

CRAIG GARTHWAITE

Northwestern University

ZEYNAL KARACA

Agency for Healthcare Research and Quality

JOHN GRAVES

Vanderbilt University

VICTORIA MARONE

Northwestern University

TAL GROSS

Boston University

MATTHEW J. NOTOWIDIGDO

Northwestern University

All Medicaid Expansions Are Not Created Equal: The Geography and Targeting of the Affordable Care Act

ABSTRACT We use comprehensive patient-level discharge data to study the effect of Medicaid on the use of hospital services. Our analysis relies on cross-state variation in the Affordable Care Act's Medicaid expansion, along with within-state variation across zip codes in exposure to the expansion. We find that the Medicaid expansion increased Medicaid visits and decreased uninsured visits. The net effect is positive for all visits, suggesting that those who gain coverage through Medicaid consume more hospital services than they would if they remained uninsured. The increase in emergency department visits is largely accounted for by "deferrable" medical conditions. Those who gained coverage under the Medicaid expansion appear to be those who had

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relatively high need for hospital services, suggesting that the expansion was well targeted. Lastly, we find significant heterogeneity across Medicaid expansion states in the effects of the expansion, with some states experiencing a large increase in total utilization and other states experiencing little change. Increases in hospital utilization were larger in Medicaid expansion states that had more residents gaining coverage and lower pre-expansion levels of uncompensated hospital care costs.

The United States health care sector is often described as a market-based system driven by private firms. The government nevertheless plays an enormous role. As of 2018, nearly half of all U.S. health care expenditures came from the public sector—primarily through Medicare and Medicaid but also through the subsidization of employer-sponsored health insurance via the tax code. Medicare has covered the elderly (65 and over) population in the United States since its creation in 1965, and growth in program enrollment has been driven primarily by shifting demographics. Medicaid, by contrast, has grown from a program that initially targeted the indigent and the disabled to a far more generous program that currently provides coverage to over 70 million Americans (Rudowitz, Hinton, and Antonisse 2018).

Expansion of Medicaid eligibility can be thought of as a reflection of society’s evolving beliefs about social insurance. Historically, Medicaid enrollees needed to be both low-income and in a particular category in order to qualify for coverage. Coverage was extended to pregnant women and their children in the 1980s and then to relatively higher-income children in the 1990s through the State Children’s Health Insurance Program (SCHIP). Throughout the 1990s and 2000s, states used federal waivers to expand Medicaid to additional categories of low-income individuals. These expansions mostly covered parents, but in only a few states were low-income childless adults covered (Long, Zuckerman, and Graves 2006). This focus on categorical eligibility was partly motivated by a belief that individuals in these specific groups were in particular need of assistance and that limiting the eligibility criteria to include only those groups could increase the target efficiency of Medicaid spending.

The largest and most controversial expansion occurred with the implementation of the Affordable Care Act (ACA) in 2014. For those earning below 138 percent of the federal poverty level (approximately \$16,600 for an individual in 2019), the ACA fundamentally changed the concept of Medicaid eligibility. It did so by stripping away categorical requirements,

along with considerations over nonincome assets, for the purposes of determining program eligibility for the under-65 population. Instead, the law transformed Medicaid into an entitlement with new eligibility criteria based on a current monthly modified adjusted gross income (MAGI) standard.¹

Expansion of Medicaid eligibility to a greater fraction of the low-income population was driven by a variety of motivations. Certainly, policymakers were motivated by the desire to ensure some baseline level of access to health care. As such, the expansions reflected the preferences of the electorate over what this baseline level of access entails.² That said, policymakers were also motivated by questions regarding the efficiency of the health care sector. Specifically, policymakers and advocates for the ACA routinely noted that lack of access to formal insurance results in health care being provided in more-expensive settings than would otherwise be necessary (for example, primary care services provided in emergency departments).

Finally, federal lawmakers have also shown a preference for establishing a baseline of access to health care across states. While Medicaid has always been a state-administered program, federal expansions have progressively raised the floor of who would be covered in all states. States have always had—and many have exercised—the right to exceed that floor and provide more generous social insurance. In this way, federal Medicaid policy serves as a safety net that reflects the nation’s preferences for a compromise, maintaining a minimum level of access but allowing for variation above that minimum across states.

The ACA represents the largest reform of the health care sector since the creation of the Great Society programs in the 1960s. But nearly a decade after the ACA’s adoption, approximately 10 percent of the non-elderly population remains formally uninsured. This persistence of uninsurance stems, in part, from a 2012 Supreme Court decision that allowed states to refrain from implementing the ACA’s Medicaid expansion. In 2014, when the expansion was fully implemented with 100 percent federal financing,

1. Categorical eligibility determinations are still used within non-expansion states and within the entire Medicaid program to determine the share of state versus federal financing. Moreover, asset tests can still be used for eligibility determinations of individuals over age 65.

2. In 2013, President Obama defended the ACA and cited both its social insurance benefits and increased access to health care: “In the wealthiest nation on Earth, no one should go broke just because they get sick. In the United States, health care is not a privilege for the fortunate few, it is a right” (Wilson and Wiggins 2013).

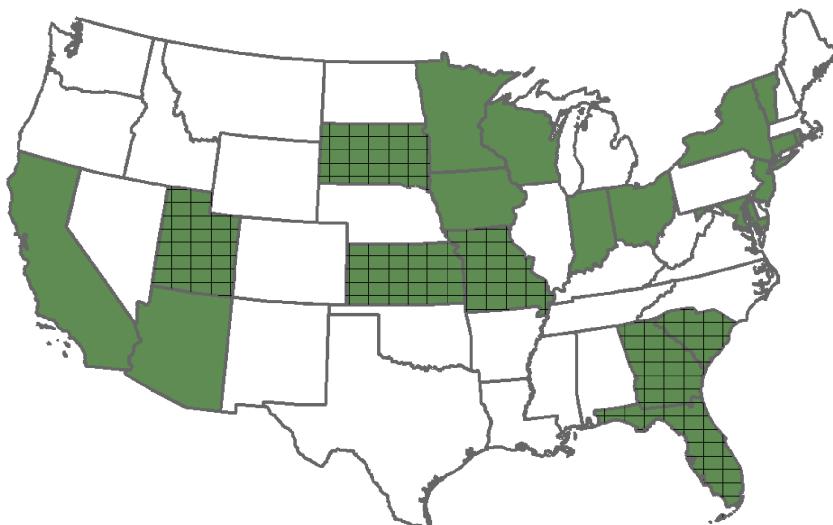
only twenty-four states elected to expand Medicaid. Over the next three years, an additional seven states adopted expansions. Currently, thirty-six states have expanded their Medicaid programs under the (nearly full) federal financing and authority granted by the ACA. Research has shown that state expansion decisions have a meaningful impact on access to formal insurance. As of 2018, the share of the population without insurance was 16.1 percent in non-expansion states compared to 7.5 percent in expansion states (Haley and others 2018).

While the decision over whether to expand Medicaid is clearly an important one, a variety of other policy decisions have contributed to an ongoing lack of universal coverage in the United States. These include features of the ACA as well as differences in implementation decisions both within and across states. Lack of universal coverage has led to a variety of calls to further expand the social safety net for health care. These policies range from expansions of the existing ACA framework to a single-payer system that covers the entire nation.

Evaluating the efficacy of an expanded social insurance system requires careful consideration of the impact of previous expansions. In this paper, we examine the effects of the ACA using a large data set maintained by the Agency for Healthcare Research and Quality (AHRQ) that covers the near universe of hospitalizations in twenty states. In each of those states, shown in figure 1, we have data from 2012 to 2015 covering all outpatient and inpatient emergency department visits as well as inpatient hospitalizations that initiated in the emergency department.³ As we consider the ACA, three natural questions arise that can inform both the design of future expansion efforts as well as help with understanding broader economic effects of existing social insurance programs.

First, did the ACA's expansion of Medicaid lead to a more efficient utilization of health care? In particular, did those who became newly insured through Medicaid decrease their use of emergency departments? To answer this question, we use several identification strategies to examine overall and state-level impacts of the Medicaid expansion on emergency department use. We find consistent evidence across those identification strategies that Medicaid coverage increased the use of hospital services.

3. The data encompass about 95 percent of all discharges in each state. Healthcare Cost and Utilization Project (HCUP) databases do not include federal hospitals (for example, Veterans Affairs, Department of Defense, and Indian Health Service hospitals), long-term hospitals, psychiatric hospitals, alcohol/chemical dependency treatment facilities, and hospital units within institutions such as prisons.

Figure 1. Map of States in Analysis Sample

Source: Authors' calculations based on Healthcare Cost and Utilization Project (HCUP) data from the Agency for Healthcare Research and Quality (AHRQ).

Note: The sample includes twenty states: thirteen expansion states and seven non-expansion states. The non-expansion states are indicated with a grid pattern in this map and all of the maps that follow.

The estimates rule out large declines in the use of emergency departments as a result of Medicaid expansions.

Second, did the expansion and transformation of Medicaid meet the goal of providing access to health care for those who most needed it? This is often described as the “target efficiency” of social insurance: the degree to which those who gain coverage are those who most need the assistance. To examine the target efficiency of the ACA we examine the use of health care for the newly insured compared to those who remain ineligible for the expanded program. We find that those gaining access to Medicaid in expansion states had greater pre-expansion utilization of health care than those who remained uninsured. This suggests that the expansion of Medicaid based on income, rather than specific categories of need, successfully targeted the remaining uninsured with greater pre-expansion use of medical services. Looking at non-expansion states, we see an increase in private insurance driven by the creation of the ACA marketplaces. In this setting, we find that those who purchased private insurance were also those with the greatest use of medical services. This suggests that

the subsidized marketplaces, even though they required contributions from enrollees, provided coverage to those with a greater demand for health care services.

Finally, we examine heterogeneity in the impact of the expansion across states. At a minimum, the decision of some states not to expand Medicaid created variation in the social safety net across states. We investigate other sources of heterogeneity in the effects of the ACA across states. This variation extends beyond simply the question of take-up (that is, how much of the eligible population signed up for formal insurance) and also reflects differences in the increase in the use of hospital services among the newly insured. This heterogeneity should generate some caution in generalizing results from previous state expansions to other settings. It also provides some explanation for the heterogeneity in the existing literature on the relationship between Medicaid coverage and hospitalizations. Across all the states in our sample, we find that the ACA Medicaid expansion resulted in an increase in the use of hospital services. In a number of states, however, the estimated effect is small and statistically indistinguishable from zero. We also examine heterogeneity in the target efficiency of the expansions, finding that the degree to which the expansions could target those with the greatest need for medical services varied meaningfully across states.

I. Medicaid Expansions and Use of Hospital Services

Concerns about access to health care have resulted in regulations that make the sale of health care fundamentally different from other sectors of the economy. For instance, hospital emergency departments are required by law to stabilize anyone with an emergency condition regardless of their ability to pay.⁴ This creates several economic frictions. First, hospitals are effectively required to serve as “insurers of last resort” for care not paid for directly by patients or explicitly financed via public or private insurance (Garthwaite, Gross, and Notowidigdo 2018).⁵ Second, since only hospitals with emergency departments are covered by this mandate, some conditions

4. The Emergency Medical Treatment and Active Labor Act (EMTALA) introduced this requirement in 1983.

5. While hospitals do receive supplementary funding to account for these expenses, the degree to which these fully reimburse hospitals is unclear. For example, Garthwaite, Gross, and Notowidigdo (2018) find that hospitals bear the brunt of the costs of marginal uninsured patients through lower profits.

Table 1. Average Utilization Rate by Type of Visit and Insurance Status

	<i>Uninsured</i>	<i>Medicaid</i>	<i>Private</i>
Type of visit			
Inpatient hospital visit (not originating in emergency department)	0.009	0.046	0.026
Inpatient hospital visit (originating in emergency department)	0.026	0.049	0.018
Outpatient emergency department visit	0.357	0.364	0.138
Total visits (hospital plus emergency department visits)	0.391	0.459	0.181
Share of total visits			
Inpatient hospital visit (not originating in emergency department)	2.2%	10.0%	14.1%
Inpatient hospital visit (originating in emergency department)	6.6%	10.7%	9.9%
Outpatient emergency department visit	91.2%	79.4%	76.0%
Ratio of outpatient emergency department visits/inpatient visits			
Not originating in emergency department	42.0	7.9	5.4
Originating in emergency department	13.8	7.4	7.6
Share of inpatient visits originating in emergency department	75.3%	51.6%	41.3%

Source: Authors' calculations.

Note: Data are 2013 estimates (for all states in the sample) of average utilization by insurance status and type of visit. Diagnosis-related group (DRG) population estimates were used to calculate utilization rate: the total number of visits divided by population with that insurance status.

may be treated in the relatively high marginal cost setting of the hospital emergency department when they could be more efficiently treated in other, lower-cost settings. Third, the uninsured are often unable to gain access to routine, preventive primary care and expensive pharmaceuticals. Thus, there is a concern that medical conditions that could have been managed early and at a lower cost instead develop into acute episodes that end up costing the entire system more than they would if there were more widespread insurance coverage.

Differences in the ability to access health care can be seen in the data. Table 1 describes the use of hospital services by insurance status before the ACA. In our data, only 2.2 percent of the hospital visits for the uninsured were inpatient stays that did not originate in the emergency department. This is far less than the share for Medicaid patients (10 percent) and the privately insured (14.1 percent). Relatedly, three-quarters of the inpatient visits for the uninsured began in the emergency department. The corresponding

numbers for Medicaid recipients and the privately insured are much lower, 52 and 41 percent, respectively. Overall, those with private insurance had the lowest use of hospital services, which likely reflects the fact that those with private coverage are relatively healthy.⁶

These estimates suggest that while the uninsured do have access to health care through the emergency department, there are legitimate concerns that they lack access to more discretionary and expensive health care services. Those concerns are often called the “access motive” for health insurance. The access motive argues that consumers need health insurance for reasons that extend beyond the need to smooth consumption across different states of the world, that is, the traditional economic rationale for insurance. Rather, an additional primary benefit of health insurance is to maintain *access* to health care for liquidity-constrained populations (Nyman 1998; Besanko, Dranove, and Garthwaite 2016).

The access motive was cited by many policymakers in support of the ACA. For example, Speaker of the House Nancy Pelosi argued that “the uninsured will get coverage, no longer left to the emergency room for medical care” (Blase 2016). On the opposite side of the aisle, Rick Snyder, the Republican governor of Michigan, argued: “Uninsured citizens often turn to emergency rooms . . . leading to crowded emergency rooms, longer wait times and higher costs. By expanding Medicaid, those without insurance will have access to primary care, lowering costs and improving overall health” (Kliff 2014).

As is often the case, economic research on this topic is less clear than what one would infer from the statements of activists and policy-makers. It is true that the uninsured often face barriers to care outside of the emergency department. That said, care at the emergency department for the uninsured can be quite costly to the uninsured themselves. While hospitals are required to stabilize emergency patients regardless of their ability to pay, they are allowed to (and often do) bill for these services. Existing evidence suggests that hospitals do not recover all—or even most—of the costs of providing this service, but they do exact meaningful financial and psychic costs on those from whom they attempt to collect (Mahoney 2015). Nonprofit hospitals enjoy tax-exempt status because they provide community benefit, including charity care to the uninsured. But even nonprofit hospitals have been shown to go to

6. Despite some erroneous commentary in the popular press, it is wrong to consider this higher use of medical services by Medicaid recipients as a causal effect of Medicaid decreasing people’s health.

great lengths—including litigation and wage garnishment—to recover unpaid bills.⁷

As a result, health insurance decreases the cost of accessing the emergency department, and this could create a moral hazard response that results in more emergency department visits. The moral hazard effect could be exacerbated by both perceived and real transaction costs. These costs derive from the need to separately secure office-based appointments, lab tests, and other complementary services outside of the emergency setting. This requires identifying providers that accept Medicaid as a form of payment and have availability for appointments—a process that can be time consuming. By comparison, nearly all hospital-based emergency departments accept Medicaid as payment, offer a wide spectrum of services under one roof, and have minimal differential cost-sharing requirements for Medicaid patients. In addition, it is unclear whether emergency department services are a complement or a substitute for primary care or whether that relationship might vary by insurance status.

Numerous studies have found clear evidence that Medicaid coverage tends to increase health care consumption in general and emergency department visits in particular. The Oregon health insurance experiment found that low-income, uninsured people who gain health insurance coverage through Medicaid are 40 percent more likely to visit an emergency department (Taubman and others 2014). That finding matches the conclusions of work by Nikpay and others (2017); Anderson, Dobkin, and Gross (2012, 2013); Card, Dobkin, and Maestas (2008); Dresden and others (2017); DeLeire and others (2013); Garthwaite and others (2017); Smulowitz and others (2014); and Heavrin and others (2011).

These studies have shown that insurance coverage increases the likelihood of an emergency department visit. But the literature is not entirely uniform on this point. Antwi et al. (2015), Hernandez-Boussard and others (2014), and Sommers and others (2016) all conclude that expansions of Medicaid actually *decrease* the risk of an emergency department visit. In particular, Miller (2012) finds that the Massachusetts health care reform—which nearly eliminated the uninsured population in that state—decreased emergency department visits overall.

7. For example, a recent investigation by *ProPublica* found that Methodist Le Bonheur Healthcare in Memphis brought thousands of lawsuits for unpaid medical bills in recent years (Thomas 2019), and the *New York Times* published a similar investigation into the collection efforts of nonprofit hospitals back in 2004 (Cohn 2004). Such practices have led some politicians to discuss trying to “rein in” nonprofit hospitals that bring lawsuits and garnish wages (Armour 2019).

Some of the disagreement across these studies may be driven by general equilibrium effects in the provision of medical services. For example, in a more heavily insured population, primary care physicians or other outpatient facilities may change their business practices to accommodate the new payer mix in ways that change the use of emergency department facilities (Richards, Nikpay, and Graves 2016). This could explain why two of the studies of the market-wide change in Massachusetts produced estimates that were different from the general thrust of the literature.

By changing both the quantity and setting of health care consumed, expansions of Medicaid can have meaningful economy-wide impacts. To the extent that expansion leads to lower health care spending, this can free up economic resources for more efficient uses in other parts of the economy. In addition, to the extent that more efficient provision of health care can increase the underlying health of the population, it could also increase labor force productivity for those affected. Both of these channels suggest meaningful macroeconomic impacts from changes to Medicaid.

Determining the broader economic impact of Medicaid is even more important given the current uneven geographic access to the ACA Medicaid expansion. As of mid-2019, thirteen states have still not expanded their programs. In the next section, we describe the specifics of the ACA Medicaid expansion, which underlies our various identification strategies.

II. Background on the ACA Medicaid Expansion

Of primary importance to the questions in this paper, the ACA increased access to health insurance through both a large expansion of Medicaid for low-income populations and the creation of a series of state-based insurance marketplaces where individuals could purchase non-group insurance. Individuals purchasing insurance in these state-based marketplaces could not be denied coverage for preexisting medical conditions, and their premiums could vary only by smoking status, across geographic rating areas determined by the state, and by age (with the ratio of premiums across age groups not to exceed 3:1). In order to combat adverse selection, individuals were mandated to purchase insurance or pay a penalty on their income taxes.⁸

Legal residents who earn less than 138 percent of the federal poverty level are eligible for Medicaid. Those who earn between 100 and 400 percent

8. The individual mandate was effectively eliminated as part of a congressional reform of the federal tax system in 2017.

of the federal poverty level and who aren't otherwise Medicaid-eligible qualify for federal subsidies that limit marketplace plan premiums to a fixed percentage of the enrollee's income. Those earning between 138 and 250 percent of the federal poverty level receive additional subsidies that limit their exposure to cost sharing (for example, deductibles, copayments, and coinsurance). Those who earn more than 400 percent of the federal poverty level, and those under 100 percent, can still purchase insurance on the marketplace but they are required to pay the entire premium.

The ACA was exceptionally controversial and attracted large amounts of litigation. In the summer of 2012, the U.S. Supreme Court upheld the constitutionality of the ACA's individual mandate. However, the court also allowed states to opt out of the act's expansion of Medicaid to 138 percent of the federal poverty level.

For those living in states that did not expand Medicaid, access to formal health insurance effectively depends on family income. Those who earn between 100 and 138 percent of the federal poverty level can purchase heavily subsidized insurance on the marketplace. These individuals also receive generous cost-sharing subsidies that make their coverage more similar to Medicaid—though Medicaid could be a preferred coverage vehicle given its even lower cost-sharing requirements, zero-dollar premiums (in some states), and broader range of benefits than traditionally covered by private plans (for example, transportation services).

Residents in non-expansion states who earn less than 100 percent of the federal poverty level fall into a coverage gap. These residents earn too much money to qualify for their state's relatively parsimonious and categorically based Medicaid program and too little to qualify for subsidies on the ACA marketplaces. According to the Kaiser Family Foundation, this has resulted in approximately 2.3 million residents who lack access to health insurance based solely on their state of residence (Garfield, Orgera, and Damico 2020). Nearly half of these residents live in either Florida or Texas and over 90 percent live in the southern United States. Given the state-based nature of decisions about the ACA, the potential economic benefits of the increased social insurance and the economic opportunities that it might provide can impact the economic growth of different geographies. In addition, the uneven implementation of Medicaid expansion under the ACA raises concerns over equity. To a greater degree than in the past, Americans' access to health care often depends on the state in which they reside.

The number of people in the coverage gap meant that the share of the uninsured population fell faster in expansion states compared to

non-expansion states. For example, in the first quarter of 2018, the share of uninsured in non-expansion states was 16.1 percent compared to 7.5 percent in expansion states (Haley and others 2018). In addition to having a higher share of uninsured, the composition of the insured market also differed based on a state's Medicaid expansion decision. In expansion states, those between 100 and 138 percent of poverty enrolled in Medicaid. However, in non-expansion states these individuals had access to heavily subsidized insurance through the marketplaces. Thus, one would expect the share with private insurance to be different across these states after the implementation of the ACA.

III. Data

The primary databases used in our empirical analysis are the State Emergency Department Databases (SEDD) and the State Inpatient Databases (SID). The databases are part of the Healthcare Cost and Utilization Project (HCUP) and are maintained by the Agency for Healthcare Research and Quality (AHRQ).

The SID and the SEDD are both made up of state-specific files. Each state-specific file covers a near census of hospital and emergency department visits for a given calendar year. The databases are detailed and comprehensive; they are well suited to studying state-level policy changes. Our analysis focuses on the following twenty states: Arizona, California, Connecticut, Florida, Georgia, Iowa, Indiana, Kansas, Maryland, Minnesota, Missouri, New Jersey, New York, Ohio, Rhode Island, South Carolina, South Dakota, Utah, Vermont, and Wisconsin.⁹ These states cover 51 percent of the U.S. population and 55 percent of the Medicaid population and include both expansion and non-expansion states.¹⁰

The SID contains about 97 percent of all inpatient hospitalizations in participating states, while the SEDD contains more than 95 percent of emergency department encounters. Both databases contain clinical information

9. We selected this sample of states based on conversations with AHRQ staff. We excluded states that did not have consistent measurement and categorization of payer categories during this time period or did not have patient zip code information that is necessary for our county- and zip code–level analysis.

10. Data sources for these calculations are the U.S. Census Bureau American FactFinder (https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=PEP_2018_PEPANNRES&src=pt) and the Centers for Medicare and Medicaid Services enrollment data (<https://data.medicaid.gov/Enrollment/2018-12-Updated-applications-eligibility-determinacy72-q4z9/data>).

(for example, length of stay, primary and secondary diagnoses) and non-clinical information (for example, age, gender, race, total charges) on all patients, including individuals covered by Medicare, Medicaid, or private insurance, as well as those who are uninsured.¹¹ In this paper, we focus on the primary diagnosis code, since it allows us to categorize hospitalizations into deferrable versus nondeferrable visits.

We follow Mulcahy and others (2013) and Garthwaite and others (2017) in identifying deferrable and nondeferrable visits. Deferrable visits are those for which, as indicated by a panel of physicians, the patient likely has some discretion as to when to present to a professional. By contrast, nondeferrable visits are hospital visits for one of twelve conditions that have been identified by a panel of physicians as likely to require immediate medical treatment regardless of insurance coverage or financing. For instance, an intracerebral hemorrhage is classified as nondeferrable—patients with this condition would almost certainly present at an emergency department regardless of their insurance status.¹²

Most important for our purposes, we also observe each patient's insurance coverage (Medicare, Medicaid, private) as well as whether the patient was uninsured. Lastly, we observe the patient's zip code of residence, and we observe hospital identifiers in both databases, which we merge to hospital-level characteristics using survey data from the American Hospital Association (AHA).

We process the SID and SEDD state-specific files by first restricting the data to 2012–2015. We then collapse the data into counts of visits by the following variables: patient zip code, year, month, indicator functions for deferrable conditions, insurance status, and age group (under 18, 18–64, and age 65 and above).¹³ The collapsed data can then be used for difference-in-differences and event study analyses, and most of our empirical models use either raw counts of visits or the natural logarithm of those counts.

11. We categorize patients as uninsured if they are labeled as self-pay, no charge, or no expected payment source in the data.

12. Nondeferrable conditions include fracture, poison or toxic effects, dislocation, intracranial injury, appendicitis, foreign body, internal injury, ectopic pregnancy with rupture, crush injury, bowel obstruction, blood-vessel injury, and other nondiscretionary conditions.

13. We use patient zip code information to exclude out-of-state patients; these visits represent a small share of all visits. We also exclude the fourth quarter of 2015, because this is when HCUP switched from International Classification of Diseases, Ninth Revision (ICD-9) to ICD-10 for diagnostic code variables; excluding this quarter helps to maintain comparability across time. We have data covering the first quarter of 2012 through the third quarter of 2015 for all states except for Utah, where we drop all of 2015 because of missing data.

Our secondary data come from several other sources. We collect information on state-level uncompensated care costs (per uninsured individual) by merging AHA data on hospital-level uncompensated care costs with Current Population Survey (CPS) data that allow us to measure the size of the uninsured population in each state in 2013.¹⁴ We calculate the share of the uninsured population eligible for the Medicaid expansion in each county using estimates from the Small Area Health Insurance Estimates (SAHIE) program. Finally, we combine these data with county-level enrollment totals for public and private sources of insurance from Decision Resources Group (DRG), a market research firm. We also draw on longitudinal data on health insurance coverage from waves 1 and 2 of the 2014 Survey of Income and Program Participation (SIPP). As explained below, we use these supplementary data sources to estimate county-based measures of the share of the pre-Medicaid expansion uninsured population who transitioned to Medicaid coverage after the expansions.

IV. The Effects of the ACA Medicaid Expansion on Hospitalizations and Emergency Department Visits

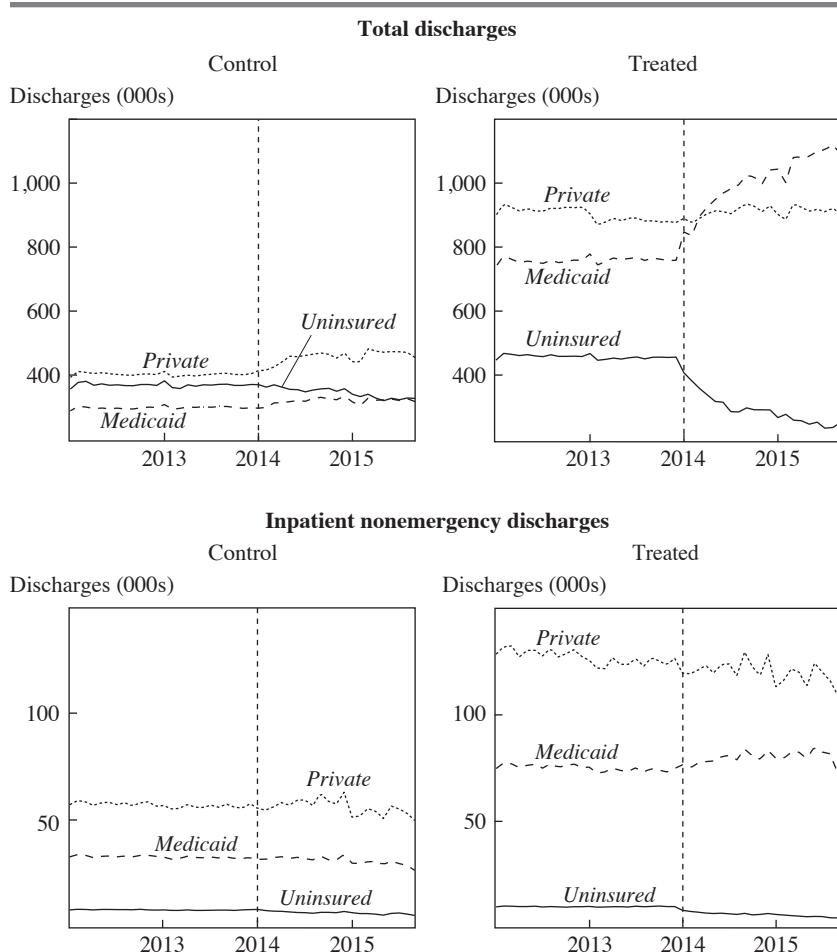
In order to estimate the effects of the ACA expansion, we exploit the decision by states as to whether or not to expand Medicaid. Figure 2 presents a simple time series of hospital encounters across states that either expanded Medicaid or did not. The top panel of the figure presents trends by insurance status for all hospital discharges, and the bottom panel presents the same for scheduled inpatient visits.¹⁵ Each panel consists of two separate figures: one for non-expansion states and one for states that did expand Medicaid in January 2014. Then, in the same vein, figure 3 presents those plots for inpatient emergency discharges and outpatient emergency discharges.

Across all types of hospital encounters, a basic pattern is unchanged. Medicaid expansion states saw a decrease in uninsured visits and a corresponding increase in Medicaid visits. By contrast, we observe only a slight increase in Medicaid-covered visits in non-expansion states, possibly

14. Garthwaite, Gross, and Notowidigdo (2018) describe the AHA and CPS data in more detail.

15. By “scheduled inpatient visits,” we mean overnight stays in the hospital that do not involve the emergency department. By “emergent inpatient visits,” we mean overnight stays in the hospital in which the patient is admitted through the emergency department.

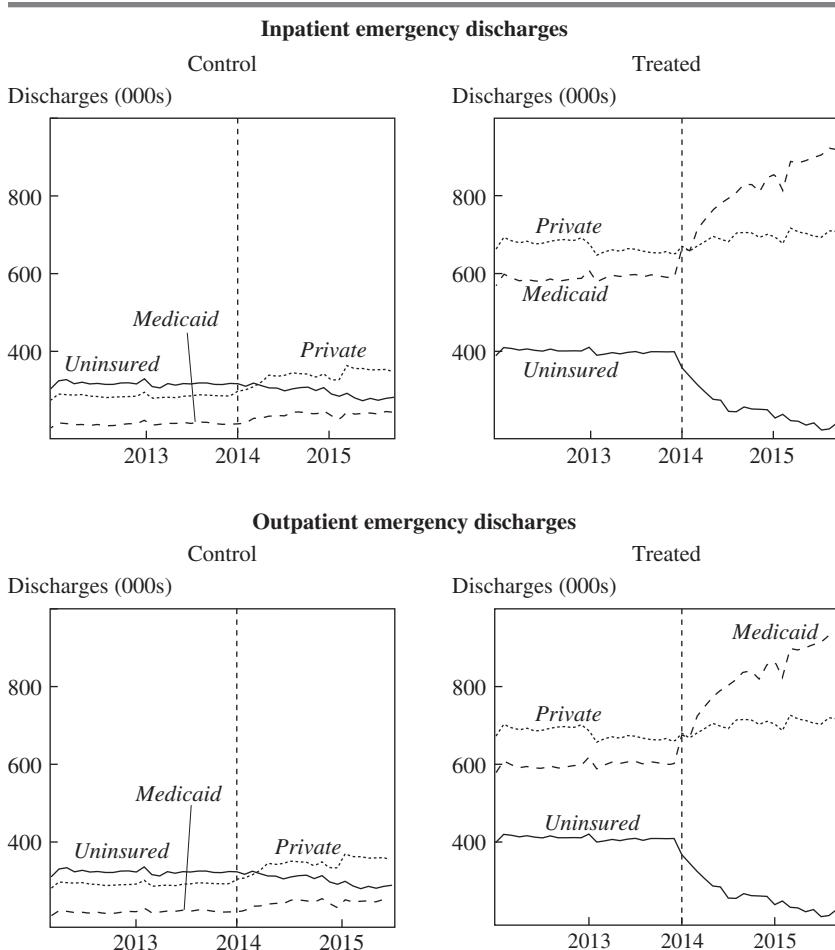
Figure 2. Total Discharges in Sample States, by Payer Category and State Treatment Status



Source: Authors' calculations.

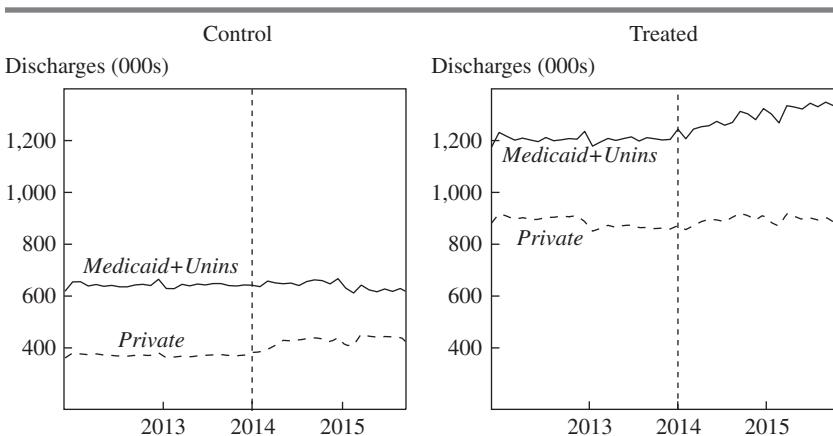
Note: Total discharges include hospital and emergency department combined; inpatient nonemergency discharges are shown for the expansion (treated) and non-expansion (control) states. The monthly totals are aggregated across expansion and non-expansion states separately, with month fixed effects residualized out to remove seasonality; the trends are reported separately for three insurance types: Medicaid, private, and uninsured. The data are monthly totals, and the time period spans January 2012 through September 2015.

Figure 3. Emergency Department Discharges in Sample States, by Payer Category and State Treatment Status



Source: Authors' calculations.

Note: The monthly totals are aggregated across expansion and non-expansion states separately, with month fixed effects residualized out to remove seasonality; the trends are reported separately for Medicaid, private, and uninsured. The data are monthly totals, and the time period spans January 2012 through September 2015.

Figure 4. Total Discharges in Sample States, Combining Medicaid and Uninsured

Source: Authors' calculations.

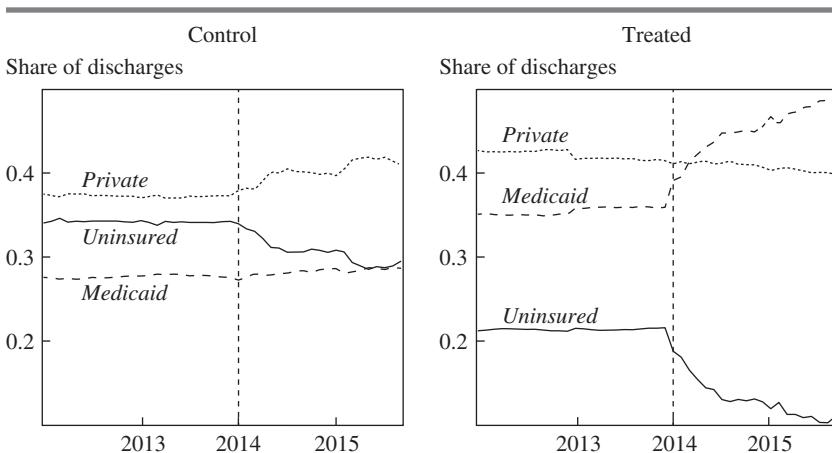
Notes: Total discharges include hospital and emergency department combined; inpatient nonemergency discharges are shown for the expansion (treated) and non-expansion (control) states. The monthly totals are aggregated across expansion and non-expansion states separately, with month fixed effects residualized out to remove seasonality. The trends are reported separately for two insurance types: Medicaid and uninsured (combined) and private. The data are monthly totals, and the time period spans January 2012 through September 2015.

driven by the welcome mat effect.¹⁶ These patterns in the data are what we would expect given states' decisions over the Medicaid expansion.

Figure 4 combines the Medicaid and uninsured visits into one category. Looking at the treatment states, this figure provides evidence of an increase in the use of hospital services following the expansion.

Figure 5 describes the share of visits by insurance category—and the growing importance of Medicaid in expansion states. Together, figures 4 and 5 present another intriguing and perhaps less expected pattern. We observe a moderate increase in private discharges in non-expansion states and yet no such increase in Medicaid expansion states. One explanation is that private visits differentially increased in non-expansion states as a result of the presence of individual marketplace subsidies for individuals at 100–138 percent of the federal poverty level in non-expansion states

16. The “welcome mat effect” refers to the tendency for Medicaid enrollment to increase among previously eligible (but unenrolled) individuals as a consequence of broad outreach and enrollment efforts for the ACA’s insurance exchanges. Even in states that did not expand Medicaid, the attention and advertising involved in the rollout of the ACA may have led those who were already eligible for Medicaid to sign up for preexisting Medicaid programs.

Figure 5. Share of Total Discharges by Type of Insurance

Source: Authors' calculations.

Note: The share of total discharges by insurance type (Medicaid, Private, Uninsured) for expansion (treated) and non-expansion (control) states is based on the residualized discharges reported in figures 3 and 4.

but not in expansion states (individuals in expansion states would have been enrolled in Medicaid instead). A portion of the population targeted for Medicaid expansion (that is, those under 138 percent) thus received access to more affordable marketplace coverage when no Medicaid option was made available. Below, we provide further evidence for this explanation with enrollment data.

This presents an interesting economic point and an econometric complication. Of economic interest, this suggests that low-income residents (100–138 percent of the federal poverty level) in non-expansion states are more likely to be covered by private rather than public coverage. Future work should examine the impact of this difference on access to health care and on health outcomes, as differences in utilization mediated by type of coverage (for example, Medicaid or heavily subsidized private insurance) could inform current policy debates over whether to expand further via public or private modes of coverage. Unfortunately, we were unable to quantify these impacts in our data because we lacked measures of individual income to identify patients in this narrow income range.

Econometrically, this dynamic complicates a simple difference-in-differences approach because the non-expansion states still saw increases in coverage among an overlapping share of the low-income population (those at 100–138 percent of the federal poverty level). This complication

extends to the wide and growing body of research on the ACA as well. In essence, the estimated effect of Medicaid expansion is the differential effect of Medicaid for those below 100 percent of the federal poverty level plus the effect of differences in mode of coverage for those between 100 and 138 percent. The effect of differences in mode of coverage on utilization is likely not insubstantial. In a recent study, among those at 100–138 percent of the federal poverty level, adults in expansion states had differentially lower out-of-pocket spending (−\$344) and a lower probability of having a high spending burden (−4.1 percentage points) as compared to those in non-expansion states (Blavin and others 2018). We discuss this issue further in section IV.B, first by examining the effect of the expansion on private coverage and then by studying within-state variation in exposure to the expansion.

Regardless, these raw time-series figures suggest a natural starting point to study the effects of Medicaid expansion. We next explore standard difference-in-differences regressions that assess the degree to which Medicaid expansion affected the magnitude and coverage profile of hospital utilization. As discussed below, we account for this increase in private coverage in non-expansion states. We then examine a triple difference specification that attempts to overcome the potential bias from the differential impact of the ACA on private insurance coverage in the non-expansion states.

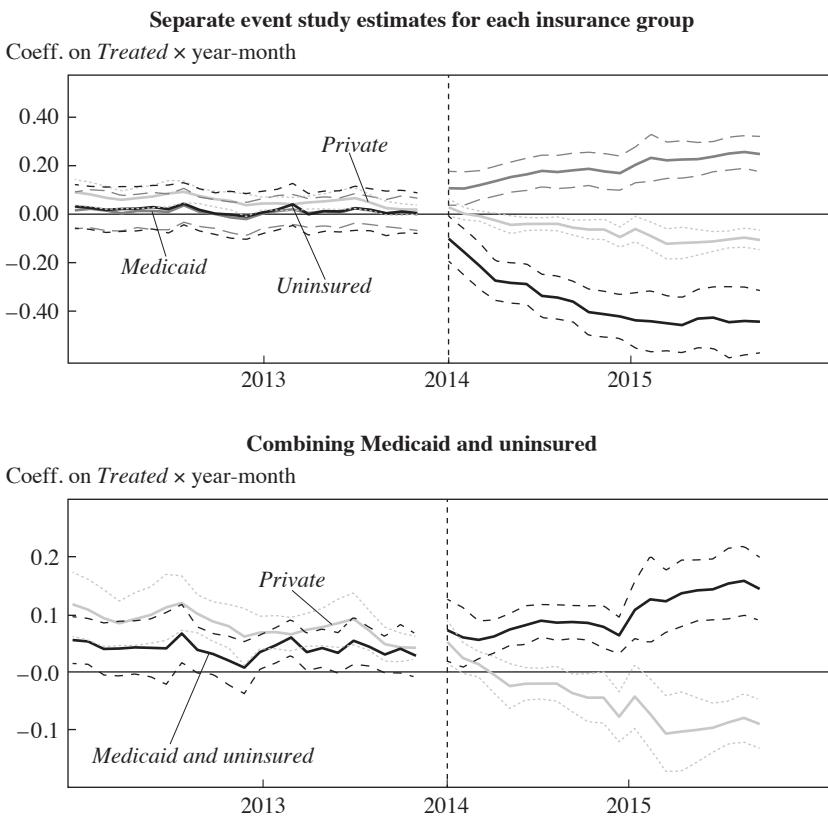
IV.A. Difference-in-Differences Estimates

To isolate the effect of the Medicaid expansion, we calculate utilization for each zip code, year, and month. We estimate the following regression model:

$$(1) \quad Y_{ist} = \beta \times Post_{st} + \alpha_i + \alpha_t + \alpha_s \times t + \varepsilon_{ist}.$$

Here, we study outcome Y_{ist} for zip code i in state s and year-month t . The variable $Post_{st}$ indicates whether the state has expanded Medicaid, α_i are zip code-specific fixed effects, α_t are year-month-specific fixed effects. In addition, we include a state-specific linear time trend, $\alpha_s \times t$.

Such a regression approach relies on the standard parallel trends assumption, which is that trends in hospital utilization would have evolved along parallel paths in expansion states relative to non-expansion states if not for the expansion itself. We evaluate the validity of this assumption by examining trends in raw data in the years leading up to the reform as well as the pre-expansion coefficients from event study specifications.

Figure 6. Event Study Estimates, Total Discharges

Source: Authors' calculations.

Notes: Data report event study estimates analogous to the difference-in-differences estimates. The standard errors are clustered by state and year-month. Each event study coefficient (for each insurance type) is relative to December 2013 (the omitted year-month).

Figures 6 through 8 present event study estimates for a variety of outcomes. First, the top panel of figure 6 presents event study estimates for all hospital discharges and each type of insurance. Each point represents the difference in total discharges in Medicaid expansion states versus non-expansion states with the associated confidence interval plotted by dashed lines. The figure suggests that, after 2014, there was a clear increase in Medicaid visits and a decrease in uninsured visits. Importantly, the 2014 change does not seem to be driven by a preexisting trend. In that sense, the figure supports the parallel trends assumption that underlies the regression estimates in equation (1).

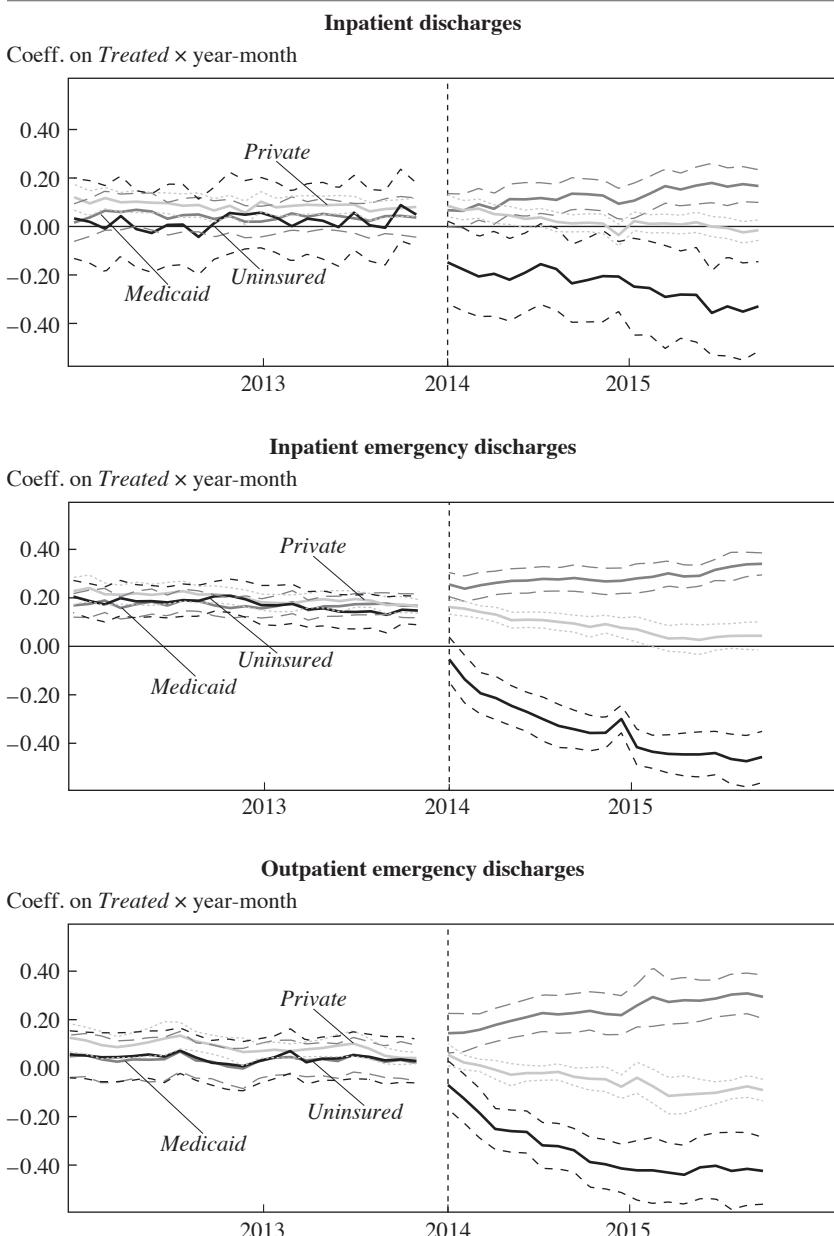
In order to examine whether the expansion increased utilization, we next consider combinations of visits for patients with various types of insurance. The bottom panel of figure 6 presents similar event studies, but with Medicaid-plus-uninsured hospital discharges plotted alongside private visits. The estimates suggest a clear increase in Medicaid-plus-uninsured visits. Again, that change appears to be sudden and not explained by pre-2014 trends. However, it is also clear that there was a *decrease* in private hospital discharges. Given the aggregate trends described above (and depicted in figures 4 and 5) this differential decline is likely driven by the *increase* in private coverage in non-expansion states as low-income individuals became eligible for heavily subsidized marketplace coverage.¹⁷ In expansion states, individuals with income that qualifies them for Medicaid coverage would likely prefer that to marketplace coverage because Medicaid provides superior financial protection. Therefore, these estimates likely reflect an actual treatment of the ACA on insurance access for low-income individuals in non-expansion states. This increase should provide caution for interpreting other studies comparing expansion and non-expansion states that do not account for differential use of the ACA marketplaces by individuals earning between 100 and 138 percent of the federal poverty level.

Next, figure 7 presents event study estimates separately for the three types of hospital discharges: scheduled inpatient, inpatient emergency, and outpatient emergency.¹⁸ The three panels of figure 7 suggest decreases in uninsured visits, increases in Medicaid visits, and smaller decreases in private visits with a smaller effect for inpatient discharges. That smaller effect for inpatient visits is unsurprising given that relatively few uninsured patients have scheduled inpatient visits and those visits tend to be less discretionary. Recall that hospitals are only required to provide care regardless of the ability to pay for patients in the emergency room; they are not required to provide scheduled inpatient visits to the uninsured. Finally, figure 8 presents the same analysis but focuses on the sum of Medicaid and uninsured visits. Like the bottom panel of figure 6, figure 8 suggests a net increase in Medicaid-plus-uninsured visits and a decrease in private visits across all types of discharges.

17. Given that the decline in private hospital discharges appears to be driven by an *increase* in private admissions in the non-expansion states, we do not believe that it demonstrates a crowding out of private coverage by public coverage in the expansion states.

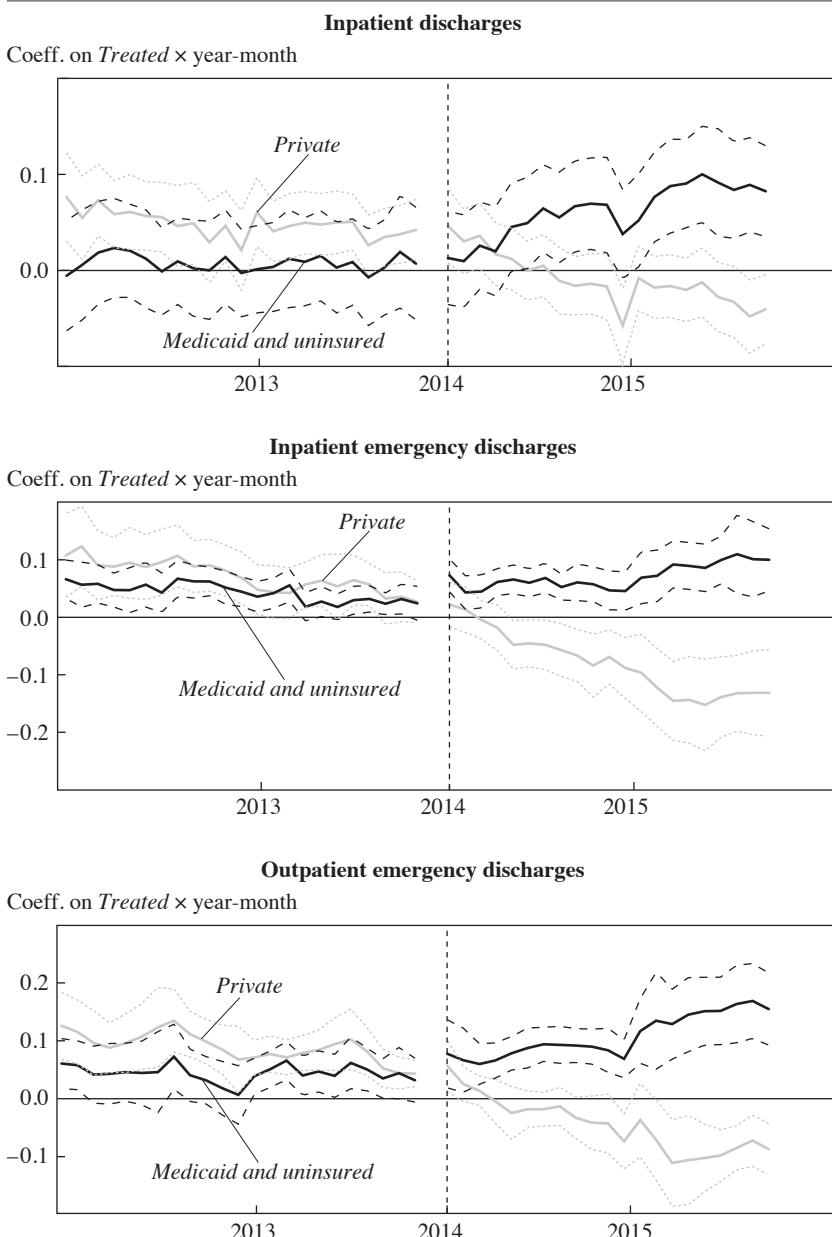
18. Emergency department visits come in two types. Outpatient emergency department visits are medical encounters that begin and end in the emergency department and the patient is never admitted to the hospital. Inpatient emergency department visits are medical encounters that begin in the emergency department and the patient is subsequently admitted to the hospital. Inpatient visits are hospitalizations that do not originate in the emergency department.

Figure 7. Event Study Estimates by Type of Encounter (Each Insurance Type Estimated Separately)



Source: Authors' calculations.

Note: Data report event study estimates analogous to the difference-in-differences estimates. The standard errors are clustered by state and year-month. Each event study coefficient (for each insurance type) is relative to December 2013 (the omitted year-month).

Figure 8. Event Study Estimates by Type of Encounter (Medicaid plus Uninsured)

Source: Authors' calculations.

Note: Data report event study estimates analogous to the difference-in-differences estimates. The standard errors are clustered by state and year-month. Each event study coefficient (for each insurance type) is relative to December 2013 (the omitted year-month).

In order to provide a sense of the magnitude of the effect, we also estimate the regression specification above. The top part of table 2 presents this approach for all types of hospital encounters, with the dependent variable being the number of visits in levels. Each cell presents estimates from a separate regression, with the main $Post_{st}$ coefficient tabulated. Column (1) suggests that Medicaid expansion led to roughly 10,000 more Medicaid-covered hospitalizations and roughly 7,000 fewer uninsured hospitalizations. Those point estimates, in combination, suggest that the increase in Medicaid visits was larger than the decrease in uninsured visits. The second part of table 2 presents estimates in which the logarithm of hospitalizations is the outcome of interest; Medicaid visits increase by roughly 14 percent and uninsured visits decrease by roughly 25 percent.¹⁹

To further study that comparison, the table also presents estimates for the sum of Medicaid and uninsured visits and for the sum of Medicaid, uninsured, and privately covered visits. The estimates suggest an increase in both of these groupings, though the estimate for all visits is less precisely estimated and more sensitive to the specification. This pattern suggests that Medicaid coverage leads to an increase, rather than a decrease, in utilization.

To better understand the dynamics of the effect of expanding Medicaid on utilization, we separate hospital encounters by category. Columns (2) through (4) suggest a roughly similar pattern for scheduled inpatient visits, inpatient visits that originated in the emergency department, and emergency department visits, respectively. In all cases, we see a statistically significant decrease in uninsured visits, combined with an increase in Medicaid visits. All types of encounters seem to increase on net: the increase in Medicaid visits is larger than the decrease in uninsured visits. When we consider all visits (Medicaid, uninsured, private) the effect is still positive and relatively large but is not statistically significant in all specifications.

Finally, table 2 offers insight into which *types* of hospital encounters became more common. Column (5) presents estimates with deferrable hospital visits as the outcome of interest, and column (6) presents estimates with nondeferrable hospital visits as the outcome of interest. Following Garthwaite and others (2017), we focus on deferrable and nondeferrable visits as a way to disentangle changes in coverage rates from changes in the propensity to visit the hospital.

19. It is important to remember that these percentage changes are from meaningfully different bases and therefore the magnitudes should not be directly compared. This is why the net effect of the smaller percentage Medicaid change is still an increase in overall use for the Medicaid and uninsured population.

Table 2. Difference-in-Differences Estimates at the Level of the Zip Code

	(1) All visits	(2) Scheduled inpatient visits	(3) Emergency inpatient visits	(4) Emergency outpatient visits	(5) Deferable visits	(6) Nondeferrable visits
<i>Number of visits</i>						
Medicaid	9,812 (1,208)***	0,343 (0,084)***	1,037 (0,114)***	8,431 (1,088)***	9,371 (1,149)***	0,441 (0,071)***
Private	-1,221 (0,783)	-0,051 (0,087)	-0,141 (0,101)	-1,029 (0,671)	-1,090 (0,743)	-0,131 (0,070)*
Uninsured	-6,932 (0,909)***	-0,142 (0,035)***	-0,692 (0,085)***	-6,099 (0,827)***	-6,451 (0,863)***	-0,482 (0,060)***
Medicaid plus uninsured	2,879 (1,081)***	0,202 (0,088)**	0,345 (0,104)***	2,333 (0,973)***	2,920 (1,048)***	-0,041 (0,066)
Medicaid plus uninsured plus private	1,659 (1,389)	0,150 (0,136)	0,204 (0,149)	1,304 (1,267)	1,830 (1,337)	-0,172 (0,119)
<i>Logarithm of visits</i>						
Medicaid	0,132 (0,017)***	0,042 (0,012)***	0,115 (0,014)***	0,141 (0,018)***	0,131 (0,017)***	0,126 (0,017)***
Private	-0,025 (0,009)***	-0,002 (0,008)	-0,026 (0,011)*	-0,029 (0,010)***	-0,024 (0,009)***	-0,029 (0,016)*
Uninsured	-0,223 (0,024)***	-0,107 (0,024)***	-0,335 (0,027)***	-0,209 (0,024)***	-0,219 (0,024)***	-0,209 (0,024)***
Medicaid plus uninsured	0,031 (0,010)***	0,026 (0,011)**	0,035 (0,008)***	0,030 (0,011)***	0,032 (0,010)***	-0,001 (0,014)
Medicaid plus uninsured plus private	0,010 (0,007)	0,010 (0,006)	0,010 (0,006)*	0,010 (0,008)	0,012 (0,007)*	-0,016 (0,014)

Source: Authors' calculations.

Note: Each cell presents the estimates of the key difference-in-differences coefficient for a separate regression. The sample consists of zip code by year by month counts of hospitalizations; there are 18,643 zip codes and 45 months (January 2012 through September 2015) for a total of $N = 838,935$ observations per payer and type of hospital visit. When logarithm of visits is the dependent variable, we add 1 to the number of visits. Standard errors in parentheses are clustered on state and year-month. Zip code-specific fixed effects, year-month-specific fixed effects, and zip code-specific time trends not shown.

The two columns suggest similar relative drops in uninsured visits for either category, with roughly similar relative increases in Medicaid-covered visits. However, the regressions suggest a clear increase in Medicaid-plus-uninsured visits for deferrable encounters and no such increase for non-deferrable encounters. That pattern of results is easy to rationalize. The types of visits that are most discretionary are deferrable visits. So it is unsurprising that we see a net increase in those types of visits. Nondeferrable visits, by contrast, are visits that likely must occur regardless of insurance status.²⁰

IV.B. Triple Difference Estimates

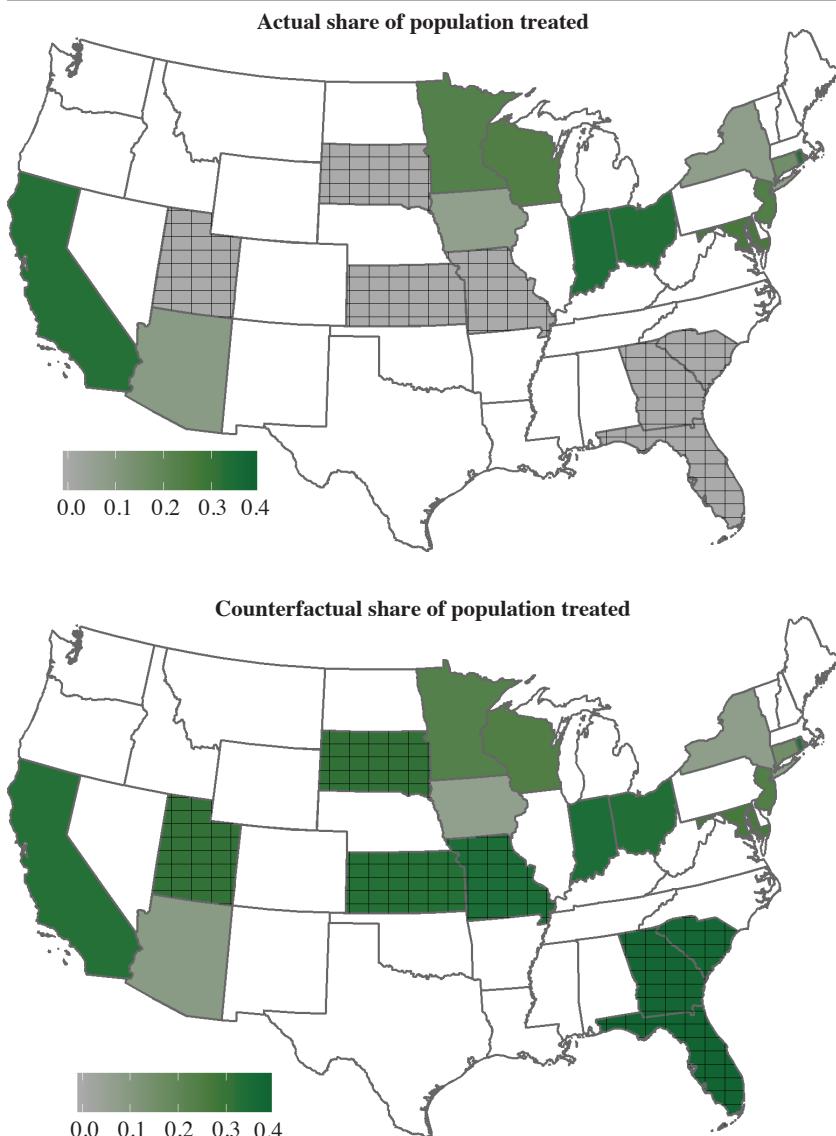
A concern with the difference-in-differences approach above is that there may be a variety of state-level factors that are correlated with the Medicaid expansion decision which could bias the estimates. For example, differential exposure to subsidized coverage in the ACA marketplaces for those at 100–138 percent of the federal poverty level may make it hard to assess the effect of the Medicaid expansion on the overall use of hospital services. This may contribute to the relatively small and imprecise estimates of the effect of insurance on the overall use of hospital services.

To address these concerns and provide a more reliable estimate of the effect of the ACA Medicaid expansion, we next explore within-state variation in the share of each zip code that was made newly eligible for Medicaid as a result of the expansion. Given that the ACA was based on a single income standard (that is, earnings below 138 percent of the federal poverty line) there is a large amount of variation in the share of each zip code that gained Medicaid eligibility. To measure that variation, we use a zip code–level measure of new Medicaid eligibility adapted from the work of Dranove, Garthwaite, and Ody (2016).²¹

Figure 9 shows the variation across states in this measure. The top map shows variation across expansion states in the overall share of each population made newly eligible, with larger increases in eligibility in California and Ohio and relatively smaller increases in Indiana and Iowa. The bottom

20. In addition, regulations require hospitals to treat all patients with an emergency condition regardless of ability to pay.

21. This measure was generated using a combination of data from the Brookings Institution on zip code income, the Current Population Survey, and Kaiser Family Foundation income limits for eligibility. The measure is intended to calculate the share of a zip code that would have been made newly eligible for Medicaid as a result of the ACA expansion based on income and the state's preexisting income limits and the distribution of income in the zip code. More details can be found in footnotes 11–14 in Dranove, Garthwaite, and Ody (2016).

Figure 9. Share of Population Treated by Medicaid Expansion

Source: Authors' calculations.

Note: The top map shows the actual share of the population treated by the Medicaid expansion, with non-expansion states all set to zero, since these states chose not to expand Medicaid. The bottom map shows the counterfactual share of population that would have been treated by the Medicaid expansion in the non-expansion states (had they expanded), using the same gradient for scale. Vermont is excluded from this map because we do not have information on the share treated but is in the analysis sample for difference-in-differences results (though not in triple difference results that use the share treated).

map shows the counterfactual population share that would have been made newly eligible in non-expansion states; this map shows that all of the non-expansion states would have had high treatment intensity compared to the expansion states (that is, much closer to the large increases in California and Ohio than the other expansion states in our sample).

Figure 10 illustrates the within-state variation (across zip codes) for two expansion states, Minnesota and New Jersey (the zip code maps for the remaining expansion states are available in the online appendix). The maps show that some zip codes had relatively small changes in eligibility, while other zip codes had increases in eligibility of more than 30–40 percent.

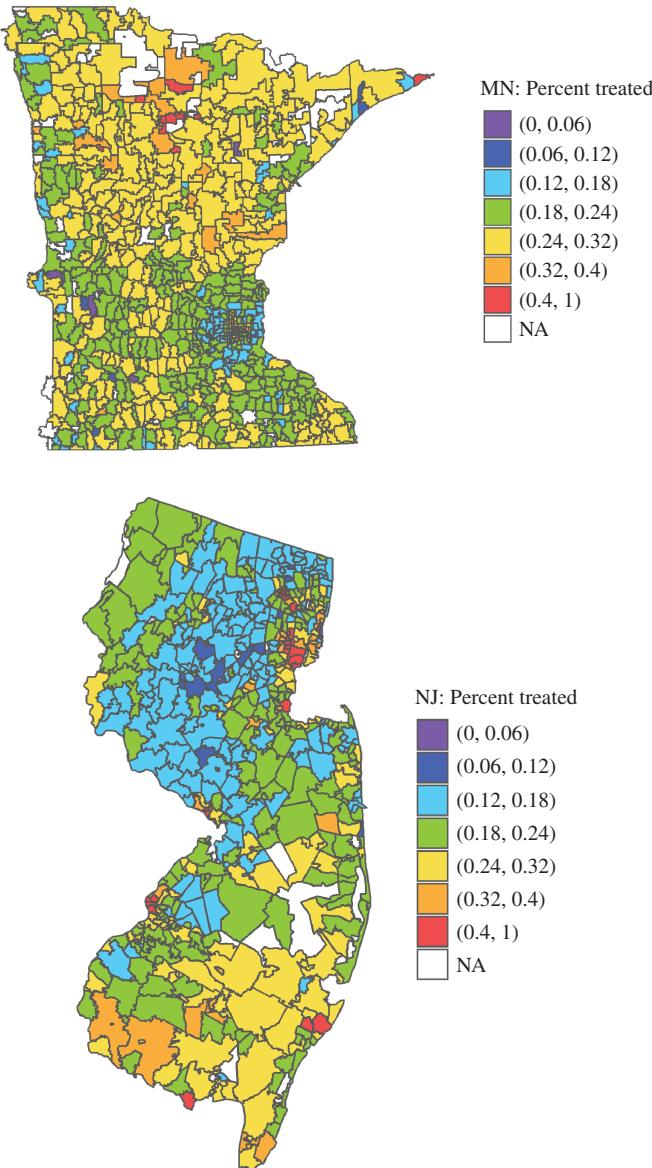
Using this within-state variation, we implement a triple difference specification that allows the effect of the Medicaid expansion to vary by the share of newly eligible in each zip code. This approach allows us to control for other features of the marketplace or the ACA (other than the Medicaid expansion) that differentially impacted zip codes with a greater share of their residents made eligible. Additionally, we are able to include state-year-month fixed effects in all specifications, which can account for confounding state-level shocks that are correlated with expansion and non-expansion status. We estimate the following regression model:

$$(2) \quad Y_{ist} = \beta \times Post_{st} \times ShareEligible_i + \alpha_i + ShareEligible_i \\ \times \alpha_t + \alpha_s \times \alpha_t + \varepsilon_{ist}.$$

As with the difference-in-differences model above, we study outcome Y_{ist} for zip code i in state s and year t . The variable $Post_{st}$ indicates whether the state has expanded Medicaid, α_i are zip code-specific fixed effects. The $ShareEligible$ variable is the estimate of the share of the zip code's population that was made newly eligible for the ACA in expansion states and the share that would have been made eligible in non-expansion states. In the spirit of a triple difference model, this variable is interacted with a full set of year-month-specific fixed effects, α_t , and the regression model also includes a full set of state-year-month-specific fixed effects.

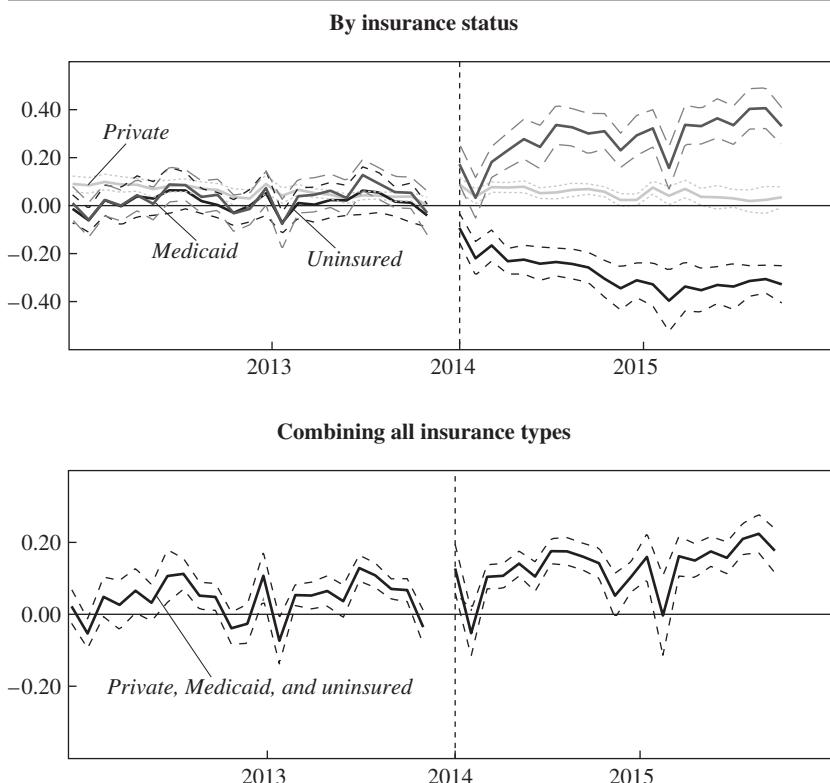
Figure 11 presents event study estimates from such a triple difference specification.²² The top panel presents estimates for each type of insurance. Prior to the expansion, the pattern of the estimated coefficients for all

22. The event study estimates are based on the same estimation equation except that the $Post_{st}$ variable is replaced with a full set of event time dummy variables for each month, excluding December 2013 (which is the normalized reference month in all of our event study figures).

Figure 10. In-State Variation in Share of Population Treated by Expansion

Source: Authors' calculations.

Note: These are two of the twelve expansion states in our sample for which we have information on the share treated by expansion; analogous maps for the remaining expansion states are in the online appendix, figure A7.

Figure 11. Triple Difference Event Studies

Source: Authors' calculations.

Note: The vertical axis reports event study coefficients in log-linear regression models. The confidence intervals are based on standard errors clustered by state and year-month.

insurance types is broadly flat and generally statistically insignificant. After the expansion, there is an immediate change in utilization by insurance status, with Medicaid visits surging and uninsured visits declining. Unlike the negative estimates of the difference-in-differences specification above, we observe no meaningful changes in the number of privately covered visits.

The bottom panel of figure 11 presents triple difference event study coefficients for the combined outcome of Medicaid, uninsured, and privately insured visits. Similar to the estimates by category, prior to the expansion, these estimates are broadly flat and near zero. After the expansion, the estimates suggest a gradual, positive, and statistically significant

post-expansion increase in hospital visits. That pattern is consistent with individuals gaining access to insurance and changing their use of medical services, rather than simply a mechanical reclassification of existing behavior, although more research is needed to understand the mechanism driving this gradual increase.

To explore the precise magnitude of the change depicted in these event study figures, table 3 presents triple difference regression estimates. Considering the overall use of hospital services, column (1) suggests that the Medicaid expansion caused an increase in the number of hospital visits. To interpret the magnitude of the coefficient, consider that the average zip code in our sample had 24 percent of its residents made eligible for Medicaid. Based on the estimates in table 3, this implies a change in utilization of approximately 1.9 percent (0.080 coefficient for Medicaid plus uninsured for log visit outcome, multiplied by 24 percent).²³ Understanding the treatment on the treated—that is, the implied effect for those who actually gained coverage—involves considering the impact of the Medicaid expansion on the share of the population with coverage. If we consider the overall population (that is, the Medicaid, uninsured, and private) the increase in the share of the population with coverage is approximately 3.75 percent.²⁴ This implies an increase in the use of hospital services of approximately 50 percent.

Given that most of the privately insured population was largely unaffected by the expansion, this treatment-on-the-treated estimate likely overestimates the change in the use of hospital services. If, instead, we consider the change in insurance status for the population most directly affected by the expansion (that is, the Medicaid and uninsured population), the implied change in the use of hospital services is much smaller and likely a more accurate estimate of the actual change in behavior. The expansion is associated with a 9.6 percentage point increase in the share of the Medicaid and uninsured population with insurance coverage. This implies an increase in the use of hospital services by each newly insured person of approximately 20 percent.

Columns (5) and (6) of table 3 estimate the change in utilization by the type of visit. These estimates show that the overall increase in hospital visits was almost entirely driven by outpatient emergency department visits

23. We reach a similar conclusion whether we rely on the Medicaid plus uninsured specification or the Medicaid plus uninsured plus private specification.

24. This is based on authors' estimates in the SIPP of the expansion increasing the Medicaid population by 15 percent off of a base of 25 percent.

Table 3. Triple Difference Estimates at the Level of the Zip Code

	(1) All visits	(2) Scheduled inpatient visits	(3) Emergency inpatient visits	(4) Emergency outpatient visits	(5) Deferable visits	(6) Nondeferrable visits
<i>A. Number of visits</i>						
Medicaid	0.539 (0.029)***	0.003 (0.002)	0.039 (0.003)***	0.500 (0.027)***	0.516 (0.028)***	0.023 (0.001)***
Private	0.010 (0.012)	0.000 (0.001)	-0.006 (0.001)***	0.016 (0.011)	0.008 (0.012)	0.002 (0.001)*
Uninsured	-0.449 (0.025)***	-0.011 (0.002)***	-0.052 (0.003)***	-0.388 (0.022)***	-0.428 (0.024)***	-0.021 (0.001)***
Medicaid plus uninsured	0.191 (0.027)***	-0.005 (0.002)**	-0.001 (0.004)	0.196 (0.025)***	0.183 (0.026)***	0.007 (0.001)***
Medicaid plus uninsured plus private	0.67 (0.031)***	-0.003 (0.002)	-0.007 (0.004)*	0.175 (0.028)***	0.159 (0.030)***	0.008 (0.001)***
<i>B. Logarithm of visits</i>						
Medicaid	0.240 (0.013)***	0.002 (0.002)	0.035 (0.003)***	0.249 (0.014)***	0.235 (0.013)***	0.022 (0.001)***
Private	0.004 (0.008)	0.000 (0.001)	-0.006 (0.001)***	0.009 (0.008)	0.003 (0.008)	0.002 (0.001)*
Uninsured	-0.302 (0.015)***	-0.011 (0.002)***	-0.050 (0.003)***	-0.268 (0.014)***	-0.292 (0.015)***	-0.020 (0.001)***
Medicaid plus uninsured	0.080 (0.011)***	-0.004 (0.002)**	0.000 (0.003)	0.091 (0.012)***	0.079 (0.011)***	0.007 (0.001)***
Medicaid plus uninsured plus private	0.079 (0.011)***	-0.002 (0.002)	-0.004 (0.003)	0.087 (0.011)***	0.078 (0.011)***	0.007 (0.001)***

Source: Authors' calculations.

Note: Each cell presents the estimates of the key triple difference coefficient for a separate regression. The key variable on the right-hand side is the interaction between a post-January 2014 indicator for states expanding Medicaid during the sample period and share eligible for Medicaid as a result of the ACA. Share eligible is calculated for both expansion and non-expansion states. The sample consists of zip code by year by month counts of hospitalizations; see table 1 for more details. The sample excludes all zip codes in Vermont in all regressions. There are 18,643 zip codes and 45 months (January 2012 through September 2015) for a total of $N = 838,935$ observations per payer and type of hospital visit. When logarithm of visits is the dependent variable, we add 1 to the number of visits. Standard errors in parentheses are clustered on state and year-month. Zip code-specific fixed effects, year-month-specific fixed effects, and zip code-specific time trends not shown. The average share of the population treated in expansion states is 0.24.

for deferrable conditions. This pattern of estimates is intuitive. Medicaid expansion effectively lowers the price of an emergency department visit for the patient, and so we would expect an increase in visits for those that are discretionary. Online appendix figure A5 presents the corresponding event studies for these outcomes. These again suggest that the increase in outpatient emergency department visits was gradual in the post-expansion months and not a sharp reclassification.

VARIATION IN THE NUMBER OF RESIDENTS TRANSITIONING TO MEDICAID
The triple difference estimates result from the combination of two mechanisms. First, there is a mechanical effect: visits that would have occurred without any policy change are now categorized as a Medicaid visit rather than an uninsured visit. Second, there is an increase in use by those who gained coverage. This second effect likely operates through several channels, including a reduction in the price of a hospital visit, a greater ability of insured patients to access nonemergency hospital services, and the potential that hospitals are a complement, rather than a substitute, for physician and outpatient services.

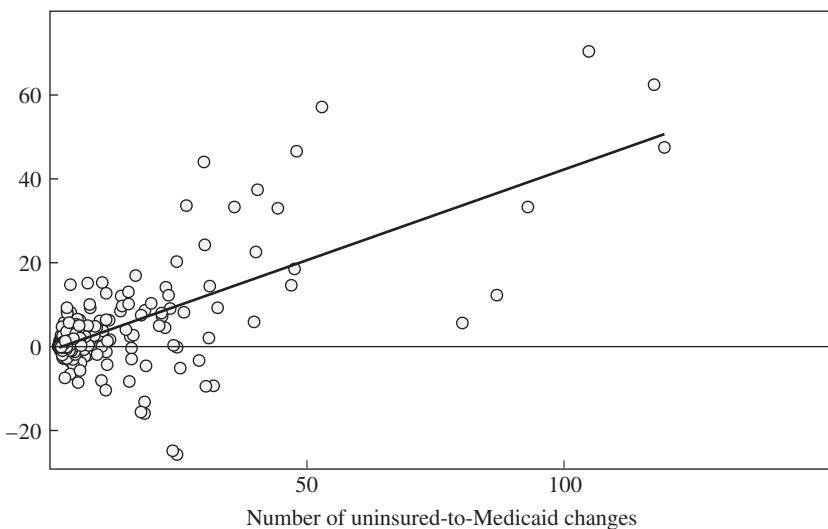
Given Medicaid's retroactive coverage, the mechanical transition of uninsured to Medicaid visits can happen without any action by the newly eligible. After all, if those individuals have a medical shock that requires the use of hospital services, they (or the hospital) can sign up for Medicaid at that point. The behavioral effect, however, likely requires that an individual is actually aware of their new Medicaid coverage in order to change their consumption of medical services.

To examine this second point, we turn to an analysis that examines within-state changes in hospital encounters based on county-level estimates of the number of residents who shifted from uninsured status to Medicaid. This analysis is motivated by the hypothesis that the changes in health care utilization we observe were driven by those who actually obtained coverage rather than simply those who were made eligible. We therefore seek to measure the size of the transition population and to exploit variation across counties in that number to estimate the direct effect of Medicaid on the use of health care services. Again, exploiting this source of variation allows us to estimate the effect both in the entire sample and in a sample consisting of only counties in Medicaid expansion states.

The triple difference analysis above examines the relationship between the outcome (hospital utilization) and the expansion dose, the fraction of the population that could enroll in Medicaid. However, to facilitate interpretation in terms of utilization rates per person, we develop estimates of the response, the number of uninsured individuals who actually took up the

Figure 12. Correlation between Number of Uninsured-to-Medicaid Transitions and 2013–2015 Change in Medicaid and Uninsured Visits

Change in Medicaid and uninsured visits



Source: Authors' calculations.

Notes: The scatter plot excludes the two largest counties in the sample for readability, but these counties are included in some of the columns in table 4. The slope of the regression line is 0.40 (with a standard error of 0.02), which means that each uninsured-to-Medicaid change in a county is associated with an additional 0.40 visits.

Medicaid coverage for which they were newly eligible. We derive these county-level measures from three data sources: (1) county-specific estimates of the number of insured and uninsured residents in 2013 from the Census Bureau; (2) county-level measures of Medicaid and private coverage enrollment in 2013 from DRG; and (3) a model of insurance transitions fitted to a large nationally representative longitudinal (January 2013 to December 2014) panel of monthly insurance coverage among 44,227 individuals in the SIPP.²⁵ Using those data, we construct a measure for each county of the number of uninsured residents who actually enrolled in Medicaid. This procedure follows the work of Graves and others (2020) and Graves, Hatfield, and McWilliams (2020).

Figure 12 summarizes the relationship between this measure and a measure of the change in health care utilization before and after the expansion

25. We also utilize the Census Bureau's 2015 Small Area Health Insurance Estimates (SAHIE) in a validation exercise, as described below.

from the HCUP data. Specifically, we limit the data to the eleven Medicaid expansion states in the main sample. The figure plots the association between the change in total Medicaid and uninsured visits from 2013 to 2015 for each county and the number of uninsured-to-Medicaid transitions in that county during the same time period. The figure demonstrates a positive relationship.

Building on figure 12, table 4 reports analogous regression results, quantifying the magnitude of the association. Table 4 presents regressions in which the outcome of interest is the difference in Medicaid-plus-uninsured visits between the 12 months after Medicaid expansion and the 12 months before. Column (1) presents a simple regression in which the only variable on the right-hand side is the measure, described above, of the number of county residents who shifted from uninsured status to being Medicaid covered. The coefficient on that variable is 0.32, suggesting that each county resident who gained Medicaid was associated with approximately one-third of a visit.

Columns (2) through (4) probe the robustness of this finding. The regression in column (2) adds controls for state-specific fixed effects in order to isolate within-state variation in uninsured-to-Medicaid transitions, and the regression in column (3) adds a control for the number of visits consumed by the county's residents in the pre-expansion period. Column (4) includes a control for the size of the county's Medicaid enrollment before expansion. In all cases, the key coefficient on the proxy for the number of uninsured-to-Medicaid transitions remains roughly 0.3. Columns (5) through (8) present similar results from analogous specifications that exclude the largest counties. Since the regression is in first differences and in levels, including the largest counties substantially increases precision, but the inclusion of those counties does not entirely drive the results.

Online appendix table A1 reports results which address the fact that we likely measure each county's number of uninsured-to-Medicaid transitions with error. Given that potential measurement error, we instrument for the uninsured-to-Medicaid transitions with the change in the uninsured population before and after Medicaid expansion. The IV estimates in online appendix table A1 are very similar in magnitude to the estimates in table 4.²⁶ Finally, online appendix table A2 replicates table 4, but with

26. Additionally, online appendix table A2 reports results using the DRG-based estimate rather than the SIPP-based population estimate. That table presents fairly similar results to those in table 4 using this alternative estimate of population transitioning from being uninsured to being on Medicaid.

Table 4. Heterogeneity across Counties in Number of Uninsured Who Transitioned to Medicaid

	Full sample				Exclude largest counties			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Number of uninsured who transitioned to Medicaid	0.321 (0.016)***	0.318 (0.016)***	0.302 (0.051)***	0.359 (0.061)***	0.326 (0.045)***	0.327 (0.048)***	0.323 (0.098)***	0.347 (0.103)***
Total encounters			0.007 (0.021)	0.034 (0.027)			0.001 (0.025)	0.017 (0.039)
July 2012–June 2013				-0.023 (0.017)			-0.012 (0.024)	
Initial number of uninsured residents		✓	✓	✓		✓		
State fixed effects							✓	✓
N	553	553	553	553	551	551	551	551
R ²	0.816	0.835	0.835	0.840	0.537	0.589	0.589	0.592

Source: Authors' calculations.

Note: Each column presents regression estimates where the dependent variable is the 2013–2015 change in the total number of Medicaid and uninsured visits (inpatient and emergency department visits combined). The sample consists of counties in the eleven ACA Medicaid expansion states we study. The key variable on the right-hand side is the number of uninsured individuals who transitioned to Medicaid. The columns report results from alternative specifications, and the last four columns exclude the two largest counties in the sample. Robust standard errors are reported in parentheses.

the outcome of interest being the combined total of Medicaid, uninsured, and private visits. Those estimates are quite similar to those in tables 4 and online appendix table A1, which suggests that changes in private visits are not biasing our conclusions about the net effect of the expansion on Medicaid-plus-uninsured visits.

This estimated increase is larger in magnitude than our preferred triple difference estimate. This is understandable given that this is likely an overestimate of the true increase in use resulting from the expansion. While we are able to accurately measure the share of the population that actively transitions to Medicaid, any individuals who become newly eligible as a result of the expansion but do not sign up for coverage would not be accounted for in our transition measure. Visits by these individuals, however, would largely be categorized as a Medicaid visit in the hospital data because these individuals are retroactively eligible for coverage and Medicaid therefore paid for the visit. Thus, the measure of the increased use of hospital services based on the transition measure will overstate the true increase in use by those who take up Medicaid coverage. That said, this upward bias is likely small and therefore the fact that this estimate is similar to the triple difference estimate provides additional support for the fact that insurance expansions increase rather than decrease the use of hospital services.

V. How Target Efficient Was the ACA Medicaid Expansion?

One of the goals of publicly provided insurance is to provide assistance for those with the highest unmet need for health care coverage. The ACA attempted to meet this goal through both the expansion of Medicaid and the creation of heavily subsidized insurance marketplaces. This section examines how well targeted these policies were toward those with the highest unmet need for health insurance.²⁷

V.A. *The Target Efficiency of Medicaid Expansions*

Historically, Medicaid has been a program of categorical eligibility with benefits provided to low-income groups that were perceived to have high unmet need for health care. For example, Medicaid was available for low-income individuals who were disabled or pregnant—two groups with higher-than-average medical spending. The ACA expansion did not

27. Note that this is not the same as unmet need for health care. We lack data on underlying health status and instead have data on the use of health care services.

target particular groups but instead made coverage available to everyone earning below 138 percent of the federal poverty level. That feature of the expansion led to a concern that the program would fail to provide coverage to those with the highest demand for health care. This would decrease the proverbial “bang for the buck” of the program.

To examine the target efficiency of the ACA Medicaid expansion, we focus on counties in the thirteen expansion states listed in section III. In each of these counties, we calculate average utilization by dividing total uninsured visits by an estimate of the uninsured population from 2012 to 2014. We then perform the same calculation for the Medicaid population, dividing utilization by enrollment in each year. Finally, we do the same calculation for the privately insured.

Table 5 reports the results of these calculations. The first row shows an average of 0.355 visits (combining hospital visits and emergency department visits) per uninsured individual in the pre-ACA period. After the ACA, this average drops to 0.237 in 2014, a decline of 33.2 percent. These averages are based on simple unweighted means across the counties in the sample; the last two columns suggest a similar pattern when taking a weighted average across counties based on pre-ACA county population. This weighting causes little substantive change in the estimates. The decline in average utilization for the uninsured is consistent with the hypothesis that those who move from uninsured status to Medicaid have higher-than-average utilization in the pre-ACA period. As a result, removing them from the uninsured population leads to a reduction in the average utilization rate for the uninsured population in the post-ACA period. These estimates thus suggest that the ACA was broadly target efficient.

The data for the Medicaid population in table 5 also suggest that *pre-ACA* Medicaid expansions were not particularly target efficient compared to earlier categorical expansions. After the ACA expansion, the visits per Medicaid enrollee increases. This suggests that the newly insured also had a greater use of hospital services than those who were made eligible for Medicaid through prior expansions. In other words, Medicaid under categorical eligibility was not more target efficient, on average, than a system with eligibility based solely on income.

A concern with this analysis is that these changes in utilization rates might be driven by broader trends over time unrelated to the ACA. For that reason, table 5 presents the same calculations for non-expansion states. Reassuringly, the bottom three rows of table 5 suggest relatively small changes in utilization rates for non-expansion states. This suggests that the changes in expansion states were not driven by preexisting trends.

Table 5. Average Utilization Rate for Uninsured and Medicaid Populations, Before and After ACA Medicaid Expansion

	Average utilization rate across counties				Weighted average utilization rate			
	(1) 2012	(2) 2013	(3) 2014	(4) % change, 2012-14	(5) 2012	(6) 2013	(7) 2014	(8) % change, 2012-14
Expansion states								
Uninsured population	0.355	0.353	0.237	-33.2%	0.358	0.352	0.249	-30.4%
Medicaid population	0.553	0.535	0.683	+23.5%	0.459	0.464	0.582	+26.8%
Private population	0.199	0.191	0.199	+0.0%	0.190	0.183	0.188	-1.1%
Non-expansion states								
Uninsured population	0.433	0.430	0.419	-3.2%	0.462	0.462	0.445	-3.7%
Medicaid population	0.388	0.383	0.403	+3.9%	0.432	0.439	0.468	+8.3%
Private population	0.191	0.189	0.206	+7.9%	0.178	0.179	0.200	+12.4%

Source: Authors' calculations.

Note: Each cell presents estimates of average utilization (total hospital plus emergency department visits divided by total population). Columns (1) through (3) report average utilization by calculating averages in each county and then calculating (unweighted) averages across the counties in the expansion state sample. Columns (5) through (7) present weighted averages, weighting by the pre-ACA population.

V.B. Target Efficiency of the ACA Marketplaces

The results above ought to be interpreted with one important institutional detail in mind. Unlike private insurance, Medicaid coverage is retroactive, that is, enrollees can receive coverage for medical expenses that occurred prior to their enrollment. Hospital billing departments often facilitate this enrollment in order to secure coverage for emergency services. There are thus two types of new Medicaid enrollees: those who enrolled in Medicaid ahead of their hospitalization and those who enrolled afterward. The former likely value Medicaid more than the latter, since they enrolled soon after becoming eligible. But we cannot separate those two types of Medicaid enrollees in the data. Therefore, it is difficult for us to estimate enrollees' valuation of Medicaid. The results, however, do speak to the Medicaid expansion's target efficiency. The expansion's target efficiency is based on society's preference for providing health insurance to those who most need health care. Estimating the need for health care across subpopulations does not involve enrollees' valuation of Medicaid and so is an object we can pursue in the data.

An additional question is whether those who gained access to insurance as a result of the ACA were truly those who valued it most as opposed to simply those who consumed the most hospital services. An individual's valuation of Medicaid may not match their use of health care if they bore little cost for the uncompensated use of hospital care when they were uninsured. A number of recent papers have examined the willingness to pay for individuals who gain access to subsidized health insurance. For example, Finkelstein, Hendren, and Shepard (2019) and Finkelstein, Hendren, and Luttmer (2019) examine whether individuals value publicly provided insurance greater than the cost of the coverage.²⁸ These papers are consistent with the work of Garthwaite, Gross, and Notowidigdo (2018) and other studies which demonstrate that hospitals provide substantial

28. Finkelstein, Hendren, and Luttmer (2019) calibrate a stylized model of the demand for health insurance using results from the Oregon health insurance experiment and conclude that the average willingness to pay for Medicaid is quite low (on the order of 20 percent of costs). Finkelstein, Hendren, and Shepard (2019) estimate demand for public health insurance using a regression discontinuity (RD) approach, where the out-of-pocket premium varies with household income. They show how to translate the RD estimate into a revealed preference measure of demand for public health insurance and also conclude that demand is low on average. The existence of hospital uncompensated care, free health care clinics, and other charity care in the health care system is one possible explanation for the low estimated willingness to pay in both settings.

uncompensated care and that this may crowd out demand for formal health insurance.

The creation of the ACA marketplaces in non-expansion states can shed further light on this issue. Standard economic theory suggests that the least healthy will value health insurance the most, holding constant risk preferences and other demand-side factors. This, in turn, suggests that the least healthy uninsured ought to be those most eager to transition onto formal insurance when they become eligible for subsidized coverage. While everyone below the income threshold becomes eligible for Medicaid without taking any action, those who were ineligible for expanded Medicaid needed proactively to sign up for coverage in the ACA marketplaces during an open enrollment period.²⁹

Given these facts about the enrollment process, we can use data from non-expansion states to examine whether those who signed up on the ACA marketplaces were healthier on average than those who remained uninsured. The data for the non-expansion states in table 5 present the change in the use of hospital services in non-expansion states by insurance status. The utilization rate for uninsured residents of non-expansion states declined, while the utilization rate for the privately insured increased. This pattern suggests that those who purchased insurance used more medical services than those who previously lacked coverage and further, that many state residents were previously uninsured and had a high valuation of insurance but were kept from coverage by either a preexisting condition or a lack of financial resources.³⁰

It should be noted that a firm conclusion on whether the ACA's expansion of coverage via marketplaces is target efficient is much more difficult to pin down. Viewed one way, if the marketplaces attracted individuals with the highest health care needs, then this pattern of results might lead us to believe that the expansion was target efficient. But this observation is also consistent with a standard adverse selection story. Viewed another way,

29. Even those who did not proactively sign up for Medicaid could join the program retroactively. Hospitals can help those individuals enroll in Medicaid even after they receive treatment. Regarding the ACA's marketplaces, open enrollment periods are required in order to avoid adverse selection. Absent a change in life circumstances (birth, death, change in employer-provided coverage), individuals can only enroll in coverage during open enrollment periods.

30. The table also suggests a slight increase in utilization among Medicaid enrollees. Given that there was no change in Medicaid eligibility in these states, the increase in use for Medicaid enrollees could be the result of a change in the use of hospital services for those who signed up for Medicaid as a result of the welcome effect.

then, the consequent rise in private insurance premiums to cover higher costs induced by adverse selection (and moral hazard) could price out higher-income (unsubsidized) people with high health care needs. Indeed, enrollment data since 2014 demonstrate that as marketplace premiums have increased, enrollment in the unsubsidized (greater than 400 percent of the federal poverty level) income range has shrunk—the marketplaces are now effectively concentrated to those in the subsidized income range. As of February 2019, for example, 87 percent of marketplace enrollees received premium assistance (that is, had income 100–400 percent of the federal poverty level).³¹ Whether or not the policy was target efficient is therefore an open question that is highly dependent on society’s preferences for redistribution *away* from higher-income people with health care needs and toward lower-income people with high health care needs.

VI. How Did the Effects of the ACA Medicaid Expansion Vary across States?

The estimates above suggest that Medicaid coverage increases hospital and emergency department visits and that the Medicaid expansion was generally well targeted, that is, those gaining coverage had greater demand for hospital services than those who remained uninsured. That said, an important feature of Medicaid is that the program is jointly funded by federal and state governments but is solely administered by the states. Prior to the ACA expansion, states made a number of different decisions about the operation and generosity of their Medicaid programs that could affect the impact of the expansion. In addition, Medicaid works in concert with a variety of other supply-side features of the health care market that vary across states.

The combination of these supply- and demand-side factors could result in heterogeneous effects of the expansion on the increased use of hospital services and the target efficiency of the policy. This section investigates state-level heterogeneity on both of these dimensions. We first document a wide amount of state-level heterogeneity in the magnitude of the effect of Medicaid expansion on utilization. We then investigate potential explanations for that heterogeneity by correlating state-specific estimates with characteristics of each state and expansion. Finally, we examine how the

31. See Kaiser Family Foundation, “Marketplace Effectuated Enrollment and Financial Assistance,” <https://www.kff.org/other/state-indicator/effectuated-marketplace-enrollment-and-financial-assistance/>.

target efficiency of the program varied across both expansion and non-expansion states.

VI.A. Heterogeneity in the Use of Hospital Services

We first estimate the effects of Medicaid expansion on hospital utilization for every state. This exercise is different from simply estimating the change in the take-up of Medicaid across states. Unlike private insurance, individuals are able to sign up for Medicaid at any point within the year, and they have retroactive eligibility that allows them to apply Medicaid to medical events that happen prior to enrollment. Given that we use administrative—as opposed to survey—data, the uninsured in our data must be those who are likely ineligible for Medicaid and did not enroll for private insurance during open enrollment. Therefore, changes in overall utilization in the data reflect differences in the take-up decision across states to the extent that such enrollment in insurance has an impact on the decision to seek treatment at the hospital. Our results above suggest that enrollment in insurance does have a causal effect on utilization. Differences across states in the increase in utilization that is correlated with differences in state take-up would further support these estimates and demonstrate that gaining insurance increases the use of hospital services.

Given that Medicaid is administered at the state level, the program's operations differ somewhat across states. Even among the states that chose to expand Medicaid, a variety of operational decisions likely affected the success of these expansions at decreasing the share of uninsured and increasing the take-up of Medicaid. While most research has focused on the binary state-level decision of whether or not to expand Medicaid to adults under the ACA, states faced many additional decisions once they decided to expand Medicaid. For example, states could choose whether or not to set up state-based marketplaces or whether to rely on the federal marketplace. Similarly, states decided whether their marketplaces had the authority to enroll eligible applicants in Medicaid or the Children's Health Insurance Program (CHIP). The so-called no wrong door policy in the ACA required all marketplaces to assess whether applicants are eligible for Medicaid or CHIP but only required state-based marketplaces to go through and actually enroll publicly eligible applicants (Skinner 2012). In other words, if states decided to rely on the federal exchange rather than set up their own state-level exchange, they could defer that enrollment authority to state Medicaid agencies.

As a result, the ultimate effect of Medicaid expansion on the take-up of Medicaid could have been shaped by these other state-level decisions.

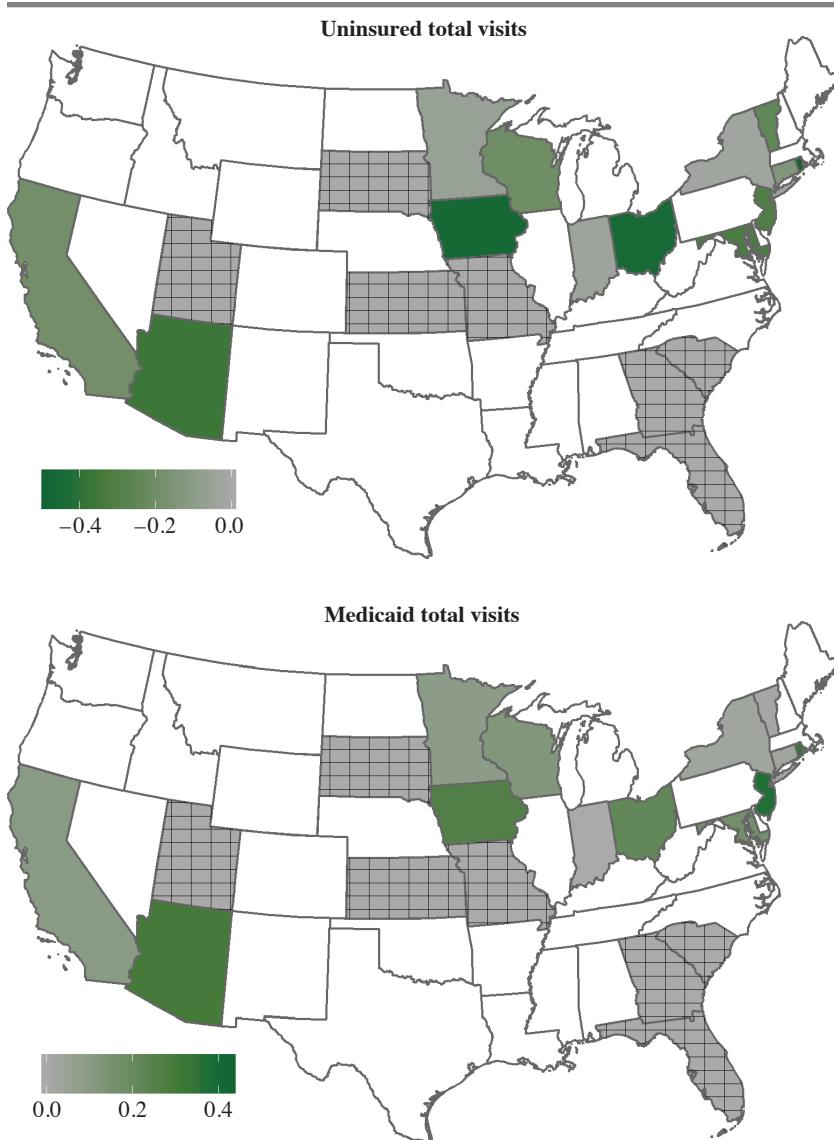
To the extent that enrollment has a causal impact on the utilization of health care services, these decisions would then affect utilization. All Medicaid expansions, in other words, are not created equal.

Hudson and Moriya (2018) suggest that a key factor in determining Medicaid take-up is not whether the state's marketplace was a state-based exchange or a "federally facilitated" exchange but rather whether the exchange had the authority to enroll individuals who had been determined to be eligible for Medicaid. The key factor is marketplace enrollment authority, because otherwise Medicaid-eligible applicants would have to leave the marketplace and seek out state Medicaid agencies themselves, a process that invariably involved fewer state residents gaining Medicaid coverage.

Of course, variation in the effect of the Medicaid expansion on utilization likely reflects far more than differences in take-up. For example, variation could also be driven by the underlying demand for health care by low-income individuals and the access to care for the uninsured prior to the expansion. Some states arranged generous financing for uncompensated care which may have affected whether the uninsured could have regularly visited hospitals and emergency departments prior to the Medicaid expansion. By contrast, if the uncompensated-care financing pool was less generous or nonexistent, then hospitals may have discouraged visits from the uninsured in ways that did not violate the Emergency Medical Treatment and Active Labor Act. For instance, hospitals may have aggressively billed self-pay patients, partially to discourage visits from the uninsured. The availability of uncompensated care may influence the decision to sign up for Medicaid (Finkelstein, Mahoney, and Notowidigdo 2018). However, in our context even those who do not sign up for Medicaid would appear as a Medicaid visit in the data if they were eligible for the expansion.

To investigate these issues empirically, we augment the main difference-in-differences specification above by interacting the key difference-in-differences coefficient with a full set of indicator functions for each state that expanded Medicaid. This amounts to a fully nonparametric specification of state-level treatment-effect heterogeneity, continuing to use the non-expansion states as controls. The results of these augmented difference-in-differences results are first presented in maps in figures 13 through 15. Since the non-expansion states are used as controls, they are normalized to zero in each map. The gradient scale in each map shows the difference in each expansion state relative to average non-expansion states, with darker shades indicating larger changes. For example, the top map in figure 13 shows larger changes in uninsured visits in Ohio and Iowa and

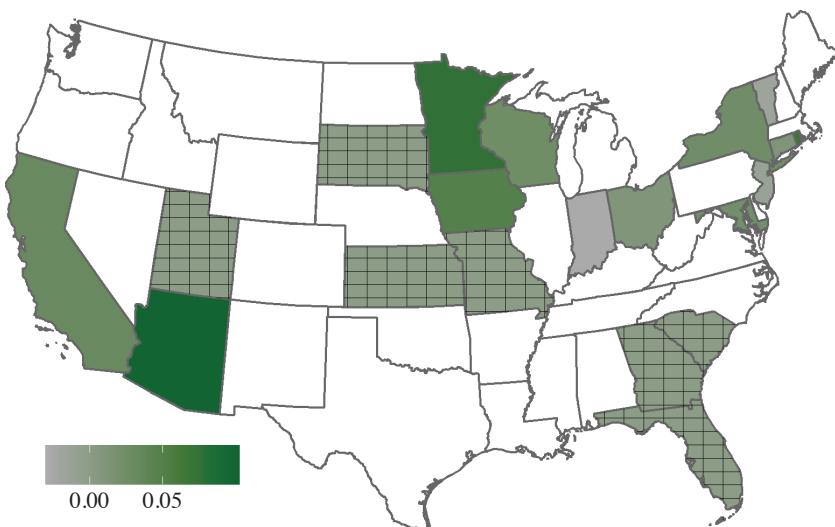
Figure 13. State Heterogeneity in Effect of Medicaid Expansion on Uninsured Visits and Medicaid Visits



Source: Authors' calculations.

Note: The top map shows the state-specific estimates of the effect of the Medicaid expansion on uninsured total visits relative to non-expansion states (which are normalized to zero). The bottom map reports analogous estimates for Medicaid total visits.

Figure 14. State Heterogeneity in Effect of Medicaid Expansion on Uninsured plus Medicaid Visits



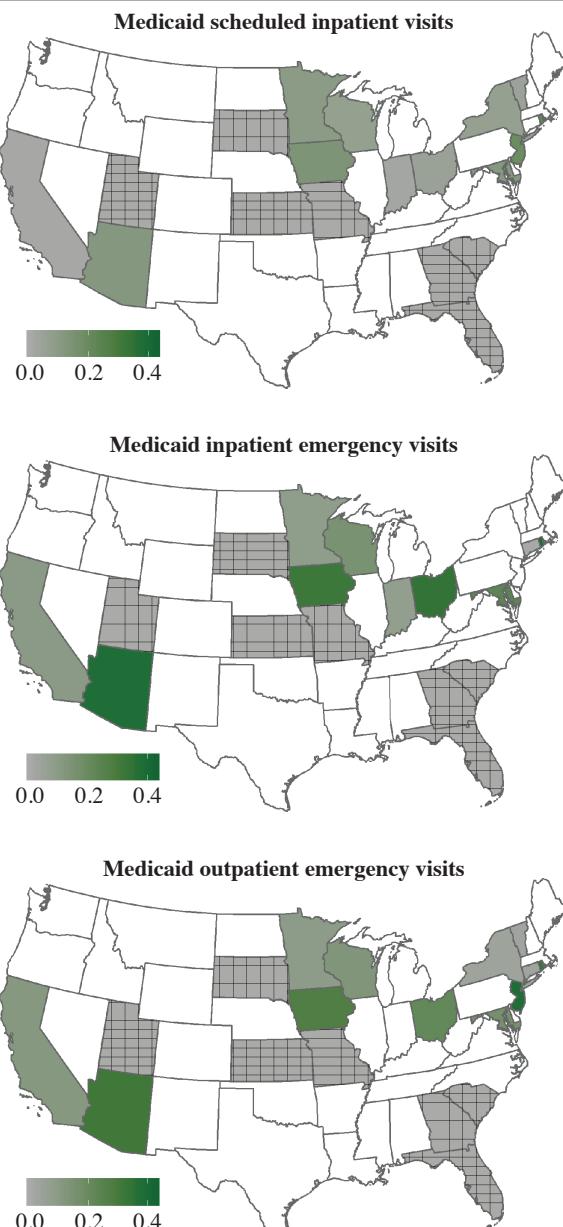
Source: Authors' calculations.

Note: The map shows the state-specific estimates of the effect of the Medicaid expansion on combined Medicaid and uninsured visits relative to non-expansion states (which are normalized to zero).

relatively smaller changes in New York (relative to non-expansion states), and the bottom map shows a similar geographic pattern for changes in Medicaid visits. Figure 14 reports the combined Medicaid and uninsured visits. Figure 15 then breaks out Medicaid visits by type of encounter, and these maps show greater geographic variation for outpatient emergency visits relative to scheduled inpatient visits. This implies that the small average effect for scheduled inpatient visits reported in tables 1 and 2 is broadly replicated across each state. By contrast, the significant increase in Medicaid visits and decrease in uninsured visits (on average across expansion states) masks considerable heterogeneity across the expansion states in our sample.

Figure 16 presents the point estimates from these specifications. The dotted line plots the cross-state average estimate, an equal-weighted average across eleven expansion states.³² On average, Medicaid expansion

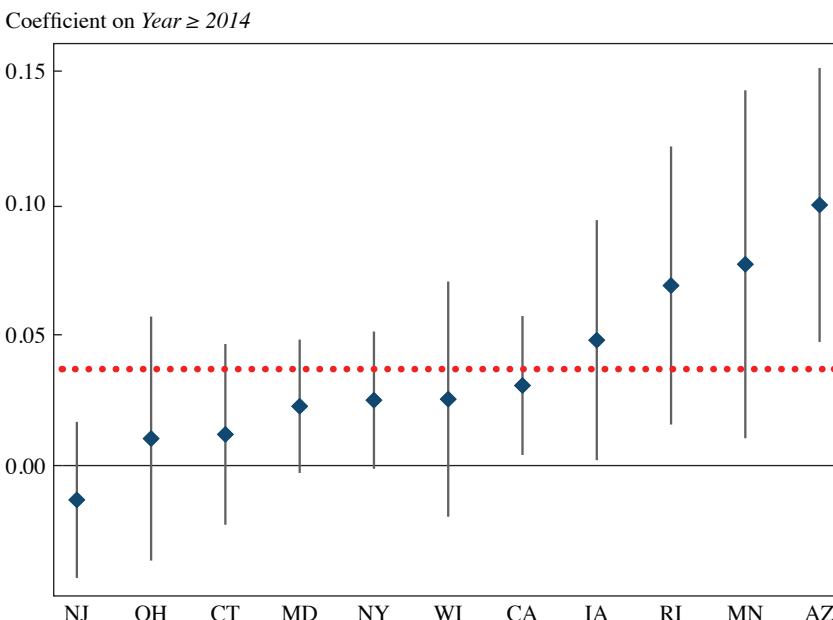
32. We exclude Vermont and Indiana (which are expansion states in our main analysis sample) because we do not have all of the explanatory variables in the analysis that follows.

Figure 15. State Heterogeneity in Effect of Medicaid Expansion, by Type of Encounter

Source: Authors' calculations.

Note: The maps show the state-specific estimates of the effect of the Medicaid expansion on Medicaid visits (for each category of visits: scheduled inpatient visits, inpatient emergency visits, and outpatient emergency visits), relative to non-expansion states (which are normalized to zero).

Figure 16. State-Specific Heterogeneity in the Estimated Effect of ACA Medicaid Expansion on Combined Medicaid plus Uninsured Encounters



Source: Authors' calculations.

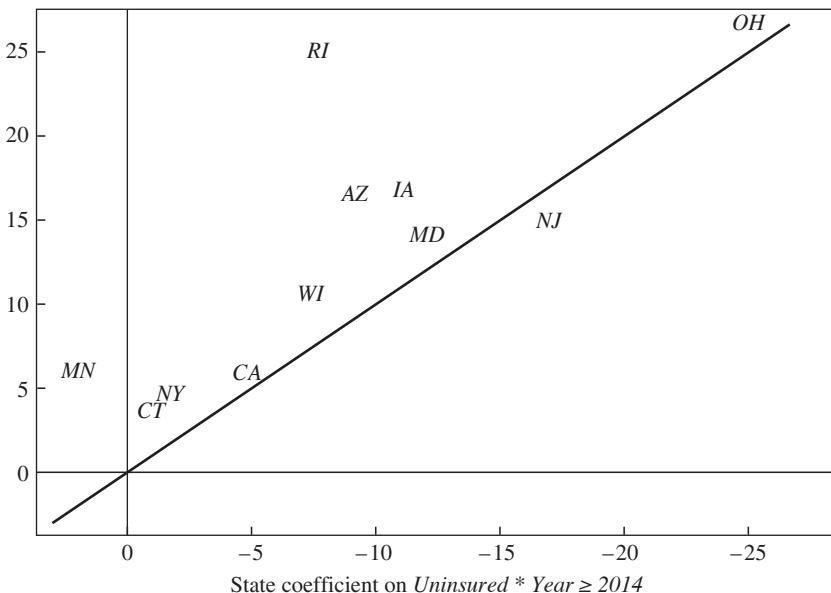
Note: State-specific difference-in-differences estimates of the effect of the ACA Medicaid expansion on total encounters (hospital and emergency department visits) combining Medicaid visits and uninsured visits are shown. The dotted line is the average. State-specific estimates include 95 percent confidence intervals based on standard errors clustered by state and year-month.

is associated with an increase in the total number of visits of roughly 4 percent. Interestingly, the effects of Medicaid expansion vary considerably across the expansion states in our sample. In Minnesota and Arizona, the difference-in-differences coefficient is roughly 10 percent, while in New Jersey and Connecticut the estimates are close to zero and are not statistically significant. In other words, some states that expanded Medicaid saw no meaningful change in visits. Additionally, we can reject the null hypothesis that all of the state-specific estimates are the same, which provides an initial piece of evidence of meaningful state-level heterogeneity in the effects of the Medicaid expansion.

To investigate the source of that heterogeneity, consider whether or not states implemented their own exchanges. Among the states in figure 16, California, Maryland, New York, Rhode Island, and Minnesota created their own marketplaces. The remaining states relied on the federal marketplace

Figure 17. Correlation between State-Specific Estimates of the Effect of ACA Medicaid Expansion on Medicaid Encounters and Effect of ACA Medicaid Expansion on Uninsured Encounters

State coefficient on *Medicaid * Year ≥ 2014*



Source: Authors' calculations.

Notes: All states above the 45-degree line (solid line) have larger increases in Medicaid visits than they have decreases in uninsured visits.

or had a federal-state partnership. New Jersey is the only state that used the federal exchange but allowed the federal marketplace to make a Medicaid eligibility determination, as all the state-based exchanges would have done (Rosenbaum and others 2016). Thus, the four states in figure 16 with the lowest Medicaid-plus-uninsured utilization effects allowed exchanges to determine eligibility, as opposed to assessing potential eligibility and then referring individuals to state Medicaid agencies.

To further explore state-level heterogeneity, we separately estimate an effect on Medicaid and an effect on uninsured emergency department visits for each state. Figure 17 plots the state-specific effects, with the effect on uninsured visits along the horizontal axis and the effect on Medicaid visits along the vertical axis. The figure suggests a natural correlation: states that experienced the largest decreases in uninsured visits after expansion saw the largest increases in Medicaid visits. The two patterns are nearly

mirror images of each other. To facilitate comparison, the figure includes a 45-degree line.

Lastly, we account for state-level heterogeneity by regressing the state-level estimates on four state-specific variables. The first is the measure of the number of individuals that likely transitioned from uninsured status to Medicaid as a result of the expansion. We aggregate these county-level estimates to construct a state-level estimate of the number of state residents transitioning from being uninsured to being on Medicaid.

The second variable is a measure of which states were more “treated” by the Medicaid expansion, based on the share of the adult population that was made newly eligible (that is, the dose measure in the SIPP transition model, described in section IV.B). For example, in New York only about 7 percent of the adult population was made eligible for Medicaid through the Medicaid expansion, while in Ohio and Rhode Island that share was closer to 33 percent. Given Medicaid’s retroactive eligibility, if any of these newly eligible individuals sought hospital treatment after the expansion they would be classified as a Medicaid patient.

The third variable we explore is a state-level measure of the total uncompensated hospital care costs per uninsured adult. This measure is constructed following Garthwaite, Gross, and Notowidigdo (2018), who study the relationship between Medicaid eligibility and uncompensated hospital care costs. We interpret this variable as reflecting a combination of the preexisting generosity of uncompensated care in the state (across hospitals) as well as the latent demand for health care among the uninsured. In other words, high spending on the uninsured by hospitals (as measured by uncompensated costs—costs for which the hospitals are not directly compensated) can arise because the uninsured are particularly sick in that state and also because the hospitals provide more uncompensated care than other states (perhaps because of the state’s generous uncompensated care policies toward hospitals). For states where uncompensated care is constrained by the willingness of hospitals to treat uninsured people (that is, where uncompensated care per capita was low), an insurance expansion could increase total utilization.

The final variable we construct is a binary indicator variable for whether the state’s exchange allowed for Medicaid eligibility determination. We hypothesize, following Hudson and Moriya (2018), that exchanges that directly enrolled Medicaid-eligible applicants would lead to higher Medicaid enrollments and thus larger impacts on hospital visits.

Table 6 reports the estimates from this regression for the outcome of Medicaid plus uninsured visits, total visits combining hospital visits and

Table 6. State-Level Heterogeneity in Effects of ACA Medicaid Expansion

	(1)	(2)	(3)	(4)	(5)
Number of individuals changing from uninsured to Medicaid	4.99 (1.43) (3.494)				3.88 (1.33) (2.921)
Share of adult population newly eligible for Medicaid		-8.69 (8.60) (1.010)			-1.11 (5.91) (0.188)
State-wide hospital uncompensated care costs per uninsured individual, 2010			-2.52 (0.79) (3.181)		-2.10 (0.70) (2.990)
Federal or state health insurance exchange eligibility determination indicator				-1.44 (1.56) (0.923)	-0.97 (1.09) (0.885)
OLS regression weighted by inverse of the standard error of state-specific difference-in-differences estimate	✓	✓	✓	✓	✓
<i>N</i> (no. of states)	11	11	11	11	11
<i>R</i> ²	0.24	0.10	0.55	0.09	0.72

Source: Authors' calculations.

Note: The dependent variable is the state-specific estimate of Medicaid expansion on total inpatient and emergency department visits, Medicaid plus uninsured. Regressions are shown for state-specific difference-in-differences estimates of Medicaid expansion on four variables to explore whether they predict the magnitude of the state-specific effect of expansion. Weighted OLS regressions are used for efficiency, where the weight is the inverse of the standard error of state-specific difference-in-differences estimate. Robust standard errors are reported in parentheses.

emergency department encounters. Columns (1) to (4) each present a specification including only one of the four state-specific variables; column (5) presents a specification that includes all of the variables. The only statistically significant predictors of variation across states are the size of the population that took up insurance and the amount of uncompensated care prior to the expansion.

The negative coefficient on uncompensated care suggests that in places where there was a lot of uncompensated care before the expansion there was a smaller increase in total hospital encounters as a result of the expansion. This suggests that a large amount of uncompensated care prior to expansion represents high utilization by the uninsured prior to the expansion. If the degree of implicit insurance via uncompensated care was relatively higher in states with high levels of uncompensated care, we might expect that the uninsured transitioning to Medicaid would not have increased utilization as much following expansion of explicit insurance through Medicaid.

We also find that in places where take-up was higher, there was a greater increase in total hospital encounters. This is consistent with the results in section IV and further suggests that gaining insurance increases the use of hospital services.

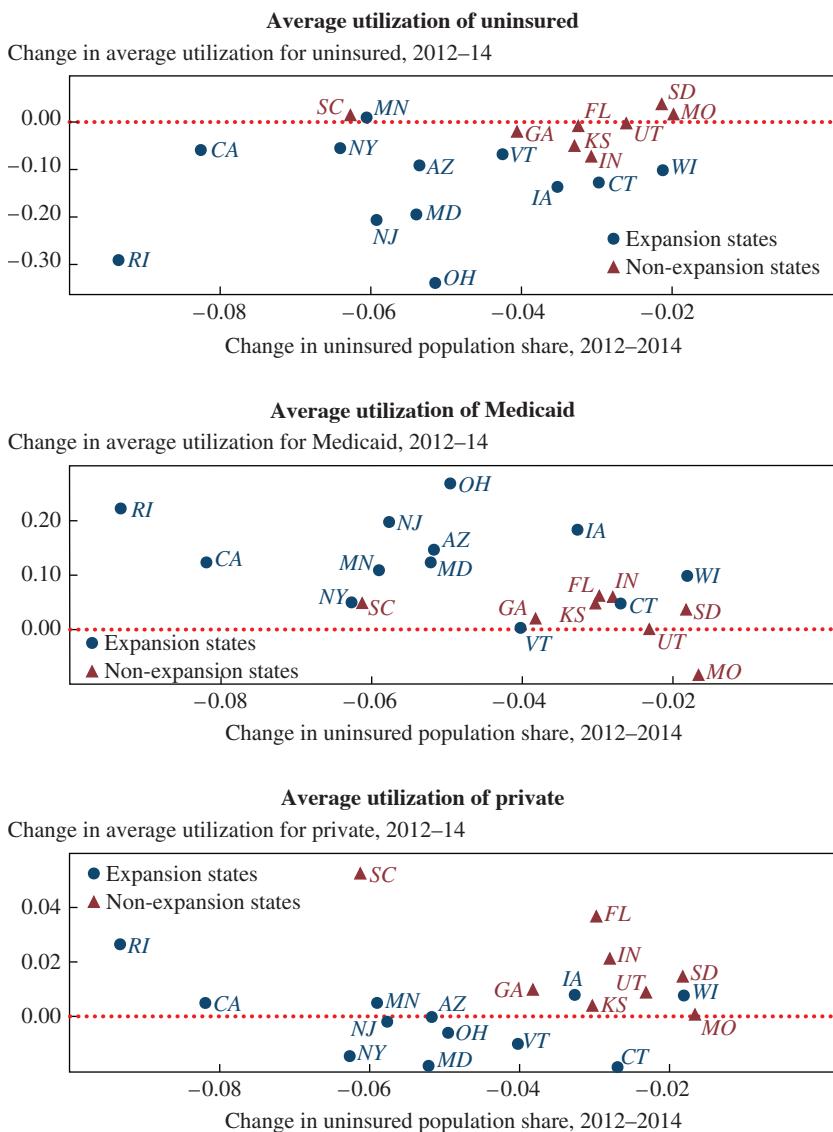
VI.B. Heterogeneity in the Target Efficiency of the ACA Expansion

A variety of factors may have led to variation in the target efficiency of the Medicaid expansion across states. Some states had built more-generous Medicaid programs before the ACA. States also varied in the share of their population that is low income and in the underlying health status of their uninsured populations. All of these factors could lead to meaningful variation in the target efficiency of the expansion.

To examine that potential variation, we study the relationship between changes in utilization and features of each state's pre-expansion market. If we observe a decline in utilization by the uninsured, then that suggests that the expansion was largely target efficient, in that those who gained coverage had a greater need for health care prior to the expansion. Conversely, if we observe an increase in the utilization by Medicaid patients, then that suggests that the pre-expansion Medicaid system was not particularly target efficient.

Figure 18 examines the relationship between the decrease in the size of a state's uninsured population and the change in hospital visits for the uninsured, Medicaid, and privately insured populations. The top panel shows that states which experienced a greater decline in the size of their uninsured populations saw larger decreases in utilization for the uninsured. This suggests that larger expansions appear to be more target efficient. That is, those gaining insurance had a greater demand for health care than those who remained uninsured.

The middle panel of figure 18 shows that states with the largest declines in their uninsured population were also those with the largest increases in the use for hospital services in the post-expansion Medicaid program. This suggests that state decisions about the generosity of the existing Medicaid program appear to have resulted in a set of uninsured residents that had a higher demand for hospital services than those who were able to qualify for social insurance. Whether or not this was optimal is a question of how much value state residents placed on access to care for various groups. It does, however, suggest that if the metric is providing formal insurance for individuals who would still otherwise consume a large amount of hospital services, then some of these existing programs were not accomplishing that goal.

Figure 18. State Heterogeneity in Targeting

Source: Authors' calculations.

Note: Data show the association between change in average utilization (for uninsured, Medicaid, and private) and the change in the share uninsured. Both are calculated as long differences between 2012 and 2014. The top panel shows that the larger reduction in average utilization among the uninsured in expansion states (relative to non-expansion states) masks considerable heterogeneity across expansion states. The pattern for average utilization for Medicaid is similar, with more variation along the vertical axis for expansion states relative to non-expansion states (middle panel). The bottom panel shows more variation in non-expansion states (in contrast to the other two).

Finally, the bottom panel of figure 18 depicts the change in the use of hospital services by the privately insured based on the change in the share uninsured. Non-expansion states are marked with triangles and show a clear pattern where states with larger declines in the share of uninsured had greater increases in the post-expansion use of hospital services by the privately insured. This suggests that the ACA marketplaces provided access to health insurance for enrollees with a greater demand for hospital services than the set of patients with prior insurance prior to the expansion.

Further evidence of target efficiency can be seen in the top panel of figure 19, which shows that states which had the highest use of hospital services for the uninsured prior to the expansion also had the largest declines in the use of hospital services by the uninsured after the expansion. While some of this relationship may be mechanical, that is, those states also had the greatest potential for a decline in hospital visits, this figure suggests that overall the expansion provided coverage for uninsured residents with the greatest demand for hospital services. This can also be seen in the bottom panel of figure 19, where states with the greatest amount of uncompensated care prior to the expansion also saw the largest declines in the use of hospital services by the remaining uninsured.

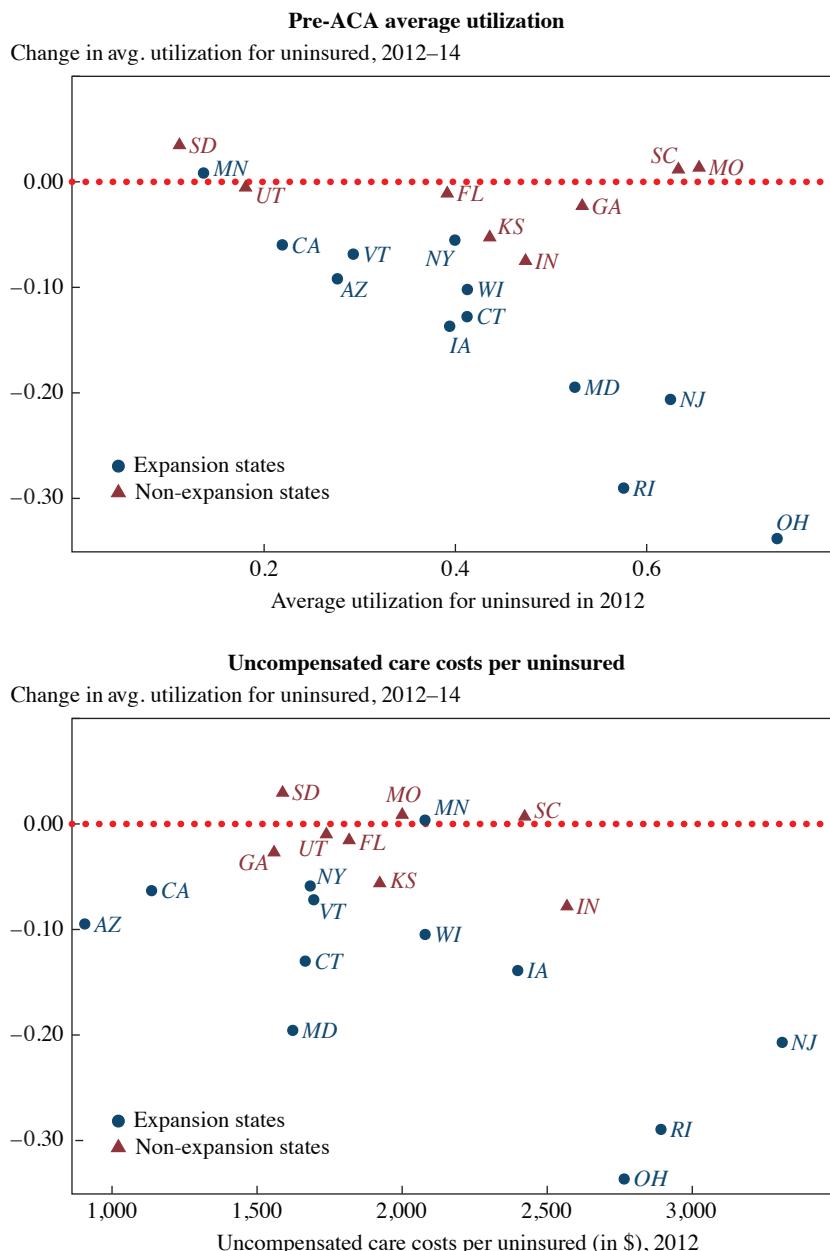
VII. The Broader Economic Impacts of Variation in the Social Safety Net

Our results demonstrate that the ACA Medicaid expansion resulted in meaningful changes in the access to and utilization of health care services. In addition, we demonstrate that there is meaningful variation in the impact of this expansion across states. This results not just from the state-level decision to expand Medicaid but is also a function of both state decisions to support the ACA and the preexisting market conditions for the uninsured.

Given the growing importance of the social safety net, this can have a variety of impacts that extend well beyond health care utilization but could lead to regional variation in a variety of economic outcomes. This includes, but is not limited to, changes in labor market structure, the market for entrepreneurs, and underlying productivity and income.

In order to understand how variation in the expansion could affect broader economic outcomes, we next summarize the relevant literature in various areas where a differential impact of Medicaid could help to shape and drive economic growth.

Figure 19. Exploring State Heterogeneity in Changes in the Average Utilization for Uninsured



Source: Authors' calculations.

VII.A. Effects of Medicaid on Health

An important contributor to economic growth and productivity is the underlying health of the population. An important question then is how does health insurance coverage affect health itself? Unfortunately, this question is not easily answered. Studies on health insurance and health need to overcome several empirical challenges in order to credibly capture the health effects of insurance. First, they need to exploit plausibly exogenous variation in health insurance, given that the insured population differs from the uninsured population. Second, credible studies need to quantify health, an outcome that is arguably multidimensional and that evolves slowly over time. A small body of research literature has overcome those challenges—the paucity of studies is remarkable given the importance of the topic.³³

First, several studies have evaluated the health effects of Medicare. Finkelstein and McKnight (2008) studied the introduction of Medicare in 1965 and found no effect of the program on aggregate death rates. Card, Dobkin, and Maestas (2008) focused on emergency hospital visits by patients who just barely qualified for Medicare based on its age 65 threshold versus patients who were too young to qualify for Medicare. Within that particular sample, the authors found a large effect of Medicare coverage on short-term mortality.

Most of the other work on this topic has focused on Medicaid. The Oregon health insurance experiment found that Medicaid coverage improved self-reported physical and mental health and increased the diagnosis of diabetes and the use of diabetes medication.³⁴ Other research has focused on Medicaid expansions before the ACA and expansions that were part of the ACA. Sommers, Baicker, and Epstein (2012) study state-by-state Medicaid expansions through a difference-in-differences framework and find a clear reduction in mortality rates after expansion. Additional research by Sommers and others (2015) and Miller and

33. We focus here on the effect of health insurance on the health of adults. A related literature has studied the health of children (Dafny and Gruber 2005) and also the long-term impacts of providing children with health insurance (Wherry and others 2017; Goodman-Bacon 2016).

34. The evidence from the Oregon health insurance experiment on blood pressure and other physical outcomes did not find statistically significant health improvements, although there exists some debate regarding the study's statistical power for some of these outcomes (see, for example, "Effects of Medicaid on Clinical Outcome" (letter to the editor), *New England Journal of Medicine*, August 8, 2013, <https://www.nejm.org/doi/full/10.1056/NEJMc1306867>).

Wherry (2017) demonstrates that the ACA's Medicaid expansions led to an improvement in self-reported health. Finally, a recent working paper has found that the Medicaid expansion led to a decrease in mortality for eligible Americans in expansion states compared to non-expansion states (Miller and others 2019).

All in all, these studies tend to find that health insurance coverage leads to improvements in health. That said, relatively few studies exist in this area, and several studies of the ACA expansion have found no effect (Mazurenko and others 2018). Moreover, the majority of studies focus on the short-run impacts of health insurance, which may be very different from the long-run impacts. Health, after all, is a stock variable (Grossman 1972), which suggests treatment effects that change over time.

Nevertheless, the research suggests that health insurance coverage reduces mortality, improves self-reported health, and improves some short-run markers of good health. One analysis found that Medicaid costs between \$327,000 to \$867,000 for every life it saves (Sommers 2017). Those estimates of the program are based solely on the effect of Medicaid on mortality, ignoring its other benefits, and suggest that Medicaid is likely a cost-effective use of government funds. To the extent that our estimates demonstrate a meaningfully different impact of the ACA expansion across states, this would lead to different impacts of the expansions on health.

VII.B. Labor Market Effects of Medicaid

Historically, most Americans have faced a remarkably tight link between health insurance coverage and employment. They could find affordable health insurance coverage by working for a large employer but would lose that coverage if they stopped working or moved to a smaller firm. As a result, expanded access to health insurance could potentially have a large effect on the labor market, allowing workers to leave their jobs without fear of losing their health insurance coverage.

To date, several studies have demonstrated a significant relationship between insurance coverage and labor supply. Garthwaite, Gross, and Notowidigdo (2014) studied a large Medicaid disenrollment in Tennessee in 2005, during which approximately 170,000 Tennessee residents lost Medicaid coverage. The authors found large increases in labor supply as a result and argued that those who lost Medicaid coverage entered the labor market in order to regain health insurance coverage. Similarly, Dague, DeLeire, and Leininger (2017) studied Wisconsin residents who were allowed onto Medicaid and found that those new Medicaid recipients became much less likely to seek employment. Kim (2016) found that

Connecticut's early expansion of Medicaid under the ACA led to a reduction in the employment rate.

At the same time, other studies have not found such a clear link between Medicaid coverage and the labor market. Leung and Mas (2018) found that the 2014 expansion of Medicaid did not meaningfully affect employment. Similarly, participants in the Oregon health insurance experiment who gained Medicaid did not become more or less likely to work (Baicker and others 2014).

This literature is thus divided between studies that have found a significant effect of Medicaid coverage on labor supply and studies that have not. One important issue in evaluating this gap in the literature is the degree to which the studies in question isolate workers who highly value health insurance. Basic economic theory suggests that the workers who value health insurance the most will be those who enter the labor market to retain access to health insurance. For instance, those who are HIV positive, who are diabetic, or who suffer from other chronic conditions find it extremely costly to be without health insurance. Such workers are difficult to isolate in the national surveys that are often used to measure employment rates and so may not have been captured by some of the previous research.

Beyond the extensive margin of labor supply, broader access to health insurance could plausibly increase entrepreneurship. Without the ACA, aspiring entrepreneurs may be locked into work for large employers. A reform that makes health insurance cheaper for small businesses and individuals might eliminate that barrier for aspiring entrepreneurs (Fairlie, Kapur, and Gates 2011).

In addition, there is a case to be made that health insurance coverage may directly increase the productivity of its beneficiaries. To begin with, there is evidence that medical treatment can increase labor supply and productivity. Berndt and others (1998) found that the treatment of clinical depression led to an increase in a self-reported composite measure of workplace performance. Garthwaite (2012) studied the removal of Vioxx from the market, a drug commonly used to treat arthritis at the time. His results suggest that a large share of Americans left the labor market once their arthritis was no longer treated. More generally, Chen and Goldman (2018) performed a meta-analysis of randomized clinical trials that evaluated the effect of medical care on productivity. The authors found that, for many disease categories, randomized trials have uncovered large productivity effects, in some cases greater than 25 percent.

So if medical care improves productivity, then health insurance, by increasing access to medical care, may also boost productivity. To our

knowledge, there exists no direct evidence for such an effect, that is, no studies have demonstrated that individuals who are given health insurance experience increases in their labor market productivity, but such a hypothesis appears warranted based on previous research. Furthermore, to the extent that these broad labor supply effects vary with the magnitude of the expansion, the variation that we identify could have meaningful economic impacts.

VII.C. Longer-Run Effects of Health Insurance Coverage

The majority of the research described here focuses on the short-run impact of health insurance coverage across a variety of outcomes. The typical study relies on a difference-in-differences regression or instrumental variables strategy that isolates the effect of health insurance over, at most, several years. It is much more challenging to study effects that evolve over decades. And yet, in the context of health insurance, longer-run effects might be very different from what we observe over only a year or two. Health is a stock variable, and so cumulative access to health care over decades can lead to dramatic consequences later (Grossman 1972).

Several studies have compiled suggestive evidence on precisely such a dynamic. Brown, Kowalski, and Lurie (2019), Miller and Wherry (2017), and Goodman-Bacon (2019) all study childhood Medicaid coverage and adult outcomes. The studies consider children who were born in particular states and particular years such that they enjoyed Medicaid coverage through their childhoods and compare them to similar children who were not covered by Medicaid. The authors then study health outcomes years later and find dramatic benefits of childhood Medicaid coverage. Adults who were covered by Medicaid as children earn more, are less likely to be disabled, and are more likely to be employed. Related work by Cohodes and others (2016) suggests that childhood Medicaid coverage also leads to increases in educational attainment. Brown, Kowalski, and Lurie (2019) estimate that the federal government recovers 57 percent of the cost of Medicaid coverage through increased tax revenue years later. Overall, we view these studies as suggestive of meaningful longer-run effects of Medicaid coverage, although more research is needed to uncover a fuller picture.

VII.D. Economic Transfers between States

Medicaid is administered by state governments but is jointly financed by federal and state governments. The amount of money from the federal

government is dictated by each state's federal medical assistance percentage (FMAP). In 2012, the average FMAP was 60 percent: for every dollar of Medicaid spending, 60 percent came from the federal rather than the state government. This average masks a great deal of variation, because each state's FMAP is determined based on the state's average personal income. States that have lower average incomes receive more federal assistance. By statute, the FMAP cannot fall below a floor of 50 percent. In fiscal year 2020, this FMAP floor applied to Alaska, California, Colorado, Connecticut, Maryland, Massachusetts, Minnesota, New Hampshire, New Jersey, New York, Virginia, Washington, and Wyoming. Many states have FMAPs well above this floor. For example, the following states had an FMAP above 70 percent: Arizona, Idaho, South Carolina, Arkansas, Kentucky, Alabama, New Mexico, West Virginia, and Mississippi.

Expansions of Medicaid have often involved enhanced FMAPs that provide more-generous federal support for the newly eligible population. For example, under the State Children's Health Insurance Program (SCHIP), states received an enhanced FMAP that ranged from 76.5 to 95 percent in fiscal year 2020. These enhanced FMAPs continued with the ACA Medicaid expansion, where the federal government pays a constant 90 percent of costs across all states regardless of the state's income.

This generous contribution combined with variation in both the expansion decision and the impact of the expansions has meaningfully shifted the distribution of transfers across states. Table 7 contains data from the Medicaid and CHIP Payment and Access Commission (MACPAC) on funding sources and enrollment for Medicaid programs by a state's expansion status. Unsurprisingly, these data show that the average expansion state had a much larger increase in Medicaid enrollment than the average non-expansion state. That said, non-expansion states also saw a nontrivial increase in the size of their Medicaid population. This is a combination of economic conditions and the welcome mat effect described in section IV, where publicity about Medicaid and the ACA individual mandate increased enrollment. Importantly, some of the increase in expansion states is also likely the result of this welcome mat effect.

These new enrollees resulted in greater spending for both sets of states. However, for expansion states there was also a meaningful increase in the share of spending coming from the federal government. This was likely driven by the more generous sharing of costs for the newly eligible cohort. In non-expansion states the share paid by the federal government was largely flat. Looking at spending per enrollee, the average expansion state saw its own spending per enrollee drop by 18 percent from 2012 to

Table 7. Characteristics of the States' Medicaid Programs

	<i>Expansion states</i>	<i>Non-expansion states</i>
Mean enrollment before expansion	1,164,453	1,175,039
Mean enrollment after expansion	1,667,961	1,443,135
% change in enrollment	43%	23%
Mean federal funding before expansion (in thousands)	\$5,613.59	\$5,339.85
Mean federal funding after expansion (in thousands)	\$8,288.20	\$6,466.15
Mean state funding before expansion (in thousands)	\$4,479.41	\$3,196.46
Mean state funding after expansion (in thousands)	\$4,776.03	\$3,829.69
% increase in total spending	29%	21%
Pre-expansion federal share	56%	63%
Post-expansion federal share	63%	63%
Average state spending per enrollee, 2012	\$3,592.68	\$2,720.30
Average state spending per enrollee, 2016	\$2,962.78	\$2,653.73
Decline in state spending per enrollee	-18%	-2%

Source: Authors' calculations.

2016. Non-expansion states saw a decline of only 2 percent over the same time period.

An economically meaningful fraction of Medicaid spending simply replaces uncompensated care that would have been provided by hospitals in that state (Garthwaite, Gross, and Notowidigdo 2018). In addition, the increased use of hospital services resulting from the ACA expansion represents an infusion of federal sources into state economies. To the extent this infusion exceeds the state's contribution to federal taxation, this shift in the distribution of federal spending could have economically meaningful effects on regional economic output. Future work should examine the potential fiscal and economic ramifications of this effect on regional economic development.

VIII. Conclusion

The United States social insurance system has meaningfully expanded over the past two decades and yet a nontrivial fraction of the United States population remains uninsured. The uninsured population is not evenly distributed across the country. Much of this variation results from state differences in decisions to adopt (mostly) federally financed social insurance programs. As we consider expanding the social safety net further

to address the remaining uninsured, it is important to have a full understanding of both the impact of the ACA and variation in its impact across the country.

This paper's results lead to three main conclusions. First, the paper provides evidence that the market-wide impact of the ACA has been to increase the use of hospital services. That increase primarily occurred through outpatient visits to the emergency department for conditions that might have been deferrable and treatable outside of the emergency department. Our preferred estimate suggests an approximately 20 percent increase in the use of the hospital for the newly insured.

It is unclear whether or not that increase in emergency department visits is socially efficient. On the one hand, emergency departments are believed to be especially expensive venues to treat deferrable conditions. An increase in emergency department visits for such conditions thus indicates an inefficient use of resources, since those patients could have been treated in lower-cost settings. On the other hand, it is unclear whether the emergency department is truly a higher-cost setting. If the higher utilization is completely accounted for in slack capacity of the emergency department, the marginal costs could be quite low. However, the presence of a large number of potential uninsured patients could distort the fixed cost decision of the hospital for the optimal size of its emergency department, which means that evaluating economic costs using only the marginal cost may not be appropriate. In addition, other studies on health insurance, catalogued above, suggest that insurance coverage decreases mortality rates. It is difficult to assess whether that decrease in mortality rates is driven by the increase in utilization, but such a mechanism is, at the very least, plausible. In that case, the increased spending on hospital services likely increases social welfare. More research is needed to assess both the true increased economic costs from this increased utilization and whether those costs are greater than the societal benefits.

Second, beyond the increase in utilization, this paper also demonstrates variation in the impact of the ACA across states. The results suggest that some of that variation can be explained by the size of the expansion and the preexisting levels of uncompensated hospital care. There is room for more work unpacking the mechanism behind how a uniform federal policy can have such different effects across the country. Still, these estimates should raise broad concerns about the ability to generalize from a single setting to the entire nation. The variation that we estimate demonstrates that even small differences in the implementation of a uniform policy can cause meaningfully different outcomes. Beyond demonstrating important

questions about external validity, this variation is something that policy-makers may hope to harness as they attempt to develop a nationwide health care safety net. Given the important economic impact of health insurance, failing to understand and plan for this variation could lead to meaningfully different regional economic impacts from federal policies. For this reason, we believe that far more research is needed to understand the mechanisms underlying our results. These mechanisms could be useful policy levers for elected officials as they attempt to develop a robust social safety net.³⁵

Finally, we also study the target efficiency of the Medicaid expansion, the degree to which it gave coverage to those who most needed it. The estimates suggest that the existing safety net's policy of categorical eligibility was not more target efficient than the Medicaid expansion. As federal policymakers consider the optimal size and nature of the safety net it may be necessary to more clearly account for the degree to which existing market features can drive the efficiency of federal spending.

Taken together, this paper's estimates lead to several implications for policy. First, the results clearly suggest that the ACA's Medicaid expansions increased hospital utilization, including use of the emergency department. That finding should inform analysts seeking to predict the cost of future expansions. Moreover, if policymakers plan to expand coverage in areas with little excess supply of health care, then they should also consider complementary policies to expand the capacity of the local health care system. Second, policymakers should view evidence of state-specific heterogeneity as perhaps suggesting that some federal laws should leave room for state-by-state customization. Health care is a fundamentally local product, and thus markets for health care act very differently across the country. Finally, this paper's estimates suggest that the ACA Medicaid expansion was well targeted. To the extent that policymakers are worried about targeting in a social insurance program that is available based only on income, our estimates should decrease these concerns.

35. Another implication of this across-state heterogeneity is that it may affect the interpretation of future difference-in-differences studies of the ACA. Those future studies will be carried out over longer time periods, particularly as other states choose to expand Medicaid. Recent research emphasizes that difference-in-differences studies with variation in treatment timing need to be interpreted carefully when there is treatment-effect heterogeneity (Goodman-Bacon 2018), and so the results above imply that future researchers need to pay close attention to state-level heterogeneity when comparing results across studies that are estimated in different time periods or sets of expansion and non-expansion states.

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References

- Anderson, Michael L., Carlos Dobkin, and Tal Gross. 2012. "The Effect of Health Insurance Coverage on the Use of Medical Services." *American Economic Journal: Economic Policy* 4, no. 1: 1–27. <https://doi.org/10.1257/pol.4.1.1>.
- Anderson, Michael L., Carlos Dobkin, and Tal Gross. 2013. "The Effect of Health Insurance on Emergency Department Visits: Evidence from an Age-Based Eligibility Threshold." *Review of Economics and Statistics* 96, no. 1: 189–95. https://doi.org/10.1162/REST_a_00378.
- Antwi, Yaa Akosa, Asako S. Moriya, Kosali Simon, and Benjamin D. Sommers. "Changes in Emergency Department Use among Young Adults after the Patient Protection and Affordable Care Act's Dependent Coverage Provision." *Annals of Emergency Medicine* 65, no. 6: 664–72.
- Armour, Stephanie. 2019. "When Patients Can't Pay, Many Hospitals Are Suing." *Wall Street Journal*, June 25. <https://www.wsj.com/articles/nonprofit-hospitals-criticized-for-debt-collection-tactics-11561467600>.
- Baicker, Katherine, Amy Finkelstein, Jae Song, and Sarah L. Taubman. 2014. "The Impact of Medicaid on Labor Market Activity and Program Participation: Evidence from the Oregon Health Insurance Experiment." *American Economic Review* 104, no. 5: 322–28. <https://doi.org/10.1257/aer.104.5.322>.
- Berndt, Ernst R., Stan N. Finkelstein, Paul E. Greenberg, Robert H. Howland, Alison Keith, A. John Rush, James Russell, and Martin B. Keller. 1998. "Workplace Performance Effects from Chronic Depression and Its Treatment." *Journal of Health Economics* 17, no. 5: 511–35.
- Besanko, David, David Dranove, and Craig Garthwaite. 2016. "Insurance and the High Prices of Pharmaceuticals." Working Paper 22353. Cambridge, Mass.: National Bureau of Economic Research. <https://www.nber.org/papers/w22353>.
- Blase, Brian. 2016. "Medicaid Expansion Causes Surge in ER Visits." *Forbes*, October 20. <https://www.forbes.com/sites/theapotheccary/2016/10/20/medicaid-expansion-causes-surge-in-er-visits/>.
- Blavin, Fredric, Michael Karpman, Genevieve M. Kenney, and Benjamin D. Sommers. 2018. "Medicaid versus Marketplace Coverage for Near-Poor Adults: Effects on Out-of-Pocket Spending and Coverage." *Health Affairs* 37, no. 2 (2018): 299–307.
- Brown, David, Amanda Kowalski, and Ithai Lurie. 2019. "Long-Term Impacts of Childhood Medicaid Expansions on Outcomes in Adulthood." *Review of Economic Studies*. <https://doi.org/10.1093/restud/rdz039>.
- Card, David, Carlos Dobkin, and Nicole Maestas. 2008. "The Impact of Nearly Universal Insurance Coverage on Health Care Utilization: Evidence from Medicare." *American Economic Review* 98, no. 5: 2242–58. <https://doi.org/10.1257/aer.98.5.2242>.
- Chen, Alice, and Dana Goldman. 2018. "Productivity Benefits of Medical Care: Evidence from US-Based Randomized Clinical Trials." *Value in Health* 21, no. 8: 905–10.

- Cohodes, Sarah R., Daniel S. Grossman, Samuel A. Kleiner, and Michael F. Lovenheim. 2016. “The Effect of Child Health Insurance Access on Schooling: Evidence from Public Insurance Expansions.” *Journal of Human Resources* 51, no. 3: 727–59.
- Cohn, Jonathan. 2004. “Uncharitable?” *New York Times*, December 19. <https://www.nytimes.com/2004/12/19/magazine/uncharitable.html>.
- Dafny, Leemore, and Jonathan Gruber. 2005. “Public Insurance and Child Hospitalizations: Access and Efficiency Effects.” *Journal of Public Economics* 89, no. 1: 109–29. <https://doi.org/10.1016/j.jpubeco.2003.05.004>.
- Dague, Laura, Thomas DeLeire, and Lindsey Leininger. 2017. “The Effect of Public Insurance Coverage for Childless Adults on Labor Supply.” *American Economic Journal: Economic Policy* 9, no. 2: 124–54. <https://doi.org/10.1257/pol.20150059>.
- DeLeire, Thomas, Laura Dague, Lindsey Leininger, Kristen Voskuil, and Donna Friedsam. 2013. “Wisconsin Experience Indicates That Expanding Public Insurance to Low-Income Childless Adults Has Health Care Impacts.” *Health Affairs* 32, no. 6: 1037–45.
- Dranove, David, Craig Garthwaite, and Christopher Ody. 2016. “Uncompensated Care Decreased at Hospitals in Medicaid Expansion States but Not at Hospitals in Nonexpansion States.” *Health Affairs* 35, no. 8: 1471–79.
- Dresden, Scott M., Emilie S. Powell, Raymond Kang, Megan McHugh, Andrew J. Cooper, and Joe Feinglass. 2017. “Increased Emergency Department Use in Illinois after Implementation of the Patient Protection and Affordable Care Act.” *Annals of Emergency Medicine* 69, no. 2: 172–80. <https://doi.org/10.1016/j.annemergmed.2016.06.026>.
- Fairlie, Robert W., Kanika Kapur, and Susan Gates. 2011. “Is Employer-Based Health Insurance a Barrier to Entrepreneurship?” *Journal of Health Economics* 30, no. 1: 146–62. <https://doi.org/10.1016/j.jhealeco.2010.09.003>.
- Finkelstein, Amy, Nathaniel Hendren, and Erzo F. P. Luttmer. 2019. “The Value of Medicaid: Interpreting Results from the Oregon Health Insurance Experiment.” *Journal of Political Economy* 127, no. 6: 2836–74.
- Finkelstein, Amy, Nathaniel Hendren, and Mark Shepard. 2019. “Subsidizing Health Insurance for Low-Income Adults: Evidence from Massachusetts.” *American Economic Review* 109, no. 4: 1530–67. <https://doi.org/10.1257/aer.20171455>.
- Finkelstein, Amy, Neale Mahoney, and Matthew J. Notowidigdo. 2018. “What Does (Formal) Health Insurance Do, and for Whom?” *Annual Review of Economics* 10:261–86. <https://doi.org/10.1146/annurev-economics-080217-053608>.
- Finkelstein, Amy, and Robin McKnight. 2008. “What Did Medicare Do? The Initial Impact of Medicare on Mortality and Out-of-Pocket Medical Spending.” *Journal of Public Economics* 92, no. 7: 1644–68.
- Garfield, Rachel, Kendal Orgera, and Anthony Damico. 2020. “The Coverage Gap: Uninsured Poor Adults in States That Do Not Expand Medicaid.” Issue

- Brief. Kaiser Family Foundation. <https://www.kff.org/medicaid/issue-brief/the-coverage-gap-uninsured-poor-adults-in-states-that-do-not-expand-medicaid/>.
- Garthwaite, Craig L. 2012. "The Economic Benefits of Pharmaceutical Innovations: The Case of Cox-2 Inhibitors." *American Economic Journal: Applied Economics* 4, no. 3: 116–37. <https://doi.org/10.1257/app.4.3.116>.
- Garthwaite, Craig, Tal Gross, and Matthew J. Notowidigdo. 2014. "Public Health Insurance, Labor Supply, and Employment Lock." *Quarterly Journal of Economics* 129, no. 2: 653–96.
- Garthwaite, Craig, Tal Gross, and Matthew J. Notowidigdo. 2018. "Hospitals as Insurers of Last Resort." *American Economic Journal: Applied Economics* 10, no. 1: 1–39. <https://doi.org/10.1257/app.20150581>.
- Garthwaite, Craig, Tal Gross, Matthew Notowidigdo, and John A. Graves. 2017. "Insurance Expansion and Hospital Emergency Department Access: Evidence from the Affordable Care Act." *Annals of Internal Medicine* 166, no. 3: 172–79. <https://doi.org/10.7326/M16-0086>.
- Goodman-Bacon, Andrew. 2016. "The Long-Run Effects of Childhood Insurance Coverage: Medicaid Implementation, Adult Health, and Labor Market Outcomes." Working Paper 22899. Cambridge, Mass.: National Bureau of Economic Research. <https://www.nber.org/papers/w22899>.
- Goodman-Bacon, Andrew. 2018. "Difference-in-Differences with Variation in Treatment Timing." Working Paper 25018. Cambridge, Mass.: National Bureau of Economic Research. <https://www.nber.org/papers/w25018>.
- Graves, John, Laura Hatfield, William J. Blot, Nancy Keating, and J. Michael McWilliams. 2020. "Medicaid Expansion Slowed Rates of Health Decline for Low-Income Adults in Southern States." *Health Affairs* 39, no. 1:67–76. <https://doi.org/10.1377/hlthaff.2019.00929>.
- Graves, John, Laura Hatfield, and J. Michael McWilliams. 2020. "Difference-in-Difference Estimation for Transitions in Discrete Outcomes: Insurance Transitions after the Affordable Care Act's Medicaid Expansion." Working Paper.
- Grossman, Michael. 1972. "On the Concept of Health Capital and the Demand for Health." *Journal of Political Economy* 80, no. 2: 223–55.
- Haley, Jennifer, Stephen Zuckerman, Michael Karpman, Sharon Long, Lea Bart, and Joshua Aarons. 2018. "Adults' Uninsurance Rates Increased by 2018, Especially in States That Did Not Expand Medicaid—Leaving Gaps in Coverage, Access, and Affordability." Blog post, September 6, Health Affairs, Bethesda. <https://www.healthaffairs.org/do/10.1377/hblog20180924.928969/full/>.
- Heavrin, Benjamin S., Rongwei Fu, Jin H. Han, Alan B. Storrow, and Robert A. Lowe. 2011. "An Evaluation of Statewide Emergency Department Utilization Following Tennessee Medicaid Disenrollment." *Academic Emergency Medicine* 18, no. 11: 1121–28. <https://doi.org/10.1111/j.1553-2712.2011.01204.x>.
- Hernandez-Boussard, Tina, Carson S. Burns, N. Ewen Wang, Laurence C. Baker, and Benjamin A. Goldstein. 2014. "The Affordable Care Act Reduces Emergency

- Department Use by Young Adults: Evidence from Three States.” *Health Affairs* 33, no. 9: 1648–54.
- Hudson, Julie L., and Asako S. Moriya. 2018. “Association between Marketplace Policy and Public Coverage among Medicaid or Children’s Health Insurance Program–Eligible Children and Parents.” *JAMA Pediatrics* 172, no. 9: 881–82. <https://doi.org/10.1001/jamapediatrics.2018.1497>.
- Kim, Daeho. 2016. “Health Insurance and Labor Supply: Evidence from the Affordable Care Act Early Medicaid Expansion in Connecticut.” Working Paper. <https://doi.org/10.2139/ssrn.2785938>.
- Kliff, Sarah. 2014. “Study: Expanding Medicaid Doesn’t Reduce ER Trips. It Increases Them.” *Washington Post*, January 2. <https://www.washingtonpost.com/news/wonk/wp/2014/01/02/study-expanding-medicaid-doesnt-reduce-er-trips-it-increases-them/>.
- Leung, Pauline, and Alexandre Mas. 2018. “Employment Effects of the Affordable Care Act Medicaid Expansions.” *Industrial Relations* 57, no. 2: 206–34. <https://doi.org/10.1111/irel.12207>.
- Long, Sharon K., Stephen Zuckerman, and John A. Graves. 2006. “Are Adults Benefiting from State Coverage Expansions? Public Coverage Does Increase as a Result of States’ Program Expansions, but Sometimes at the Expense of Private Coverage.” *Health Affairs* 25, suppl. 1: W1–W14. <https://doi.org/10.1377/hlthaff.25.w1>.
- Mahoney, Neale. 2015. “Bankruptcy as Implicit Health Insurance.” *American Economic Review* 105, no. 2: 710–46. <https://doi.org/10.1257/aer.20131408>.
- Mazurenko, Olena, Casey P. Balio, Rajender Agarwal, Aaron E. Carroll, and Nir Menachemi. 2018. “The Effects of Medicaid Expansion under the ACA: A Systematic Review.” *Health Affairs* 37, no. 6: 944–50.
- Miller, Sarah. 2012. “The Effect of Insurance on Emergency Room Visits: An Analysis of the 2006 Massachusetts Health Reform.” *Journal of Public Economics* 96, nos. 11–12: 893–908. <https://doi.org/10.1016/j.jpubeco.2012.07.004>.
- Miller, Sarah, and Laura Wherry. 2017. “Health and Access to Care during the First Two Years of the ACA Medicaid Expansions.” *New England Journal of Medicine* 376: 947–56.
- Miller, Sarah, Sean Altekroose, Norman Johnson, and Laura R. Wherry. 2019. “Medicaid and Mortality: New Evidence from Linked Survey and Administrative Data.” Working Paper 26081. Cambridge, Mass.: National Bureau of Economic Research.
- Mulcahy, Andrew, Katherine Harris, Kenneth Finegold, Arthur Kellermann, Laurel Edelman, and Benjamin D. Sommers. 2013. “Insurance Coverage of Emergency Care for Young Adults under Health Reform.” *New England Journal of Medicine* 368, no. 22: 2105–12. <https://doi.org/10.1056/NEJMsa1212779>.
- Nikpay, Sayeh, Seth Freedman, Helen Levy, and Tom Buchmueller. 2017. “Effect of the Affordable Care Act Medicaid Expansion on Emergency Department Visits: Evidence from State-Level Emergency Department Databases.”

- Annals of Emergency Medicine* 70, no. 2: 215–25.e6. <https://doi.org/10.1016/j.annemergmed.2017.03.023>.
- Nyman, John A. 1998. “Theory of Health Insurance.” *Journal of Health Administration Education* 16, no. 1: 41–66.
- Richards, Michael R., Sayeh S. Nikpay, and John A. Graves. 2016. “The Growing Integration of Physician Practices: With a Medicaid Side Effect.” *Medical Care* 54, no. 7: 714–18. <https://doi.org/10.1097/MLR.0000000000000546>.
- Rosenbaum, Sara, Sara Schmucker, Sara Rothenberg, and Rachel Gunsalus. 2016. “Streamlining Medicaid Enrollment: The Role of the Health Insurance Marketplaces and the Impact of State Policies.” Issue Brief 1869, vol. 8. Washington: Commonwealth Fund. <https://www.commonwealthfund.org/publications/issue-briefs/2016/mar/streamlining-medicaid-enrollment-role-health-insurance>.
- Rudowitz, Robin, Elisabeth Hinton, and Larisa Antonisse. 2018. “Medicaid Enrollment and Spending Growth: FY 2018 and 2019.” Blog post, October 25, Kaiser Family Foundation. <https://www.kff.org/medicaid/issue-brief/medicaid-enrollment-spending-growth-fy-2018-2019/>.
- Skinner, Jonathan. 2012. “Causes and Consequences of Regional Variations in Health Care.” In *Handbook of Health Economics*, vol. 2, edited by Mark V. Pauly, Thomas G. McGuire, and Pedro P. Barros. Waltham, Mass.: Elsevier. <https://doi.org/10.1016/B978-0-444-53592-4.00002-5>.
- Smulowitz, Peter B., James O’Malley, Xiaowen Yang, and Bruce E. Landon. 2014. “Increased Use of the Emergency Department after Health Care Reform in Massachusetts.” *Annals of Emergency Medicine* 64, no. 2: 107–15, 115.e1-3. <https://doi.org/10.1016/j.annemergmed.2014.02.011>.
- Sommers, Benjamin D. 2017. “State Medicaid Expansions and Mortality, Revisited: A Cost-Benefit Analysis.” *American Journal of Health Economics* 3, no. 5: 392–421. https://doi.org/10.1162/ajhe_a_00080.
- Sommers, Benjamin D., Katherine Baicker, and Arnold M. Epstein. 2012. “Mortality and Access to Care among Adults after State Medicaid Expansions.” *New England Journal of Medicine* 367, no. 11: 1025–34. <https://doi.org/10.1056/NEJMsa1202099>.
- Sommers, Benjamin D., Robert J. Blendon, E. John Orav, and Arnold M. Epstein. 2016. “Changes in Utilization and Health among Low-Income Adults after Medicaid Expansion or Expanded Private Insurance.” *JAMA Internal Medicine* 176, no. 10: 1501–9. <https://doi.org/10.1001/jamainternmed.2016.4419>.
- Sommers, Benjamin D., Munira Z. Gunja, Kenneth Finegold, and Thomas Musco. 2015. “Changes in Self-Reported Insurance Coverage, Access to Care, and Health under the Affordable Care Act.” *JAMA* 314, no. 4: 366–74. <https://doi.org/10.1001/jama.2015.8421>.
- Taubman, Sarah L., Heidi L. Allen, Bill J. Wright, Katherine Baicker, and Amy Finkelstein. 2014. “Medicaid Increases Emergency-Department Use: Evidence from Oregon’s Health Insurance Experiment.” *Science* 343, no. 6168: 263–68. <https://doi.org/10.1126/science.1246183>.

- Thomas, Wendi C. 2019. “The Nonprofit Hospital That Makes Millions, Owns a Collection Agency and Relentlessly Sues the Poor.” *ProPublica*, June 27. <https://www.propublica.org/article/methodist-le-bonheur-healthcare-sues-poor-medical-debt>.
- Wherry, Laura R., Sarah Miller, Robert Kaestner, and Bruce D. Meyer. 2017. “Childhood Medicaid Coverage and Later-Life Health Care Utilization.” *Review of Economics and Statistics* 100, no. 2: 287–302. https://doi.org/10.1162/REST_a_00677.
- Wilson, Scott, and Ovetta Wiggins. 2013. “Obama Defends Health-Care Law, Calls Coverage ‘a Right.’” *Washington Post*, September 26. https://www.washingtonpost.com/politics/obama-defends-health-care-law-calling-health-insurance-a-right/2013/09/26/9e1d946e-26b8-11e3-b75d-5b7f66349852_story.html.

Comments and Discussion

COMMENT BY

AMY FINKELSTEIN This is an extremely nice paper which brings fantastic, novel national data to bear on a question that is simultaneously both timely and perennial: How do health insurance expansions affect health care utilization? To study this, the authors take advantage of a rich database that covers essentially all hospital admissions and emergency room visits in about half of the states. They use these data to study the impact of the expansion of Medicaid under the Affordable Care Act (ACA) to previously ineligible low-income adults. Their empirical strategy leverages the fact that some states expanded Medicaid—the public health insurance program for low-income adults—while others did not. They find that the Medicaid expansions increased both hospital admissions and emergency room visits but that effects were quite heterogeneous across states. The heterogeneity of impacts across states is intriguing—and highly related to a rich existing Dartmouth Atlas Project literature documenting substantial geographic variation in health care provision across the United States. My fellow discussant covers this aspect of the work very well. I will instead confine my remarks to two sets of comments.

My first set of comments takes a step back from the paper to provide some perspective. Readers not deeply steeped in health care policy debates would be forgiven for asking: Why, in 2019, is it still a question whether health insurance increases health care utilization? Health insurance by design lowers the price individuals pay for their medical care; isn't it pretty well established that demand curves tend to slope down? My comments here are designed to help place the current paper in the larger context.

My second set of comments offers some speculations on where we might go next. Here I draw on recent research (much of which is conducted by

combinations of the current authors) that suggests that the *direct* effects of Medicaid expansions on the newly insured may be only part of the story of the total impact of Medicaid; there are also substantial *indirect* beneficiaries of Medicaid expansions which warrant further investigation.

DIRECT EFFECTS OF MEDICAID EXPANSIONS ON HEALTH CARE USE: DEMAND CURVES SLOPE DOWN

Theories. Health insurance, by design, lowers the price individuals pay for their medical care. One might think it therefore obvious that health insurance increases use of health care, that is, that the demand curve for medical care slopes downward. Yet, in the context of health care, there are (at least) two other views.

One view is rooted in the notion that health care is not like other goods; it is determined by needs, not by economic factors. Or, as an economist might put it, the demand for health care is completely inelastic with respect to its price. Malcolm Gladwell has forcefully articulated this view in a 2005 *New Yorker* article tellingly entitled “The Moral-Hazard Myth” (Gladwell 2005). He writes: “The moral-hazard argument makes sense . . . only if we consume health care in the same way that we consume other consumer goods, and to [some] economists . . . this assumption is plainly absurd. We go to the doctor grudgingly, only because we’re sick.” According to this view, health insurance will not change health care use.

A second view holds that health insurance will actually *reduce* health care use: demand for health care slopes up! This view is rooted in two related hypotheses. One is the conjecture that health insurance will improve people’s health by increasing timely and effective medical care (for example, preventive care or better management of chronic conditions) and that this improved health will in turn reduce health care utilization. Another version focuses on the idea that health insurance will make the provision of health care more efficient, thus reducing health care spending. In particular, although most health care providers in the United States can choose whether or not to see patients, emergency rooms cannot; the Emergency Medical Treatment and Active Labor Act (EMTALA) requires hospitals to provide emergency medical treatment to all patients.

There is therefore widespread speculation that one of the benefits of providing health insurance to previously uninsured individuals is to get them out of the expensive emergency room and into cheaper primary care. Indeed, this has become a leitmotif of advocates of expanding health insurance coverage in the United States. For example, in making the case that Michigan should expand Medicaid coverage under the ACA, Republican

governor Rick Snyder's policy team argued: "Today, uninsured citizens often turn to emergency rooms for non-urgent care because they don't have access to primary care doctors—leading to crowded emergency rooms, longer wait times and higher cost. By expanding Medicaid, those without insurance will have access to primary care, lowering costs and improving overall health" (Michigan State 2013).

Evidence. With this set of theories by way of background we can put this part of the paper in perspective: it is yet another in a long line of papers providing compelling evidence that in health care, as with most goods, demand curves slope down. And yet, despite a large body of existing evidence on this point, the preceding discussion illustrates how timely and well-crafted papers such as this one are unfortunately still needed to hammer yet more nails into this coffin.

An enormous body of empirical literature has provided compelling empirical evidence that health insurance increases health care spending. There have been, to date, three randomized evaluations of health insurance coverage in the United States, all of which focus on non-elderly populations, primarily adults, and all of which find that health insurance increases health care spending. The first was the famous RAND health insurance experiment of the 1970s, which randomly assigned different cost sharing provisions (that is, copays and deductibles) across about 2,000 non-elderly families for three to five years (Newhouse 1993; Aron-Dine, Einav, and Finkelstein 2013). Second, the 2008 Oregon health insurance experiment randomly assigned Medicaid for about two years to about 10,000 uninsured adults below the federal poverty line (Finkelstein and others 2012; Baicker and Finkelstein 2013; Baicker and others 2013; Baicker and others 2014; Taubman and others 2014; Finkelstein and others 2016). Finally, the 2007–2009 Accelerated Benefits Demonstration randomly assigned public health insurance to about 1,000 uninsured adults on Social Security disability insurance during their two-year waiting period for Medicare (Michalopoulos and others 2011).

In addition to the evidence from randomized evaluations, there is a wealth of evidence from quasi-experimental studies that health insurance increases health care spending. These studies exploit variation in health insurance coverage arising from, among other things, the introduction of Medicare coverage for the elderly both in calendar time (1965) and over the life cycle (at age 65), the staggered introduction of Medicaid coverage by states in the 1960s, the staggered expansions by states of Medicaid coverage to low-income women and children in the 1980s and 1990s, the

more recent Medicaid expansions under the ACA, and the sharp change in health insurance coverage when individuals enter the famous “donut hole” for prescription drug coverage in Medicare Part D. Einav and Finkelstein (2018) and Finkelstein, Mahoney, and Notowidigdo (2018) provide a more detailed discussion of this quasi-experimental literature.

According to a 2015 survey by the IGM Economic Experts Panel, only 7 percent of economists surveyed agree with the statement “expanding health insurance to more people through the ACA’s public subsidies and Medicaid expansion will reduce total healthcare spending in the economy”—and none strongly agree (IGM Forum 2015). Unfortunately, despite the overwhelming empirical evidence and the near consensus among economic experts that health insurance expansions increase health care spending, the general public is not yet convinced. I am grateful to Garthwaite and his colleagues for being willing to undertake the important but often thankless task of continuing to beat this dead horse.

INDIRECT EFFECTS OF MEDICAID EXPANSIONS

Providers of uncompensated care. Compared to the copious existing evidence on the direct impacts of Medicaid expansions on the recipients, there is relatively little evidence on what is likely as important a group of beneficiaries: those actors who were previously covering the costs of providing care to the low-income uninsured. This is an important direction for further work, as it likely affects both the economic impact and politics of public health insurance expansions.

The history and policies of health insurance in the United States strongly hint at the existence of substantial indirect beneficiaries beyond those newly covered by insurance. For example, the first wide-scale formal health insurance plans in the United States, the Blue Cross hospital insurance plans, were created during the Great Depression to provide financial help not only to patients but also to the hospitals that served them. As one hospital executive from the time recalled, “I could remember the difficulties we had then, trying to keep our doors open. . . . People brought chickens in and meat to pay their bills. They would paint or do work around the hospital of some kind” (Cunningham and Cunningham 1997, 9–10). In more recent times, hospitals have been an important lobbying force for Medicaid expansions under the ACA, and against their subsequent repeal, arguing that increases in the number of uninsured patients would be financially devastating (Ollove 2013; Goldstein 2016).

The uninsured receive substantial implicit insurance (Mahoney 2015; Dobkin and others 2018). Estimates suggest that the uninsured pay only

20–35 cents per dollar of expenditures on their medical care (Coughlin and others 2014; Hadley and others 2008; Finkelstein, Hendren, and Luttmer 2019). This implicit insurance arises due to a host of factors. For example, the federal EMTALA requires hospitals to provide emergency care on credit and prohibits them from delaying treatment to inquire about insurance status or means of payment. As a matter of practice, many hospitals report providing nonemergency medical care on credit as well (IRS 2007). Nonprofit hospitals—which constitute approximately 70 percent of all hospitals—are required to provide a community benefit in exchange for federal, state, and local tax exemptions; charity care, along with medical research and teaching, is one way that hospitals can fulfill this requirement (U.S. Government Accountability Office 2008; Nicholson and others 2000). In addition, a number of states have charity care pools that redistribute funding to hospitals based on the volume of uncompensated care (Dranove, Garthwaite, and Ody 2016). Finally, even when medical providers wish to seek payment for medical services, a number of factors limit their recovery rates, generating *ex post* charity care—that is, bad debt. The uninsured have disproportionately low incomes, and many have very few assets (Mahoney 2015); as a result, medical providers typically recover only about 10–20 percent of bills submitted to uninsured individuals (LeCuyer and Singhal 2007).

As a result, when the previously uninsured are covered by a Medicaid expansion, those who were previously bearing the cost of informally insuring the uninsured also benefit. An open and challenging question concerns the economic incidence of this informal insurance. But we have some suggestive evidence already.

In the first instance, implicit insurance for the uninsured seems to be directly financed by hospitals and the public sector. For example, Garthwaite, Gross, and Notowidigdo (2018) estimate that each uninsured individual costs hospitals approximately \$800 per year in uncompensated care costs. Likewise there is evidence that states that expanded Medicaid under the ACA experienced a decline in hospital uncompensated care costs relative to nonexpansion states (Dranove, Garthwaite, and Ody 2016). There are also a number of ways the public sector pays for implicit insurance, including federal disproportionate share hospital (DSH) payments and state uncompensated care pools that provide funding to hospitals that face bad debt from unpaid medical bills and funding shortfalls due to providing uncompensated care to the uninsured seeking emergency medical treatment (Hadley and others 2008). As a result, formal health insurance

expansions are also accompanied by a reduction of such public funding (Rudowitz 2013; Kolstad and Kowalski 2012).

The ultimate economic incidence of changes in implicit insurance payments due to formal health insurance is conceptually complicated and empirically elusive. The list of potentially affected parties is long and includes shareholders (at for-profit hospitals), buyers (insurance companies and patients), suppliers (for example, employees and prescription drug and medical device manufacturers), hospital competitors (community health clinics), and local, state, and federal governments. Interestingly, many policymakers either implicitly or explicitly assume that hospitals simply pass on uncompensated care costs to privately insured patients. For example, the text of the ACA (42 U.S.C. 18091) states, “to pay for [uncompensated care], health care providers pass on the cost to private insurers, which pass on the cost to families. This cost-shifting increases family premiums by on average over \$1,000 a year. By significantly reducing the number of the uninsured, the requirement, together with the other provisions of this Act, will lower health insurance premiums.” Cost shifting was also cited by Chief Justice Roberts in the Supreme Court decision upholding the ACA’s constitutionality (*National Federation of Independent Business v. Sebelius*, 567 U.S. 1, 2012). Despite this widespread assumption of substantial cost shifting, there is limited empirical evidence of the ability of hospitals to actually pass on uncompensated care costs. Garthwaite, Gross, and Notowidigdo (2018) show that increases in the uninsurance rate are associated with a decline in hospital operating (profit) margins. This indicates that hospitals are not able to fully pass on increased uncompensated care costs, at least over the relatively short time horizon that Garthwaite and others examine.

The previously insured. Finally, but relatedly, another group of actors potentially affected by health insurance expansions are the previously insured. Market-wide expansions in insurance coverage may well have general equilibrium effects on those whose insurance is not affected. Here, however, the sign of any such effects is theoretically unclear, and the empirical evidence is limited.

On the one hand, if the supply of health care inputs is upward sloping, an expansion of health insurance to one group—and with it increased demand for health care by that group—may reduce care for the previously uninsured. This seems particularly plausible for physicians, where supply is constrained by the American Medical Association’s determination of the number of residency slots. Consistent with this, Garthwaite

(2012) finds that the expansion of public health insurance for low-income children in the 1990s reduced the amount of time physicians spent per office visit.

On the other hand, by expanding aggregate demand for (and use of) health care, health insurance expansions may stimulate increased supply of health care inputs. Consistent with this, I found that the introduction of Medicare in 1965 increased hospital construction and the adoption of new medical technologies (Finkelstein 2007). Other work from the pharmaceutical industry indicates that increases in market size (such as presumably occur through health insurance expansions) increase research and development on new drugs (Finkelstein 2004; Acemoglu and Linn 2004; Yin 2008).

CONCLUSION The impact of health insurance on health care spending by the newly insured has been well studied and the verdict is clear: health insurance increases health care spending. There is no free lunch. Garthwaite and his colleagues drive home this point forcefully.

Equally important, however, is the impact of health insurance on other actors, including those who were implicitly or explicitly subsidizing care provision for the previously uninsured and the previously insured whose own care may be affected—even if their insurance nominally remains the same—by the changes in the market for health care. These are more subtle issues on which both economic theory and economic evidence is not definitive. Moreover, they have important implications for both the politics of health insurance reform and its economic impacts. Hopefully we will see more work on these important and challenging issues going forward.

REFERENCES FOR THE FINKELSTEIN COMMENT

- Acemoglu, D., and J. Linn. 2004. “Market Size in Innovation: Theory and Evidence from the Pharmaceutical Industry.” *Quarterly Journal of Economics* 119, no. 3: 1049–90.
- Aron-Dine, Aviva, Liran Einav, and Amy Finkelstein. 2013. “The RAND Health Insurance Experiment, Three Decades Later.” *Journal of Economic Perspectives* 27, no. 1: 197–222.
- Baicker, Katherine, and Amy Finkelstein. 2013. “Effects of Medicaid on Clinical Outcomes: Reply to Letters.” *New England Journal of Medicine* 369, no. 6: 581–83.
- Baicker, Katherine, Amy Finkelstein, Jae Song, and Sarah L. Taubman. 2014. “The Impact of Medicaid on Labor Market Activity and Program Participation: Evidence from the Oregon Health Insurance Experiment.” *American Economic Review* 104, no. 5: 322–28.

- Baicker, Katherine, Sarah L. Taubman, Heidi L. Allen, Mira Bernstein, Jonathan H. Gruber, Joseph P. Newhouse, Eric C. Schneider, Bill J. Wright, Alan M. Zaslansky, and Amy Finkelstein. 2013. "The Oregon Experiment—Effects of Medicaid on Clinical Outcomes." *New England Journal of Medicine* 386, no. 18: 1713–22.
- Coughlin, Teresa A., John Holahan, Kyle Caswell, and Megan McGrath. 2014. *Uncompensated Care for the Uninsured in 2013: A Detailed Examination*. Washington: Henry J. Kaiser Family Foundation. <https://www.kff.org/uninsured/report/uncompensated-care-for-the-uninsured-in-2013-a-detailed-examination/>.
- Cunningham, Robert, III, and Robert M. Cunningham Jr. 1997. *The Blues: A History of the Blue Cross and Blue Shield System*. DeKalb, Ill.: Northern Illinois University Press.
- Dobkin, Carlos, Amy Finkelstein, Raymond Kluender, and Matthew J. Notowidigdo. 2018. "The Economic Consequences of Hospital Admissions." *American Economic Review* 108, no. 2: 308–52.
- Dranove, David, Craig Garthwaite, and Christopher Ody. 2016. "Uncompensated Care Decreased at Hospitals in Medicaid Expansion States but Not at Hospitals in Nonexpansion States." *Health Affairs* 35, no. 8: 1471–79.
- Einav, Liran, and Amy Finkelstein. 2018. "Moral Hazard in Health Insurance: What We Know and How We Know It." *Journal of the European Economic Association* 16, no. 4: 957–82.
- Finkelstein, Amy. 2004. "Static and Dynamic Effect of Health Policy: Evidence from the Vaccine Industry." *Quarterly Journal of Economics* 119, no. 2: 527–64.
- Finkelstein, Amy. 2007. "The Aggregate Effects of Health Insurance: Evidence from the Introduction of Medicare." *Quarterly Journal of Economics* 122, no. 1: 1–37.
- Finkelstein, Amy, Nathaniel Hendren, and Erzo F. P. Luttmer. 2019. "The Value of Medicaid: Interpreting Results from the Oregon Health Insurance Experiment." *Journal of Political Economy* 127, no. 6: 2836–74.
- Finkelstein, Amy, Neale Mahoney, and Matthew J. Notowidigdo. 2018. "What Does (Formal) Health Insurance Do, and For Whom?" *Annual Review of Economics* 10:261–86.
- Finkelstein, Amy, Sarah L. Taubman, Heidi L. Allen, Bill J. Wright, and Katherine Baicker. 2016. "Effect of Medicaid Coverage on ED Use—Further Evidence from Oregon's Experiment." *New England Journal of Medicine* 375, no. 16: 1505–7.
- Finkelstein, Amy, Sarah L. Taubman, Bill J. Wright, Mira Bernstein, Jonathan Gruber, Joseph P. Newhouse, Heidi L. Allen, and Katherine Baicker. 2012. "The Oregon Health Insurance Experiment: Evidence from the First Year." *Quarterly Journal of Economics* 127, no. 3: 1057–1106.
- Garthwaite, Craig L. 2012. "The Doctor Might See You Now: Supply Side Effects of Public Health Insurance Expansions." *American Economic Journal: Economic Policy* 4, no. 3: 190–217.

- Garthwaite Craig L., Tal Gross, and Matthew J. Notowidigdo. 2018. "Hospitals as Insurers of Last Resort." *American Economic Journal: Applied Economics* 10, no. 1: 1–39.
- Gladwell, Malcolm. 2005. "The Moral-Hazard Myth." *New Yorker*, August 29. <https://www.newyorker.com/magazine/2005/08/29/the-moral-hazard-myth>.
- Goldstein, Amy. 2016. "Hospitals Warn Trump, Congress of Massive Losses with Affordable Care Act Repeal." *Washington Post*, December 6. https://www.washingtonpost.com/national/health-science/hospitals-warn-trump-congress-of-massive-losses-with-affordable-care-act-repeal/2016/12/06/3de2f7de-bbd8-11e6-91ee-1adddfc36cbe_story.html.
- Hadley, Jack, John Holahan, Teresa Coughlin, and Dawn Miller. 2008. "Covering the Uninsured in 2008: Current Costs, Sources of Payment, and Incremental Costs." *Health Affairs* 27, no. s1: 399–415.
- Initiative on Global Markets (IGM) Forum. 2015. "Health Insurance Subsidies." Chicago Booth, October 5. <http://www.igmchicago.org/surveys/health-insurance-subsidies>.
- Internal Revenue Service (IRS). 2007. *Hospital Compliance Project: Interim Report*. https://www.irs.gov/pub/irs-tege/eo_interim_hospital_report_072007.pdf.
- Kolstad, Jonathan T., and Amanda E. Kowalski. 2012. "The Impact of Health Care Reform on Hospital and Preventive Care: Evidence of Massachusetts." *Journal of Public Economics* 96, nos. 11–12: 909–29.
- LeCuyer, Nick A., and Shubham Singhal. 2007. "Overhauling the US Health Care Payment System." *McKinsey Quarterly*. <https://healthcare.mckinsey.com/overhauling-us-healthcare-payment-system>.
- Mahoney, Neale. 2015. "Bankruptcy as Implicit Health Insurance." *American Economic Review* 105, no. 2: 710–46.
- Michalopoulos, Charles, David Wittenburg, Dina A. R. Israel, Jennifer Schore, Anne Warren, Aparajita Zutshi, Stephen Freedman, and Lisa Schwartz. 2011. *The Accelerated Benefits Demonstration and Evaluation Project: Impacts on Health and Employment at Twelve Months*. New York: MDRC. <https://www.mdrc.org/publication/accelerated-benefits-demonstration-and-evaluation-project>.
- Michigan State. 2013. "Facts about Medicaid Expansion: Improving Care, Saving Money." https://www.michigan.gov/documents/snyder/Medicaid_expansion_-_factsheet_final_2-6-13_410658_7.pdf.
- Newhouse, Joseph P. 1993. *Free for All?* Cambridge, Mass.: Harvard University Press.
- Nicholson, Sean, Mark V. Pauly, Lawton R. Burns, Agnieszka Baumritter, and David A. Asch. 2000. "Measuring Community Benefits Provided by For-Profit and Nonprofit Hospitals." *Health Affairs* 19, no. 6: 168–77.
- Ollove, Michael. 2013. "Hospitals Press States to Expand Medicaid." *Kaiser Health News*, April 17. <https://khn.org/news/hospitals-lobby-for-medicaid-expansion-states/>.

- Rudowitz, Robin. 2013. "How Do Medicaid Disproportionate Share Hospital (DSH) Payments Change under the ACA?" Issue Brief. Washington: Kaiser Commission on Medicaid and the Uninsured, Henry J. Kaiser Family Foundation. <https://www.kff.org/medicaid/issue-brief/how-do-medicaid-disproportionate-share-hospital-dsh-payments-change-under-the-aca/>.
- Taubman, Sarah L., Heidi L. Allen, Bill J. Wright, Katherine Baicker, and Amy Finkelstein. 2014. "Medicaid Increases Emergency-Department Use: Evidence from Oregon's Health Insurance Experiment." *Science* 343, no. 6168: 263–68.
- U.S. Government Accountability Office. 2008. *Nonprofit Hospitals: Variation in Standards and Guidance Limits Comparison of How Hospitals Meet Community Benefit Requirements*. GAO-08-880. Washington: U.S. Government Accountability Office.
- Yin, Wesley. 2008. "Market Incentives and Pharmaceutical Innovation." *Journal of Health Economics* 27:1060–77.

COMMENT BY

JONATHAN SKINNER In considering the legacy of the Patient Protection and Affordable Care Act (ACA), the expansion of the Medicaid program will likely rank as one of the most important changes, if not the most important change, in the provision of U.S. health care. By fiscal year 2017, Medicaid and CHIP (the Children's Health Insurance Program) enrolled 73.7 million people, an increase of 35 percent above the 54.5 million enrolled in fiscal year 2010, at the outset of the ACA.¹ Yet aside from the Oregon experiment, which took place in a single state prior to the ACA expansions (Finkelstein and others 2012; Baicker and others 2013), we know little about the detailed impact of this great experiment. It is for this reason that this paper by Garthwaite and his colleagues is a welcome study that considers the Medicaid expansion across a wide sample of states and captures the impact of the expansion on emergency room admissions, the differential impact on discretionary versus nondiscretionary admissions, and the extent to which the expansions have targeted the sickest patients. The study is notable for using a wide range of data sources and a very strong triple difference identification strategy that avoids serious biases inherent in the conventional difference-in-differences approaches.

While my fellow discussant, Amy Finkelstein, addresses the larger questions regarding the demand curve for health care, I will focus here

1. Medicaid and CHIP Payment and Access Commission (MACPAC), Exhibit 10: Medicaid Enrollment and Total Spending Levels and Annual Growth, <https://www.macpac.gov/publication/medicaid-enrollment-and-total-spending-levels-and-annual-growth/>.

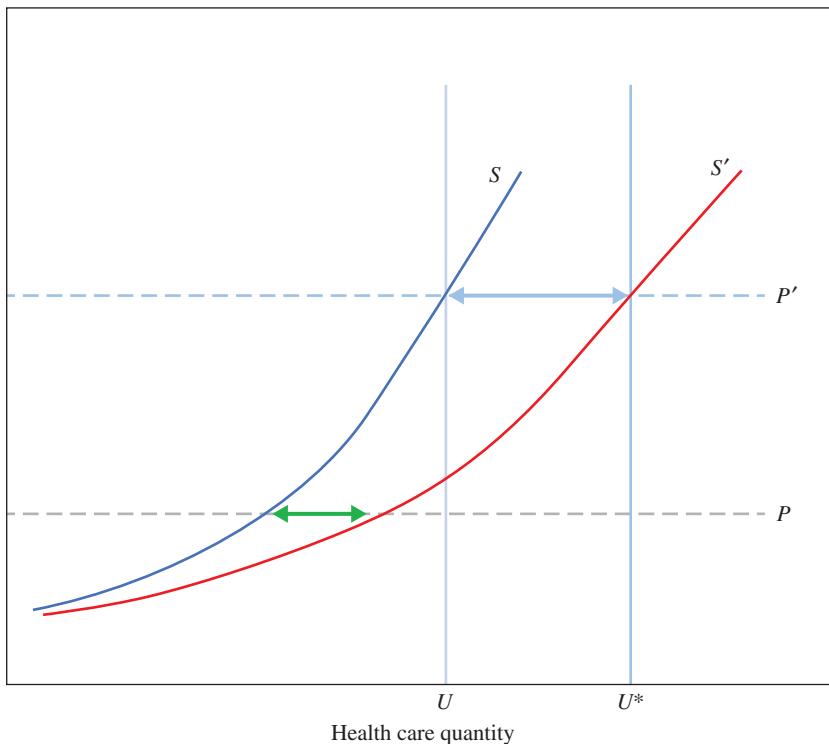
on the authors' finding that when it comes to Medicaid, all states are not alike. Despite the uniform size of the federal subsidy—with states paying almost nothing for the new enrollees under the expansion—the authors find heterogeneity in both how enrollment rates increased and by how much utilization changed. The idea that there might be variability across states in their response to health insurance expansion under the ACA is not new given that many states opted out of the expansion entirely, but what is surprising here is the heterogeneity even among states that chose to sign up.² In these comments, I therefore expand on the authors' finding of heterogeneity at both the *micro* level—that the level of Medicaid reimbursement rates matters in encouraging providers to see newly enrolled patients—and at the *macro* level—how variations in state-level responses undermine the redistributive macroeconomic goals of federal health policy. I consider each in turn.

A MICRO-LEVEL PERSPECTIVE The authors consider a variety of state-level policies that could explain the heterogeneity across states in the extent to which hospital discharges and emergency department (ED) visits responded to Medicaid expansions. But there may be another salient factor that could help to explain the variability in Medicaid expansion: the reimbursement rates paid to Medicaid providers. There are well-known differences across states in how well they compensate providers for services to Medicaid enrollees (Alexander and Schnell 2019). Figure 1 illustrates the theoretical impact of such differences on the expansionary effect of a given Medicaid expansion. The key assumption is an upward-sloping supply curve for Medicaid utilization rates; an increase in the reimbursement rate leads to a higher level of utilization per Medicaid enrollee. Initially, the supply curve is given by S for a restricted group of Medicaid enrollees. After Medicaid expansion, a greater number of previously unreimbursed patients became eligible for Medicaid, leading to a larger number of Medicaid visits supplied by physicians at a given price. Thus the Medicaid expansion shifts the supply curve of Medicaid services over to S' at a fixed price. Considering first a generous price P' , the increase in utilization rates is given by the difference between U and U^* . By contrast, when the price is lower, at P , the expansionary effect (shown by the smaller arrow) is considerably less. While one must take care in making inferences about log changes in utilization (given that, at P , the initial level of utilization is also lower),

2. Kowalski (2016) has considered the potential for heterogeneity in the pre-ACA Oregon and Massachusetts expansions based on patient types; and Kowalski (2014) finds substantial state-level heterogeneity in the expansion of health insurance exchanges.

Figure 1. A Hypothetical Association between the Medicaid Reimbursement Rate and the Impact of Medicaid Expansion on Utilization

Medicaid reimbursement rate



Source: Author's calculations.

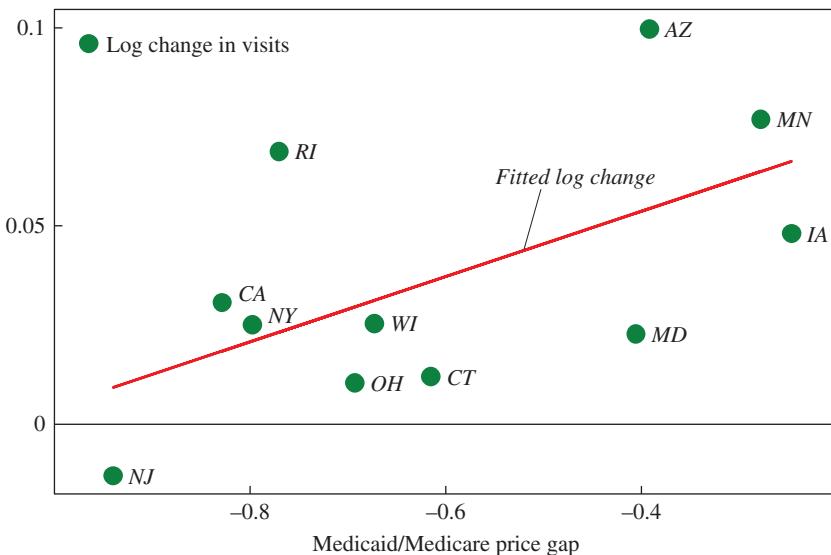
Note: The graph illustrates a hypothetical case demonstrating how the Medicaid reimbursement rate might affect the size of a given Medicaid expansion. The expansion is shown by a shift in the supply curve from S to S' as a larger number of patients become eligible for Medicaid services. As drawn it shows the difference in health care quantity that occurs when the price is high P' (the difference between U and U^*) versus the much smaller expansionary effect occurring at the lower price P (shown by the gap between S and S').

the fraction of uninsured affected by the expansion will be larger the higher is the newly available Medicaid reimbursement rate.

Is there any empirical support for this proposition? Alexander and Schnell (2019) compiled state-level measures of Medicaid reimbursement rates for a new patient physician evaluation. They kindly provided data by state prior to 2013 for Medicaid reimbursement rates relative to the corresponding Medicare reimbursement rate; I refer to the Medicaid/Medicare ratio as the “reimbursement gap” or a proxy for the Medicaid price paid for

Figure 2. The Association between the Medicaid Reimbursement Rate for an Office Visit and the Change in Medicaid and Uninsured Hospital Admissions, by State

Log change in hospital + ED visits



Source: Data provided by Diane Alexander and Molly Schnell based on Alexander and Schnell (2019).

Note: Data for price differentials are for an office visit relative (in log terms) to the Medicare reimbursement rate, while the quantity change is also in log terms for total (Medicaid plus uninsured) hospital admissions plus emergency department (ED) visits.

hospital and ED visits. As I do not have direct measures of reimbursement rates for hospitalizations and ED visits, I must assume that states that pay their physicians generously feel the same largess when it comes to hospital and ED visits.³

Figure 2 considers the association between the reimbursement gap (Alexander and Schnell 2019) and the log change in hospital and ED visits for the combined group of uninsured and Medicaid insured (from the current authors). There is a strong positive correlation of $\rho = 0.59$,

3. A key focus of Alexander and Schnell (2019) is the *change* in the reimbursement rate. Under the ACA, Medicaid physician reimbursement rates were set equal to Medicare reimbursement for 2013–14; subsequently, some states restored the previous reimbursement rates while others maintained parity with Medicare. The authors use these changes to identify the supply curve. However, prices paid for hospital and ED visits were not affected by this policy change, and thus I use the pre-2013 data as a proxy for what Medicaid is assumed to have continued to pay during the period of analysis.

and the result holds up even after adjusting for commensurate changes in Medicaid enrollment.⁴

While these are correlations and cannot be interpreted as causal, the pattern estimated by the authors and by Alexander and Schnell (2019) points toward a general principle regarding state-administered Medicaid programs. Even though the federal government may pay the lion's share of the expenses, every state runs its programs with varying degrees of generosity, eligibility, provider engagement, and patient populations. So perhaps it is not altogether surprising that even among states that did expand Medicaid coverage, the overall impact on enrollment (and likely benefits) varied so much.

A MACRO-LEVEL PERSPECTIVE ON MEDICAID (AND MEDICARE) The United States spends more than \$3 trillion on health care, with approximately one-third financed through the Medicare and Medicaid programs; these two programs in turn account for nearly one-quarter of all federal spending.⁵ Federal health transfers are a highly progressive avenue for redistribution to states with larger elderly or disabled populations or, more importantly, for states with a larger fraction of their populations at or near the poverty level. The reason is straightforward: a larger fraction of residents should be eligible for Medicaid, the federal government pays a much higher fraction of Medicaid payments in lower-income states (among those previously enrolled in Medicaid), and federal tax outflows are much smaller in magnitude for low-income states (Feenberg and Skinner 2000).

The heterogeneity in the responsiveness of state Medicaid programs to the ACA expansions might therefore have macroeconomic effects, as well as affecting the progressivity of federal government transfers across states. To assess whether these macroeconomic effects are substantial, I draw on the National Health Expenditures database in conjunction with data from MACPAC (2015) and the Kaiser Family Foundation to calculate the state-level per capita inflow of federal funds arising from Medicaid, and

4. The *p*-value for the simple bivariate regression is 0.057, although it is likely to be biased because the data from Garthwaite and his colleagues were from their triple difference regression estimates. The multivariate regression explaining the log expansion in hospital discharges plus ED visits ($N = 11$) was $.053 + 0.226 * (\text{percentage increase in Medicaid enrollment}) [s.e. = 0.176] + 0.083 * (\text{reimbursement gap}) [s.e. = 0.036]$.

5. According to the Center for Budget and Policy Priorities, health care spending is about 25 percent of total federal spending, but that figure includes exchange subsidies and children's health insurance (CHIP); see "Policy Basics: Where Do Our Federal Tax Dollars Go?," <http://goo.gl/ZgeQBo>.

Medicaid plus Medicare combined.⁶ Because the direct recipients of these federal transfers are health care providers—health care professionals and hospital systems—I consider federal flows based on where the provider is located, rather than where the patient lives.⁷ Unfortunately, the state-level National Health Expenditures were available only through 2014, so I just have one year of data following the Medicaid expansion.

In considering the change over time in federal funds, there were not large differences across states in the Garthwaite sample with regard to changes in federal inflows through Medicaid; New Jersey (at the low end of increased utilization) experienced an increase of \$202 per capita in Medicaid transfers, while Minnesota (at the high end) gained \$342. However, the story is quite different when one expands the sample to all states, including those that failed to expand Medicaid.

Figure 3 shows per capita federal flows from Medicaid and Medicare (in constant 2014 dollars) for three states. During much of the 2000s, Kansas and Oregon received about the same per capita federal dollars, but the two states diverged in the late 2000s when Oregon began an early expansion of its Medicaid program.⁸ Following an enthusiastic response to the ACA Medicaid expansion, these factors combined (along with increases in Medicare spending) led to a sharp increase of roughly \$1,000 in federal health spending for every person in Oregon between 2008 and 2014. By contrast, Kansas eschewed the expansion, and its federal inflows declined slightly in real terms during the same period. These are large and continued macroeconomic inflows for Oregon; if applied at the national level, it would be equivalent to more than a \$300 billion expansionary policy. And it is perhaps coincidental that during 2008–18, Oregon’s annual real GDP growth rate exceeded Kansas’s growth rate by 0.4 percent.⁹

The endogeneity of state responses to federal policy may ultimately challenge the progressive structure of federal spending across regions. This can be seen again in figure 3 by comparing federal per capita spending in Louisiana and Oregon. In 2018, Oregon’s median family income

6. This calculation requires applying the average federal matching rates to state-level Medicaid payments; the calculation becomes more complicated in 2014 when new Medicaid enrollees experienced a much higher match rate. See MACPAC (2015, 45–46); and the Kaiser Family Foundation, Federal Medical Assistance Percentage (FMAP) for Medicaid and Multiplier.

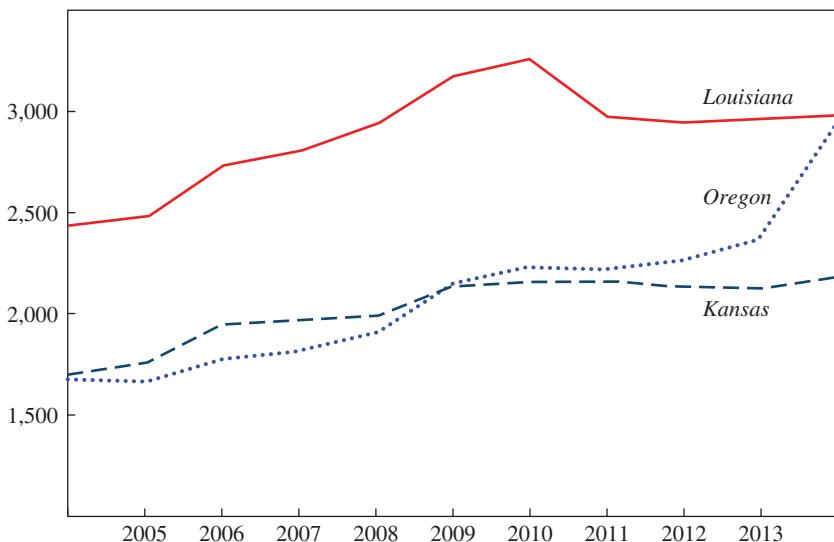
7. I am grateful to Victor Fuchs for suggesting this approach.

8. As in Finkelstein and others (2012).

9. Based on the difference in real per capita GDP by state; www.statistica.com.

Figure 3. Per Capita Federal Medicare plus Medicaid Transfers, 2004–14, by Selected States

U.S. dollars



Sources: Health Expenditures by State of Provider, 2017, Centers for Medicare and Medicaid Services, <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData>; share data from the Kaiser Family Foundation, Federal Medical Assistance Percentage (FMAP) for Medicaid and Multiplier, 2019, and from the Medicaid and CHIP Payment and Access Commission (MACPAC) Report, Exhibit 10: Medicaid Enrollment and Total Spending Levels and Annual Growth (posted December 4, 2018).

Note: Federal Medicare plus Medicaid transfers are defined as state-level Medicare reimbursements plus the federal share of Medicaid payments, based on the residence of the provider (not the enrollee).

was 25 percent higher than in Louisiana.¹⁰ For most of the 2000s, there were correspondingly greater federal transfers to Louisiana compared to Oregon. Like Kansas, Louisiana did not expand Medicaid, and so its federal support remained roughly constant, but Oregon's efforts to expand coverage, as noted earlier, turned on the federal money tap, so by 2014, Oregon was receiving about the same federal health spending on a per capita basis as Louisiana. While the net federal health care transfers—after

10. Based on American Community Survey data from 2018 on median family income (in Oregon, \$77,655, and in Louisiana, \$61,847); https://data.census.gov/cedsci/table?g=0100000US.04000.001&tid=ACSSST1Y2018.S1901&hidePreview=false&vintage=2018&t=Income%20%28Households,%20Families,%20Individuals%29&cid=S1901_C01_001E.

accounting for federal taxes—are still presumably in Louisiana’s favor, the impact of the ACA is still one that may have reduced the progressivity of government transfers across regions. And while the ACA was successful in reducing disparities in health insurance coverage at the micro level by race, income, and marital status (Courtemanche and others 2019), it may be contributing to increasing divergence in regional income over time (Ganong and Shoag 2017).

In sum, the study by Garthwaite and his colleagues has given us an important first look at the variability in how the Medicaid program can have widely disparate effects depending on state-level characteristics of policies, patients, and providers. As federal policy on health care continues to evolve—whether toward block grants to states or toward a stronger federal role in Medicare expansions—the issues raised in this paper will only become more important.

REFERENCES FOR THE SKINNER COMMENT

- Alexander, Diane, and Molly Schnell. 2019. “The Impacts of Physician Payments on Patient Access, Use, and Health.” Working Paper 26095. Cambridge, Mass.: National Bureau of Economic Research. <https://www.nber.org/papers/w26095>.
- Baicker, Katherine, Sarah L. Taubman, Heidi L. Allen, Mira Bernstein, Jonathan H. Gruber, Joseph P. Newhouse, Eric C. Schneider, Bill J. Wright, Alan M. Zaslavsky, and Amy Finkelstein. 2013. “The Oregon Experiment—Effects of Medicaid on Clinical Outcomes.” *New England Journal of Medicine* 386, no. 18: 1713–22.
- Courtemanche, Charles J., Ishtiaque Fazlul, James Marton, Benjamin D. Ukert, Aaron Yelowitz, and Daniela Zapata. 2019. “The Impact of the ACA on Insurance Coverage Disparities after Four Years.” Working Paper 26157. Cambridge, Mass.: National Bureau of Economic Research. <https://www.nber.org/papers/w26157>.
- Feenberg, Daniel R., and Jonathan Skinner. 2000. “Federal Medicare Transfers across States: A Lifetime Perspective.” *National Tax Journal* 52, no. 3: 713–32.
- Finkelstein, Amy, Sarah L. Taubman, Bill J. Wright, Mira Bernstein, Jonathan Gruber, Joseph P. Newhouse, Heidi L. Allen, and Katherine Baicker. 2012. “The Oregon Health Insurance Experiment: Evidence from the First Year.” *Quarterly Journal of Economics* 127, no. 3: 1057–1106.
- Ganong, Peter, and Daniel Shoag. 2017. “Why Has Regional Income Convergence in the US Declined?” *Journal of Urban Economics* 102:76–90.
- Kowalski, Amanda E. 2014. “The Early Impact of the Affordable Care Act State-by-State.” *Brookings Papers on Economic Activity*, Fall, 277–333.
- Kowalski, Amanda E. 2016. “Doing More When You’re Running LATE: Applying Marginal Treatment Effect Methods to Examine Treatment Effect Heterogeneity in Experiments.” Working Paper 22363. Cambridge, Mass.: National Bureau of Economic Research. <https://www.nber.org/papers/w22363>.

Medicaid and CHIP Payment and Access Commission (MACPAC). 2015.

MACPACStats: Medicaid and CHIP Data Book. <https://www.macpac.gov/wp-content/uploads/2015/11/MACStats-Medicaid-and-CHIP-Data-Book-December-2015.pdf>.

GENERAL DISCUSSION Caroline Hoxby wondered whether it was possible to get person-level data to explore the hypothesis that once people receive Medicaid (or any type of health care) they will make more use of primary care.

John Haltiwanger noted that it was likely that Medicaid expansions and the Affordable Care Act (ACA) changed the composition of where people get their care. This possibility, along with the large heterogeneity in productivity across hospitals, is likely to have affected the productivity of the health care sector. He asked the authors to comment on this possible phenomenon.

Ed Lazear observed that a major problem with health care is that people use the wrong amount on the margin. He pondered what would happen if—when instituting a new program, like Medicaid—the amount of doctor visits increased and the amount of emergency room (ER) visits decreased to zero. Although the number of ER visits is zero in this scenario, he commented, it is complicated by the fact that people are using more services. He noted that one advantage of the ER is that it is unpleasant, which could serve as another way to price the services; he asked the authors to remark on whether they thought this consequence had any social value.

Henry Aaron asked the authors to comment on the policy implications of their paper.

James Stock stated that a macroeconomic reason a policymaker might pursue a Medicaid expansion is its possible effect on the economy. He noted that the authors' findings showed there was no increase in the incomes of the people who became insured due to a Medicaid expansion and asked the authors to comment on the implications of this finding.

William Brainard noted a recent experience when he took a friend to the doctor and they were immediately sent to the ER. The ER then kept this person for several days, but never admitted them. The ER personnel called this special designation “observational.” He wondered how many institutions have this observational category and how this might affect the results of the paper.

Jason Furman remarked that one defense of the emergency department proposition is the cross-price effect. The paper shows—in line with other

research—that there is no cross-price effect. He pointed out, however, that a more sophisticated defense of this proposition is that although Medicaid expansions increase use, they also include a whole bunch of other delivery system reforms, like accountable care organizations (ACOs) and better payment mechanisms that keep people out of the emergency room. He queried the authors to comment on this sophisticated defense and whether the state variation is at all related to these differences.

Craig Garthwaite responded that there aren't any fine-grain primary care data, although there are survey data. The survey data could be used to figure out whether people make more use of primary care once they receive Medicaid. He observed that this question is related to whether primary care services and inpatient emergency department (ED) visits are complements or substitutes. For example, one could find that Medicaid coverage increases the use of physicians, which then increases ED visits. He remarked that the answer to this question of primary care use affects the interpretation of their paper's findings, rather than the findings themselves.

John Graves added that there are ways to get at the primary care data question indirectly, for example, ambulatory care sensitive hospitalization data which can be filtered by International Classification of Diseases, Ninth Revision (ICD-9) codes. He commented that although these measures allow researchers to get around the lack of data—especially for the uninsured—they are noisy.

Craig Garthwaite explained that the existing data on Medicaid recipients' use of physicians are of poor quality. Generally, the data are mostly from Medicaid managed care organizations, which means they are within-firm data. Moreover, since the data are post-insurance, they do not include information about the uninsured. In addition, since physicians are not required to provide care to the uninsured by law, they provide relatively little uncompensated care compared to hospitals. Indeed, a paper by Gruber finds that physicians provide negative uncompensated care since they charge the uninsured such high prices, which makes up for any losses from those who don't pay.¹

In response to Haltiwanger's question, Garthwaite noted that there are currently two reinsurance program designs, each of which affects productivity differently. First, he noted, there are market-based mechanisms (like Medicaid) which provide health insurance to the individual. Under this design, patients can receive care wherever they want, which implies

1. Jonathan Gruber and David Rodriguez, "How Much Uncompensated Care Do Doctors Provide?," *Journal of Health Economics* 26:1151–69, <https://economics.mit.edu/files/6423>.

that some people might switch from public to private facilities. Second, the government can directly pay certain hospitals to provide care to the uninsured. Although in this type of program the uninsured can't receive care wherever they want, allocated hospitals are able to remain open even though they are providing a large amount of uncompensated care. He noted that the United States already has programs that do this—such as the disproportionate share program (DSH). DSH funds provide an additional supplement to hospitals based on how many uninsured people they treat. All in all, this implies that the United States has two reinsurance programs. He commented that it is important to discuss which of these programs is the most efficient way to provide care to the uninsured. For example, maybe it is most efficient to have the uninsured receive care in the lowest marginal cost setting possible, which would allow more people to receive care.

In response to Lazear's question, Garthwaite made it clear that he and his coauthors do not hold the normative view that ED use is bad. He remarked, however, that increased demand does require constructing newer and larger ED facilities. Building new, larger facilities could be wasteful if the types of conditions being treated in such facilities could be handled in a lower fixed and marginal cost setting.

He stated that the paper does discuss the effect of Medicaid on incomes and added that the literature shows that there are some economic benefits to Medicaid beneficiaries in the long term. However, he noted that seeing an effect in the data in the short term depends on the channel. If, for example, giving people more income increases their human capital, which in turn increases their productivity, he would expect this effect to be realized later than the eight to nine years currently observed in the data.

In response to Brainard's question, Garthwaite noted that a patient classified under an observational status would show up as an outpatient ED visit in their data set. He said that since hospitals do a large amount of outpatient ED visits, he doesn't believe this classification would affect any of their results.

He stated that he doesn't believe the development of Medicaid ACOs would have much of an effect on their results, since there aren't many facilities, although there might be some general spillover effects. He noted that there are more Medicare ACOs and that the best data on these types of organizations show that they have had little effect. He mentioned, however, that research shows that physician-led ACOs have been more successful. He said that these physician-led organizations have more of an effect because they are built around the right incentives; indeed, a physician can

reduce a hospital visit and share in some of the savings. If a hospital, however, reduces hospital visits, it loses money.

John Graves remarked on Amy Finkelstein's presentation where she made the comment that knowing one state Medicaid program means that you only know one state Medicaid program. He said that Tennessee's TennCare program has been particularly out-front in terms of adopting bundle payments and other alternative payment models. However, this is specific to Tennessee and he wasn't sure what the effect would be in the aggregate.

Zeynal Karaca responded to Aaron's question about policy implications and Hoxby's question on physician data. In terms of policy implications, he noted a key takeaway from their paper was the heterogeneity across states. In terms of physician data, he noted that his agency—the Agency for Healthcare Research and Quality (AHRQ)—is currently working on a physician database. However, like other commenters, he mentioned that the collection of this type of data is quite challenging and is very expensive. He specified that whether the AHRQ ends up producing the data will depend on appropriation of funding in their budget.

Amy Finkelstein responded to Lazear's comment on the implicit assumption that ED is bad. She remarked that just because the ER is expensive doesn't mean it has a greater social cost. Indeed, if an emergency room must be staffed for 24 hours, the social marginal cost of a doctor's time at 4:00 a.m. might be quite low, even though it is billed at a high rate. Along these lines, she added that the question of whether triage is being handled efficiently within the emergency room is an important question about which there exists little evidence.

Finkelstein noted that she wrote a paper with Erzo Luttmer and Nathaniel Hendren that analyzes the social welfare of the Oregon experiments.² The paper compares the costs and benefits of the Oregon program. She stated that the costs of the program—such as direct public spending and increased medical care—were easy to measure. She remarked, on the other hand, that benefits were difficult to measure as they are typically traded in a poorly functioning market. This problem meant that they couldn't use standard demand tools. Instead, they calibrate a utility model and estimate the welfare benefits. Their results show that low-income uninsured individuals

2. Amy Finkelstein, Nathaniel Hendren, and Erzo F. P. Luttmer, "The Value of Medicaid: Interpreting Results from the Oregon Health Insurance Experiment," *Journal of Political Economy* 127, no. 6: 2836–74, <https://scholar.harvard.edu/hendren/publications/value-medicaid-interpreting-results-oregon-health-insurance-experiment>.

prefer cash to a Medicaid transfer. In addition, Finkelstein mentioned another paper she wrote with Hendren and Shepard that estimates the demand curve for Medicaid using a product traded on the Massachusetts health insurance exchange.³ Similarly, in this paper, she and her colleagues find that willingness to pay for Medicaid was well below cost. She perceived these results to explain low program take-up. Furthermore, she stated that these results imply that Medicaid is not a very effective redistributive program; indeed, Medicaid is paying for the care that was being previously paid for by hospitals to the low-income uninsured.

Jonathan Skinner remarked on Aaron's question about policy implications. He observed that his most important takeaway was that health insurance program designs for those who are low-income should be the reverse of a block grant. He noted that, in an ideal world, Medicaid should be an entirely federally funded program with federal rules. He asked those in the room to image what Medicare would look like today if states paid for half of it. In such a situation, he postulated, there would be an enormous amount of inequality. The fact that Louisiana is shutting down their Medicaid out of failure to pay while Oregon has taken advantage of Medicaid expansion policies and has lots of money as a result is direct evidence, to him, that redistribution is not happening.

Garthwaite ended the discussion by mentioning what he took to be the most important policy implication. He stated that the federal government should look carefully at how they distribute non-Medicaid money. For example, there might be other ways through supplemental payments to inject money in non-expansion states for low-income people. He noted that some states like New Jersey and California have low reimbursement rates, while Alabama and Mississippi have high reimbursement rates. Although slightly counterintuitive, he specified that while these southern states substantially limit Medicaid eligibility, doctor visits for the small amount who are eligible are reimbursed at a high rate. All in all, he noted that policymakers should look more carefully at payment rules; changing such rules could be an important redistributive method and reduce inequalities in Medicaid access.

3. Amy Finkelstein, Nathaniel Hendren, and Mark Shepard, "Subsidizing Health Insurance for Low-Income Adults: Evidence from Massachusetts," *American Economic Review* 109, no. 4: 1530–67.