Entry Regulation and Rural Health Care

Certificate-of-Need Laws, Ambulatory Surgical Centers, and Community Hospitals

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Abstract

Certificate-of-need (CON) laws disallow hospitals, nursing homes, ambulatory surgical centers (ASCs), and other healthcare providers from entering new markets, expanding their practice, or making certain capital investments without first receiving approval from state regulators. These laws are currently in effect in 36 states. Over the past 40 years, CON laws have been justified as a way to achieve numerous public policy goals, such as controlling costs, increasing charity care, and protecting access to health care in rural communities by shielding hospitals from increased competition. However, the effects of CON laws on rural health care are not well understood. We examine the effect of entry regulation on ASCs and community hospitals and find that there are both more rural hospitals and more rural ambulatory surgical centers per capita in states without a CON program regulating the opening of an ASC. This finding indicates that CON laws may not be protecting access to rural health care, but are instead correlated with decreases in rural access.

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I. Introduction

Certificate-of-need (CON) laws currently restrict the entry or expansion of healthcare facilities in 36 states.[1] These laws prohibit hospitals, nursing homes, ambulatory surgical centers, and other healthcare providers from expanding their practice in the same area, from creating new facilities in a different location in the state, or from making certain capital investments without first receiving approval from state regulators. These programs are implemented with the expressed purpose of achieving a number of public policy goals. Three primary goals are consistent across most certificate-of-need programs: controlling cost, increasing charity care, and providing medical access in rural healthcare markets.

In order to achieve the third goal—protecting medical access in rural markets (as well as other geographical areas that are deemed underserved)—many states have sought to regulate the entry and expansion of "hospital substitutes,"[2] which include ambulatory surgical centers (ASCs) (Cimasi 2005). The theory is that allowing competition between general hospitals and ASCs will

[1] While 36 states have CON programs, they vary significantly in both the stringency of the review process and the services and equipment covered. For example, Ohio regulates only one service (long-term acute care) while Vermont regulates 30 categories of medical services and equipment (AHPA 2012).

[2] To understand the theoretical underpinnings for using CON programs to protect access, see Colon Health Centers of America v. Hazel et al., No. 14-2283, slip op. at 23 (4th Cir. 2016), which notes,

> A related purpose of the CON program is geographical in nature. For reasons not difficult to discern, medical services tend to gravitate toward more affluent communities. The CON program aims to mitigate that trend by incentivizing healthcare providers willing to set up shop in underserved or disadvantaged areas such as Virginia's Eastern Shore and far Southwest. "In determining whether" to issue a certificate, for example, Virginia considers "the effects that the proposed service or facility will have on access to needed services in areas having distinct and unique geographic, socioeconomic, cultural, transportation, or other barriers to access to care." Va. Code Ann. § 32.1-102.3(B)(1).

The CON program may also aid underserved consumers in a more indirect fashion. By reducing competition in highly profitable operations, the program may provide existing hospitals with the revenue they need not only to provide indigents with care, but also to support money-losing but nonetheless important operations like trauma centers and neonatal intensive care units.

result in "cream skimming," meaning that ASCs will accept only the more profitable, less complicated, and well-insured patients while hospitals will be left to treat the less profitable, more complicated, and uninsured patients (Tynan et al. 2009). Some raise the concern that allowing free entry by ASCs will increase cream-skimming, which may harm the financial sustainability of hospitals and in addition adversely affect access to health care in rural areas (Piper 2004; Tynan 2009). As a result, states have chosen to regulate how these providers enter a market, with the goal of protecting access to health care by protecting community hospitals. Currently, 26 states regulate the entry of ASCs through their CON programs. Moreover, Piper (2004) notes that a number of states have considered creating additional, special criteria for these providers in an effort to further protect against cream-skimming and to protect access to hospitals in rural areas.

But are these programs achieving their intended goals? There have already been studies on cost control (Sloan and Steinwald 1980; Sloan 1981; Joskow 1980; Joskow 1981) and on charity care (Stratmann and Russ 2014). However, little is known about the effects that specific entry regulations for ASCs have on healthcare access in rural, or otherwise traditionally underserved, communities.

In this paper, we analyze whether CON programs, by regulating entry of nonhospital providers, have affected competition between nonhospitals and hospitals, as measured by the number of these respective providers. We find that, contrary to the intended goal of protecting access, the presence of a CON program in a state is correlated with both fewer community hospitals per capita and fewer ASCs per capita across an entire state and specifically within its rural areas. Our finding that non-CON states have both more community hospitals and more ASCs per capita is not consistent with the hypothesis that ASCs divert the most profitable

patients from community hospitals and are therefore a threat to their existence. If the presence of many ASCs drives community hospitals out of the market, then it is unlikely that they would both be more concentrated in the same areas.

Our paper is organized as follows: Section II provides a brief history of the healthcare certificate-of-need programs. Section III discusses the various justifications for CON programs since the 1960s and also surveys the research on CON laws. Section IV provides a brief discussion of the hypotheses we intend to test. Section V includes our description of the data used and outlines our empirical strategy. We present our results in section VI and discuss these results in section VII. The conclusion in section VIII outlines the implications of these findings for policymakers.

II. A Brief History of State Certificate-of-Need Programs

While CON laws were initially a creation of some state governments, their diffusion across the country is the result of policies created by the federal government. New York was the first state to adopt a CON program in 1964. The purpose was to strengthen regional health planning programs by creating a process for prior approval of certain capital investments (Simpson 1985). Between 1964 and 1974, 26 other states adopted CON programs. However, with the passage of the National Health Planning and Resources Development Act of 1974 (NHPRDA), the availability of certain federal funds was made contingent on enactment of CON programs. That is, if states wanted to remain eligible for federal funding, they had to enact CON programs. In the seven years following the passage of NHPRDA, nearly every state implemented some version of a CON program.

In the early 1980s, as the evidence accumulated that CON regulations were not achieving their goals, federal support for CON began to wane (Cimasi 2005). In particular, federal

legislators became increasingly concerned that CON programs "failed to reduce the nation's aggregate healthcare costs, and it was beginning to produce a detrimental effect in local communities" (McGinley 1995). In 1986, the NHPRDA was repealed,[3] and state CON programs were no longer subsidized by federal funding.

After the repeal of the NHPRDA, states began repealing their CON laws. Twelve states (Arizona, California, Colorado, Idaho, Kansas, Minnesota, New Mexico, South Dakota, Texas, Utah, Wisconsin, and Wyoming) repealed their CON programs during the 1980s. Between 1990 and 2000, three more states (Indiana, North Dakota, and Pennsylvania) repealed their CON programs. From 2000 to the present, Wisconsin has been the only state to repeal its program.[4]

III. Evolving Justifications for Certificate-of-Need Programs

Since their beginnings, CON laws have been justified on the basis that they achieve numerous public policy goals. In particular, policymakers have seen CON programs as a way for governments to control costs, regulate the level of capital investments, increase charity care, protect the quality of medical services, and protect access to services across geographic locations. However, some studies have called into question the success of CON laws at controlling costs and hospital investments.

After the passage of the National Health Planning and Resources Development Act of 1974 and the subsequent implementation of CON programs across the country, most early studies found no evidence that CON laws serve as a cost-control measure (Sloan and Steinwald 1980; Sloan 1981; Joskow 1980; Joskow 1981). However, more recent research has been mixed. For example, studies released by Chrysler, Ford, and General Motors find that healthcare costs in

[3] For a fuller discussion of the NHPRDA, see Madden (1999).
[4] Wisconsin has repealed its CON program twice.

non-CON states are higher than in states with CON laws (DaimlerChrysler Corporation 2002; Ford Motor Company 2000; General Motors Corporation 2002). Conover and Sloan (1998) find that CON laws have only modest cost-control effects and that the removal of CON is not associated with a surge in costs. Rosko and Mutter (2014) find that CON laws are associated with increased cost efficiency, while other studies return mixed results (Bates, Mukherjee, and Santerre 2006; Ferrier, Leleu, and Valdmanis 2010). Rivers, Fottler, and Frimpong (2010), however, find no evidence that CON laws are associated with reduced hospital costs; in fact, they find the opposite: that stringent CON programs increase costs by 5 percent.

The early studies on the effect of CON laws on hospital investments also find no evidence of success (Hellinger 1976; Salkever and Bice 1976). Salkever and Bice (1976) conclude that CON programs have had little effect on hospital investments, stating that there is "no empirical evidence to suggest that [certificate-of-need legislation] has decreased investment." Hellinger (1976) finds that CON laws do not reduce the volume of hospital investments but they are altering their composition. That is, restricting investments via a CON program does not reduce how much hospitals invest, but it does change what investments hospitals make. Instead of investing less, hospitals simply direct investments toward unregulated items.

Thus, researchers have studied the issues of cost control and hospital investment, but the effects of CON laws on the provision and quality of care—both charity and rural care—have not received as much attention. Stratmann and Russ (2014) were the first to empirically test the relationship between CON programs and charity care; they found no evidence associating CON programs with an increase in such care. Others have tried to measure the effect CON programs have on the overall quality of care (Robinson et al. 2001).

There has been little scholarly work that has focused on CON laws and the provision of rural care. A recent study finds evidence that the presence of a CON program may actually be correlated with decreased rural access to hospice care (Carlson et al. 2010). Others hypothesize that CON programs may explain the uniform geographic disbursement of renal services in CON states compared to non-CON states (Rodriguez, Hotchkiss, and O'Hare 2013), although this claim has yet to be the subject of empirical analysis.

While little is known about the effects of CON programs on rural care, access to health care in rural communities has remained a central focus of CON programs. Congress had explicitly made rural access a central goal of state-based CON legislation with the passage of the National Health Planning and Resources Development Act of 1974.[5] Many states continue to use rural access as a primary rationale for continued implementation of CON programs, explicitly including geographic considerations.[6] For example, North Carolina's CON statute states that "access to health care services and health care facilities is critical to the welfare of rural North Carolinians, and to the continued viability of rural communities, and that the needs of rural North Carolinians should be considered in the certificate of need review process."[7] Virginia also includes references to protecting rural health care through its CON program. For example, the stated goal of Virginia's CON program is to support the "geographical distribution of medical facilities and to promote the availability and accessibility of proven technologies."[8] Moreover, states have issued CON regulations—even beyond their CON statutes—that explicitly reference

[5] The NHPRDA included National Health Priorities, which begin with the goal of "the provision of primary care services for medically underserved populations, especially those which are located in rural or economically depressed areas."
[6] See, e.g., Arkansas (A.C.A. § 20-8-103(b)-(c)); Florida (Fla. Stat. Ann. § 408.034(3)); Georgia (Ga. Code Ann., § 31-6-1); Kentucky (KRS § 216B.010); North Carolina (N.C. Gen. Stat. Ann. § 131E-175(3a)); Tennessee (Tenn. Code Ann. § 68-11-1625(c)(7)); Virginia (12 Va. Admin. Code 5-230-30(2)).
[7] N.C. Gen. Stat. Ann. § 131E-175(3a) (2015).
[8] 12 Va. Admin. Code 5-230-30(2) (2015).

rural care as additional justification for CON programs. For example, the West Virginia Health Care Authority, which administers the state's CON program, has included in its regulations the justification for its program that CON is a way to provide "some protection for small rural hospitals . . . by ensuring the availability and accessibility of services and to some extent the financial viability of the facility."[9]

A mentioned above, a primary rationale for CON programs is to protect against cream-skimming by ASCs. The basic theory is that, in order to protect access to a wide array of services in rural areas, it is necessary to protect community hospitals from competition by nonhospital providers. Specifically, the fear is that, as the number of nonhospitals increase, they will accept only the most profitable patients and offer the most profitable procedures, leaving hospitals with the unprofitable procedures and the uninsured patients. (Schactman 2005). Moreover, as the more profitable, less complicated, well-insured patients seek care elsewhere, a hospital's ability to cross-subsidize charity care and other essential services will be reduced. This development threatens the financial sustainability of rural community hospitals and could lead to their closures. Given that there are perhaps only one or two hospitals in many rural areas, a hospital closure might have disproportionate negative effects on the rural population residing in that area. In this context, states justify CON programs as a way to protect the ability of community hospitals to cross-subsidize the less profitable services and patients by reducing competition from other providers, such as ASCs. (Tynan et al. 2009).

Some scholars have researched cream-skimming behavior by ASCs (Plotzke and Courtemance 2011; Munnich and Parente 2014) and others have researched cream-skimming arguments (Cimasi 2005; Piper 2004; Tynan et al. 2009). In this paper, we do not explicitly test

[9] West Virginia Health Care Authority, *Annual Report to the Legislature 1998*, http://www.hca.wv.gov/data/Reports/Documents/annualRpt98.pdf.

whether ASCs are cream-skimming; instead, we test for some of the implications of this hypothesis.

IV. Hypotheses

Our hypotheses test two claims—not based on textbook economics—made in support of CON laws: that CON programs protect hospitals from competition by regulating the entry and expansion of nonhospital providers and that they protect access to rural care by regulating the entry and expansion of nonhospital providers.

Hypothesis 1: *States that administer a CON program have more total community hospitals, and more community hospitals in rural areas, than states without a CON program.*

Our first hypothesis focuses on one of the primary goals of CON laws: providing hospital services by restricting competition. CON laws are intended to accomplish the goal by regulating the entry of new providers or the expansion of existing providers based on the current capacity of established providers.

Although the individual items covered by a particular state's CON program may target specific aspects of health care, the general goal of such a program is to reduce competition to community hospitals by regulating entry and expansion by nonhospital providers, thereby preventing cream-skimming. Therefore, we predict that states that regulate entry via CON laws have more hospitals than those that do not. In particular, CON laws are intended to assure survival of marginally profitable hospitals (such as those in rural areas) that would not otherwise survive in a competitive market with open entry. If CON laws are effective barriers to entry, we expect these hospitals to remain open, protected from cream-skimming by nonhospital providers.

Thus, we predict that we should find more total hospitals and more rural hospitals in states that have CON laws than in those that do not.

Hypothesis 2: *States with ASC-specific CON laws have fewer total ASCs, and fewer ASCs in rural areas, than states without ASC-specific CON laws.*

Ambulatory surgical centers are competitors to hospitals, and they tend to be charged with cream-skimming. Our second hypothesis focuses more specifically on a second intended goal of CON laws, that is, to protect access to medical services by regulating entry of nonhospital providers. If ASCs cannot open shop and engage in cream-skimming, existing hospitals will be more profitable and thus more likely to survive. Given that the stated goal of ASC-specific CON laws is to reduce the number of ASCs in a state, we predict that states that regulate ASC entry via CON laws have fewer ASCs. Second, we predict that there will be fewer ASCs in rural communities, given the focus of CON laws to regulate entry based on the current capacity of established providers, and for the reasons outlined in hypothesis 1.

V. Data and Empirical Strategy

We use two state-level annual measures of healthcare providers: the number of community hospitals per 100,000 state population and the number of ASCs per 100,000 state population, both from 1984 through 2011. We obtained these data series from the Centers for Medicare and Medicaid Services Provider of Services (POS) file. The POS file contains data collected by CMS regional offices on characteristics of hospitals and other types of healthcare facilities. This file includes the medical provider type, name, and address of each facility.

To determine whether providers were located in a rural or urban community, we used their zip codes in the POS file to see if they were within or outside a core-based statistical area (CBSA). A CBSA is a geographic designation defined by the Office of Management and Budget as having an urban center of at least 10,000 people. A CBSA includes both metropolitan and micropolitan areas. We classified providers as urban if they were located within a CBSA and rural if they were located outside a CBSA.

Data on state-level certificate-of-need laws from 1984 through 2011 come from two sources: the American Health Planning Association (AHPA) and HeinOnline's Digital Session Laws Library. The AHPA publishes its annual survey of state CON laws in annual national directories. From these directories we assembled a data set on state CON regulations from 1992 through 2011. As the AHPA did not publish directories before 1992, we obtained that data from HeinOnline's Digital Session Laws Library.

The source for our state-level socioeconomic control variables is the Census Bureau. These variables include population size, poverty level, percentages of white, black, and Hispanic citizens, and the population below age 18 and above age 65. Data on nominal per capita state income come from the Bureau of Economic Analysis. We converted this data to real income using the consumer price index from the Bureau of Labor Statistics, using 2011 as the base year. State-level unemployment data also come from the Bureau of Labor Statistics. To control for residents' health status in a given state, we collected mortality rates due to lung cancer or diabetes for state residents 18 years and older, both by year and by state. This last information comes from the Centers for Disease Control and Prevention.

Table 1A (page 23) shows summary statistics for each of our measures. Column 1 reports the number of observations per variable. In column 2, the mean for the CON indicator is

approximately 0.76, indicating that 76 percent of our annual state observations are associated with a CON law. The mean for the ASC CON indicator, measuring whether the CON law requires permission from state regulators to open an ASC, is approximately 0.50. In the last year of our data—as figure 1 (page 26) shows—approximately three-quarters of states (36 states) implemented a CON program, and—as figure 2 (page 27) shows—in the last year of our data approximately half of all states (26 states) have ASC-specific CON requirements.

Table 1B (page 24) provides summary statistics for states with a CON program, and table 1C (page 25) provides summary statistics for states that specifically regulate ASCs with a CON program.

We estimate the two models:

$$\text{Ln Hospital}_{it} = \alpha + \gamma \text{CON}_{it} + \boldsymbol{\beta}\mathbf{X}_{it} + \mu_t + \varepsilon_{it}, \quad (1)$$

$$\text{Ln ASC}_{it} = \nu + \lambda \text{ASC-CON}_{it} + \rho\mathbf{X}_{it} + \mu_t + \eta_{it}. \quad (2)$$

In the first model, we are interested in the impact of having any CON laws in the state on the number of hospitals. In this model, the CON variable is an indicator variable equal to 1 if there is a CON law in place in states *i* in year *t*. For equation (1) we estimate two specifications for our dependent variable. In one specification the dependent variable is the natural logarithm of the number of hospitals per 100,000 population in state *i* in year *t*. In the other specification, it is the corresponding natural logarithm of the number of rural hospitals per 100,000 rural state population.

In the second model, we consider the impact of CON laws that regulate ASCs on the number of ambulatory surgical centers. In equation (2), the ASC-CON variable is a binary indicator equal to 1 if the state has a CON law that regulates ASCs in a given year and 0 otherwise. Similarly to what we did for equation (1), for equation (2) we estimate two specifications for our dependent variable. In one case, the specification of the dependent variable

is the natural logarithm of the number of ambulatory surgical centers per 100,000 state population. In the other specification, it is the natural logarithm of the number of ambulatory surgical centers per 100,000 rural state population.

For both equation (1) and equation (2), we will estimate various versions of these regressions, starting with a simple bivariate model. In other version, we add different sets of control variables. This approach allows us to assess the sensitivity of the point estimate that is of most of interest to us, that is, the estimated coefficient on CON requirements, with respect to adding or dropping control variables.

The vector **X** includes the aforementioned control variables. We include variables for year fixed effects, μ_t, and cluster the standard errors by states.

VI. Results

Before estimating equations (1) and (2), we show the estimated relationship between the presence of a CON program and the number of total hospitals per 100,000 state population by year (figure 3, page 28). These estimates come from a bivariate regression with our hospital measure on the left hand side of the equation and a dummy variable for states with CON regulations on the right hand side, plus an intercept. We estimate this regression for each year, using all states in each year. We plot these results in figure 3 to test whether we observe the hypothesized negative relationship between CON laws and the number of hospitals, both when not including control variables and when considering each year separately. Examining estimates on a yearly basis also allows us to determine whether CON laws have any negative cumulative effects on the number of hospital providers.

The dots in figure 3 show the point estimates and the whiskers show the corresponding 95 percent confidence intervals. Figure 3 shows a slight negative relationship in the number of hospitals per 100,000 state population in a state with a CON program relative to states without a CON program, although the relationship is not statistically significant. Given that the confidence interval contains zero for all years included, without controlling for any other factors, this approach provides no evidence that the presence of a CON program is associated with a statistically significant lower number of hospitals. Nonetheless, all point estimates are negative, as hypothesized.

Figure 4 (page 28) presents point estimates and confidence intervals from a bivariate regression of CON programs and rural hospitals. The plots show a statistically significant negative correlation in the number of rural hospitals per 100,000 rural population and CON programs. This negative correlation is consistent across all years.

The sum of the evidence in figure 4 suggests that CON programs are not associated with more rural hospitals in rural areas. In fact, CON programs are associated with fewer rural hospitals in all states. Moreover, and interestingly, the point estimates in figure 4 are larger in absolute value than the point estimates in figure 3. This suggests that CON programs have an even more negative effect on the number of hospitals in rural areas in a state than they do on the overall number of hospitals in the same state.

Figures 5 and 6 (page 29) are based on the same methodology as the previous two figures. Now the dependent variable is the number of ASCs in a state (figure 5) and the number of ASCs in rural areas in the same state (figure 6). Both figures 5 and 6 show a negative correlation between ASC-specific CON programs and the total number of ASCs per 100,000 state population, as well as rural ASCs per 100,000 rural population. Further, absolute value of

these negative correlations increases over time. Moreover, toward the end of our sample period, this negative correlation appears to be about 20 percent larger for rural ASCs (figure 6) than for all ASCs (figure 5), suggesting that the reduction in ASCs in rural areas is larger than the reduction in ASCs in a state overall.

Table 2 (page 30) shows estimates for the effect of the presence of a CON program on the log of the number of hospitals per 100,000 population for an entire state. All specifications reported in table 2, as well as the subsequent tables, have standard errors clustered by state. The results show that the estimated coefficients on CON are negative and statistically significant across all specifications. This indicates that the presence of a CON program is correlated with fewer hospitals across a state. When controlling for demographics and year-specific effects, we find that the presence of a CON program is associated with 30 percent (1−exp(−.35)) fewer hospitals per capita across an entire state (table 2, column 4).

Table 3 (page 31) shows estimates for the effect of the presence of a CON program on the number of rural hospitals within a state. These point estimates on the CON variable are similar to those in table 2. Again, the estimated coefficients on the CON measures are negative across all specifications and are statistically significant. In particular, when controlling for demographics and year-specific effects, the presence of a CON program is associated with 30 percent (1−exp(−.36)) fewer rural hospitals per 100,000 rural population (table 3, column 4).

Tables 4 and 5 (pages 32–33) show estimates for the effect of ASC-specific CON requirements on the number of all ASCs per 100,000 state population, and rural ASCs per 100,000 rural population for an entire state. Table 4 shows estimates for the effect of ASC-specific CON requirements on the total number of ASCs in a state. Our findings are consistent with the findings reported above in that our coefficients of interest—state ASC CON laws—are

negative and statistically significant across all specifications. We estimate that the presence of an ASC-specific CON requirement within a state is associated with 14 percent (1−exp(−.156)) fewer total ASCs per capita when controlling for demographics and year-specific effects (table 4, column 4).

Table 5 shows estimates for the effect of ASC-specific CON requirements on the total number of rural ASCs per 100,000 rural population per state. As in table 4, the estimated coefficients for ASC-specific CON requirements are negative and statistically significant across all specifications. When controlling for demographics and year-specific effects, ASC-specific CON requirements are associated with 13 percent (1−exp(−.135)) fewer rural ASCs per 100,000 rural population.

Overall, these findings show that states with CON programs have fewer total hospitals and fewer rural hospitals. Further, these findings show that states with ASC-specific CON requirements have fewer total ASCs and fewer rural ASCs.

VII. Discussion

As we noted in our introduction, a number of states continue to implement CON programs with an expressed purpose of protecting access to health care in rural communities by protecting community hospitals from competition. If this is an effective tool, however, we predict that we would find more rural hospitals in those states that regulate entry of ASCs. Our findings demonstrate that is not the case.

Our findings do show that ASC CON programs are effective barriers to entry into rural communities for hospital substitutes. The data show that the presence of an ASC-specific CON requirement is correlated with approximately 14 percent fewer ASCs compared to states without

a CON program. This finding suggests that ASC CON programs act as a significant barrier for new alternatives to compete with established rural hospitals.

However, even though we find that CON requirements are associated with fewer ASCs in rural areas, this barrier to entry does not seem to protect rural access to health care as measured by the number of rural community hospitals. Specifically, while the presence of a CON program is associated with fewer "hospital substitutes" in rural communities, it is also associated with 30 percent fewer rural hospitals. This suggests that CON programs are limiting both hospitals and hospital substitutes.

The cream-skimming hypothesis predicts that the entry of new nonhospital providers, such as ASCs, and other hospital substitutes leads to fewer hospitals over time. According to this hypothesis, this happens because nonhospitals will siphon off the more profitable patients and procedures, and consequently hospitals will have lower revenues and less ability to cross-subsidize charity care and other essential services.

If the anti–cream-skimming justification for CON requirements is correct, then we expect to find a higher number of hospitals in states with a CON program versus those without. However, the data show that this is not the case. The regression results show that there are 30 percent fewer total hospitals per capita in states with a CON program when compared to those that do not have a CON program.

Moreover, our findings are also not consistent with the claim that CON programs protect access to health care in rural areas. In particular, as a tool for protecting rural health care, our findings suggest that these CON programs have failed. CON requirements are associated with fewer rural hospitals and rural ASCs. While CON programs may be viewed as a protective measure to ensure access in rural communities, the data show otherwise.

There are two limitations to this study. First, while we are able to present correlations, we do not have an identification strategy that would allow us to provide any causal interpretation to our results. Second, while we use community hospitals and ASCs per 100,000 population as the measure of access to health care, this may not fully capture all options available to those seeking care in rural communities.

VIII. Conclusion

Twenty-six states limit the entry of ASCs into their healthcare markets. These restrictions have been justified on a number of grounds, including protecting access to health care in rural communities by protecting hospitals from cream-skimming. If these claims are correct, then we expect to find both more hospitals per capita and more rural hospitals in states that restrict entry and competition through a CON program.

Our findings show that the opposite is true. We find that states with a CON program have fewer total and fewer rural hospitals per capita. We estimate that, when controlling for demographics and year-specific effects, the presence of a CON program is associated with 30 percent fewer total hospitals per 100,000 state population and 30 percent fewer rural hospitals per 100,000 rural population. Moreover, we find 14 percent fewer total ASCs per 100,000 state population and 13 percent fewer rural ASCs per 100,000 rural population. These findings suggest that CON programs do not protect access in rural healthcare markets. Policymakers looking to protect rural health care may want to look elsewhere.

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Table 1. Summary Statistics from State Annual Data, 1984–2011

Panel A. Summary Statistics for All States

Variables	(1) N	(2) Mean	(3) Std. dev.	(4) Min	(5) Max
State certificate-of-need regulation (yes = 1)	1,400	0.759	0.428	0	1
State ASC certificate-of-need regulation (yes = 1)	1,400	0.500	0.500	0	1
Black percentage	1,400	0.100	0.0939	0.00243	0.372
White percentage	1,400	0.809	0.133	0.227	1.005
Hispanic percentage	1,400	0.0729	0.0873	0.00472	0.467
Elderly percentage (65 and over)	1,400	0.119	0.0203	0.00651	0.187
Youth percentage (under 18)	1,400	0.256	0.0264	0.0707	0.379
Unemployment rate (seasonally adjusted)	1,400	5.739	1.945	2.300	14.77
Population (logged)	1,400	15.02	1.011	13.03	17.44
Adults diagnosed diabetes and lung cancer percentage (18+, age adjusted, logged)	1,400	4.326	0.237	3.296	4.877
Hospitals per 100,000 state population	1,400	3.112	1.728	1.045	10.39
Hospitals per 100,000 state population (logged)	1,400	1.008	0.490	0.0436	2.341
Rural hospitals per 100,000 rural population	1,400	4.850	4.167	0	17.00
Rural hospitals per 100,000 rural population (logged)	1,400	1.522	0.718	0	2.890
ASCs per 100,000 state population	1,400	1.018	0.905	0	6.312
ASCs per 100,000 state population (logged)	1,400	0.623	0.382	0	1.990
Rural ASCs per 100,000 rural population	1,400	0.488	0.671	0	5.107
Rural ASCs per 100,000 rural population (logged)	1,400	0.326	0.351	0	1.810

Panel B. Summary Statistics for States with and without a Certificate-of-Need Program

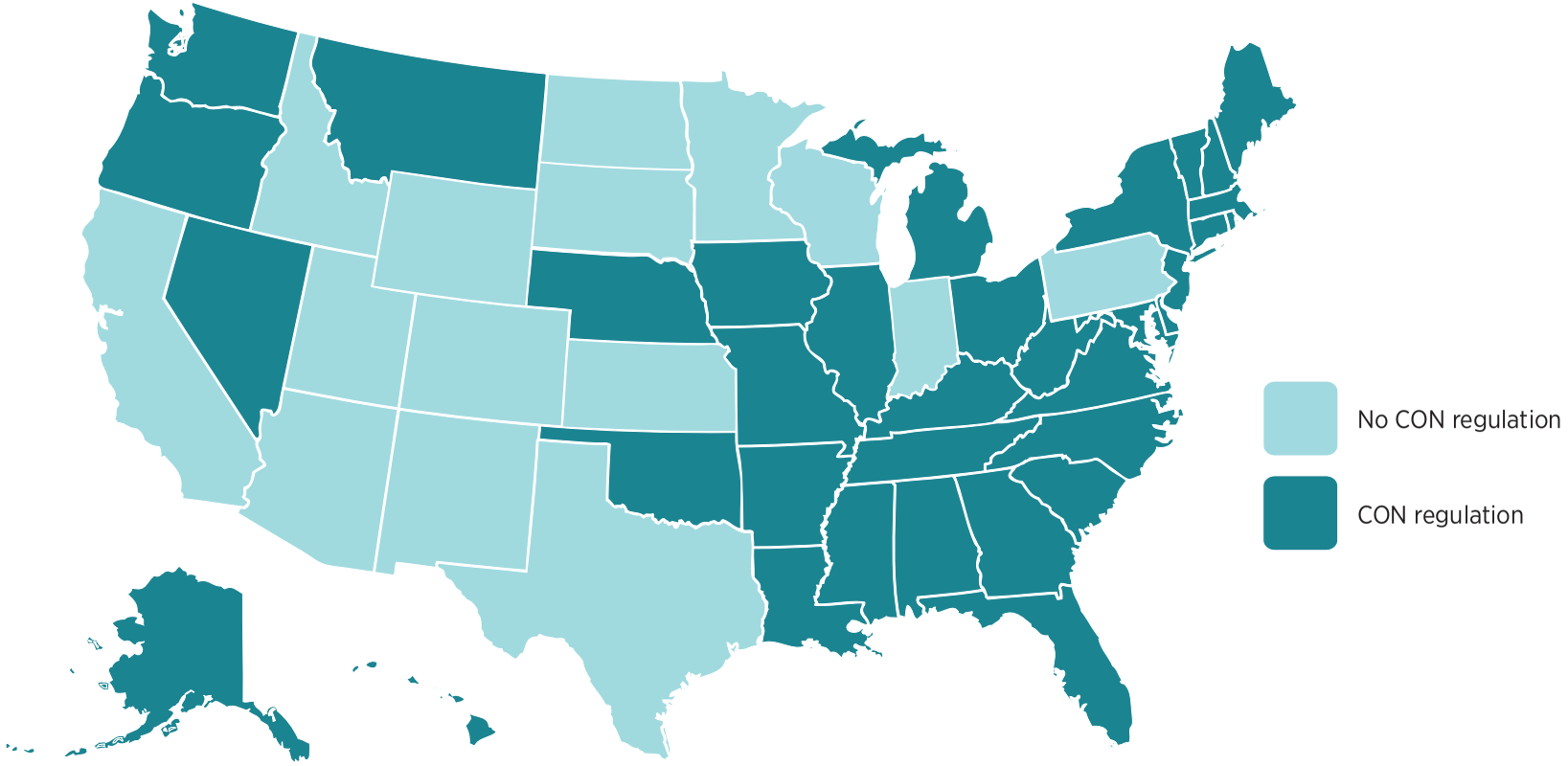
	CON law			No CON law		
	(1)	(2)	(3)	(4)	(5)	(6)
Variables	N	Mean	Std. dev.	N	Mean	Std. dev.
Black percentage	1,062	0.117	0.098	338	0.047	0.515
White percentage	1,062	0.803	0.133	338	0.825	0.132
Hispanic percentage	1,062	0.051	0.050	338	0.141	0.133
Elderly percentage (65 and over)	1,062	0.121	0.201	338	0.113	0.018
Youth percentage (under 18)	1,062	0.251	0.024	338	0.272	0.028
Unemployment rate (seasonally adjusted)	1,062	5.845	1.948	338	5.407	1.900
Population (logged)	1,062	15.03	0.946	338	14.99	1.195
Adults diagnosed diabetes and lung cancer percentage (18+, age adjusted, logged)	1,062	4.376	0.210	338	4.168	0.247
Hospitals per 100,000 state population	1,062	2.908	1.545	338	3.754	2.084
Hospitals per 100,000 state population (logged)	1,062	0.952	0.465	338	1.181	0.526
Rural hospitals per 100,000 rural population	1,062	4.069	3.724	338	7.307	4.520
Rural hospitals per 100,000 rural population (logged)	1,062	1.383	0.703	338	1.960	0.576
ASCs per 100,000 state population	1,062	0.912	0.901	338	1.348	0.836
ASCs per 100,000 state population (logged)	1,062	0.569	0.375	338	0.792	0.355
Rural ASCs per 100,000 rural population	1,062	0.378	0.556	338	0.832	0.859
Rural ASCs per 100,000 rural population (logged)	1,062	0.264	0.313	338	0.522	0.390

Panel C. Summary Statistics for States with and without an Ambulatory Surgical Center Certificate-of-Need Requirement

	ASC-CON law			No ASC-CON law		
	(1)	(2)	(3)	(4)	(5)	(6)
Variables	N	Mean	Std. dev.	N	Mean	Std. dev.
Black percentage	699	0.077	0.079	701	0.123	0.102
White percentage	699	0.819	0.129	701	0.798	0.137
Hispanic percentage	699	0.096	0.111	701	0.050	0.047
Elderly percentage (65 and over)	699	0.118	0.023	701	0.120	0.017
Youth percentage (under 18)	699	0.263	0.031	701	0.250	0.018
Unemployment rate (seasonally adjusted)	699	5.652	1.886	701	5.827	5.827
Population (logged)	699	15.01	1.064	701	15.03	0.957
Adults diagnosed diabetes and lung cancer percentage (18+, age adjusted, logged)	699	4.270	0.267	701	4.382	0.187
Hospitals per 100,000 state population	699	3.582	1.953	701	2.643	1.313
Hospitals per 100,000 state population (logged)	699	1.143	0.510	701	0.873	0.429
Rural hospitals per 100,000 rural population	699	6.131	4.590	701	3.574	3.229
Rural hospitals per 100,000 rural population (logged)	699	1.749	0.684	701	1.297	1.297
ASCs per 100,000 state population	699	1.115	0.784	701	0.921	1.003
ASCs per 100,000 state population (logged)	699	0.683	0.362	701	0.563	0.392
Rural ASCs per 100,000 rural population	699	0.597	0.739	701	0.378	0.575
Rural ASCs per 100,000 rural population (logged)	699	0.391	0.371	701	0.261	0.317

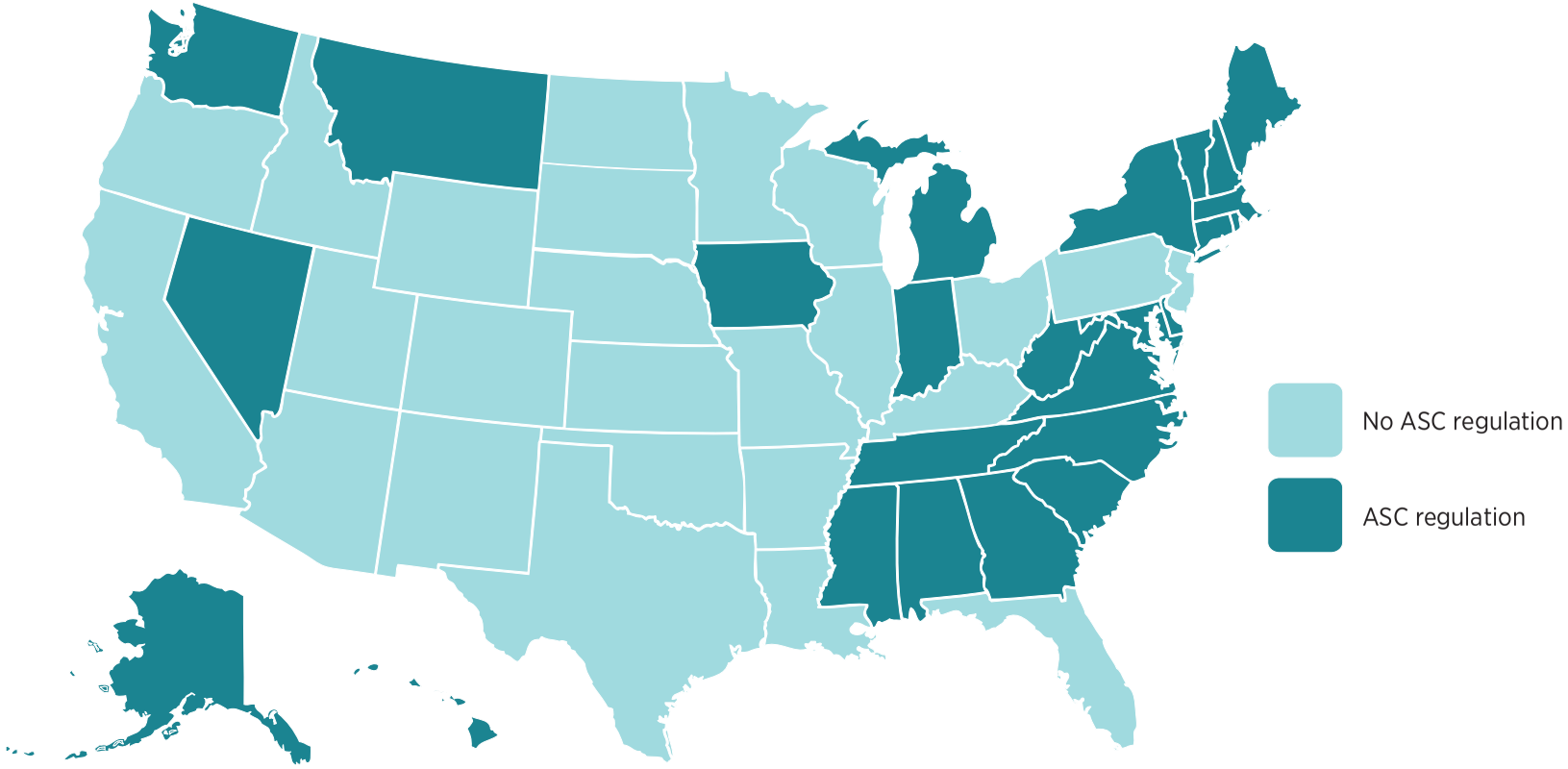
Note: ASC = ambulatory surgical center, CON = certificate of need.

Figure 1. Certificate-of-Need (CON) Regulation in the United States



Source: "Certificate of Need: State Health Laws and Programs," National Conference of State Legislatures, January 2016, http://www.ncsl.org/research/health/con-certificate-of-need-state-laws.aspx.

Figure 2. Certificate-of-Need Requirements for Ambulatory Surgical Centers (ASCs) by State



Source: "Certificate of Need: State Health Laws and Programs," National Conference of State Legislatures, January 2016, http://www.ncsl.org/research/health/con-certificate-of-need-state-laws.aspx.

Figure 3. Relationship between Certificate-of-Need (CON) Programs and Total Hospitals per 100,000 Population, by Year

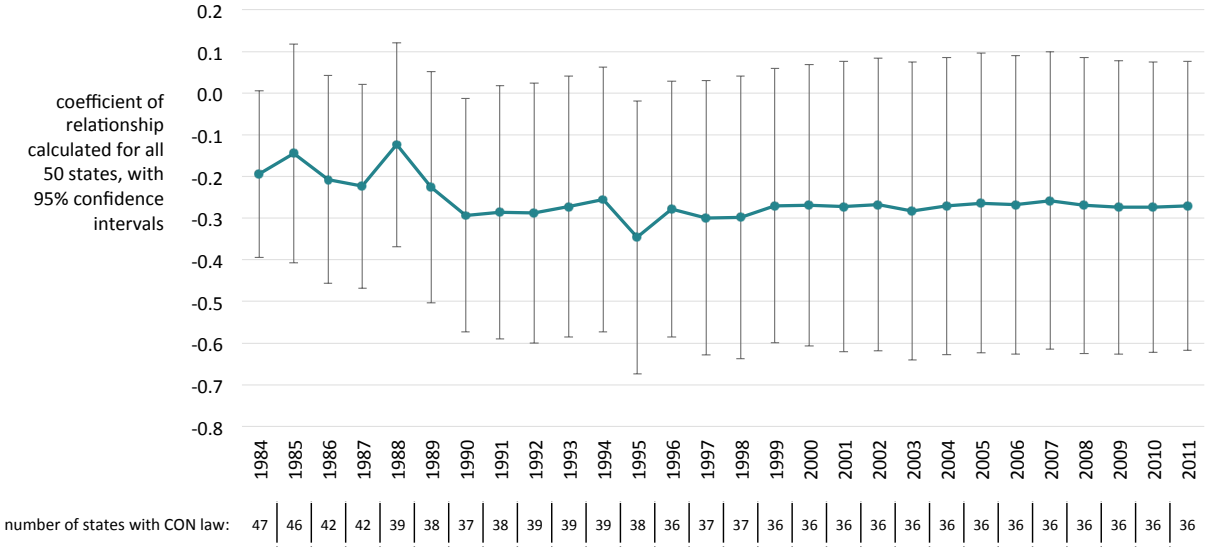


Figure 4. Relationship between Certificate-of-Need (CON) Programs and Rural Hospitals per 100,000 Rural Population, by Year

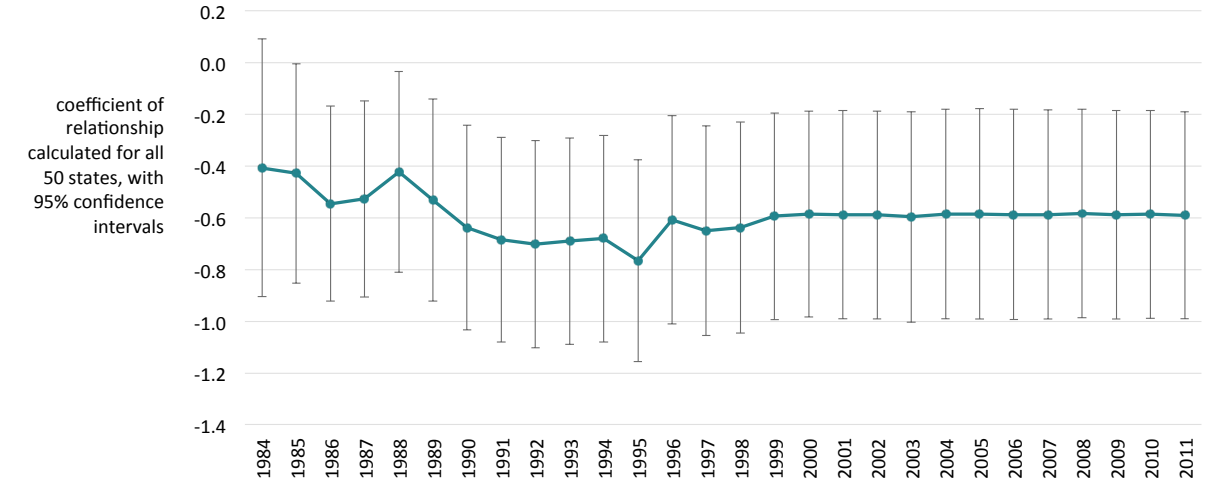


Figure 5. Relationship between Ambulatory Surgical Center Certificate-of-Need (CON) Requirements and Ambulatory Surgical Centers per 100,000 Population, by Year

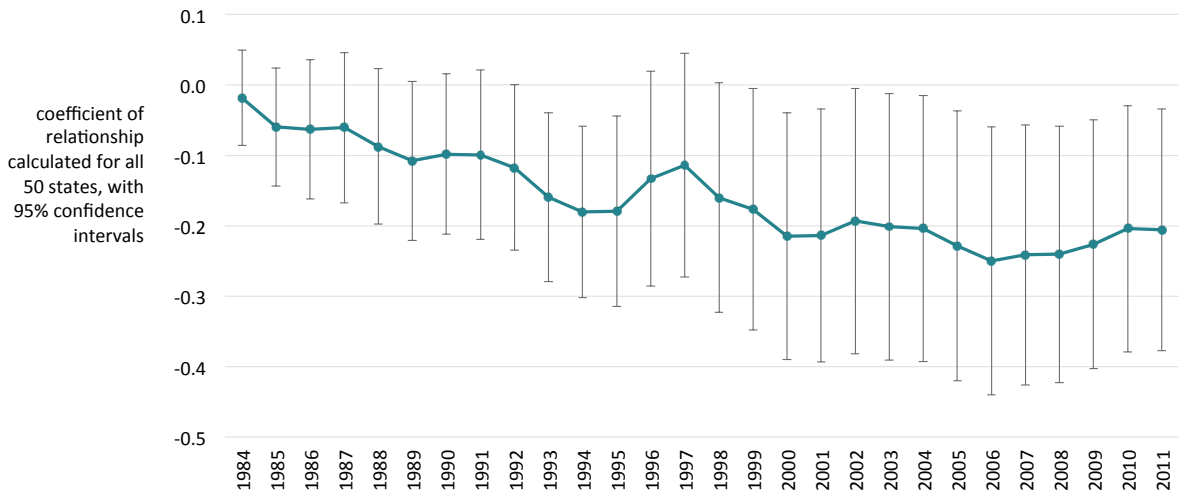


Figure 6. Relationship between Ambulatory Surgical Center Certificate-of-Need (CON) Requirements and Rural Ambulatory Surgical Centers per 100,000 Rural Population, by Year

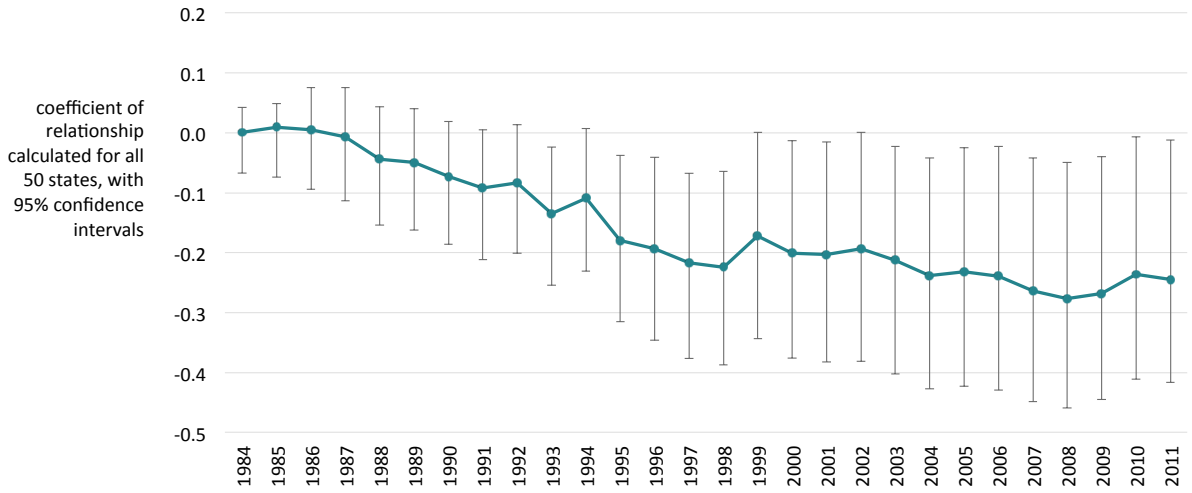


Table 2. Determinants of Number of Hospitals per 100,000 Population per State

	(1)	(2)	(3)	(4)
State certificate-of-need regulation (yes = 1)	−0.265*	−0.247**	−0.338***	−0.350***
	(0.146)	(0.108)	(0.110)	(0.106)
Population (logged)		−0.264***	−0.209***	−0.192**
		(0.054)	(0.075)	(0.074)
Elderly percentage (65 and over)			2.766	−2.594
			(2.722)	(3.341)
Youth percentage (under 18)			3.017	6.330**
			(3.243)	(2.850)
Unemployment rate (seasonally adjusted)			0.009	−0.018
			(0.026)	(0.027)
White percentage			0.188	−0.170
			(0.333)	(0.308)
Hispanic percentage			−1.623**	−1.466**
			(0.713)	(0.622)
Black percentage			−0.049	−0.977
			(0.798)	(0.771)
Adults diagnosed diabetes and lung cancer percentage (18+, age adjusted, logged)				0.929***
				(0.296)
Observations	1,400	1,400	1,400	1,400
R^2	0.110	0.404	0.493	0.537
Year fixed effects	yes	yes	yes	yes

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Note: The dependent variable in these regressions is the log of the number of hospitals per 100,000 population per state. Clustered standard errors at the state level are in parentheses.

Table 3. Determinants of Number of Rural Hospitals per 100,000 Population per State

	(1)	(2)	(3)	(4)
State certificate-of-need regulation (yes = 1)	−0.600***	−0.579***	−0.355*	−0.363*
	(0.177)	(0.140)	(0.182)	(0.181)
Population (logged)		−0.314***	−0.143	−0.132
		(0.090)	(0.125)	(0.124)
Elderly percentage (65 and over)			−3.038	−6.464
			(4.238)	(5.435)
Youth percentage (under 18)			8.052*	10.169**
			(4.729)	(4.613)
Unemployment rate (seasonally adjusted)			−0.015	−0.033
			(0.039)	(0.041)
White percentage			−0.694**	−0.922**
			(0.335)	(0.411)
Hispanic percentage			−1.964*	−1.864*
			(1.126)	(1.084)
Black percentage			−2.789**	−3.382***
			(1.178)	(1.200)
Adults diagnosed diabetes and lung cancer percentage (18+, age adjusted, logged)				0.594
				(0.455)
Observations	1,400	1,400	1,400	1,400
R^2	0.129	0.322	0.448	0.457
Year fixed effects	yes	yes	yes	yes

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Note: The dependent variable in these regressions is the log of the number of rural hospitals per 100,000 rural population per state. Clustered standard errors at the state level are in parentheses.

Table 4. Determinants of Number of Ambulatory Surgical Centers per 100,000 Population per State

	(1)	(2)	(3)	(4)
ASC-specific certificate-of-need requirement (yes = 1)	−0.159**	−0.159**	−0.158**	−0.156**
	(0.063)	(0.063)	(0.059)	(0.059)
Population (logged)		−0.023	−0.053	−0.051
		(0.029)	(0.041)	(0.041)
Elderly percentage (65 and over)			−0.242	−0.922
			(1.220)	(1.677)
Youth percentage (under 18)			0.899	1.336
			(0.679)	(0.991)
Unemployment rate (seasonally adjusted)			−0.001	−0.004
			(0.016)	(0.015)
White percentage			0.012	−0.032
			(0.167)	(0.160)
Hispanic percentage			0.339	0.366
			(0.587)	(0.615)
Black percentage			0.617	0.497
			(0.492)	(0.551)
Adults diagnosed diabetes and lung cancer percentage (18+, age adjusted, logged)				0.117
				(0.189)
Observations	1,400	1,400	1,400	1,400
R^2	0.503	0.507	0.530	0.531
Year fixed effects	yes	yes	yes	yes

** $p < 0.05$.

Note: The dependent variable in these regressions is the log of the number of ambulatory surgical centers (ASCs) per 100,000 population per state. Clustered standard errors at the state level are in parentheses.

Table 5. Determinants of Number of Rural Ambulatory Surgical Centers per 100,000 Population per State

	(1)	(2)	(3)	(4)
ASC-specific certificate-of-need requirement (yes=1)	−0.157**	−0.156***	−0.137**	−0.135**
	(0.060)	(0.053)	(0.057)	(0.056)
Population (logged)		−0.092***	−0.078*	−0.076*
		(0.034)	(0.043)	(0.044)
Elderly percentage (65 and over)			0.788	0.026
			(1.702)	(1.943)
Youth percentage (under 18)			0.445	0.934
			(1.065)	(1.267)
Unemployment rate (seasonally adjusted)			−0.009	−0.013
			(0.014)	(0.015)
White percentage			−0.468*	−0.516**
			(0.236)	(0.247)
Hispanic percentage			−0.130	−0.101
			(0.408)	(0.401)
Black percentage			−0.586	−0.720
			(0.495)	(0.529)
Adults diagnosed diabetes and lung cancer percentage (18+, age adjusted, logged)				0.131
				(0.164)
Observations	1,400	1,400	1,400	1,400
R^2	0.354	0.423	0.447	0.449
Year fixed effects	yes	yes	yes	yes

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Note: The dependent variable in these regressions is the log of the number of rural ambulatory surgical centers (ASCs) per 100,000 rural population per state. Clustered standard errors at the state level are in parentheses.