

ST. LOUIS COUNTY PRESCRIPTION DRUG MONITORING PROGRAM

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BOONE COUNTY Q4 2017



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Executive Summary

St. Louis County enacted legislation on March 1, 2016, to establish and authorize the operation of a Prescription Drug Monitoring Program (PDMP) by Saint Louis County Department of Public Health (DPH). The St. Louis County PDMP is the first locally based PDMP in the country. DPH serves as the program administrator, and any Missouri jurisdiction may subscribe to the St. Louis County PDMP upon enacting authorizing legislation and signing a User Agreement with St. Louis County.

Chapter 602 of the St. Louis County Revised Ordinances (SLCRO) is known as the "St. Louis County Narcotics Control Act" or more commonly known as the PDMP ordinance.

The St. Louis County PDMP monitors the prescribing and dispensing of schedule II-IV controlled substances to assist in the identification and prevention of prescription drug misuse and abuse.

The program's goals are to 1) <u>improve controlled substance prescribing</u> by providing critical information regarding a patient's controlled substance prescription history, 2) <u>inform clinical practice</u> by identifying patients at high-risk who would benefit from early interventions, and 3) <u>reduce the number of people who</u> <u>misuse, abuse, or overdose</u> while making sure patients have access to safe, effective treatment.

The St. Louis County PDMP launched on April 25, 2017, with 14 jurisdictions participating in the initial implementation. As of April 25, 2018, 58 jurisdictions have enacted legislation to participate in the St. Louis County PDMP. Additional jurisdictions will continue to be added to the PDMP on a monthly basis. A list of all participating jurisdictions and links to enacted legislation can be found on the DPH PDMP website, www.stlouisco.com/PDMP.

Additional information on the PDMP can be found at <u>www.stlouisco.com/PDMP</u> or by contacting DPH at <u>PDMP.DPH@stlouisco.com</u> or 314-615-0522.

This report contains dispensation information for patients residing in Boone County submitted by dispensers (pharmacies) in any of the 40 jurisdictions participating in PDMP implementation cycles 1-5. Quarter 4 (Q4) 2017 (October-December) is the third complete quarter the PDMP was operational, and this report contains only prescriptions dispensed in Q4 2017. As this report only contains one quarter of information, the findings are not necessarily indicative of average prescribing practices in Boone County. Rates in this report represent projected annual rates based on one quarter of data. Pharmacy compliance is an ongoing focus of DPH, and while over 90% of pharmacies are appropriately submitting data, not all pharmacies were submitting data at the time of this report. DPH continues to work with pharmacies on data submission and increasing pharmacy compliance. <u>Appendix A</u> contains data tables used to create all figures.

Figure 1 represents the PDMP participation status for Q4 2017; these jurisdictions were part of the first 5 PDMP implementation cycles. Prescriptions dispensed from these jurisdictions to Boone County residents are reflected in this report.

Figure 2 represents the PDMP participation status as of April 25, 2018. 58 jurisdictions are currently participating in the PDMP and cover 79% of the Missouri population and 92% of healthcare providers.



Figure 1. PDMP participation map for implementation cycles 1-5 (as of 10/01/2017).

User Registration & System Utilization

Section 602.806 SLCRO details persons authorized to be provided dispensation information or authorized users. Authorized users are divided into three categories with varying levels of access to the PDMP and to PDMP data.

- 1) Authorized users with direct, full access to the PDMP.
 - a. Healthcare providers accessing the PDMP for the purpose of providing medical or pharmaceutical care have direct, full access to the PDMP. Doctors, dentists, and pharmacists have the ability to supervise and delegate access to the PDMP but maintain all liability. Examples of delegate users include nurses, pharmacy technicians, and medical residents.
- 2) Authorized users with restricted or limited access to the PDMP.
 - a. These authorized users register in the PDMP and can submit search requests, but these requests require DPH approval and verification of additional ordinance requirements before authorized users are provided with any PDMP data. Authorized users with restricted PDMP access include state regulatory boards, law enforcement or prosecutorial officials, MO HealthNet, and judges or judicial officers.
- 3) Authorized users with ability to request PDMP data but do not directly access the PDMP.
 - a. Persons may request their own dispensation information in accordance with law. These requests are submitted directly to DPH and returned to the requestor.

Each user must register individually in the PDMP. Registration requires users provide personal and employer information along with validation documentation. Validation documentation is required for all users and varies by user type. Healthcare providers must provide a copy of their current professional license. DPH validates registration information prior to approving access to the PDMP.

User registration for the PDMP opened on April 4, 2017. As of April 25, 2018, there are over 6,700 approved users within the system. Figures 3 and 4 represent approved user counts for the total PDMP by month and type, respectively. User registration has steadily increased since registration started in early April 2017. Approximately 50 new users are registering per day. Pharmacists represent approximately 43% of users, and physicians represent 40%. Delegates comprise 14% of users and include medical residents, pharmacy technicians, nurses, etc. Pharmacists comprise the largest user group as expected as pharmacists receive multiple rounds of communication and are required to submit dispensation to the PDMP. It is expected that the physician and delegate user groups will surpass pharmacist users as the PDMP progresses.

System utilization has increased as both the number of approved users and participating jurisdictions have increased. In May 2017, PDMP users were performing an average of 690 patient searches per day. In March 2018, over 2,500 patient searches were performed by approved users each day. Increasing utilization of the PDMP will be of primary focus for DPH in 2018.

Figure 3. PDMP Approved User Counts by Month.



PDMP Approved Users by Month

Figure 4. PDMP Approved User Counts by User Type.



Dispensation Rates

Throughout this report, rates will be represented per 1,000 population. Significance noted in the report is statistical significance at a 95% confidence level (α =0.05). Rates in this report represent projected annual rates based on one quarter of data. Population counts were identified from the 2010 census. Appendix A contains dispensation data tables. Suppressed rates indicate too few dispensations to report; counts less than or equal to 5 were suppressed per DPH policy. Dispensation rates by geography, age, gender, and drug type will be discussed in this report with statistically significant differences highlighted. The total or overall rate means the rate of all jurisdictions participating in PDMP implementation cycles 1-5. When examining rates by gender, total rates include dispensations to those with a gender of male, female, and unknown. Rates for those with an unknown gender are not separately displayed but are included in the total rates.

While 40 jurisdictions enacted legislation to participate in PDMP implementation cycles 1-5, for the purpose of this report, some jurisdictions are combined. Boone County represents both City of Columbia and Boone County; Cole County represents Jefferson City and Cole County; Greene County represents City of Springfield and Greene County (excluding City of Republic); Osage County represents both City of Linn and Osage County; and Vernon County represents City of Nevada and Vernon County. Mississippi County enacted PDMP legislation, but the enacted legislation does not apply to incorporated areas of the County. All Mississippi County pharmacies are located in incorporated areas and therefore not covered by legislation. Dispensations from Mississippi Counties were not included in the Q4 reports.

Again, pharmacy compliance is a continued focus of DPH, and not all pharmacies were appropriately reporting data at the time of this report.

Dispensation Rates by Geography

Dispensation rates vary by patient residence. The schedule II-IV controlled substance dispensation rate of the total system is 1,575.4 prescriptions per 1,000 population. St. Francois County residents receive the highest rates of controlled substance dispensations (2,401.1 prescriptions per 1,000 population). McDonald County residents receive the lowest rates of controlled substances (734.6 prescriptions per 1,000 population). Boone County's dispensation rate is significantly lower than the overall system (1,387.0 prescriptions per 1,000 population).

When compared to the total system (all jurisdictions combined), 12 jurisdictions have significantly higher dispensation rates. In descending order of dispensation rates, these 12 jurisdictions are: St. Francois County, Pemiscot County, Madison County, Jefferson County, Lincoln County, Butler County, St. Charles County, City of Independence, Wayne County, Jackson County (excluding Kansas City & Independence), Benton County, and Ste. Genevieve County.

19 jurisdictions have significantly lower rates (again in descending order): St. Louis County, Cole County, Saline County, Perry County, Vernon County, Montgomery County, Boone County, Pettis County, Kansas City, Audrain County, Bollinger County, St. Louis City, Osage County, Greene County (excluding Republic), Johnson County, Gasconade County, Miller County, Cooper County, and McDonald County.

New Madrid County, Stoddard County, and Bates County's dispensation rates are not significantly different than the overall system.

Figure 5 represents the dispensation rates per 1,000 population for each jurisdiction. Jurisdictions were categorized as either higher, lower, or not different than the overall dispensation rate based on statistical significance at α =0.05. In Figure 5, the darker the color, the higher the dispensation rate.

Further figures compare Boone County to the entire system. Note that not all figures are on the same scale.



Figure 5. Schedule II-IV controlled substance dispensation rates per 1,000 by patient residence.

Dispensation Rates by Gender

Females receive controlled substance prescriptions at significantly higher rates than males in both Boone County and the entire system (Figure 6). The dispensation rate for Boone County females is 1,510.4 prescriptions per 1,000 population compared to 1,208.7 per 1,000 population for males. Females in Boone County receive significantly lower rates of controlled substance prescriptions compared to the overall system while Boone County males receive controlled substance prescriptions at a significantly higher rate compared to the overall system.

Figure 6. Controlled substance dispensation rates per 1,000 population by gender.



Dispensation Rates by Age

For Boone County, dispensation rates increase with age (Figure 7). Unlike the overall system where there is a significant decrease in dispensation rates from those aged 55-64 to 65+, Boone County residents aged 65+ receive the highest rates of controlled substances at 3,052.0 prescriptions per 1,000 population.



Figure 7. Controlled substance dispensation rates per 1,000 population by age.

Boone County Total

Dispensation Rates by Age and Gender

Across all schedule II-IV controlled substances, females receive higher rates of controlled substances for all ages, except for minors. Figure 8 demonstrates that, across both genders, dispensation rates increase with age. Boone County females aged 65+ receive the highest rates of controlled substances at 3,295.2 prescriptions per 1,000 population. For Boone County males, those aged 65+ receive the highest rates of controlled substances at 2,663.3 prescriptions per 1,000 population.

Across all age groups, females in Boone County receive 1,380.2 prescriptions per 1,000 population which is significantly lower than the overall rate of 1,550.7 prescriptions per 1,000 population. Boone County males receive 1,208.7 prescriptions per 1,000 population which is significantly higher than the overall system (1,146.3 prescriptions per 1,000 population).

Figure 8. Controlled substance dispensation rates per 1,000 population by age and gender.



Dispensation Rates by Age, Gender, and Drug Type

The group 'Unclassified' contains schedule II-IV controlled substances not classified as opioids, benzodiazepines, muscle relaxants, stimulants, or zolpidem. Steroids and hormones are two examples of unclassified controlled substances.

All Ages

Across all age groups, opioids are the most frequently prescribed schedule II-IV controlled substance drug type (Figure 9). Benzodiazepines are the second most frequently prescribed drug type, followed by stimulants, zolpidem, unclassified, and muscle relaxants. Females receive higher rates of all drug types, except stimulants. Opioids comprise approximately 40% of all controlled substances dispensed.

Figure 9. Dispensation rates per 1,000 by gender and drug type, all ages.



Schedule II-IV Controlled Substance Dispensation Rates per 1,000 population by Drug Type and Gender, Q4 2017

Opioid Dispensations

Opioid Dispensation Rates by Geography

Opioid dispensation rates per 1,000 population are represented in Figure 10. Jurisdictions were categorized as either higher, lower, or not different than the overall opioid dispensation rate based on statistical significance at α =0.05. In Figure 10, the darker the color, the higher the dispensation rate.

The opioid dispensation rate for the total system is 687.0 prescriptions per 1,000 population. Like all schedule II-IV controlled substances, St. Francois County residents receive the highest rates of opioid prescriptions (1,224.7 opioid prescriptions per 1,000 population). McDonald County residents receive the lowest rates of opioid prescriptions (416.2 opioid prescriptions per 1,000 population). Boone County's opioid dispensation rate is significantly lower than the overall system (569.5 opioid prescriptions per 1,000 population).

When compared to the total system (all jurisdictions combined), 16 jurisdictions have significantly higher opioid dispensation rates. In descending order of dispensation rates, these 16 jurisdictions are: St. Francois County, Madison County, Pemiscot County, Wayne County, Butler County, Lincoln County, Benton County, Jefferson County, City of Independence, Bates County, Ste. Genevieve County, Vernon County, Stoddard County, St. Charles County, Saline County, and Jackson County (excluding Kansas City & Independence).

17 jurisdictions have significantly lower rates (again in descending order): Bollinger County, Cole County, Pettis County, New Madrid County, St. Louis County, Gasconade County, Audrain County, Kansas City, St. Louis City, Johnson County, Greene County (excluding Republic), Perry County, Boone County, Osage County, Miller County, Cooper County, and McDonald County.

Montgomery County's opioid dispensation rate is not significantly different than the overall system.



Figure 10. Opioid dispensation rates per 1,000 by patient location.

Opioid Dispensation Rates by Age and Gender

Across both genders, Boone County residents aged 65+ receive the highest rates of opioids compared to all other age groups (1,583.1 prescriptions per 1,000 population) as displayed in Figure 11. Among Boone County females, those aged 65+ receive the highest rates of opioids (1,724.2 prescriptions per 1,000 population); for Boone County males, those aged 65+ have an opioid dispensation rate of 1,365.9 prescriptions per 1,000 population. In Boone County, opioid dispensation rates increase as patient age increases with drastic jumps in dispensation rates from 18-24 to 25-34 year olds and from minors to 18-24 year olds, increases of 315% and 177%, respectively.

Figure 11. Opioid dispensation rates per 1,000 by age and gender.



Age-Adjusted Opioid Dispensation Rates per 1,000 population by Age and Gender, Q4 2017

Morphine Milligram Equivalents (MME)

Opioid dispensations were categorized into one of three morphine milligram equivalent (MME) groupings using CDC's prescribing guidelines. Per CDC's guidelines, prescribers are to prescribe the lowest dosage possible, use caution when writing prescriptions for 50-90 MME, and use extreme caution when exceeding 90 MME. From these guidelines, opioid dispensations were categorized into <50 MME (low dose), 50-90 MME (medium dose), and >90 MME (high dose).

Of note, this data represents individual opioid prescriptions, not a cumulative patient total. It is possible for patients to receive multiple opioid prescriptions that combine to a daily MME greater than 90.

As displayed in Figure 12, the low dose opioids (MME<50) are the most commonly prescribed MME dosage category. In Boone County, low dose opioids (<50 MME) have the highest dispensation rates (373.8 prescriptions per 1,000 population) compared to all other dosage categories. Dispensation rates decrease as dosage increases. Opioid dispensations 50-90 MME have higher dispensation rates than opioid dispensations >90 MME for Boone County residents, 98.8 and 65.1 prescriptions per 1,000 population, respectively. As shown in Figure 13, buprenorphine and methadone are in the top ten opioids dispensed. These drugs are typically used in medication assisted treatment (MAT) and have high MME conversions. Overall, low dose opioid prescriptions (<50 MME) comprise over 65% of all opioid dispensations.





Opioid Dispensation Rates per 1,000 population by Morphine Milligram Equivalent (MME) Category and Gender, All Ages, Q4 2017

🖩 Females - Boone County 🔰 Females - Total 🛛 🔳 Males - Boone County 📄 Males - Total 🖉 Total - Boone County (including unknown gender) 👘 Total - Total (including unknown gender)

Primary Drug Ingredient

Figure 13 displays the top ten opioids dispensed by primary drug ingredient for the overall system. In descending order, hydrocodone, oxycodone, and tramadol are the three most frequently prescribed opioids. These three drugs comprise 84% of all opioids dispensed. Buprenorphine and methadone are in the top 10 dispensed opioids; these opioids are typically used in medication assisted treatment (MAT) for opioid use disorder.



Figure 13. Percent of opioid dispensations by top 10 primary drug ingredient.

Appendix A: Data Tables

Table 1. Schedule II-IV controlled substance dispensation rates per 1,000 population by jurisdiction.

Schedule II-IV		<18		18-24		25-34	35-44		45-54		55-64		65+		Total	
	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI
Audrain County	484.2	(450.0, 518.4)	545.0	(481.5, 608.5)	950.5	(883.5, 1017.5)	1380.4	(1297.9, 1462.9)	1596.0	(1513.3, 1678.7)	2624.5	(2509.3, 2739.7)	2044.1	(1956.4, 2131.8)	1318.7	(1290.5, 1346.8)
Bates County	243.5	(213.9, 273.2)	608.1	(521.0, 695.3)	1211.4	(1111.3, 1311.5)	1905.0	(1782.7, 2027.3)	1777.3	(1675.0, 1879.5)	3083.6	(2934.0, 3233.2)	2683.0	(2566.1, 2799.9)	1585.8	(1548.0, 1623.6)
Benton County	289.8	(253.8, 325.8)	426.7	(348.7, 504.7)	1205.8	(1089.5, 1322.1)	1755.6	(1635.9, 1875.3)	2053.3	(1948.8, 2157.7)	2747.5	(2637.1, 2858.0)	2160.5	(2078.4, 2242.5)	1706.8	(1669.7, 1743.9)
Bollinger County	412.8	(366.1, 459.4)	263.3	(198.3, 328.3)	552.6	(471.0, 634.2)	936.7	(839.2, 1034.1)	1722.2	(1605.7, 1838.7)	2706.9	(2550.0, 2863.9)	2070.9	(1946.6, 2195.2)	1276.1	(1236.2, 1315.9)
Boone County	454.1	(439.8, 468.3)	434.2	(420.2, 448.2)	1214.5	(1187.0, 1242.0)	1772.0	(1733.8, 1810.3)	1963.9	(1924.9, 2002.9)	2936.5	(2883.6, 2989.4)	3052.0	(2996.2, 3107.8)	1387.0	(1375.5, 1398.4)
Butler County	426.4	(400.8, 452.1)	534.5	(486.3, 582.6)	1454.9	(1388.1, 1521.7)	2395.0	(2310.6, 2479.5)	2684.8	(2603.5, 2766.1)	3726.0	(3624.9, 3827.1)	3021.6	(2941.7, 3101.6)	1995.3	(1968.6, 2022.1)
Cole County	595.0	(572.4, 617.5)	590.2	(554.1, 626.4)	1059.7	(1020.2, 1099.1)	1542.9	(1494.8, 1591.0)	1887.0	(1836.8, 1937.2)	2693.8	(2628.1, 2759.6)	3080.3	(3009.1, 3151.6)	1551.3	(1533.5, 1569.0)
Cooper County	259.4	(227.7, 291.0)	297.0	(245.1, 348.9)	676.4	(610.6, 742.1)	1259.8	(1163.0, 1356.6)	1102.5	(1021.9, 1183.1)	1684.7	(1574.8, 1794.6)	1089.6	(1010.8, 1168.3)	863.4	(835.9, 890.8)
Gasconade County	379.3	(337.7, 420.9)	296.2	(230.0, 362.3)	814.6	(722.6, 906.6)	1237.0	(1132.2, 1341.8)	1073.3	(991.3, 1155.2)	1986.6	(1865.8, 2107.4)	1666.9	(1575.4, 1758.3)	1105.2	(1071.8, 1138.6)
Greene County (exc Republic)	327.1	(317.5, 336.8)	294.9	(283.7, 306.0)	881.5	(862.3, 900.8)	1446.9	(1419.9, 1473.8)	1645.3	(1618.5, 1672.1)	2363.3	(2328.8, 2397.8)	1963.5	(1935.0, 1992.1)	1181.5	(1173.2, 1189.9)
City of Independence	528.7	(511.2, 546.1)	683.8	(651.7, 716.0)	1465.8	(1427.6, 1504.0)	2267.4	(2216.9, 2317.9)	2306.5	(2261.6, 2351.4)	3773.4	(3709.9, 3836.8)	2847.0	(2798.8, 2895.3)	1909.1	(1893.2, 1924.9)
Jackson County (exc. Indep & KC)	547.6	(536.2, 559.0)	733.3	(712.0, 754.7)	1146.9	(1125.6, 1168.2)	2154.1	(2122.9, 2185.2)	2294.5	(2263.6, 2325.4)	3239.1	(3197.2, 3281.0)	3206.7	(3164.4, 3249.0)	1711.7	(1701.6, 1721.9)
Jefferson County	755.7	(741.2, 770.3)	910.6	(882.9, 938.4)	1660.6	(1630.7, 1690.6)	2434.8	(2399.6, 2470.0)	2669.3	(2635.6, 2703.1)	4356.5	(4306.4, 4406.7)	3746.3	(3697.8, 3794.9)	2204.2	(2191.7, 2216.6)
Johnson County	341.8	(320.9, 362.7)	292.5	(271.3, 313.6)	809.0	(766.4, 851.5)	1491.0	(1429.9, 1552.0)	1668.4	(1606.6, 1730.1)	2780.3	(2688.7, 2871.9)	2399.0	(2318.2, 2479.8)	1154.3	(1135.9, 1172.6)
Kansas City	377.3	(370.1, 384.5)	540.6	(527.1, 554.0)	1014.5	(1000.2, 1028.9)	1552.4	(1532.6, 1572.2)	1737.7	(1717.4, 1757.9)	2695.5	(2666.9, 2724.1)	2403.3	(2376.3, 2430.3)	1325.3	(1318.7, 1332.0)
Lincoln County	623.7	(598.1, 649.2)	957.7	(899.1, 1016.4)	1559.5	(1500.7, 1618.4)	2341.5	(2269.6, 2413.3)	2639.9	(2570.0, 2709.7)	4371.0	(4262.0, 4480.1)	3575.2	(3477.1, 3673.2)	2044.0	(2019.5, 2068.4)
Madison County	622.3	(565.2, 679.4)	491.4	(416.2, 566.6)	2104.9	(1929.3, 2280.5)	2409.7	(2246.9, 2572.6)	3428.9	(3259.4, 3598.3)	4592.2	(4376.2, 4808.2)	3427.8	(3271.9, 3583.7)	2349.1	(2294.8, 2403.4)
McDonald County	174.8	(154.5, 195.2)	142.1	(108.6, 175.7)	350.0	(305.7, 394.3)	717.9	(657.4, 778.3)	1195.8	(1122.2, 1269.4)	1684.5	(1585.1, 1783.8)	1366.1	(1280.9, 1451.4)	734.6	(712.5, 756.7)
Miller County	201.8	(179.4, 224.3)	321.3	(270.4, 372.2)	547.3	(492.4, 602.2)	898.0	(830.9, 965.2)	1259.3	(1187.4, 1331.2)	1694.9	(1604.7, 1785.0)	1646.4	(1565.8, 1727.0)	916.9	(893.1, 940.8)
Montgomery County	447.2	(398.2, 496.3)	323.9	(247.5, 400.4)	781.5	(685.2, 877.8)	1430.2	(1303.9, 1556.6)	1554.1	(1443.4, 1664.7)	2930.4	(2763.8, 3096.9)	2085.7	(1967.3, 2204.1)	1396.5	(1354.7, 1438.4)
New Madrid County	412.9	(375.4, 450.4)	478.0	(408.6, 547.5)	1140.2	(1050.3, 1230.1)	1712.8	(1606.9, 1818.7)	2137.3	(2029.8, 2244.8)	2908.7	(2775.4, 3041.9)	2615.4	(2500.5, 2730.3)	1606.0	(1570.0, 1642.1)
Osage County	495.2	(448.1, 542.3)	438.6	(366.5, 510.8)	694.0	(610.0, 778.1)	847.0	(762.1, 931.9)	1440.5	(1338.2, 1542.7)	2320.1	(2172.8, 2467.5)	2378.4	(2245.8, 2511.1)	1199.3	(1162.9, 1235.7)
Pemiscot County	363.1	(329.8, 396.4)	521.7	(451.2, 592.3)	1802.7	(1687.5, 1917.9)	2699.6	(2560.5, 2838.7)	3498.2	(3353.1, 3643.4)	5318.0	(5124.2, 5511.8)	3909.4	(3760.0, 4058.8)	2363.6	(2319.0, 2408.1)
Perry County	817.3	(765.9, 868.7)	718.7	(629.8, 807.6)	1109.9	(1023.3, 1196.5)	1490.8	(1394.2, 1587.4)	1748.5	(1650.1, 1846.9)	2509.4	(2381.2, 2637.5)	2128.4	(2023.3, 2233.5)	1482.5	(1447.8, 1517.1)
Pettis County	374.6	(351.5, 397.7)	441.5	(400.2, 482.8)	1108.8	(1052.3, 1165.3)	1527.3	(1458.4, 1596.1)	1699.7	(1634.5, 1765.0)	2729.5	(2636.2, 2822.7)	2324.0	(2248.2, 2399.9)	1356.9	(1334.7, 1379.2)
Saline County	584.9	(544.1, 625.7)	366.3	(320.8, 411.8)	1036.5	(960.3, 1112.7)	1785.1	(1682.4, 1887.9)	1702.5	(1613.6, 1791.5)	2902.1	(2778.3, 3025.9)	2459.0	(2358.0, 2560.1)	1489.3	(1458.0, 1520.6)
St. Charles County	806.2	(794.6, 817.7)	1101.5	(1078.2, 1124.9)	1659.6	(1636.5, 1682.8)	2134.2	(2108.8, 2159.7)	2171.8	(2147.7, 2196.0)	3532.1	(3495.6, 3568.5)	3423.3	(3387.2, 3459.3)	1949.5	(1940.4, 1958.6)
St. Francois County	688.2	(661.1, 715.3)	566.5	(528.9, 604.1)	1446.8	(1398.1, 1495.6)	2670.5	(2601.6, 2739.4)	3200.1	(3129.8, 3270.3)	5515	(5408.6, 5621.3)	3605.7	(3528.8, 3682.7)	2401.1	(2377.4, 2424.9)
St. Louis City	386.9	(377.5, 396.3)	341.6	(330.0, 353.1)	1008.0	(991.6, 1024.4)	1473.7	(1450.0, 1497.4)	1595.9	(1572.5, 1619.3)	2689.6	(2655.0, 2724.1)	2210.0	(2178.9, 2241.1)	1250.8	(1243.0, 1258.6)
St. Louis County	598.6	(592.3, 604.9)	894.4	(881.8, 907.0)	1315.5	(1302.7, 1328.4)	1566.2	(1552.2, 1580.2)	1659.8	(1647.0, 1672.6)	2608.9	(2591.2, 2626.5)	2655.0	(2638.5, 2671.5)	1562.4	(1557.5, 1567.3)
Ste. Genevieve County	679.5	(629.7, 729.2)	589.6	(507.7, 671.6)	1154.2	(1057.8, 1250.7)	1800.8	(1687.6, 1914.0)	1947.0	(1848.6, 2045.3)	3332.8	(3189.8, 3475.8)	2271.4	(2161.9, 2380.9)	1693.9	(1656.0, 1731.8)
Stoddard County	494.8	(461.4, 528.2)	536.7	(478.9, 594.5)	1304.5	(1228.0, 1381.0)	1835.3	(1747.6, 1923.0)	2251.5	(2162.7, 2340.4)	2833.1	(2726.8, 2939.4)	2062.1	(1985.1, 2139.1)	1591.8	(1563.3, 1620.4)
Vernon County	496.3	(458.2, 534.4)	471.4	(408.8, 533.9)	1068.5	(984.4, 1152.6)	1685.4	(1581.9, 1789.0)	2307.3	(2199.3, 2415.4)	2534.0	(2415.9, 2652.1)	2056.4	(1961.0, 2151.7)	1478.1	(1445.4, 1510.9)
Wayne County	390.6	(344.3, 436.8)	468.9	(384.0, 553.9)	1485.0	(1348.8, 1621.1)	1694.9	(1565.7, 1824.1)	2645.2	(2504.3, 2786.0)	3501.5	(3336.7, 3666.3)	2499.5	(2384.3, 2614.7)	1895.7	(1849.3, 1942.1)
Total	537.0	(534.0, 540.0)	635.0	(630.0, 640.0)	1216.9	(1211.0, 1222.9)	1765.9	(1758.4, 1773.4)	1927.9	(1920.6, 1935.1)	2985.9	(2975.9, 2995.9)	2692.2	(2683.1, 2701.3)	1575.4	(1572.9, 1577.9)

Boone County		<18	:	18-24		25-34	35-44		45-54		55-64		65+		Total	
	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI
Benzodiazepine	22.5	(19.4, 25.7)	59.3	(54.1, 64.5)	248.6	(236.2, 261.0)	456.1	(436.7, 475.5)	522.0	(501.9, 542.1)	766.6	(739.5, 793.6)	904.2	(873.8, 934.6)	330.5	(324.9, 336.1)
Female	19.7	(15.4, 23.9)	67.6	(60.0, 75.3)	308.6	(288.9, 328.3)	546.7	(517.0, 576.4)	642.7	(611.9, 673.6)	931.4	(890.1, 972.8)	1029.2	(986.4, 1071.9)	405.0	(396.3, 413.6)
Male	23.7	(19.1, 28.2)	47.7	(40.9, 54.4)	176.2	(161.4, 190.9)	345.5	(321.3, 369.6)	377.7	(352.9, 402.5)	548.3	(515.3, 581.3)	723.7	(682.1, 765.3)	240.5	(233.6, 247.3)
Muscle Relaxant	*	*	*	*	4.5	(2.9, 6.2)	16.6	(12.9, 20.2)	20.6	(16.6, 24.6)	32.0	(26.5, 37.6)	23.1	(18.2, 27.9)	10.5	(9.5, 11.5)
Female	*	*	*	*	7.8	(4.7, 11.0)	22.7	(16.7, 28.8)	28.9	(22.3, 35.4)	42.4	(33.6, 51.3)	24.1	(17.5, 30.6)	14.1	(12.5, 15.7)
Male	*	*	*	*	*	*	8.8	(4.9, 12.6)	10.2	(6.1, 14.2)	20.2	(13.9, 26.5)	21.8	(14.6, 29.0)	6.3	(5.2, 7.4)
Opioid	40.5	(36.3, 44.8)	112.0	(104.9, 119.2)	465.0	(448.0, 482.0)	691.9	(668.0, 715.8)	853.3	(827.6, 879.0)	1382.7	(1346.4, 1419.0)	1583.1	(1542.9, 1623.2)	569.5	(562.2, 576.9)
Female	38.6	(32.7, 44.6)	124.7	(114.4, 135.1)	550.9	(524.6, 577.2)	807.4	(771.3, 843.6)	961.6	(923.9, 999.3)	1433.2	(1381.9, 1484.4)	1724.2	(1668.8, 1779.6)	647.6	(636.7, 658.5)
Male	38.7	(32.9, 44.5)	95.6	(86.1, 105.1)	370.0	(348.6, 391.3)	558.4	(527.7, 589.1)	717.2	(683.0, 751.4)	1291.2	(1240.5, 1341.9)	1365.9	(1308.8, 1423.0)	474.4	(464.8, 484.0)
Stimulant	375.8	(362.8, 388.8)	238.4	(228.0, 248.8)	377.1	(361.8, 392.4)	341.1	(324.3, 357.9)	189.7	(177.5, 201.8)	177.7	(164.7, 190.8)	83.1	(73.9, 92.3)	273.8	(268.7, 278.9)
Female	179.5	(166.7, 192.4)	197.7	(184.7, 210.8)	372.6	(351.0, 394.2)	369.4	(344.9, 393.8)	211.4	(193.7, 229.1)	187.4	(168.9, 206.0)	87.0	(74.6, 99.4)	228.4	(221.9, 234.9)
Male	545.2	(523.4, 567.1)	271.4	(255.4, 287.5)	364.2	(343.0, 385.4)	296.8	(274.4, 319.1)	157.7	(141.7, 173.7)	155.8	(138.2, 173.4)	74.1	(60.7, 87.4)	309.0	(301.3, 316.8)
Unclassified	14.9	(12.4, 17.5)	18.2	(15.3, 21.1)	79.5	(72.4, 86.5)	163.4	(151.7, 175.0)	207.8	(195.1, 220.5)	282.8	(266.3, 299.2)	189.5	(175.6, 203.4)	108.6	(105.4, 111.8)
Female	7.4	(4.8, 10.1)	22.6	(18.2, 27.0)	98.3	(87.2, 109.4)	184.5	(167.2, 201.8)	184.8	(168.3, 201.4)	234.6	(213.9, 255.4)	138.4	(122.7, 154.0)	102.4	(98.0, 106.7)
Male	16.2	(12.4, 19.9)	11.6	(8.3, 14.9)	56.2	(47.8, 64.5)	128.2	(113.5, 142.9)	227.6	(208.4, 246.9)	317.9	(292.7, 343.0)	247.7	(223.3, 272.0)	108.1	(103.5, 112.7)
Zolpidem	*	*	5.9	(4.2, 7.5)	39.8	(34.8, 44.8)	103.0	(93.7, 112.2)	170.5	(159.0, 182.0)	294.7	(277.9, 311.4)	269.1	(252.5, 285.7)	94.0	(91.0, 97.0)
Female	*	*	4.9	(2.9, 7.0)	43.1	(35.8, 50.5)	131.4	(116.8, 146.0)	215.7	(197.8, 233.5)	336.2	(311.4, 361.1)	292.5	(269.7, 315.3)	112.9	(108.4, 117.5)
Male	*	*	6.9	(4.4, 9.5)	35.6	(29.0, 42.2)	69.4	(58.5, 80.2)	113.2	(99.6, 126.7)	235.1	(213.4, 256.7)	230.2	(206.8, 253.7)	70.4	(66.7, 74.1)
Total	454.1	(439.8, 468.3)	434.2	(420.2, 448.2)	1214.5	(1187.0, 1242.0)	1772.0	(1733.8, 1810.3)	1963.9	(1924.9, 2002.9)	2936.5	(2883.6, 2989.4)	3052.0	(2996.2, 3107.8)	1387.0	(1375.5, 1398.4)
Female	245.3	(230.3, 260.3)	417.9	(398.9, 436.8)	1381.3	(1339.7, 1423.0)	2062.1	(2004.4, 2119.9)	2245.1	(2187.5, 2302.7)	3165.4	(3089.2, 3241.5)	3295.2	(3218.7, 3371.8)	1510.4	(1493.7, 1527.0)
Male	624.2	(600.8, 647.5)	433.7	(413.4, 454.0)	1003.4	(968.2, 1038.5)	1406.9	(1358.2, 1455.6)	1603.5	(1552.4, 1654.6)	2568.5	(2497.0, 2639.9)	2663.3	(2583.6, 2743.1)	1208.7	(1193.3, 1224.0)
* indicates the rate has been suppl	ressed															

Table 2. Dispensation rates per 1,000 population for Boone County by age, gender, and drug type.

Table 3. Dispensation rates per 1,000 population for total PDMP by age, gender, and drug type.

Total	<18		18-24		25-34		35-44			45-54	55-64		65+		Total	
	Rate	95% CI		95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI
Benzodiazepine	23.7	(23.1, 24.4)	96.9	(94.9, 98.8)	284.1	(281.2, 287.0)	477.8	(473.9, 481.7)	538.4	(534.6, 542.2)	852.2	(846.9, 857.6)	849.5	(844.4, 854.6)	407.3	(406.1, 408.6)
Female	20.2	(19.4, 21.1)	94.2	(91.5, 96.9)	295.0	(290.9, 299.2)	507.9	(502.3, 513.5)	590.5	(584.9, 596.0)	903.4	(895.7, 911.0)	925.2	(918.2, 932.2)	450.0	(448.2, 451.9)
Male	20.2	(19.4, 21.0)	68.0	(65.7, 70.3)	183.4	(180.1, 186.7)	283.3	(279.0, 287.6)	323.5	(319.3, 327.7)	536.2	(530.0, 542.4)	553.2	(546.9, 559.6)	247.6	(246.2, 249.0)
Muscle Relaxant	0.0	(0.0, 0.0)	0.6	(0.4, 0.7)	4.6	(4.2, 5.0)	14.5	(13.8, 15.1)	21.4	(20.7, 22.2)	33.9	(32.9, 35.0)	14.3	(13.7, 15.0)	11.6	(11.4, 11.8)
Female	0.0	(0.0, 0.1)	0.6	(0.4, 0.8)	5.1	(4.6, 5.7)	15.8	(14.8, 16.8)	24.3	(23.2, 25.4)	38.3	(36.8, 39.9)	14.8	(13.9, 15.7)	13.1	(12.8, 13.4)
Male	0.0	(0.0, 0.0)	0.3	(0.1, 0.4)	2.7	(2.3, 3.1)	8.1	(7.4, 8.9)	12.3	(11.5, 13.1)	19.7	(18.5, 20.9)	9.9	(9.1, 10.8)	6.7	(6.5, 6.9)
Opioid	49.4	(48.5, 50.3)	203.8	(201.0, 206.6)	456.1	(452.5, 459.7)	713.2	(708.5, 718.0)	868.1	(863.2, 872.9)	1496.8	(1489.7, 1503.9)	1490.1	(1483.4, 1496.9)	687.0	(685.4, 688.7)
Female	42.4	(41.1, 43.6)	207.4	(203.3, 211.4)	482.6	(477.3, 487.9)	719.2	(712.5, 725.9)	845.9	(839.2, 852.5)	1401.1	(1391.6, 1410.6)	1494.3	(1485.4, 1503.2)	699.9	(697.5, 702.2)
Male	43.3	(42.1, 44.5)	139.4	(136.1, 142.7)	307.9	(303.7, 312.2)	497.6	(492.0, 503.3)	657.4	(651.3, 663.4)	1203.2	(1194.0, 1212.4)	1154.6	(1145.4, 1163.8)	501.3	(499.3, 503.4)
Stimulant	444.4	(441.6, 447.1)	304.5	(301.0, 307.9)	363.9	(360.6, 367.1)	315.3	(312.2, 318.5)	189.8	(187.5, 192.0)	158.8	(156.5, 161.1)	52.3	(51.0, 53.6)	279.7	(278.7, 280.8)
Female	218.9	(216.1, 221.6)	224.1	(219.9, 228.3)	310.9	(306.7, 315.1)	287.6	(283.4, 291.9)	191.9	(188.8, 195.1)	163.0	(159.7, 166.2)	48.1	(46.5, 49.7)	204.6	(203.3, 205.8)
Male	512.7	(508.6, 516.9)	271.5	(266.8, 276.1)	279.7	(275.7, 283.8)	218.0	(214.3, 221.8)	115.2	(112.7, 117.7)	97.0	(94.4, 99.6)	42.0	(40.3, 43.8)	256.0	(254.6, 257.5)
Unclassified	19.0	(18.5, 19.6)	19.8	(18.9, 20.7)	66.9	(65.5, 68.3)	143.3	(141.2, 145.4)	165.3	(163.2, 167.5)	199.4	(196.8, 202.0)	98.4	(96.7, 100.1)	94.8	(94.2, 95.4)
Female	13.1	(12.4, 13.8)	23.2	(21.9, 24.6)	76.9	(74.8, 79.0)	140.3	(137.3, 143.2)	144.3	(141.5, 147.0)	158.1	(154.9, 161.3)	75.1	(73.2, 77.1)	84.6	(83.8, 85.4)
Male	15.9	(15.2, 16.6)	9.1	(8.2, 9.9)	34.6	(33.2, 36.1)	96.7	(94.2, 99.2)	132.8	(130.1, 135.5)	175.9	(172.4, 179.4)	104.5	(101.7, 107.2)	74.3	(73.6, 75.1)
Zolpidem	0.4	(0.3, 0.5)	9.5	(8.9, 10.1)	41.4	(40.3, 42.5)	101.8	(100.0, 103.6)	144.9	(142.9, 146.8)	244.7	(241.9, 247.6)	187.5	(185.1, 189.9)	94.7	(94.1, 95.3)
Female	0.4	(0.3, 0.6)	9.0	(8.1, 9.8)	44.0	(42.4, 45.6)	108.3	(105.7, 110.9)	148.6	(145.8, 151.4)	243.5	(239.5, 247.5)	180.7	(177.7, 183.8)	98.5	(97.6, 99.3)
Male	0.2	(0.2, 0.3)	7.0	(6.3, 7.8)	24.8	(23.6, 26.0)	57.7	(55.8, 59.6)	89.3	(87.0, 91.5)	163.9	(160.5, 167.3)	143.6	(140.4, 146.9)	60.4	(59.6, 61.1)
Total	537.0	(534.0, 540.0)	635.0	(630.0, 640.0)	1216.9	(1211.0, 1222.9)	1765.9	(1758.4, 1773.4)	1927.9	(1920.6, 1935.1)	2985.9	(2975.9, 2995.9)	2692.2	(2683.1, 2701.3)	1575.4	(1572.9, 1577.9)
Female	295.0	(291.8, 298.2)	558.5	(551.9, 565.1)	1214.5	(1206.2, 1222.9)	1779.1	(1768.6, 1789.6)	1945.4	(1935.3, 1955.5)	2907.4	(2893.7, 2921.1)	2738.3	(2726.3, 2750.3)	1550.7	(1547.2, 1554.2)
Male	592.4	(587.9, 596.8)	495.3	(489.0, 501.5)	833.2	(826.2, 840.2)	1161.5	(1152.8, 1170.1)	1330.4	(1321.8, 1339.0)	2195.9	(2183.4, 2208.3)	2007.9	(1995.7, 2020.0)	1146.3	(1143.2, 1149.4)

Opioids		<18	1	18-24		25-34		35-44	45-54		55-64		65+		Total	
	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI
Audrain County	35.8	(26.5, 45.1)	277.3	(232.0, 322.6)	453.7	(407.4, 500.0)	632.5	(576.6, 688.3)	809.1	(750.3, 868.0)	1247.8	(1168.3, 1327.2)	1092.1	(1028.0, 1156.2)	603.5	(584.5, 622.6)
Bates County	34.8	(23.6, 46.0)	269.9	(211.8, 328.0)	682.1	(607.0, 757.2)	1050.6	(959.8, 1141.4)	998.1	(921.5, 1074.7)	1802.6	(1688.2, 1916.9)	1499.8	(1412.5, 1587.2)	865.5	(837.6, 893.4)
Benton County	41.9	(28.2, 55.6)	241.2	(182.6, 299.8)	583.9	(503.0, 664.9)	882.0	(797.2, 966.9)	1118.0	(1040.9, 1195.0)	1684.6	(1598.1, 1771.0)	1284.4	(1221.2, 1347.7)	958.6	(930.8, 986.5)
Bollinger County	59.0	(41.3, 76.6)	108.7	(66.9, 150.4)	329.7	(266.6, 392.7)	493.4	(422.7, 564.1)	873.4	(790.5, 956.3)	1551.2	(1432.4, 1670.0)	1097.6	(1007.1, 1188.1)	649.4	(620.9, 677.8)
Boone County	40.5	(36.3, 44.8)	112.0	(104.9, 119.2)	465.0	(448.0, 482.0)	691.9	(668.0, 715.8)	853.3	(827.6, 879.0)	1382.7	(1346.4, 1419.0)	1583.1	(1542.9, 1623.2)	569.5	(562.2, 576.9)
Butler County	51.3	(42.5, 60.2)	324.3	(286.8, 361.8)	745.4	(697.6, 793.2)	1231.2	(1170.7, 1291.8)	1367.1	(1309.1, 1425.1)	2027.1	(1952.6, 2101.7)	1687.0	(1627.3, 1746.7)	1025.8	(1006.7, 1045.0)
Cole County	50.2	(43.6, 56.7)	240.0	(216.9, 263.1)	450.2	(424.5, 475.9)	672.7	(641.0, 704.5)	792.2	(759.7, 824.7)	1248.5	(1203.7, 1293.2)	1487.2	(1437.7, 1536.7)	646.1	(634.7, 657.6)
Cooper County	43.2	(30.3, 56.1)	150.9	(113.9, 187.8)	309.1	(264.7, 353.5)	628.9	(560.6, 697.3)	661.8	(599.3, 724.3)	966.4	(883.2, 1049.6)	669.1	(607.4, 730.8)	458.8	(438.8, 478.9)
Gasconade County	54.7	(38.9, 70.5)	173.1	(122.5, 223.6)	487.1	(416.0, 558.3)	603.5	(530.3, 676.7)	630.3	(567.5, 693.1)	1177.8	(1084.8, 1270.8)	1022.9	(951.2, 1094.5)	609.1	(584.3, 633.9)
Greene County (exc Republic)	44.4	(40.9, 48.0)	137.9	(130.2, 145.5)	430.0	(416.6, 443.5)	673.9	(655.5, 692.3)	811.1	(792.3, 829.9)	1253.5	(1228.4, 1278.6)	1114.3	(1092.8, 1135.8)	583.1	(577.2, 589.0)
City of Independence	58.8	(53.0, 64.6)	318.5	(296.6, 340.5)	669.9	(644.1, 695.7)	954.0	(921.2, 986.8)	1115.6	(1084.3, 1146.8)	1987.2	(1941.2, 2033.3)	1687.7	(1650.5, 1724.8)	925.1	(914.1, 936.2)
Jackson County (exc. Indep & KC)	64.0	(60.1, 67.9)	252.5	(240.0, 265.0)	417.5	(404.6, 430.4)	808.6	(789.5, 827.7)	943.4	(923.6, 963.2)	1554.3	(1525.3, 1583.3)	1820.2	(1788.3, 1852.1)	718.7	(712.1, 725.3)
Jefferson County	50.7	(46.9, 54.5)	279.6	(264.2, 295.0)	614.3	(596.1, 632.6)	952.4	(930.3, 974.4)	1176.9	(1154.5, 1199.4)	2183.7	(2148.2, 2219.2)	2071.5	(2035.4, 2107.6)	937.5	(929.3, 945.6)
Johnson County	51.5	(43.4, 59.6)	131.1	(117.0, 145.3)	386.2	(356.8, 415.5)	749.1	(705.8, 792.4)	857.7	(813.4, 901.9)	1526.8	(1458.9, 1594.7)	1436.6	(1374.0, 1499.1)	586.6	(573.5, 599.7)
Kansas City	45.6	(43.1, 48.1)	197.2	(189.1, 205.4)	362.5	(353.9, 371.1)	608.6	(596.2, 621.0)	809.6	(795.7, 823.4)	1422.6	(1401.8, 1443.3)	1408.4	(1387.8, 1429.1)	597.5	(593.0, 602.0)
Lincoln County	51.1	(43.8, 58.4)	441.0	(401.2, 480.8)	738.2	(697.7, 778.6)	1050.2	(1002.1, 1098.3)	1354.4	(1304.3, 1404.4)	2331.7	(2252.1, 2411.4)	2202.6	(2125.7, 2279.6)	990.7	(973.7, 1007.7)
Madison County	62.8	(44.6, 80.9)	266.7	(211.3, 322.1)	1132.5	(1003.7, 1261.3)	1237.8	(1121.1, 1354.5)	1741.7	(1620.9, 1862.5)	2561.8	(2400.5, 2723.1)	1975.1	(1856.7, 2093.4)	1211.2	(1172.2, 1250.2)
McDonald County	21.0	(13.9, 28.1)	90.6	(63.8, 117.4)	205.6	(171.7, 239.6)	386.8	(342.4, 431.1)	706.4	(649.8, 762.9)	992.4	(916.1, 1068.6)	888.1	(819.4, 956.9)	416.2	(399.6, 432.9)
Miller County	39.1	(29.2, 48.9)	165.9	(129.3, 202.5)	282.2	(242.8, 321.6)	441.8	(394.7, 488.9)	672.9	(620.4, 725.4)	847.4	(783.7, 911.2)	937.1	(876.3, 997.9)	468.1	(451.0, 485.1)
Montgomery County	23.8	(12.5, 35.2)	178.4	(121.7, 235.1)	410.8	(341.0, 480.6)	720.9	(631.2, 810.7)	754.5	(677.4, 831.6)	1515.7	(1395.9, 1635.5)	1165.4	(1076.8, 1253.9)	681.6	(652.3, 710.9)
New Madrid County	39.0	(27.5, 50.5)	233.7	(185.2, 282.3)	381.9	(329.9, 433.9)	642.5	(577.7, 707.4)	843.4	(775.8, 910.9)	1259.7	(1172.1, 1347.4)	1216.4	(1138.1, 1294.8)	640.4	(617.6, 663.2)
Osage County	51.3	(36.1, 66.4)	197.7	(149.3, 246.1)	317.9	(261.0, 374.8)	328.2	(275.3, 381.0)	648.4	(579.8, 717.0)	1214.9	(1108.3, 1321.4)	1224.8	(1129.6, 1320.0)	534.4	(510.0, 558.7)
Pemiscot County	32.6	(22.6, 42.6)	206.2	(161.8, 250.6)	714.6	(642.0, 787.1)	1033.6	(947.5, 1119.7)	1593.1	(1495.1, 1691.1)	2553.3	(2419.0, 2687.6)	1954.7	(1849.1, 2060.3)	1043.3	(1013.7, 1072.9)
Perry County	63.0	(48.7, 77.3)	240.5	(189.1, 292.0)	404.6	(352.3, 456.9)	513.2	(456.6, 569.9)	725.0	(661.7, 788.4)	1178.9	(1091.0, 1266.7)	1151.4	(1074.0, 1228.7)	580.0	(558.4, 601.7)
Pettis County	36.0	(28.8, 43.1)	197.1	(169.5, 224.7)	557.4	(517.4, 597.5)	657.8	(612.6, 703.0)	796.3	(751.7, 841.0)	1447.3	(1379.4, 1515.2)	1283.3	(1226.9, 1339.6)	645.0	(629.7, 660.3)
Saline County	86.7	(71.0, 102.4)	160.4	(130.2, 190.5)	452.6	(402.2, 502.9)	859.5	(788.1, 930.8)	858.5	(795.4, 921.7)	1599.5	(1507.6, 1691.3)	1494.5	(1415.7, 1573.3)	744.5	(722.4, 766.7)
St. Charles County	60.1	(57.0, 63.3)	283.1	(271.2, 294.9)	516.6	(503.7, 529.6)	760.7	(745.5, 775.9)	870.4	(855.1, 885.7)	1631.3	(1606.5, 1656.1)	1862.8	(1836.2, 1889.4)	746.5	(740.9, 752.2)
St. Francois County	51.4	(44.0, 58.8)	287.8	(261.0, 314.6)	735.6	(700.8, 770.4)	1336.9	(1288.1, 1385.6)	1674.1	(1623.3, 1724.9)	3056.1	(2976.9, 3135.3)	2088.1	(2029.5, 2146.7)	1224.7	(1207.8, 1241.7)
St. Louis City	33.6	(30.9, 36.4)	133.9	(126.7, 141.2)	377.9	(367.9, 388.0)	649.1	(633.4, 664.9)	788.2	(771.8, 804.6)	1509.5	(1483.6, 1535.3)	1349.0	(1324.8, 1373.3)	596.6	(591.3, 602.0)
St. Louis County	50.5	(48.7, 52.3)	212.1	(206.0, 218.3)	424.2	(416.8, 431.5)	584.9	(576.4, 593.5)	693.3	(685.1, 701.6)	1217.1	(1205.1, 1229.2)	1393.9	(1381.9, 1405.8)	627.1	(624.0, 630.2)
Ste. Genevieve County	54.0	(40.0, 68.0)	251.9	(198.3, 305.4)	415.5	(357.7, 473.4)	794.8	(719.6, 870.0)	1028.5	(957.0, 1100.0)	1762.2	(1658.2, 1866.1)	1196.8	(1117.4, 1276.3)	780.2	(754.5, 805.9)
Stoddard County	28.7	(20.7, 36.7)	256.2	(216.2, 296.1)	661.6	(607.1, 716.1)	894.2	(833.0, 955.4)	1113.0	(1050.5, 1175.5)	1476.3	(1399.5, 1553.0)	1132.1	(1075.0, 1189.1)	767.1	(747.3, 786.9)
Vernon County	54.0	(41.4, 66.5)	240.0	(195.4, 284.6)	567.0	(505.7, 628.3)	837.7	(764.8, 910.7)	1239.9	(1160.7, 1319.1)	1441.7	(1352.6, 1530.7)	1307.2	(1231.2, 1383.3)	775.5	(751.7, 799.2)
Wayne County	42.8	(27.5, 58.1)	336.7	(264.7, 408.7)	848.1	(745.2, 951.0)	964.1	(866.7, 1061.6)	1470.0	(1365.0, 1575.0)	1957.6	(1834.4, 2080.8)	1374.8	(1289.4, 1460.2)	1026.3	(992.1, 1060.4)
Total	49.4	(48.5, 50.3)	203.8	(201.0, 206.6)	456.1	(452.5, 459.7)	713.2	(708.5, 718.0)	868.1	(863.2, 872.9)	1496.8	(1489.7, 1503.9)	1490.1	(1483.4, 1496.9)	687.0	(685.4, 688.7)

Table 4. Opioid dispensation rates per 1,000 population by jurisdiction.

Table 5. Opioid dispensation rates per 1,000 population for Boone County by MME category.

Boone County		<18	1	18-24		25-34		35-44		45-54		55-64		65+		Total
	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI
<50	27.4	(23.9, 31.0)	76.2	(70.4, 82.1)	273.0	(260.0, 286.1)	444.5	(425.4, 463.7)	558.9	(538.1, 579.7)	907.6	(878.2, 937.0)	1,097.4	(1064.0, 1130.8)	373.8	(367.9, 379.8)
Female	24.5	(19.7, 29.2)	92.7	(83.8, 101.6)	346.5	(325.6, 367.3)	545.9	(516.1, 575.6)	642.7	(611.9, 673.6)	967.7	(925.6, 1009.8)	1,225.8	(1179.1, 1272.5)	440.7	(431.7, 449.7)
Male	28.4	(23.4, 33.4)	56.8	(49.5, 64.1)	193.8	(178.4, 209.3)	329.7	(306.1, 353.3)	456.1	(428.8, 483.3)	815.9	(775.7, 856.2)	905.4	(858.9, 951.9)	294.7	(287.1, 302.3)
50-90	5.6	(4.0, 7.2)	17.7	(14.9, 20.6)	68.6	(62.1, 75.2)	118.7	(108.8, 128.6)	157.2	(146.1, 168.2)	262.6	(246.8, 278.5)	267.0	(250.5, 283.5)	98.8	(95.8, 101.9)
Female	4.6	(2.5, 6.6)	18.4	(14.4, 22.3)	77.4	(67.5, 87.2)	121.3	(107.3, 135.3)	170.6	(154.7, 186.5)	268.0	(245.9, 290.2)	267.5	(245.7, 289.3)	105.6	(101.2, 110.0)
Male	6.6	(4.2, 9.0)	16.8	(12.8, 20.8)	59.7	(51.1, 68.3)	114.1	(100.3, 128.0)	141.1	(126.0, 156.3)	251.1	(228.8, 273.4)	260.7	(235.8, 285.7)	90.2	(86.0, 94.4)
>90	*	*	11.4	(9.1, 13.7)	104.6	(96.5, 112.6)	95.4	(86.6, 104.3)	86.0	(77.8, 94.1)	131.1	(119.9, 142.3)	132.7	(121.1, 144.3)	65.1	(62.6, 67.5)
Female	*	*	7.8	(5.2, 10.4)	111.0	(99.2, 122.8)	95.6	(83.2, 108.0)	92.0	(80.4, 103.7)	113.5	(99.1, 127.9)	144.8	(128.8, 160.9)	66.6	(63.1, 70.1)
Male	*	*	15.3	(11.5, 19.1)	97.9	(86.9, 108.8)	93.9	(81.4, 106.5)	76.3	(65.1, 87.4)	148.6	(131.4, 165.8)	116.4	(99.7, 133.0)	62.6	(59.1, 66.1)
Total	37.7	(33.6, 41.8)	109.3	(102.3, 116.4)	459.0	(442.1, 475.9)	681.0	(657.2, 704.7)	832.9	(807.5, 858.3)	1,352.7	(1316.8, 1388.6)	1,552.8	(1513.0, 1592.6)	557.9	(550.7, 565.2)
Female	35.0	(29.4, 40.7)	122.7	(112.4, 133.0)	545.7	(519.5, 571.8)	791.8	(756.0, 827.6)	941.9	(904.6, 979.3)	1,399.8	(1349.1, 1450.4)	1,693.2	(1638.3, 1748.1)	634.9	(624.1, 645.7)
Male	37.1	(31.4, 42.8)	92.9	(83.5, 102.2)	364.2	(343.0, 385.4)	552.7	(522.1, 583.2)	697.3	(663.6, 731.0)	1,266.4	(1216.2, 1316.6)	1,337.3	(1280.7, 1393.8)	464.7	(455.2, 474.3)
* indicates the rate has been suppressed.																

Total		<18	1	8-24	:	25-34		35-44		45-54		55-64		65+	•	Total
	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI
<50	34.2	(33.5, 35.0)	128.6	(126.3, 130.8)	276.5	(273.6, 279.3)	431.8	(428.1, 435.5)	529.5	(525.7, 533.3)	930.4	(924.8, 936.0)	1061.3	(1055.6, 1067.0)	441.8	(440.5, 443.1)
Female	30.1	(29.0, 31.1)	143.5	(140.1, 146.8)	315.1	(310.9, 319.4)	463.5	(458.1, 468.9)	543.7	(538.4, 549.1)	916.9	(909.2, 924.6)	1109.2	(1101.6, 1116.9)	476.3	(474.3, 478.2)
Male	30.8	(29.8, 31.8)	84.0	(81.4, 86.6)	175.6	(172.4, 178.9)	290.8	(286.5, 295.1)	392.9	(388.2, 397.5)	728.8	(721.6, 735.9)	795.1	(787.5, 802.7)	311.9	(310.3, 313.5)
50-90	5.0	(4.7, 5.3)	35.5	(34.3, 36.7)	73.0	(71.6, 74.5)	126.1	(124.1, 128.1)	176.8	(174.6, 179.0)	298.0	(294.8, 301.1)	227.8	(225.2, 230.4)	122.2	(121.5, 122.9)
Female	4.6	(4.2, 5.0)	35.7	(34.0, 37.4)	77.5	(75.4, 79.6)	128.7	(125.9, 131.5)	170.3	(167.3, 173.3)	274.3	(270.1, 278.5)	214.4	(211.0, 217.8)	121.0	(120.1, 122.0)
Male	4.3	(3.9, 4.6)	27.3	(25.8, 28.8)	53.4	(51.7, 55.2)	93.6	(91.1, 96.0)	144.3	(141.5, 147.2)	258.9	(254.6, 263.2)	203.6	(199.7, 207.4)	98.2	(97.3, 99.1)
>90	0.8	(0.7, 0.9)	18.5	(17.7, 19.4)	73.3	(71.9, 74.8)	93.2	(91.4, 94.9)	88.1	(86.5, 89.6)	143.5	(141.3, 145.7)	86.3	(84.7, 87.9)	65.4	(64.9, 65.9)
Female	0.5	(0.4, 0.7)	14.6	(13.6, 15.7)	68.1	(66.2, 70.1)	81.4	(79.2, 83.7)	77.2	(75.2, 79.3)	120.1	(117.3, 122.9)	80.0	(78.0, 82.1)	58.7	(58.0, 59.4)
Male	0.9	(0.8, 1.1)	18.9	(17.7, 20.1)	65.5	(63.6, 67.5)	84.8	(82.4, 87.1)	79.1	(77.0, 81.1)	137.8	(134.7, 141.0)	78.1	(75.7, 80.4)	59.0	(58.3, 59.7)
Total	45.2	(44.3, 46.1)	192.0	(189.3, 194.8)	440.6	(437.1, 444.2)	681.3	(676.7, 686.0)	832.7	(828.0, 837.4)	1436.6	(1429.6, 1443.6)	1439.7	(1433.0, 1446.3)	659.7	(658.0, 661.3)
Female	39.2	(38.0, 40.4)	200.5	(196.6, 204.5)	474.1	(468.9, 479.3)	697.4	(690.8, 704.0)	823.1	(816.5, 829.7)	1363.4	(1354.0, 1372.8)	1458.2	(1449.4, 1466.9)	681.3	(679.0, 683.7)
Male	40.2	(39.1, 41.4)	134.3	(131.0, 137.6)	302.3	(298.1, 306.5)	483.2	(477.6, 488.8)	638.2	(632.2, 644.1)	1168.8	(1159.7, 1177.9)	1121.5	(1112.5, 1130.6)	486.8	(484.8, 488.8)

Table 6. Opioid dispensation rates per 1,000 population for total PDMP by MME category.

Table 7. Opioid dispensation counts for total PDMP by primary drug ingredient.

Primary Drug Ingredient	Dispensation Count	Rate	95% CI
Buprenorphine	23,378	24.4	(24.1, 24.8)
Butophanol	450	0.5	(0.4, 0.5)
Codeine	33,198	34.7	(34.3, 35.1)
Dihydrocodeine	2	0.0	(0.0, 0.0)
Diphenoxylate	741	0.8	(0.7, 0.8)
Fentanyl	12,356	12.9	(12.7, 13.1)
Hydrocodone	244,094	255.2	(254.2, 256.2)
Hydromorphone	5,270	5.5	(5.4, 5.7)
Levarphanol	87	0.1	(0.1, 0.1)
Meperidine	397	0.4	(0.4, 0.5)
Methadone	5,909	6.2	(6.0, 6.3)
Morphine	21,315	22.3	(22.0, 22.6)
Opium	220	0.2	(0.2, 0.3)
Oxycodone	156,834	164.0	(163.1, 164.8)
Oxymorphone	919	1.0	(0.9, 1.0)
Paregoric	10	0.0	(0.0, 0.0)
Pentazocine	96	0.1	(0.1, 0.1)
Tapentadol	1,237	1.3	(1.2, 1.4)
Tramadol	136,157	142.3	(141.6, 143.1)
Total	642,670	671.9	(670.2, 673.5)

Appendix B: Sources & Calculations

Population counts obtained from U.S. Census Bureau, 2010 Census.

Dispensation data pulled from the St. Louis County PDMP by DPH staff.

Dispensation rates were calculated per 1,000 population using the formula below; dispensation rates represent projected annual rates based on one quarter of data.

Dispensation Rate =
$$\left(\frac{\# dispensations}{\frac{population}{4}}\right) * 1000$$

Morphine milligram equivalent (MME) was calculated using the CDC calculation (formula below).

$$MME = strength * \left(\frac{units}{days supply}\right) * MME conversion factor$$

Appendix C: Suggested Citation

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