

Does Government Oversight Improve Access to Nursing Home Care? Longitudinal Evidence From US Counties

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Abstract

Gains in life expectancy around the world have increasingly placed pressure on governments to ensure that the elderly receive assistance with activities of daily living. This research examines the impact of government oversight of Medicaid payment policies on access to nursing home care services in the United States. Variation in price levels induced by a federal policy shift in 1997 is used to identify the effect of Medicaid reimbursements on the number of nursing homes and beds available. Court rulings prior to the policy change are used to categorically define a range of oversight treatments at the state level. Difference-in-differences estimates indicate a significant decline in access to nursing home care services for individuals living in states in which courts consistently ruled that Medicaid reimbursements did not meet the minimum standard implied by federal law. The findings suggest that nursing home care services were made more accessible through a combination of legislative and judicial oversight of Medicaid payment policies.

Keywords

nursing home care, Medicaid, federal state, intergovernmental relations

Introduction

Due to aging populations, societies around the world face the challenge of providing assistance to people who are no longer able to care for themselves. Trends toward smaller families and greater labor market participation in the United States have coincided with an increasing reliance on publicly funded providers of long-term care, as opposed to informal care provided by family members.¹ Over the next few decades, the number of elderly individuals aged 65 and over is expected to increase by 7 percentage points to approximately 20% of the population.² Although recent evidence suggests that there have been increases in disability-free life expectancy among the elderly,^{3,4} any growth in the size of the population utilizing nursing home care would place greater pressure on governments and taxpayers to publicly fund Medicaid programs covering the services.⁵ In fact, even if there are no changes in demand for nursing home care, the costs are likely to continue to rise. For instance, the number of Medicaid recipients utilizing nursing home care remained at about 1.6 million from 1999 to 2009, yet the total program spending for these services increased by more than 50% to US\$48.6 billion.⁶ The Medicaid program now accounts for over a third of total spending on long-term care services in the United States. Part of the impact of an aging population on nursing home care costs is directly related to the choices

state governments make in the design of Medicaid provider reimbursement policies.

This article investigates whether Medicaid price levels affect the accessibility of nursing home care. We measure access to care using the total number of homes and beds available in markets defined by county boundaries within states. Typically, equilibrium market prices and quantities are simultaneously determined, which makes it difficult to identify causal effects of prices on supply-side outcomes. By defining markets at the county level, we are able to take advantage of changes during the 1980s and 1990s in the federalist structure of the administration of the Medicaid program to evaluate how nursing home care providers responded to plausibly exogenous changes in market prices determined at the state government level. Currently, nursing home care services are a federally mandated component of Medicaid's long-term care benefits, but each state is free to set reimbursement prices at any level below the upper payment limits based on Medicare policy.⁷ In previous years, this was not

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the case as the prices offered by states for nursing home care were subject to federal government scrutiny and oversight. The Omnibus Reconciliation Act of 1980 introduced a new policy requiring states to pay nursing home care providers rates that were “reasonable and adequate to meet the costs that must be incurred by efficiently and economically operated facilities,” and the policy was subsequently repealed with the Balanced Budget Act of 1997. (The policy is also known as the Boren amendment after former Democratic Senator David Boren, from Oklahoma, who sponsored it.) However, in the interim years, there were a series of lawsuits brought by nursing home care providers challenging whether a state’s reimbursement met the minimum standard implied by federal law.⁸ The variation in court rulings is used to construct a range of oversight treatments ranging from the greatest oversight for states that only lost lawsuits challenging Medicaid nursing home reimbursement prices to the least oversight for states experiencing no lawsuits challenging their Medicaid nursing home reimbursement prices during this time. While initial government oversight initiatives are often times in direct response to prevailing outcomes, the repeal of this particular federal policy was applied equally across all states at the same time and is therefore less likely to be endogenously related with access to nursing home care services in counties.

We use a difference-in-differences (DD) empirical framework to estimate the effects of government oversight on nursing home care access before and after the federal policy change targeting Medicaid reimbursement prices. The results indicate a significant decline in both the number of nursing homes and nursing home beds in states that only lost lawsuits challenging their Medicaid nursing home reimbursement policies. For these 9 states, the repeal led to an average decrease of approximately 1 nursing home and 100 nursing home beds at the county level. Tests of the parallel trend assumption underlying the DD empirical framework suggest that the repeal of government oversight had a causal impact on access to nursing home care. Additional results indicate that there were not simultaneous changes in the fundamental structure of health care markets of counties in this period. Further evidence is presented that suggests that the observed patterns of nursing home exit decisions were attributable to declines in Medicaid reimbursement prices following the repeal in 1997.

The article proceeds as follows. The “Background and Related Literature” section provides a brief background of the history of the federal policy change examined here and discusses the related literature examining nursing home care supply decisions. The “Estimation Strategy and Data” section discusses the estimation strategy and data used for the empirical analysis. The “Results” section presents the main results and addresses the question of whether the estimates of the effects of government oversight can be interpreted as causal. Then, the next section presents evidence on the

mechanism of the government oversight impact in this context. The last section concludes.

Background and Related Literature

Annual federal and state government expenditures for the provision of nursing home care services through the Medicaid program now exceed US\$48 billion. Elderly recipients account for nearly three-fourths of the total costs of nursing home care, and nursing home care services comprise 15% of the total Medicaid program spending.⁶ (Nursing home care services are also commonly referred to as nursing facility services. Elderly recipients are individuals aged 65 and older and are also commonly referred to as aged beneficiaries. Nursing home care costs account for about 5% of the total non-elderly recipient costs.) There has been remarkable growth in Medicaid spending on this particular type of health care since the program’s inception in 1966. Spending on nursing home care services increased 11-fold during the 1970s and, over the next decade, it continued to increase and more than doubled during this time. From 1990 through 2000, spending on nursing home care services grew by 175% (for a summary of aggregate nursing home care expenditures by payment source, see Table 15 at <http://www.cms.hhs.gov/NationalHealthExpendData/downloads/tables.pdf>).

In response to the rapid growth of nursing home care costs in the 1970s, the federal government introduced a new Medicaid provider payment policy as a part of the Omnibus Reconciliation Act of 1980. The change was intended to help reduce costs by relaxing federal government oversight and giving states more discretion in setting Medicaid reimbursement prices for nursing home care.⁹ In particular, the new policy required that states pay nursing home care providers rates that were “reasonable and adequate to meet the costs that must be incurred by efficiently and economically operated facilities.” However, a policy shift that was originally intended to reduce government oversight of Medicaid reimbursement prices eventually led to increases in government oversight for a number of states. Miller⁸ identifies 84 lawsuits in 34 states brought by nursing home care providers challenging whether a state’s reimbursement met the minimum standard implied by the federal policy between 1981 and 2001. In each of the cases, a final decision was reached and a prevailing party was determined on the issues. Overall, states prevailed in 46.4%, nursing homes prevailed in 38.1%, and mixed court rulings occurred in 15.5% of the lawsuits. We consider the lawsuits in which nursing homes prevailed as an adverse outcome from a state’s perspective because it implies that Medicaid reimbursement prices for nursing home care would need to increase to comply with federal policy. The subsequent repeal of the policy with the Balanced Budget Act of 1997 suggests that Medicaid reimbursement prices for nursing home care would decline in the states that had only lost lawsuits as the primary legal basis for the

lawsuits challenging Medicaid nursing home care reimbursement prices was eliminated.

Related Literature

There exists a large literature examining the determinants of decisions of nursing home care providers in the United States. It has been recognized that government reimbursement policies for nursing home care directly influence the profitability of the industry.¹⁰ In contrast to other common types of health care, providers of nursing home care are able to enter the market for relatively low costs. Start-up costs are generally lower for nursing home care because the facilities do not need to invest in specialized equipment and are able to utilize low-skill labor to meet the health needs of patients.¹ As a result of the rapid increase in nursing home care costs for Medicaid recipients in the 1970s, “certificate-of need” regulation was implemented at the state level to restrict entry into the industry. (The National Health Planning and Resources Development Act of 1974 first required state approval. It was repealed in 1986, and all 5 states continue to implement some form of regulation to limit.¹) To enter or expand, firms had to prove to state governments that a need for additional supply of nursing home beds was evident in a local market.^{11,12} In contrast, there are no barriers preventing firms from exiting the nursing home care industry. The majority of nursing home care providers are owned and operated by for-profit firms.¹³ Nursing homes typically serve a mix of private paying and Medicaid patients, and the profits of nursing homes that serve a greater share of Medicaid patients would be more sensitive to changes in Medicaid reimbursement rates. If nursing homes are limited in the extent to which they can substitute private paying patients for Medicaid patients, then exiting may be a profit-maximizing decision in the face of lower Medicaid reimbursements. The present study is the first to empirically examine the decision of nursing home care providers to exit the industry.

Estimation Strategy and Data

We are interested in the relationship between Medicaid reimbursement prices and access to nursing home care, which might be approximated as

$$Q_{ist} = \alpha + \beta P_{st} + \mathbf{X}_{ist}\Gamma + u_{ist}. \quad (1)$$

Here, Q_{ist} is an outcome measuring the quantity of nursing homes or nursing home beds available in county i in state s during year t , P_{st} is the Medicaid reimbursement price determined by state governments, \mathbf{X}_{ist} is a vector of county and state characteristics, and u_{ist} is the error term. The parameter of interest is β , which is the effect of Medicaid reimbursement prices on overall access to nursing home care. Note that the effect expressed in equation (1) is not at the county level, but at the state level because decisions on Medicaid provider

reimbursement prices are applied equally to providers in all counties within a state. A key impediment to obtaining an unbiased estimate of β is that prices are not randomly assigned to states and are likely to be endogenously determined with other unobserved state-level factors related with access to nursing home care. For instance, states with higher reimbursement prices may have greater demand for health care services, more generous Medicaid eligibility criteria, or higher health care costs. To address the endogeneity problem, we take advantage of the timing of a discrete change in federal government policy concerning the oversight of Medicaid nursing home reimbursement prices. The variation in reimbursement prices induced by the federal policy shift is plausibly uncorrelated with unobserved state-level factors related with access to nursing home care.

The challenge in estimating the effect of government oversight of Medicaid reimbursement prices on access to nursing home care is finding a control group that credibly tracks how counties would have developed in the absence of oversight. In this case, every state Medicaid program was subject to the policy introduced with the Omnibus Reconciliation Act of 1980. (Arizona did not begin covering nursing home care services through Medicaid until 1988.) A key ramification of the policy was a series of lawsuits brought by nursing home care providers against states on the grounds that reimbursement prices were inadequate. The variation across states in lawsuit initiation and court rulings for or against the plaintiff suggests a range of oversight treatments. We categorically define treatment status based on each of the four possible outcomes for states during the period before the repeal of the policy with the Balanced Budget Act of 1997: states with no lawsuits, states that only won lawsuits, states with mixed court rulings on lawsuits, and states that only lost lawsuits. The latter treatment category is arguably the case where government oversight had the strongest impact on Medicaid reimbursement prices for nursing home care because the courts ruled that prices were inadequate under federal law. In our initial approach, we focus on this case of government oversight, and use a DD methodology to examine the effect of strong government oversight on access to nursing home care. The first estimation equation is specified as

$$y_{ist} = \alpha + \beta(\text{Lost}_s \times \text{After}_t) + \gamma \text{Lost}_s + \delta \text{After}_t + v_{ist}, \quad (2)$$

where the dependent variable measures the number of nursing homes and nursing home beds in a county, and After_t is a dichotomous variable that is set to 1 for the period after the repeal of the policy. Lost_s is a dichotomous variable that is set to 1 if the county is located in a state that only lost lawsuits challenging its Medicaid nursing home reimbursement prices.

The effect of strong government oversight is captured by β in equation (2). The specification controls for changes over time in average nursing home levels and average differences

in nursing home levels of counties located within states that only lost lawsuits and counties located within states that had no lawsuits, had only won lawsuits, or had mixed court rulings. The key identifying assumption is that any relative change in nursing home levels is due to the repeal of the policy and, hence, the federal law underlying previous court decisions. As changes in nursing home supply may also be correlated with other time-varying demographic and economic characteristics affecting demand for nursing home care within counties and states, we further include a set of additional controls to equation (2). At the county level, we include fixed effects to control for all unobserved and observed time-invariant factors influencing the availability of and demand for nursing home care. Over time, changes in the number of residents as well as their income and employment opportunities would be expected to affect demand for Medicaid and health care services. We include income per capita, the annual unemployment rate, and the size of the population to control for shifts in demand for counties and the states in which the counties are located. However, at the state level, we are concerned with potential omitted variables related to Medicaid policy choices affecting eligibility criteria and benefit levels, which are expected to influence demand for health care services, particularly nursing home care. Additional explanatory variables for the population structure include the population aged 14 or younger per capita, the population aged 65 and over per capita, and the female population aged 15 to 44 per capita. These three segments of the population are primary targets of the Medicaid program. To control for changes in Medicaid recipients of nursing home care, we include the number of elderly Supplemental Security Income (SSI) recipients per capita, as well as the number of blind-disabled SSI recipients per capita. SSI program eligibility implies eligibility for the Medicaid program. Finally, we include the federal medical assistance percentage (FMAP) to control for differences over time in federal government financing incentives associated with Medicaid matching grants to states. To the extent that states' Medicaid reimbursement prices for nursing home care are determined by these factors, the additional controls will help to remove any resulting bias from omitted variables.

Our second approach considers the possibility that the reference group of states in equation (2), which includes states that had no lawsuits, states that had only won lawsuits, and states that had mixed court rulings, may lead to an over- or underestimate of strong government oversight on access to nursing home care. For instance, every state could potentially lower Medicaid reimbursement prices for nursing home care after the repeal of the policy because the legal basis for lawsuits against states was eliminated. However, states with previous lawsuits may respond differently to the repeal as compared with states with no previous lawsuits challenging their Medicaid reimbursement prices for nursing home care. Modeling the entire range of government oversight treatments would allow us to further investigate whether

the judiciary involvement in states that won lawsuits also affected access to nursing home care. The estimating equation is specified as

$$y_{ist} = \alpha + \beta_1 (\text{Lost}_s \times \text{After}_t) + \gamma_1 \text{Lost}_s + \beta_2 (\text{Won}_s \times \text{After}_t) + \gamma_2 \text{Won}_s + \beta_3 (\text{Mixed}_s \times \text{After}_t) + \gamma_3 \text{Mixed}_s + \delta \text{After}_t + v_{ist}, \quad (3)$$

where the dependent variable measures the number of nursing homes and nursing home beds in a county, and After_t is a dichotomous variable that is set to 1 for the period after the repeal of the policy. Lost_s is a dichotomous variable that is set to 1 if the county is located in a state that only lost lawsuits challenging its Medicaid nursing home reimbursement prices, Won_s is a dichotomous variable that is set to 1 if the county is located in a state that only won lawsuits challenging its Medicaid nursing home reimbursement prices, and Mixed_s is a dichotomous variable that is set to 1 if the county is located in a state that experienced mixed court rulings on lawsuits challenging its Medicaid nursing home reimbursement prices. The effects of government oversight are captured by $\beta_1 - \beta_3$ in equation (3). The specification controls for changes over time in average nursing home levels and average differences in nursing home levels of counties located within states with judiciary involvement and counties located within states with no judiciary involvement. Equations (2) and (3) are estimated using ordinary least squares (OLS), and standard errors are clustered at the state level to allow for an arbitrary pattern of serial correlation in the residual error terms of counties.

Semiparametric Censored Regression Model

The outcomes of interest in equations (2) and (3) are the number of nursing homes and nursing home beds in a county, and observations can have a limiting value of 0. Tobin¹⁴ developed a limited dependent variable (Tobit) model to account for a concentration of observations at a limiting value, where the observed outcome is

$$y_{it} = \max(0, y_{it}^*), \quad (4)$$

and the unobserved latent variable y_{it}^* is expressed as

$$y_{it}^* = \alpha + \mathbf{X}_{it}\boldsymbol{\Lambda} + \varepsilon_{it}. \quad (5)$$

Greene¹⁵ demonstrates that OLS estimates of $\boldsymbol{\Lambda}$ are biased and inconsistent, and that the bias is downward in magnitude if \mathbf{X}_{it} and ε_{it} are normally distributed. Several estimators have been developed to consistently estimate parameters in Tobit models; however, very few are amenable to the inclusion of fixed effects. To evaluate the extent of the bias evident in OLS estimates of β in equations (2) and (3), we apply the trimmed least squares estimator developed by Honoré.¹⁶ A key advantage of using this particular semiparametric estimator is that it

Table 1. Means for US Counties.

Variable	States that only lost lawsuits challenging Medicaid nursing home reimbursement prices		All other states	
	1994	2000	1994	2000
Nursing homes	1.95	0.92	1.14	0.60
Nursing home beds	155.90	67.27	94.93	48.08
County characteristics				
Income per capita	17 747	22 560	17 675	22 848
Unemployment rate	6.22	4.52	6.31	4.85
Total population	110 735	120 790	72 936	78 201
State characteristics				
Income per capita	20 757	27 781	21 024	27 586
Unemployment rate	5.74	3.93	5.34	3.82
Total population (in millions)	11.8	13.2	5.2	5.6
Population age 14 or younger per capita	0.23	0.22	0.22	0.21
Population age 65 and over per capita	0.13	0.12	0.13	0.12
Female population age 15 to 44 per capita	0.23	0.22	0.23	0.22
Elderly SSI recipients per capita	0.005	0.004	0.005	0.003
Blind-disabled SSI recipients per capita	0.016	0.016	0.020	0.020
Federal medical assistance percentage	62.36	61.39	62.72	61.60
States that only won lawsuits challenging Medicaid nursing home reimbursement prices	0		0.31	
States that had mixed rulings on lawsuits challenging Medicaid nursing home reimbursement prices	0		0.40	
No. of states	9		40	
Observations	779	779	2315	2315

Source. Centers for Medicare and Medicaid Services, US Bureau of Economic Analysis, US Bureau of Labor Statistics, US Census Bureau, and US Social Security Administration.

Note. The sample includes counties from all states except Arizona. SSI = Supplemental Security Income.

is unnecessary to assume a specific structure for the serial correlation of the residual error terms of US counties.

Data

The study utilizes county- and state-level data from a number of sources. A description of each source is provided here. Our main empirical analysis is based on a 2-period panel of 3094 counties, which is approximately 98% of all US counties, between 1994 and 2000. (There are 15 counties from Arizona that are not included in the sample because Arizona did not begin covering nursing home care services through Medicaid until 1988.) Sample means for the key variables are reported in Table 1.

Outcomes measuring the number of nursing homes and certified nursing home beds in counties are obtained from the Centers for Medicare and Medicaid Services. Additional county and state controls include the annual unemployment rate from the US Bureau of Labor Statistics, total personal income from the US Bureau of Economic Analysis, and total population from the US Census Bureau. The percentage of a state's population that is female and between the ages of 15 and 44, the percentage of a state's population aged 14 or

younger, and the percentage of a state's population aged 65 or older are also reported by the US Census Bureau. Data collected on SSI recipients from the US Social Security Administration are used to construct per capita measures of elderly SSI and blind-disabled SSI recipients in each state. The FMAPs for each state are obtained from the Green Book. Additional county-level outcomes include the total number of active medical doctors and hospitals reported by the American Medical Association and the American Hospital Association, respectively.

Additional state-level data are utilized to examine changes in state Medicaid spending on nursing home care services relative to the number of recipients over the 1994-2000 time period. Data on Medicaid spending on nursing home care are obtained from CMS-64 Expense Reports that are collected by Centers for Medicare and Medicaid Services. Data on Medicaid nursing home care recipients come from the Health Care Financing Administration (HCFA) 2082 reports for fiscal year 1994-1998. As of fiscal year 1999, all states are required to submit Medicaid expenditure and recipient information via the Medicaid Statistical Information System (MSIS).

Sample means are reported in Table 2.

Table 2. Means for US States.

Variable	States that only lost lawsuits challenging Medicaid nursing home reimbursement prices		All other states	
	1994-1997	1998-2000	1994-1997	1998-2000
Medicaid spending per recipient for nursing home care services (US\$/n)	23 060	24 330	28 532	28 210
Total Medicaid spending for nursing home care (US\$), in billions	1.26	1.35	0.83	0.83
Total Medicaid recipients of nursing home care (n)	55 101	54 249	27 892	29 385
No. of states	9	9	40	40
Observations	36	26	159	119

Source. Centers for Medicare and Medicaid Services.

Note. The sample includes all US states except Arizona for fiscal years 1994-2000; Hawaii Medicaid data are unavailable for 1997, Oklahoma Medicaid data are unavailable for 1997, and Tennessee Medicaid data are unavailable for 2000. Expenditures are adjusted by the consumer price index indexed in 2012 dollars.

Results

Main Results

Table 3 presents the OLS estimates of β in equation (2), which measures the DD in nursing homes and nursing home beds from 1994 to 2000. In column 1, the DD estimate of -0.49 is significant at the 5% level and indicates that counties located within states with the strongest government oversight experienced a decline in the number of nursing homes after the repeal of the federal policy with the Balanced Budget Act of 1997. In column 3, the point estimate of -41.74 suggests a corresponding decline in the number of certified nursing home beds available in these counties. Note that access to nursing home care declined at the state level as well; if the decrease in nursing homes and nursing home beds in certain counties was completely offset by increases in other counties within states, the DD estimate would equal 0. To assess the omitted variable bias, columns 2 and 4 present the estimates with an extensive set of controls included, and a downward bias is evident. The point estimate of β increases in magnitude to -1.01 for nursing homes and -77.04 for nursing home beds. The results indicate that the repeal of the federal policy significantly reduced access to nursing home care for residents of states that only lost lawsuits related to the policy, relative to residents in all other states.

To assess the extent to which judiciary involvement in states that won lawsuits also affected access to nursing home care, Table 4 presents the OLS estimates of $\beta_1 - \beta_3$ in equation (3). The key difference here is that the reference group is now counties located in states with no prior experience with lawsuits related to the federal policy. Columns 1 and 3 show the DD estimates for nursing homes and nursing home beds without the controls for completeness, as we expect bias related to omitted variables based on the previous results presented in Table 3. In column 2, the DD estimate of -0.94 is significant at the 5% level and indicates

that counties located within states with the strongest government oversight experienced a decline in the number of nursing homes after the federal policy repeal. In contrast, the DD estimates of -0.07 for states that had only won lawsuits and 0.26 for states that had mixed court rulings are statistically insignificant and much smaller in magnitude. Furthermore, we fail to reject the null hypothesis of joint insignificance of β_2 and β_3 ($P < .41$). The results do not indicate any significant differences in nursing home availability for states that won lawsuits, relative to states with no lawsuits.

As a final step, we apply the trimmed least squares estimator developed by Honoré¹⁶ to assess the sensitivity of our results to censoring of the dependent variables at 0. Table 5 presents the DD estimates of government oversight on nursing homes and nursing home beds based on equations (2) and (3), with and without control variables included. We focus the discussion on columns 4 and 8 based on equation (3) with controls because of the estimation issues previously discussed. In columns 4 and 8, the DD estimates of -1.10 for nursing homes and -116.22 for nursing home beds are significant at the 5% level and indicate that the censoring biased OLS estimates toward 0. The DD estimates for states that had only won lawsuits are larger compared with those obtained with OLS, but remain statistically insignificant. The DD estimate of 0.60 for nursing homes in states that had mixed court rulings is now larger compared with the OLS estimate and significant at the 5% level. It is not clear why the repeal had a positive effect of nursing home availability in these states; however, the DD estimate of 23.52 for nursing home beds is statistically insignificant. This suggests that the repeal of the federal policy may have prompted a restructuring of nursing home size, possibly to reduce costs in anticipation of lower Medicaid reimbursement prices. However, there was not a significant increase in the number of nursing home beds available to residents as a result of the increase in nursing homes.

Table 3. Ordinary Least Squares Estimates of Difference-in-Differences in Nursing Homes and Nursing Home Beds Assuming Single Government Oversight Treatment Effect.

Variable	Nursing homes		Nursing home beds	
	(1)	(2)	(3)	(4)
Only lost lawsuits × After	−0.49** (0.24)	−1.01** (0.14)	−41.74** (19.98)	−77.04** (12.38)
Only lost lawsuits	0.81* (0.42)		60.92* (34.23)	
After	−0.54** (0.11)	−1.89* (1.12)	−46.84** (10.55)	−176.24 (110.70)
County characteristics				
Income per capita		−0.00005** (0.00002)		−0.004** (0.002)
Unemployment rate		−0.02 (0.02)		−1.55 (1.58)
Total population		−0.00001** (0.000005)		−0.002** (0.001)
State characteristics				
Income per capita		0.000002 (0.0001)		0.001 (0.009)
Unemployment rate		0.49** (0.14)		45.24** (15.58)
Total population		0.0000009** (0.0000002)		0.00007** (0.00002)
Population age 14 or younger per capita		−78.92** (27.77)		−6689.21** (2863.32)
Population age 65 and over per capita		−47.23 (38.81)		−6001.12 (3842.06)
Female population age 15 to 44 per capita		−129.04** (56.28)		−12 340.74** (5817.81)
Elderly SSI recipients per capita		−83.65 (83.61)		−4103.87 (7842.11)
Blind-disabled SSI recipients per capita		145.55** (41.66)		16 119.04** (4884.13)
Federal medical assistance percentage		0.07 (0.04)		6.13 (4.68)
County fixed effects	No	Yes	No	Yes
R ²	.035	.105	.020	.168
Observations	6188	6188	6188	6188

Note. Standard errors are reported in parentheses and adjusted for state-level clustering. The sample is as described in Table 1. SSI = Supplemental Security Income.

*Significant at the 10% level. **Significant at the 5% level.

Testing the Parallel Trend Assumption

To interpret the DD estimates presented here as causal, it is crucial to establish whether nursing homes and nursing home beds in counties were changing at the same overall rate before the repeal of the federal policy with the Balanced Budget Act of 1997. We test the parallel trend assumption by

examining changes in nursing home care availability between 1991 and 1994. Table 6 presents the results based on equations (2) and (3) for nursing homes and nursing home beds. In columns 1 and 2, the point estimates of −0.82 and −1.85 for nursing homes are statistically insignificant, and suggest that counties in states that had only lost lawsuits were experiencing the same overall decline in nursing homes during

Table 4. Ordinary Least Squares Estimates of Difference-in-Differences in Nursing Homes and Nursing Home Beds Assuming Multiple Government Oversight Treatment Effects.

Variable	Nursing homes		Nursing home beds	
	(1)	(2)	(3)	(4)
Only lost lawsuits × After	-0.55*	-0.94**	-40.27	-72.17**
	(0.29)	(0.17)	(29.22)	(12.38)
Only lost lawsuits	0.95*		60.74	
	(0.50)		(49.04)	
Only won lawsuits × After	-0.19	-0.07	-6.44	-0.31
	(0.31)	(0.21)	(30.03)	(19.45)
Only won lawsuits	0.24		2.67	
	(0.53)		(49.50)	
Mixed lawsuit rulings × After	-0.002	0.26	8.74	14.42
	(0.25)	(0.21)	(27.71)	(20.75)
Mixed lawsuit rulings	0.18		-2.55	
	(0.48)		(51.78)	
After	-0.47**	-2.35**	-48.31**	-198.26*
	(0.20)	(1.15)	(23.79)	(110.70)
County fixed effects	No	Yes	No	Yes
County controls	No	Yes	No	Yes
State controls	No	Yes	No	Yes
R ²	.036	.102	.020	.168
Observations	6188	6188	6188	6188

Note. Standard errors are reported in parentheses and adjusted for state-level clustering. The sample is as described in Table 1.

*Significant at the 10% level. **Significant at the 5% level.

Table 5. Trimmed Least Squares Estimates of Difference-in-Differences in Nursing Homes and Nursing Home Beds Assuming Single and Multiple Government Oversight Treatment Effects.

Variable	Nursing homes				Nursing home beds			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Only lost lawsuits × After	-0.62**	-1.23**	-0.69**	-1.10**	-70.72**	-111.26**	-53.95	-116.22**
	(0.18)	(0.23)	(0.24)	(0.27)	(28.54)	(36.23)	(34.94)	(42.12)
Only won lawsuits × After			-0.50*	-0.28			1.33	-34.31
			(0.27)	(0.20)			(31.54)	(25.07)
Mixed lawsuit rulings × After			0.21	0.60**			41.95	23.52
			(0.21)	(0.23)			(35.51)	(30.14)
After	-1.28**	-0.41	-1.21**	-1.39	-129.60**	-50.13	-146.37**	-108.83
	(0.11)	(1.18)	(0.19)	(1.09)	(14.26)	(157.57)	(24.70)	(152.07)
County fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
County controls	No	Yes	No	Yes	No	Yes	No	Yes
State controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	6188	6188	6188	6188	6188	6188	6188	6188

Note. Honoré¹⁶ developed the trimmed least squares estimator applied here. The sample is as described in Table 1.

*Significant at the 10% level. **Significant at the 5% level.

this period as counties located in other states. Similarly, in columns 3 and 4, the point estimates of -59.11 and -200.13 for nursing home beds are statistically insignificant. Overall, we fail to reject the null hypothesis of a parallel trend in nursing homes and nursing home beds before the federal policy repeal.

Testing for Confounding Changes in Health Care Markets

An additional threat to interpreting the DD estimates presented here as causal is that there may have been changes in the structure of other health care markets in counties that

Table 6. Testing the Parallel Trend Assumption.

Variable	Nursing homes		Nursing home beds	
	(1)	(2)	(3)	(4)
Only lost lawsuits × Year	−0.82 (1.48)	−1.85 (1.46)	−59.11 (145.77)	−200.13 (139.19)
Only lost lawsuits	1.62 (1.56)	2.80* (1.53)	126.82 (154.87)	272.25* (149.11)
Only won lawsuits × Year		−1.10 (1.09)		−129.05 (119.49)
Only won lawsuits		1.35 (1.21)		135.54 (126.74)
Mixed lawsuit rulings × Year		−1.76** (0.84)		−259.12* (129.79)
Mixed lawsuit rulings		1.98** (0.88)		265.26* (136.69)
Year (= 1 if 1994)	−3.45** (0.46)	−2.42** (0.41)	−387.55** (62.90)	−246.52** (45.52)
R ²	.051	.054	.041	.045
Observations	6130	6130	6130	6130

Note. Standard errors are reported in parentheses and adjusted for state-level clustering. These data cover the years 1991 and 1994 from the period before the repeal of the federal policy in 1997. Counties from Alaska are not included due to missing data on nursing homes and nursing home beds in 1991.

*Significant at the 10% level. **Significant at the 5% level.

were correlated with the changes in nursing home care availability that we find. For instance, nursing home residents frequently have health care needs that can only be provided by hospitals and doctors. Nursing homes may find that locating in counties with a greater number of hospitals and doctors increases demand for available beds. We examine DD in doctors, hospitals, and long-term hospitals to assess the extent to which there were possible contemporaneous changes in health care markets that would confound our DD estimates of government oversight on access to nursing home care. Table 7 presents the results based on equations (2) and (3) for doctors, hospitals, and long-term hospitals. We do not find any evidence of significant changes in the availability of other types of health care providers for counties located in states with the strongest government oversight of Medicaid reimbursement prices for nursing home care.

Mechanism of Government Oversight Impact

A key assumption underlying the findings presented here is that the federal policy shift in 1997 removed a binding barrier preventing states from lowering nursing home reimbursement rates. In general, nursing homes are likely to respond to lower reimbursements by reducing the number of beds allocated to Medicaid patients. However, if nursing homes are unable to substitute private paying patients for less profitable Medicaid patients, then they may be forced to exit the market when faced with lower Medicaid

reimbursements. Nyman¹¹ demonstrates that reductions in the supply of nursing home beds result in higher market prices. This suggests that we would expect to observe higher prices and fewer available beds if nursing homes exit the industry due to low Medicaid reimbursements in the years following the repeal.

Although direct information on the reimbursement rates prevailing during this period is unavailable, we are able to examine trends in average Medicaid spending on nursing home care services per recipient. We estimate the following reduced-form model:

$$y_{st} = \alpha + \beta_1 (\text{Lost}_s \times \text{Trend}_t) + \gamma_1 \text{Lost}_s + \beta_2 (\text{Won}_s \times \text{Trend}_t) + \gamma_2 \text{Won}_s + \beta_3 (\text{Mixed}_s \times \text{Trend}_t) + \gamma_3 \text{Mixed}_s + \delta \text{Trend}_t + v_{st}, \quad (6)$$

where the dependent variable measures Medicaid spending per recipient for nursing home care services in state s during year t , and Trend_t is a linear time trend. Spending per recipient depends on the Medicaid reimbursement prices offered to nursing home care providers and on the number of beds allocated to Medicaid patients. Prior to the repeal, we would expect to observe below-average levels of Medicaid spending per recipient in states with the strongest government oversight because courts had consistently ruled that the Medicaid reimbursement prices did not meet the minimum standard implied by federal law. As a result of adverse court rulings, the trend in Medicaid spending per recipient should be positive for states with the strongest government oversight. In contrast, we would expect to observe the opposite in

Table 7. Ordinary Least Squares Estimates of Difference-in-Differences in Medical Doctors, Hospitals, and Long-Term Hospitals Assuming Multiple Government Oversight Treatment Effects.

Variable	Medical doctors		Hospitals		Long-term hospitals	
	(1)	(2)	(3)	(4)	(5)	(6)
Only lost lawsuits ×	6.94	3.66	-0.07	-0.01	-0.01	0.01
After	(5.42)	(5.84)	(0.06)	(0.07)	(0.02)	(0.02)
Only won lawsuits ×		-6.57		0.09*		0.02
After		(4.01)		(0.05)		(0.01)
Mixed lawsuit rulings ×		-3.07		0.06		0.04*
After		(6.55)		(0.06)		(0.02)
After	-31.18	-33.54	0.19	0.19	-0.05	-0.08
	(19.82)	(21.91)	(0.22)	(0.24)	(0.06)	(0.06)
County fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
County controls	Yes	Yes	Yes	Yes	Yes	Yes
State controls	Yes	Yes	Yes	Yes	Yes	Yes
R ²	.85	.85	.82	.82	.23	.23
Observations	6188	6188	6188	6188	6188	6188

Note. Standard errors are reported in parentheses and adjusted for state-level clustering. The sample is as described in Table 1.

*Significant at the 10% level. **Significant at the 5% level.

the years immediately following the policy repeal. A key consequence of nursing homes exiting the industry is higher prices and fewer beds available for Medicaid patients, both of which would work to increase Medicaid spending per recipient. This would suggest that states with the strongest government oversight would have relatively higher levels of Medicaid spending per recipient and a negative trend if states take advantage of the reduction in government oversight following the federal policy shift in 1997.

Table 8 presents the results based on equation (6). Over the period 1994-1997, we see that states with the strongest government oversight of Medicaid reimbursement prices for nursing home care had significantly lower levels of Medicaid spending per recipient for nursing home care services, relative to states with no prior experience with lawsuits related to the federal policy that was repealed in 1997. In contrast, the results do not indicate any significant differences in nursing home spending per recipient for states that won lawsuits or experienced mixed court rulings, relative to states with no lawsuits. No significant trends in spending per recipient were evident during this time period; however, the estimated trend for states with the strongest government is positive. Focusing on the years immediately following the federal policy shift reveals a different picture. Over the period 1998-2000, states that had only lost lawsuits or experienced mixed rulings had significantly higher levels of Medicaid spending per recipient for nursing home care services, relative to states with no prior experience with lawsuits. Furthermore, the trend in Medicaid spending per recipient for nursing home care services among states that experienced lawsuits was significantly lower compared with states with no prior experience with lawsuits. The evidence suggests that in states with prior lawsuits challenging their Medicaid nursing home care

reimbursement prices, Medicaid spending per recipient for nursing home care services grew at a significantly slower rate immediately following the policy repeal. This is consistent with lower provider reimbursements, which would create disincentives for providers to operate in these states.

Conclusions

This study presents the first empirical analysis of the role of government oversight in determining the accessibility of nursing home care in the United States. Changes during the 1980s and 1990s in the federalist structure of the administration of the Medicaid program created differences across states in the extent to which the judiciary was involved in regulating provider payment policies for nursing home care. Overall, 9 states experienced lawsuits in which courts consistently ruled that Medicaid reimbursement prices did not meet the minimum standard implied by federal law that was originally introduced with the Omnibus Reconciliation Act of 1980 and then subsequently repealed with the Balanced Budget Act of 1997. (The 9 states that had only lost lawsuits were California, Florida, Montana, Nebraska, Ohio, Oklahoma, Texas, Vermont, and Wisconsin.) Using a DD empirical framework, we estimate that the repeal led to an average decrease of approximately 1 nursing home and 100 nursing home beds at the county level between 1994 and 2000 for the states with the strongest government oversight.

The findings presented here suggest that government oversight of Medicaid nursing home reimbursement prices benefited both Medicaid and private paying nursing home patients. Nyman^{12,17} demonstrates that the quality of nursing home care is lower in markets where there exists excess Medicaid demand for available beds. The decline in the

Table 8. Ordinary Least Squares Estimates of Differences in Average State Medicaid Spending per Recipient for Nursing Home Care Services From 1994 to 2000.

Variable	US\$/recipient	
	1994-1997	1998-2000
Only lost lawsuits	-5631* (3360)	15 423* (8871)
Only won lawsuits	-452 (3401)	15 153 (9214)
Mixed lawsuit rulings	2665 (6362)	22 394* (11 885)
Only lost lawsuits × Trend	456 (749)	-3 154** (1575)
Only won lawsuits × Trend	44 (536)	-2740* (1564)
Mixed lawsuit rulings × Trend	378 (684)	-3289* (1804)
Trend	-255 (494)	2671* (1488)
Constant	28 188** (2625)	11 823 (8346)
R ²	.07	.07
Observations	195	145

Note. Standard errors are reported in parentheses and adjusted for state-level clustering. The sample includes all US states except Arizona for fiscal years 1994-2000; Hawaii Medicaid data are unavailable for 1997, Oklahoma Medicaid data are unavailable for 1997, and Tennessee Medicaid data are unavailable for 2000. Expenditures are adjusted by the consumer price index indexed in 2012 dollars.

*Significant at the 10% level. **Significant at the 5% level.

number of nursing homes and beds following the federal policy repeal is likely to create or increase excess Medicaid demand and therefore result in a lower overall quality of care for all patients. Furthermore, Nyman¹¹ examined the relationship between market concentration and the price of nursing home care and found higher prices in markets with fewer nursing homes. A key implication of higher private nursing home care costs is an increase in Medicaid recipients, as people unable to care for themselves “spend down” to obtain Medicaid eligibility for nursing home care.

The policy issue of ensuring individual access to nursing home care services is unlikely to become less important over time. Recent federal government expansions in the scope of eligibility for Medicaid through the Patient Protection and Affordable Care Act¹⁸ will eventually test whether additional government oversight is necessary to guarantee the availability of health care services covered by the program. The budgetary pressure generated by increases in Medicaid recipients will create strong incentives for states to lower provider reimbursement prices to help control costs. Predicted changes in the age structure of the US population will further exacerbate budgetary pressure arising from the Medicaid program, and force state governments to make difficult decisions

involving tradeoffs between raising taxes and cutting other public expenditures to cover the costs. Baicker¹⁹ demonstrates that state governments respond to federally mandated Medicaid spending by reducing spending on other welfare programs. The implication is that giving more authority to states in the design of federal-state welfare programs such as Medicaid may work to shift the accessibility of health care services from one low-income population to another. Our findings suggest that government oversight of Medicaid reimbursements, involving both the legislative and judiciary branches of government, is one policy lever that works to increase overall access to nursing home care services. Whether judiciary mandates distort states’ welfare budgets to the same extent as legislative mandates remains an open question.

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