



DRUG ENFORCEMENT ADMINISTRATION
DIVERSION CONTROL DIVISION

NFLIS

NATIONAL FORENSIC LABORATORY INFORMATION SYSTEM



DRUG

NFLIS-Drug Special Report: Tramadol Reported in NFLIS, 2010–2019



Highlights

From 2010 to 2019, tramadol reports increased 382%, from 1,702 to 8,196 reports. The largest increases in tramadol reports occurred from 2013 to 2014 (34%), 2014 to 2015 (59%), and 2017 to 2018 (36%).

The Midwest had the highest number of tramadol reports per 100,000 persons aged 15 or older in 2010 and from 2014 through 2019. From 2011 through 2013, the South's numbers were slightly higher than those of the Midwest. The West had the lowest number of tramadol reports per 100,000 persons aged 15 or older in every year except 2015, when the Northeast had the lowest number of reports.

Tramadol reports per 100,000 persons aged 15 or older increased significantly from 2010 to 2019 across all regions. More recently, from 2018 to 2019, tramadol reports per 100,000 persons aged 15 or older decreased significantly in the West, Midwest, and South but increased significantly in the Northeast.

In 2019, 3,961 tramadol reports had at least one other drug in the same item. Of tramadol reports that contained at least one other drug in the same item, 85% contained fentanyl.

From 2010 to 2019, the percentage of total drug reports that were identified as tramadol increased in 44 States. States with the highest relative increases in tramadol reports as a percentage of total drug reports were primarily in the South and Northeast, with 10 States in those regions increasing 1,000% or more. The highest increases occurred in New York (27,000% increase), Alabama (23,000% increase), North Carolina (13,000% increase), and Florida (4,000% increase).

Between 2010 and 2019, a total of 380.0 million tramadol prescriptions were dispensed in the United States. The number of dispensed tramadol prescriptions peaked at 44.2 million in 2014, followed by a continuous decrease to 33.6 million in 2019.

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Introduction

The National Forensic Laboratory Information System (NFLIS) is a program of the Drug Enforcement Administration (DEA), Diversion Control Division. NFLIS-Drug systematically collects drug identification results and associated information from drug cases submitted to and analyzed by Federal, State, and local forensic laboratories. These laboratories analyze controlled and noncontrolled substances secured in law enforcement operations across the country, making NFLIS-Drug an important resource in monitoring illicit drug abuse and trafficking, including the diversion of legally manufactured pharmaceuticals into illegal markets.

Tramadol is a Schedule IV narcotic analgesic prescribed for the treatment of moderate to moderately severe pain. Taken at high doses or in combination with other drugs, tramadol can cause adverse effects such as serotonin syndrome.ⁱ Using National Survey on Drug Use and Health (NSDUH) data in conjunction with total annual prescription data from Symphony Health, researchers concluded that past year misuse of oral tramadol by persons aged 12 or older represented 4% of prescriptions from 2015 to 2017.ⁱⁱ For comparison, other narcotic analgesics such as morphine, oxycodone, and hydrocodone averaged past year

misuse of 7% to 8% of total prescriptions during the same period.ⁱⁱ The 2019 NSDUH data show past year prescription narcotic analgesic misuse as a percentage of any past year use, ranging from 7.8% each for tramadol and morphine to 27.3% and 27.8% for oxycodone and buprenorphine, respectively.ⁱⁱⁱ Slightly more than 50% of the misused prescription narcotic analgesics were obtained (given, purchased, or taken) from a friend or relative, and 66% were misused to relieve physical pain.ⁱⁱⁱ Tramadol first appeared in NFLIS-Drug's top 25 most frequently identified drugs in 2015 as the 17th most reported drug;^{iv} by 2019, tramadol was the 12th most reported drug in NFLIS-Drug and the 6th most frequently reported narcotic analgesic.^v

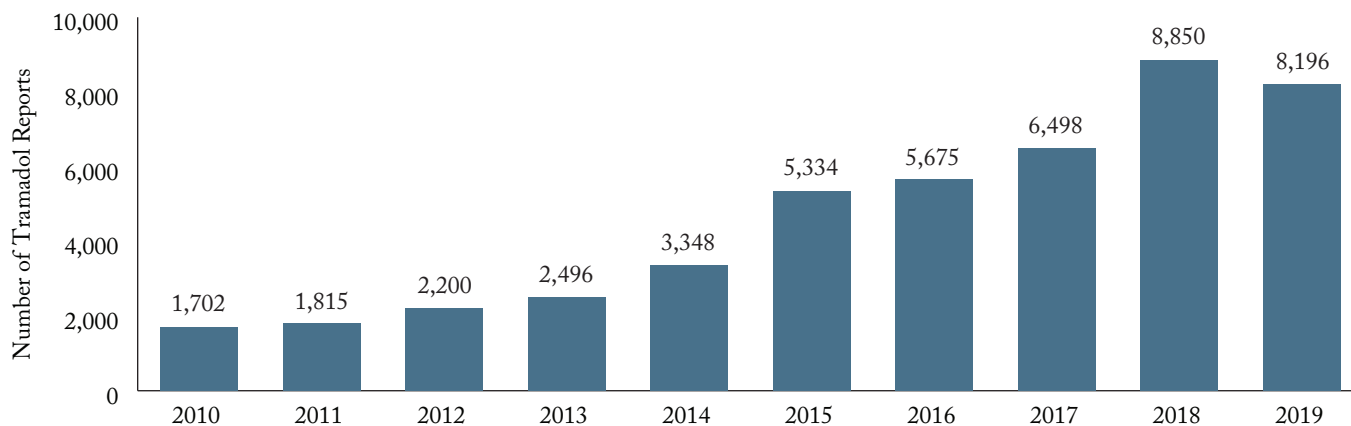
This publication presents results of tramadol drug cases submitted to State and local laboratories from January 1, 2010, through December 31, 2019, that were analyzed by March 31, 2020. Federal data during the same period are also shown. National and regional estimates, tramadol reports that contained at least one other drug in the same item, State and county maps, and IQVIA Launch data on dispensed prescriptions of tramadol are presented.

National Estimates

Figure 1 presents national annual estimates of tramadol reports that were submitted to State and local laboratories from January 2010 through December 2019 and were analyzed within three months of each calendar year reporting period. From 2010 to 2019, tramadol reports increased 382%, from 1,702 to

8,196 reports. From 2010 to 2018, tramadol reports increased between 7% and 59% annually. From 2018 to 2019, however, tramadol reports decreased 7%, from 8,850 to 8,196 reports. The largest increases in tramadol reports occurred from 2013 to 2014 (34%), 2014 to 2015 (59%), and 2017 to 2018 (36%).

Figure 1 National annual estimates for tramadol in NFLIS-Drug, 2010–2019¹



¹ Includes tramadol reports submitted to State and local laboratories from January 1, 2010, through December 31, 2019, and analyzed within three months of each calendar year reporting period.

Regional Trends

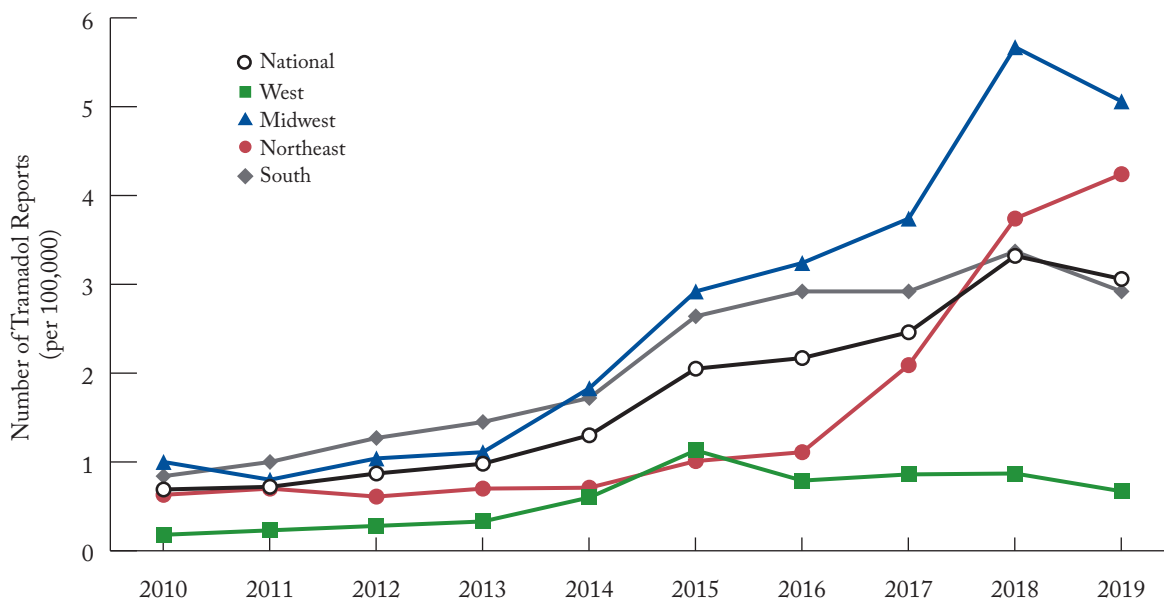
Regionally, the Midwest had the highest number of tramadol reports per 100,000 persons aged 15 or older in 2010 and from 2014 through 2019 (Figure 2). From 2011 through 2013, the South's numbers were slightly higher than those of the Midwest. The South had the 2nd highest number of tramadol reports per 100,000 persons in 2010 and from 2014 to 2017, but the Northeast surpassed the South in 2018. The West had the lowest number of tramadol reports per 100,000 persons aged 15 or older in every year except 2015, when the Northeast had the lowest number of reports. The number of tramadol reports per 100,000 persons aged 15 or older in the West was always below the national trend. The number of tramadol reports per 100,000 persons aged 15 or older in the Northeast surpassed the national trends in 2018 and 2019, while the South's number fell slightly below the national trend in 2019.

- In the West, tramadol reports per 100,000 persons aged 15 or older increased significantly from 2010 to 2019 (from 0.18 to 0.67 reports). Reports increased each year from 2011 to 2015 and again in 2017 and 2018. The most notable increases occurred from 2013 to 2014 (from 0.33 to 0.60 reports) and from 2014 to 2015 (from 0.60 to 1.13 reports), when reports nearly doubled. Tramadol reports per 100,000 persons aged 15 or older significantly decreased in the West from 2018 to 2019, from 0.87 reports to 0.67 reports.
- In the Midwest, tramadol reports per 100,000 persons aged 15 or older increased significantly from 2010 to 2019 (from 1.00 to 5.06 reports). Reports in the Midwest increased each year from 2013 to 2019. Reports increased 41% from 2014 to 2015 (from 1.11 to 1.01 reports), 88% from 2016 to 2017 (from 1.11 to 2.09 reports), and 79% from 2017 to 2018 (from 2.09 to 3.74 reports). The Northeast was the only region in which tramadol reports per 100,000 persons aged 15 or older increased from 2018 to 2019, increasing significantly from 3.74 to 4.24 reports.

to 5.06 reports). Reports in the Midwest increased each year from 2012 to 2018. The most notable increases occurred from 2013 to 2014 (from 1.11 to 1.83 reports) and from 2014 to 2015 (from 1.83 to 2.92 reports), when reports increased by 60% or more, and from 2017 to 2018 (from 3.74 to 5.67 reports), when reports increased by more than 50%. Tramadol reports per 100,000 persons aged 15 or older significantly decreased in the Midwest from 2018 to 2019, from 5.67 to 5.06 reports.

- In the Northeast, tramadol reports per 100,000 persons aged 15 or older increased significantly from 2010 to 2019 (from 0.63 to 4.24 reports). Reports in the Northeast increased each year from 2013 to 2019. Reports increased 41% from 2014 to 2015 (from 0.71 to 1.01 reports), 88% from 2016 to 2017 (from 1.11 to 2.09 reports), and 79% from 2017 to 2018 (from 2.09 to 3.74 reports). The Northeast was the only region in which tramadol reports per 100,000 persons aged 15 or older increased from 2018 to 2019, increasing significantly from 3.74 to 4.24 reports.
- In the South, tramadol reports per 100,000 persons aged 15 or older increased significantly from 2010 to 2019 (from 0.84 to 2.92 reports). Reports in the South increased annually from 2011 to 2018, including a 53% increase from 2014 to 2015 (from 1.72 to 2.64 reports). Tramadol reports per 100,000 persons aged 15 or older significantly decreased in the South from 2018 to 2019, from 3.37 to 2.92 reports.

Figure 2 National and regional trends in tramadol reported per 100,000 persons aged 15 or older, January 2010–December 2019



Tramadol Reported with Other Drugs in the Same Item

This section presents raw data from Federal, State, and local laboratories on tramadol combinations—items reported with tramadol and at least one other drug in the same item. The data presented in this section are not necessarily counts of true combinations (e.g., powders mixed together); they also include counts of separate drugs reported together in the same item. For example, a bag of tramadol packaged with a bag of heroin may be considered a single item, and both would be reported as substances within that item. Policies for identifying what constitutes an item vary by laboratory. Data presented in this section were generated on August 28, 2020, from the NFLIS-Drug database.

Among items containing tramadol reported in 2019, 3,961 contained at least one other drug in the same item. Of these tramadol combination items, 85% contained fentanyl, 57% contained heroin, 10% contained acetyl fentanyl, and 7% contained cocaine (Figure 3).

There were 2,662 items that had two or more drugs in addition to tramadol, resulting in a total of 8,544 drugs reported in combination with tramadol. Of all drugs reported in combination with tramadol, fentanyl was the most frequently identified (39% or 3,363 reports), with heroin being the next most common (26% or 2,240 reports) (Figure 4).

Figure 3 Percentage of all NFLIS-Drug 2019 items containing tramadol and at least one other drug¹

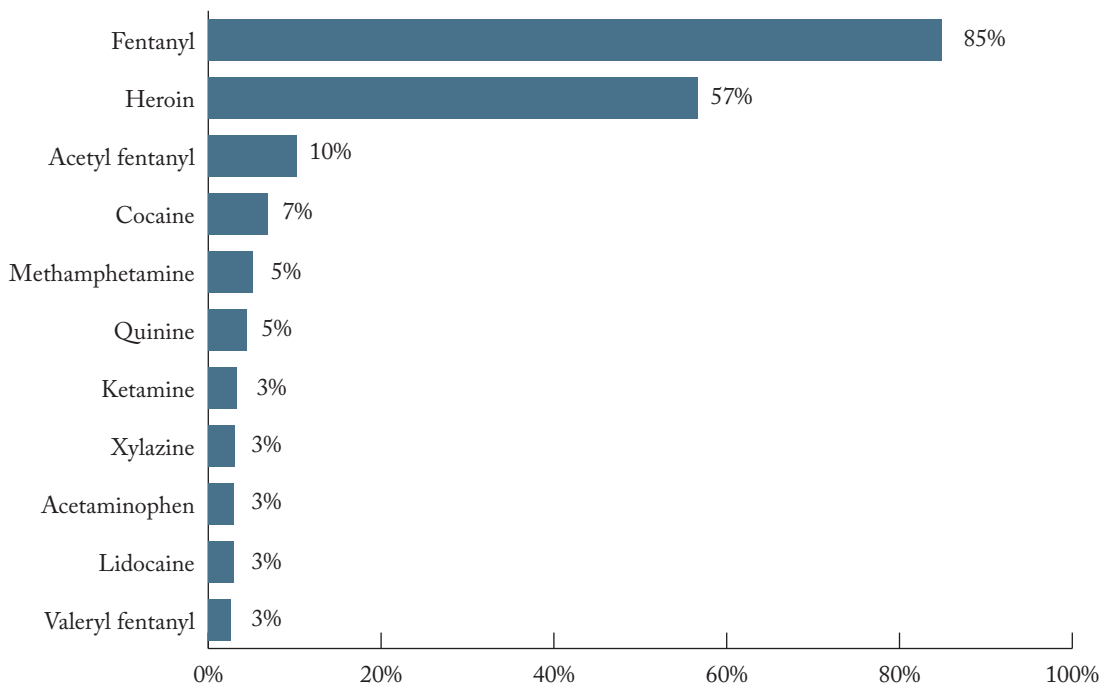
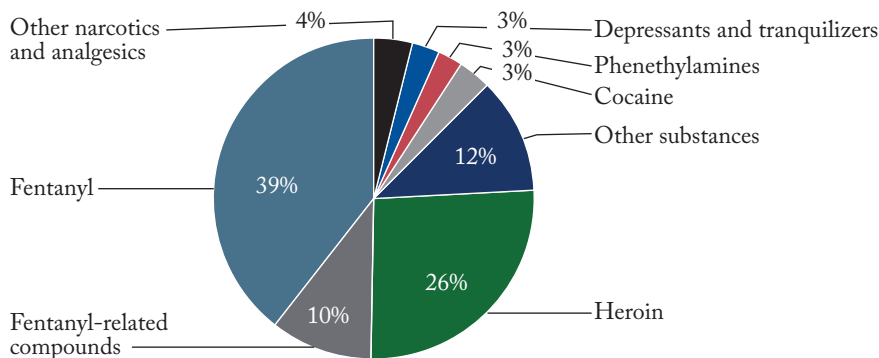


Figure 4 Percentage of drugs reported in combination with tramadol in NFLIS-Drug, 2019¹



¹ The data presented in this figure are not necessarily counts of true combinations (e.g., powders mixed together); they also include counts of separate drugs reported together in the same item. The data presented in this figure were generated on August 28, 2020, from the NFLIS-Drug database.

Tramadol Reports by Federal Laboratories

NFLIS-Drug collects the results of drug evidence from eight DEA and seven U.S. Customs and Border Protection (CBP) laboratories. The data reflect results of substance evidence from drug seizures, undercover drug buys, targeted operations, and other evidence analyzed at DEA and CBP laboratories across the country. Although DEA data capture domestic and international drug cases, the results presented in this section describe only those drugs obtained in the United States. Similarly, the CBP data represent seizures at U.S. points of entry and domestic drug cases.

A total of 66,215 drugs were submitted to DEA and CBP laboratories during 2019 and analyzed by March 31, 2020.^v Of these, tramadol was the 6th most frequently identified drug and the 3rd most reported narcotic analgesic, accounting for 1% (796 reports) of all reports. Tramadol was the 6th most frequently identified drug reported by DEA and CBP laboratories in 2018 (656 reports)^{vi} and the 10th most frequently reported drug in 2017 (372 reports).^{vii}

Tramadol Reports, by State and County

The data presented in this section are raw data—not estimates—from Federal, State, and local laboratories that were generated on August 26, 2020, from the NFLIS-Drug database. The geographic data are based on information provided to the forensic laboratories by the submitting law enforcement agencies in the county of origin associated with each drug seizure incident. It is important to note that these data represent only those items that were submitted to and analyzed by forensic laboratories. A small number of laboratories within a few States were not reporting data to NFLIS-Drug, and their absence may affect the relative distribution of drugs seized and analyzed.

[Figure 5](#) shows that in 2010, 33 States had at least one tramadol report, with one State reporting 200 or more reports. Less than 1% of drug reports in all States were reported as tramadol ([Figure 6](#)). By 2019, 49 States had at least one tramadol report. A total of 11 States had 200 or more tramadol reports, including three States—New York, Ohio, and Pennsylvania—reporting more than 1,000 tramadol reports ([Figure 7](#)). In 2019,

1% or more of all drug reports in 10 States were tramadol ([Figure 8](#)), including five States—Alaska, Connecticut, Delaware, New York, and Vermont—where 2% or more of total drug reports were tramadol.

From 2010 to 2019, the percentage of total drug reports that were identified as tramadol increased in every reporting State except Kentucky, Nebraska, Nevada, North Dakota, and South Dakota, where the percentage decreased, and Hawaii, which had no tramadol reports in 2010 or 2019 (data not shown). States with the highest relative increases in tramadol reports as a percentage of their total drug reports were primarily in the South and Northeast, with 10 States in those regions increasing 1,000% or more. The highest increases occurred in New York (27,000% increase), Alabama (23,000% increase), North Carolina (13,000% increase), and Florida (4,000% increase). Arizona had the largest relative increase in the West (700%), and Ohio had the largest relative increase in the Midwest (900%).



Seized bags of tramadol

Figure 5 Tramadol reports, by State, 2010

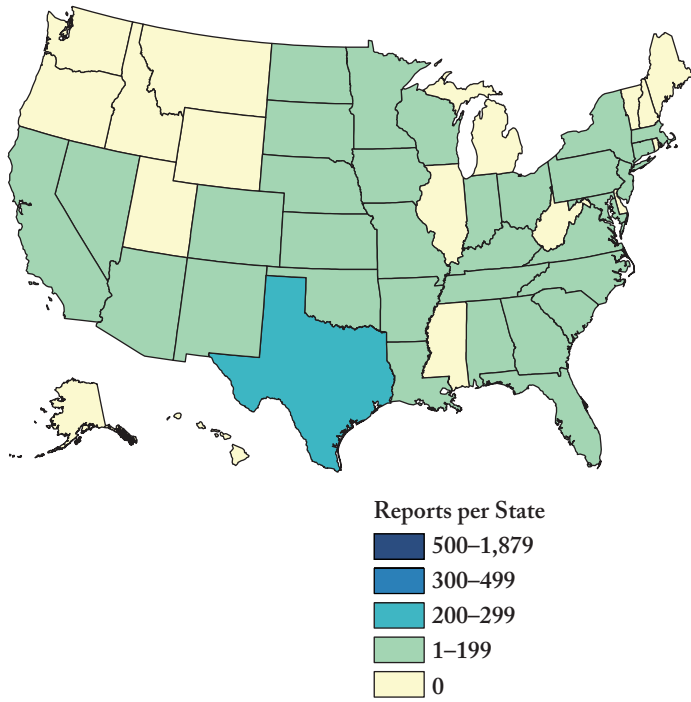


Figure 6 Percentage of total drug reports identified as tramadol, by State, 2010

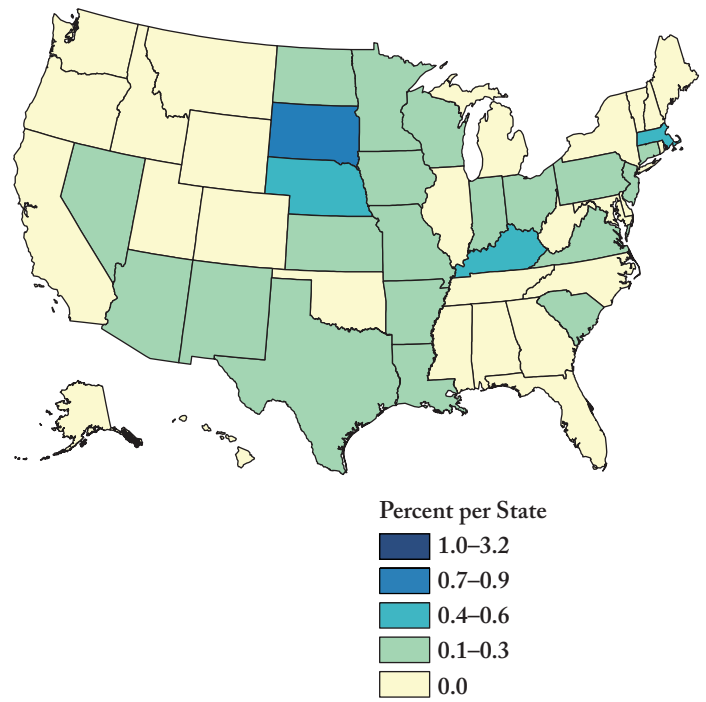


Figure 7 Tramadol reports, by State, 2019

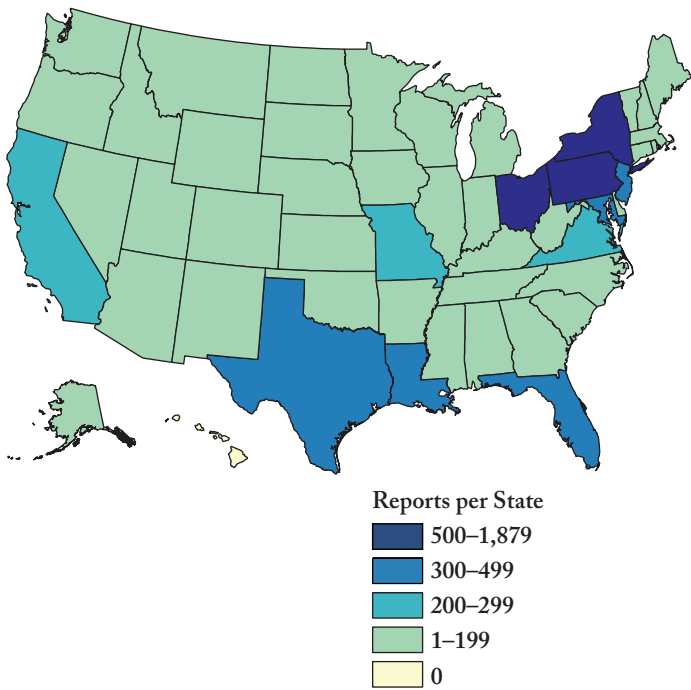
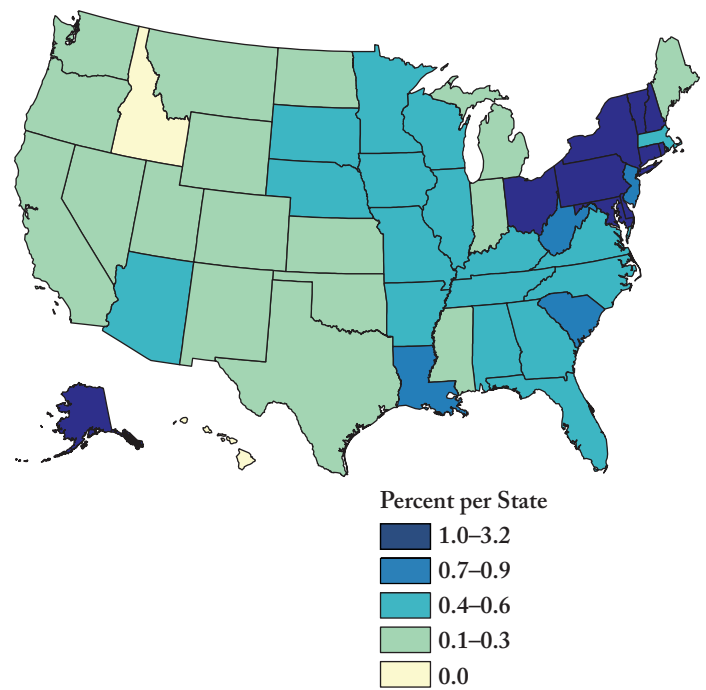


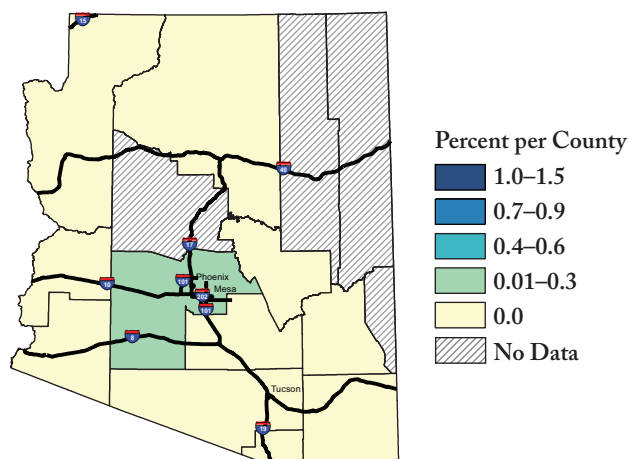
Figure 8 Percentage of total drug reports identified as tramadol, by State, 2019



The rest of this section shows tramadol reports, by counties in selected States, in 2010 and 2019. States were selected based on their geographic diversity (one State per U.S. census region) and large relative increases from 2010 to 2019 in the number and percentage of total drug reports identified as tramadol.

Arizona had the 4th highest number of tramadol reports in the West in 2010 and the 2nd highest number of tramadol reports in the West in 2019. In 2010, Maricopa County, with seven tramadol reports, was the only county in Arizona that reported tramadol, representing just 0.1% of total drug reports in the county (Figure 9). By 2019, 10 of the 15 counties in Arizona had at least one tramadol report, with Maricopa (81 reports) and Pima (12 reports) Counties having the highest numbers of reports. Tramadol represented 1% or more of total drug reports in Yuma (1.5%), Santa Cruz (1.2%), and Greenlee (1.1%) Counties (Figure 10).

Figure 9 Percentage of total drug reports identified as tramadol in Arizona, by county, 2010



Ohio had the 6th highest number of tramadol reports in 2010 (97 reports) and by 2019 had the highest number of reports across all 50 States (1,879 reports). Of the 88 counties in Ohio, only 18 had tramadol reports in 2010, with the highest numbers reported in Lake (29 reports) and Hamilton (25 reports) Counties. In 2010, 1% or more of total drug reports in Coshocton (1.3%), Ashland (1.0%), and Lake (1.0%) Counties were tramadol (Figure 11). By 2019, all but nine counties in Ohio had at least one tramadol report, with the highest numbers occurring in Cuyahoga (304 reports), Franklin (202 reports), Hamilton (182 reports), Montgomery (163 reports), and Mahoning (139 reports) Counties. In 51 counties, tramadol represented 1% or more of total drug reports, with the highest percentages reported in Mahoning (7.7%), Pike (5.7%), Clark (4.1%), and Ross (3.0%) Counties (Figure 12).

Figure 10 Percentage of total drug reports identified as tramadol in Arizona, by county, 2019

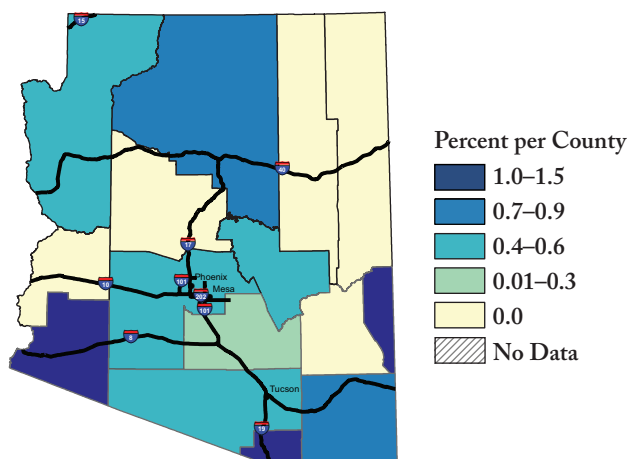


Figure 11 Percentage of total drug reports identified as tramadol in Ohio, by county, 2010

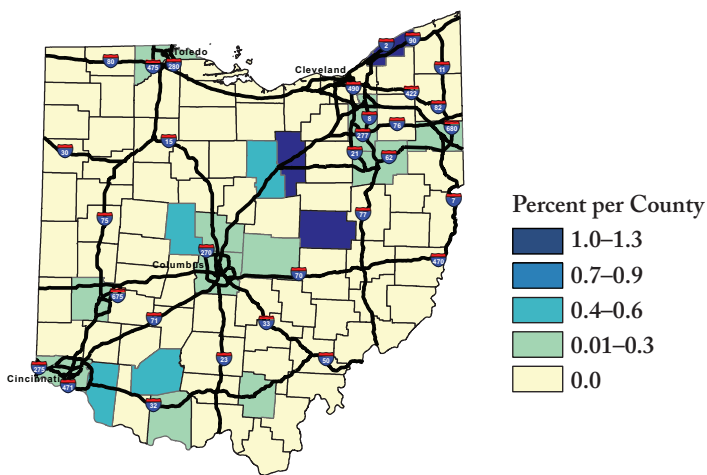
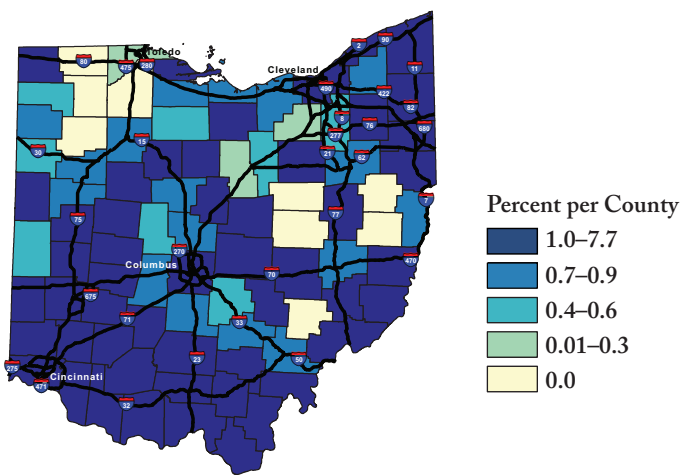


Figure 12 Percentage of total drug reports identified as tramadol in Ohio, by county, 2019



In 2010, New Jersey had the 12th highest number of tramadol reports (37 reports), with 12 of the 21 counties reporting tramadol. All of those 12 counties had five or fewer tramadol reports. The percentage of total drug reports that were tramadol was 0.5% or less in all the counties in New Jersey with tramadol reports (Figure 13). By 2019, all 21 counties in New Jersey had at least one tramadol report, with the highest numbers of reports occurring in Passaic and Camden Counties (54 reports each); another nine counties had between 20 and 45 reports. Tramadol accounted for 1% or more of total drug reports in Passaic (1.4%), Salem (1.3%), Bergen (1.1%), and Mercer (1.0%) Counties (Figure 14).

Maryland had the 16th highest number of tramadol reports in 2010. Of Maryland's 24 counties, 13 had at least one tramadol report in 2010, with the highest numbers occurring in Harford (six reports) and Howard (five reports) Counties. In each Maryland county that reported tramadol in 2010, tramadol accounted for less than 0.5% of total drug reports (Figure 15). By 2019, Maryland had the 4th highest number of tramadol reports across all 50 States. All but two counties in Maryland in 2019 had at least one tramadol report, with the highest numbers occurring in Baltimore City (179 reports) and in Baltimore (71 reports), Anne Arundel (55 reports), Frederick (38 reports), and Montgomery (29 reports) Counties. Tramadol accounted for 1% or more of total drug reports in 13 counties, with the highest percentages in Baltimore City (1.7%) and in Caroline (3.4%), Frederick (2.2%), and Carroll (1.6%) Counties (Figure 16).

Figure 13 Percentage of total drug reports identified as tramadol in New Jersey, by county, 2010

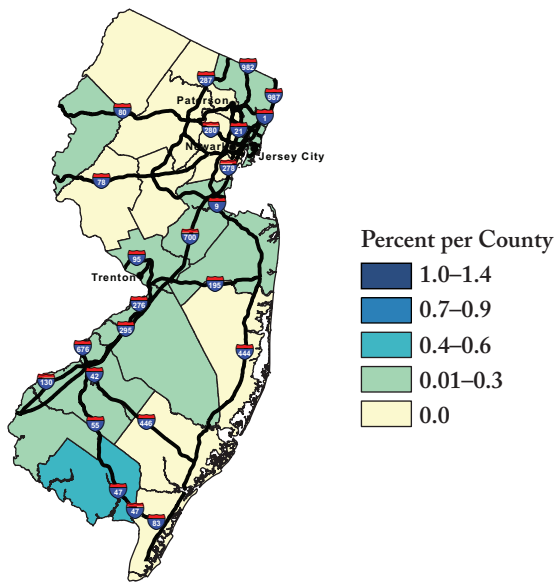


Figure 14 Percentage of total drug reports identified as tramadol in New Jersey, by county, 2019

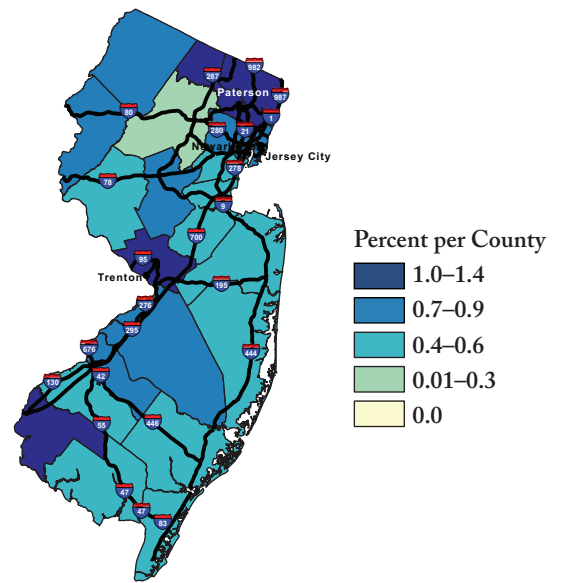


Figure 15 Percentage of total drug reports identified as tramadol in Maryland, by county, 2010

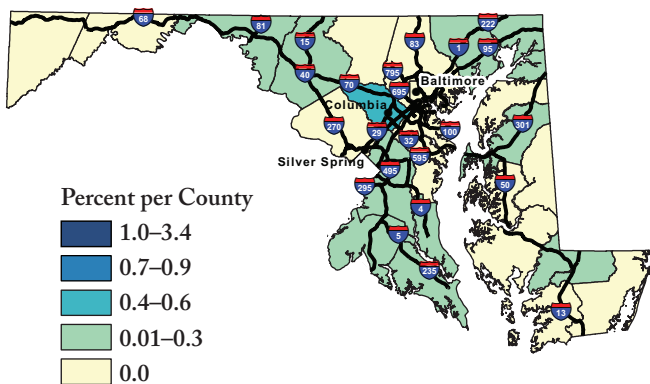
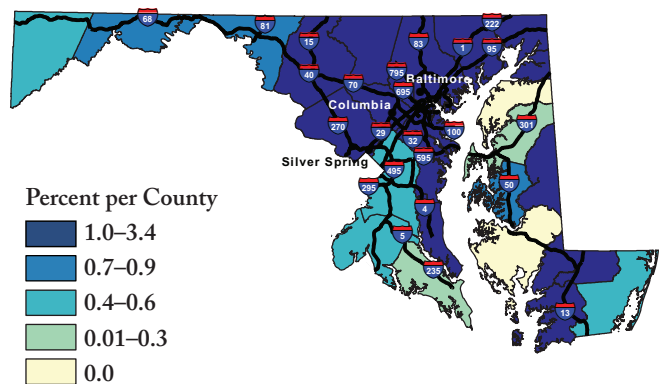


Figure 16 Percentage of total drug reports identified as tramadol in Maryland, by county, 2019

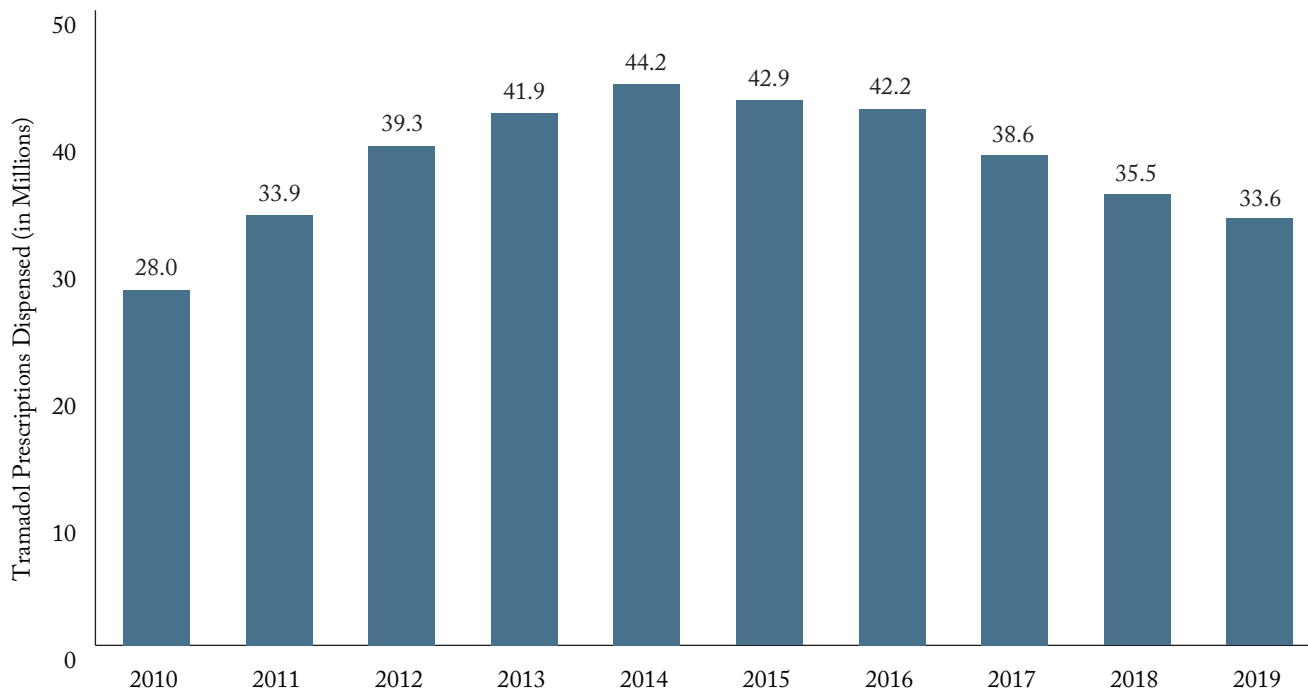


Tramadol Prescriptions Dispensed

Figure 17 shows IQVIA Launch data on the total number of tramadol prescriptions dispensed (in millions) in the United States. Between 2010 and 2019, a total of 380.0 million tramadol prescriptions were dispensed. The lowest number of tramadol prescriptions dispensed was 28.0 million in 2010. The number of tramadol prescriptions dispensed peaked at 44.2 million in 2014, followed by a continuous decrease to 33.6 million in 2019. The total number of tramadol prescriptions dispensed in 2019 (33.6 million) was slightly lower than the total number of tramadol prescriptions dispensed in 2011 (33.9 million).

Comparing national IQVIA Launch data on prescriptions dispensed with NFLIS-Drug data allows for an approximation of diversion of prescriptions in the United States. This seizure-to-prescription ratio is an approximation for diversion because some of the seized tramadol may be illicitly manufactured, there is not a census of laboratories participating in NFLIS-Drug, and the number of participating laboratories reporting data to NFLIS-Drug at any given time can fluctuate. The seizure-to-prescription ratio is calculated as NFLIS reports divided by prescriptions dispensed per 10,000. From 2010 to 2014, the seizure-to-prescription ratio was 0.62 and increased to 1.79 between 2015 and 2019.

Figure 17 IQVIA total tramadol prescriptions dispensed, 2010–2019



References

- i U.S. Drug Enforcement Administration, Diversion Control Division. (2020, March). *Tramadol*. Retrieved from https://www.deadiversion.usdoj.gov/drug_chem_info/tramadol.pdf
- ii Reines, S. A., Goldmann, B., Harnett, M., & Lu, L. (2020). Misuse of tramadol in the United States: An analysis of the National Survey of Drug Use and Health 2002–2017. *Substance Abuse: Research and Treatment*, 14, 1–8. <https://doi.org/10.1177/1178221820930006>
- iii Substance Abuse and Mental Health Services Administration. (2020). *Key substance use and mental health indicators in the United States: Results from the 2019 National Survey on Drug Use and Health* (HHS Publication No. PEP20-07-01-001, NSDUH Series H-55). Rockville, MD: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration. Retrieved from <https://www.samhsa.gov/data/>
- iv U.S. Drug Enforcement Administration, Diversion Control Division. (2016). *National Forensic Laboratory Information System: Year 2015 Annual Report*. Springfield, VA: U.S. Drug Enforcement Administration. Retrieved from <https://www.nflis.deadiversion.usdoj.gov/Reports.aspx>
- v U.S. Drug Enforcement Administration, Diversion Control Division. (2020). *National Forensic Laboratory Information System: NFLIS–Drug 2019 Annual Report*. Springfield, VA: U.S. Drug Enforcement Administration. Retrieved from <https://www.nflis.deadiversion.usdoj.gov/Reports.aspx>
- vi U.S. Drug Enforcement Administration, Diversion Control Division. (2019). *National Forensic Laboratory Information System: NFLIS–Drug 2018 Annual Report*. Springfield, VA: U.S. Drug Enforcement Administration. Retrieved from <https://www.nflis.deadiversion.usdoj.gov/Reports.aspx>
- vii U.S. Drug Enforcement Administration, Diversion Control Division. (2018). *National Forensic Laboratory Information System: NFLIS–Drug 2017 Annual Report*. Springfield, VA: U.S. Drug Enforcement Administration. Retrieved from <https://www.nflis.deadiversion.usdoj.gov/Reports.aspx>

Methodology: A summary of the NFLIS estimation methodology can be found in the *NFLIS Statistical Methodology* publication at <https://www.nflis.deadiversion.usdoj.gov/DesktopModules/ReportDownloads/Reports/NFLIS-2017-StatMethodology.pdf>.

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