Increased demand for primary care NPs after ACA

by

Deborah Weissner

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Author . . . .
Economics
March 15, 2020

Certified by. . . . .
TBD
Associate Professor
Thesis Supervisor

Accepted by . . . .
TBD
Chairman, Department of Economics

Chapter 1

1.1   Introduction

Low income families in the United States face unique obstacles when it comes to accessing basic health care. The minimum requirements for public insurance and the high cost of private insurance have made even basic primary care inaccessible to many. For those who do have Medicaid, finding a primary care physician presents an additional challenge since many physicians refuse to accept it due to low reimbursement rates compared to those of the commercial market. The Affordable Care Act (ACA) introduced measures intended to increase accessibility of primary care for the most vulnerable including a substantial expansion of public insurance, increased funding for health centers and the promotion of alternative payment models that encourage a collaborative approach to care by expanding the roles of non-physicians such as registered nurses. These measures have the potential to impact both the supply and demand sides of the health care system. While much research has been carried out on the demand side, very little work has been done on the supply effects of these changes. In this study, I examine the effect that these measures may have had on the supply of registered nurses in outpatient settings relative to hospitals. I expect the role that registered nurses play in the provision of primary care and management of chronic diseases to have expanded both as a means of improving the quality of care and for reducing its overall cost.

1.2 Background

Healthcare expenditure is currently a major concern in the United States. At $9,892 per capita in 2017, the nation's health care spend was 145 percent above the median spend among industrialized member countries of the Organization for Economic Co-operation Development (OECD). Despite having the highest spend, in 2015 the US had 19 percent fewer practicing physicians per 1,000 than the OECD median. Of practicing physicians, it had the absolute lowest percentage of general practitioners among all OECD countries [2]. General practitioners are the front line for basic health care and include those practicing in general and family medicine, internal medicine, geriatrics, and pediatrics but do not include hospitalists [30].

National demand for primary care physicians is projected to exceed supply by over 23,000 full-time equivalents (FTEs) by 2025 assuming current trends of work-force participation, health care delivery and utilization continue [30]. This shortfall is expected to be most severe among Medicaid beneficiaries [3]. Contributing to the shortage on the supply side is an imbalance in clinician supply as higher numbers of new clinicians are choosing to specialize [39]. Median compensation for primary care physicians is significantly lower than for those who enter a specialty thus luring new physicians away from general medicine. In 2017, the median compensation for physicians across all specialties was $300,000 while median compensation for physicians in primary care was only $242,000. Among physicians specializing in radiology, median compensation was as high as $460,000. Even with this wide a variance in compensation, primary care physicians remain toward the lowest end of the spectrum [6].

Further weakening supply, fewer physicians are choosing to accept public insurance due to lower reimbursement rates relative to private insurers and the higher administrative burden associated with Medicaid [9, 8]. While private insurer prices vary widely by hospital and individual insurer, they average out to approximately 50 percent above Medicare payment rates. Medicaid payment rates are even lower than those of Medicare. Before the ACA went into effect, primary care payment rates for

Medicaid services were averaging about 59 percent of the Medicare fee levels [6].

The rising price differential between private and public insurers has been largely attributed to rampant price growth in the private sector due to increasing consolidation of hospitals and physician groups. Consolidation reduces competition by reducing the number of physician groups in the market and thus increasing each group's share of the market. When a physician group claims a higher market share, they gain leverage in negotiations with insurers which they can use to drive up payment rates in the private insurance market. The rates in the private market reflect the supply and demand equilibrium whereas Medicaid rates are arbitrarily set by the government. The divergence may thus equally suggest that Medicaid rates are set too low. As the divergence between private insurer and Medicaid reimbursement grows over time, the profitability of caring for a privately insured patient incentivizes physicians to prioritize them over Medicaid beneficiaries and either institute long wait times for Medicaid patients or decline to participate in the public program altogether[6].

While supply continues to stagnate, the U.S. population is expected to have grown by 18 percent between 2000 and 2020, resulting in an additional fifty million people who will require healthcare and the aging baby boomer generation with a higher prevalence of chronic conditions is also expected to intensify demand for healthcare services [40]. The ACA also increased demand through various measures including expansion of Medicaid coverage, subsidies for individual plans, an insurance mandate whereby those not covered and above a certain income threshold are subject to a penalty and by eliminating cost sharing for essential preventive care services.

The Affordable Care Act (PPACA) of 2010 mandated that all states expand Medicaid eligibility to all non-elderly adults with household incomes up to 138 percent of the Federal Poverty Level (FPL). This measure was struck down in 2012 by the Supreme Court, making expansion optional to each individual state. As of July 2016, 30 states and D.C. opted to expand their Medicaid programs. In March 2013, just before the first open enrollment period, the uninsured rate among non-elderly adults was 17.6 percent and by March 2015 it fell to 10.1 percent [24]. Between 2013 and 2015, the number of uninsured adults fell by over 15 million [24]. The fall in the

overall uninsured rate was substantially larger in states that expanded Medicaid than in those that did not. In states that expanded Medicaid, the uninsured rate decreased by 52.5 percent and in states that did not expand, the decrease was only 30.6 percent [24]. Studies have shown a significant increase in coverage among the targeted population of low-income childless adults [35, 7] with the highest gains seen among those without a college degree, non-whites, young adults, unmarried individuals, and those without children in the home [7].

The ACA required non-grandfathered private insurance plans to provide preventive care services without any cost sharing in the form of deductibles, copayments or co-insurance. This would enable those who were previously insured but had foregone preventive care due to the cost of their deductibles to seek care. There is reason to believe that this would have contributed to a surge in demand for preventive care from underinsured individuals who had previously delayed due to cost. An individual is considered to be underinsured if their out-of-pocket costs excluding premiums over the 12 months prior are equal to 10 percent or more of household income. Being either uninsured or underinsured is associated with difficulty paying medical bills as well as delaying or forgoing preventive care such as cancer screenings due to cost [33]. In 2010, 44 percent of adults between the ages of 19 and 64 were either uninsured or underinsured. A significant proportion of these at-risk adults had incomes below 250 percent of the federal poverty level [33]. Eliminating cost sharing for preventive care would have enabled those who had previously delayed or forgone care to be able to afford it.

Indeed studies have shown there was a surge in primary care utilization after the ACA was passed reflecting the demand induced by expanded coverage and greater affordability of care. Increases in outpatient visits, fewer who skipped medications as a result of cost, increased screening for diabetes delivered by primary care providers and fewer emergency department visits [36, 11]. Access to preventive care and related chronic disease management may have also decreased the incidence of ED visits and higher cost hospitalizations.

Increased demand for primary care resulting from coverage expansions has been

estimated to require an additional 7,200 primary care providers or 2.5 percent of the 2013 baseline supply [19]. In 2013, an estimated seven million people resided in areas where the expected increase in demand was greater than 10 percent of the baseline [19]. To address the primary care physician shortage, the ACA contained several provisions to boost the supply side of the primary care market. To encourage acceptance of new Medicaid patients among providers, the ACA increased Medicaid reimbursement rates to match those of Medicare for primary care services. This would have have a varying differential impact across states because of the wide distribution in Medicaid to Medicare reimbursement ratios that prevailed before the ACA. States with the lowest Medicaid to Medicare ratios in 2008 such as New Jersey at 37 percent and California at 47 percent also had the lowest Medicaid patient acceptance rates [9] thus showing the potential to increase acceptance through this policy lever.

Ideally, there would not be a physician shortage and every person would have access to a physician for basic health care regardless of their geographic location or demographics. One solution to the physician shortage is to empower the nursing workforce to share responsibility in providing care by (1) enabling nurse practitioners and physicians assistants (PA) to practice to their fullest potential, (2) to expand the role that registered nurses play in ambulatory care through care delivery transformation by implementing alternative payment models (APM) such as those based on the patient centered medical home and bundled payments that aim to reduce costs through resource optimization and care coordination while ensuring quality of care standards are met (3) and by increasing the prevalence of nurse-led clinics in high need areas.

Nurse practitioners (NPs) also known as advanced practice registered nurses (APRNs) are trained in primary care and qualified with a Master's of Science degree but are inhibited from practicing in many states due to a patchwork of state restrictions. In 2013, there were 57,330 NPs in the labor force and that number is expected to grow to 110,540 full-time equivalents (FTEs) by 2025 whereas the primary care physician workforce is only expected to grow by 22,880 FTEs to 133,420 over the same period [30]. The ACA contained several provisions to expand the supply of NPs in primary

7

care through scholarships, loans and training opportunities in health clinics.

While NPs and PAs can practice independently as primary care providers in many states, their scope of practice is more limited in other states by mandates for physician oversight, transition to practice periods, restrictions on their authority to prescribe medications and lower rates of reimbursement relative to physicians. The National Council of State Boards of Nursing defines independence as practicing with "no requirement for a written collaborative agreement, no supervision, [and] no conditions to practice." In its report on supply and demand, the HRSA highlights the potential to effectively mitigate primary care provider shortages by allowing NPs and PAs to practice to the fullest extent of the their training [30] and in 2010, full practice status became the recommended model in the Institute of Medicine's Future of Nursing Report and the National Council for State Boards of Nursing's Model Nursing Practice Act and Administrative Rules [8, 9]. In 2013 before the ACA Medicaid expansions went into effect, 17 states and the District of Columbia had full scope of practice policies in place.

Allowing NPs to provide primary care independently may lead to more collaborative care as NPs establish nurse-led clinics in which responsibilities are shared with registered nurses and other medical professionals. Unlike in the lone physician model of care in which all care is delivered or delegated by the physician, in collaborative delivery models responsibilities are shared with a team from the start.

While empowering NPs to practice would directly increase the supply of primary care providers, it is the army of registered nurses that could have a substantial impact on primary care capacity. Registered nurses comprise the single largest segment of the US healthcare workforce [29]. In May, 2019 there were over 2,980,000 registered nurses employed in the US workforce outnumbering both physicians and NPs by over a million combined at 109,370 and 200,600 respectively [31].

In practices that follow the traditional fee for service model (FFS), decisions are often made and carried out by the lone physician with a few helpers on hand, usually medical aids, under increasingly strained capacity as the ratio of clinicians to population declines [5, 18]. Increasing the number of patients seen by physicians

8

would require increasing their panel size, the number of patients seen in a given year. Increasing panel sizes are associated with compromised quality and burnout among physicians. In addition, there is usually little communication between providers which can lead to redundancies in care.

To address the capacity limiting constraints of the FFS system, increasing attention has been paid to expanding the roles of registered nurses to include chronic disease management, prescription refills and other care occurring in ambulatory care settings for which well-established clinical practice guidelines are available. It has been shown that registered nurses can add value among patients with hypertension, diabetes, rheumatoid arthritis or hyperlipidemia. Expanding the roles of nurses in this way could thereby add capacity without further demands on a physician's time[14, 34].

Nurse-led care has been shown to be both cost-effective and lead to outcomes that are on par with and sometimes superior than those of physician-led care. One study found that among patients with rheumatoid arthritis, nurse-led care achieves better outcomes and is more cost effective than rheumatologist-led care [26]. Another study that was based on a randomized trial found that among patients with atrial fibrillation, nurse-led care produced better patient outcomes including better adherence to treatment and lower mortality rates than cardiologist-led care [17].

In addition to increasing primary care capacity, there are other incentives that could motivate more practices to adopt a team-oriented approach. Most APMs include cost sharing incentives that tie profits to cost savings achieved relative to an established baseline level. To reduce the cost of care, organizations can optimize skill-mix by allocating primary care providers, RNs and other staff to cases for which their care would be most effective in terms of both quality and cost. Shifting care from physicians and NPs to nurses can reduce the overall cost by substituting lower cost practitioners for those who command a higher wage [22]. As part of their recommendations on policy, The American Academy of Nursing recently highlighted the value of expanding the role of baccalaureate registered nurses in primary care. The ACA contained several provisions intended to support the transformation of healthcare delivery including the implementation of ACOs in the Medicare program through the

Medicare Shared Savings Program, testing of bundled payment and episode based payment initiatives, the expansion of value-based purchasing in the Medicare Program (ACA Title III Subpart A, Part I, Secs 3001-3008) and Community Health Teams to support Medical Homes (Sec 3502).

NPs and RNs already play an integral role in Health Centers. Health Centers are a vital source of outpatient care for uninsured, Medicaid patients, those located in medically underserved areas, participants of high-deductible health plans and low income patients with chronic illness. The Health Centers Program administered by the Health Resources and Services Administration (HRSA) and authorized in Public Health Service Act Section 330 distributes grants to Federally Qualified Health Centers (FQHC). In order to be eligible, Health Centers must provide comprehensive primary care services as well as ancillary services via a sliding scale payment structure that facilitate access in a health care shortage area. Health Centers that are not designated as FQHCs can receive many of the same benefits but are not entitled to receive Section 330 grant funds. The wide array of services that must be provided by health centers in order to qualify requires a team-based approach among physicians, non-physician clinicians and other staff.

It has been shown that Health Center patients on Medicaid have lower utilization of and spending on both inpatient and outpatient services relative to non-health centers. Health Center Medicaid patients also have lower utilization of costly hospital emergency department related services [27]. This suggests that if individuals can access basic primary care including preventive and chronic disease services, they may be less likely to face more complicated problems that require hospitalization later on. Thus channeling resources to primary care may reduce health care expenditure overall.

Using 2006-2007 data from the National Ambulatory Medical Care Survey, a study comparing office-based and health center based primary care found that Health Centers employ significantly more non-physician clinicians (including PAs and NPs) than physician offices. It found that nearly a third of all visits were with non-physicians and the vast majority of these were without a physician being present [18]. This

suggests that the uptake of team-oriented care and reliance on non-physicians has long been on the rise and moving faster in Health Centers than in physician offices. Another study of prevailing staffing patterns in Health Centers found that overall levels of productivity are similar across Health Centers with typical staffing patterns and those staffed with a high proportion of RNs. It found that neither model was dominant over the other showing that practices can be productive with varying blends of physicians, NPs, RNs and other medical staff [21]. Furthermore, staffing patterns is linked to local factors such as the supply of clinicians and non-clinicians as well as scope of practice laws which together may suggest that any solution to the primary care provider shortage would require flexibility.

The ACA authorized the Health Centers Program with a consistent flow of funds ensuring a continued if not increased flow of resources to the program. It also established a new grant program for Nurse-Managed Health Clinics (NMHCs) which are similar to Health Centers but usually led by NPs. In 2017, 16 percent of Medicaid patients were served by Health Centers while Health Center Medicaid revenue represented only 1.7 percent of total Medicaid Expenditures thus making Health Centers a very cost-effective source of health care for Medicaid patients [28].

Medicaid is the largest source of health center funding accounting for 44 percent of total revenue [?]. From 2010 to 2017, Medicaid revenue increased by 97 percent whereas on a per patient basis, it grew by only 11 percent. This differential reflects the increase in patient volume due to the Medicaid Expansion [32]. The next largest source is federal grant funding under Section 330. The ACA established the Community Health Center Fund to supplement program funding from the annual appropriations process and directed 11 billion dollars in mandatory appropriations over fiscal years 2011 through 2015 [41]. This cumulative increase across its key sources of revenue enabled the Health Centers program and individual health centers to expand capacity and increase services. Over 2010 through 2017, the number of health center sites increased by 59 percent to 11,056 sites, the number of patients served increased by 40 percent to 27.2 million, and total staff increased by 70 percent to 223,840 FTEs [32].

In 2013, 40 percent of Health Center funding came from Medicaid patient revenue whereas only 18 percent of this funding came from its second largest source, Section 330 grants. This implies that Health Centers in states that expanded Medicaid were likely to have incurred a higher boost in revenue from the influx in newly covered patients relative to states that chose not to expand. Furthermore, two years after the start of the expansion, Medicaid revenue comprised 49 percent of total health center revenue in expansion states whereas it was only 29 percent of total revenue among non-expansion states [32]. I expect that the combination of higher demand for primary care services from the newly insured and the increase in health center Medicaid revenue would have led to a surge in demand for RNs in health centers in Medicaid expansion states.

In May 2019, the BLS reported that the mean hourly wage across the US was $37.24 and $40.73 for RNs working in hospitals and outpatient care centers, respectively, but the average was only $33.45 for RNs working in physician offices. It is possible that the higher average wage in outpatient centers reflects a higher marginal revenue product for work performed in outpatient centers such as Health Centers increasingly adopting collaborative care models.

The regular day time working hours in clinics and physician offices may be more attractive than irregular shifts in hospitals for some RNs especially those with young children. A health care clinic setting may also be a less stressful environment with more routine work and appointments scheduled ahead of time in contrast to the intense shift work and emergency care associated with hospitals [1]. Preferences are likely to vary with one's family situation and household income. For example, one study found that among nurse qualification holders who have children, not having a partner decreased the likelihood of working as a nurse whereas with a partner, the likehood of working as a nurse increased with decreasing partner's income [16].

I use the 2013 Medicaid Expansion to examine whether a surge in demand for primary care generated an increase in demand for RNs in outpatient care clinics. I expect an increase in demand for RNs in the current environment of payment and delivery restructuring, expanding roles of nurses including NPs as primary care providers,

12

shortages of primary care providers and the growth and continued success of Health Centers.

1.3   Design and Statistical Analysis

I examine the effect of the 2014 expansion on the labor supply of nurse practitioners in primary care settings. The resulting surge in newly covered individuals from the 2014 expansion allows me to use the policy as a plausibly exogenous increase in the demand for primary care providers and estimate the effects this may have had on the nurse practitioner labor market.

Regressional analysis and tabulations are executed in Stata/SE 16.0 [38]. Some data calculations and graphs were generated using Python [13].

1.3.1   Data

For analysis, I used the single-year Public Use Microdata Sample (PUMS) which contains a sample of actual responses to the American Community Survey (ACS). The ACS was developed by the U.S. Census Bureau and surveys approximately 3 million persons each year. The single year PUMS files contain survey units from approximately one percent of the United States population.

The smallest geographical unit is the Public Use Microdata Area (PUMA) which are contiguous areas dividing each state along state lines. While each PUMA contains at least 100,000 persons, they vary in population density. Since the ACS does not include an urban or rural area indicator, I merged the ACS PUMA data with the MET2013 dataset from IPUMS USA which identifies metro areas of residence using the 2013 definitions for metropolitan statistical areas (MSAs) from the U.S. Office of Management and Budget (OMB). Specifically, this dataset provides MSA codes and MSA titles with all of their corresponding PUMA codes (that is PUMAS within their zones) along with the percentage of each MSA's population residing in each PUMA. Since MSAs do not follow PUMA lines, many fall within multiple PUMAs and similarly multiple PUMAs fall within multiple MSAs. With the goal of categorizing PUMAs as either urban or non-urban, using Python, I reduce the dataset to a unique set of PUMA codes by keeping the PUMA that has the highest population among MSAs. The PUMAS designated as urban are those in which at least 50 percent of the

PUMA population belong to the MSA. For the years 2010 and 2011, PUMAs were classified based on the Census 2000 but starting in 2012, they were reassigned based on the 2010 Census data. Therefore I separately merge the MSA-PUMA crosswalk based on the Census 2000 with the ACS for those surveyed in 2010 and 2011 and the crosswalk of PUMAs based on the 2010 Census were merged with ACS survey years 2012 through 2017.

1.3.2 Model and Validation

I use a difference-in-differences model with fixed effects to examine how the ACA Medicaid expansion affected NP employment in outpatient facilities. Even though the outcome under examination is binary, I chose not to use a model based on maximum likelihood such as logit or probit citing results obtained by Greene 2004 that the MLE tends to show a large finite sample bias and underestimated asymptotic variances in discrete choice models in the presence of fixed effects which is beyond the scope of this paper [15].

In the absence of a simple random sampling experiment in which randomly chosen PUMAs might have been subjected to the Medicaid Expansion and ACA mandates, validity of the difference in differences model rests on the assumption that in the absence of the ACA, the both expansion and non-expansion states would have exhibited similar trends over the time period. I test the parallel trends assumption by graphing the dependent variable over time for both groups in Figure 1.3.2. From 2010 to 2012, the proportion of nurses employed in outpatient settings declined significantly in both expansion and non-expansion states whereas in 2014, the trend seems to diverge with a sudden rise in the proportion or NPs working in outpatients settings among the expansion states.

I focus on labor supply of NPs under 35 years of age because this group exhibits more job mobility and higher turnover rates in the nursing field and can thus provide more variation during the time period under study [23, 4]. Focusing only on the subpopulation of NPs in areas most likely to be exposed to the ACA expansion, I narrow the dataset to PUMAS containing elevated proportions of low income and

uninsured individuals. Following Decker [9] I examine PUMAs in which at least 15 percent of households have an income to federal poverty line ratio of 250 percent or less. I analyze the following model:

$$Outpt_{ist} = \beta_0 + \beta_1 Expan_s * EffectYear_t + \eta X_{ist} + \phi Dem_{PUMA} + \delta State_s + \tau Year_t + \varepsilon \tag{1.1}$$

The outcome variable is an indicator for whether NP i worked in an outpatient setting in state s and year t. The coefficient β_1 on the interaction variable indicates whether person i lived in an expansion state in the year the policy went into effect captures the effect among individuals living in states that expanded Medicaid at the beginning 2014 without a work waiver. A β_1 greater than one would indicate that the primary care demand shock resulting from the Medicaid Expansions made employment in an outpatient setting more likely for a given NP in an expansion state after 2014. The states designated in the treatment set are Arizona, California, Colorado, Delaware, Hawaii, Idaho, Illinois, Iowa, Kentucky, Maryland, Michigan, Minnesota, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Dakota, Ohio, Oregon, Rhode Island, Vermont and West Virginia. I excluded California, Connecticut, the District of Columbia, Massachusetts and Washington because these states had 1115 waivers federally approved to expand Medicaid eligibility before January 2014. While New Jersey also filed a waiver in 2011, it only expanded eligibility to those with household incomes of less than 23 percent of the federal poverty level [12].

X is the set of nurse characteristics, mainly gender and an indicator for whether NP i was a single parent. At the PUMA level, I include an indicator for urban and a set of PUMA level population statistics that I calculated in python separately capturing the proportion of the population that is hispanic, black, and between the ages of 35 and 50 as the sub-populations that are most likely to have the highest exposure to the policy and pent up demand for primary care services. I include a set of state fixed effects to ensure that the estimated effects of the ACA policies cannot be attributed to unmeasured time-invariant differences between states such as number of nursing schools in different areas of the country that may influence an NP's decision

16

to work in an outpatient setting. I also include a set of year fixed effects controlling for the effects of the ACA that may coincide with trends occurring across all PUMAS during the same time period.

The PUMS Dataset provides a set of person and household weights as well as a set of replicate weights which account for the increased sampling error due to its multi-stage design. To estimate coefficients I use the person weights and standard errors are calculated using both person weights and replicate weights employing a successive difference replicate (SDR) method. This is consistent with guidance from the Census Bureau that the SDR method using replicate weights generally produces more accurate estimates than using the alternative generalized variance function (GVF) method which employs design factors rather than replicate weights. Therefore, while the population under study is a subset of the full PUMS dataset, with an understanding of the survey design, I am able to leverage Stata's specialized survey functionality which uses an algorithm that employs all cases to calculate standard errors with higher accuracy.

1.3.3 Limitations

Unfortunately, the ACS does not include information on population density by PUMA in its single year files and it has been shown that there are considerable differences between urban and rural areas both in terms of population and healthcare industry characteristics and ACA outcomes. Hospitals in rural areas tend to be smaller with 47 percent having 25 or fewer beds while 41 percent of urban hospitals have 200 or more. The rural workforce also tends to be less specialized [25]. Rural populations had a higher uptake in Medicaid coverage resulting from the expansion [37], and similarly rural hospitals had higher increases in Medicaid revenue than urban hospitals [20]. The differential impact may signal a similar distribution in the impact on demand for primary care. There was also a steeper decrease in the proportion of costs for uncompensated care among the latter. [20].

To minimize the potential bias this would expose, I overcome this absence of data by merging the crosswalk dataset of MSAs and PUMAs from 2010. While I consider
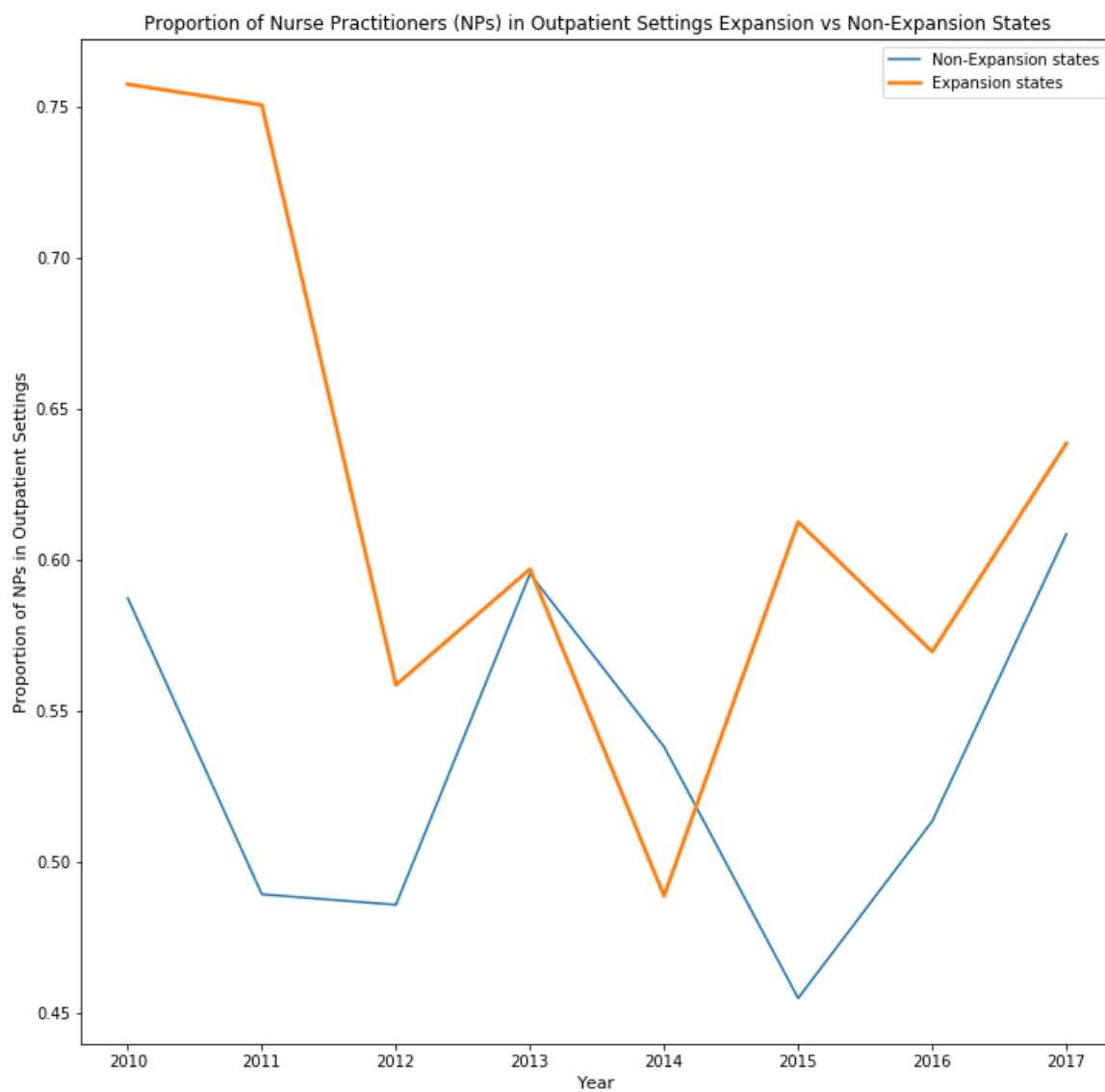
Figure 1-1: Line chart depicting proportion of NPs. Based on weighted estimates calculated from ACS 2010-2017

this to be an imperfect measure as it does not specifically identify urban or rural clusters or areas, it likely captures a lot of the variation.

A source of bias in my model that must be acknowledged is due to the lack of variation in scope of practice restrictions across the states that did not expand Medicaid enrollment among which only one allowed NPs to practice as independent primary care providers (also referred to as full scope of practice) and that is Wyoming which is also the least populous state in the United States and thus offers little variation to the set of nonexpansion states. As a robustness check on my model, I also run the full model using only states that do not have full scope of practice. This excludes Alaska, Arizona, Colorado, Hawaii, Idaho, Iowa, Maine, Montana, Nevada, New Hampshire, New Mexico, North Dakota, Oregon, Rhode Island, Vermont, Washington and Wyoming.

1.3.4 Results

A summary of the regression results is presented in table 1.1. In the first column, the variable indicating whether or not a nurse works in an outpatient setting is linearly regressed on all main design variables and all included states regardless of full scope of practice status. Based on this model, it is highly suggestive that the ACA Medicaid expansion significantly increased the number of nurses working in outpatient settings and fewer working in hospitals.

The second column summarizes the model results excluding all states allowing full scope of practice. While the results are suggest there may have been an upward effect on NPs working in outpatient clinics, this coefficient was not significant in my model and I could not reject the null hypothesis at the 10 percent significance level (the actual p-value was 0.198). This may be indicative of bias in my first model caused by the variation in scope of practice restrictions across states. It may also suggest that nurses in states that allow nurses to practice independently are perhaps more liberated from economic and political barriers and thus in a more favorable position to better respond to market forces calling for their supply where their services are needed most.

Table 1.1: Effect of ACA on Labor Supply of Nurses in Outpatient Clinics

Working in outpatient clinic		
	(1)	(2)
PolicyYear$_t$ X Expansion$_s$	0.153**	0.103
	(0.076)	(.080)
PolicyYear$_t$	-0.058	-.074
	(0.090)	(.088)
Expansion$_s$	-0.294	-0.253
	(0.189)	(0.187)
Nurse Characteristics	Y	Y
State Fixed Effects	Y	Y
PUMA Characteristics	Y	Y
Year Fixed Effects	Y	Y
Scope of Practice Laws	Mixed	Not full
Observations	25,045,556	25,045,392
Subpopulation No. Observations	1,236	956
R-squared	0.092	.075

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

1.4 Discussion

A shift in NP employment toward health centers and other outpatient settings could have many economic implications. Hospitals located in areas that contain a limited number of hospitals may employ a large fraction of the supply of nurses in their local market and thus wield considerable market power in the setting of wages for nurses. With more power over the supply of their key input, hospitals may also have less of an incentive to ensure favorable work conditions.

Many studies have concluded nurse labor supply tends to be inelastic along the intensive margin [?]. That is, when not accounting for entry and exit from the labor force. More recently, it has also been shown that the elasticity may be much higher when accounting for the extensive margin due to entry and exit from the labor force [16]. Within firm inelasticity is also a direct measure for a given firm's market power over its labor supply. Since hospitals may employ a significant proportion of available nurses, they may have the power to exert considerable market power over nurses. Wage setting control. Increasingly for NPs entering a new environment of increased acceptability and demand for their services as primary care providers, there is considerable potential to diminish this market power.

NEXT POTENTIAL STEPS: define more specifically how I created the outpatient in the data and methods section, create table of summary statistics for expansion vs nonexpansion and/or outpatient vs. hospital and discuss it. I would like to a separate analysis on wage changes in outpatient employment and further comment on the impact Health Center employment growth may have on hospital market power (and potential monopsony).

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