

Tracking Medicaid-Covered Prescriptions to Treat Opioid Use Disorder

Methodology Appendix (last updated November 19, 2019)

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This document describes the methods and limitations of the data and analysis published under “Tracking Medicaid-Covered Prescriptions to Treat Opioid Use Disorder.”

Data

We obtained state records from Medicaid State Drug Utilization Data (Medicaid SDUD) of drug prescriptions filled and dispensed in outpatient settings, such as pharmacies, processed as Medicaid outpatient drug claims from the first quarter of 2010 through the fourth quarter of 2018.¹ We treat the most recent quarter of data as preliminary and suppress it from analysis, unless otherwise stated. Records include both Medicaid fee-for-service (FFS) and managed care organization (MCO) data.

To receive federal matching funds, states must report outpatient drugs reimbursed under Medicaid in the Medicaid Drug Rebate Program (Levinson 2012). However, certain data limitations and sample exclusions apply. Until the enactment of the Affordable Care Act (ACA) on March 23, 2010, rebate and reporting requirements excluded prescriptions for Medicaid enrollees of MCOs (Levinson 2012). We exclude data prior to 2010 because some states that covered prescriptions through MCOs (a carve-in managed care approach) reported this data to Medicaid SDUD inconsistently before then (Levinson 2012; Wen, Hockenberry, and Pollack 2018). Our analysis showed that most states appear to have reported Medicaid SDUD data consistently in 2010 (including several states that did not cover prescriptions through MCOs); a separate study showed that all 21 states that covered prescriptions through MCOs completed managed care data reporting by the end of the second quarter of 2011 (for revised Medicaid SDUD data), but the District of Columbia

inconsistently reported managed care data through the third quarter of 2011 (Wen, Hockenberry, and Pollack 2018). We did not suppress data for any state quarters, even in cases where data appeared to be inconsistently reported, because these data were used for federal reimbursement, despite apparent inconsistencies.

The data for FFS programs include records for filled outpatient prescriptions reimbursed in full or part by state Medicaid agencies, and the data for managed care programs include dispensed Medicaid outpatient prescriptions. Because some MCOs use capitated payment arrangements, the Medicaid SDUD managed care data may show outpatient prescriptions that have a nonzero value for the number of prescriptions dispensed but a zero value for the Medicaid amount reimbursed. The data include quarterly records of filled prescription drugs dispensed in outpatient settings—and, for FFS programs, reimbursed by Medicaid—but exclude drugs dispensed in emergency departments or inpatient settings or paid with cash.² Medicaid-covered outpatient drugs include those dispensed to patients at pharmacies and administered by practitioners to patients (Murrin 2016). The Medicaid SDUD are collected to exclude claims representing drugs purchased under the 340B Drug Pricing Program (340B Program) by certain safety net providers, generally federally funded clinics and hospitals serving underserved or vulnerable populations, known as 340B-covered entities. However, these claims are difficult for states to identify and exclude (MACPAC 2018; Murrin 2016).

States can make revisions to the Medicaid SDUD back to March 23, 2010 (Levinson 2012). Documentation of the Medicaid SDUD states that, with each release of a new quarter of data, data from the previous five years may also be updated, and in the February data release each year, data from any preceding year may be updated.³ Revisions include adjustments to remove claims purchased under the 340B Program, which are administratively difficult to identify (MACPAC 2018).

Use of Unsuppressed Data and Imputations for Low Prescription Counts

Medicaid SDUD suppress data for National Drug Code (NDC) state-quarter-utilization type, where utilization types are FFS or MCO data that have prescription counts under 11. We obtained unsuppressed Medicaid SDUD for some NDCs and quarters through a collaboration with a research colleague, Alex Gertner (Gertner 2019). We used the raw, unsuppressed values for prescription counts, number of units, and spending when data in the publicly available Medicaid SDUD were suppressed and the unsuppressed prescription count was under 11. Currently, we have unsuppressed data from 2011 through the first two quarters of 2018.

When unsuppressed data were not available, we imputed the missing prescription count data based on an analysis of one year (2014) of claims-level data from Medicaid Statistical Information Statistics (MSIS). To do this, we tabulated quarterly fiscal year (FY) 2014 MSIS data for the 32 states for which we had MSIS prescription data in 2014, examining the number of buprenorphine prescriptions by state and quarter for each NDC with at least one suppressed quarter in the SDUD for FY 2014. The MSIS prescription data files do not distinguish between FFS and MCO at the claims level and include claims for both. For each NDC with at least one suppressed state-quarter in the Medicaid SDUD for FY 2014, we calculated the quarterly median MSIS number of buprenorphine prescriptions across states when the Medicaid SDUD were missing or zero for all FY 2014 quarters; the MSIS quarterly mean for state-quarter NDCs with this high level of suppression was six. We also computed the quarterly median MSIS number of buprenorphine prescriptions across states when the SDUD mean had at least one nonmissing or nonzero value for an FY 2014 quarter; the MSIS quarterly mean for state-quarter NDCs with this lower level of suppression was 26.

When the national total number of prescriptions for an NDC from the Medicaid SDUD was not suppressed for a quarter for an FFS or MCO group, we used that national total number of prescriptions for the NDC to identify the number of prescriptions suppressed across states for that NDC within that quarter and within that FFS or MCO group. For a given NDC within a given quarter for each utilization type, we subtracted the total number of prescriptions in nonsuppressed states from the national total number of prescriptions, which aggregates all prescriptions across states, including those in suppressed states. This value, which we call the “total suppressed prescriptions,” is the total suppressed prescriptions across all suppressed states for the quarter and FFS/MCO group.

We use the national total number of prescriptions and the total suppressed prescriptions to allocate the total suppressed prescriptions across the suppressed NDC states within each quarter and FFS/MCO group. We used the following rules, based on our estimates from MSIS data, to impute suppressed prescription counts by NDC, year, quarter, and FFS/MCO group:

1. If the national total and 2 to 10 states were suppressed, we imputed 1 if the quarter before or after was zero or suppressed, and we imputed 2 if the quarters before and after were not zero or suppressed. If the national total and over 10 states were suppressed, we imputed 1 to all states.
2. If the national total and only one state were suppressed, we imputed 1 if the quarter before or after was zero or suppressed, and we imputed 4 if the quarters before and after were not zero or suppressed.

3. If the national total was not suppressed, we distributed the total suppressed prescriptions value in a 1:4 ratio. We used a weight of 1 for an SDUD quarter that was zero or suppressed in the quarter before or after the suppression and a weight of 4 for an SDUD quarter that had a nonzero and nonsuppressed value before and after the suppressed value.

When publicly available SDUD were suppressed and we had access to unsuppressed data but the unsuppressed data showed a prescription count of 11 or more prescriptions, we used the unsuppressed data to calculate spending per prescription. We then imputed the number of prescriptions using the methods described above. We calculated spending using the unsuppressed spending per prescription amount multiplied by the imputed number of prescriptions.

If the spending variable was not suppressed for the national total but was suppressed in one or more states and we did not have access to unsuppressed data for these states, we calculated the suppressed spending amount by subtracting the spending across unsuppressed states from the sum national total spending. We then distributed this amount to the suppressed states, weighting by the number of imputed prescriptions in each suppressed state.

For suppressed spending data where the national total was also suppressed for the NDC state-quarter-utilization type, meaning prescription counts were under 11, we did not impute spending. Because the spending suppression did not relate to a minimum spending value, any potential spending imputation could not be strengthened by imposing a true maximum upper bound as was done in the prescription imputation (which had a maximum value of 10 prescriptions).

Identification of Prescriptions Related to Opioid Use Disorder

We constructed three main types of outpatient prescriptions received by Medicaid enrollees: (1) buprenorphine or buprenorphine/naloxone FDA approved for opioid use disorder (OUD), (2) naltrexone FDA approved for indications including OUD, and (3) naloxone FDA approved to reverse opioid overdose.

Prescriptions were identified by linking the NDC numbers in Medicaid SDUD to drug information in the National Drug Code Directory, managed by the US Food and Drug Administration.⁴ We also included NDCs identified in relevant publications that listed NDCs for the three drugs of interest (Hadland et al. 2018).⁵ These publications helped us identify NDC numbers from drugs that had expired, as these NDC numbers are not included in the National Drug Code Directory. We identified

the primary use for each drug using the National Institutes of Health's DailyMed database, which contains drug label information by NDC number.⁶ When the DailyMed database did not contain information on NDC numbers, generally because the drug label had expired, we imputed the drug's most likely primary use based on information from archived labels from the DailyMed database and from relevant drug lists containing the drug's brand name and/or strength and formula.⁷

For the buprenorphine estimates, we compiled a list of all prescription drugs used to treat OUD containing buprenorphine. We used the National Drug Code Directory and the publications mentioned previously to identify all substances containing buprenorphine hydrochloride (or buprenorphine hydrochloride and naloxone hydrochloride) in their nonproprietary or substance name. We included the following drugs:

- Suboxone sublingual tablets and films (strength buprenorphine/naloxone: 2 mg/0.5 mg, 4 mg/1 mg, 8 mg/2 mg, 12 mg/3 mg)
- Subutex sublingual tablets (strength: 2mg, 8 mg)
- Bunavail buccal films (strength buprenorphine/naloxone: 2.1 mg/0.3 mg, 4.2 mg/0.7 mg, 6.3 mg/1 mg)
- Probuphine implant (strength: 80 mg)
- Zubsolv sublingual tablets (strength buprenorphine/naloxone: 0.7 mg/0.18 mg, 1.4 mg/0.36 mg, 2.9 mg/0.71, 5.7 mg/1.4 mg, 8.6 mg/2.1 mg, 11.4 mg/2.9 mg)
- Sublocade injection (strength: 100 mg/mL, 300 mg/mL)
- generic equivalents

We excluded Buprenex injectable, Butrans transdermal patches, Belbuca buccal films, and the generic equivalents because they are typically prescribed for pain management.

For the naltrexone estimates, we compiled a list of all prescription drugs containing naltrexone with a primary use to treat alcohol dependence and to block the effects of exogenously administered opioids. Because naltrexone is also FDA approved for the treatment of alcohol use disorder, some prescriptions may relate to treating alcohol rather than OUD; the data do not distinguish between the two. We included Vivitrol (strength: 380 mg/4mL), Revia (strength: 50 mg), Depade (strength: 50 mg), and all generic forms of naltrexone hydrochloride (strength: 50mg/1). We excluded Contrave, which is typically prescribed for weight management; Embeda, which is typically prescribed for pain; and Relistor, which is typically prescribed for constipation.

For naloxone estimates, we compiled a list of all prescription drugs containing naloxone with a primary indication of use to reverse opioid overdose. We included the following drugs: Evzio

autoinjector formulations (strength: 2 mg/0.4 mL, 0.4 mg/mL); Narcan nasal sprays (strength: 2 mg/0.1 mL, 4 mg/0.1 mL, 0.02 mg/mL, 0.4 mg/mL, 1 mg/mL); and generic naloxone injections (strength: 0.4 mg/mL, 1 mg/mL). We excluded drugs containing both naloxone and buprenorphine, which are primarily used to treat OUD, and drugs containing naloxone and pentazocine, which are used primarily to treat pain.

We excluded all methadone drugs because methadone treatment for OUD is dispensed at special clinics called opioid treatment programs and is not consistently reported in the Medicaid SDUD. To test this, we used the National Drug Code Directory to compile a list of methadone NDCs. We then analyzed literature as well as the MSIS claims to learn more about the various methadone formulations (diskettes, liquid, tablets, etc.) and dosages to differentiate methadone used exclusively for the treatment of OUD from methadone used for pain management, though this was not always possible. Using the final list, we looked at the NDCs reported in the SDUD and found that methadone treatment for OUD does not appear to be reported in that data.

Measures

We compute three main measures of outpatient prescriptions received: (1) number of Medicaid prescriptions of each type, (2) Medicaid spending on each type of prescription, and (3) Medicaid spending on prescriptions of each type per year per 1,000 Medicaid enrollees ages 12 and older. We report nominal spending.

Unadjusted Medicaid Spending

For spending estimates, we show the unadjusted Medicaid amount spent, which does not include any rebates paid through the Medicaid Drug Rebate Program.⁸ We updated the methodology in October 2019 to apply the share of total spending that Medicaid paid to dispensing fees, and we subtract that amount from Medicaid spending at the state level, reporting total spending as the sum across states. Dispensing fees are published through the Centers for Medicare & Medicaid Services and do not include historical data.⁹ For states where dispensing fees vary by prescription volume of the prescribing location, we used an average value of the different dispensing fee amounts.

Per Medicaid Enrollee

We updated our methodology to estimate Medicaid enrollee counts in July 2019. We compute annual prescription estimates per 1,000 Medicaid enrollees ages 12 and older with full benefits in each state.¹⁰ To estimate state Medicaid enrollment for this population from 2010 to 2018, we used person-level analytical data files of administrative records derived from the MSIS and the Medicaid Analytic eXtract. When we lacked data to directly compute enrollment counts, we adjusted counts based on relevant MSIS/Medicaid Analytic eXtract data and/or reports states submitted to the Centers for Medicare & Medicaid Services with counts of broader Medicaid populations. For a more detailed description of how the Medicaid enrollee counts were computed, see additional documentation (Lynch, Winiski, and Clemans-Cope 2019).

Medicaid Expansion Status

We categorize states and the District of Columbia into four groups by the timing and status of state action on Medicaid expansion, either through the ACA or by waiver (Sommers et al. 2013):¹¹

1. “Early 2014 expansion states” are the 25 states and DC that expanded Medicaid through the ACA or waiver on or before April 2014 (some states had expanded Medicaid under the ACA by early 2014, with dates indicated, and/or had expanded eligibility for adults before the ACA): Minnesota (3/1/2010), Connecticut (4/1/2010), California (7/1/2010), DC (7/1/2010), Washington (1/3/2011), New Jersey (4/14/2011), Colorado (4/1/2012), Arizona (1/1/2014), Arkansas (1/1/2014), Delaware (1/1/2014), Hawaii (1/1/2014), Illinois (1/1/2014), Iowa (1/1/2014), Kentucky (1/1/2014), Maryland (1/1/2014), Massachusetts (1/1/2014), Nevada (1/1/2014), New Mexico (1/1/2014), New York (1/1/2014), North Dakota (1/1/2014), Ohio (1/1/2014), Oregon (1/1/2014), Rhode Island (1/1/2014), Vermont (1/1/2014), West Virginia (1/1/2014), and Michigan (4/1/2014).
2. “Late 2014–16 expansion states” are the six states that expanded Medicaid between April 2014 and before August 2016: New Hampshire (8/15/2014), Pennsylvania (1/1/2015), Indiana (2/1/2015), Alaska (9/1/2015), Montana (1/1/2016), and Louisiana (7/1/2016).
3. “2019 expansion states” are the two states that expanded Medicaid after December 2018: Maine (1/10/2019) and Virginia (1/1/2019).
4. “Nonexpansion states” are the 17 states that had not enacted a Medicaid expansion by January 1, 2019: Alabama, Florida, Georgia, Idaho, Kansas, Mississippi, Missouri, Nebraska

North Carolina, Oklahoma, South Carolina, South Dakota, Tennessee, Texas, Utah, Wisconsin, and Wyoming.¹²

Limitations

This analysis has several limitations. First, as indicated previously, this analysis underestimates the total spending and quantity of medication treatment for OUD in Medicaid, because the estimates do not include methadone treatment, a long-standing effective treatment for OUD. As discussed, methadone treatment for pain is included in the Medicaid SDUD, but methadone treatment for OUD may not be fully reported in the Medicaid SDUD, and distinguishing methadone treatment for OUD from methadone treatment for pain in the Medicaid SDUD is difficult. Second, states may inconsistently report the SDUD, including whether claims representing drugs purchased under the 340B Drug Pricing Program are excluded from data reporting, as required by the Centers for Medicare & Medicaid Services. Third, as noted, some states that covered prescriptions through MCOs in 2010 and 2011 may have underreported data related to MCOs in 2010 and, to a smaller extent, in 2011. Fourth, the per capita estimates have limitations: They may not reflect treatment relative to need, because prevalence of the need for OUD treatment varies across states, as does access to methadone for OUD, which can substitute for other OUD treatment medications. Additionally, per capita estimates are derived from aggregate data, not individual-level data, and thus are a rough measure of prescriptions per individual. Fifth, increases in buprenorphine prescriptions in Medicaid may have been offset somewhat by decreases in buprenorphine prescriptions among other payers and the uninsured; however, the total volume of buprenorphine prescriptions across all payment types increased every year from 2012 to 2016 (IMS Institute for Healthcare Informatics 2016). Sixth, these data aggregate prescriptions across all strengths, dosage forms, and routes of administration and thus contain considerable heterogeneity. Seventh, separate spending estimates will account for federal rebates administered through the Medicaid Drug Rebate Program. Eighth, there are limitations in the estimation of Medicaid enrollment, as described in additional documentation (Lynch, Winiski, and Clemans-Cope 2019).

Notes

- ¹ “State Drug Utilization Data,” the Centers for Medicare & Medicaid Services, accessed September 25, 2019, <https://www.medicaid.gov/medicaid/prescription-drugs/state-drug-utilization-data/index.html>.
- ² “State Drug Utilization Data FAQs,” Medicaid.gov, accessed February 5, 2019, <https://www.medicaid.gov/medicaid/prescription-drugs/state-drug-utilization-data/state-drug-utilization-data-faq/index.html>.
- ³ “State Drug Utilization Data FAQs,” Medicaid.gov, accessed February 5, 2019, <https://www.medicaid.gov/medicaid/prescription-drugs/state-drug-utilization-data/state-drug-utilization-data-faq/index.html>.
- ⁴ “National Drug Code Directory,” US Food and Drug Administration, accessed February 5, 2019, <https://www.fda.gov/drugs/informationondrugs/ucm142438.htm>.
- ⁵ “Chronic Conditions Data Warehouse Opioid-Related Indicators and Algorithms,” Chronic Conditions Data Warehouse, accessed February 5, 2019, <https://www.ccwdata.org/documents/10280/19139421/other-condition-algorithms-and-reference-list-opioids.pdf>; and “HEDIS 2018 Final NDC Lists,” National Committee for Quality Assurance, accessed February 5, 2019, <https://www.ncqa.org/hedis/measures/hedis-2018-ndc-license/hedis-2018-final-ndc-lists/>.
- ⁶ “DailyMed,” National Institutes of Health, US National Library of Medicine, accessed February 5, 2019, <https://dailymed.nlm.nih.gov/dailymed/index.cfm>.
- ⁷ “Opioid Overdose Data Resources,” Center for Disease Control and Prevention, accessed February 5, 2019, <https://www.cdc.gov/drugoverdose/resources/data.html>; “DataFacts by Medi-Span: Medi-Span Drug File Changes Reports,” accessed February 5, 2019, https://wds.medispans.com/DataFacts/DataFactsDocumentsDownload.aspx?file=%5C120%20United%20States%5C120%20Medi-Span%20Drug%20File%20Changes%20Reports%5C150%202003%5CDrug_File_Changes_10-22-2003.xls; “Washington State Department of Social and Health Services: Drug Codes,” Washington State Department of Social and Health Services, accessed February 5, 2019, <https://www.dshs.wa.gov/sites/default/files/SESA/rda/documents/cross-system/SUD-Tx-Pen-Value-Set-3.xlsx>; and “Wyoming Medicaid NDC Crosswalk,” Wyoming Medicaid Program, accessed February 5, 2019, https://wymedicaid.acs-inc.com/bulletins/E01%20NDC%20Crosswalk%203_10_16.pdf.
- ⁸ “Medicaid Drug Rebate Program,” Medicaid.gov, accessed February 5, 2019, <https://www.medicaid.gov/medicaid/prescription-drugs/medicaid-drug-rebate-program/index.html>; and Payment for Covered Outpatient Drugs § 1927, 42 U.S.C. § 1396r-8.
- ⁹ “Medicaid Covered Outpatient Prescription Drug Reimbursement Information by State,” Medicaid.gov, accessed November 11, 2019, <https://www.medicaid.gov/medicaid/prescription-drugs/state-prescription-drug-resources/drug-reimbursement-information/index.html>.
- ¹⁰ We focus on those ages 12 and older because national data indicate that OUD rates are not zero among adolescents ages 12 to 17, though rates are higher for older age groups (and presumably lower among younger age groups). Data from the National Survey on Drug Use and Health (NSDUH) show that in 2017, an estimated 0.4 percent of adolescents ages 12 to 17 had an OUD in the past year, representing about 103,000 adolescents.
- ¹¹ Several states (Arizona, Arkansas, Indiana, Iowa, Kentucky, Michigan, Montana, and New Hampshire) used Section 1115 waivers for Medicaid expansion. See “Status of State Action on the Medicaid Expansion Decision,” Henry J. Kaiser Family Foundation, accessed February 5, 2019, <https://www.kff.org/health-reform/state-indicator/state-activity-around-expanding-medicaid-under-the-affordable-care-act/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D>; Lynn A. Blewett, “Medicaid ‘Early Opt-In’ States,” State Health Access Data Assistance Center, February 5, 2013, <https://www.shadac.org/news/medicaid-%E2%80%9Cearly-opt-in%E2%80%9D-states>.

¹² Medicaid expansion has been approved via ballot initiative in Idaho, Nebraska, and Utah but has not yet been implemented. Wisconsin did not expand Medicaid under the Affordable Care Act but has Medicaid eligibility for adults up to 100 percent of the federal poverty level. See “Status of State Action on the Medicaid Expansion Decision,” Henry J. Kaiser Family Foundation.

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For more information on this project, see <https://www.urban.org/policy-centers/health-policy-center/projects/tracking-medicaid-covered-prescriptions-treat-opioid-use-disorder>.



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