Opioid prescription claims among women aged 15–44 years—United States, 2013–2017

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Abstract

Objective: To estimate the annual percentage of women of reproductive age with private insurance or Medicaid who had opioid prescription claims during 2013–2017 and describe trends over time.

Design: A secondary analysis of insurance claims data from IBM MarketScan® Commercial and Multi-State Medicaid Databases to assess outpatient pharmacy claims for prescription opioids among women aged 15–44 years during 2013–2017.

Participants: Annual cohorts of 3.5–3.8 million women aged 15–44 years with private insurance and 0.9–2.1 million women enrolled in Medicaid.

Main Outcome Measure: The percentage of women aged 15–44 years with outpatient pharmacy claims for opioid prescriptions.

Results: During 2013–2017, the proportion of women aged 15–44 years with private insurance who had claims for opioid prescriptions decreased by 22.1 percent, and among women enrolled in Medicaid, the proportion decreased by 31.5 percent.

Conclusions: Opioid prescription claims decreased from 2013 to 2017 among insured women of reproductive age. However, opioid prescription claims remained common and were more common among women enrolled in Medicaid than those with private insurance; additional strategies to improve awareness of the risks associated with opioid prescribing may be needed.

Keywords

INTRODUCTION

Opioid use during pregnancy is associated with adverse maternal, infant, and childhood outcomes, including an increased risk of maternal death, intrauterine growth restriction, some birth defects, neonatal abstinence syndrome (NAS), and educational disabilities.[1–4] Prenatal opioid exposure may be due to maternal use of opioid medications for pain management, treatment for opioid use disorder, or misuse of prescription or illicit opioids. Monitoring trends in opioid prescription claims among women of reproductive age may demonstrate the effect of the Centers for Disease Control and Prevention's 2016 opioid prescribing guidelines[5] and be indicative of possible exposure to opioids during pregnancy.[6]

In a 2015 study using 2008–2012 data, Ailes et al. reported that opioid prescription claims were common among women of reproductive age, and a higher proportion of women enrolled in Medicaid filled a prescription for an opioid than those with private insurance.[7] On average, 27.7 percent of women aged 15–44 years with private insurance and 39.4 percent of those enrolled in Medicaid filled at least one opioid prescription in an outpatient

pharmacy annually during 2008–2012.[7] Although a steady increase in opioid prescribing has been noted in the United States starting in the early 1990s through approximately 2010,[8] estimates in more recent years have described decreasing trends in opioid prescribing.[8–11] However, these estimates were for opioid prescribing in the general US population and not specifically for women of reproductive age. The primary objectives of this analysis were to provide updated annual estimates of opioid prescription claims among women of reproductive age for 2013–2017 and describe the trends over time.

METHODS

This study was a secondary analysis of insurance claims data from IBM MarketScan® Commercial and Multi-State Medicaid Databases* to assess opioid prescriptions in outpatient pharmacy claims among women aged 15–44 years during 2013–2017. The Commercial Database is a convenience sample of persons with employer-sponsored insurance and their dependents from all US states. The Multi-State Medicaid Database includes Medicaid recipients in 8–10 unspecified US states from all four US census regions; the included states may vary from year to year. The study population included women aged 15–44 years enrolled for at least 334 days of the year under study in a private insurance plan sponsored by a large, self-insured employer, or Medicaid insurance plan, which reported prescription drug claims.

National Drug Codes were used to identify any outpatient pharmacy claim for any prescription opioids, including cough and cold formulations, methadone, and buprenorphine. While methadone and buprenorphine are evidence-based treatments of opioid use disorder, including during pregnancy,[12] these medications were included because they are still potentially associated with adverse neonatal outcomes such as NAS and low birth weight.[13] Pure opioid antagonists were excluded when not combined with an opioid agonist.

The proportion of women with at least one outpatient pharmacy opioid prescription claim during 2013–2017 was examined by year, insurance type, opioid medication type, age, US census region (women with private insurance only), and race/ethnicity (women enrolled in Medicaid only). To describe trends over time, we assessed the percent change in the proportion of women with opioid prescription claims between 2013 and 2017. We also assessed the proportion of women with more than one opioid prescription claim, among women who had at least one opioid prescription claim. To provide additional context for these findings, we examined the proportion of men aged 15–44 years who had opioid prescription claims and met the same inclusion criteria, stratified by insurer, for each study year. Because even small differences in percentage were statistically significant due to the large sample size, statistical tests of comparisons are not presented.

RESULTS

Approximately 3.5–3.8 million women with private insurance aged 15–44 years were included annually in the study sample during 2013–2017 (Table 1). Among these women,

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the proportion with an opioid prescription claim decreased by 22.1 percent, from 25.0 percent in 2013 to 19.5 percent in 2017 (Table 1; Figure 1). A greater proportion of women over 30 years of age had opioid prescription claims compared to women of younger ages, although a decreasing trend was observed between 2013 and 2017 across all age groups. Similarly, the proportion of women with opioid prescription claims decreased by more than 20 percent during the study period across all census regions. Hydrocodone was the most commonly filled opioid prescription, followed by codeine and oxycodone. The percent change between 2013 and 2017 varied by specific opioid but declines in claims were noted for all types of opioids.

Of the 0.9–2.1 million women enrolled in Medicaid who were included annually in the study sample during 2013–2017, the proportion with opioid prescription claims decreased by 31.5 percent, from 36.1 percent in 2013 to 24.7 percent in 2017 (Table 2; Figure 1). The annual proportion of women enrolled in Medicaid with opioid prescription claims generally increased with the increasing age, but the proportion decreased between 2013 and 2017 across all age groups (Table 2). The proportion of women with opioid prescription claims decreased by more than 30 percent during the study period for each race/ethnicity group. Similar to women with private insurance, hydrocodone was the most commonly filled opioid prescription, followed by oxycodone and tramadol. A decline in the percentage of women filling opioid prescriptions was noted for all types of opioids during 2013–2017, except for buprenorphine.

Compared to women with private insurance, the proportion of women enrolled in Medicaid with opioid prescription claims was consistently higher during 2013–2017, although the difference narrowed over this time period (Figure 1). Regardless of insurer type, women were more likely to have opioid prescription claims than men (Figure 1).

Among women with at least one opioid prescription claim, the proportion with more than one claim decreased by 16.9 and 13.6 percent among women with private insurance (from 37.8 to 31.4 percent) and women enrolled in Medicaid (from 55.7 to 48.1 percent), respectively, during 2013–2017 (Figure 2). Women enrolled in Medicaid with at least one opioid prescription claim were approximately 1.5 times more likely to fill more than one opioid prescription than women with private insurance each year (Figure 2). Among women that had at least one opioid prescription claim in the year of study, the median days' supply was 7 days for women enrolled in Medicaid (interquartile range [IQR]: 3–28 days) throughout the study period, but decreased slightly among women with private insurance from 6 days in 2013 (IQR: 3–15 days) to 5 days in 2017 (IQR: 3–20 days).

DISCUSSION

During 2013–2017, the proportion of women in this sample with private insurance who filled an opioid prescription decreased by approximately 22.1 percent, and among women enrolled in Medicaid, the proportion decreased by approximately 31.5 percent. Still, in 2017, about one in five women with private insurance and about one in four women enrolled in Medicaid filled at least one opioid prescription. Across all study years, women enrolled in Medicaid were more likely to fill at least one opioid prescription and, among women

who filled at least one opioid prescription, were also more likely to fill more than one opioid prescription, compared to women with private insurance; these differences, however, narrowed over this time period. Regardless of insurance type, a higher proportion of women had opioid prescription claims compared to men aged 15–44 years.

The proportion of women aged 15–44 years who filled a prescription for an opioid during 2013–2017 is lower than 2008–2012 estimates.[7] These findings are consistent with other studies that have reported recent declines in opioid prescribing in the general US population.[9–11] Guy et al. analyzed 2006–2015 data from a sample of 59,000 US pharmacies and found that per capita sales of opioids peaked in 2010 and decreased significantly each subsequent year through 2015.[9] In a second study using the same data from 2006 to 2017, Schieber et al. reported decreases over time in the prescribing rate for high-dosage and short-term opioid prescriptions.[10] However, the authors also reported an increase in the median days' supply,[10] which is inconsistent with our finding of a relatively stable trend in days' supply from 2013 to 2017. Using 2006–2016 nationwide US Drug Enforcement Administration's Automation of Reports and Consolidated Orders System data, Piper et al. (2018) noted a decrease in opioid sales from 2011 to 2016, but changes over time varied by specific medication.[11] All of these previous studies noted substantial geographic variability in the prevalence and changes in prescription opioid sales or prescription opioid prescribing; none of these studies described prescription opioid use specifically among women of reproductive age.

The decrease in the percentage of women with opioid prescription claims observed in this study may be related to a number of factors, including increased awareness in the United States of risks associated with opioid use. Federal and state-level efforts to reduce opioid prescribing during 2013–2017 include increased utilization of prescription drug monitoring programs and increased provider education on recommended opioid prescribing practices to treat chronic pain.[14] In addition, in March 2016, the CDC issued guidelines for prescribing prescription opioids for chronic pain which recommended nonopioid therapy as a first-line treatment for chronic pain, and if treatment with opioids is initiated for acute pain, providers should prescribe the lowest effective dosage and for only the expected duration of severe pain.[5]

However, any conclusions about changes over time in our analysis of Medicaid data, in particular, should be interpreted with caution. The 8–10 states included in the Multi-State Medicaid sample are not disclosed and may vary between years. Also, some socioeconomic characteristics of the national Medicaid-enrolled population may have changed due to Medicaid expansion. For instance, Medicaid enrollees in states with expanded Medicaid programs were more likely to have higher incomes and less likely to have comorbidities than enrollees from nonexpansion states.[15] Therefore, the overall health of the Medicaid-insured population may explain some of the observed decreases in opioid prescription claims in our study's Medicaid sample. However, in a sensitivity analysis restricted to women who were enrolled in Medicaid during all five years of the study, the trend in opioid claims did not change (data not shown).

This analysis is subject to at least four additional limitations. These results are not generalizable to the entire US population (including those who are uninsured), because the commercial data were a convenience sample of individuals with private insurance, and the Medicaid data includes only a sample of 8–10 states annually. Based on the American Community Survey's annual population estimates for civilian, non-institutionalized women aged 18–44 years in 2013–2016 (19–44 years in 2017), our analysis represented approximately 8–9 percent of US women with private insurance and 8–16 percent of those enrolled in Medicaid or other means-tested public coverage per year.[16] Second, these analyses likely underestimate the prevalence of prescription opioid use because they do not include inpatient data on medication orders, opioids administered in outpatient clinics, opioids paid for out-of-pocket, or diverted prescription opioids. In particular, these analyses likely underestimated the prevalence of methadone and buprenorphine use, because treatment of opioid use disorder with methadone must be conducted in federally approved opioid treatment program clinics and buprenorphine can be directly dispensed in physician offices or other outpatient clinics.[17] Furthermore, these data represent opioids dispensed by outpatient pharmacies with no verification that medications were taken as prescribed. Finally, we chose not to make inference regarding the indication for the opioid prescriptions filled in this study because indication is not included on the pharmacy claims and these claims are not directly linkable to the inpatient and outpatient claims on which diagnoses are recorded.

Despite the observed decline over time in the annual percentage of women with opioid prescription claims, they remained common among reproductive-aged women. Given the increasing rates of opioid-related overdose deaths,[17,18] opioid use disorder at labor and delivery,[19] and other adverse infant outcomes that have been associated with prenatal opioid exposure (eg, orofacial clefts,[3,21,22] gastroschisis[23]), opioid prescribing that is not concordant with prescribing guidelines and illicit use of opioids during pregnancy are public health concerns. An increasing incidence of NAS has been reported,[24,25] but this increase could be due, in part, to an increase in the treatment of opioid use disorder during pregnancy.[26] Thus, monitoring trends in opioid prescription claims and treatment of opioid use disorder among reproductive-aged women may be useful to evaluate the effect of opioid prescribing guidelines on changing prescribing practices and may predict some of the level of exposures anticipated in pregnancy.

Although opioid prescription claims among insured reproductive-aged women have declined in recent years, they remain common. While many women need prescription opioids to appropriately manage medical conditions and treat pain, improving concordance with prescribing guidelines may further reduce opioid prescribing in this group. Reducing exposure to prescription opioids may decrease adverse outcomes, including adverse impacts on women's health as well as potential pregnancy, infant, or childhood outcomes.

ACKNOWLEDGMENTS

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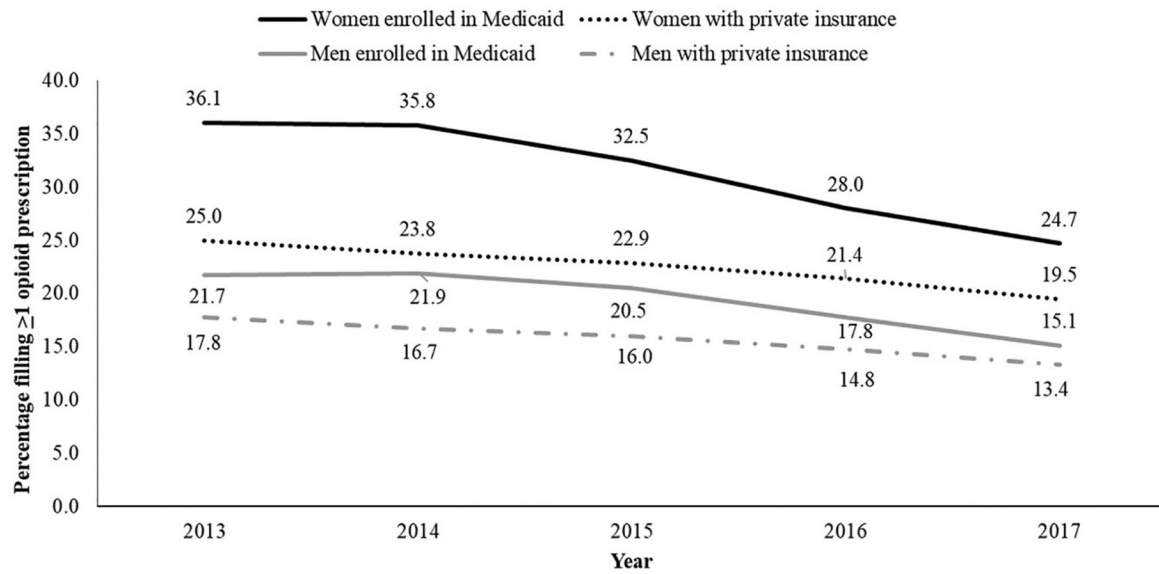
Figure 1. Percentage* of women and men aged 15–44 years with private or Medicaid insurance who filled a prescription for an opioid from an outpatient pharmacy, by insurance type and year[†]—United States, 2013–2017.

*The percentage of individuals with opioid prescription claims was calculated among the total population of eligible women or men, eg, women aged 15–44 years enrolled   334 days per year in a plan that includes prescription drug coverage.

[†]The same individual could be included in more than one year of data.

Figure 2. Percentage* of women aged 15–44 years with private or Medicaid insurance who filled more than one opioid prescription, among those who filled at least one opioid prescription, by year†—United States, 2013–2017.

*The percentage of women who filled more than one opioid prescription was calculated among the population of eligible women who filled at least one opioid prescription, ie, women aged 15–44 years enrolled 334 days per year in a plan that includes prescription drug coverage.

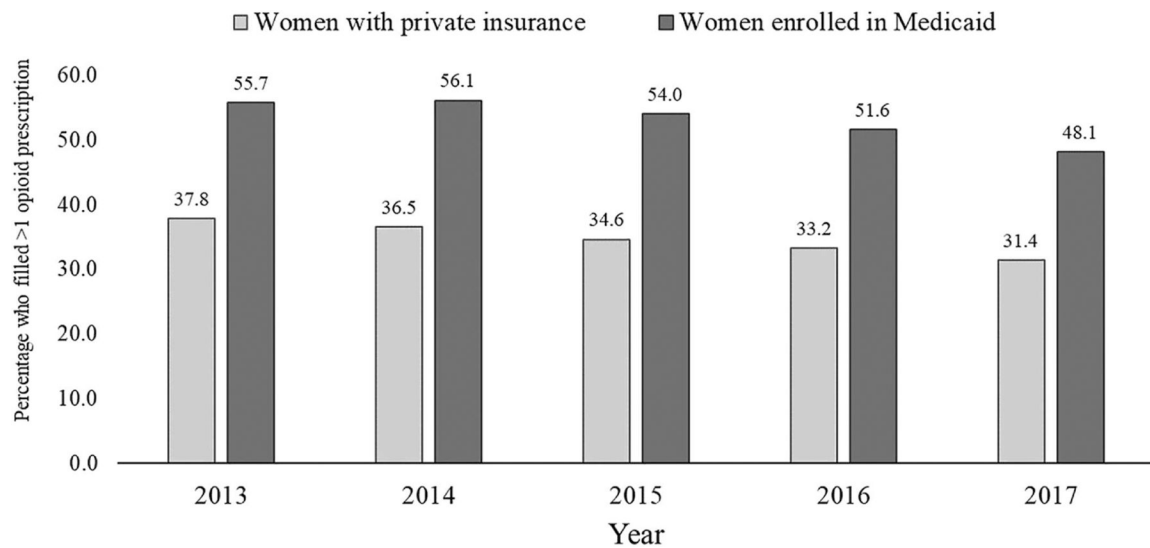†The same woman could be included in more than one year of data.

Table 1.

Percentage and percent change of women aged 15–44 years with private Insurance who filled an opioid prescription, by selected demographic characteristics and type of opioid—United States, 2013–2017

Study population characteristics [*]	2013 (percent)	2014 (percent)	2015 (percent)	2016 (percent)	2017 (percent)	Percent change from 2013 to 2017 [*]
Any opioid prescription	25.0	23.8	22.9	21.4	19.5	−22.1
Age group (years) [†]						
15–19	16.9	16.1	15.7	14.8	13.5	−20.2
20–24	21.1	19.9	19.2	17.7	16.0	−24.0
25–29	25.5	23.6	22.5	20.8	18.7	−26.5
30–34	29.2	27.6	26.7	24.8	22.4	−23.3
35–39	29.1	27.7	26.7	25.3	23.2	−20.3
40–44	29.0	27.6	26.7	25.2	23.2	−19.9
US census region [†,‡,§]						
South	28.9	27.0	26.1	24.8	23.0	−20.4
West	24.1	22.7	22.1	20.3	18.2	−24.5
North Central	23.9	23.0	22.1	20.7	18.6	−22.1
Northeast	19.0	17.5	16.8	15.4	13.4	−29.2
Specific opioid [‖]						
Hydrocodone	15.5	14.2	11.9	10.9	9.8	−37.1
Codeine	6.0	5.6	6.6	6.0	5.3	−11.1
Oxycodone	5.8	5.8	5.9	5.7	5.2	−10.1
Tramadol	3.3	3.4	3.4	3.1	2.8	−13.5
Hydromorphone	0.3	0.3	0.3	0.2	0.2	−29.0
Buprenorphine [¶]	0.2	0.2	0.2	0.2	0.2	−14.4
Meperidine	0.1	0.1	0.1	0.1	0.0	−60.5
Morphine	0.1	0.1	0.1	0.1	0.1	−24.4
Tapentadol	0.1	0.1	0.1	0.1	0.1	−40.2
Fentanyl	0.1	0.1	0.1	0.1	0.0	−52.1

Study population characteristics [*]	2013 (percent)	2014 (percent)	2015 (percent)	2016 (percent)	2017 (percent)	Percent change from 2013 to 2017 [*]
Methadone [¶]	0.0	0.0	0.0	0.0	0.0	−54.5
Oxymorphone	0.0	0.0	0.0	0.0	0.0	−53.1
No. of eligible women [#]	3,820,433	3,709,015	3,494,772	3,600,027	3,660,343	

[*]
The same woman could be included in multiple years of data. Year-specific values are rounded to one significant digit. Percent change estimates describe the percentage change in the proportion of reproductive-aged women who filled an opioid prescription between 2013 and 2017 for each characteristic and are based on unrounded data.

[†]
The percentage of women with opioid prescription claims was calculated among the total population of eligible women (ie, women aged 15–44 years enrolled 334 days per year in a plan that includes prescription drug coverage) with the particular demographic characteristic of interest.

[‡]
Northeast: Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont; *North Central:* Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin; *South:* Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia; *West:* Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

[§]
Excludes those with missing values. Among women eligible for the analytic sample, data for US census region were missing for 0.3–2.9 percent per year.

[‖]
Not mutually exclusive; percentages may sum to >100 percent because a woman may have had multiple opioid prescription claims within a calendar year. Specific medications were included in the table if the percentage was at least 0.1 percent in at least one calendar year.

[¶]
Buprenorphine and methadone prescriptions that were dispensed in outpatient clinics (eg, opioid treatment programs) are not included.

[#]
Women aged 15–44 years enrolled 334 days per year in a plan that includes prescription drug coverage.

Table 2.

Percentage and percent change of women aged 15–44 years enrolled in Medicaid who filled an opioid prescription, by selected demographic characteristics and type of opioid—United States, 2013–2017

Study population characteristics [*]	2013 (percent)	2014 (percent)	2015 (percent)	2016 (percent)	2017 (percent)	Percent change from 2013 to 2017 [*]
Any opioid prescription	36.1	35.8	32.5	28.0	24.7	−31.5
Age group (years) [†]						
15–19	22.6	20.3	17.6	15.7	13.8	−39.2
20–24	36.9	34.5	31.1	26.4	22.5	−38.9
25–29	43.2	42.1	38.1	32.3	28.9	−33.1
30–34	45.7	44.9	40.8	33.6	29.4	−35.6
35–39	47.6	46.2	42.3	35.9	31.4	−33.9
40–44	48.9	47.3	43.8	37.3	32.9	−32.7
Race/ethnicity [†,‡]						
Non-Hispanic white	41.1	40.1	36.0	31.7	28.0	−32.0
Non-Hispanic black	31.6	31.6	28.9	23.7	21.1	−33.3
Hispanic	24.6	26.1	22.5	18.9	15.7	−36.3
Other	30.5	28.5	25.2	20.7	18.5	−39.1
Specific opioid [§]						
Hydrocodone	23.0	22.3	19.1	15.8	13.2	−42.8
Oxycodone	12.7	13.0	12.1	10.3	8.8	−30.8
Tramadol	9.0	9.2	7.5	6.1	4.8	−46.7
Codeine	6.6	6.9	6.7	5.6	4.8	−27.4
Fentanyl	1.1	0.6	0.6	0.5	0.4	−66.9
Hydromorphone	0.9	0.6	0.6	0.5	0.3	−65.7
Buprenorphine [‖]	0.7	1.2	1.2	1.3	1.4	108.4
Meperidine	0.1	0.1	0.1	0.1	0.1	−62.1
Morphine	0.4	0.4	0.4	0.4	0.3	−26.9
Tapentadol	0.1	0.1	0.0	0.0	0.0	−55.4

Study population characteristics [*]	2013 (percent)	2014 (percent)	2015 (percent)	2016 (percent)	2017 (percent)	Percent change from 2013 to 2017 [*]
Methadone [//]	0.2	0.1	0.1	0.1	0.1	−65.7
Oxymorphone	0.2	0.1	0.1	0.0	0.0	−85.2
No. of eligible women [¶]	932,509	1,611,902	1,873,282	2,066,338	2,117,524	

[*] The same woman could be included in multiple years of data. Year-specific values are rounded to one significant digit. Percent change estimates describe the percentage change in the proportion of reproductive-aged women who filled an opioid prescription between 2013 and 2017 for each characteristic and are based on unrounded data.

[†] The percentage of women with opioid prescription claims was calculated among the total population of eligible women (ie, women aged 15–44 years enrolled ≥334 days per year in a plan that includes prescription drug coverage) with the particular demographic characteristic of interest.

[‡] Excludes those with missing values. Among women eligible for the analytic sample, data for race/ethnicity was missing for 8.0–9.1 percent of women per year.

[§] Not mutually exclusive; percentages may sum to >100 percent because a woman may have had multiple opioid prescription claims within a calendar year. Specific medications were included in the table if the percentage was at least 0.1 percent in at least one calendar year.

[//] Buprenorphine and methadone prescriptions that were dispensed in outpatient clinics (eg, opioid treatment programs) are not included.

[¶] Women aged 15–44 years enrolled ≥334 days per year in a plan that includes prescription drug coverage.