



Full length article

Evaluating short- and long-term impacts of a Medicaid “lock-in” program on opioid and benzodiazepine prescriptions dispensed to beneficiaries



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ABSTRACT

Background: Insurance-based “lock-in” programs (LIPs) have become a popular strategy to address controlled substance (CS) (e.g., opioid) misuse. However, little is known about their impacts. We examined changes in CS dispensing to beneficiaries in the 12-month North Carolina Medicaid LIP.

Methods: We analyzed Medicaid claims linked to Prescription Drug Monitoring Program (PDMP) records for beneficiaries enrolled in the LIP between October 2010 and September 2012 (n = 2702). Outcomes of interest were 1) number of dispensed CS prescriptions and 2) morphine milligram equivalents (MMEs) of dispensed opioids while a) locked-in and b) in the year following release.

Results: Compared to a period of stable CS dispensed prior to LIP enrollment, numbers of dispensed CS during lock-in and post-release were lower (count difference per person-month: −0.05 (95% CI: −0.11, 0.01); −0.23 (95% CI: −0.31, −0.15), respectively). However, beneficiaries’ average daily MMEs of opioids were elevated during both lock-in and post-release (daily mean difference per person: 18.7 (95% CI: 13.9, 23.6); 11.1 (95% CI: 5.1, 17.1), respectively). Stratification by payer source revealed increases in using non-Medicaid (e.g., out-of-pocket) payment during lock-in that persisted following release.

Conclusion: While the LIP reduced the number of CS dispensed, the program was also associated with increased acquisition of CS prescriptions using non-Medicaid payment. Moreover, beneficiaries acquired greater dosages of dispensed opioids from both Medicaid and non-Medicaid payment sources during lock-in and post-release. Refining LIPs to increase beneficiary access to substance use disorder screening and treatment services and provider use of PDMPs may address important unintended consequences.

1. Introduction

Between 2000 and 2015, half a million Americans died from a drug overdose, and the majority of these deaths involved an opioid (57%) (Centers for Disease Control and Prevention, 2016). The rapid escalation in opioid deaths during this period was due to multiple factors, one of which was that previous perceptions and cautions related to the risks and addictive potential of opioid prescription drugs were inappropriately dismissed, and opioid prescribing rapidly escalated (Van Zee, 2009).

Several policies and programs have been implemented in an attempt

to curb opioid misuse, abuse, and addiction. One strategy used by insurers across the U.S., and especially by Medicaid, is a “lock-in” program (LIP). LIPs are designed to identify beneficiaries demonstrating potential overutilization of opioids and other controlled substance (CS) prescription drugs (e.g., benzodiazepines) and to limit the beneficiaries’ access, typically by requiring them to use a single prescriber and/or pharmacy to obtain CS for a specified period of time, such as 12 months (Centers for Disease Control and Prevention, 2012; Roberts and Skinner, 2014).

Because LIPs are designed primarily to reduce waste and abuse of CS prescriptions in healthcare systems, evaluations have largely been

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limited to understanding changes in prescription utilization and cost savings to insurers (Beaubien, 2005; Blake, 1997; Centers for Disease Control and Prevention, 2012; Chinn, 1985; Dreyer et al., 2015; Hladilek et al., 2004; Mitchell, 2009; Singleton, 1977). However, studies to date have failed to provide a comprehensive picture of LIP impacts from a beneficiary perspective, including a clear understanding of short and long-term LIP impacts on beneficiaries' CS prescription regimens.

Our team has been evaluating North Carolina's (NC) Medicaid LIP with the goal of providing a more complete understanding of LIP impacts on beneficiaries (Roberts et al., 2016; Skinner et al., 2016). However, analyses to date have been limited to the "lock-in" period, and focused mainly on numbers of dispensed CS during this period. While examining dispensed CS prescriptions can provide insight into overall prescription coordination within this population, understanding total dosage received helps us more closely assess beneficiary treatment regimens and the potency of all prescriptions acquired. Thus, the purpose of this study was to: 1) expand estimation of LIP effects by exploring sustained LIP effects in the year following release from the program and 2) estimate both immediate and sustained LIP effects on the dosage of opioid prescriptions dispensed to beneficiaries in terms of average daily morphine milligram equivalents (MMEs).

2. Methods

2.1. Study design

Using an observational prospective cohort study design, we established and followed a cohort of independently living adults (e.g., excluding those living in residential facilities) between the ages of 18 and 64 who were enrolled in the NC Medicaid LIP between October 2010 and September 2012. In order to obtain a more complete picture of LIP effects, we used NC Medicaid claims linked to records from the NC Controlled Substance Reporting System (CSRS), the state's Prescription Drug Monitoring Program (PDMP). To understand sustained LIP influence, we included up to 12 months of person-time on beneficiaries following release from the program. We estimated program effects while locked-in and following LIP release on numbers of dispensed CS per person-month and average daily MMEs of dispensed opioids per person.

2.2. NC's Medicaid LIP

The NC Medicaid LIP was first implemented in October 2010 (North Carolina Department of Health and Human Services, 2010). Medicaid beneficiaries were eligible for the LIP if they filled, within two consecutive calendar months, (1) more than six opioid prescriptions, (2) more than six benzodiazepine prescriptions, or (3) opioid or benzodiazepine prescriptions that were written by more than three different prescribers (North Carolina Department of Health and Human Services, 2010). Each month, LIP-eligible beneficiaries, as determined from Medicaid prescription dispensing information for the previous two months, were prioritized for LIP enrollment using a proprietary algorithm combined with a review process by pharmacists. Based on this prioritization, approximately 200 of the highest-ranking beneficiaries were selected for LIP enrollment each month due to administrative resource constraints (i.e., not all LIP-eligible beneficiaries were enrolled). Beneficiaries were notified of their selection for program enrollment and that LIP enrollment restricted them, for a one-year period, to using one prescriber and one pharmacy location to obtain opioids or benzodiazepines. Beneficiaries were given 30 days to choose a preferred prescriber and pharmacy before restrictions began. If they did not choose a preferred prescriber and pharmacy, they were assigned one of each.

2.3. Linked Medicaid claims and Prescription Drug Monitoring Program data

Our research team linked NC Medicaid claims to records from the NC CSRS. Linked data for the period of October 2009 through June 2013 were obtained for beneficiaries enrolled in the LIP between October 2010 and September 2012. NC Medicaid claims included beneficiaries' demographics, periods of Medicaid enrollment, adjudicated pharmacy and medical claims, and assigned LIP enrollment and release dates. NC CSRS records included data on all CS (schedules II–V) dispensed to LIP beneficiaries, regardless of source of payment (e.g., Medicaid-reimbursed or out-of-pocket). Additional details on the linkage have been previously documented (Roberts et al., 2016).

2.4. Study subjects

To estimate the association between LIP-related periods and numbers of CS (opioids and benzodiazepines, specifically) dispensed per person-month, we followed beneficiaries in our cohort from the first day they received an opioid or benzodiazepine prescription on or after October 1, 2009, throughout their period of lock-in, and up to one year following program release or until June 30, 2013, whichever came first. To estimate the association between LIP-related periods and average daily MMEs of dispensed prescription opioids per person, we followed beneficiaries in the same manner, except that their start of follow-up was the first day of receiving any opioid prescription, as opposed to any opioid or benzodiazepine prescription.

To avoid conflating program effects for those who remained continuously enrolled in the LIP and those who exited the LIP prior to completion, we restricted this analysis to those who remained in the LIP for a full 12 months or were administratively censored in June 2013, the last month for which we had data. We defined continuous enrollment as no more than a 7-day gap in coverage. These beneficiaries constituted 62% of all beneficiaries ages 18–64 years with an independent living arrangement who were ever enrolled in the LIP between October 2010 and September 2012. There were no requirements regarding continuous Medicaid coverage in the time prior to LIP enrollment or in the year after LIP release. However, previous analyses indicated that those with continuous coverage while enrolled in the LIP had, on average, close to complete Medicaid coverage prior to enrollment as well.

2.5. "Lock-in" status as a time-dependent measure

To examine changes in the numbers of CS dispensed per person-month and average daily MMEs of dispensed opioids per person, we divided time into four segments. These consisted of two pre-enrollment periods (> 6 months pre-enrollment, or "pre-spike," and 0–6 months pre-enrollment, or "spike"), a 12 month program period ("lock-in"), and a period (up to 12 months) after program release ("post-release"). Descriptive analyses revealed a specific period with large spikes in numbers and dosages of CS dispensed in the months just prior to program enrollment. This spike period precipitated LIP enrollment for many beneficiaries. During this period, a sudden escalation was met by a similar de-escalation in the six months prior to LIP enrollment, resulting in dispensing that appeared to largely return to pre-spike levels just prior to actual enrollment (Fig. 1). Moreover, additional analyses revealed that this pattern of escalation, triggering of LIP criteria, and a nearly equal de-escalation was not unique to the LIP-enrolled population. It also occurred in Medicaid beneficiaries who were never enrolled in the LIP but met the LIP enrollment criteria. While this spike period reveals critical information regarding the average CS utilization trajectory leading to eligibility for the LIP, this volatile period of utilization is likely not the most appropriate reference period for LIP effect estimation. Rather, understanding the extent to which the LIP was associated with CS utilization during and upon release, as compared to a more stable utilization period

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