Dispensed Opioid, Buprenorphine, Benzodiazepine, and Stimulant Prescriptions among Rhode Island Residents, 2017–2021

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ABSTRACT

The Rhode Island Prescription Drug Monitoring Program (PDMP) requires dispensers with an active Controlled Substance Registration to report Schedule II-V substances and opioid antagonists within 24 hours of dispensing. This database was designed to surveille diversion and identify high-risk prescribing to prevent drug related harms. Using PDMP data from January 1, 2017, to December 31, 2021, opioid, buprenorphine, stimulant, and benzodiazepine dispensing trends were explored. During this time, opioid prescriptions dispensed annually decreased by 27.3% (from 576,421 to 419,220), and benzodiazepine prescriptions dispensed annually decreased by 12.3% (552,430 to 484,496). High-risk prescribing also decreased with opioids prescriptions ≥ 90 daily MME decreasing by 52.1% and instances of overlapping benzodiazepine and opioid prescriptions decreasing by 34.1%. Buprenorphine and stimulant dispensing have increased by 11.1% and 20.7%, respectively. Prevention interventions will continue to educate providers on appropriate prescribing practices and work to further reduce unnecessary prescribing within the state.

KEYWORDS: Controlled substances, overdose risk, opioid, Prescription Drug Monitoring Program, Rhode Island

INTRODUCTION

In response to the opioid overdose epidemic, in September of 2012, Rhode Island (RI) implemented the Prescription Drug Monitoring Program (PDMP). Since 2012, the PDMP has undergone numerous changes to increase its effectiveness and prevent drug related harms. When the PDMP launched, registration was voluntary, and dispensers had 30 days to report data on dispensed Schedule II, III, and IV substances. In June 2014, new legislation required all dispensers and prescribers with an active Controlled Substance Registration (CSR) to register for the PDMP and reduced the reporting period to 72 hours.[1] In March 2015, the Rhode Island Department of Health (RIDOH) put forth regulations requiring prescribers to check the PDMP prior to initiating an opioid and/or when a patient is on opioids for more than six (6) months in a 12-month period. In addition to these requirements, RIDOH strongly encouraged all prescribers to review the PDMP before prescribing any controlled substance (**Figure 1**, see **Appendix**).

To increase registration efficiency and remove the onus from providers, in July of 2016, all those with an active controlled substance registration, including manufacturers, distributers, administrators, and dispensers were automatically registered annually with the PDMP (21-28-3.02). Other regulatory changes that occurred in July of 2016 included: decreasing the reporting timeline to one (1) business day, adding a requirement to report Schedule V substances and opioid antagonists to the PDMP, and requiring prescribers to review the PDMP every 3 months for patients on continuous use (21-28-3.20). In addition to this, for the first time, dispensing caps were implemented in which schedule II scripts were made valid for 90 days for fulfillment, only 30 days could be dispensed at a time, and initial opioid prescriptions could not exceed 30 MMEs per day or contain more than 20 doses (21-28-3.18). In 2017, initial opioid prescriptions were defined as prescriptions dispensed to anyone who had not been on opioids in the prior 30 days.

To increase safety precautions and lower overdose risk, in 2018 providers were required to have a conversation with their patients regarding the risk and benefits before prescribing an opioid. Additionally, providers were obligated to indicate diagnosis with appropriate ICD-10 code on a patient's opioid prescription and to co-prescribe naloxone: 1) anytime a daily dose of over 50 MME is given either individually, or in combination with other opioid medications, 2) if opioids and benzodiazepine are given at the time, or if the script overlaps, or 3) if the patient has a history of opioid use disorder (OUD) or overdose.[2] In addition, as of January 2020, RIDOH has mandated that all controlled substances be prescribed electronically, with limited exceptions.

The PDMP currently functions as a centralized, regulated system for collecting data on all controlled substances dispensed by retail pharmacies with a CSR within the state, and currently receives dispensed medications to RI residents in 34 other states (including all New England states). Authorized users/pharmacies with an active CSR can consult the electronic PDMP database to produce information about their own prescribing practices, or the prescriptive history for individual patients, which can be used to inform potential prescriptions for the patient.[3]

The PDMP is a tool that can identify high-risk prescribing patterns for an individual, such as: prescriptions with excessive morphine milligram equivalents (MME) or multiple controlled substance prescriptions from several pharmacies and providers. This generates clinical alerts which are automatically sent to relevant prescribers. These features aid in the surveillance of diversion and high-risk prescribing, identify individuals' risks and facilitate appropriate patient education, and support positive health outcomes as they relate to opioid and other controlled substance usage.

While PDMP data is routinely used to document overall prescribing trends in the state,[4,5] this work aims to provide a high-level overview of opioid, buprenorphine, benzodiazepine, and stimulant prescriptions dispensed to RI residents between 2017–2021.

METHODS

For this analysis, we utilized data from the RI PDMP to identify all opioid, buprenorphine, stimulant, and benzodiazepine prescriptions filled for RI residents between January 1, 2017, and December 31, 2021. Buprenorphine prescriptions approved by the Food and Drug Administration (FDA) for the treatment of opioid use disorder (OUD) were extracted from opioid prescriptions and analyzed separately.

Demographic variables including age, sex, and insurance status were reported as recorded in the PDMP. When reporting demographic characteristics among unique users, a prescription was selected at random if an individual was dispensed multiple prescriptions for the drug class/calendar year of interest.

Individuals dispensed opioids were classified as naïve users, non-naïve users, or both, using the prescription fill date and the days' supply of medication dispensed. Individuals dispensed an opioid with no opioid exposure in the prior 30 days were classified as naïve. Individuals who were dispensed an opioid prescription but had opioid exposure in the prior 30 days were considered non-naive. Individuals who met both criteria, such as individuals who received a naïve opioid prescription followed by a subsequent non-naïve prescription, were classified as both naïve and non-naive. To observe trends in high-risk prescribing practices, we identified unique patients with a total daily dose of at least 90 MME and unique patients who received an overlapping benzodiazepine and opioid prescriptions for one or more days. Unique patients were compared using demographic variables, user type, calendar year, high risk prescribing practices, and type of controlled substance dispensation.

RESULTS

(See **Appendix** for **Tables 1–5**)

Overall, the number of unique RI residents dispensed at least one opioid prescription decreased 29.5% from 156,095 individuals in 2017 to 110,081 individuals in 2021. Despite a decrease in the number of individuals exposed to opioids, the demographics of individuals remained relatively constant over time with most patients aged 45+ (69.1%; median age overall of 56 years), and 57.2% of prescriptions filled by females (**Table 1**). When focusing on high-risk prescribing practices, the number of individuals with overlapping benzodiazepine and opioid prescriptions dropped from 30,200 in 2017 to 19,905 in 2021 (a 34.1% decrease). Most individuals dispensed overlapping prescriptions were 55+ years of age (67.7%), and 65.3% of overlapping prescriptions were dispensed to females. Additionally, the number of individuals dispensed at least one opioid prescription with a daily MME of ≥90 decreased from 12,825 individuals in 2017 to 6,149 in 2021 (a 52.1% decrease). Most individuals dispensed a prescription with a daily MME of ≥90 were 45+ years of age (87.6%), and 51.5% of prescriptions were dispensed to females (**Table 2**).

The amount of naïve opioid users dropped 28.5% from 94,626 in 2017 to 67,677 in 2021, while non-naïve users dropped 11.4% from 15,378 in 2017 to 13,645 in 2021. Patients classified as both naïve and non-naïve users dropped 37.6% from 46,091 in 2017 to 28,759 in 2021 (**Table 1**). Over the 5-year timeframe, the number of overall opioid prescriptions dispensed per year decreased 27.3% from 576,421 to 419,220, with oxycodone (41.5%), and hydrocodone (25.9%) being the most prescribed opioid prescriptions (**Table 3**).

The number of unique RI residents dispensed at least one buprenorphine prescription for OUD increased 7.6% from 7,038 in 2017 to 7,574 in 2021 and the number of overall buprenorphine prescriptions increased 11.1% from 75,409 in 2017 to 83,764 in 2021 (**Table 5**). Overall, most individuals who received a buprenorphine were male (60.4%) and between the ages of 25–54 (75.7%; **Table 4**). The number of unique RI residents dispensed at least one stimulant prescription increased 9.4% from 48,637 in 2017 to 53,219 in 2021, and overall, 54.9% of recipients were female, and 56.5% were between 0 and 34 years old (**Table 4**). The overall number of stimulant prescriptions increased 20.7% from 374,919 in 2017 to 452,739 in 2021. The most dispensed stimulant was amphetamine (60.9%) followed by methylphenidate (17.5%; **Table 5**). In contrast, the number of unique RI residents dispensed at least one benzodiazepine prescription decreased 14.6% from 112,754 in 2017 to 96,287 in 2021. Most individuals who received a benzodiazepine were female (66.9%) and aged 45+ (71.7%, **Table 4**). The number of overall benzodiazepine prescriptions decreased 12.3% from 552,430 in 2017 to 484,496 in 2021. The most prescribed benzodiazepine overall was clonazepam (30.9%), followed by lorazepam (27.5%; **Table 5**).

DISCUSSION

During the 5-year study timeframe, opioid prescriptions, benzodiazepine prescriptions, and the number of unique individuals receiving opioids, benzodiazepines, and high-risk opioid prescriptions (MME > 90 or overlapping opioid and benzodiazepine) all declined, with no major changes in the demographics of individuals receiving these prescriptions. Though the decline in opioid exposures is encouraging at the population level, it does not provide insight into individual prescribing practices. Further work will need to explore if these trends are indicative of more responsible prescribing, or a more concerning trend such as patient abandonment which can contribute to illicit opioid use and worsen the existing opioid epidemic. In contrast to the decreasing trends noted above, dispensation of buprenorphine and stimulant prescriptions and the number of unique individuals receiving buprenorphine or stimulants have increased during the study timeframe.

When developing interventions and educational campaigns to reduce the number of individuals prescribed opioids, efforts often focus on decreasing the number of naïve users. Focusing on naïve users and offering alternative pain management options when appropriate can help avoid introducing individuals to opioids and eliminate the chance of a prescription induced opioid overdose from improper use. As an example, patients with appropriate conditions, such as musculoskeletal pain, frequently improve over time independent of treatment. Due to this, treatment guidelines now recommend non-pharmacotherapy options be explored first, followed by anti-inflammatory medications, with opioids reserved as a last resort.[6] In contrast, reducing the number of non-naïve users (or individuals who have been using opioids long-term) is substantially more difficult, as they can have a higher tolerance to opioids and restricting their accessibility to prescription opioids may influence them to shift to illicit substances to manage their pain.[7,8] Fortunately when examining the decrease in the number of individuals who received an opioid prescription, the number of users receiving only naïve opioid prescriptions exhibited a steep decrease (28.5%) when compared to users with only non-naïve prescriptions (11.4%). While we cannot attest if non-naïve users were appropriately transitioned off opioids, providers should follow published guidance on this practice to maximize patient outcomes.[9,10,11,12] Likely due to these efforts to reduce opioid prescribing and exposures overall, the proportion of overdose deaths involving exclusively prescription drugs decreased from 67% in 2009 to 6% in 2021.[13,14]

From 2017–2021, there has been a notable increase in dispensed buprenorphine prescriptions for opioid use disorder, likely reflecting of ongoing efforts to connect individuals to treatment and improve treatment access. In contrast to individuals dispensed opioids, most individuals who die from an opioid overdose are male (74%), and between the ages of 25–54 (74%).[9] Fortunately, this closely aligns with the demographics of individuals dispensed buprenorphine, with 61% male and 76% aged 25–54, showcasing that these prescriptions are reaching the population at highest risk of overdose.

In a study reviewing changes in patterns in benzodiazepine prescribing in the United States before and during the COVID-19 pandemic, it was found that buprenorphine prescription dispensation to women decreased 0.7% between January 2018 and March 2021. In men, buprenorphine prescription dispensations decreased 0.4% during the same time period.[15] Rhode Island buprenorphine dispensing trends parallel national trends but are decreasing at a more dramatic rate. Stimulant dispensing trends within the United States increased 8.9% from 2014 to 2019, which is slightly less than the increases seen in RI from 2017 to 2021.[16] With stimulant prescriptions on the rise, efforts will need to be allocated to understand the factors for stimulant prescribing and implementing prevention strategies.

To help promote responsible prescribing, the RI PDMP has implemented many changes to reduce exposure at the population level (**Figure 1**) as discussed above. Prescriber reports are sent out electronically to users to review their prescribing practices. Additionally, the PharmD Academic Detailing (PhAD) Program was initiated in 2019 and is ongoing, where pharmacists hold educational sessions on non-opioid therapies, appropriate opioid dosing, naloxone prescribing, Rhode Island pain management regulations, and best practices for acute pain management. This program aims to increase prescriber knowledge of naloxone, decrease initiate, or naïve, prescribing, and increase co-prescribing as appropriate, provider ability to counsel patients, and prescriber utilization of the PDMP.

Strengths and Limitations

The greatest strength of this study was the use of the RI PDMP data, a system where prescribers are automatically registered, which provides us complete data on all controlled substances dispensed from pharmacies in RI and prescriptions dispensed to RI residents in 34 other states. Of note, the RI population has exhibited minimal change during the study period (3.7% increase) highlighting the findings observed in this study are not due to underlying changes in the population. This work is subject to several limitations; first, the PDMP does not collect information on race or ethnicity, so dispensations by race/ethnicity cannot be explored. Second, the PDMP only collects information on medications dispensed, and no information is available on prescriptions that were prescribed but not dispensed. Finally, patient adherence to prescriptions is unknown, so high-risk prescribing practices were identified based on fill date and the days' supply, and my not be indicative of the behavior of individual patients.

Since 2017, encouraging trends in the prescribing practices for both opioids and benzodiazepines can be observed at the

population level in Rhode Island. Future work will need to investigate if these trends are indicative of more responsible prescribing, or a more concerning trend such as patient abandonment. With the overdose epidemic continuing to worsen, these data can be used as a benchmark for continued public health interventions promoting responsible prescribing and efforts to link individuals with opioid use disorder to appropriate treatment.

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Figure 1. Timeline of the Evolution of the Rhode Island Prescription Drug Monitoring Program (PDMP) from 2003-2022.

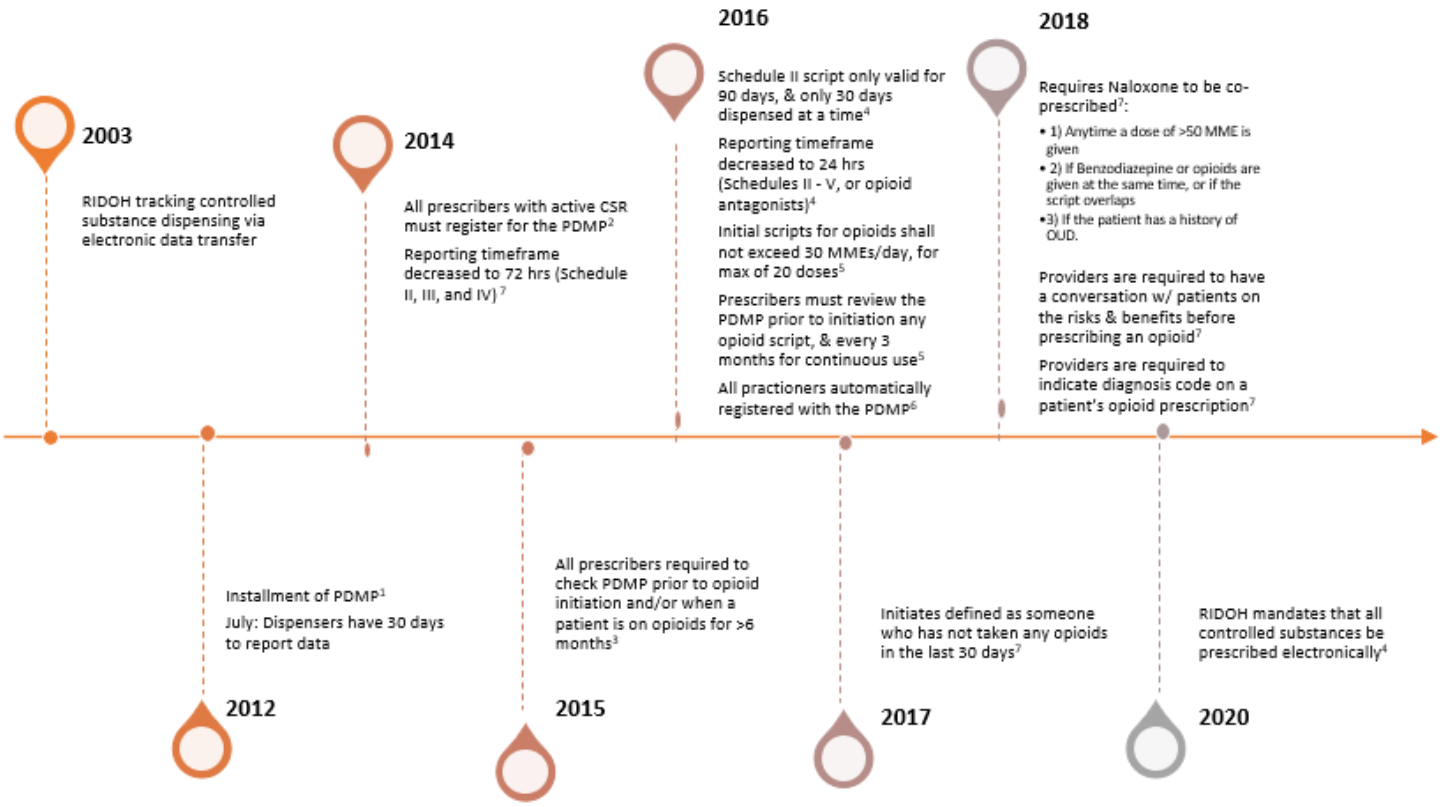

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Table 1. Number of Unique Rhode Island Residents Dispensed At least One Opioid Prescription, 2017-2021

	2017	2018	2019	2020	2021
Opioids for Pain Management					
Unique individuals dispensed a prescription	156,095	134,800	120,982	107,011	110,081
Sex					
Female	88,527 (56.7%)	76,832(57%)	69,141 (57.1%)	61,259 (57.2%)	63,242 (57.5%)
Male	67,554 (43.3%)	57,948 (43%)	51,666 (42.7%)	45,742 (42.7%)	46,825 (42.5%)
Unknown	14 (<0.1%)	20 (<0.1%)	175 (0.2%)	10 (<0.1%)	14 (<0.1%)
Median Age, Years [IQR]	54 [37-66]	55 [39-67]	56 [40-68]	57 [41-69]	57 [41-69]
Age Category					
<18	4,624 (3.0%)	3,524 (2.6%)	3,007 (2.5%)	2,201 (2.1%)	2,300 (2.1%)
18-24	9,906 (6.3%)	7,539 (5.6%)	6,535 (5.4%)	5,278 (4.9%)	5,438 (4.9%)
25-34	18,837 (12.1%)	15,108 (11.2%)	12,889 (10.7%)	10,900 (10.2%)	11,140 (10.1%)
35-44	19,943 (12.8%)	16,554 (12.3%)	14,598 (12.1%)	12,539 (11.7%)	13,017 (11.8%)
45-54	27,544 (17.6%)	22,896 (17.0%)	19,670 (16.3%)	16,690 (15.6%)	16,668 (15.1%)
55-64	32,249 (20.7%)	28,996 (21.5%)	26,254 (21.7%)	23,454 (21.9%)	23,982 (21.8%)
65+	42,992 (27.5%)	40,183 (29.8%)	38,029 (31.4)	35,949 (33.6%)	37,536 (34.1%)
User Type					
Only received naive prescriptions	94,626 (60.6%)	81,298 (60.3%)	73,132 (60.4%)	64,048 (59.9%)	67,677 (61.5%)
Only received non-naïve prescriptions	15,378 (9.9%)	16,380 (12.2%)	15,092 (12.5%)	14,255 (13.3%)	13,645 (12.4%)
Received both naïve and non-naïve prescriptions	46,091 (29.5%)	37,122 (27.5%)	32,758 (27.1)	28,708 (26.8%)	28,759 (26.1%)
High Risk Prescribing practices					
Dispensed an overlapping benzodiazepine and opioid prescription	30,200 (19.3%)	25,299 (18.8%)	21,619 (17.9%)	20,377 (19.0%)	19,905 (18.1%)
Dispensed a daily MME >=90	12,825 (8.2%)	8,889 (6.6%)	7,427 (6.1%)	6,555 (6.1%)	6,149 (5.6%)

Table 2. High Risk Prescribing Practices, 2017-2021

	2017	2018	2019	2020	2021
Unique Individuals dispensed a daily MME >=90	**12,825**	**8,889**	**7,427**	**6,555**	**6,149**
Sex					
Female	6,738 (52.5%)	4,695 (56.8%)	3,727 (50.2%)	3,284 (50.1%)	3,131 (50.9%)
Male	6,083 (47.4%)	4,194 (47.2%)	3,518 (47.4%)	3,266 (49.8%)	3,016 (49.0%)
Unknown	<5	--	182 (2.5%)	5 (0.1%)	<5
Mean Age, Years (SD)	60.2 (17.4)	63.9 (16.5)	64.3 (16.1)	64.7 (15.8)	64.3 (15.4)
Age Category					
<18	64 (0.5%)	15 (0.2%)	19 (0.3%)	13 (0.2%)	11 (0.2%)
18-24	216 (1.7%)	74 (0.8%)	39 (0.5%)	29 (0.4%)	37 (0.6%)
25-34	675 (5.3%)	271 (3.0%)	215 (2.9%)	170 (2.6%)	159 (2.6%)
35-44	1,184 (9.2%)	614 (6.9%)	517 (7.0%)	430 (6.6%)	390 (6.3%)
45-54	2,420 (18.9%)	1,461 (16.4%)	1,101 (14.8%)	926 (14.1%)	885 (14.4%)
55-64	3,387 (26.4%)	2,438 (27.4%)	2,044 (27.5%)	1,826 (27.9%)	1,733 (28.2%)
65+	4,879 (38%)	4,011 (45.1%)	3,492 (47.0%)	3,161 (48.2%)	2,934 (47.7%)
Unique individuals dispensed an overlapping benzodiazepine and opioid prescription	**30,200**	**25,299**	**21,619**	**20,377**	**19,905**
Sex					
Female	19,640 (65.0%)	16,654 (65.8%)	14,038 (64.9%)	13,244 (65.0%)	13,053 (65.6%)
Male	10,557 (35.0%)	8,636 (34.1%)	7,429 (34.4%)	7,124 (35.0%)	6,851 (34.4%)
Unknown	<5	9 (<0.1%)	152 (0.7%)	9 (<0.1%)	<5
Mean Age, Years (SD)	59.6 (17.7)	61.4 (17.5)	62.7 (17.6)	64.2 (17.8)	63.8 (17.9)
Age Category					
<18	231 (0.8%)	163 (0.6%)	141 (0.7%)	130 (0.6%)	174 (0.9%)
18-24	471 (1.6%)	310 (1.2%)	241 (1.1%)	229 (1.1%)	279 (1.4%)
25-34	1,858 (6.2%)	1,283 (5.1%)	950 (4.4%)	812 (4.0%)	815 (4.1%)
35-44	3,208 (10.6%)	2,324 (9.2%)	1,935 (9.0%)	1,657 (8.1%)	1,603 (8.1%)
45-54	5,748 (19.0%)	4,396 (17.4%)	3,423 (15.8%)	2,867 (14.1%)	2,650 (13.3%)
55-64	7,266 (24.1%)	6,218 (24.6%)	5,141 (23.8%)	4,700 (23.1%)	4,549 (22.9%)
65+	11,418 (37.8%)	10,605 (41.9%)	9,788 (45.3%)	9,982 (49.0%)	9,835 (49.4%)

Table 3. Counts of the Most Prescribed Opioids Overall in Rhode Island, 2017-2021

	2017	2018	2019	2020	2021
Overall	**576,421**	**520,066**	**464,545**	**426,507**	**419,220**
Oxycodone	226,606 (39.3%)	211,999 (40.8%)	194,603 (41.9%)	181,677 (42.6%)	185,047 (44.1%)
Hydrocodone	167,460 (29.1%)	139,082 (26.7%)	117,467 (25.3%)	102,810 (24.1%)	97,055 (23.1%)
Tramadol	90,361 (15.7%)	85,063 (16.4%)	76,394 (16.4%)	70,808 (16.6%)	67,593 (16.1%)
Morphine	32,676 (5.7%)	31,967 (6.1%)	28,706 (6.2%)	28,838 (6.8%)	27,514 (6.6%)
Codeine	30,537 (5.3%)	25,786 (5.0%)	22,350 (4.8%)	18,529 (4.3%)	16,968 (4.0%)
Fentanyl	10,421 (1.8%)	9,105 (1.8%)	7,074 (1.5%)	6,071 (1.4%)	6,028 (1.4%)
Hydromorphone	7,677 (1.3%)	6,472 (1.2%)	6,137 (1.3%)	5,676 (1.3%)	6,789 (1.6%)
Methadone	5,950 (1.0%)	5,663 (1.1%)	5,309 (1.1%)	5,231 (1.2%)	4,830 (1.2%)
Tapentadol	1,326 (0.2%)	1,235 (0.2%)	1,147 (0.2%)	1,118 (0.3%)	1,151 (0.3%)
Buprenorphine (pain)	1,294 (0.2%)	2,322 (0.4%)	4,140 (0.9%)	4,788 (1.1%)	5,340 (1.3%)
Oxymorphone	1,129 (0.2%)	509 (0.1%)	457 (0.1%)	355 (<0.1%)	298 (<0.1%)
Opium	366 (<0.1%)	337 (0.1%)	350 (<0.1%)	321 (<0.1%)	380 (<0.1%)
Butorphanol	230 (<0.1%)	196 (<0.1%)	189 (<0.1%)	146 (<0.1%)	144 (<0.1%)
Pentazocine	198 (<0.1%)	179 (<0.1%)	147 (<0.1%)	102 (<0.1%)	62 (<0.1%)
Dispensed to Opioid Naïve Patients[1]	**110,845**	**94,005**	**83,905**	**73,303**	**77,157**
Hydrocodone	43,392 (39.1%)	32,362 (34.4%)	24,763 (29.5%)	19,200 (26.2%)	19,283 (26.3%)
Oxycodone	36,744 (33.1%)	35,136 (37.4%)	34,719 (41.4%)	33,014 (45.0%)	37,243 (37.2%)
Tramadol	13,939 (12.6%)	11,965 (12.7%)	11,054 (13.2%)	9,438 (12.9%)	9,849 (13.4%)
Codeine	13,392 (12.1%)	11,175 (11.9%)	9,901 (11.8%)	7,611 (10.4%)	7,113 (9.7%)
Morphine	2,772 (2.5%)	2,851 (3.0%)	2,924 (3.5%)	3,554 (4.8%)	3,079 (4.2%)
Hydromorphone	441 (0.4%)	388 (0.4%)	425 (0.5%)	393 (0.5%)	479 (0.7%)
Tapentadol	39 (<0.1%)	21 (<0.1%)	21 (<0.1%)	9 (<0.1%)	6 (<0.1%)
Opium	36 (<0.1%)	22 (<0.1%)	24 (<0.1%)	25 (<0.1%)	39 (<0.1%)
Fentanyl	30 (<0.1%)	18 (<0.1%)	10 (<0.1%)	9 (<0.1%)	6 (<0.1%)
Buprenorphine (pain)	26 (<0.1%)	25 (<0.1%)	28 (<0.1%)	26 (<0.1%)	45 (<0.1%)
Methadone	13 (<0.1%)	25 (<0.1%)	24 (<0.1%)	16 (<0.1%)	10 (<0.1%)
Meperidine	11 (<0.1%)	17 (<0.1%)	<5	--	<5
Dispensed to Non-Naïve Opioid Patients[2]	**209,045**	**228,869**	**210,775**	**201,995**	**194,230**
Oxycodone	87,581 (41.9%)	93,532 (40.9%)	86,293 (40.9%)	82,418 (40.8%)	79,248 (40.8%)
Hydrocodone	55,773 (26.7%)	63,175 (27.6%)	58,427 (27.7%)	55,626 (27.5%)	52,384 (27.0%)
Tramadol	25,206 (12.1%)	29,661 (13.0%)	27,447 (13.0%)	26,352 (13.0%)	25,454 (13.1%)
Morphine	17,768 (8.5%)	18,722 (8.2%)	16,560 (7.9%)	16,091 (8.0%)	15,604 (8.0%)
Fentanyl	6,971 (3.3%)	7,069 (3.1%)	5,656 (2.7%)	4,675 (2.3%)	4,844 (2.5%)
Codeine	4,911 (2.3%)	5,445 (2.4%)	4,608 (2.2%)	4,537 (2.2%)	3,909 (2.0%)
Methadone	4,390 (2.1%)	4,529 (2.0%)	4,401 (2.1%)	4,217 (2.1%)	4,095 (2.1%)
Hydromorphone	3,577 (1.2%)	3,315 (1.4%)	2,871 (1.4%)	3,093 (1.5%)	3,356 (1.7%)
Oxymorphone	972 (0.5%)	488 (0.2%)	398 (0.2%)	327 (0.2%)	288 (0.1%)
Tapentadol	737 (0.4%)	890 (0.4%)	876 (0.4%)	929 (0.5)	953 (0.5%)
Buprenorphine (pain)	691 (0.3%)	1,451 (0.6%)	2,854 (1.4%)	3,407 (1.7%)	3,721 (1.9%)
Butorphanol	167 (<0.1%)	170 (<0.1%)	175 (<0.1%)	74 (<0.1%)	133 (<0.1%)

[1] *Patients are considered opioid naïve when they have at least 30 days between opioid prescriptions.*

[2] *Patients are considered non-naïve opioid users when they have continuous (<30 days) between opioid prescriptions.*

Table 4. Number of Unique Rhode Island Residents Dispensed at least one Buprenorphine, Stimulant, or Benzodiazepine prescription, 2017-2021.

	2017	2018	2019	2020	2021
Buprenorphine for OUD					
Unique individuals dispensed an Rx	7,038	7,543	7,654	7,594	7,574
Sex					
Female	2,686 (38.2%)	2,819 (37.4%)	2,941(38.4%)	2,911 (38.3%)	2,883 (38.1%)
Male	4,117 (58.5%)	4,479 (59.4%)	4,629 (60.5%)	4,682 (61.7%)	4,687 (61.9%)
Unknown	235 (3.3%)	245 (3.2%)	84 (1.1%)	<5	<5
Mean Age, Years (SD)	41.9 (11.6)	42.8 (11.8)	43.6 (11.9)	44.3 (11.9)	45.3 (12)
Age Category					
<18	6 (<0.1%)	<5	<5	<5	<5
18-24	297 (4.2%)	258 (3.4%)	230 (3.0%)	182 (2.4%)	151 (2.0%)
25-34	1,848 (26.3%)	1,864 (24.7%)	1,702 (22.2%)	1,558 (20.5%)	1,408 (18.6%)
35-44	2,082 (29.6%)	2,248 (29.8%)	2,382 (31.1%)	2,361 (31.1%)	2,329 (30.7%)
45-54	1,582 (22.5%)	1,692 (22.4%)	1,710 (22.3%)	1,755 (23.1%)	1,786 (23.6%)
55-64	1,038 (14.7%)	1,216 (16.1%)	1,312 (17.1%)	1,342 (17.7%)	1,413 (18.7%)
65+	185 (2.6%)	263 (3.5%)	317 (4.1%)	395 (5.2%)	484 (6.4%)
Stimulants					
Unique individuals dispensed an Rx	48,637	49,468	50,199	49,995	53,219
Sex					
Female	26,122 (53.7%)	26,878 (54.3%)	27,412 (54.6%)	27,671 (55.3%)	30,202 (56.8%)
Male	22,514 (46.3%)	22,584 (45.6%)	22,777 (45.4%)	22,323 (44.7%)	22,992 (43.2%)
Unknown	<5	6 (<0.1%)	10 (<0.1%)	<5	25 (<0.1%)
Mean Age, Years (SD)	31.8 (17.5)	32.3 (17.5)	32.8 (17.4)	33.1 (17.1)	33.8 (17.1)
Age Category					
<18	13,311 (27.4%)	12,982 (26.2%)	12,630 (25.2%)	12,136 (24.3%)	11,757 (22.1%)
18-24	6,436 (13.2%)	6,255 (12.6%)	6,154 (12.3%)	5,891 (11.8%)	6,340 (11.9%)
25-34	9,010 (18.5%)	9,379 (19.0%)	9,507 (18.9%)	9,647 (19.3%)	10,710 (20.1%)
35-44	7,423 (15.3%)	7,890 (15.9%)	8,409 (16.8%)	8,775 (17.6%)	9,785 (18.4%)
45-54	6,374 (13.1%)	6,567 (13.3%)	6,804 (13.6%)	6,775 (13.6%)	7,210 (13.5%)
55-64	4,200 (8.6%)	4,359 (8.8%)	4,570 (9.1%)	4,644 (9.3%)	5,039 (9.5%)
65+	1,883 (3.9%)	2,036 (4.11%)	2,125 (4.2%)	2,127 (2.3%)	2,378 (4.5%)
Benzodiazepines					
Unique individuals dispensed an Rx	112,754	106,389	101,351	96,621	96,287
Sex					
Female	75,205 (66.7%)	70,930 (66.7%)	67,752 (66.8%)	65,060 (67.3%)	64,769 (67.3%)
Male	37,532 (33.3%)	35,436 (33.3%)	33,420 (33.0%)	31,551 (32.7%)	31,495 (31.7%)
Unknown	17 (<0.1%)	23 (<0.1%)	179 (0.2%)	10 (<0.1%)	23 (<0.1%)
Mean Age, Years (SD)	54.3 (18.3)	54.9 (18.3)	55.2 (18.3)	55.8 (18.4)	55.7 (18.4)
Age Category					
<18	2,058 (1.8%)	1,938 (1.8%)	1,862 (1.8%)	1,624 (1.7%)	1,858 (1.9%)
18-24	4,305 (3.8%)	3,760 (3.5%)	3,534 (3.5%)	3,042 (3.1%)	3,072 (3.2%)
25-34	11,549 (10.2%)	10,599 (10.0%)	9,828 (9.7%)	9,334 (9.7%)	9,105 (9.5%)
35-44	14,987 (13.3%)	13,872 (13.0%)	13,048 (12.9%)	12,768 (13.2%)	12,817 (13.3%)
45-54	21,621 (19.2%)	19,417 (18.3%)	17,927 (17.7%)	16,249 (16.8%)	15,756 (16.4%)
55-64	25,249 (22.4%)	24,079 (22.6%)	22,838 (22.5%)	21,567 (22.3%)	21,219 (22.0%)
65+	32,985 (29.3%)	32,724 (30.8%)	32,314 (31.9%)	32,037 (33.2%)	32,460 (33.7%)

Table 5. Counts of the Most Prescribed Buprenorphine, Stimulants, and Benzodiazepines in Rhode Island, 2017-2021

	2017	2018	2019	2020	2021
Buprenorphine					
Overall Prescriptions	**75,409**	**89,945**	**91,546**	**88,792**	**83,764**
Buprenorphine & Comb.	75,409 (100.0%)	89,945 (100.0%)	91,546 (100.0%)	88,792 (100.0%)	83,764 (100.0%)
Stimulants					
Overall Prescriptions	**374,919**	**404,260**	**416,891**	**426,019**	**452,739**
Amphetamine & Comb.	220,027 (58.7%)	244,576 (60.5%)	253,393 (60.8%)	264,188 (62.0%)	281,985 (62.3%)
Methylphenidate	72,530 (19.3%)	74,043 (18.3%)	72,635 (17.4%)	70,624 (16.6%)	73,787 (16.3%)
Lisdexamfetamine	32,147 (8.5)	32,724 (8.1%)	33,653 (8.1%)	34,860 (8.2%)	37,040 (8.2%)
Phentermine & Comb.	18,636 (5.0%)	20,420 (5.1%)	22,440 (5.4%)	21,782 (5.1%)	24,072 (5.3%)
Dexmethylphenidate	11,221 (3.0%)	13,054 (3.2%)	15,445 (3.7%)	15,081 (3.5%)	15,376 (3.4%)
Dextroamphetamine	8,457 (2.3%)	7,732 (1.9%)	7,561 (1.8%)	7,642 (1.8%)	7,594 (1.7%)
Phendimetrazine	6,290 (1.7%)	5,667 (1.4%)	5,532 (1.3%)	5,283 (1.2%)	6,025 (1.3%)
Modafinil	3,636 (1.0%)	4,056 (1.0%)	4,221 (1.0%)	4,211 (1.0%)	4,411 (1.0%)
Armodafinil	1,802 (0.5%)	1,892 (0.5%)	1,849 (0.4%)	2,029 (0.5%)	2,066 (0.5)
Diethylpropion	118 (<0.1%)	56 (<0.1%)	82 (<0.1%)	101 (<0.1%)	61 (<0.1%)
Solriamfetol	--	--	43 (<0.1%)	190 (<0.1%)	255 (<0.1%)
Methamphetamine	40 (<0.1%)	28 (<0.1%)	22 (<0.1%)	21 (<0.1%)	18 (<0.1%)
Fenfluramine	--	--	--	6 (<0.1%)	49 (<0.1%)
Benzphetamine	15 (<0.1%)	12 (<0.1%)	15 (<0.1%)	<5	--
Benzodiazepine					
Overall Prescriptions	**552,430**	**545,788**	**511,058**	**503,129**	**484,496**
Clonazepam	168,820 (30.6%)	168,947 (31.0%)	158,831 (31.1%)	156,766 (31.2%)	151,159 (31.2%)
Alprazolam	152,554 (27.6%)	150,350 (27.5%)	140,823 (27.6%)	138,171 (27.5%)	132,225 (27.3%)
Lorazepam	146,742 (26.6%)	149,102 (27.3%)	142,222 (27.8%)	144,829 (28.8%)	140,255 (28.9%)
Diazepam	56,249 (10.2%)	51,123 (9.4%)	45,833 (9.0%)	41,655 (8.3%)	40,250 (8.3%)
Temazepam	18,689 (3.4%)	17,236 (3.2%)	15,004 (2.9%)	13,888 (2.7%)	12,682 (2.6%)
Triazolam	3,219 (0.6%)	2,972 (0.5%)	2,814 (0.6%)	2,431 (0.5%)	2,472 (0.5%)
Clorazepate & Comb.	2,363 (0.4%)	2,048 (0.4%)	1,755 (0.3%)	1,507 (0.3%)	1,365 (0.3%)
Chlordiazepoxide	1,200 (0.2%)	1,183 (0.2%)	1,013 (0.2%)	901 (0.2%)	916 (0.2%)
Clobazam	1,126 (0.2%)	1,428 (0.3%)	1,686 (0.3%)	1,925 (0.4%)	2,143 (0.4%)
Oxazepam	716 (0.1%)	671 (0.1%)	511 (0.1%)	493 (0.1%)	404 (<0.1%)
Flurazepam	352 (<0.1%)	320 (<0.1%)	147 (<0.1%)	68 (<0.1%)	74 (<0.1%)
Clidinium & Comb.	145 (<0.1%)	91 (<0.1%)	71 (<0.1%)	68 (<0.1%)	39 (<0.1%)
Amitriptyline & Comb.	110 (<0.1%)	127 (<0.1%)	107 (<0.1%)	82 (<0.1%)	59 (<0.1%)
Midalozam	80 (<0.1%)	123 (<0.1%)	183 (<0.1%)	281 (<0.1%)	412 (<0.1%)
Estazolam	65 (<0.1%)	67 (<0.1%)	58 (<0.1%)	64 (<0.1%)	41 (<0.1%)