postnatal follow-up (a significant decrease of 11.2% compared to the 6 months before pregnancy). Of those clients (n = 19), they reported an average of 19 days experiencing chronic pain.

FIGURE IV.65. CHRONIC PAIN IN THE 6 MONTHS BEFORE PREGNANCY AND THE 6 MONTHS BEFORE POSTNATAL FOLLOW-UP (N = 117)¹⁰²

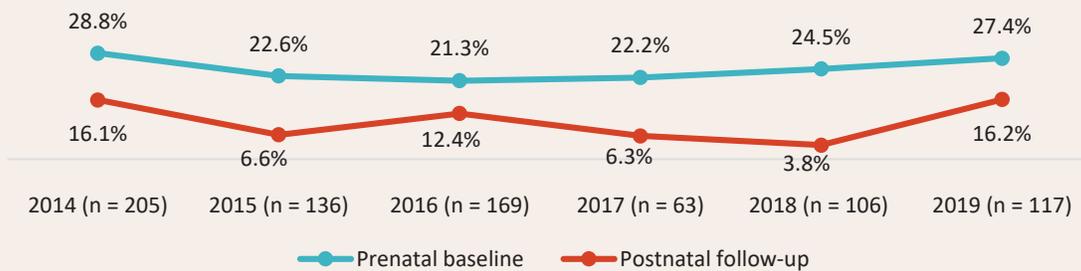


*p<.05

Trends in Chronic Pain at Prenatal Baseline and Postnatal Follow-up

Around one-quarter of clients each year reported having chronic pain at baseline. In 2014, 28.8% of clients at baseline and 16.1% of clients at follow-up reported having chronic pain. In 2019, 27.4% of clients reported experiencing chronic pain at baseline and 16.2% of clients reported chronic pain at postnatal follow-up, which was an increase from 3.8% in 2018.

FIGURE IV.66. CLIENTS IN THE FOLLOW-UP SAMPLE REPORTING CHRONIC PAIN AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP, 2014-2019



Perceptions of Poor Physical or Mental Health Limiting Activities

Clients were asked how many days in the past 30 days their physical and mental health were not good at prenatal baseline and postnatal follow-up (see Figure IV.67). There was a significant decrease from baseline to follow-up in the number of days clients reported their physical health was not good (from 5.0 days to 1.4 days¹⁰³). In comparison, America’s Health Rankings indicate people in Kentucky report an average of 5.4 days of poor physical health in the past 30 days. Specifically, Kentucky women reported 5.5 poor physical health days.¹⁰⁴ KY-Moms MATR clients

¹⁰² One client was missing data for chronic pain at follow-up.

¹⁰³ This could possibly be due to no longer being pregnant.

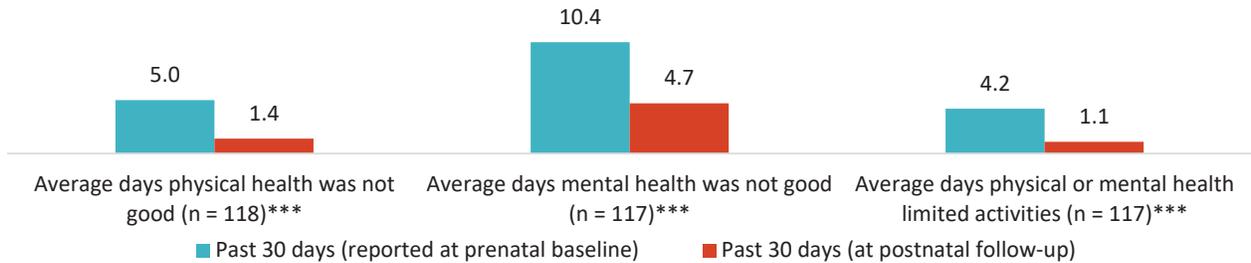
¹⁰⁴ America’s Health Rankings: A Call to Action for Individuals and Their Communities. Retrieved from <https://www.americashealthrankings.org/explore/annual/measure/PhysicalHealth/state/KY>.

report fewer days of poor physical health at prenatal baseline and fewer days at postnatal follow-up compared to both the overall population and women surveyed in Kentucky.

The number of days clients reported their mental health was not good decreased from 10.4 days at prenatal baseline to 4.7 days at postnatal follow-up. America’s Health Rankings indicate that, overall, Kentuckians reported an average of 4.9 days of poor mental health in the past 30 days while Kentucky women reported an average of 5.3 days of poor mental health.¹⁰⁵ This indicates KY-Moms MATR clients reported almost twice the amount of days their mental health was poor compared to the overall population in Kentucky at prenatal baseline and a similar number of days compared to women surveyed in Kentucky at postnatal follow-up.

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 4.2 days at baseline to 1.1 days at follow-up.

FIGURE IV.67. PERCEPTIONS OF POOR PHYSICAL HEALTH AND MENTAL HEALTH LIMITING ACTIVITIES IN THE PAST 30 DAYS AT BASELINE AND FOLLOW-UP¹⁰⁶



*** p < .001
Significance tested with paired sample t-test

¹⁰⁵ Retrieved from <https://www.americashealthrankings.org/explore/annual/measure/MentalHealth/state/KY>.

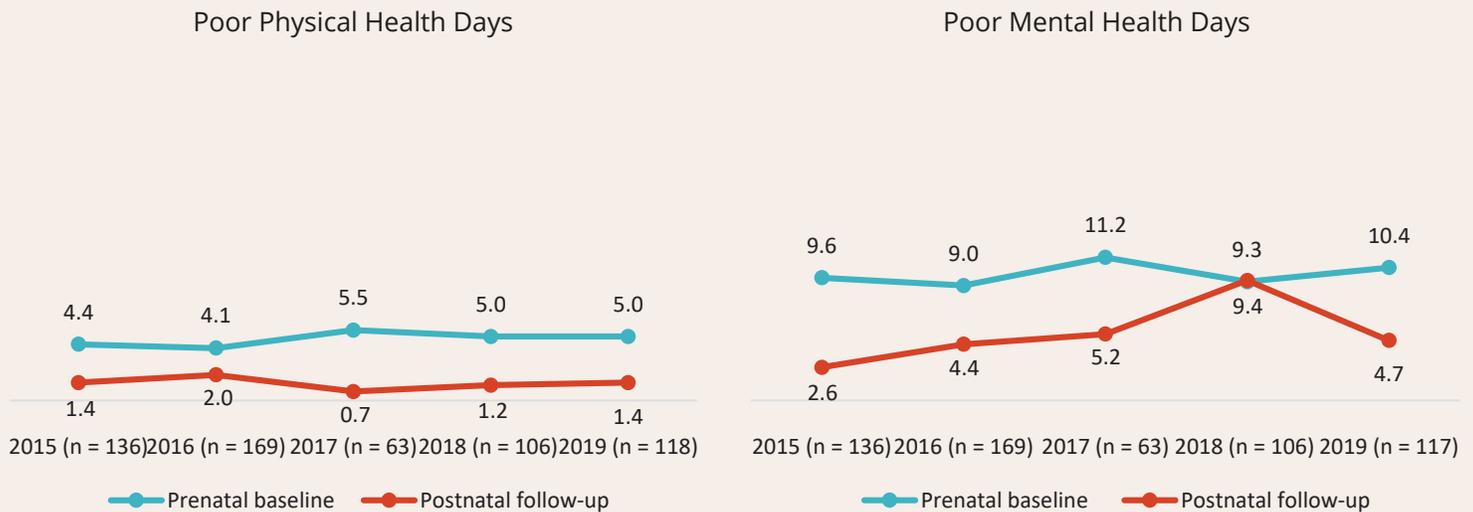
¹⁰⁶ One client was missing the average number of days mental health was not good and average days their physical and mental health limited their activities at follow-up.

Trends in Average Number of Days Physical and Mental Health Were Poor at Prenatal Baseline and Postnatal Follow-up

At baseline and follow-up, clients are asked how many days in the past 30 days their physical health had been poor. Each year, the number of days clients report poor physical health has significantly decreased from baseline to follow-up. In 2019 clients reported an average of 5.0 days their physical health was poor compared to 1.4 days at follow-up.

At baseline and follow-up, clients are also asked how many days in the past 30 days their mental health had been poor. The average number of poor mental health days reported at baseline has fluctuated from 2015 to 2018. In 2017, the average number of poor mental health days reported at baseline was 11.2 compared to 9.3 days in 2018 and 10.4 days in 2019. At follow-up, the number of poor mental health days has increased from 2015 (2.6) to 2016 (4.4), and again from 2017 (5.2) to 2018 (9.4). In 2019, the average number of poor mental health days clients reported at follow-up decreased to 4.7.

FIGURE IV.68. CLIENTS IN THE FOLLOW-UP SAMPLE REPORTING AVERAGE NUMBER OF DAYS PHYSICAL AND MENTAL HEALTH WERE POOR AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP, 2015-2019



Summary

At prenatal baseline, almost 60% of clients reported having at least one chronic health problem such as asthma, other STIs, Hepatitis C, and dental problems. About 13% of clients reported they had health problems that were not currently being treated. Clients' overall current health status rating improved significantly from prenatal baseline to postnatal follow-up. Over one-quarter of clients reported experiencing chronic pain in the 6 months before pregnancy and this decreased significantly to 16.2% in the past 6 months at postnatal follow-up. Clients also reported a significant decrease in the average number of days their physical health and mental health were not good.

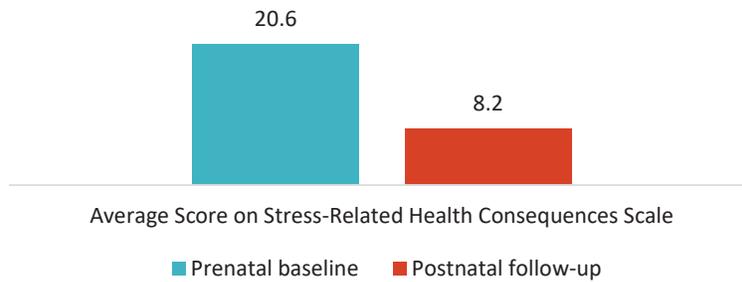
Stress, Quality of Life, and Emotional Support

This subsection examines changes in stress, quality of life, and emotional support including the following factors: (1) health consequences of stress, (2) quality of life ratings, (3) satisfaction with life, (4) the number of people clients said they could count on for emotional support, and (5) their satisfaction with the level of emotional support from others.

Stress-related Health Consequences

Clients were asked about 12 physiological symptoms often associated with higher stress called the Stress-Related Health Consequences scale.¹⁰⁷ The scale asks clients to indicate how often they have experienced the symptoms in the past 7 days (e.g., unexplained aches and pains, slept poorly, increased heart rate). Higher scores on the scale indicate higher stress and greater health consequences of stress. The minimum score is 0 and the maximum score is 60. For the overall sample, Stress-Related Health Consequences scores decreased significantly from 20.6 at prenatal baseline to 8.2 at postnatal follow-up (see Figure IV.69).

FIGURE IV.69. AVERAGE SCORES ON THE STRESS-RELATED HEALTH CONSEQUENCES SCALE AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP (N = 88)^{108***}



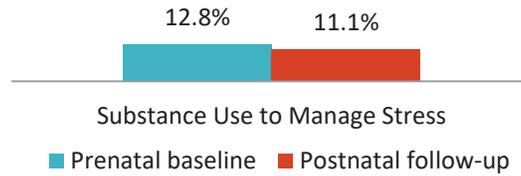
*** p < .001; Significance tested with paired sample t-test

Clients were also asked if they used alcohol, prescription drugs, or illegal drugs in the past 7 days to reduce or manage stress at prenatal baseline and postnatal follow-up. Figure IV.70 shows that 12.8% of clients reported they used at least one type of substance to reduce or manage their stress in the 7 days entering the KY-Mom MATR program and 11.1% of clients reported using at least one type of substance to reduce or manage their stress in the 7 days before follow-up.

¹⁰⁷ Logan, T. & Walker, R. (2010). Toward a deeper understanding of the harms caused by partner stalking. *Violence and Victims*, 25(4), 440-455.

¹⁰⁸ Stress-related health consequences measure was removed in May 2018; therefore 30 people did not have the opportunity to answer.

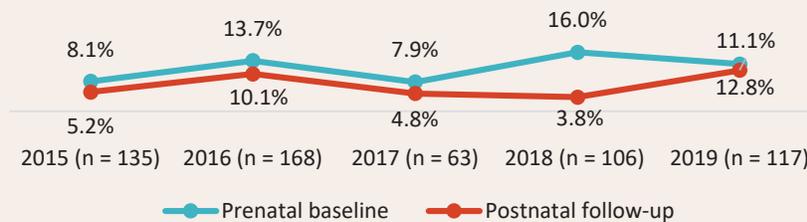
FIGURE IV.70. CLIENTS REPORTING SUBSTANCE USE TO REDUCE OR MANAGE STRESS AT INTAKE AND FOLLOW-UP (N = 117)¹⁰⁹



Trends in Substance Use to Manage Stress at Prenatal Baseline and Postnatal Follow-up

The number of clients who reported using substances to manage stress at baseline and follow-up remained fairly consistent from 2015 to 2017. In 2018, however, 16.0% of clients reported using alcohol or drugs to manage their stress at baseline compared to 3.8% of clients at follow-up.

FIGURE IV.71. CLIENTS IN THE FOLLOW-UP SAMPLE REPORTING SUBSTANCE USE TO MANAGE STRESS AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP, 2015-2019



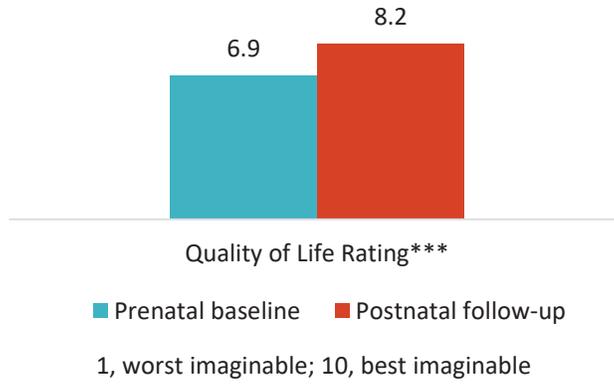
Quality of Life

There were two quality of life and satisfaction with life indexes used including: (1) quality of life rating, and (2) satisfaction with life.

At both prenatal baseline and postnatal follow-up, clients were asked to rate their current quality of life using ratings ranging from 1 = 'Worst imaginable' to 10 = 'Best imaginable'. Clients rated their quality of life before entering the KY-Moms MATR program as a 6.9, on average (see Figure IV.72). The average rating of quality of life increased significantly to 8.2 at postnatal follow-up.

¹⁰⁹ One client was missing data for this question at follow-up.

FIGURE IV.72. PERCEPTION OF QUALITY OF LIFE AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP (n = 118)

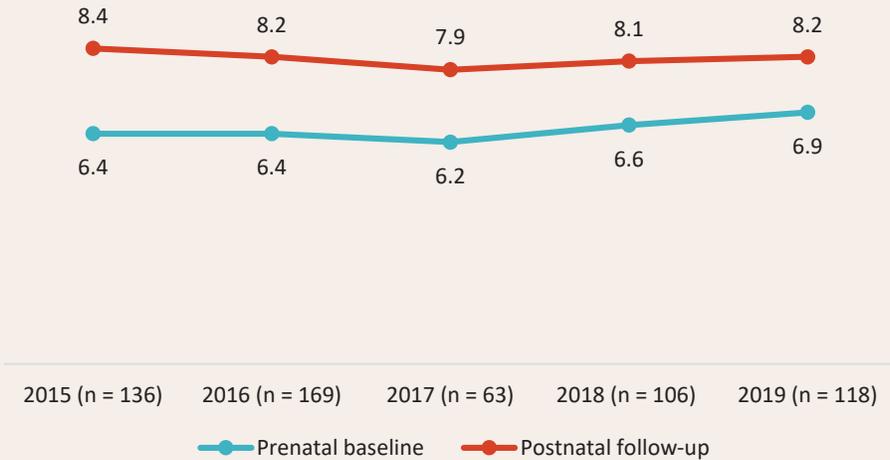


*** p < .001

Trends in Quality of Life at Prenatal Baseline and Postnatal Follow-up

KY-Moms MATR clients are asked to rank their overall quality of life on a scale from 1 (worst imaginable) to 10 (best imaginable) at both baseline and follow-up. At baseline, clients have rated their quality of life, on average, from 6.2 to 6.9. At postnatal follow-up, that rating has significantly increased to an average of around 8.

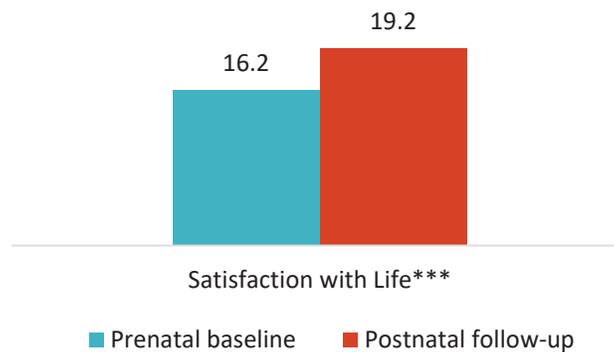
FIGURE IV.73. CLIENTS IN THE FOLLOW-UP SAMPLE RANKING THEIR QUALITY OF LIFE AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP, 2015-2019



Satisfaction with Life

In order to measure the clients' overall satisfaction with their life, clients were asked 5 questions on the Satisfaction With Life Scale (SWLS)¹¹⁰ at both prenatal baseline and postnatal follow-up, and clients responded to each item with 1 'Extremely dissatisfied' to 5 'Extremely satisfied' (see Figure IV.74). Scale scores were a sum of the five items and ranged from 5, which indicates the client is extremely dissatisfied with her current life, to 25 which indicates the client is highly satisfied with her life. At prenatal baseline, clients reported an average well-being score of 16.2 and this significantly increased to 19.2 at postnatal follow-up, indicating that clients were generally happy with their lives at follow-up.

FIGURE IV.74. AVERAGE RANKING OF SATISFACTION WITH LIFE AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP (N = 88)¹¹¹

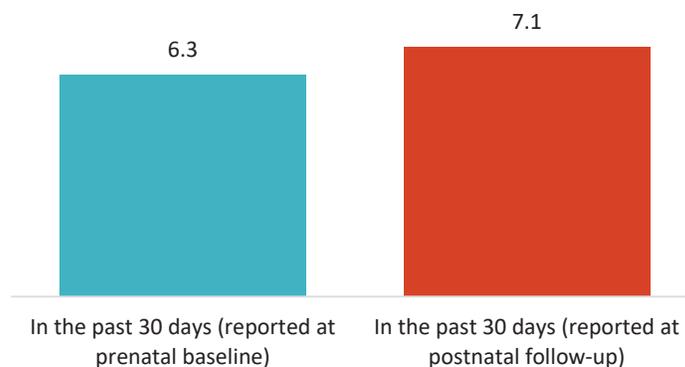


***p < .01

Emotional Support

In the past 30 days at baseline, clients reported they could count on an average of 6.3 people for emotional support. In the past 30 days at postnatal follow-up, clients reported that they could count on an average of 7.1 people for emotional support (see Figure IV.75).

FIGURE IV.75. AVERAGE NUMBER OF PEOPLE CLIENT COULD COUNT ON FOR EMOTIONAL SUPPORT AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP (N = 105)



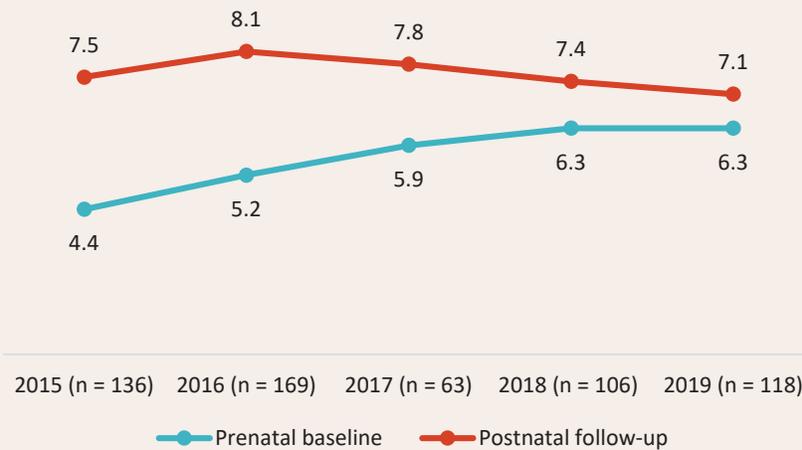
¹¹⁰ A modified version of the Satisfaction With Life Scale. Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment*, 49, 71-75.

¹¹¹ Satisfaction with Life Scale was removed in May 2018; therefore, some clients did not get the opportunity to answer.

Trends in the Average Number of People Clients Can Count on for Emotional Support at Prenatal Baseline and Postnatal Follow-up

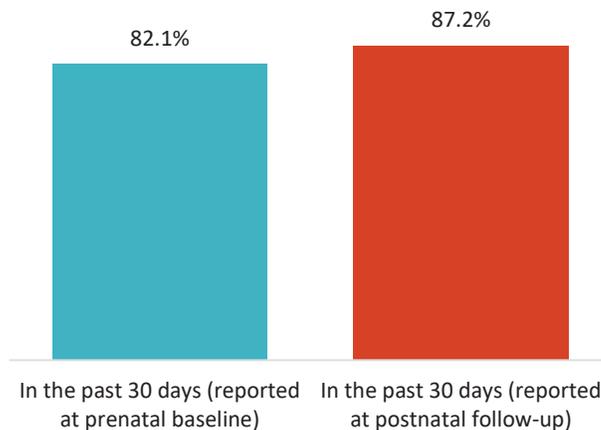
The average number of people clients reported they could count on for emotional support in the past 30 days has steadily increased over the past 4 years at baseline. In 2015 clients reported they could count on 4.4 people and in 2018 and 2019 clients reported an average of 6.3 people they could count on for emotional support. While the average number of people clients could count on for emotional support has increased over time at baseline, at follow-up, the average number of people have decreased since 2016.

FIGURE IV.76. CLIENTS IN THE FOLLOW-UP SAMPLE ON THE AVERAGE NUMBER OF PEOPLE CLIENTS CAN COUNT ON FOR EMOTIONAL SUPPORT AT PRENATAL BASELINE AND POSTNATAL FOLLOW-UP, 2015-2018



In general, the majority of clients were satisfied with the level of emotional support they received from others in the past 30 days. About 82% of clients at prenatal baseline and 87.2% of clients at postnatal follow-up reported they were extremely or fairly satisfied with the level of emotional support they received from others (see Figure IV.77).

FIGURE IV.77. SATISFACTION WITH THE OVERALL LEVEL OF SUPPORT IN LIFE (N = 117)¹¹²



¹¹² One client was missing information on satisfaction with overall level of support at follow-up.

Global Functioning Difficulties

This subsection examines change in an index of global functioning from the period before becoming pregnant to postnatal follow-up.

The index of global functioning is based on individuals' reports of substance use, employment, homelessness, criminal justice system involvement, depression and/or anxiety, partner violence, self-rating of overall health, recovery supports, and rating of quality of life. Table IV.1 describes the factors that compose the index. This index is used to better capture overall recovery functioning at postnatal follow-up. The presence of any of the functioning difficulties means an individual is classified as having functioning difficulties.

TABLE IV.1. ALTERNATE INDEX OF GLOBAL FUNCTIONING

INDICATOR	BETTER FUNCTIONING	FUNCTIONING DIFFICULTIES
Illicit drug use	No illicit drug use	Illicit drug use
Employment	Employed at least part-time or in school	Unemployed (not on disability, not going to school, not a caregiver)
Homelessness	No reported homelessness	Reported homelessness
Criminal Justice System Involvement.....	No arrest or incarceration	Any arrest or incarceration
Depression and/or anxiety	No depression or anxiety.	Depression or anxiety
Partner violence	No partner violence	Any partner violence
Overall health	Fair to excellent overall health	Poor overall health
Recovery support.....	Had at least one person she could count on for recovery support	Had no one she could count on for recovery support
Quality of life	Mid to high-level of quality of life	Low-level quality of life

At prenatal baseline, the majority individuals (82.8%) were classified as having functioning difficulties (see Figure IV.78). At postnatal follow-up, 46.6% had functioning difficulties—a significant decrease of 36.2%.

FIGURE IV. 78. FUNCTIONING DIFFICULTIES AT INTAKE AND FOLLOW-UP (N = 116)¹¹³

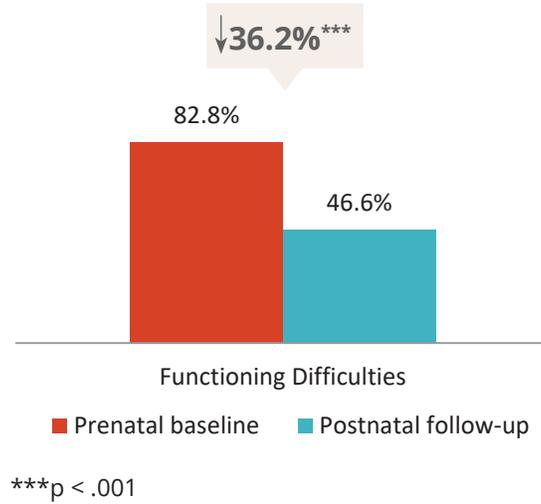


Table IV.2 presents the frequency of clients who reported each indicator of worse functioning at follow-up. Individuals who were in the Yes column in Table IV.2 were classified as having worse functioning at follow-up. The factors with the highest percent of clients answering “yes” to those indicators were meeting study criteria for depression and/or generalized anxiety in the past 6 months at postnatal follow-up and reporting alcohol or illegal drug use in the past 6 months at postnatal follow-up.

TABLE IV.2. PERCENT OF CLIENTS WITH INDICATORS OF WORSE FUNCTIONING AT POSTNATAL FOLLOW-UP (N = 116)

Factor	No	Yes
Reported illicit drug use in the past 6 months at postnatal follow-up.....	87.1%	12.9%
Usual employment was not employed in the past 6 months at postnatal follow-up ...	93.0%	7.0%
Homeless at any point in the past 6 months at postnatal follow-up	97.4%	2.6%
Arrested and/or incarcerated in the past 6 months at postnatal follow-up	94.8%	5.2%
Met study criteria for depression and/or generalized anxiety in the past 6 months at postnatal follow-up.....	63.8%	36.2%
Reported any partner violence in the past 6 months at postnatal follow-up	88.7%	11.3%
Self-rating of overall health in the past 6 months at postnatal follow-up was poor	100.0%	0.0%
Reported have no one she could count on for recovery support in the past 6 months at postnatal follow-up.....	97.4%	2.6%
Reported a low-level quality of life	99.1%	0.9%

Summary

Clients reported significantly fewer physiological consequences associated with higher stress at postnatal follow-up compared to prenatal baseline. In addition, clients reported a significantly greater quality of life at postnatal follow-up compared to prenatal baseline. Furthermore, clients reported a significant increase in their satisfaction with their lives at postnatal follow-up. About 87% of KY-Moms MATR clients at postnatal follow-up were satisfied with the level of support they received from others. The average number of people clients felt they could count on for support

¹¹³ Two individuals had missing data for at least one of the variables that was used to compute the index of global functioning at follow-up.

did not increase significantly from before pregnancy to postnatal follow-up. An index of global functioning that takes into account substance use, employment, homelessness, criminal justice system involvement, depression and/or anxiety, partner violence, overall health, recovery support, and quality of life was computed for clients at prenatal baseline and postnatal follow-up. Almost all clients were classified as having worse global functioning at intake, whereas only 47% had worse global functioning at follow-up.

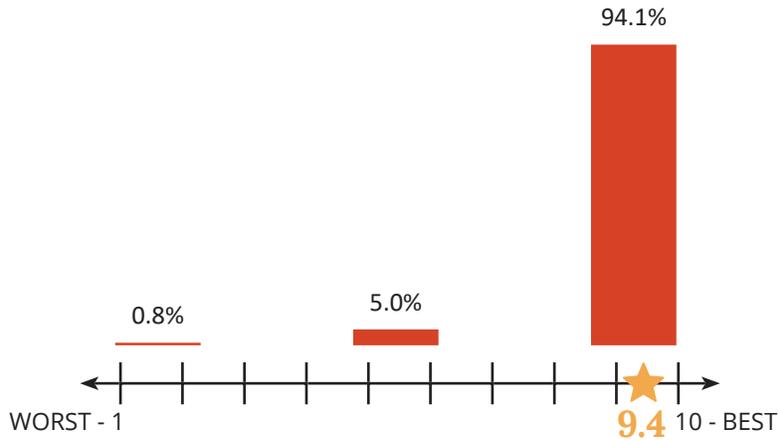
Part V. Client Satisfaction with KY-Moms MATR Case Management

This section describes three aspects of clients’ satisfaction with the program assessed for clients who completed a postnatal follow-up: (1) overall program satisfaction, (2) ratings of program experiences, and (3) if the client would recommend the program to a friend.

KY-Moms MATR Case Management Services Satisfaction Rating

At the beginning of the follow-up interview, interviewers asked clients questions about their satisfaction with the KY-Moms MATR case management services where 1 represented the worst experience and 10 represented the best experience. Clients rated their KY-Moms MATR experience, on average, as 9.4 (see Figure V.1). Overall, 94.1% gave a rating between 8 and 10 and 70.3% of clients gave the highest possible rating, 10.

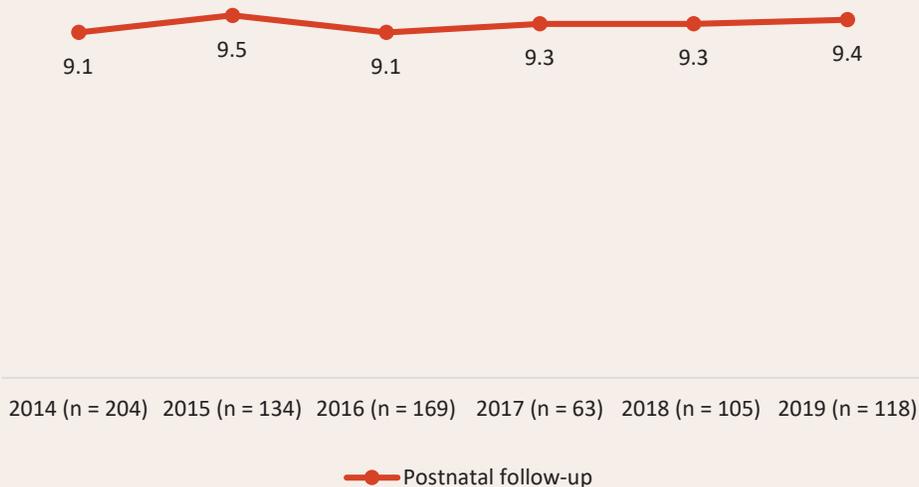
FIGURE V.1. RATING OF EXPERIENCE WITH KY-MOMS MATR (N = 118)



Trends in Ratings of Experience with KY-Moms MATR at Postnatal Follow-up

On a scale of 1 to 10 with 1 being the worst possible experience and 10 being the best possible experience, KY-Moms MATR clients have consistently ranked their experience with the program as an average of 9.1 or higher over the past 6 years.

FIGURE V.2. AVERAGE SATISFACTION RATING OF THE KY-MOMS MATR PROGRAM AT POSTNATAL FOLLOW-UP, 2014-2019



Satisfaction with Experience¹¹⁴

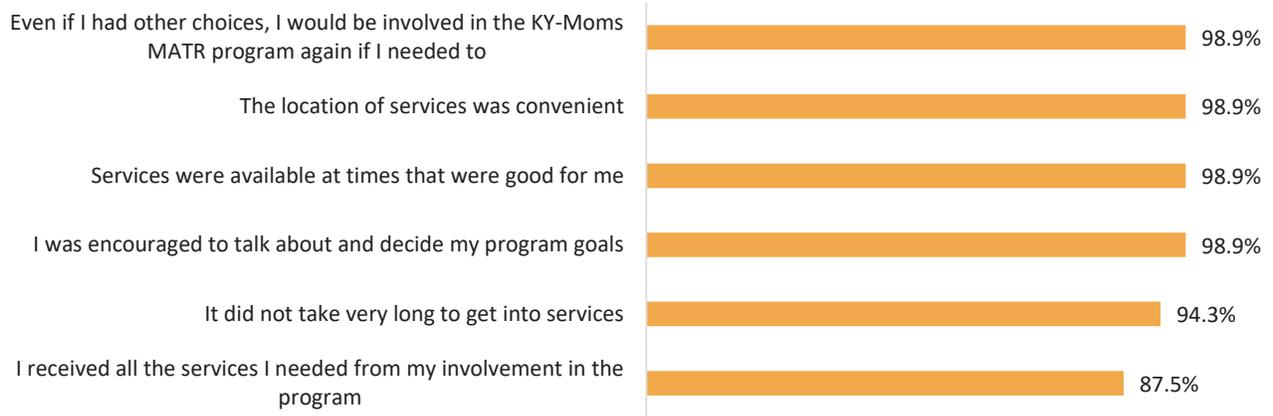
Figure V.3 shows that KY-Moms MATR clients were extremely satisfied with the overall program services. In fact, the majority of clients (98.9%) reported that, even if they had other choices, they would be involved in KY-Moms MATR again if they needed to, that the location and the available times of the services was convenient, that services were available at the times that were good for them, and that they were encouraged to talk about and decide their program goals. About 94% of clients reported that it didn't take very long to get into services. Almost 86% of clients believed that they received all the services they needed from their involvement in the program.

“[My case manager] was really good. I couldn't ask for a better friend and teacher.”

- KY-MOMS MATR FOLLOW-UP CLIENT

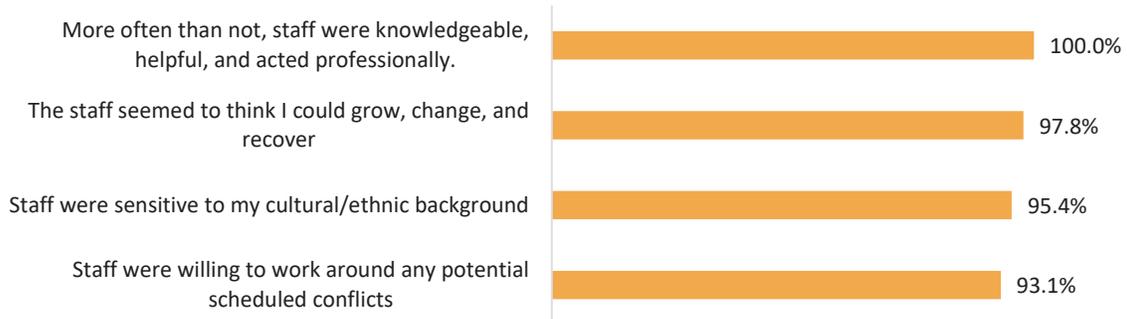
¹¹⁴ These updated program satisfaction questions were added to the follow-up survey in February 2018; therefore, not all clients had the opportunity to answer.

FIGURE V.3. SATISFACTION WITH KY-MOMS MATR SERVICES (N = 88)

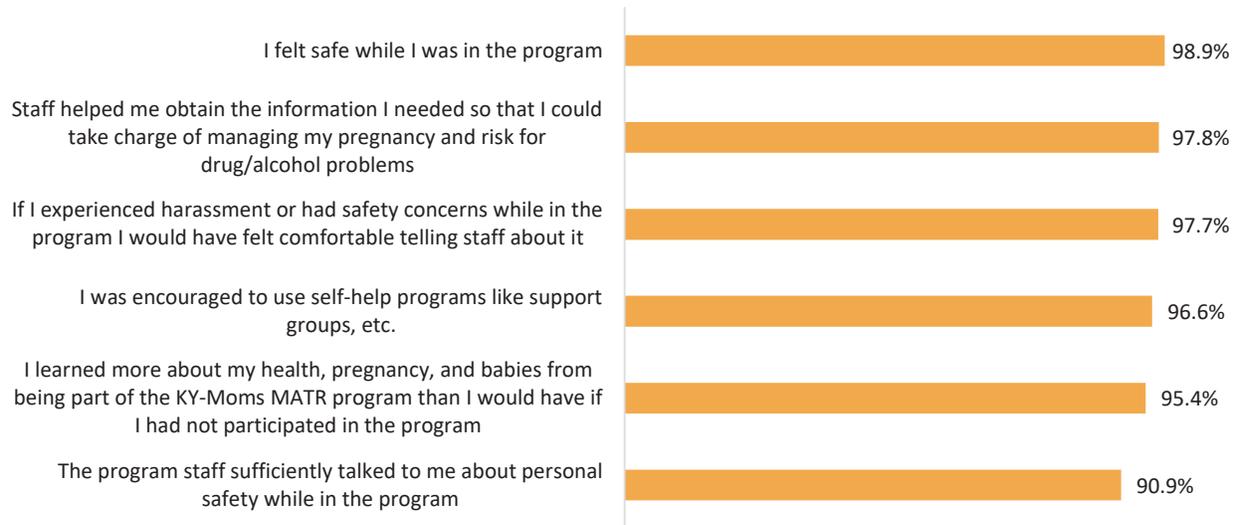


Clients were also very satisfied with the KY-Moms MATR program staff (see Figure V.4). Specifically, all clients reported that more often than not, staff were knowledgeable, helpful, and acted professionally. Almost 98% of clients reported that the staff seemed to think they could grow, change, and recover and 95.4% of clients agreed that staff were sensitive to their cultural/ethnic background. About 93% of clients reported that staff were willing to work around any potential scheduled conflicts.

FIGURE V.4. GENERAL SATISFACTION WITH KY-MOMS MATR STAFF (N = 88)



Close to 99% of clients reported that they felt safe while in the case management program. The majority of clients (97.8%) believed that the staff helped them obtain information so they could take charge of managing their pregnancy and risk for drug/alcohol problems and that if they experienced harassment or had safety concerns while in the program that they would have felt comfortable telling staff about it. Almost 97% of clients reported they were encouraged to use self-help programs like support groups. About 95% of clients agreed that they learned more about their health, pregnancy, and babies from being part of the KY-Moms MATR program than they would have if they had not participated. Close to 91% reported that the staff talked to them about personal safety while in the program.

FIGURE V.5. SATISFACTION WITH PROGRAM ASPECTS ADDRESSING TARGETED FACTORS (N = 88)¹¹⁵

Recommend KY-Moms MATR to a Friend

Ninety-eight percent of clients in the postnatal follow-up sample indicated they would recommend KY-Moms MATR case management to a friend. The following are some quotes from clients about why they would recommend the program to a friend:

"I was homeless and on the street at the beginning and they helped me out a lot. Everything I got for my son was from them."

"I really liked how the case manager was. I learned quite a few new things."

"I just loved it. Still learned new things even though it was my 3rd kid."

¹¹⁵ One client was missing information on if the client learned more about health, pregnancies, and babies.

Part VI. Conclusion

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

Areas of Success

In spite of these significant risk factors (low income, high rates of unemployment, adverse childhood experiences, victimization, substance use, mental health problems and intimate partner violence), the KY-Moms MATR mothers had very positive birth outcomes that were similar to the general population of mothers in Kentucky who had babies during the same period. Specifically, the two groups of mothers had similar birth outcomes, such as babies' average number of gestational weeks, the percent of babies who were born premature, birth weight, highest APGAR, the percent of babies with birthing problems, the percent of babies being taken to the neonatal intensive care unit, their decision to breastfeed, and the number of prenatal care visits with a health care provider. In addition, improvements were seen in the targeted risk factors:

Substance Use

Close to half of clients reported illegal drug use in the 30 days before becoming pregnant, compared to 11.4% of non-pregnant women reporting illegal drug use in the past month in a national survey.¹¹⁶ In the past 30 days at prenatal baseline, 17.9% of clients reported illegal drug use and in the 30 days before the baby was born, 2.7% of clients reported illegal drug use. Illegal drug use decreased significantly at postnatal follow-up compared to the period before clients found out about the pregnancy.

A similar pattern was seen with reduction in alcohol use with clients reporting significantly less use while pregnant and in KY-Moms MATR with a sustained decrease after the birth of the baby. About half of clients reported using alcohol in the 30 days before pregnancy. Further, 1.8% of KY-Moms MATR clients reported any alcohol use in the past 30 days at prenatal baseline and 0.9% of clients reported alcohol use in the 30 days before the baby was born. Although there was an increase in the number of clients who reported any alcohol use in the past 30 days at postnatal follow-up compared to during pregnancy, there were still significantly fewer clients reporting alcohol use compared to the 30 days before pregnancy.

In addition, the number of clients who reported smoking decreased significantly from the 30 days before the client became pregnant to the 30 days before the baby was born. This decrease was sustained in the 30 days before postnatal follow-up. In addition, the average number of cigarettes clients smoked decreased from before the client found out about their pregnancy (15.5) to the past 30 days at prenatal baseline (7.9). The number of cigarettes decreased further in the 30 days before the baby was born (6.0) and remained lower in the past 30 days at postnatal follow-up (8.7).

Mental Health

Clients' mental health also showed significant improvements. Specifically, significant reductions in

¹¹⁶ Substance Abuse and Mental Health Services Administration. *Results from the 2013 National Survey on Drug Use and Health: Summary of National Findings, NSDUH Series H-48, HHS Publication No. (SMA) 14-4863*. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2014.

the average number of reported depression (6.5 symptoms at baseline to 1.4 symptoms at follow-up) and anxiety symptoms (4.9 symptoms at baseline to 1.9 symptoms at follow-up) were found in the past 6 months at postnatal follow-up compared to before pregnancy. Similar results were found for past 30 day measures. Clients also reported fewer stress-related health consequences at postnatal follow-up (20.6 at baseline compared to 8.2 at follow-up).

Victimization and Trauma

Reported incidences of any intimate partner violence, such as psychological abuse and coercive control, decreased from the period before clients found out they were pregnant (25.6%) to postnatal follow-up (11.1%).

Global Functioning

The index of global functioning measures multiple domains of clients' functioning: substance use, employment, homelessness, criminal justice system involvement, meeting study criteria for depression and/or anxiety, any partner violence, self-rating of overall health, recovery supports, and rating of quality of life. Nearly all clients had worse functioning at prenatal baseline, with a significant decrease to 47% at postnatal follow-up.

Other Areas of Improvement

In addition to the improvement in targeted risk factors, there were improvements in other areas of the mothers' lives after becoming involved in the KY-Moms MATR program including a reduction in chronic pain and improved overall health. Moreover, individuals reported significantly fewer days in the past 30 days their physical health was not good at follow-up compared to baseline. Women reported significantly greater emotional attachment to their babies at follow-up compared to baseline. Women also reported improved economic conditions with significantly fewer clients reporting they had difficulty meeting health care needs as a result of financial problems.

Clients reported significantly higher quality of life after the program and an overall greater satisfaction with life at postnatal follow-up compared to prenatal baseline. The vast majority of clients were satisfied with KY-Moms MATR case management services and would recommend the program to others.

Areas of Concern

Despite significant improvements in many areas of clients' lives, there was a minority of new mothers who continued to struggle with targeted risks such as drug use, tobacco use, mental health problems, partner abuse, and economic hardship at follow-up.

Drug Use

Almost 13% of clients reported still using illegal drugs in the 6 months since having the baby. Of those clients ($n = 15$), 93.3% reported marijuana use, 13.3% reported non-prescribed opioids (painkillers, methadone, buprenorphine), 6.7% reported central nervous system depressants (barbiturates, benzodiazepines, sedatives and tranquilizers), and 6.7% reported stimulant (including cocaine) use. Parental drug use may interfere with the ability to care for a child and provide a safe environment. From the physical and mental impairments resulting from the drugs themselves, prioritizing money spent on drugs instead of other household needs, or time

spent looking for drugs, children's needs may go unmet by a drug using parent.¹¹⁷ Furthermore, a household with a substance using parent may be unsafe if illegal drugs or paraphernalia are accessible to children.¹¹⁸

Smoking

The majority of clients smoked during pregnancy (58.6% in the past 30 days at prenatal baseline and 56.8% in the 30 days before the baby was born) and during the 6 months after the baby was born (68.1%). This is considerably higher than the number of both pregnant and non-pregnant women who smoke in the U.S. and higher than mothers in Kentucky who did not participate in KY-Moms MATR. While it is well known that smoking can cause negative birth outcomes, many mothers may not consider the impact that cigarette smoke has on a baby's health once the baby has been born. In fact, several studies have shown that childhood exposure to cigarette smoke contributes to the incidence of sudden infant death syndrome,^{119, 120} respiratory infections,¹²¹ middle ear disease and adenotonsillectomy,¹²² poor lung function and asthma,^{123, 124, 125} neurodevelopmental and behavioral problems,¹²⁶ and childhood cancer.^{127, 128, 129} As a result, there may be a need to increase postpartum support services for substance use and smoking cessation in the KY-Moms MATR program.

Mental Health

Over one-third of KY-Moms MATR clients reported meeting study criteria for depression or anxiety (or both) in the six months after the baby was born. Dealing with a newborn and the typical new mother sleep deprivation may be especially difficult for women experiencing trauma, depression, and/or anxiety. Trauma and depression/anxiety may increase risk for, or exacerbate, postpartum

¹¹⁷ Child Welfare Information Gateway. (2003). *Substance Abuse and Child Maltreatment*. U.S. Department for Health and Human Services, Washington, DC. Retrieved from https://www.childwelfare.gov/pubPDFs/subabuse_childmal.pdf

¹¹⁸ Smith, V. & Wilson, C., AAP Committee on Substance Use and Prevention. (2016) *Families affected by parental substance use*. *Pediatrics*, 138(2), e20161575.

¹¹⁹ Anderson, H. R., & Cook, D. G. (1997). Passive smoking and sudden infant death syndrome: review of the epidemiological evidence. *Thorax*, 52(11), 1003-1009.

¹²⁰ Zhang, K., & Wang, X. (2013). Maternal smoking and increased risk of sudden infant death syndrome: a meta-analysis. *Legal Medicine*, 15(3), 115-121.

¹²¹ Strachan, D. P., & Cook, D. G. (1997). Health effects of passive smoking. 1. Parental smoking and lower respiratory illness in infancy and early childhood. *Thorax*, 52(10), 905-914.

¹²² Strachan, D. P., & Cook, D. G. (1998). Health effects of passive smoking. 4. Parental smoking, middle ear disease and adenotonsillectomy in children. *Thorax*, 53(1), 50-56.

¹²³ Strachan, D. P., & Cook, D. G. (1998). Health effects of passive smoking. 9. Parental smoking and spirometric indices in children. *Thorax*, 53 (1), 884-893.

¹²⁴ Von Mutius, E. (2002). Environmental factors influencing the development and progression of pediatric asthma. *Journal of Allergy and Immunology*, 109(6), 525-532.

¹²⁵ Burke, H., Leonardi-Bee, J., Hashim, A., Pine-Abata, H., Chen, Y., Cook, D. G., Britton, J., & McKeever, T. M. (2012). Prenatal and passive smoke exposure and incidence of asthma and wheeze: systematic review and meta-analysis. *Pediatrics*, 129(4), 735-744.

¹²⁶ Eskenazi, B., & Castorina, R. (1999). Association of prenatal maternal or postnatal child environmental tobacco smoke exposure and neurodevelopmental and behavioral problems in children. *Environmental Health Perspectives*, 107(12), 991-1000.

¹²⁷ John, E., Savitz, D., & Sandler, D. (1991). Prenatal exposure to parents' smoking and childhood cancer. *American Journal of Epidemiology*, 133(2), 123-132.

¹²⁸ Sasco, AJ, & Vainio, H. From in utero and childhood exposure to parental smoking to childhood cancer: a possible link and the need for action. *Human and Experimental Toxicology*, 18, 192-201.

¹²⁹ Hofhuis, W., Jongste, JC, & Merkus, P. (2003). Adverse health effects of prenatal and postnatal tobacco smoke exposure on children. *Archives of Disease in Childhood*, 88, 1086-1090.

depression. Postpartum depression is a common problem affecting millions of new mothers and though it usually presents itself around 4 weeks postpartum,¹³⁰ it can continue for as long as 14 months.¹³¹ While it is mostly caused by the swing of hormones that occur after birth, a study by the Centers for Disease Control found that postpartum depression was significantly associated with tobacco use in the last trimester, intimate partner violence, and financial stress (including the use of Medicaid).^{132, 133} In addition, studies have found that marital status (being single), having a history of depression or anxiety as well as experiencing depression or anxiety during pregnancy can be risk factors for experiencing postpartum depression.^{134, 135} For these women who have experienced mental health problems, targeted or adapted mental health services may be critical.

Adverse Childhood Experiences, Victimization, and PTSD

At baseline, 82.7% of clients reported at least one adverse childhood experience such as neglect or abuse before the age of 18. Of particular importance, is that the risk of alcohol or drug use increases as the number of adverse childhood experiences increases.^{136, 137, 138, 139} Higher ACE scores are associated with initiating alcohol abuse and smoking in adolescence.^{140, 141} Additionally, experiencing more types of childhood abuse is associated with greater likelihood of experiencing an unintended first pregnancy among women.¹⁴² Poor self-rated health as well as health problems such as ischemic heart disease, cancer, and liver disease were more prevalent in those who reported a higher number of ACEs.¹³⁹ Poor sleep, severe obesity, and multiple somatic symptoms were increased for those with ACE scores over 4.¹³² Higher ACE scores have been linked

¹³⁰ American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders (5th ed.)*. Arlington, VA: American Psychiatric Publishing.

¹³¹ Wolkind S, Zajicek E, & Ghodsian J. (1990). Continuities in maternal depression. *International Journal of Family Psychiatry, 1*, 167-182.

¹³² Centers for Disease Control and Prevention (2008). Prevalence of self-reported postpartum depressive symptoms --- 17 states, 2004—2005. *MMWR, 57*(14), 361-366.

¹³³ Segre, L. S., O'Hara, M. W., Arndt, S., & Stuart, S. (2007). The prevalence of postpartum depression. *Social Psychiatry and Psychiatric Epidemiology, 42*(4), 316-321.

¹³⁴ O'Hara, M. & McCabe, J. (2013). Postpartum depression: current status and future directions. *Annual Review of Clinical Psychology, 9*, 379-407.

¹³⁵ Robertson, E., Grace, S., Wallington, T., & Stewart, D. E. (2004). Antenatal risk factors for postpartum depression: a synthesis of recent literature. *General Hospital Psychiatry, 26*(4), 289-295.

¹³⁶ Anda, R., Felitti, V., Walker, J., Whitfield, C., Bremner, J., Perry, B., Dube, S., & Giles, W. (2006). The enduring effects of abuse and related adverse experiences in childhood: a convergence of evidence from neurobiology and epidemiology. *European Archives of Psychiatry and Clinical Neurosciences, 56*(3), 174-86.

¹³⁷ Dube, S., Felitti, V., Dong, M., Chapman, D., Giles, W., & Anda, R. (2003a). Childhood abuse neglect and household dysfunction and the risk of illicit drug use: The Adverse Childhood Experiences Study. *Pediatrics, 111*, 564-572.

¹³⁸ Dube, S., Felitti, V., Dong, M., Giles, W., & Anda, R. (2003b). The impact of adverse childhood experiences on health problems: evidence from four birth cohorts dating back to 1900. *Preventative Medicine, 37*, 268-277.

¹³⁹ Felitti, V., Anda, R., Nordenberg, D., Williamson, D., Spitz, A., Edwards, V., & Marks, J. (1998). The relationship of adult health status to childhood abuse & household dysfunction. *American Journal of Preventative Medicine, 14*(4), 245-258.

¹⁴⁰ Anda, R., Croft, J., Felitti, V., Nordenberg, D., Giles, W., Williamson, D., & Giovino, G. (1999). Adverse childhood experiences and smoking during adolescence and adulthood. *Journal of the American Medical Association, 282*, 1652-1658.

¹⁴¹ Dube, S., Miller, J., Brown, D., Giles, W., Felitti, V., Dong, M., & Anda, R. (2006). Adverse childhood experiences and the association with ever using alcohol and initiating alcohol use during adolescence. *Journal of Adolescent Health, 38*(4), 444. e1-10.

¹⁴² Dietz, P., Spitz, A., Anda, R., Williamson, D., McMahon, P., Santelli, J., Nordenberg, D., Felitti, V., & Kendrick, J. (1999). Unintended pregnancy among adult women exposed to abuse or household dysfunction during their childhood. *Journal of the American Medical Association, 282*, 1359-1364.

to having a higher number of health risk factors for leading causes of death in adults¹⁴³ and a higher rate of mortality in women.¹⁴⁴

One significant possible consequence of victimization is PTSD. At baseline, among clients who reported any crime or interpersonal victimization, about 31% of clients had PTSD scores that indicated risk of PTSD in the 6 months before the birth of the baby. About 1 in 10 individuals with exposure to traumatic events developed PTSD at some point, with the highest risk of PTSD associated with assaultive violence (20.9%).¹⁴⁵ Individuals with PTSD have a high rate of alcohol/drug abuse or dependence in their lifetime^{146, 147} and the overall prevalence of PTSD is high among individuals with substance use disorders.^{148, 149}

Intimate partner violence

At baseline, one-quarter of clients reported any form of intimate partner violence in the 6 months before they found out they were pregnant. At follow-up, 12.8% of KY-Moms MATR clients reported experiencing intimate partner violence in the 30 days before their baby was born and 11.1% reported experiencing intimate partner violence in the past 6 months which suggests that the intimate partner violence is an ongoing concern through the pregnancy and after the baby is born. Partner violence and trauma can contribute to mental health symptoms and can interfere with the parenting relationship.¹⁵⁰ Infants can experience symptoms of trauma (eating problems, sleep disturbances, emotional developmental problems, poor health and irritability) as a result of witnessing or hearing intimate partner violence.¹⁵¹ Thus, support and resources for trauma and partner violence is an issue that should be targeted during the pregnancy and postnatal period.

Financial Issues

With 60.2% of KY-Moms MATR women reporting being currently unemployed and about 38% of women reporting difficulty meeting basic needs because of financial reasons at follow-up, economic hardship is a continuing problem for many of these new mothers. As mentioned previously, financial stress has been linked to the risk for developing postpartum depression (and vice versa). Research suggests that financial stress has an adverse effect on parents' emotions and

¹⁴³ Felitti, V., Anda, R., Nordenberg, D., Williamson, D., Spitz, A., Edwards, V., & Marks, J. (1998). The relationship of adult health status to childhood abuse & household dysfunction. *American Journal of Preventative Medicine*, 14(4), 245-258.

¹⁴⁴ Chen, E., Turiano, N., Mroczek, D., & Miller, G. (2016). Association of reports of childhood abuse and all-cause mortality rates in women. *Journal of the American Medical Association*, 73(9), 920-927.

¹⁴⁵ Breslau, N., Kessler, R., Chilcoat, H., Schultz, L., Davis, G., & Andreski, P. (1998). Trauma and posttraumatic stress disorder in the community. The 1996 Detroit Area Survey of Trauma. *Archives of General Psychiatry*, 55(7), 626-632.

¹⁴⁶ Kessler, R., Sonnega, A., Bromet, E., Hughes, M., & Nelson, C. (1995). Posttraumatic stress disorder in the National Comorbidity Survey. *Archives of General Psychiatry*, 52, 1048-1060.

¹⁴⁷ Regier, D., Farmer, M., Rae, D., Locke, B., Keith, S., & Judd, L. (1990). Comorbidity of mental disorders with alcohol and other drug abuse: Results from the Epidemiologic Catchment Area (ECA) Study. *Journal of the American Medical Association*, 264, 2511-2518.

¹⁴⁸ Cottler, L., Compton, W., Mager, D., Spitznagel, E., & Janca, A. (1992). Posttraumatic stress disorder among substance users from the general population. *American Journal of Psychiatry*, 149, 664-670.

¹⁴⁹ Najavits, L., Runkel, R., Neuner, C., Frank, A., Thase, M., Crits-Christoph, P., & Blaine, J. (2003). Rates and symptoms of PTSD among cocaine-dependent patients. *Journal of Studies on Alcohol*, 64, 601-606.

¹⁵⁰ Dubowitz, H., Black, M. M., Kerr, M. A., Hussey, J. M., Morrel, T. M., Everson, M. D., & Starr, R. H. (2001). Type and timing of mothers' victimization: Effects on mothers and children. *Pediatrics*, 107, 728-735.

¹⁵¹ Bogat, G. A., DeJonghe, E., Levendosky, A. A., Davidson, W. S., & von Eye, A. (2006). Trauma symptoms among infants exposed to intimate partner violence. *Child Abuse & Neglect*, 30(2), 109-125.

behaviors which, in turn, may impact their parenting.¹⁵² In addition, children born to parents with limited economic resources have less to invest in the development of the child because they must invest a larger proportion of their resources into basic living needs (e.g., food, shelter, utilities, medical needs).¹⁵³ Therefore, providing referrals and support to help new mothers with financial difficulties may improve basic living situations for many mothers and promote continued long-term positive results for both mother and infant.

Chronic Pain

Though the number of women reporting chronic pain decreased at postnatal follow-up, 16.2% of women still reported experiencing chronic pain, which is a higher percentage compared to previous years. Individuals with persistent or chronic pain are more likely to report anxiety, depression, lower overall health ratings¹⁵⁴ and substance use disorders.¹⁵⁵ Self-medication can be problematic, especially in substance abuse treatment program participants who report chronic pain.¹⁵⁶

Trend Report Summary

Trend reports provided throughout this report reflect the importance of annual data collection. These data trends over time can show consistency, improvement, or highlight an area which may need further attention in the KY-Moms MATR program. Clients reporting their current health rating has remained fairly consistent at both intake and follow-up over the past 5 years. The number of clients who have reported chronic pain in the 6 months before pregnancy also remained constant at baseline. In addition, the average number of poor physical health days in the past 30 days clients have reported were consistent at both baseline and follow-up over the past 5 years. Further, clients' ranking of their quality of life were relatively consistent through the years for both baseline and follow-up. Trend analysis also shows that KY-Moms MATR clients have been consistently and highly satisfied with their experiences in the program, with clients consistently ranking their experience with the program as an average of 9.1 or higher over the past 6 years.

Trend analysis of substance use shows a steady increase in clients reporting past-6-month illegal drug use at prenatal baseline. While the number of clients reporting illegal drug use decreased for each year at follow-up compared to baseline, over the years the number of clients reporting illegal drug use at follow-up has increased slightly. In addition, a five-year trend analysis shows that rates of depression and/or anxiety had remained steady at prenatal baseline but increased this report year. Rates of depression and/or anxiety at follow-up have fluctuated at postnatal follow-up; however, this year appears stable when compared to 2018. Further, with trend analysis, findings show that the number of clients who have reported any partner abuse at prenatal baseline has been fairly consistent over the past 4 years with a slight decrease this year.

¹⁵² Kiernan, K. E., & Huerta, M. C. (2008). Economic deprivation, maternal depression, parenting and children's cognitive and emotional development in early childhood1. *The British Journal of Sociology*, 59(4), 783-806.

¹⁵³ Conger, R. D., & Conger, K. J. (2008). Understanding the processes through which economic hardship influences families and children. *Handbook of Families and Poverty*, 64-81.

¹⁵⁴ Gureje, O., Von Korff, M., Simon, G., & Gater, R. (1998). Persistent pain and well-being: A World Health Organization study in primary care. *JAMA*, 280(2), 147-151

¹⁵⁵ Ballantyne, J. & LaForge, S. (2007). Opioid dependence and addiction during opioid treatment of chronic pain. *Pain*, 129(3), 235-255.

¹⁵⁶ Rosenblum, A., Joseph, H., Fong, C., Kipnis, S., Cleland, C., Portenoy, R. (2003). Prevalence and characteristics of chronic pain among chemically dependent patients in methadone maintenance and residential treatment facilities. *JAMA*, 289(18), 2370-2378.

Trend analysis has also shown areas where the gap between prenatal baseline and postnatal baseline is narrowing. The percent of clients reporting difficulty meeting basic household needs increased at follow-up in 2018 compared to past years, but decreased in 2019. In addition, for the number of clients who reported being currently unemployed, the difference between prenatal baseline and postnatal follow-up has decreased. In terms of the average number of days clients reported poor mental health days, the difference in the number of days reported at baseline and at follow-up narrowed considerably in 2018, but widened again this year to be comparable to previous years. Finally, the difference between baseline and follow-up on the average number of people clients can count on for emotional support has narrowed over the past five years with this year not being significantly different at all.

Limitations

There are several limitations to this outcome study including the lack of random assignment to the KY-Moms MATR program. Although it would be ethically and procedurally difficult to conduct a random assignment of pregnant women at risk for substance use to participate in a program such as KY-Moms MATR, random assignment could provide more confidence that the birth outcomes of these mothers are directly due to interventions provided by KY-Moms MATR. Also, this study has no control group with which to compare KY-Moms MATR clients. While the matched comparison group matches mothers on several key factors (age, race, education, marital status, community residence, and smoking status), there is no information on drug use, mental health problems or intimate partner violence for the comparison group. However, given the small number of cases that had negative birth outcomes against significant odds (i.e., multiple risk factors), it is reasonable to assume that the services provided by KY-Moms MATR play an important role in the health and safety of these mothers and their children. Further, in order to better understand the results of the KY-Moms MATR program, the analysis was conducted in several ways. As presented in this report, a multivariate analysis of birth outcomes was conducted to control for several key factors that may be associated with birth outcomes. Additionally, a group of mothers matched on selected factors¹⁵⁷ along with a randomly selected comparison group from the general population were compared to the KY-Moms MATR case management group on birth outcomes (see Appendix B). Results were similar to findings of the multivariate analysis on birth outcomes. Specifically, compared to the general population, babies born to mothers in KY-Moms MATR had a similar average number of gestational weeks, highest APGAR score, birth weight, and prenatal visits. In addition, like the multivariate regression analysis, the matched comparison analysis showed that KY-Moms MATR mothers were similar to the general population and comparison in terms of birthing problems.

Second, most of the data for this report is self-reported by KY-Moms MATR clients. Recent research has supported findings about the reliability and accuracy of individuals' reports of

¹⁵⁷ Mothers were matched on age, education, metropolitan/non-metropolitan residence, marital status and smoking status.

their substance use.^{158, 159, 160, 161} Skepticism about the validity of self-report data has prompted investigations of the concordance of self-report data on sensitive issues such as substance use with more objective measures, such as urinalysis or blood serum analysis of drugs and alcohol. In most of these studies the concordance or agreement is acceptable or high.^{162, 163, 164, 165} In several studies, when there were discrepant results, the majority were self-reported substance use that was not detected with urinalysis or blood serum analysis.^{166, 167, 168} Underreporting of substance use occurs less in certain conditions, such as, when assurances of confidentiality can be made and when positive results are not associated with negative consequences.¹⁶⁹ During the informed consent process at the beginning of the KY-Moms MATR follow-up survey, interviewers tell participants that the research team operates independently from the KY-Moms MATR program and individuals' responses will be reported in group format and will not be identifiable at the individual level. These assurances of confidentiality and lack of affiliation with the program staff may minimize individuals' concern about reporting stigmatizing behavior or conditions. In addition, studies of pregnant women and substance use indicate that self-report is as good as urine tests in identifying illegal drug use.^{170, 171}

Third, clients are self-selected and voluntarily agree to participate in KY-Moms MATR case management rather than being randomly or mandated to participate. While these women report high risk factors such as substance use, mental health and interpersonal violence victimization, there is likely a segment of the pregnant population who are heavier drug users, have more

¹⁵⁸ Del Boca, F.K., & Noll, J.A. (2000). Truth or consequences: The validity of self-report data in health services research on addictions. *Addiction, 95*, 347-360.

¹⁵⁹ Harrison, L. D., Martin, S. S., Enev, T., & Harrington, D. (2007). *Comparing drug testing and self-report of drug use among youths and young adults in the general population (DHHS Publication No. SMA 07-4249, Methodology Series M-7)*. Rockville, MD: Substance abuse and Mental Health Services Administration, Office of Applied Studies.

¹⁶⁰ Rutherford, M.J., Cacciola, J.S., Alterman, A.I., McKay, J.R., & Cook, T.G. (2000). Contrasts between admitters and deniers of drug use. *Journal of Substance Abuse Treatment, 18*, 343-348.

¹⁶¹ Shannon, E.E., Mathias, C.W., Marsh, D.M., Dougherty, D.M., & Liguori, A. (2007). Teenagers do not always lie: Characteristics and correspondence of telephone and in-person reports of adolescent drug use. *Drug and Alcohol Dependence, 8* (90), 288-291.

¹⁶² Buchan, B. J., Dennis, M. L., Tims, F. M., & Diamond, G. S. (2002). Cannabis use: Consistency and validity of self-report, on-site urine testing and laboratory testing. *Addiction, 97* (Suppl. 1), 98-108.

¹⁶³ Denis, C., Fatséas, M., Beltran, V., Bonnet, C., Picard, S., Combourieu, I., Daulouède, J., & Auriacombe, M. (2012). Validity of the self-reported drug use section of the Addiction Severity and associated factors used under naturalistic conditions. *Substance Use & Misuse, 47*, 356-363.

¹⁶⁴ Rowe, C., Vittinghoff, E., Colfax, G., Coffin, P. O., & Santos, G. M. (2018). Correlates of validity of self-reported methamphetamine use among a sample of dependent adults. *Substance Use & Misuse, 53* (10), 1742-1755.

¹⁶⁵ Rygaard Hjorthoj, C., Rygaard Hjorthoj, A., & Nordentoft, M. (2012). Validity of Timeline Follow-Back for self-reported use of cannabis and other illicit substances—Systematic review and meta-analysis. *Addictive Behaviors, 37*, 225-233.

¹⁶⁶ Babor, T. F., Steinberg, K., Anton, R., & Del Boca, F. (2000). Talk is cheap: Measuring drinking outcomes in clinical trials. *Journal of Studies on Alcohol, 61*, 53-63.

¹⁶⁷ Hilario, E. Y., Griffin, M. L., McHugh, R. K., McDermott, K. A., Connery, H. S., Fitzmaurice, G. M., & Weiss, R. D. (2015). Denial of urinalysis-confirmed opioid use in prescription opioid dependence. *Journal of Substance Abuse Treatment, 48*, 85-90.

¹⁶⁸ Weiss, R. D., Najavits, L. M., Greenfield, S. F., Soto, J. A., Shaw, S. R., & Wyner, D. (1998). Validity of substance use self-reports in dually diagnosed outpatients. *American Journal of Psychiatry, 155*(1), 127-128.

¹⁶⁹ Hilario, E. Y., Griffin, M. L., McHugh, R. K., McDermott, K. A., Connery, H. S., Fitzmaurice, G. M., & Weiss, R. D. (2015). Denial of urinalysis-confirmed opioid use in prescription opioid dependence. *Journal of Substance Abuse Treatment, 48*, 85-90.

¹⁷⁰ Christmas, J., Nislely, J., Dawson, K., Dinsmoor, M., Weber, S., Schnoll, S. (1992). Comparison of questionnaire screening and urine toxicology for detection of pregnancy complicated by substance use. *Obstetrics & Gynecology, 80*, 750-754.

¹⁷¹ Yonkers, K. A., Howell, H. B., Gotman, N., & Rounsaville, B. J. (2011). Self-report of illicit substance use versus urine toxicology results from at-risk pregnant women. *Journal of Substance Use, 16*(5), 372-380.

severe mental health problems, or are at an even greater risk for safety compared to the women who voluntarily enter KY-Moms MATR. Women with more severe use may be more hesitant to seek or accept treatment because they either do not accept they have a problem, fear having the child removed from their custody, or fear being prosecuted.¹⁷² On the other hand, the fact that this program is voluntary, but recruits and retains high risk women, is a strength of the program. High-risk pregnant mothers in other state-funded substance abuse programs in Kentucky are referred by the courts or the child protective service agency, the Department for Community Based Services. Recruiting and retaining clients who have no external motivating factor poses challenges to service providers who must rely on their interpersonal skills to engage clients in services.

Conclusion

This study provides support of the efforts by the Kentucky Division of Behavioral Health to address the rising statewide and national problem of drug-exposed pregnancies given the positive changes in the clients' substance-using behavior once interventions were initiated. Overall, pregnant women participating in KY-Moms MATR services significantly improved on all three targeted areas of behavioral health and had birth outcomes similar to the general population of mothers. Further, clients were overwhelmingly positive about the program. They indicated they would refer their friends or others to the program and felt like what they gained from the program helped them have a healthier pregnancy, improved their birth outcomes, and provided valuable information about the risk of substance use during pregnancy.

One of the most important policy questions implicit in this study is about the months and early years of the child's life after the mother has given birth. Those mothers who persist in or return to drug-using lifestyles are at great risk for child neglect and other forms of child maltreatment,^{173, 174} as well as for setting the stage for their children to use and misuse alcohol and illegal drug as adolescents and adults.^{175, 176} Thus, reducing risk during the early development of the child is in large part contingent on continued services and engagement with recovery and parenting supports. As Kentucky continues to work toward more integrated service provisions under the umbrella of behavioral health, the utilization of all possible resources will be important both for these mothers and their newborns. The KY-Moms MATR program plays a critical role toward this end.

¹⁷² Tuchman, E. (2010). Women and addiction: The importance of gender issues in substance abuse research. *Journal of Addictive Diseases, 29*(2), 127-138.

¹⁷³ McKeganey, N., Barnard, M. & McIntosh, J. (2002) Paying the price for their parent's addiction: meeting the needs of the children of drug using parents. *Drugs: Education, Prevention and Policy, 9*, 233-246.

¹⁷⁴ Barnard, M., & McKeganey, N. (2004). The impact of parental problem drug use on children: what is the problem and what can be done to help? *Addiction, 99*(5), 552-559.

¹⁷⁵ Ireland, T. O., Smith, C. A., & Thornberry, T. P. (2002). Developmental issues in the impact of child maltreatment on later delinquency and drug use. *Criminology, 40*(2), 359-400.

¹⁷⁶ Biederman, J., Faraone, S. V., Monuteaux, M. C., & Feighner, J. A. (2000). Patterns of alcohol and drug use in adolescents can be predicted by parental substance use disorders. *Pediatrics, 106*(4), 792-797.

Appendix A: Methods

This evaluation project collects data from pregnant women in Kentucky who are at high risk for substance abuse and participate in KY-Moms MATR case management services. Eleven community mental health centers participate in the program and collect baseline data on each client entering the KY-Moms MATR case management services program. Data analysis has three main phases: (1) change in behavior and risks over time, using the prenatal baseline information and the postnatal follow-up interviews among clients who gave birth, (2) comparisons of KY-Moms MATR clients and general population birth outcome information from the Vital Statistics birth outcome data set, and (3) comparison of KY-Moms MATR clients matched to mothers in the general population who did not receive KY-Moms MATR case management services based upon age, race, education, marital status, smoking status and metropolitan/non-metropolitan residence.

Baseline Assessment

The baseline assessment is an electronic, evidence-based interview developed by the University of Kentucky Center on Drug and Alcohol Research (UK CDAR) in collaboration with KY-Moms MATR program administrators. Baseline information is collected during face-to-face client interviews with case managers when the client enters the program and interview responses are electronically submitted to UK CDAR. At the end of the baseline interview, clients are told about the opportunity to participate in a follow-up telephone interview that is conducted independently from the program by the UK CDAR Behavioral Health Outcome Studies (BHOS) staff approximately 6 months after the birth of their baby. Clients who volunteer to participate in the follow-up interview provide locator information including phone numbers of two relatives or friends who could help UK CDAR locate the client for the postnatal follow-up interview. Overall, a total of 177 baselines were completed between May 2016 and December 2017 with women who had due dates that would result in target months for a follow-up interview between July 2017 and June 2018. Overall, women completed a KY-Moms MATR case management baseline when they were an average of 23 weeks pregnant (minimum = 7 weeks, maximum = 40 weeks).¹⁷⁷

Method of Determining Follow-up Sample

Follow-up Assessment. KY-Moms MATR clients are eligible for the follow-up assessment if: (1) the client consents to be contacted by UK CDAR BHOS staff, (2) the prenatal baseline is submitted to UK CDAR within 30 days of completion, (3) the client plans on keeping the baby, (4) the client is in the program at least 30 days before the birth of the baby, and (5) adequate contact information is provided for follow-up staff to use to attempt to locate and contact them for the follow-up interview. These individuals are then included in the sample of women to be followed up. The target month for a follow-up assessment is computed by adding 6 months (180 days) to the self-reported due date the client provides at prenatal baseline. In reality, there was an average of 5.7 months between the time the baby was born and the date of the follow-up assessment (with a mode of 5 months).

Follow-up interviews are conducted on the telephone by the UK CDAR BHOS research team and are independent of KY-Moms MATR case management services in order to confidentially examine changes in clients' behavior and risks. In addition, UK CDAR BHOS obtained a Federal Certificate of

¹⁷⁷ The average number of days between when the client was admitted to the KY-Moms MATR program and when the baseline was completed was 20.2 days with a minimum of 0 days and a maximum of 160 days. One case was not included in the average days because the intake date was entered as being after the submit date.

Confidentiality from the National Institute of Health which states that BHOS researchers cannot be forced to disclose any information which may identify the client, even by court subpoena, in any federal, state, or local civil, criminal administrative, legislative, or other proceedings.¹⁷⁸ The follow-up interviews examine program satisfaction, current substance use, intimate partner violence, physical and mental health status, employment, and recovery supports.

The UK CDAR BHOS team begins their efforts to locate and conduct follow-up interviews with women pulled into the follow-up sample one month before the target month for their follow-up interview and continue their efforts until the women have completed the follow-up interview or for two months after the target month, whichever comes first. For example, if a woman has a targeted follow-up interview in August, the research team will begin their attempts to locate and contact her in July (i.e., one month before the targeted month for her follow-up interview). If the team is unable to locate this woman they will continue their efforts until the end of October (i.e., two months after her target month for the follow-up interview).

When the follow-up team contacts women, they must determine additional eligibility criteria before completing the follow-up interview: (1) women who have not given birth to their babies or who do not have the baby living with them are not eligible for the follow-up interview, and (2) women who are living in a controlled environment (e.g., jail, prison, residential treatment) are not eligible for completing the follow-up interview. As mentioned previously, 177 baselines were completed between May 2016 and December 2017 and had a targeted month for follow-up in FY 2018 (July 2017 – June 2018). Of these clients who were in the targeted window to complete a postnatal follow-up, 20 clients were ineligible for follow-up staff to begin locating as a result of prenatal baseline data (4 clients were in the program less than 30 days, 8 clients had their baseline assessment submitted more than 30 days after it was completed, 1 client indicated at prenatal baseline that they may not keep their baby, and 7 clients had invalid contact data; see Table AA.1).

In addition, 13 were not eligible because they were in jail or another controlled environment (n = 1), because their baby was not living with them (n = 8), the client passed away (n = 1), and the baby passed way (n = 3).

Of the remaining eligible clients (n = 144), 26 clients (18.1%) had a final follow-up status of expired because interviewers were not able to complete a follow-up survey with them during the follow-up period. Overall, UK CDAR staff completed follow-up interviews with 118 clients, representing a follow-up rate of 81.9%.

¹⁷⁸ The exception to this is if harm to the client, harm to others, or child abuse is disclosed to the researchers.

TABLE AA.1. FOLLOW-UP SAMPLE AND EFFORTS

	Number of baselines (n = 177)
Did not consent to follow-up	0
	n = 177
Not eligible for follow-up	33
Other reasons based upon prenatal baseline (i.e., invalid locator data, client was not sure if she was keeping the baby, client not in program long enough, baseline submission more than 30 days after completion).....	20
In jail or controlled environment (i.e, residential treatment).....	1
Baby not living with client.....	8
Client was deceased.....	1
Baby was deceased	3
Total number of baseline surveys eligible for follow-up	144
Expired cases (i.e., never contacted, did not complete the survey during the follow-up period).....	26
Expired rate ((the number of expired cases/eligible cases)*100).....	18.1%
Refused	0
Refusal rate ((the number of refusal cases/eligible cases)*100).....	0.0%
Completed follow-up interviews.....	118
Follow-up rate	81.9%

Obtaining the Birth Event Data. The Vital Statistics birth data is used to compare mothers in KY-Moms MATR case management and their babies to mothers who had babies during the same period but who did not participate in KY-Moms MATR Case Management. Before any analysis of the Vital Statistics birth data is conducted, a series of steps is performed to ensure data quality and integrity. Each step is described in the following paragraphs.

Kentucky Vital Statistics automatically moves each year of updated birth index text files to UK CDAR using the CHFS MoveIT Central FTP process. The data is then opened in Microsoft Access to create variables based upon a file layout codebook provided by Kentucky Vital Statistics. From Access, the data are transferred into SPSS and given variable names, values, and labels corresponding to the codebook. Births occurring within the time frame of the annual report are then saved to a separate file where they are cleaned.

As a first step in merging Vital Statistics data with KY-Moms MATR baseline data, birth event data for babies during the same time period as KY-Moms MATR clients were combined (December 2016-December 2017); thus, 52,560 cases (January 2017-December 2017) were combined with 4,292 cases (December 2016) for an initial sample of 56,852. Next, KY-Moms MATR clients in the birth event data set were identified based upon social security number. Three cases were then removed because they matched KY-Moms MATR clients who either did not give permission for their birth data to be used, or the response for consent to use their birth data was missing. In addition, 51 cases were removed from the whole birth event data set because they matched mothers involved in KY-Moms MATR but who were not involved in the current follow-up sample

analysis and, therefore, should not be included in the general population of mothers. Also, 23 cases were removed because they matched individuals in last year's outcome report.

The next step to preparing the data was that all cases in which the mother was not a Kentucky resident were eliminated (n=2,025) which was 3.6% of the birth data sample and left a sample of 54,750 cases in Kentucky.

Follow-up Sample. In order to be included in the analysis of this report, there were other criteria clients needed to meet before being included in the report and therefore:

- Because only clients who had data in the birth event data set were included in the analysis, 4 clients were not included in the follow-up analysis.^{179, 180} This left a follow-up sample of 114 KY-Moms MATR mothers for the birth event analysis.

Analysis. Once the data set was cleaned and internally certified according to UK CDAR BHOS quality standards, data analysis began. This included using the statistical software SPSS to complete Chi-square tests of independence, one-way ANOVAS, and McNemar tests. The statistical results were then placed in tables for review by the research team.

Birth Data Sample. As described in the section regarding obtaining the birth event data, based upon the range of dates that the KY-Moms MATR clients gave birth, which were from December 2016 to December 2017, the final sample for the general population of mothers is 53,641 mothers and 54,633 babies who were not involved in KY-Moms MATR (114 mothers and 117 babies were involved in the KY-Moms MATR program).

The KY-Moms MATR Case Management study focuses on two units of analysis depending on the outcome being examined: (1) some outcomes use the mother as the unit of analysis and in those cases the mother will be represented only one time in the data set to avoid violating the assumption of independence; and (2) some outcomes use the birth and baby characteristics as the unit of analysis and those outcomes can include all of the babies in the Vital Statistics data set.

While the Vital Statistics data set has a variable which identified those mothers who had multiple births at one birth event (e.g., twins, triplets or quadruplets), it does not capture mothers who may have had two pregnancies and deliveries within the period analyzed (i.e., December 2016 – December 2017). In addition, the Vital Statistics data set counts each child as a multiple. For example, Child A will have a value indicating he or she is a twin and Child B will also have a value indicating he or she is a twin. When the unit of analysis is the baby (or births), all children should be included in the analysis. When the unit of analysis is the mother, only one child (the one with the first child identification number) will be included in the analysis to avoid violating the assumption of independence of cases. Thus, a variable is created in the data set which identifies whether the baby is a twin, triplet or quadruplet, or if there is a sibling in the file that was born in the approximate 12 months that were analyzed for this report.

Table AA.2 displays the number of children born at the same birth event as well as the number of children with a sibling in the data set. For the entire data set (54,750 babies) there were 1,730 twins, 27 triplets, and 5 quintuplets (totaling 1,762 multiple births, or 3.2% of the sample) and 103 children that had siblings born during the time frame but the child was not a twin or triplet. Thus,

¹⁷⁹ This could be due to an incorrect social security number, name or birthdate, or the client could have given birth out of state.

¹⁸⁰ Out of the 118 follow-ups, 2 clients did not give permission to use their birth data, one client had a missing response, and one client could not be matched to the Vital Statistics data set.

when analyzing outcomes of the birth and baby characteristics the total sample size is 54,750 in order to include all babies.

TABLE AA.2. MULTIPLE BIRTH EVENTS AT ONE BIRTH EVENT OR SIBLINGS BORN AT SEPARATE BIRTH EVENTS BETWEEN DECEMBER 2016 AND DECEMBER 2017

Out of a total of 54,750 babies:	
Twins	1,730
Triplets	27
Quadruplets.....	0
Quintuplets.....	5
Total multiple births.....	1,762 or 3.2%
Siblings born in separate deliveries within the time frame	103

Note: Six of the babies in the KY-Moms MATR sample were multiples.

Using mothers' social security numbers and children's dates of birth, mothers with multiple and multiparous births were identified as shown in Table AB.3. This shows there were 53,755 mothers total and 995 events with the same mother that were excluded from the analysis. The mother data that remained for analysis was based upon the first child identification number (as determined by the birth data set), or in the case of multiparous births, the child with the earlier birth date. A total of 865 mothers had twins, 9 had triplets, one had quintuplets, and 103 had children in separate deliveries but within the selected time frame. When analyzing characteristics of the mother the sample size will be 53,775 so that these mothers are not counted more than once.

TABLE AA.3. MOTHERS WITH MORE THAN ONE BABY IN THE BIRTH DATA SET BETWEEN DECEMBER 2016 AND DECEMBER 2017

Out of a total of 53,755 mothers:	
Mothers who had twins	865
Mothers who had triplets	9
Mothers who had quadruplets	0
Mothers who had quintuplets	1
Total mothers with multiple births	875
Mothers with two separate single deliveries within the selected timeframe (siblings).....	103
Total mothers with more than one child in the data set.....	978 or 1.8%

Analysis. Using the statistical software IBM SPSS, analysis included Chi-square tests and one-way ANOVAS comparing clients that were in KY-Moms MATR to the general population of mothers. Demographics, socio-economic indicators, physical health status, smoking, prenatal visits, and birth outcomes (i.e., average weeks gestation, prematurity, birth weight and birthing problems) were included in the analysis. All analyses were done using a $p < .01$ alpha level based on power analysis, including the multivariate analysis and the comparison group analysis. For example, with the comparison group analysis using a Chi-square test, to detect a moderate effect size (0.3) with 8 degrees of freedom (3 groups X 3 category levels) on an overall sample size of 798, the alpha would be set at .00000001 when power is 0.95 using GPower to calculate the power analysis. Thus,

alpha was set at $< .01$ because having a larger alpha would increase the risk of a Type I error. And for the multivariate analysis the sample size was so large GPower could not calculate the required alpha due to extreme parameters. Even reducing the sample size by an order of magnitude to 3,400 would require an alpha of .00000001 to detect a small effect size of .15 with a power of .95 and 7 degrees of freedom. Thus, to control for Type I error alpha was set at .01.

Multivariate regression models were used to examine the association between KY-Moms MATR participation and birth outcomes while adjusting for key factors. Each birth outcome was entered as the dependent variable in a separate binary logistic regression model with KY-Moms MATR participation as the predictor variable and the covariates of mother's age, education (i.e., less than a high school diploma or GED vs. high school diploma or higher), area of residence (metropolitan vs. non-metropolitan county), and smoking at the time of the birth (No/Yes).

Matched Comparison Sample. In order to create a similar sample to which the KY-Moms MATR birth outcomes and service data can be compared, clients were matched to mothers in the general population who did not receive KY-Moms MATR case management services based upon age, race, education, marital status, smoking status and metropolitan/non-metropolitan residence.

To create these samples, a random number was assigned to the general population of mothers in Excel. Then, the KY-Moms MATR and general population mothers were placed in separate data files within Access. A query was created from the KY-Moms MATR file which contained the fields upon which we wanted to base the comparison group. In addition, a count was created to determine how many clients had a certain set of characteristics that needed to be matched.

Next, a table was created in which the comparison characteristics in the above query were linked to the variables in the general population birth data set in order to create a table with only cases that had characteristics matching KY-Moms MATR clients. A structure only copy of this table was then created and the six fields being matched were set as the primary keys.

Another query was created which included the query from KY-Moms MATR with the data from the six fields we wanted to match and the birth data table with matching characteristics. The query and the table were linked on the six variables and appended to the table which had the six fields set to primary keys. This created the first sample in which one individual from the general birth data matched on the six characteristics to one case in the KY-Moms MATR birth event data.

Next, a table of birth event data with characteristics matching KY-Moms MATR was created, but without cases that were chosen for the first sample in order to pull cases for additional matches. Based upon the count that was created to determine how many clients from KY-Moms MATR possess each of the six characteristics, the next step was to pull the remaining number of cases from the birth data set that matched KY-Moms MATR.

If there were KY-Moms MATR clients that did not have a match to the birth event data set on all characteristics for comparison, the clients were excluded from the analysis because the remaining cases would not result in a complete matched comparison.

Once a matched comparison sample was generated, the remaining birth event data was sorted by the random number assigned and the top cases were chosen for the general population file based upon the sample size of the KY-Moms MATR client file. This resulted in a sample size of $n = 104$ mothers for each group. Because some mothers had multiple births, there were 107 babies in the KY-Moms MATR sample, 105 babies in the comparison group and 105 babies in the general population sample.

The three groups were analyzed using Chi-square tests and one-way ANOVAs with Tukey's HSD (honestly significant difference) test in order to determine which groups in the sample differ on birth characteristics and outcomes (see Appendix B).

Appendix B. KY-Moms MATR Birth Outcome Data Comparison

This section compares (A) general risk factors, (B) targeted risk factors, and (C) birth events and outcomes from the Kentucky Vital Statistics data for three mutually exclusive groups including: (1) high risk pregnant mothers involved in KY-Moms MATR case management services who gave birth between December 2016 and December 2017 ($n = 104$)¹⁸¹, (2) a comparison group of mothers ($n = 104$) matched on selected characteristics (race, age, education, metropolitan/non-metropolitan residence, marital status and smoking status), and (3) a randomly selected group of mothers ($n = 104$) from the general population. Only mothers who reside in regions served by KY-Moms MATR were analyzed.

There are two units of analysis depending on the outcome being examined: (1) some outcomes use the mother as the unit of analysis and in those cases the mother will only be represented one time in the data set (although the Vital Statistics data set can include the mother multiple times if she has had multiple births [e.g., twins or siblings] during the time frame examined); and (2) some outcomes use the birth and baby characteristics as the unit of analysis and those outcomes can include all of the babies in the Vital Statistics data set.

Three mothers in KY-Moms MATR, one mother from the comparison group, and one mother in the general population have more than one child in the sample. This means there were 107 babies in the KY-Moms MATR sample, 105 babies in the comparison group and 105 babies in the general population sample.

General Risk Factors

The general risk factors compared in this section are from the Kentucky Vital Statistics data set. This section describes demographic information (e.g., age, race, and type of community in which the mother resided), socioeconomic status indicators (e.g., education and source of payment for birth of the baby), and physical health status (e.g., maternal health problems).

Demographics

Table AB.1 shows that there are a few significant demographic differences between the KY-Moms MATR clients and matched comparison sample compared to the general population of mothers in the KY-Moms MATR regions. Significantly more women in KY-Moms MATR and the comparison group were white compared to the general population. There was no difference in metropolitan/nonmetropolitan status across the groups. A significantly greater percentage of clients in the general population (53.8%) were married compared to the KY-Moms MATR and comparison group (31.7%). In addition, mothers in the KY-Moms MATR and comparison group were significantly younger (25.2) compared to the general population (27.6)

¹⁸¹ While analysis on postnatal follow-up data includes 114 pregnant women involved in KY-Moms MATR, a match on all characteristics for 4 KY-Moms MATR clients could not be found in the sample of other mothers in the KY-Moms MATR regions. Thus, clients who did not have a matched comparison were excluded from the sample leaving a sample size of 104.

TABLE AB.1. DEMOGRAPHIC DIFFERENCES BETWEEN BIRTH EVENT DATA GROUPS

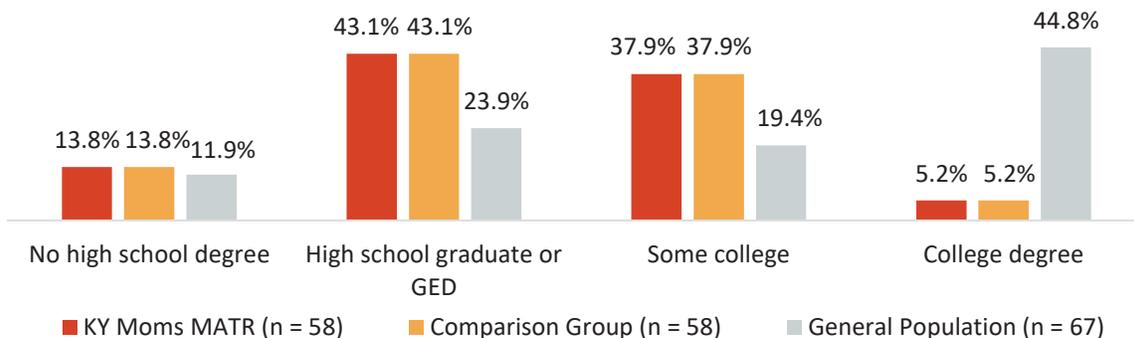
	KY-Moms MATR (n = 104)	Comparison Group (n = 104)	General Population (n = 104)
Race**			
White	93.3%	93.3%	78.8%
Minority.....	6.7%	6.7%	21.2%
Average age***	25.2	25.2	27.6
Metropolitan/ nonmetropolitan status			
Metropolitan.....	44.2%	44.2%	55.8%
Nonmetropolitan	30.8%	30.8%	33.7%
Very rural	25.0%	25.0%	10.6%
Marital status**			
Not married	68.3%	68.3%	46.2%
Married.....	31.7%	31.7%	53.8%

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

Socioeconomic Status Indicators

It is important to compare education rates only for those who had sufficient time to finish high school. The 2012-2016 census estimates that of Kentuckians ages 25 and older, 84.6% had high school degrees.¹⁸² When groups of women ages 25 and older are compared, 86.2% of KY-Moms MATR mothers and 88.1% of mothers in the general population have at least a high school diploma or GED (see Figure AB.1). Therefore, when looking at women 25 years old or older, 13.8% of KY-Moms MATR and the matched comparison group mothers and 11.9% of mothers in the general population had less than a high school degree. Further, 44.8% of mothers in the general population received a college degree compared to 5.2% of mothers in KY-Moms MATR and the matched comparison sample.

FIGURE AB.1. LEVEL OF EDUCATION BETWEEN BIRTH EVENT DATA GROUPS***

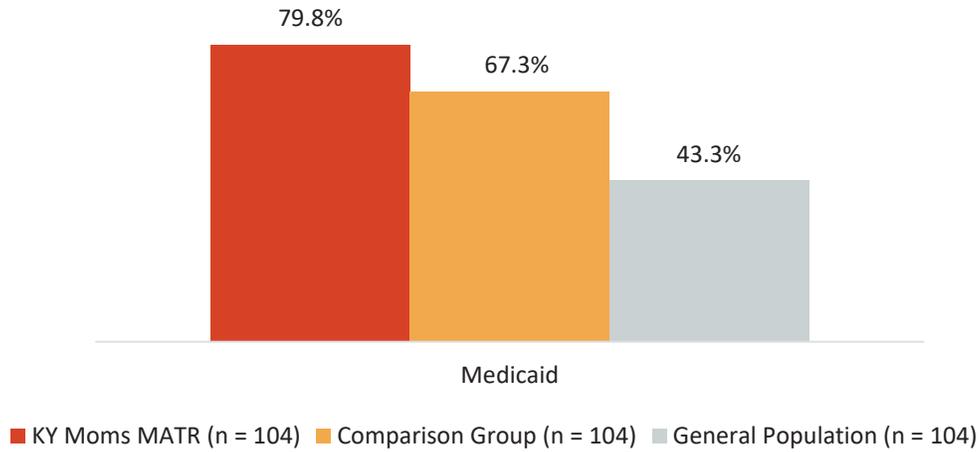


***p < .001

¹⁸² <https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF>

KY-Moms MATR women were more likely to use Medicaid as their source of payment for the birth of the baby compared to either the matched comparison sample or the general population as Figure AB.2 shows.

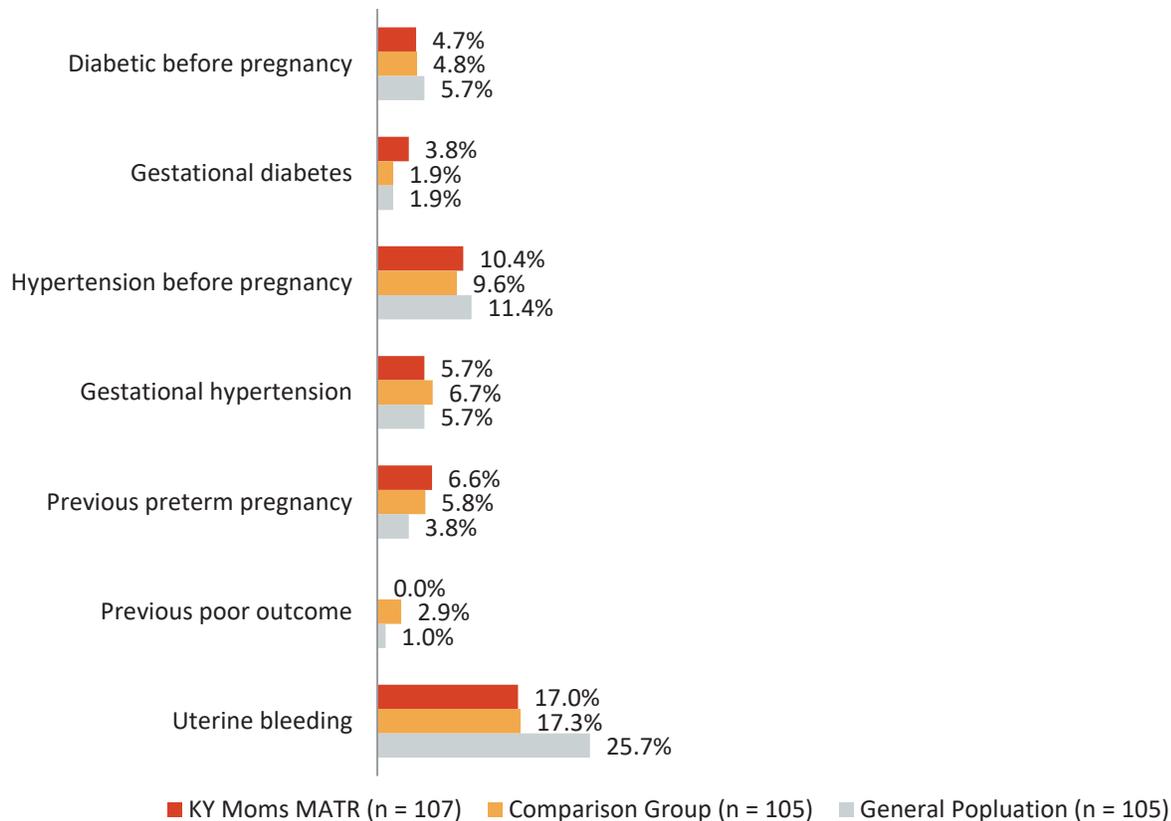
FIGURE AB.2. MOTHERS WITH MEDICAID AS THE SOURCE OF PAYMENT BETWEEN BIRTH DATA GROUPS***



***p < .001

Physical Health Status

General health conditions of pregnancy were examined from the Vital Statistics data set as well (see Figure AB.3). There were no significant differences between the groups on health conditions such as gestational diabetes, gestational hypertension or previous poor birth outcomes.

FIGURE AB.3. OTHER MATERNAL RISK FACTORS BETWEEN BIRTH DATA GROUPS^a

a- Maternal health risk factors were unknown for 1 mother in the KY-Moms MATR group and 1 mother in the comparison group.

KY-Moms MATR women were not significantly more likely to have a sexually transmitted infection such as gonorrhea, syphilis, herpes, or chlamydia (8.7%) compared to the matched comparison group (6.7%) or the general population sample (8.6%; not depicted in a figure).

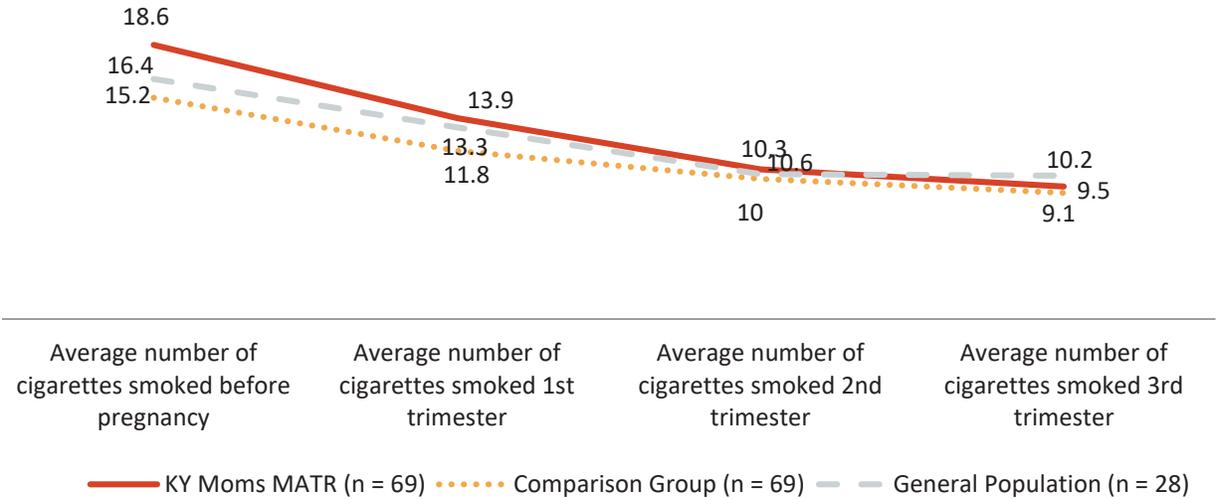
When only hepatitis B and C are examined, significantly more KY-Moms MATR mothers were infected (12.6%) compared to the matched comparison group (8.7%) and the general population sample (2.9%).

Targeted Risk Factors

Smoking Patterns

Significantly more KY-Moms MATR clients and the matched comparison mothers reported being a smoker (66.3%) compared to the general population (26.9%; not depicted in a figure). However, of those who smoked, KY-Moms MATR clients did not report smoking significantly more cigarettes in any trimester compared to mothers in the matched comparison sample or general population.

FIGURE AB.4. AVERAGE NUMBER OF CIGARETTES SMOKED PER TRIMESTER

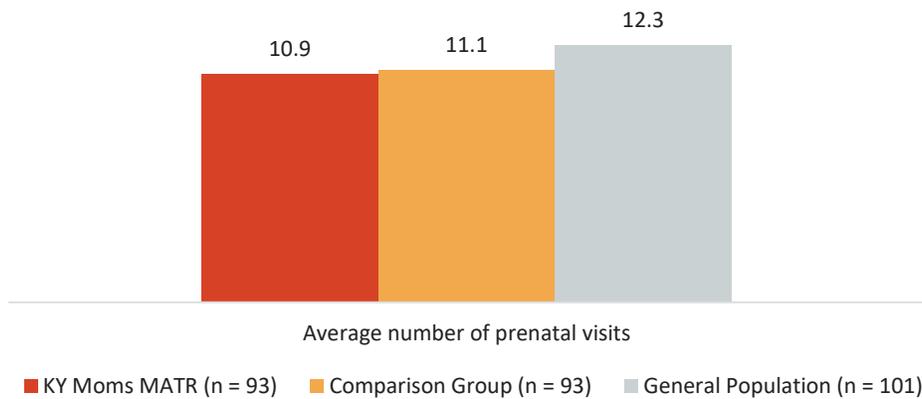


Birth Events and Outcomes

Prenatal Visits

Mothers in the KY-Moms MATR and comparison group had significantly fewer prenatal care visits compared to the general population of mothers (see Figure AB.5). KY-Moms MATR women had an average of 10.9 prenatal visits, the matched comparison group had an average of 11.1 prenatal visits, and the general population had an average of 12.3 prenatal visits.

FIGURE AB.5. AVERAGE NUMBER OF PRENATAL CARE VISITS WITH A HEALTH CARE PROVIDER ACROSS GROUPS^{a*}



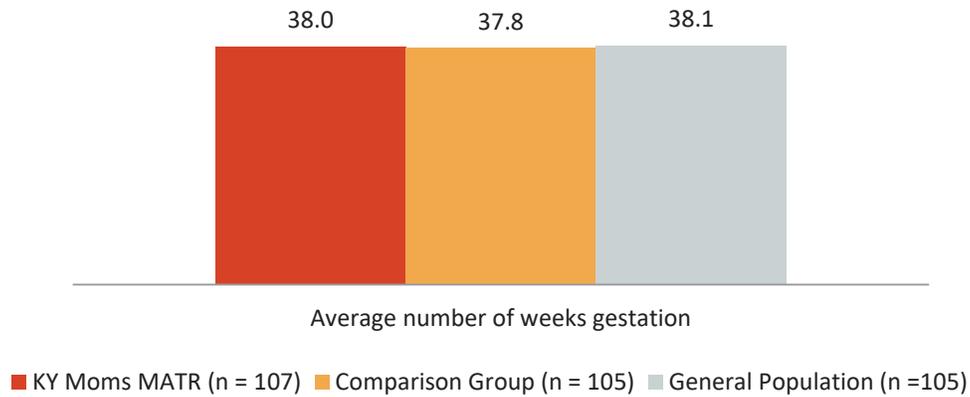
a- 11 KY-Moms MATR mothers, 11 mothers in the comparison group and 3 mothers in the general population were missing information on the number of prenatal visits.

*p < .05

Weeks Gestation

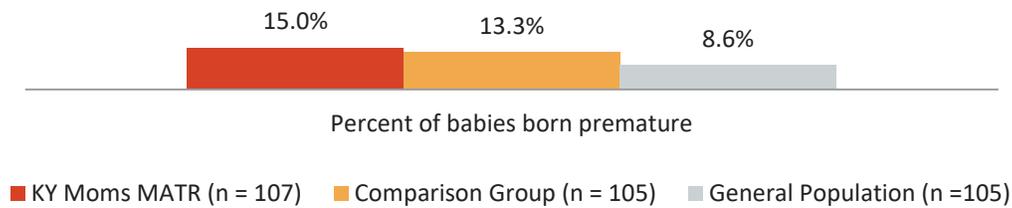
There were no differences between the three groups for average weeks of gestation as Figure AB.6 shows. KY-Moms MATR babies were born at an average of 38.0 weeks, babies born to mothers in the matched comparison group were 37.8 weeks, and babies born to mothers in the general population were born at 38.1 weeks.

FIGURE AB.6. AVERAGE NUMBER OF GESTATIONAL WEEKS ACROSS GROUPS



Similarly, comparing all three groups, there were no significant differences between the groups for the number of babies born prematurely (i.e., before 37 weeks gestation; see Figure AB.7).

FIGURE AB.7. BABIES BORN PREMATURELY ACROSS BIRTH DATA GROUPS

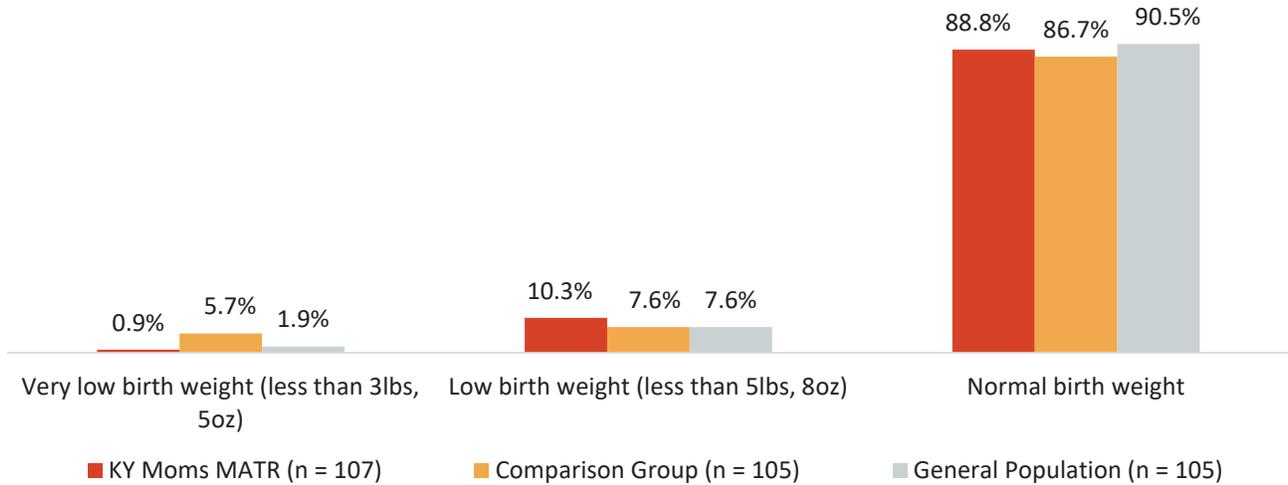


Birth Weight

There was no significant difference between the groups for average birth weight with babies born to KY-Moms MATR clients (average of 6lbs, 13oz), mothers in the comparison group (average of 6lbs, 12oz), and babies born to mothers in the general population (average of 7lbs, 0oz; not depicted in a figure).

As a result, there were no significant differences in rates of low birth weight babies between the three groups. Figure AB.8 shows that among KY-Moms MATR babies, 10.3% were considered low birth weight and 0.9% of babies were under 3lbs, 5oz, which is considered “very low birth weight” (therefore, a total of 11.2% of babies weighed less than 5lbs, 8oz). For the matched comparison group, 7.6% were considered low birth weight and 5.7% were very low birth weight (a total of 13.3% of babies weighed less than 5lbs, 8oz). Among babies born in the general population, 7.6% were considered low birth weight and 1.9% were considered “very low birth weight” (a total of 9.5% of babies weighed less than 5lbs, 8oz).

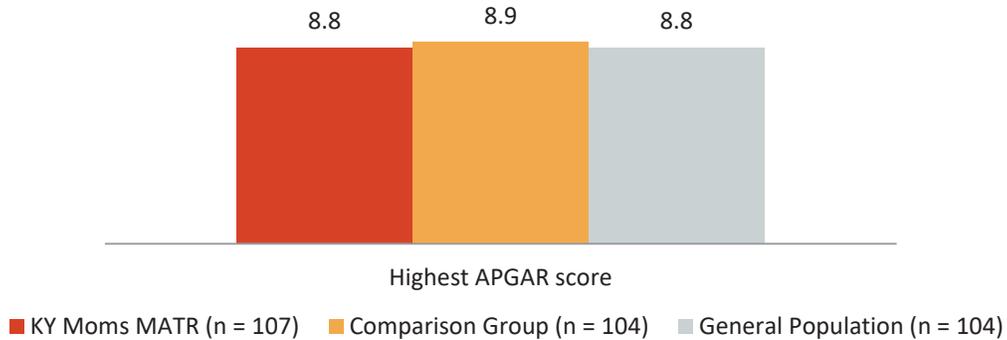
FIGURE AB.8. BIRTH WEIGHT STATUS ACROSS GROUPS



APGAR

The final APGAR scores recorded may be taken at either five minutes or ten minutes after the birth. The highest score of the 5-minute and 10-minute APGARs for each group is displayed in Figure AB.9 and shows no significant differences between the groups.

FIGURE AB.9. AVERAGE HIGHEST APGAR SCORES ACROSS GROUPS



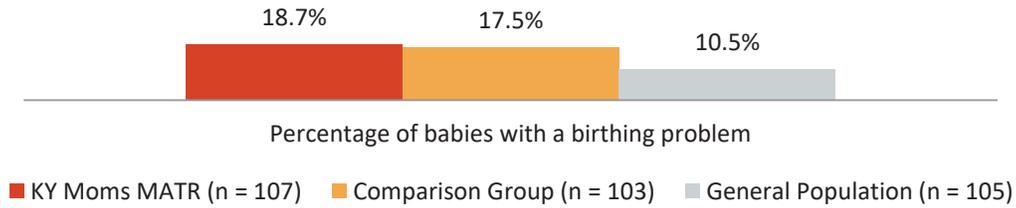
Birth Problems

There were no significant differences between the groups (one baby in KY-Moms MATR, and none in the comparison group or the general population sample) for birth defects or anomalies (such as Down’s syndrome, cleft palates, anencephaly, congenital heart failure, spina bifida, etc.).

There was not a significant difference in the percent of babies born with a birthing problem during labor and delivery as Figure AB.10 shows (not including being admitted to the neonatal intensive care unit). Almost 19% of babies born to KY-Moms MATR mothers were born with a birthing problem compared to 17.5% of babies in the matched comparison sample and 10.5% of babies born to the general population of mothers. Among those babies with birthing problems, there were also no differences in the average number of birthing problems between babies in the KY-Moms MATR group (an average of 1.4 problems) and the babies in the matched comparison

sample (an average of 1.5 problems) or the general population (an average of 1.2 problems).

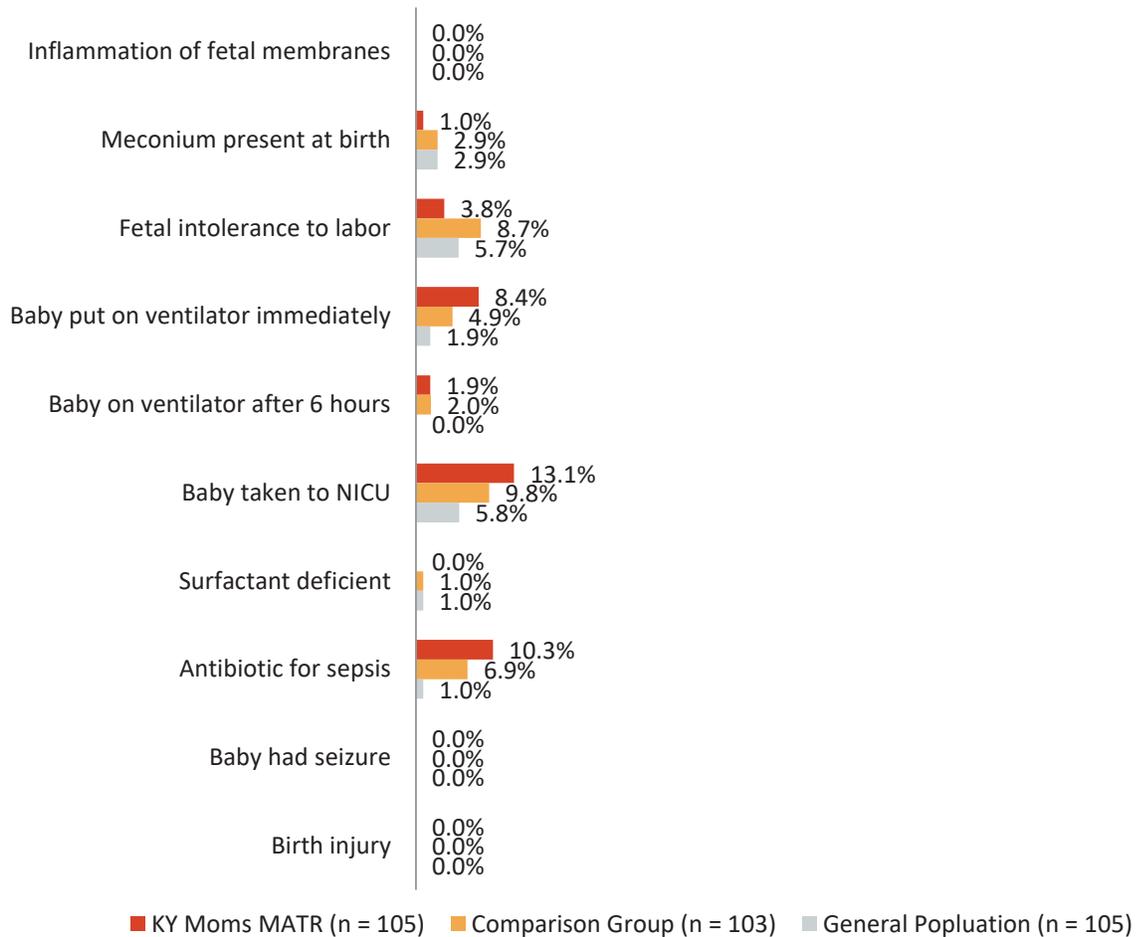
FIGURE AB.10. BABIES BORN WITH BIRTHING PROBLEMS (NOT INCLUDING NICU) ACROSS BIRTH DATA GROUPS^a



a- Two babies in the comparison group were missing information on birthing problems.

KY-Moms MATR babies were not significantly more likely to have particular birthing problems such as inflammation of fetal membranes, intolerance to labor, or being placed on a ventilator (see Figure AB.11).

FIGURE AB.11. BABIES WITH A BIRTHING PROBLEM ACROSS GROUPS^a

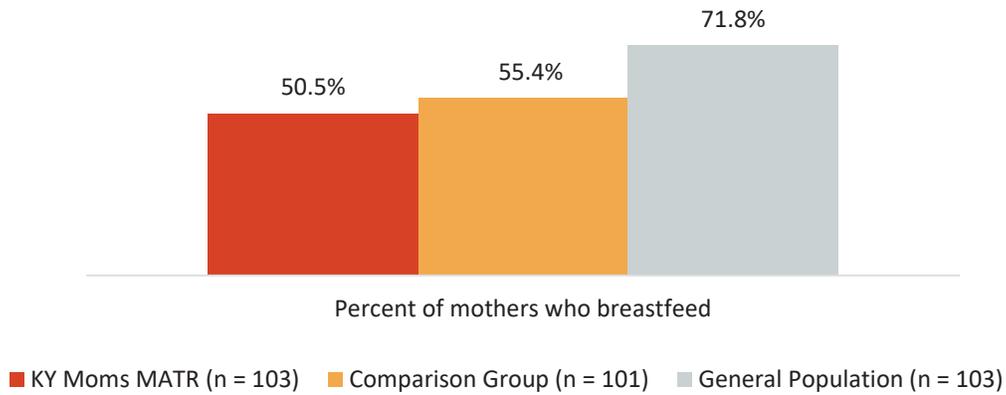


a- Two babies in the KY-Moms MATR group and two babies in the comparison group were missing information on birthing problems.

Compared to the general population, significantly fewer KY-Moms MATR mothers and mothers in the comparison group reported breastfeeding. Over half of KY-Moms MATR mothers (50.5%)

and mothers in the matched comparison group (55.4%) were breastfeeding compared to 71.8% of mothers in the general population (as shown in Figure AB.12).

FIGURE AB.12. PERCENT OF CLIENTS WHO BREASTFED**a



a- Breastfeeding information was missing for one mother in the KY-Moms MATR group, 3 in the matched comparison group, and one mother in the general population.
 **p< .01

Conclusion

In general, results of this analysis parallel the results of the multivariate analysis on birth events and outcomes. Compared to the general population of mothers, KY-Moms MATR clients and mothers in the matched comparison sample were less likely to have a college degree, and more likely to have Medicaid as their source of payment for the birth of the baby. More KY-Moms MATR mothers smoked cigarettes before becoming pregnant than mothers in the general population. At the same time, babies born to mothers in KY-Moms MATR had a similar average number of prenatal visits, gestational weeks, highest APGAR score, birth weight, and percent of babies with birthing problems compared to the general population and the matched comparison sample. Compared to the general population, however, KY-Moms MATR mothers were significantly less likely to breastfeed.

Appendix C. Client Characteristics at Baseline for Those with Completed Follow-Up Interviews and Those without Completed Follow-Up Interviews

Between June 2017 and December 2018, 177 pregnant mothers completed a prenatal baseline and were eligible for a six-month postnatal follow-up between July 2017 and June 2018. Individuals who completed a postnatal follow-up assessment during this time ($n = 118$) are compared in this section with 79 individuals who did not complete a postnatal follow-up interview but were in their 6-month follow-up window in FY 2018.

As mentioned in Appendix A, 79 clients did not complete a postnatal follow-up interview for a variety of reasons:

TABLE AC.1. REASONS WHY CLIENTS DID NOT COMPLETE A FOLLOW-UP ASSESSMENT

Reason for not completing follow-up assessment	n
Ineligible as a result of prenatal baseline criteria:	
Client was unsure she was keeping the baby	1
Client was not in the program long enough	4
More than 30 days between when the baseline was completed and when it was submitted	8
Insufficient locator information.....	7
Ineligible as a result of postnatal follow-up criteria:	
Baby was not living with the mother	8
Client was living in a controlled environment.....	1
Client passed away.....	1
Baby deceased.....	3
Client was not located within the targeted window	26
TOTAL	79

Demographic Characteristics

The average client age was around 26 years old for the group that was not followed up and about 25 years old for clients who completed a follow-up assessment (see Table AC.2). Clients who were not followed up were an average of 24.2 weeks into their pregnancies and clients who were followed up were an average of 22.4 weeks. While the difference is not significant, it is expected given clients must be in the program at least 30 days in order to be eligible for follow-up and women who are further along in their pregnancies might not have spent enough time in the program. Significantly more clients who completed a follow-up assessment were married or cohabiting (67.0%) compared to clients who were not followed up (45.7%). Of those who were married or cohabiting, significantly more clients who completed a follow-up reported that the partner is the father of the baby (97.5%) compared to clients who were not followed up (85.2%). In

addition, the majority of clients in both groups were White.

TABLE AC.2. COMPARISON OF DEMOGRAPHICS FOR CLIENTS WHO WERE INCLUDED IN THE FOLLOW-UP SAMPLE AND CLIENTS WHO WERE NOT INCLUDED IN THE FOLLOW-UP SAMPLE

	FOLLOWED UP	
	NO n = 59	YES n = 118
Average age	26.3	25.4
Average weeks pregnant	24.2	22.4
Relationship status**		
Married	16.9%	26.3%
Cohabiting	28.8%	40.7%
Separated, divorced, or widowed.....	27.1%	7.6%
Never married.....	25.4%	25.4%
Of those married or cohabiting, percent that reported the partner is the father*	85.2%	97.5%
Race		
White	86.4%	89.0%
Black	11.9%	4.2%
Other or multiracial.....	1.7%	6.8%

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

Of those who completed a postnatal follow-up, 66.1% were currently unemployed compared to 83.1% of the clients who did not complete a follow-up. There were no significant differences between clients who were followed up and not followed up on whether they expected to be employed in the next 12 months (see Table AC.3).

TABLE AC.3. CURRENT EMPLOYMENT STATUS AT PRENATAL BASELINE

	FOLLOWED UP	
	NO n = 59	YES n = 118
Employment		
Not currently employed.....	83.1%	66.1%
Full-time	6.8%	15.3%
Part-time	5.1%	12.7%
Occasional, from time to time seasonal work	3.4%	1.7%
On leave from a job for pregnancy related reasons	1.7%	4.2%
Expect to be employed in the next 12 months	69.5%	71.2%

There was a significant difference in usual living arrangement between those who completed a follow-up assessment and those who did not. Almost 90% of clients who were followed up reported that their usual living arrangement in the past 30 days at prenatal baseline was in a private residence (i.e., their own home or apartment or someone else's home or apartment; see Table AD.4) compared to clients who were not followed up (72.9%). About 25.4% of clients who did not complete a follow-up and 6.8% of clients who did complete a follow-up were living in a residential facility, hospital, recovery center, or sober living home. A small number of individuals reported their usual living arrangement had been in a shelter or on the street.

At baseline, there was no significant difference between the groups on clients who considered themselves to be homeless. About 10% of clients who did not complete a follow-up and 8.5% of clients who did complete a follow-up considered themselves homeless. The majority of clients who considered themselves homeless in either group stated that they were temporarily staying with friends or family (see Table AC.4).

TABLE AC.4 LIVING SITUATION OF CLIENTS BEFORE ENTERING THE KY-MOMS MATR PROGRAM

	FOLLOWED UP	
	NO n = 59	YES n = 118
Usual living arrangement in the past 30 days**		
Own or someone else's home or apartment.....	72.9%	89.8%
Jail or prison	0.0%	0.0%
Residential program, hospital, recovery center, or sober living home	25.4%	6.8%
Shelter or on the street.....	1.7%	3.4%
Considers self to be currently homeless	10.2%	8.5%
Why the individual considers himself/herself to be homeless	(n = 6)	(n = 10)
Staying in a shelter.....	33.3%	10.0%
Staying temporarily with friends or family.....	50.0%	40.0%
Other.....	16.7%	20.0%

**p< .01

Physical Health

Clients who completed a follow-up were very similar on physical health measures to clients who did not complete a follow-up (see Table AC.5). On a scale of 1 - 5, clients who completed a follow-up and clients who did not complete a follow-up rated their health an average of 3.1. Around 37% of clients who were not followed up and 41.5% of clients who were followed up reported they had no health problems and close to 36% of clients in both groups reported one health problem. A little over 27% of clients who did not complete a follow-up and 22.9% of clients who did complete a follow-up reported two or more health problems. There were no significant differences between the groups on chronic pain in the 6 months before pregnancy. The average number of doctor visits reported by clients was similar with 7.2 visits for clients not followed up and 5.8 visits for clients who completed a follow-up.

TABLE AC.5. PHYSICAL HEALTH ISSUES OF CLIENTS BEFORE ENTERING THE KY-MOMS MATR PROGRAM

	FOLLOWED UP	
	NO n = 59	YES n = 118
Number of health problems		
None.....	37.3%	41.5%
One health problem.....	35.6%	35.6%
Two or more health problems.....	27.1%	22.9%
Overall health rating (1 – poor, 5 – excellent).....	3.1	3.1
Chronic pain in the 6 months before pregnancy	22.0%	27.1%
Of those experiencing chronic pain	(n = 13)	(n = 32)
Average level of pain over the past 30 days	6.2	6.0
Pain continued into pregnancy	100.0%	100.0%
Average number of doctor visits about pregnancy.....	7.2	5.8

Targeted Risk Factors

Substance Use

There were significant differences for substance use at prenatal baseline between clients who did and clients who did not complete a postnatal follow-up. While the majority of clients in both groups reported illegal drugs and/or alcohol use, significantly more clients who were not followed up reported illegal drug use in the 30 days prior to pregnancy (67.8%) compared to clients who were followed up (50.8%). More clients who were followed up, however, reported alcohol use in the 6 months before pregnancy (62.7%) and in the 30 days prior to pregnancy (50.0%).

TABLE AC.6 SUBSTANCE USE OF CLIENTS AT PRENATAL BASELINE

	FOLLOWED UP	
	NO n = 59	YES n = 118
Substance use in the 6 month prior to pregnancy		
Illegal drugs and/or alcohol.....	81.4%	83.1%
Illegal drugs.....	74.6%	61.0%
Alcohol**	37.3%	62.7%
Cigarettes	78.0%	79.7%
Substance use in the 30 days prior to pregnancy		
Illegal drugs and/or alcohol.....	72.9%	74.6%
Illegal drugs*	67.8%	50.8%
Alcohol**	25.4%	50.0%
Cigarettes	76.3%	77.1%
Of clients who smoked	(N = 45)	(N = 91)
Average number of cigarettes per day	14.8	15.7
Substance use in the past 30 days		
Illegal drugs and/or alcohol.....	15.3%	19.5%
Illegal drugs.....	13.6%	17.8%
Alcohol	1.7%	1.7%
Cigarettes	62.7%	60.2%
Of clients who smoked	(N = 37)	(N = 71)
Average number of cigarettes per day	10.3	10.7

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

Mental Health

Among those clients who met criteria for depression in the 6 months before pregnancy, clients who were not followed up reported significantly more depression symptoms (see Table AC.7).

TABLE AC.7 SELF-REPORTED MENTAL HEALTH SYMPTOMS OF CLIENTS AT PRENATAL BASELINE

	FOLLOWED UP	
	NO n = 59	YES n = 118
Experienced symptoms of depression in the past 6 months before pregnancy	52.5%	41.5%
	(n = 31)	(n = 49)
Average number of symptoms**	7.5	6.5
Experienced symptoms of depression in the past 30 days at prenatal baseline	30.5%	31.4%
	(n = 18)	(n = 37)
Average number of symptoms	6.8	6.3
Experienced symptoms of anxiety in the past 6 months before pregnancy	47.5%	40.7%
	(n = 28)	(n = 48)
Average number of symptoms	5.3	4.9
Experienced symptoms of anxiety in the past 30 days at prenatal baseline	35.6%	39.8%
	(n = 21)	(n = 47)
Average number of symptoms	4.8	4.7

**p< .01

Intimate partner violence

There were significant differences between clients who completed a postnatal follow-up and clients that did not on intimate partner violence and violence measures. Around 44% of clients who did not complete a follow-up and 26.3% of clients that completed a follow-up assessment reported some type of partner abuse or violence in the 6 months before pregnancy (see Table AC.8). In addition, significantly more clients who did not complete a follow-up reported experiencing verbal abuse (35.6%) and 42.4% experienced coercive control in the 6 months before pregnancy.

TABLE AC.8 INTIMATE PARTNER VIOLENCE AND SEXUAL VIOLENCE BY ANY TYPE OF PERPETRATOR REPORTED BY CLIENTS AT PRENATAL BASELINE

	FOLLOWED UP	
	NO n = 59	YES n = 118
Any partner abuse		
6 Months before pregnancy*.....	44.1%	26.3%
Past 30 days	20.3%	11.0%
Verbal abuse		
6 Months before pregnancy*.....	35.6%	21.2%
Past 30 days	5.1%	8.5%
Coercive control		
6 Months before pregnancy*.....	42.4%	23.7%
Past 30 days*	18.6%	8.5%
Physical abuse		
6 Months before pregnancy.....	15.3%	11.0%
Past 30 days	0.0%	0.8%
Sexual abuse		
6 Months before pregnancy.....	13.6%	5.9%
Past 30 days	0.0%	1.7%

*p <.05