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HHS Public Access

Author manuscript

Health Aff (Millwood). Author manuscript; available in PMC 2018 December 01.

Published in final edited form as:

Health Aff (Millwood). 2017 December ; 36(12): 2110–2114. doi:10.1377/hlthaff.2017.0925.

The Effect Of Medicaid On Medication Use Among Poor Adults: Evidence From Oregon

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There are major barriers in access to prescription medications for the uninsured,[1] particularly people with chronic conditions, substance abuse, or mental health issues.[2,3] In 2012 uninsured adults were four times more likely than the insured to report not filling a prescription due to cost.[1] There is some evidence of higher prescription drug use among Medicaid enrollees than among the uninsured,[4] but isolating the causal effect of the program is difficult given that the uninsured differ from people with insurance in many ways that may affect care.

We took advantage of a natural experiment in coverage expansion—the Oregon Medicaid lottery—to assess the impact of Medicaid on the use of medications. Using a randomized controlled design, we found that Medicaid coverage significantly increased the use of medications related to the management of several serious conditions (Exhibit 1) and substantially reduced the use of medications that were originally prescribed to someone else, a key proxy for medication safety.[5,6]

With the future of Medicaid coverage uncertain, information on how the program affects medication use is a critical input for policy makers, patients, and health care providers alike.

Study Data And Methods

The Oregon Health Insurance Experiment

In 2008 Oregon held a lottery for a limited number of slots in its Medicaid expansion program, which offered coverage to nondisabled adults with incomes at or below the federal poverty level. Oregon drew names randomly from a “reservation list” of nearly 90,000 people to allocate 10,000 coverage slots; those who were selected received coverage if they completed the application process and proved to be eligible based on their income, assets, and citizenship status.[7] The program was otherwise closed to new enrollment. The program offered coverage for a wide range of physical and behavioral health benefits, including prescription medications (with no copayment).

Using the unique opportunity presented by this Medicaid lottery, we conducted a randomized controlled evaluation—the Oregon Health Insurance Experiment—that was designed to assess the effects on a wide range of health and health care outcomes of expanding Medicaid to low-income uninsured adults. In previous analyses, we found that Medicaid coverage increased most types of health care utilization, including prescription drug use overall.[8] Here, for the first time, we explore the way that Medicaid changed prescription drug use across the full spectrum of health conditions. We do this via an analysis of detailed medication catalogs collected for each participant.

Data

As part of the data collection effort for the Oregon Health Insurance Experiment in 2009–10, we conducted detailed in-person interviews and health assessments with people, selected in the lottery (the treatment group) and not selected (the control group), approximately two years after the lottery for most respondents (for the study flow, see online Appendix Exhibit A1; for sample characteristics, see Appendix Exhibit A2).[9] Participants were asked to bring all of their current medications to these interviews, where study staff members recorded the name, dosage, and frequency of each medication directly from the containers. This resulted in a sample size of 12,039 (6,293 in the treatment group, 5,746 in the control).

We used data from the resulting catalogs of medications to create several different outcomes. First, we categorized medications based on their therapeutic use, using a commercially available database to divide medications into mutually exclusive and exhaustive categories (for additional details, see Appendix Exhibit A3).[9] We report whether respondents possessed any medication in each category, as well as the number of medications. Second, we categorized medications based on the source of the prescription—that is, whether they were prescribed for the respondent or someone else. In supplemental analyses we examined over-the-counter medications as well as prescription drugs (see Appendix Exhibit 5).[9]

Analytical Methods

We followed our approach in previous analyses:[8,10,11] To assess the impact of Medicaid coverage on medication outcomes, we used selection in the lottery as an instrumental variable for insurance coverage in two-stage least squares regressions. The first-stage regressions showing the effect of lottery selection on Medicaid coverage are shown in Appendix Exhibit A4.[9] This approach yielded unbiased estimates of the effect of insurance coverage on our outcomes of interest (for more detail, see the Appendix text).[9] In addition to these “local average treatment effects” of Medicaid coverage, Appendix Exhibit A6 reports on “intent to treat” estimates of the effect of lottery selection on both prescription medications and all medications, including over-the-counter drugs.[9] Appendix Exhibit A7 also shows robustness to different estimation equations (such as logistic regressions).[9]

Limitations

There were limitations to our approach that should be considered in assessing the generalizability of our findings. First, this is a single-state study that reports on data collected in 2010. Some states may differ in benefit generosity or may have significantly modified their Medicaid programs and pharmacy benefits since that time. Second, our data

captured the medications in respondents' possession at the time of the interview. The medications catalogs may be incomplete (although we have no reason to suspect differential data quality between the study's treatment and control arms). More importantly, we do not know whether respondents were taking the medications exactly as directed, nor whether they had received prescriptions that they had not filled or refilled. Thus, we cannot report directly on adherence. Third, we cannot assess the clinical appropriateness of the medications possessed by our respondents.

Despite these limitations, this study offers a unique opportunity to assess how Medicaid affects the prescription medications that patients actually obtain—a key input in the management and treatment of a wide range of health conditions.

Study Results

Overall Medication Use

Medicaid coverage significantly increased both the proportion of individuals with at least one prescription medication and the number of prescription medications per person, consistent with previous findings.[8] Medicaid increased the share of people with at least one prescription medication by 11.6 percentage points (relative to the control-group mean of 49.3 percent) (Exhibit 1) and the number of prescription medications per person by 0.46 (relative to the control-group mean of 1.56) (Exhibit 2).

Medication Use By Type

Medicaid coverage increased the use of medications related to a number of chronic health conditions. The biggest observed increases were in prescription medications for mental health (an increase of 0.15 prescription per person), diabetes (0.11), cardiovascular disease (0.06), and asthma (0.05) (Exhibit 2). Collectively, these categories were responsible for 80 percent of the increase seen in the number of medications held by respondents, although only the increases for mental health and diabetes were significant. The number of people in possession of antibiotics nearly doubled. Changes in other medication categories were small in magnitude and insignificant. There was no significant increase in the possession of analgesics overall nor of prescription pioids or opioid addiction treatment drugs (often referred to as medication-assisted treatment). As noted above, we also tested the impact of Medicaid on nonprescription medications (Appendix Exhibit A5).[9] The only medication category where including over-the-counter drugs substantially changed the estimated effect of Medicaid coverage was an increase in the effect for medications for gastrointestinal conditions such as ulcers (a condition for which effective over-the-counter medication is available and which might be newly diagnosed with increased access to coverage).

Medication Use By Source

Medicaid coverage also influenced the source of prescriptions in respondents' possession. We found that Medicaid increased the number of medications prescribed for the respondents themselves by more than 30 percent, while essentially eliminating the possession of medications prescribed for someone else (Exhibit 3). The number of medications possessed by respondents that were originally prescribed to someone else fell by 0.04 (relative to the

control-group mean of 0.03; $p = 0.01$). Additional details on the regression results displayed in Exhibits 1–3 are shown in Exhibit 4.

Discussion

Evidence from this randomized controlled evaluation shows that expanding Medicaid coverage to the uninsured drove a substantial increase in the use of prescription medications, particularly those that target chronic conditions such as diabetes and mental health. These results complement previously released results from the Oregon Health Insurance Experiment showing that Medicaid increases the use of primary and preventive care and the numbers of emergency department visits and hospital stays.[8,10,11]

Our study also shows that Medicaid coverage essentially eliminated the use of prescription medications that were originally prescribed to someone else. Using someone else's prescribed medications can pose serious safety risks for patients, and this change reveals an important additional channel by which coverage can improve health.

There is considerable policy interest in the potential impacts of Medicaid expansion in the context of the opioid epidemic. Some policy makers have been concerned that Medicaid expansion could increase access to opioids, thereby exacerbating the problem.[12] Conversely, expanding Medicaid could increase access to medication-assisted treatments for opioid addiction.[13,14] Our study did not find evidence that Medicaid affected prescriptions for either opioids or medication-assisted treatments. However, it is important to note that both the extent of the opioid epidemic and the use of the treatments have evolved substantially since 2010.[13]

Overall, our results suggest that Medicaid plays an important role in access to medicines for chronic conditions for low-income populations. Chronic physical and behavioral health conditions impose a rising health burden on low-income populations, and prescription medications are an important tool for managing these conditions. Upstream investments in the pharmacological management of chronic illness might lead to fewer costly and invasive procedures downstream.[15] There may be additional barriers to optimal use and adherence, but access to these medications is a necessary first step to their effective use.

In considering policies that expand or contract Medicaid coverage, policy makers should consider the subsequent impact on access to prescription medications, particularly for people with chronic physical or behavioral health conditions.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

The authors gratefully acknowledge funding for the Oregon Health Insurance Experiment from the Office of the Assistant Secretary for Planning and Evaluation in the Department of Health and Human Services, the California Health Care Foundation, the John D. and Catherine T. MacArthur Foundation, the National Institute on Aging (Grant Nos. P30AG012810, RC2AGO36631, and R01AG0345151), the Robert Wood Johnson Foundation, the Sloan Foundation, the Smith Richardson Foundation, and the Social Security Administration (through Grant No. 5

RRC 08098400-03-00 to the National Bureau of Economic Research [NBER] as part of the SSA Retirement Research Consortium). The authors also gratefully acknowledge the matching funds provided by the Centers for Medicare and Medicaid Services for this evaluation. The findings and conclusions expressed in the article are solely those of the authors and do not represent the views of Social Security Administration, the National Institute on Aging, the National Institutes of Health, any agency of the federal government, any of the funders, or the NBER. Katherine Baicker is a director of Eli Lilly. The authors are grateful to Innessa Colaiacovo, Molly Frean, Christopher Murray, and Kathryn Clark for expert research assistance; to the survey research team at the Center for Outcomes Research and Education, Providence Health and Services, in Portland, Oregon; to numerous Oregon state employees for help acquiring the necessary data and for answering many questions about the administration of state programs; and to the generous funders.

NOTES

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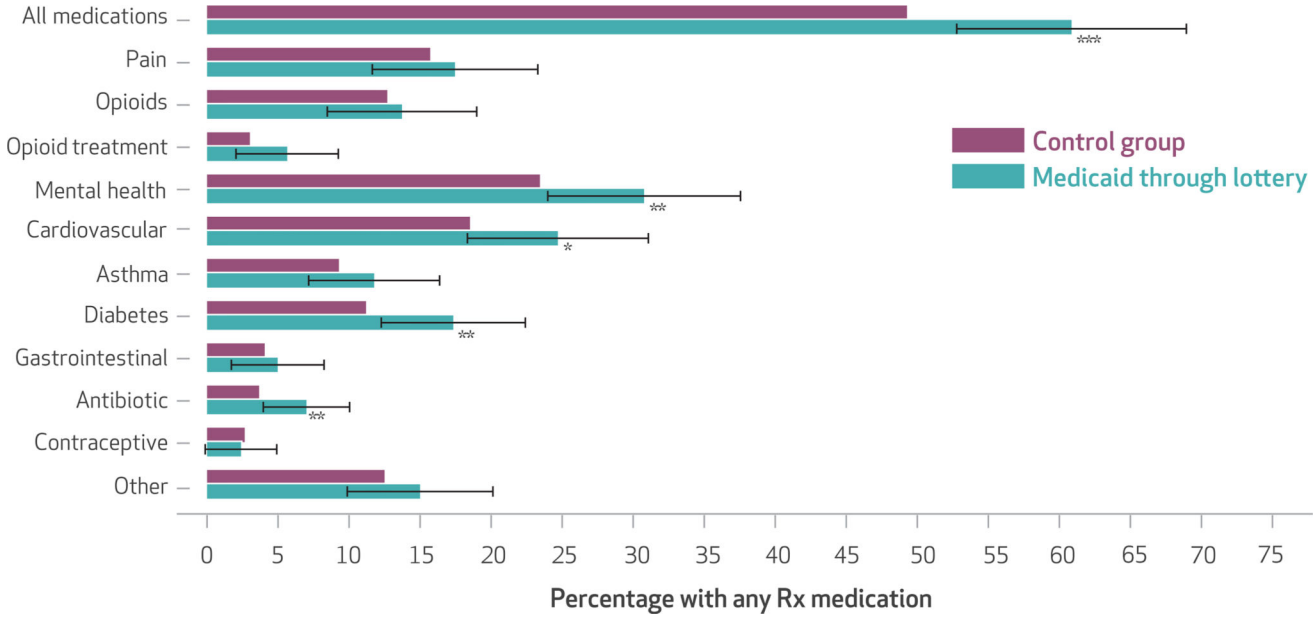

Exhibit 1. Effect of Medicaid on percentages of people in the Oregon study sample with any prescription medication, by type

SOURCE Authors' analysis of data for 2009–10 from the Oregon Health Insurance Experiment. **NOTES** *N* = 12,039. Lottery selection was used as an instrument for Medicaid coverage in a two-stage least squares estimation. The average value for people not selected to receive Medicaid in the lottery (the control group) and the Medicaid effects and 95 percent confidence intervals (shown by the error bars) were calculated using survey weights. The average value for people who received Medicaid through the lottery is the sum of the control-group mean and the effect of Medicaid. Medicaid effects were estimated including controls for the number of household members on the lottery list and adjusting standard errors for household clusters. "Opioids" and "opioid treatment" are mutually exclusive subsets of the "pain" category, which also includes medications for pain and inflammation. "Asthma" includes medications for asthma and other respiratory medications. "Diabetes" includes medications for diabetes and other endocrine medications. "Other" includes medications not included in other categories. *p < 0.10 **p < 0.05 ***p < 0.01

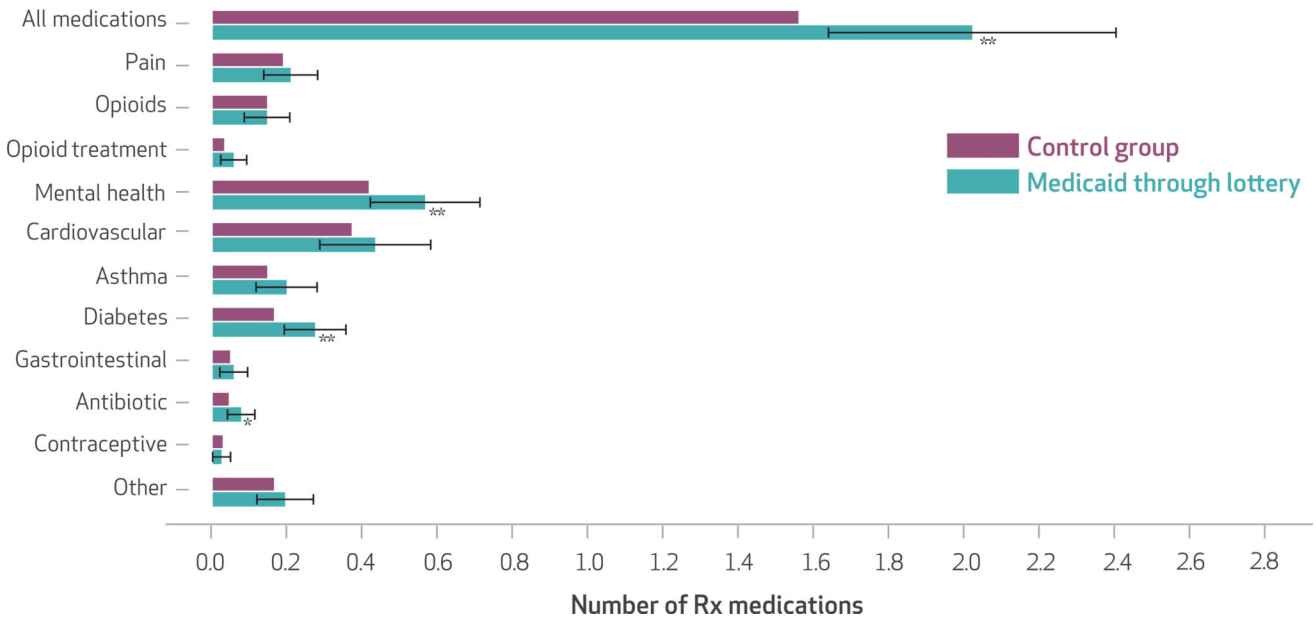

Exhibit 2. Effect of Medicaid on average number of medications in Oregon study participants' possession, by type

SOURCE Authors' analysis of data for 2009–10 from the Oregon Health Insurance Experiment. **NOTES** Lottery selection was used as an instrument for Medicaid coverage in a two-stage least squares estimation. The average value for people not selected to receive Medicaid in the lottery (the control group) and the Medicaid effects and 95 percent confidence intervals (shown by the error bars) were calculated using survey weights. The average value for people who received Medicaid through the lottery is the sum of the control group mean and the effect of Medicaid. The sample size, method of estimating Medicaid effects, and medication categories are explained in the Notes to Exhibit 1. *p < 0.10 **p < 0.05

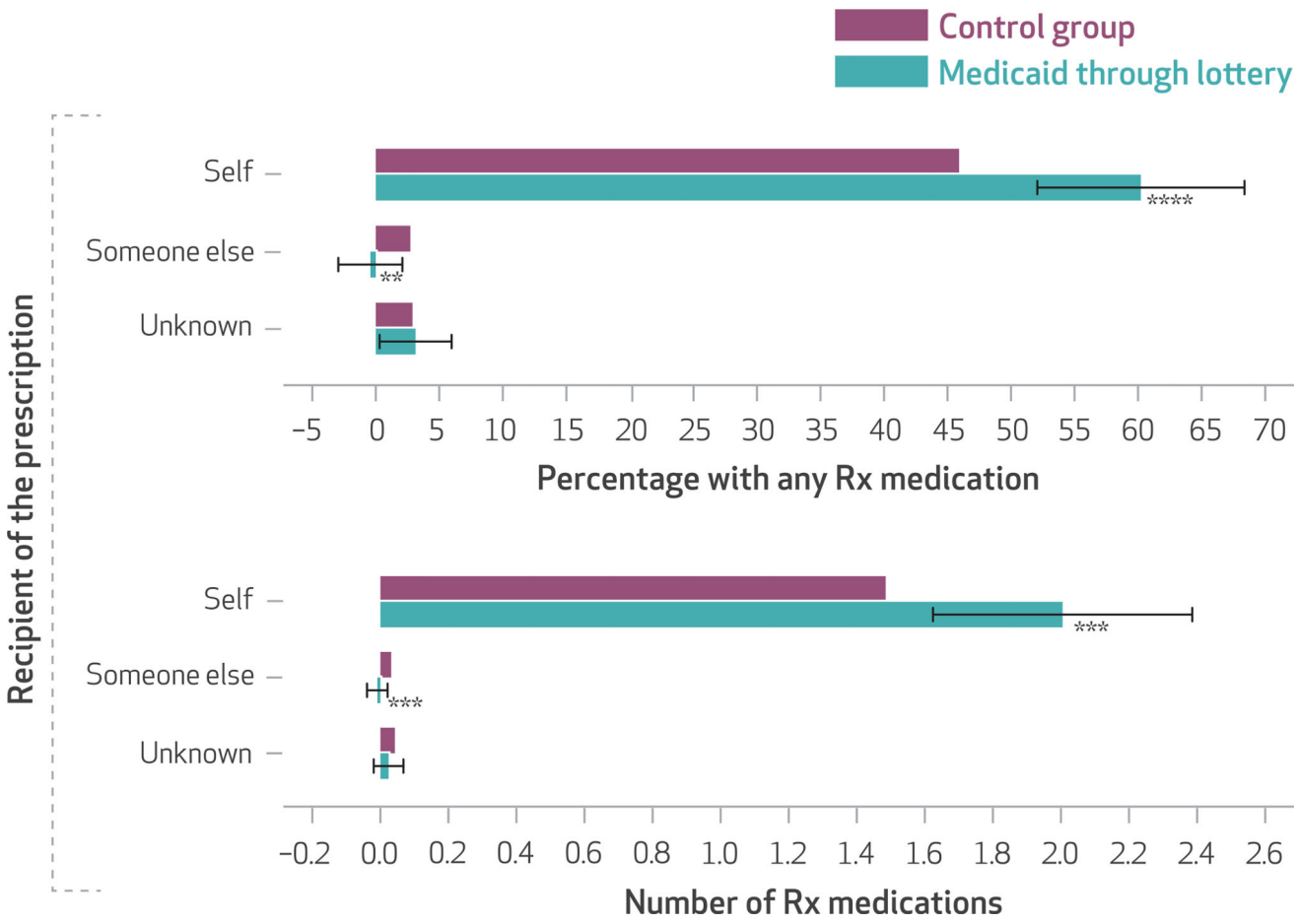

Exhibit 3. Effect of Medicaid on percentages of people in the Oregon study sample with any prescription medication and average number of prescription medications, by recipient of prescription

SOURCE Authors' analysis of data for 2009–10 from the Oregon Health Insurance Experiment data. **NOTES** Lottery selection was used as an instrument for Medicaid coverage in a two-stage least squares estimation. The average value for people not selected to receive Medicaid in the lottery (the control group) and the Medicaid effects and 95 percent confidence intervals (shown by the error bars) were calculated using survey weights. The average value for people who received Medicaid through the lottery is the sum of the control-group mean and the effect of Medicaid. The sample size and method of estimating Medicaid effects are explained in the Notes to Exhibit 1. **p < 0.05 ***p < 0.01 ****p < 0.001

Exhibit 4

Effect of Medicaid on percentages of people with any prescription medication and average number of medications, by type of medication and recipient of prescription

	Percent of people with any Rx medications			Average number of Rx medications		
	Control group	Effect of Medicaid coverage	95% CI for effect of Medicaid	Control group	Effect of Medicaid coverage	95% CI for effect of Medicaid
All medications	49.28	11.58	(3.45, 19.72)	1.56	0.46	(0.08, 0.85)
By therapeutic category						
All pain and anti-inflammatory	15.71	1.75	(−4.13, 7.63)	0.19	0.02	(−0.05, 0.09)
Opioids[a]	12.69	1.03	(−4.28, 6.35)	0.14	0.00	(−0.06, 0.06)
Opioid treatment[a]	3.03	2.62	(−1.04, 6.28)	0.03	0.03	(−0.01, 0.06)
Mental health	23.44	7.33	(0.49, 14.17)	0.42	0.15	(0.00, 0.30)
Cardiovascular	18.52	6.19	(−0.24, 12.61)	0.37	0.06	(−0.09, 0.21)
Asthma and other respiratory	9.29	2.47	(−2.19, 7.14)	0.14	0.05	(−0.03, 0.13)
Diabetes and other endocrine	11.20	6.14	(1.01, 11.27)	0.16	0.11	(0.03, 0.19)
Gastrointestinal	4.06	0.92	(−2.40, 4.23)	0.05	0.01	(−0.03, 0.05)
Antibiotics	3.67	3.33	(0.24, 6.42)	0.04	0.03	(−0.01, 0.07)
Contraceptives	2.65	−0.26	(−2.83, 2.32)	0.03	0.00	(−0.03, 0.02)
Other	12.50	2.51	(−2.68, 7.69)	0.16	0.03	(−0.05, 0.11)
By recipient of prescription						
Self	45.91	14.31	(6.16, 22.47)	1.48	0.52	(0.14, 0.90)
Someone else	2.72	−3.15	(−5.67, −0.63)	0.03	−0.04	(−0.07, −0.01)
Unknown	2.89	0.24	(−2.59, 3.07)	0.04	−0.02	(−0.06, 0.03)

SOURCE Authors' analysis of data for 2009–10 from the Oregon Health Insurance Experiment. **NOTES** Lottery selection was used as an instrument for Medicaid coverage in a two-stage least squares estimation. All regressions included indicators for the number of household members on the lottery list, clustered standard errors by household, and included sampling weights. The sample size and categories of medications are explained in the Notes to Exhibit 1. Only prescription drugs were included in the analysis; results with over-the-counter medications are shown in Appendix Exhibit A5 (see Note 9 in text).

[a]Analyses of opioid medications and medications for opioid addiction treatment as subsets of the broader pain category were not included in the prespecified analysis plan. See The Oregon Health Insurance Experiment [Internet]. Cambridge (MA): National Bureau of Economic Research; [cited 2017 Oct 27]. Available from: http://www.nber.org/oregon.