



Substance use, treatment, and demographic characteristics of pregnant women entering treatment for opioid use disorder differ by United States census region



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ABSTRACT

Opioid use disorder (OUD) among pregnant women increased substantially between 1992 and 2012 across the United States, with the greatest increases occurring in the southern states. We analyzed the 2013 Treatment Episodes Database-Admissions to determine how substances used, characteristics of treatment, and demographics of pregnant women entering treatment for opioid use disorder vary between geographical regions. Analyses were restricted to cases where women reported being pregnant at the time of admission and reported opioids as the primary substance problem leading to the treatment admission. Characteristics were compared between U.S. census regions using Chi-square tests and logistic regression with the South census region as the reference group. Compared to the South, pregnant women admitted for OUD treatment in other regions were 33–79% less likely to use benzodiazepines, twice as likely to be admitted to medication assisted treatment (MAT), 2–3 times more likely to use heroin, and up to 1.5 times more likely to inject drugs. Fewer women in the South reported having medical insurance, education beyond high school, and being married. There is a need in the southern U.S. for policies and treatment programs to target reducing concomitant opioid and benzodiazepine use, increasing access to, and utilization of, MAT, and increasing access to medical insurance.

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1. Introduction

Opioid use has risen among pregnant women in the United States since the 1990s, with the largest increases attributed to prescription opioids which accounts for 28% of pregnant admissions to substance abuse disorder treatment as of 2012 (Martin, Longinaker, & Terplan, 2015). Opioid use during pregnancy increases the risk for adverse pregnancy outcomes including fetal loss, pre-term birth and intrauterine growth restriction (Behnke et al., 2013). Gestational opioid exposure also adds a risk of the infant developing neonatal abstinence syndrome (NAS) (Finnegan, Connaughton, Kron, & Emich, 1975; Kocherlakota, 2014). In concordance with the rise in opioid use during pregnancy, incidence of NAS in the U.S. increased between 2000 and 2012 from 1.2 to 5.8 per 1000 hospital births (Patrick, Davis, Lehman, & Cooper, 2015; Patrick et al., 2012). The highest incidence rate of NAS has been reported in the East South Central U.S. census division (16.2 per 1000 hospital births) where increases in opioid use disorder in pregnant women have also been the greatest (Patrick et al., 2015; Patrick et al., 2012).

A deeper examination of the geographical differences among pregnant women with opioid use disorder could identify unmet treatment needs in specific geographical areas. For example, some locations may have higher rates of concomitant substance use; these variations have important implications. Use of cocaine and/or benzodiazepines in addition to opioids results in poorer substance use disorder treatment outcomes (Downey, Helmus, & Schuster, 2000; Williamson, Darke, Ross, & Teesson, 2006), while concomitant benzodiazepine and opioid use is associated with increased risks for overdose and overdose death (Chan, Stajic, Marker, Hoffman, & Nelson, 2006; Lee, Klein-Schwartz, Doyon, & Welsh, 2014). Prenatal exposure to opioids combined with either cocaine, benzodiazepines, or high levels of tobacco during pregnancy is associated with more severe neonatal withdrawal and longer newborn hospital stays (Abdel-Latif et al., 2006; Cleary et al., 2012; Jones et al., 2013; Seligman et al., 2008).

There may also be geographical variations in how opioid use disorder is treated, and factors that may affect access to treatment such as insurance coverage, delays to entering treatment, and source of referral for treatment. The types of treatment being used, such as detoxification, drug-free counseling, and medication assisted treatment (MAT), differ in their effectiveness. MAT involving methadone or buprenorphine combined with comprehensive behavioral and medical care is the universally accepted and recommended treatment for opioid use disorder in pregnant women (ACOG Committee on Health Care for

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Underserved Women & American Society of Addiction Medicine, 2012; Kampman & Jarvis, 2015; World Health Organization, 2009). Among those who used prescription opioids, the percentage of pregnant women who received MAT decreased nationally from 44% in 1992 to 37% in 2012 (Martin et al., 2015). It is unknown, however, whether utilization of MAT among pregnant women differs by geographic area. Underutilization of MAT may be related to lacking insurance coverage, limited capacity, and other barriers that could be common in geographic regions.

Finally, while pregnant admissions for opioid use disorder in the U.S. have become increasingly younger, unmarried, and non-Hispanic white between 1992 and 2012 (Martin et al., 2015), it is unclear whether this profile of pregnant admissions differs across geographic regions. Identifying the demographic profile of pregnant women with opioid use disorder by region could lead to more tailored prevention and treatment efforts.

The present study sought to fill existing knowledge gaps by analyzing national data from women admitted for treatment of opioid use disorder who reported being pregnant at the time of admission. Specifically, we sought to compare data related to self-reported substances used leading to the treatment admission, the characteristics of the treatment to be received (e.g., type and setting of treatment, insurance coverage), and demographic characteristics between U.S. census regions. Given that opioid use in pregnancy has increased the most in the southern U.S., analyses were aimed at identifying factors that uniquely characterize the needs of women in this region to determine avenues for ameliorating geographical disparities.

2. Materials and methods

2.1. Data source

The Treatment Episodes Data Set-Admissions (TEDS-A) is a national census data system of annual admissions to public and private substance use disorder treatment facilities that receive public funding (Substance Abuse and Mental Health Services Administration (SAMHSA), 2015). The publicly available 2013 TEDS-A was downloaded and used for this analysis. The dataset includes annual data on the number and characteristics of persons admitted to treatment programs. Data are collected by all 50 states, Washington DC and Puerto Rico and is estimated to include 83% of all eligible drug or alcohol treatment admissions in the U.S. The current study was deemed exempt for review by the Thomas Jefferson University Institutional Review Board.

2.2. Study population

Analyses were restricted to cases where women reported being pregnant at the time of admission and reported opioids (i.e., heroin, other opiates and synthetics, or non-prescription methadone or buprenorphine) as the primary substance problem leading to the treatment admission. A total of 8656 admissions met these criteria and were included in analyses. TEDS does not distinguish between treatment admissions and readmissions.

2.3. Census region classification

The four geographic regions included the Northeast, Midwest, South and West and were based on regions defined by the U.S. Bureau of Census, 1970 Census of Population. They are comprised of the following states and territories: Northeast: New England Division (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont) and Middle Atlantic Division (New Jersey, New York); Midwest: East North Central Division (Illinois, Indiana, Michigan, Ohio, Wisconsin) and West North Central Division (Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota); South: South Atlantic Division (Delaware, District of Columbia, Florida, Georgia, Maryland, North

Carolina, South Carolina, Virginia, West Virginia) and East South Central Division (Alabama, Kentucky, Mississippi, Tennessee), and West South Central Division (Arkansas, Louisiana, Oklahoma, Texas); and West: Mountain Division (Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, Wyoming) and Pacific Division (Alaska, California, Hawaii, Oregon, Washington). Data were not available in 2013 for Pennsylvania.

2.4. Substance use characteristics

All substance use data contained in TEDS-A are self-reported by the individual admitted to treatment. Substance use characteristics assessed in this analysis included: primary substance problem leading to the current treatment admission (prescription opioid or heroin), current intravenous drug use (yes, no), current polysubstance use (yes, no), and other substance(s) reported as leading to the admission. Prescription opioid use was defined as the reported use of other opiates and synthetics (i.e., buprenorphine, codeine, hydrocodone, hydromorphone, meperidine, morphine, opium, oxycodone, pentazocine, propoxyphene, tramadol, and any other drug with morphine-like effects) or non-prescription methadone at the time of treatment admission. Those reporting a secondary or tertiary substance leading to the admission were classified as exhibiting polysubstance use, and these substances included alcohol, benzodiazepines, cocaine, marijuana, and opioids (prescription opioid or heroin) differing from the primary substance problem.

2.5. Treatment characteristics

Characteristics of the current treatment admission assessed included: planned use of MAT for the current admission (yes, no), the treatment setting for the current admission (detoxification, other), wait time for admission (<1 week, 1 week or more), source of referral for the admission (court/criminal justice referral, other), psychiatric problem in addition to alcohol/drug problem (yes, no), and whether the person had a prior substance use disorder treatment episode (yes, no).

2.6. Demographic characteristics

Self-reported demographic characteristics assessed at the time of admission included: age in years (<20, 21–29, 30–39, 40 or more), race (black, white, other), ethnicity (Hispanic, non-Hispanic), highest level of education (less than high school, high school, greater than high school), employment status (employed, not employed), insurance status (insured, not insured), and marital status (married, not married). Insurance status was not differentiated between public or private insurance and may or may not have covered the treatment episode of interest.

2.7. Statistical analyses

Differences in demographic characteristics by census region were assessed using Chi-square tests. We examined independent associations with substance use and treatment characteristics by census region using multivariable logistic regression with the South as the reference group. We used the South as the reference group based on previous reports of high NAS incidence and prenatal opioid use in this region. Multivariable logistic regression analyses were completed controlling for age, race, ethnicity, educational attainment, and state. Marital status and insurance status were not included in the multivariate models due to the large number of missing responses (16.2% and 55.3%, respectively). Results were expressed as odds ratios along with their corresponding 95% confidence intervals. *P* values of *P* < 0.05 were considered to be significant. All statistical analyses were performed using SAS version 9.4 (SAS Institute, Cary, NC, USA).

3. Results

Of the 8656 pregnant admissions with opioids as the primary substance problem included in our analyses, the number of admissions within each census region was: Northeast $n = 2808$ (32%), Midwest, $n = 1932$ (22%), South, $n = 2153$ (25%), West, $n = 1763$ (20%). Demographic characteristics are displayed in Table 1. Univariate analyses revealed statistically significant differences between census regions in age, race, ethnicity, educational attainment, employment status, insurance status, and marital status.

The primary type of opioid leading to the treatment episode differed significantly between U.S. census regions. The percentage of women with prescription opioids as the primary substance problem ranged from 35% in the Northeast to 62% in the South (Table 2). After adjusting for age, race, ethnicity, education level and state, compared to women in the South, women who resided in non-South regions were significantly less likely to report prescription opioids as the primary substance problem. Intravenous drug use was significantly more likely in non-South regions.

Women in the Northeast and the West, but not the Midwest, were significantly more likely to report polysubstance use compared to women in the South. There was also significant geographic variability in the secondary and tertiary substances reported as leading to the treatment admission. Women in all three non-South regions were significantly less likely to report benzodiazepine use than women in the South. Over 13% of women in the South reported benzodiazepine use at admission compared to approximately 3% in the West, 9% in the Midwest, and 11% in the Northeast. Compared to women in the South, women in the Northeast were significantly more likely to report cocaine, marijuana and opioids as secondary or tertiary substances. Concomitant cocaine use was less common in the Midwest and West compared to the South.

There were significant differences in treatment characteristics by census region (Table 2). Pregnant women were significantly more likely to have treatment plans including MAT in the non-South regions. Fewer than 31% of pregnant women in the South received MAT compared to approximately 48% or greater in the other regions. Treatment in detoxification settings was rare, but was significantly less common in the

Midwest and West compared to the South. Women in non-South regions were more likely than women in the South to have had a prior treatment episode. Psychiatric problems were most common in the Northeast, followed by the South. The percentage of women waiting 1 week or longer for admission was similar across regions, but significantly higher in the Midwest compared to the South. There were no significant differences in the source of treatment program referral.

4. Discussion

The present analyses revealed significant geographic variability in self-reported substances used leading to the treatment admission, characteristics of the treatment to be received, and demographic characteristics among pregnant women admitted for treatment of opioid use disorder. Pregnant women entering treatment for opioid use disorder in the South U.S. census region face a unique set of circumstances, including high rates of concomitant benzodiazepine use, underutilization of MAT, and inadequate insurance that negatively impact treatment retention and treatment outcomes (Greenfield et al., 2007) and may also partially explain the higher incidence rates of NAS observed in this region (Patrick et al., 2015; Patrick et al., 2012). Prescription opioids were more commonly reported as the primary substance problem in the South compared to other census regions. This finding is not unexpected given that while an increase in prescription opioid use among pregnant admissions was observed in all U.S. geographic regions since 1992, the greatest increase was in the South (Martin et al., 2015). Variations in prescribing rates could partially explain the regional differences we found in use of prescription opioids, as substantial geographic differences in opioid prescription claims among women of reproductive age in the U.S. have been previously reported (Ailes et al., 2015). In 2012, among privately insured women, opioid prescription rates were highest among reproductive-aged women residing in the South and lowest in the Northeast (Ailes et al., 2015). Additional reports of prescribing patterns have shown similar trends, with the South having the greatest number of prescription opioid claims among pregnant women (Bateman et al., 2014; Desai, Hernandez-Diaz, Bateman, & Huybrechts, 2014) and the general population (Paulozzi, Mack, & Hockenberry, 2014).

Table 1

Demographic characteristics of pregnant admissions with opioids as primary substance problem by census region, Treatment Episodes Data Set-Admissions, 2013.

	Census region				Chi-square P-value
	Northeast $n = 2808$	Midwest $n = 1932$	South $n = 2153$	West $n = 1763$	
Age (years)					
<20	5.6	7.1	5.6	7.5	0.0001
20–29	64.3	66.7	65.0	60.7	
30–39	27.7	24.5	27.2	28.5	
40 or more	2.4	1.7	2.2	3.3	
Race					
Black	4.5	7.0	7.2	4.1	<0.0001
White	89.7	81.7	89.9	79.3	
Other	5.8	11.3	2.9	16.6	
Ethnicity					
Hispanic	7.3	3.0	4.5	18.3	<0.0001
Non-Hispanic	92.7	97.0	95.5	81.7	
Education level					
Less than high school	26.6	32.6	33.3	33.5	<0.0001
High school	46.6	42.1	43.4	40.5	
More than high school	26.7	25.2	23.3	25.9	
Employment					
Employed	11.3	13.1	11.0	10.1	0.03
Unemployed	88.7	86.9	89.0	89.9	
Insurance status					
Insured	73.5	69.9	67.8	73.0	0.007
Non-insured	26.5	30.1	32.2	27.0	
Marital status					
Married	13.5	14.5	11.5	27.8	<0.0001
Not married	86.5	85.5	88.5	72.1	

Table 2

Adjusted odds ratios for the association between census region designation and treatment characteristics among pregnant admissions with opioids as primary substance problem, Treatment Episodes Data Set-Admissions, 2013.

Characteristic	Census Region							
	Northeast n = 2808		Midwest n = 1932		West n = 1763		South n = 2153	
	%	AOR ^a (95% CI)	%	AOR ^a (95% CI)	%	AOR ^a (95% CI)	%	AOR
Primary substance problem								
Prescription opioids ^b	34.8	0.31 (0.28, 0.35)	43.8	0.46 (0.40, 0.52)	35.0	0.34 (0.30, 0.39)	61.7	1.0
Heroin	65.2	3.18 (2.82, 3.56)	56.2	2.17 (1.91, 2.47)	65.0	2.90 (2.53, 3.33)	38.1	1.0
Medication-assisted treatment	54.1	2.84 (2.51, 3.22)	47.7	2.08 (1.82, 2.37)	49.7	2.03 (1.76, 2.33)	30.6	1.0
Court or criminal justice referral	15.1	1.00 (0.85, 1.18)	15.8	1.06 (0.89, 1.27)	14.7	1.05 (0.87, 1.27)	14.8	1.0
Psychiatric problem	63.9	2.37 (2.07, 2.72)	24.8	0.47 (0.40, 0.54)	20.9	0.43 (0.36, 0.50)	39.4	1.0
Intravenous drug use	56.4	1.51 (1.34, 1.69)	52.1	1.29 (1.14, 1.46)	51.2	1.22 (1.07, 1.39)	47.2	1.0
Prior treatment episode	81.9	3.31 (2.89, 3.79)	69.6	1.71 (1.49, 1.96)	61.8	1.22 (1.06, 1.40)	57.9	1.0
Detoxification service setting	8.4	0.94 (0.77, 1.15)	5.6	0.59 (0.46, 0.75)	5.9	0.50 (0.39, 0.65)	9.9	1.0
1 week or more for treatment entry ^c	15.3	1.09 (0.86, 1.37)	20.9	1.53 (1.24, 1.89)	9.1	1.04 (0.79, 1.38)	12.9	1.0
Polysubstance use	69.1	1.20 (1.07, 1.36)	63.0	0.95 (0.84, 1.09)	67.8	1.3 (1.14, 1.52)	63.4	1.0
Other substance reported ^d								
Alcohol	10.9	0.94 (0.78, 1.14)	10.5	1.00 (0.81, 1.23)	9.0	0.89 (0.71, 1.11)	10.1	1.0
Benzodiazepines	10.7	0.77 (0.64, 0.91)	8.8	0.64 (0.52, 0.78)	3.1	0.21 (0.16, 0.29)	13.4	1.0
Cocaine	27.3	1.75 (1.51, 2.01)	13.2	0.71 (0.59, 0.84)	6.7	0.31 (0.24, 0.38)	17.8	1.0
Marijuana	25.1	1.23 (1.07, 1.41)	26.1	1.33 (1.14, 1.54)	17.3	0.88 (0.74, 1.04)	20.3	1.0
Opioid ^e	24.3	1.32 (1.14, 1.52)	18.8	0.97 (0.82, 1.13)	18.6	1.05 (0.89, 1.24)	19.2	1.0

Note: AOR = adjusted odds ratio; CI = confidence interval.

Sample sizes for multivariable models ranged from 4891 (number of days waiting to enter treatment) to 8387 (primary substance problem, intravenous drug use and other substance reported).

^a Adjusted for age, race, ethnicity, education level, and state. South as the reference group.^b Includes other opiates and synthetics and/or non-prescription methadone.^c Waiting time for treatment entry.^d Substance reported as secondary or tertiary substance problem.^e Other than the opioid reported as the primary substance problem.

It is also possible that the differences in type of opioids used (i.e., heroin vs. prescription) by region could be a reflection of the national demographic profile of people who use prescription opioids. Admissions in the South were generally younger and more likely to be non-Hispanic white, unmarried, unemployed, uninsured, and less educated, all of which are associated with poor retention in treatment and treatment outcomes (Greenfield et al., 2007). This demographic profile is similar to the general pattern of pregnant women who use prescription opioids in the U.S. (Martin et al., 2015).

Beyond the primary substance problem, concomitant use of other substances significantly varied between census regions. Concomitant use of benzodiazepines and opioids during pregnancy is of particular concern as it increases the risk for maternal overdose and overdose death (Chan et al., 2006; Lee et al., 2014), and increases dually-exposed infants' likelihood of being treated for NAS and lengthens their post-delivery hospital stay (Abdel-Latif et al., 2006; Seligman et al., 2008). The percentage of pregnant women reporting benzodiazepine use at admission ranged from 3% in the West to 13% in the South. This may represent an underestimate of the prevalence of benzodiazepine use in this population as other reports revealed prevalence ranging between 22 and 70% (Bakstad, Sarfi, Welle-Strand, & Ravndal, 2009; Davie-Gray, Moor, Spencer, & Woodward, 2013; Dryden, Young, Hepburn, & Mactier, 2009; Leifer, Goldman, & Finnegan, 1983; McGlone, Mactier, Hassan, & Cooper, 2013). Higher rates of benzodiazepine prescribing in the South (Paulozzi et al., 2014) may explain the higher prevalence of use among pregnant women with opioid use disorder in the region, which in turn may partially underlie the increased rates of NAS.

The low percentage of pregnant women with opioid use disorder who were admitted to MAT is also concerning. Fewer than 31% of admissions in the South included MAT in the treatment plan, compared to nearly half or more in other regions. The effectiveness of MAT as part of a comprehensive treatment program, including individual and group counseling, coordination of prenatal care, and residential treatment when needed, is well established (Kaltenbach, Berghella, & Finnegan, 1998), and is recommended by the American College of Obstetricians and Gynecologists (ACOG Committee on Health Care for Underserved Women & American Society of Addiction Medicine, 2012), American Society of Addiction Medicine (Kampman & Jarvis, 2015), and the World Health Organization (World Health Organization, 2009). There are several potential barriers to MAT and comprehensive treatment that could differ between census regions.

First, several states have passed laws or engaged policies that stigmatize the use of opioids during pregnancy, including those provided in MAT. Over half of the states in the South census region consider substance use during pregnancy when evaluating termination of parental rights (Guttmacher Institute, 2016). Women who fear losing their child custody may avoid MAT so as not to test positive for opioids during prenatal care or at delivery, or avoid entering the treatment system entirely so as not to raise suspicions. In a more extreme example that was enacted after collection of the present data, Tennessee passed a law from 2014 to 2016 that allowed women to be charged with assault if their infants were affected by maternal illicit drug use during pregnancy. Such laws and policies assume that a woman with a history of substance use is an unfit mother, which is not a scientifically-supported position (Terplan, Kennedy-Hendricks, & Chisolm, 2015).

Second, there may be differences in insurance eligibility and coverage between census regions. Most women with opioid use disorder rely on public insurance programs (i.e., Medicaid) (Patrick et al., 2012), and many states have provisions for providing at least temporary medical insurance to pregnant women. Nationwide, 20 states do not provide coverage for methadone maintenance under Medicaid formularies, with 8 such states located in the South (Substance Abuse and Mental Health Services Administration (SAMHSA), 2014a). Such limits aside, the number of pregnant women with opioid use disorder with medical insurance coverage may have increased since passage of the Affordable Care Act, either through plans purchased privately or through

the Medicaid expansion provisions. These provisions went into effect in 2014, the year after collection of the data used in the present analyses. Future studies should revisit whether such greater access to insurance increased the proportion of insured pregnant women receiving treatment for opioid use disorder when more recent data are made available. However, it appears unlikely that the gap in insurance coverage between the South and the other regions has shrunk given that 10 states in the South have not expanded Medicaid as of September 2016.

Finally, there may be differences in the availability and accessibility of MAT programs between regions. Every state except North Dakota and Wyoming has at least one opioid treatment program licensed to provide MAT. There were approximately 1113 facilities offering MAT in the United States in 2013 and over 33% of these facilities were located in the South census region (Substance Abuse and Mental Health Services Administration (SAMHSA), 2014b). Combining these data with 2013 US Census population estimates, the South had 3.1 MAT programs per 1,000,000 residents compared to 5.7 in the Northeast, 3.4 in the West, and 2.6 in the Midwest. Given that much of the South is rural, accessibility may be a key barrier to treatment as opioid treatment programs tend to be located in urban areas, and federal regulations stipulate that daily attendance is required for at least the first three months of treatment.

Office-based MAT using buprenorphine may be one way around these barriers. Buprenorphine has shown promise as a maintenance medication during pregnancy (Jones et al., 2010), and may be especially effective in sparsely populated areas or locations with limited transportation since daily supervised medicating is not required (Sigmon, 2015). With physicians with Drug Addiction Treatment Act of 2000 (DATA-2000) waivers able to prescribe buprenorphine to as many as 275 people receiving MAT, there is great potential for increasing the proportion of pregnant women receiving MAT. It must be noted that the effectiveness of MAT in pregnancy is closely tied to its inclusion in a comprehensive substance use disorder treatment program (Kaltenbach et al., 1998). These comprehensive services include individual and group counseling, case management, psychosocial education, peer support, coordination of prenatal care, and other services that are easily provided within a clinic-based opioid treatment program. Providing these critical services as part of office-based MAT requires innovation to ensure the behavioral health care component is included such as telemedicine to provide counseling. There are several successful models for effectively providing office-based MAT in pregnancy, such as has been described in Vermont (Meyer & Phillips, 2015). Even with the increased capacity afforded by DATA-2000, a state-by-state analysis of treatment need and DATA 2000-waived physician capacity revealed that most states had prevalence of opioid use disorder exceeding DATA 2000-waived physician capacity and most traditional opioid treatment programs were at or above 80% of their capacity (Jones, Campopiano, Baldwin, & McCance-Katz, 2015). It is clear that more MAT options are necessary.

Although this study has several potential limitations it provides a comprehensive analysis of data to inform policy and program development. Limitations include that TEDS draws only from treatment units that receive federal funds. Still, this represents >80% of U.S. treatment admissions. Second, substances leading to the treatment episode were self-reported by the person being admitted and not biochemically verified. Third, only a primary, secondary, and tertiary substance leading to the treatment episode are reported to the TEDS, and are not necessarily a complete inventory of all substances used at the time of admission. Fourth, TEDS does not distinguish treatment readmissions, which can cause duplicate client data to be reported to TEDS. Fifth, while there was statistical significance for some demographic comparisons, the absolute differences in percentages were often quite small and results should be interpreted with this in mind. Finally, data shown for a region might conceal large differences between and within states. Future analyses should examine state and regional-level patterns and differences.

5. Conclusions

The present analyses reveal geographic differences in substances used, characteristics of treatment received, and demographics of pregnant women entering treatment for opioid use disorder. Our findings highlight significant variations in concomitant substance use, utilization of MAT, and demographic factors across regions of the U.S. As opioid use disorder among pregnant women continues to increase, finding effective approaches to treating opioid use disorder should be considered a public health priority to minimize the effects of opioid use during pregnancy including enhancing family well-being. While efforts to increase comprehensive substance abuse treatment services including access to MAT to all pregnant women are warranted, they are especially needed in the South.

Conflict of interest

None.

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