Gender Differences in the Prevalence of Heroin and Opioid Analgesic Misuse in the United States, 2015–2019

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Abstract

Objectives.—Gender differences in the prevalence of opioid misuse continue to evolve and have not been well characterized in recent years. Our objective was to investigate gender differences in the prevalence of opioid misuse and use disorder in the US over the 5-year period from 2015–2019.

Methods.—We used annual survey data from the 2015–2019 National Survey on Drug Use and Health to estimate gender differences in the prevalence of opioid misuse. We examined past-year opioid analgesic misuse initiation, opioid analgesic misuse, heroin use, opioid analgesic use disorder and heroin use disorder. Logistic regression models were used to test gender differences, adjusting for sociodemographic variables.

Results.—In adjusted analyses, women had higher odds of having initiated opioid analgesic misuse in the past year compared to men. In contrast, men had higher odds of misuse of opioid analgesics, heroin use, and an opioid analgesic or heroin use disorder.

Conclusions.—Although opioid misuse has historically been more prevalent in men, the gender difference in opioid analgesic misuse continues to narrow, with more women initiating misuse than men including higher rates of misuse in adolescent girls. Heroin use continues to be approximately twice as common in men as women.

Keywords

Opioid Misuse; Opioid Use Disorder; Heroin Misuse; Gender Differences

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1. Introduction

For decades, opioid use disorder (OUD) has been more common among men than women (Huang et al., 2006; Marsh et al., 2018). However, with the staggering increase in the misuse of opioid analgesics beginning in the late 1990s, this gap began to narrow, in part due to a much smaller gender[1] difference in the misuse of opioid analgesics compared to heroin (Back et al., 2010; Green et al., 2009). Nonetheless, epidemiologic changes in women's opioid misuse are poorly characterized and the public health implications of opioid misuse in women are insufficiently addressed (Becker and Mazure, 2019). The goal of this paper is to characterize recent gender differences in the prevalence of opioid misuse in the United States using a large, representative national survey, the National Survey on Drug Use and Health (NSDUH).

Large population-based surveys over the past two decades have demonstrated substantial changes in the prevalence of opioid misuse among men and women. Data from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) between Wave 1 (collected in 2001–2002) and Wave 3 (2012–2013) showed dramatic increases in opioid use overall and a shrinking gap between men and women. Data from Wave 1 of the NESARC found that men had 80% higher odds of lifetime misuse of opioid analgesics compared with 240% higher odds of having an opioid analgesic use disorder in women (Huang et al., 2006). By Wave 3 of the NESARC, this gender gap had narrowed; men had 42% higher odds of opioid analgesic misuse in their lifetime and there was no significant gender difference in the prevalence of opioid analgesic use disorder (Kerridge et al., 2015; Saha et al., 2016).[2]

In contrast, the prevalence of heroin use and heroin use disorder was higher in men than women in both Wave 1 and Wave 3 of the NESARC, and the rate of annual increase in lifetime heroin use and heroin use disorder was greater in men (suggesting a *growing* gender difference) (Martins et al., 2017). However, data from the NSDUH yielded different results, perhaps due to a focus on past-year relative to lifetime use. Although the overall prevalence of past-year heroin use remained higher among men from 2002–2013 (consistent with the NESARC data), the prevalence of heroin use was shown to be increasing *faster* in women, with the rate of heroin use in women doubling from 2002–2004 to 2011–2013 and increasing by only 50% in men over that time (Jones et al., 2015). Consistent with this, a study of NSDUH data covering the years 2007–2015 also found that past-year heroin use was more common among men, but increasing faster among women (Marsh et al., 2018).

These trends in the gender differences in opioid misuse and OUD over time indicate fluctuation in the gap between men and women in opioid misuse. The aim of this paper is to estimate recent (2015–2019) gender differences in the prevalence of opioid misuse in the United States to provide an updated characterization of the magnitude of gender differences in opioid misuse. A secondary aim was to characterize gender differences across development. Developmental risk periods for opioid use vary, with particular risk in early

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[1]We use the term "gender" rather than "sex" throughout this manuscript because most population surveys, including the National Survey on Drug Use and Health do not specifically assess biological sex at birth. We note that the reliance on a binary definition of gender (male or female) is a limitation of this work.

[2]Of note, the diagnostic criteria differed between Wave 1 and Wave 3 due to the update from DSM-IV to DSM-5.

adulthood and the magnitude of gender differences in substance use has been shown to vary across the lifespan (Chen and Jacobson, 2012). Accordingly, consideration of the intersection of gender and age may provide further insight into patterns of opioid misuse in the US.

To achieve these aims, we utilized data from the National Survey on Drug Use and Health, a large annual survey. We focused on gender differences in several indicators of the scope of opioid misuse: (1) prevalence of past-year initiation of opioid misuse, (2) prevalence of all past-year opioid misuse, and (3) prevalence of past-year OUD. These indicators were analyzed separately for opioid analgesics and heroin. To characterize recent patterns in use and to optimize statistical power to parse potential gender differences, we combined annual survey data from 2015–2019. Gender by year interaction terms were added to all models to identify changes in the magnitude of gender differences over this 5-year period. We also characterized gender differences across age groups in an exploratory analysis.

2. Methods

This analysis utilized publicly available data from the National Survey on Drug Use and Health (NSDUH). The NSDUH is an annual survey that provides information about mental health and the use of illicit drugs, alcohol, and tobacco in the United States. The survey is administered by the Substance Abuse and Mental Health Services Administration (SAMHSA) and is conducted annually in all 50 states and the District of Colombia. Detailed descriptions of the survey methods and measures are available from SAMHSA.

2.1 Participants

The NSDUH collects information from a random sample of approximately 70,000 civilians from residents of households and noninstitutionalized groups who are 12 years or older. The survey excludes individuals who are homeless, currently active military personnel, and residents of institutional group quarters. Complex survey methodology is utilized to obtain prevalence estimates across diverse groups, including males and females and both majority and minority racial and ethnic groups. For our analyses, we utilized the data from participants who completed the NSDUH surveys between 2015 and 2019.

2.2 Measures

The sociodemographic variables included in our analyses were gender, age, race, income, health insurance and county type. The categories that compose these variables and reference categories used in analyses are summarized in Tables 1 and 2.

Participants answered questions about opioid analgesic misuse, heroin use and OUD symptoms. Beginning in 2015, opioid analgesic misuse was determined by the following question, "Have you ever, even once, used any prescription pain reliever in any way a doctor did not direct you to use it?" Prior to 2015 the following question was used to determine "nonmedical use": "Have you ever, even once, used any of these pain relievers when they were not prescribed for you or that you took only for the experience or feeling they caused?". With this modification, in 2015 the variable name was changed from "nonmedical use" to "misuse." Participants were provided with a list of names and pictures of opioid

analgesics when asked questions about opioid analgesic use and misuse. Participants also answered questions about their use of heroin ("Have you ever, even once, used heroin?") and the DSM-IV criteria for opioid abuse and opioid dependence, separately for opioid analgesics and heroin. Participants were also asked how long it had been since their last misuse of opioid analgesics or use of heroin to determine past-year use. Full details on the survey methodology, including the codebook and survey question language are publicly available from SAMHSA.

Our variables of interest included: past-year initiation of opioid analgesic misuse (heroin initiation was not available in the public NSDUH dataset), past-year misuse of opioid analgesics, past-year use of heroin, past-year opioid analgesic use disorder and past-year heroin use disorder. Survey respondents were classified as having heroin use disorder or opioid analgesic use disorder if they met DSM-IV criteria for dependence or abuse of heroin or opioid analgesics, respectively.

2.3 Data Analysis

To increase the ability to detect meaningful gender differences—particularly for the lower base rate events (e.g., heroin use disorder)—we combined data from the 2015, 2016, and 2017 NSDUH publicly available datasets. The NSDUH uses complex sampling techniques to facilitate estimation of population parameters of interest. All analyses accounted for complex sampling (e.g., oversampling of certain subgroups) based on recommendations from the Substance Abuse and Mental Health Data Archive (SAMHDA) and all analyses were conducted in SPSS Version 20, using nesting and weighting variables provided by SAMHDA in the NSDUH public use dataset.

We first calculated population estimates and bivariate odds ratios for the differences between men and women for each of our opioid variables of interest: past-year initiation of opioid analgesic misuse (coded as: yes = first misused an opioid analgesic in the past 12 months, no = never misused an opioid analgesic), total opioid analgesic misuse, opioid analgesic use disorder, heroin use and heroin use disorder. We then conducted a series of logistic regression models controlling for sociodemographic variables, including age, race, income, county type, and health insurance. We also controlled for the study year and examined the gender by year interaction term to investigate potential trends over the 5-year period of study.

Finally, in an exploratory analysis, we added the gender by age interaction term to each of these regressions to evaluate whether gender differences differed based on age. In follow-up analyses, we plotted the population bivariate estimates for each opioid outcome by gender and age.

3. Results

Figure 1 presents the prevalence of each opioid variable by gender. Men had higher odds of past-year misuse of opioid analgesics, heroin use, opioid analgesic use disorder and heroin use disorder than women. However, women had significantly higher odds than men to have initiated opioid analgesic misuse in the past year.

Adjusted models examining gender differences in opioid analgesic use are presented in Table 1. Results show that women had higher odds than men of initiation of opioid analgesic misuse for the first time in the previous year (OR=1.18, 95% CI=1.05, 1.32). Women had lower odds of past-year misuse of opioid analgesics (OR=0.81, 95% CI=0.77, 0.86) and opioid analgesic use disorder (OR=0.70, 95% CI=0.63, 0.78).

Adjusted models examining gender differences in heroin use are presented in Table 2. Due to the presence of quasi-complete separation in the data (related to the age variable), we modified our model to use a 5-level version of the age variable (12–17 years, 18–25, 26–34, 35–49, 50 and older), which combined the two oldest age cohorts. These adjusted analyses show a lower prevalence of heroin misuse (OR=0.46, 95% CI=0.37, 0.56) and heroin use disorder (OR=0.51, 95% CI=0.41, 0.63) in women relative to men.

The gender by year moderator was non-significant for all models except the model examining opioid analgesic use disorder ($p<.05$), suggesting that these gender differences were relatively stable over the time period of interest. To further understand this moderating effect, we re-ran the adjusted models separately for each year for the opioid analgesic use disorder outcomes. This generally showed a modest trend over this time period of a shrinking gap between men and women, with the smallest gender difference in the prevalence of opioid analgesic use disorder in the most recent 2 years (2018: OR=0.83, 95% CI=0.61, 1.13; 2019: OR=0.78, 95% CI=0.57, 1.06).

We then added the gender by age interaction to each of the logistic regression models. The interaction term was statistically significant for opioid analgesic misuse (Wald F=12.97, $p<.001$), and opioid analgesic use disorder (Wald F=10.76, $p < .001$). It was not significant for opioid analgesic misuse initiation (Wald F=1.11, $p=.37$ heroin misuse (Wald F=1.62, $p=.19$) or heroin use disorder (Wald F=0.89, $p=.48$).

To characterize these interaction effects, we separated the dataset into three age categories (12–17, 18–25, 26 and older) and re-ran the adjusted models to examine gender differences in these age categories. In these adjusted models, females had higher odds than males of opioid analgesic misuse (OR=1.22, 95% CI=1.09, 1.35) and use disorder (OR=1.85, 95% CI = 1.40, 2.44) in the youngest (12–17) cohort, whereas, women had lower odds of both outcomes in the 18–25 year old (opioid analgesic misuse: OR=0.86, 95% CI=0.80,0.93; opioid analgesic use disorder: OR=0.81, 95% CI=0.71, 0.92) and 26 years and older cohorts (opioid analgesic misuse: OR=0.75, 95% CI=0.70, 0.80; opioid analgesic use disorder: OR=0.60, 95% CI=0.52,0.69). Figure 2 displays the unadjusted population estimates for men and women by age category for opioid analgesic misuse and use disorder.

4. Discussion

The opioid epidemic continues to have devastating effects on families and communities. Although women have historically been less represented in this population relative to men, evidence in the last 2 decades suggests that this gap has been shrinking. In this study, we examined 5 years of recent data from the nationally representative National Survey on Drug Use and Health to characterize gender differences in the prevalence of opioid misuse.

Although men had a higher likelihood of past-year opioid analgesic misuse and an opioid analgesic use disorder, women had higher odds of having initiated opioid analgesic misuse in the past year. Specifically, women had 18% higher odds of initiating opioid analgesic misuse in the prior year than men. Although men had higher odds of reporting past-year opioid analgesic misuse and opioid analgesic misuse disorder than women, it appears that the magnitude of the difference in opioid analgesic use disorder modestly decreased from 2015–2019.

In contrast, results of analyses considering heroin use demonstrated a consistently higher prevalence among men for both past-year heroin use and heroin use disorder, with men having approximately twice the odds of heroin use and heroin use disorder than women. Thus, while there is sustained greater prevalence of heroin use and heroin use disorder in men compared with women, by contrast, the 2015 through 2019 annual NSDUH data reveal that the gap between women and men in opioid analgesic misuse and use disorder is more modest and women's initiation of opioid analgesic misuse exceeds that of men.

Although direct comparisons cannot be made due to methodological differences between this and earlier population-based surveys (e.g., NESARC), it is of note that these findings suggest that prior reported trends of a shrinking gap between men and women in opioid analgesic misuse over time (Huang et al., 2006; Kerridge et al., 2015; Saha et al., 2016) have been sustained in recent years. Furthermore, the gender difference in heroin appears to be relatively consistent, with a magnitude of difference in this study similar to that observed in data from 2011–2013 (Jones et al., 2015). As opioid analgesic misuse has been a risk factor for escalation to heroin use during the current opioid epidemic, the higher rates of initiation of opioid analgesic misuse in women are a concerning trend with respect to potential future increase in heroin among women (Compton et al., 2016).

Exploratory analyses examining the age by gender interaction demonstrated that the magnitude of gender differences varies by age for opioid analgesics, but not heroin. In the youngest cohort, adolescent girls had a higher prevalence of opioid analgesic misuse and use disorder than adolescent boys. Although these patterns should be interpreted with caution as they are secondary analyses, they indicate potential variation across ages that may reflect either cohort or developmental effects. In sum, the higher initiation of opioid misuse in women and the higher prevalence of opioid analgesic misuse and use disorder prevalence in adolescent girls raises the potential for further narrowing of the gender gap in coming years.

The findings of our study are consistent with overall trends toward a narrowing gap between men and women in substance use and use disorder prevalence, in general (Keyes et al., 2011; Seedat et al., 2009). There are several reasons why the gap between men and women in opioid misuse may be narrowing. These may include differences in biological or psychological vulnerability factors, or social or cultural factors. Women are more likely than men to suffer from chronic pain (Dahlhamer et al., 2018) and certain psychiatric disorders, such as anxiety and mood disorders (McLean et al., 2011), which may influence exposure to opioids and vulnerability for misuse. Furthermore, evidence suggests that differences in exposure to substances may explain—at least in part—observed gender differences

in the prevalence of substance use disorders. In data from the NSDUH (at that time, named the National Household Surveys on Drug Abuse) from 1979–1994, men were more likely than women to have the *opportunity* to try heroin, but when controlling for this difference, there was no gender difference in heroin use (Van Etten and Anthony, 1999; Van Etten et al., 1999). Indeed, analyses of the Wave 1 NESARC data (2001–2002) identified substantially smaller differences between men and women in opioid analgesic use disorder when only considering people who had *misused* opioid analgesics than compared to the entire population (240% higher odds in men with a history of misuse vs. 50% higher odds in men in the full sample (Huang et al., 2006). Similarly, in a secondary analysis of data from the NESARC (collected in 2001–2002), when controlling for exposure (i.e., lifetime use) to heroin, there was no significant difference between men and women in the likelihood of heroin dependence (Lev-Ran et al., 2013). This is consistent with global studies suggesting that countries with greater gender equity (e.g., workforce participation, educational attainment) have smaller gender differences in the prevalence of substance use disorders (Seedat et al., 2009).

These findings have several implications for clinical and research agendas. Our findings underscore the importance of recognizing that there are ongoing changes in the gender prevalence of opioid misuse and OUD. In addition to the growing representation of women among people with opioid misuse, women are also particularly susceptible to opioid-related impairment and suffer disproportionately from co-occurring anxiety and depressive disorders (McHugh et al., 2013). Accordingly, women with OUD may have unique clinical needs. Indeed, there is evidence for benefits of women-specific group therapy that combines both women-only composition and content (Greenfield et al., 2014). Expansion of this work to women with OUD is an important future direction.

These results also underscore the importance of research on sex and gender differences in opioid misuse, considering that women have historically been underrepresented in research in this area (Becker and Mazure, 2019). One significant gap is the lack of translational research linking clinical and preclinical research. Data from animal models of opioid use demonstrate a range of findings revealing a complex role of gender in opioid neurobiology, including associations in animals between opioid use and gonadal hormone fluctuations across the estrous cycle (Becker and Chartoff, 2019; Loyd et al., 2008), gender-dependent effects of genetic polymorphisms associated with opioid use (Mague et al., 2009), and evidence for altered response to opioids following prenatal exposure (Byrnes and Vassoler, 2018). The balance of these preclinical data is more in line with the idea that gender differences in opioid biology do not neatly map onto behavior. Indeed, it is likely that the strength of opioids as reinforcers is such that it overcomes moderate gender differences in opioid neurobiology. Accordingly, there is an essential need for both research on biological factors related to opioid use in males and females as well as consideration of the many social, environmental, and psychological mechanisms that could contribute to differences or similarities in opioid misuse and OUD based on gender and biological sex.

This study has several limitations. The NSDUH is not fully representative of people living in the US, as it excluded institutionalized persons, non-citizens, and military personnel. Additionally, these data are cross-sectional and self-reported without biological

confirmation. Another limitation of this study is that fentanyl is not separately assessed in the NSDUH. Historically, fentanyl misuse was categorized with opioid analgesics because misuse of fentanyl predominantly consisted of diverted medical fentanyl (e.g., fentanyl patches). However, illicit fentanyl is now widely available in the opioid supply mixed with (or substituting for) powder heroin or pressed into illicitly produced opioid analgesic pills. As the patterns of opioid misuse continue to evolve, measurement strategies will need to be modified to keep up with the latest trends. We were only able to consider effects of time in the years 2015 through 2019 due to methodological changes in the NSDUH implemented in 2015; given the variability in the literature on trends in gender differences, follow-ups will be needed. Furthermore, different trends have been observed across unique population surveys (e.g., NESARC vs. NSDUH), which may be attributable to methodological differences, analytic differences, or perhaps to the challenges in characterizing subgroup differences for low base-rate events (such as heroin use). Accordingly, there is a need to use caution in the interpretation of any effects drawn from a single study. Finally, the NSDUH estimates of heroin use are substantially lower than those that use other sources (Kilmer et al., 2014). Thus, it is possible that heroin use is undercounted, which may be attributable to factors such as the stigma associated with heroin use or the underrepresentation of people without a stable living situation in the NSDUH study. It is not clear whether this undercounting would disproportionately affect men or women or both, however, methods to enhance surveillance of heroin use may be needed to obtain a more accurate counting of heroin use in the United States.

5. Conclusions

The epidemiology of opioid misuse continues to evolve. One aspect of that evolution is a narrowing of the gap between men and women in the prevalence of misuse and use disorders. This study provides further evidence that women are greatly impacted by opioid misuse, although at a modestly lower prevalence of opioid analgesic misuse and substantively lower prevalence of heroin use than men. More women than men, however, have recently initiated opioid analgesic misuse, which represents a concerning indicator for continued opioid misuse and potential escalation to use disorder and/or transition to heroin use among women. This is of particular concern in adolescent girls where there was a higher prevalence of opioid analgesic misuse and use disorder than adolescent boys. Continued monitoring of sex and gender differences in opioid misuse prevalence will be important in the coming years. Increased research and public health attention to opioid misuse in women and adolescent girls is important in light of these trends.

Role of Funding Source

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Highlights

- The gap between men and women in opioid misuse is shrinking

- Women are more likely than men to initiate misuse of opioid analgesics.

- Men have a modestly higher odds of past-year opioid analgesic misuse.
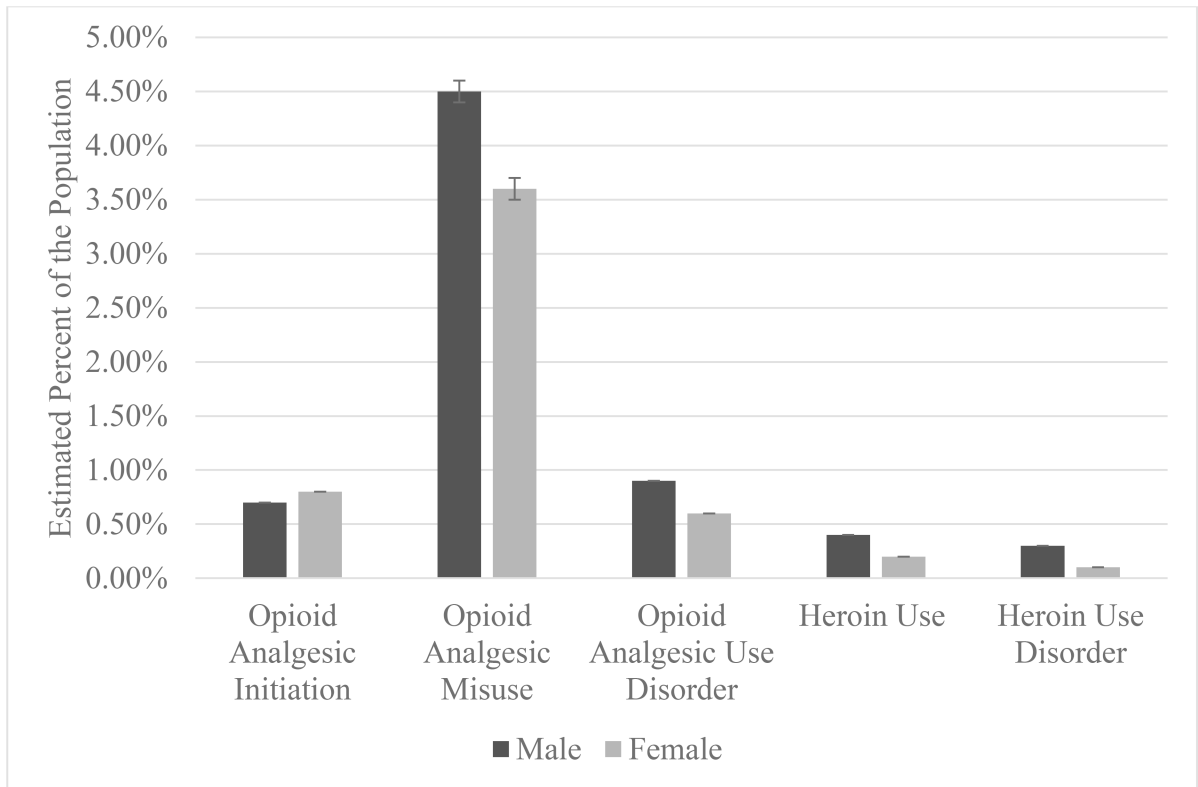
- More men than women use heroin.

Figure 1.
Population Estimates of Opioid Misuse by Sex. Note that the y-axis is truncated to aid in depiction of group differences.
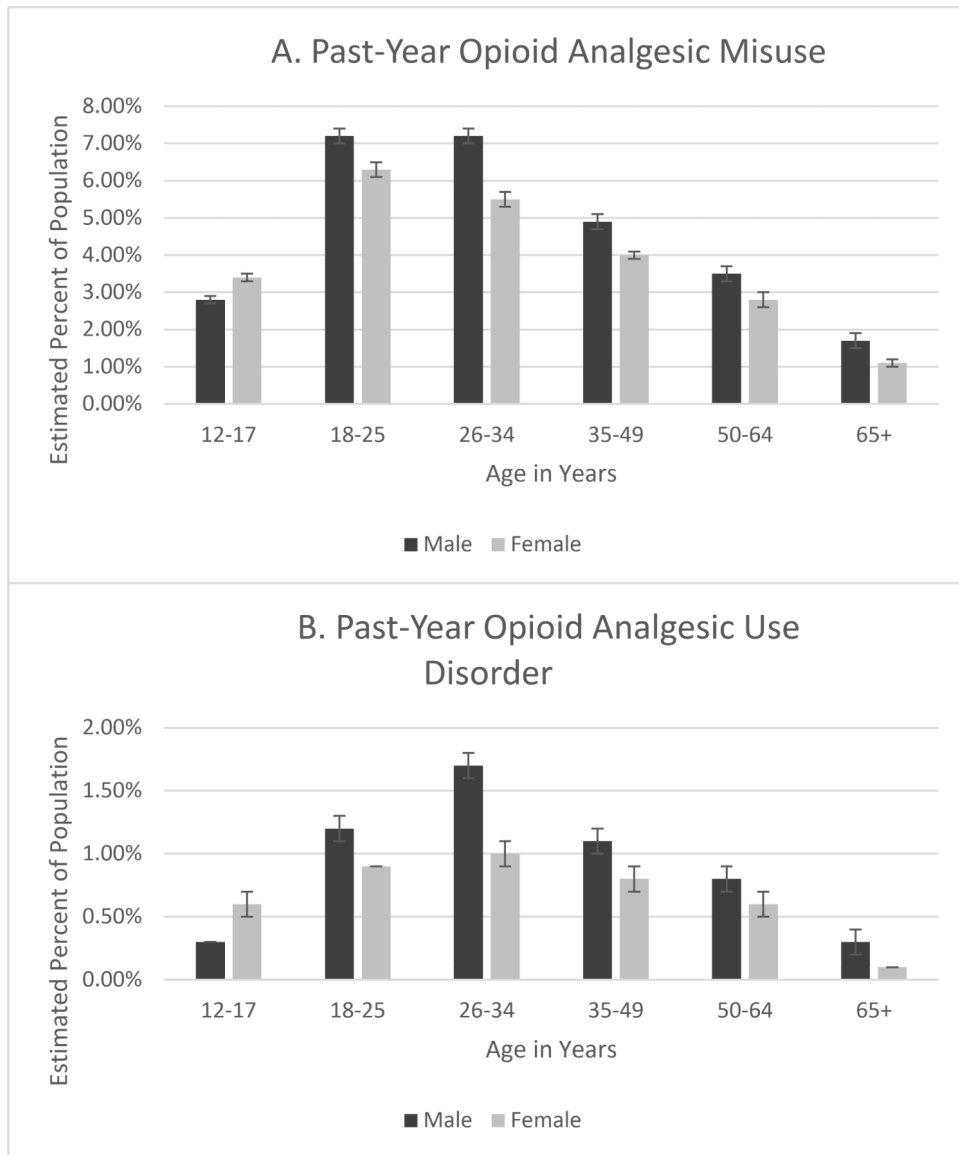
Figure 2.
Past-Year Opioid Analgesic Misuse by Sex and Age. Note y-axes are truncated to aid in depiction of group differences.

Table 1

Logistic Regressions Examining Gender Differences in Past-Year Opioid Analgesic Misuse Initiation, Overall Misuse, and Use Disorder.

	Initiation of Misuse			Past-Year Misuse			Use Disorder		
	Odds Ratio	95 % CI Lower	95 % CI Upper	Odds Ratio	95 % CI Lower	95 % CI Upper	Odds Ratio	95 % CI Lower	95 % CI Upper
Gender (reference = male)	1.18	1.05	1.32	0.81	0.77	0.86	0.70	0.63	0.78
Age (reference = 12–17)									
18–25	1.06	0.94	1.19	2.03	1.88	2.18	1.76	1.51	2.06
26–34	0.55	0.46	0.64	1.99	1.82	2.17	2.61	2.24	3.04
35–49	0.50	0.43	0.59	1.43	1.33	1.54	1.94	1.66	2.28
50–64	0.34	0.27	0.42	0.96	0.85	1.08	1.25	0.99	1.59
65+	0.20	0.14	0.27	0.39	0.33	0.46	0.31	0.19	0.54
Race (reference = nonHispanic White)									
Black/African American	0.81	0.68	0.96	0.67	0.61	0.74	0.50	0.37	0.67
Native American/ Alaskan Native	1.05	0.61	1.78	1.07	0.86	1.34	0.86	0.57	1.30
Native Hawaiian/ Other Pacific Islander	1.18	0.51	2.76	0.88	0.62	1.24	0.47	0.27	0.82
Asian	0.54	0.43	0.68	0.33	0.28	0.40	0.23	0.14	0.38
More than one race	1.01	0.75	1.35	1.19	1.02	1.38	1.14	.82	1.59
Hispanic	0.94	0.82	1.09	0.68	0.63	0.74	0.40	0.32	0.52
Income (reference = < $20,000)									
$20,000–$49,000	0.94	0.78	1.13	0.83	0.77	0.89	0.56	0.48	0.66
$50,000–$74,999	0.82	0.70	0.97	0.71	0.65	0.78	0.42	0.35	0.52
$75,000 +	0.71	0.59	0.87	0.58	0.54	0.63	0.27	0.22	0.34
County (reference = large metro)									
small metro	1.03	0.88	1.19	0.98	0.93	1.04	0.93	0.81	1.07
non-metro	0.79	0.66	0.95	0.87	0.80	0.94	0.86	0.73	1.01
Covered by Health Insurance (reference = yes)	1.01	0.84	1.22	1.30	1.20	1.40	1.44	1.22	1.69
Year (reference = 2015)									
2016	1.01	0.83	1.25	0.94	0.87	1.01	0.97	0.82	1.14
2017	0.92	0.76	1.11	0.87	0.80	0.95	0.91	0.76	1.10
2018	0.92	0.74	1.13	0.81	0.74	0.88	0.89	0.72	1.11
2019	0.74	0.61	0.91	0.79	0.72	0.87	0.75	0.63	0.90

Table 2.

Logistic Regressions Examining Sex Differences in Past-Year Heroin Misuse, and Use Disorder

	Misuse			Use Disorder		
	Odds Ratio	95% CI Lower	95% CI Upper	Odds Ratio	95% CI Lower	95% CI Upper
Sex (reference = male)	.46	.37	.56	.51	.41	.63
Age (reference = 12–17)						
18–25	8.33	5.72	12.12	23.45	12.52	43.91
26–34	14.64	10.08	21.26	41.18	21.33	79.50
35–49	7.28	4.80	11.06	20.99	10.32	42.69
50+	2.82	1.69	4.69	5.96	2.56	13.87
Race (reference = nonHispanic White)						
Black/African American	.48	.28	.81	.40	.20	.82
Native American/Alaskan Native	.63	.33	1.23	.64	.25	1.67
Native Hawaiian/Other Pacific Islander	.48	.14	1.66	.17	.04	.73
Asian	.10	.04	.25	.09	.02	.35
More than one race	.79	.44	1.42	.62	.38	1.01
Hispanic	.34	.23	.49	.39	.25	.62
Income (reference = < $20,000)						
$20,000–$49,000	.36	.30	.45	.37	.28	.50
$50,000–$74,999	.24	.18	.34	.26	.18	.36
$75,000 +	.19	.13	.27	.21	.14	.33
County (reference = large metro)						
small metro	.85	.67	1.08	.82	.65	1.04
non-metro	.59	.46	.76	.57	.42	.77
Covered by Health Insurance (reference = yes)	1.55	1.20	1.99	1.57	1.16	2.13
Year (reference = 2015)						
2016	1.16	.90	1.50	1.13	.84	1.53
2017	1.13	.88	1.43	1.22	.86	1.73
2018	1.08	.82	1.40	1.02	.69	1.49
2019	.93	.67	1.30	.82	.56	1.21