Did the Affordable Care Act's Medicaid expansion boost demand for Registered Nurses in outpatient care settings?

by

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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 (APMs) which encourage a collaborative approach to primary 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. This study examines the effect that these measures may have had on the supply of registered nurses in outpatient settings relative to hospitals. The expectation is that registered nurses (RN) will play a larger role in the provision of primary care and management of chronic diseases in outpatient settings as more health care organizations seek to improve care qualty and reduce overall costs.

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 [3]. 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 [44].

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 workforce participation, health care delivery and utilization continue [44]. This shortfall is expected to be most severe among Medicaid beneficiaries [6]. Contributing to the shortage on the supply side is an imbalance in clinician supply as higher numbers of new clinicians are choosing to specialize [57]. 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, median compensation for physicians across all specialties was $300,000 while median compensation for physicians in primary care was only $242,000. To compare, physicians specializing in radiology had a median of $460,000. Even with this wide of a variance in compensation, primary care physicians remain toward the lowest end of the spectrum [11].

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 [14, 13]. 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 [11].

The rising price differential between private and public insurers is 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. Rates in the private market reflect a market equilibrium formed by supply and demand whereas Medicaid rates are arbitrarily set by the government. The divergence may also 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 will further provide incentive to 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[11].

As physician supply has continued to stagnate, the U.S. population is expected to have grown by 18 percent over the past two decades, resulting in an additional fifty million people who will require health care and the aging baby boomer generation with a higher prevalence of chronic conditions is also expected to intensify demand for healthcare services [58]. 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.

In 2010, the ACA mandated that all states expand Medicaid eligibility to all non-elderly adults with household incomes of up to 138 percent of the Federal Poverty Level (FPL). This measure was struck down in 2012 by the Supreme Court as unconstitutional 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 [35]. Between 2013 and 2015, the number of uninsured adults fell by over 15 million [35]. 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 [35]. Studies have shown a significant increase in coverage among the targeted population of low-income childless adults with the highest gains seen among those without a college degree, non-whites, young adults, unmarried individuals, and those without children in the home [12, 51].

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 seeking care 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 [48]. 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 [48]. 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 [53, 16]. 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 [26]. In 2013, an estimated seven million people resided in areas where the expected increase in demand was greater than 10 percent of the baseline [26]. 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 [14] 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) 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 [44]. The ACA contained several provisions to expand the supply of NPs in primary care through scholarships, loans and training opportunities

in health clinics.

While NPs 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 to practice to the fullest extent of the their training [44] 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 [13, 14]. 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 the lone physician model of care in which all care is delivered or delegated by the physician, collaborative delivery models foster sharing of responsibility 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 [42]. 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 [45].

One major obstacle preventing nurses from contributing to primary care is prevailing payment structures based on the fee for service (FFS) model. In practices that follow traditional FFS, decisions are often made and carried out by the lone physician with a few helpers on hand, usually medical aids, under increasingly strained capac-

ity as the ratio of clinicians to population declines [19, 25]. Increasing the number of patients seen by physicians would require increasing their panel size, the number of patients seen in a given year, but 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 to caring for 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[19, 49].

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 [39]. 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 [24].

An increasing number of health care organizations are adopting APMs that facilitate a team-oriented approach inclusive of nurses as a way of increasing their primary care capacity. 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 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 [30]. 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. Furthermore, the ACA contained several provisions promoting APMs in support of the transformation of care delivery with the implementation of accountable care organizations (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 patients who are uninsured or on Medicaid, and for 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 with payments arranged on a sliding scale as to facilitate access to all individuals regardless of income or insurance status. 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 necessitates a team-based approach among physicians, non-physician clinicians and other staff. 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. Using 2006-2007 data from the National Ambulatory Medical Care Survey, 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 [25]. 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 featuring 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 [29]. Staffing patterns are usually linked to local factors like the prevailing supply of clinicians and non-clinicians as well as scope of practice laws. This suggests that any solution to the primary care provider shortage would need to be adaptive and flexible enough to adjust to differences in these factors as Health Centers have shown to be.

Studies have demonstrated Health Centers to be a very cost-effective source of care for Medicaid patients. 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 [41]. Health Center patients on Medicaid have lower utilization of and spending on both inpatient and outpatient services relative to non-health centers [40]. In addition, they have lower utilization of costly hospital emergency department-related services [40]. This suggests that if individuals can access basic primary care including for preventive and chronic disease, they may be less likely to face more complicated problems that require expensive hospitalization later on. Thus channeling resources to primary care may reduce health care expenditure overall.

Medicaid is the largest source of health center funding accounting for 44 percent of total revenue in 2017 [23]. Medicaid expansion was shown to have a substantial effect on the percentage of Health Center patients covered by Medicaid. Figure 2 below shows that from 2000 to 2013, the number of Medicaid patients served by Health Centers steadily increased from 3.9 million to 8.8 million while from 2013 to 2017, as the total number of patients continued to increase steadily, the growth in patients covered by Medicaid accelerated sharply to 13.3 million. The percentage of patients served by Medicaid also rose from 41 to 49 percent during this time. Furthermore, the number of uninsured patients fell by 1.4 million suggesting that some proportion of those who were previously uninsured had secured Medicaid coverage through the ACA. From 2010 to 2017, health center Medicaid revenue increased by 97 percent when adjusted for inflation while on a per patient basis, it grew by only 11 percent reflecting the increase in Medicaid beneficiaries and not an increase in per patient

cost [47].

The second largest source of health center funding comes from federal grants 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 [59] which ensured a consistent flow of resources to the Health Centers Program and ultimately supplanted the funds previously granted through the discretionary appropriations process. This cumulative increase across its key sources of revenue has enabled health centers to substantially 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 [46].

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. With Medicaid comprising a substantial share of overall Health Center revenue, the increase in revenue over 2013 to 2017 attributable to the influx of patients who were newly insured by Medicaid would have had larger impact in expansion states than in those that did not expand Medicaid. While the percentage of total revenue attributable to Medicaid increased from 38 percent in 2010 to 44 percent in 2017 across all states, there was a wide gap between expansion and non-expansion states. Among Medicaid expansion states the percentage of revenue coming from Medicaid was 48 percent and among non-expansion states it was only 29 percent [**?**].

There was also a larger increase in the number of health center patients served among Medicaid expansion states than among non-expansion states. Among expansion states, the number of patients served grew by 43 percent whereas it only rose by 33 percent in non-expansion states. The higher number of patients served in expansion states is largely attributable to the surge in operating revenue from the increased share of patients insured by Medicaid that enabled health centers to expand capacity through more sites and hiring of additional staff. A study conducted in 2015 found that health centers located in expansion states were more likely to report in-

creasing their service capacity in substance use treatment, chronic care management and vision care than those in non-expansion states [46]. The ACA also established a new grant program for Nurse-Managed Health Clinics (NMHCs) which are similar to Health Centers but are usually led by a team of NPs. The increase in resources flowing to health centers and NMHCs across all communities is very likely to have increased demand for registered nurses in outpatient settings along both the intensive and extensive margins.

In May 2019, the BLS reported that the mean hourly wage for RNs working in hospitals and outpatient care centers across the U.S. was $37.24 and $40.73, respectively, but for RNs working in physician offices, the average was only $33.45 [45]. It is possible that the higher average wage in outpatient centers reflect a higher marginal revenue product for work performed in outpatient centers such as in Health Centers where RNs increasingly play an integral role in care coordination and delivery as more teams adopt collaborative approaches to care.

There are many reasons to believe that the changes effected by the ACA would have led to more RNs choosing to work in outpatient care instead of in a hospital. It is likely that the role of RNs in outpatient care have and will continue to expand in response to (1) the growing demand for primary care services that RNs can support such as preventive care and chronic disease management, (2) the shrinking supply of primary care providers, (4) the growing number of studies demonstrating the efficacy of RN care, and (5) the acceleration of APM adoption creating financial incentives for more collaborative care. It is plausible that more RNs will choose to work in outpatient settings as these roles continue to expand and grow becoming more attractive to career-oriented RNs.

RNs have a notoriously high turnover rate. Turnover is defined as leaving one's current position or transferring to another position within the hospital or organization [27]. Turnover has been shown to negatively impact hospitals and patient outcomes [27]. In 2008, as high as 18.1 percent of full-time RNs worked for either a different employer or in a different position than in the previous year. Turnover seems to be particularly high among recent graduates with nearly 40 percent planning to leave

their current jobs within 3 years but the vast majority of whom intend to remain in the nursing profession. Only 3.3 percent of recent graduates who planned to leave their current job did not plan to stay in nursing. In comparison only 29.8 percent of all RNs under the age of 50, inclusive of recent graduates, planned to leave their current job within 3 years [43]. Studies have shown that hospital turnover is highly attributable to low job satisfaction caused by inadequate staffing, strenuous physical demands, work stress and environment. Moreover, low job satisfaction is especially concentrated in young and newly qualified RNs [22]. Wages, in contrast, have been shown in both qualitative and econometric studies to play a much more trivial role in explaining this high rate of turnover with accumulating evidence over recent decades concluding that RN labor supply and participation is very inelastic with respect to changes in own-wage [22, 31, 33, 32, 5, 50, 10, 15, 4, 55].

The regular day time working hours in clinics and physician offices may be more attractive than shift work in hospitals for many RNs and especially those who live with young children. An outpatient 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 [2]. Labor supply preferences are also moderated by family situation and household income. Several studies have found that having children decreases the likelihood of working for married RNs and that the likelihood of working decreases with increasing partner income [52, 21, 31, 33, 32, 34, 10, 50, 8, 7]. One study found that among nurse qualification holders who have children, not having a partner decreased the likelihood of working as a nurse [21]. This could be explained by reasoning that having a partner to share in the responsibility of a household might be an enabling factor for the time and intensity demanded by hospital shift work and it is possible that nursing positions in outpatient care might offer more feasibility for these single parents.

It is likely that with low job satisfaction driving boatloads of RNs to leave hospital positions while seeking to stay in the nursing profession and the burgeoning job opportunities outside of hospitals, an increasing share of hospital turnover will seek opportunities in outpatient care. This might become more likely as demand for RNs

in primary care grows and their roles in care coordination and delivery continue to expand. Together these factors contribute to an increasing elasticity of substitution for jobs in outpatient care relative to hospitals.

The demand created by the surge in the number of individuals covered by Medicaid is sure to have intensified the strain in the supply for primary care providers in areas already experiencing a shortage. In response to this surge in demand, many outpatient care sites such as health centers, nurse-led clinics and physician took to mobilizing resources and restructuring delivery with the adoption of more collaborative approaches to care that are more inclusive of RNs. If this response was substantial, this could have resulted in a substantial surge in demand for RNs in outpatient care settings. Given the high rate of hospital turnover, RNs may have been especially receptive to signals of higher demand for their services.

The analysis that follows uses the ACA Medicaid expansion to examine whether more RNs chose to work in outpatient care settings such as health centers and physician offices rather than in hospitals as a result of the surge in demand for primary care. During this period when primary care is already strained in capacity, incorporating registered nurses into primary care delivery could be seen as a cost-effective way to help bridge the gap between demand and supply. It is this author's expectation that demand for RN labor in primary care settings is on the rise in the current environment of payment and delivery restructuring, widening scope of practice for NPs as primary care providers, physician shortages and the growth and continued success of Health Centers.

1.3 Design and Statistical Analysis

This paper examines the effect of the 2014 Medicaid expansion on the labor participation of registered nurses in outpatient care settings. The surge in newly covered individuals from the 2014 Medicaid expansion facilitated an exogenous increase in the demand for primary care services. This paper uses that surge in demand to estimate the resulting changes in the supply of registered nurses in outpatient care settings such as health centers and nurse-led clinics.

Regressional analysis and tabulations are executed in Stata/SE 16.0 [56]. Some data calculations and graphs were generated in Python [18].

1.3.1 Data

Statistical and regressional analysis was carried out using data from the single-year Public Use Microdata Sample (PUMS). The PUMS dataset 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 [9].

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, the ACS PUMA data was merged with a crosswalk dataset of metropolitan statistical areas (MSAs) from IPUMS USA which identifies metro areas of residence using definitions for MSAs from the U.S. Office of Management and Budget (OMB) corresponding to the survey year [37, 38]. Specifically, this dataset provides MSA codes and 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, the

dataset was reduced to a unique set of PUMA codes by keeping the PUMA with 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 merged with the crosswalk corresponding to definitions based on the Census 2000 but starting in 2012, PUMAs were reassigned based on the 2010 Census data. For this reason, the MSA-PUMA crosswalks were merged in two stages: first, using the Census 2000 and the ACS for those surveyed in 2010 and 2011 and second, using the crosswalk of PUMAs based on the 2010 Census with ACS survey years 2012 through 2017.

1.3.2 Model and Validation

A difference-in-difference model with two-way fixed effects was used to examine changes in RN labor supply to outpatient facilities relative to hospitals that may have been facilitated by the ACA Medicaid expansion. Even though the outcome under examination is binary, a difference in differences approach was preferred to a model based on maximum likelihood such as logit or probit given results obtained by Greene 2004 that MLE tends to show a large finite sample bias and underestimates asymptotic variances in discrete choice models in the presence of fixed effects [20].

In the absence of a simple random sampling experiment in which PUMAs might have been randomly selected to enact the Medicaid Expansion, the validity of the difference-in-difference model rests on the assumption that in the absence of the ACA, both sets of expansion and non-expansion states would have exhibited similar trends over the same time period. The parallel trends assumption was tested graphically and is illustrated in 2

The model under study is as follows:

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

The outcome variable is an indicator for whether RN 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 that the policy went into effect capturing the effect among individuals living in states that expanded Medicaid at the beginning of 2014 without a work waiver. Assuming that the model can reliably predict the effect of the Medicaid expansion on the choice of RNs to supply labor in either outpatient settings or in hospitals, a β_1 greater than one would suggest that the demand shock for primary care resulting from the Medicaid expansion increased the probability of an RN being employed in an outpatient setting in an expansion state after 2014.

The states designated in the treatment set are Arizona, 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. California, Connecticut, the District of Columbia, Massachusetts and Washington were excluded from the analysis 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 [17].

X refers to the set of nurse characteristics including gender, race, ethnicity, married and parental status, age and whether the RN resides in an urban area. For each subpopulation studied under the model, a simple univariate regression was run as well as a multivariate regression controlling for nurse demographics. Only RNs whose usual hours worked per week for the past 12 months exceeded 32 hours at the time of the survey were included in the analysis. The subpopulations examined included (1) all RNs, (2) RNs restricted to different age groups including 18-30, 21-35, 35-50, 45-60 and 60 plus, (3) unmarried RNs, (4) married RNs, (5) RNs located in PUMAs in which at least fifteen percent of the population is at most 250 percent of the federal poverty line and (5) RNs with at least one child under the age of six. All combinations of the above criteria were also examined.

A set of state fixed effects were included to ensure that the estimated effects of the ACA policies cannot be attributed to unmeasured time-invariant differences between

states such as the number of nursing schools in different areas of the country that may influence an RN's decision to work in an outpatient setting. Year fixed effects were included to control for the effects of the ACA that may coincide with trends occurring across all PUMAS during the same time period. Standard errors were clustered at the state level to correct for correlation of errors for individuals within states [1].

1.3.3 Limitations

There were several limitations that warrant consideration when interpreting the results of this analysis. States were the unit chosen for fixing of effects but there may be important confounding factors that are only seen a smaller geographical scale such as those attributed to an abundance or lack of hospitals or other places of employment for RNs in a given area that may be a controlling factor in RN employment-seeking behavior or mobility.

Another important limitation is due to many outpatient care clinics being located in hospitals or areas where outpatient services are delivered in a hospital for a substantial share of the community as is sometimes the case in certain rural parts of the country. Hospitals in rural areas are sometimes a main access point to all primary care services for the whole population. Therefore it may not be clear if more RNs are broadening their roles in primary care provision if they are doing so within such a hospital.

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 [36]. Rural populations had a higher uptake in Medicaid coverage resulting from the expansion [54], and similarly rural hospitals had higher increases in Medicaid revenue than urban hospitals [28]. 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. [28]. To minimize the potential bias these differences might expose, the data was merged with the aforementioned MSA and PUMA linking crosswalk but this is an imperfect measure of urban status since it is not clear if rural areas overlap MSAs within some PUMAs.

1.3.4 Results

Table 2.1 contains a summary of selected demographics by each setting type and expansion status group averaged over 2010-2013 before the Medicaid expansions took effect. The percentages for female, married, age and full-time status defined as working over 32 hours are extremely similar for expansion and non-expansion states across all settings. The race and ethnicity variables did vary with a larger Hispanic population in expansion states and a larger black population in non-expansion states.

Under the model, there was no change in the probability of an RN working in an outpatient setting over a hospital overall but it did suggest a small increase for the subpopulation of unmarried female RNs with a child under age 6.

A summary of the regression results for the subpopulation of RNs with a young child is presented in table 2.2. Corresponding to columns one and two, among female RNs married and unmarried with at least one young child, the model suggests there is a small but statistically insignificant increase in the probability that an RN worked in an outpatient clinic over 2014 to 2017 and that this probability is higher for the population restricted to RNs between the ages of 21 and 35.

Column three restricts the data to RNs who are not married under which the model indicates that the Medicaid expansion resulted in a statistically significant increase of 0.0648 points in the probability of an RN working in an outpatient care center rather than in a hospital. Column four corresponds to estimates from the same model as that in column three with the only difference being the subpopulation of married women rather than unmarried women. There is no change in the probability for this group. In column 5, the same married subpopulation is further restricted to RNs with a maximum household income of 501 percent of the federal poverty line. Unlike for unmarried mothers of young children, there was no practical significance

for either group of married mothers.

1.3.5 Discussion

Overall, the results suggest that the ACA did not effect a measurable change in the overall labor supply of RNs in outpatient care. Among all RNs, there was no change in the probability of an RN working in an outpatient care clinic relative to a hospital. There are a few factors likely contributing to this outcome. First, there has not been enough uptake of a collaborative team approach to care inclusive of RNs for the number of opportunities to be high enough for RNs to even consider it. While APMs are increasingly gaining traction in the health care market, certain elements of FFS still prevail that discourage the inclusion of RNs in care provision particularly because their time is not directly reimbursable as it is for physicians. Secondly, RNs serve different functions in outpatient care than they do in hospitals so that switching to outpatient care entails the additional cost of time spent onboarding and training for these new roles. This would have a negative effect on the elasticity of substitution for a job in outpatient care with respect to one in a hospital. However, it may be more appealing to those hospital RNs who are both seeking to leave hospital work but remain strongly attached to the labor force and to the profession.

The results do suggest that there was a significant increase in the probability of working in an outpatient care setting among single female RNs between the ages of 21 and 35 who have a child under 6 years old. This is consistent with several previous findings. It is possible that an increasing share of new graduates are going into outpatient care and that an increasing share of turnover in hospitals are moving into outpatient care. As discussed previously, turnover rates are substantially higher for young, recent graduates relative to other RNs and the vast majority of these job leavers do plan to continue their career in nursing. RN wage has been shown to be a trivial factor in the determination of labor supply and participation with both being very inelastic with respect to RN wage. In contrast, job dissatisfaction and work environment is a most commonly cited cause of RN turnover. Thus it is likely that hospital RNs with intentions to leave their current job that are still strongly attached

to the labor force will seek other opportunities outside of hospitals which still allow them to practice to the fullest extent of their training.

The demographics of this group of RNs are consistent with those exhibiting the highest rates of turnover with intentions to remain in the labor force and nursing profession. Being single has been shown to have a significantly positive effect on both labor supply and participation in models controlling for non-labor income. Unmarried women are less likely to be in a financially codependent relationship with another income-earning individual than married women. Therefore, in addition to not having the cushion of a spouse's income they are also likely to have less non-labor income than women who are married, and it has been amply demonstrated that spouse and non-labour income are negatively associated with labor supply and participation. Unmarried women are thus likely to be strongly attached to the labor force than married women. Women with a young child who are not married are also more likely to carry a higher share of the financial responsibility for that child which would further strengthen labor force attachment.

When the model was run on married RNs in the same age group with a child under 6, there was no such increase in the probability of working in outpatient care. It is probable that a higher percentage of turnover amongst this demographic either exit the labor force, change positions or move to a different hospital rather than into outpatient care. One reason for this could be that RNs serve different roles in outpatient care that require more time and training and this might be less appealing to this group of RNs who are more willing to work part-time or exit the labor force altogether. There was also no change in the probability of working in outpatient care when the population was restricted to those with a maximum household income of 501 percent of the FPL. This was done in order to focus on households more likely to depend on two-person incomes. This group of married RNs is likely to be more strongly attached to the labor force but it might be the case that having a partner to share in the responsibility of both income and productivity in the household might still be an enabling factor to cut back on hours rather than leave the labor force or move into a different care setting.

1.4 Conclusion

The U.S. health care system is broken and this is reflected in the widening gap between supply and demand of health care professionals and in how that gap manifests in access to basic health care. While there is a wide host of factors contributing to this gap, the causes are deeply rooted in the structural elements of the U.S. health care system with the handling of payment at the center. The payment model in turn affects how health care is delivered, by whom and how much it will cost. While the ACA made many substantial investments and structural changes that ameliorated a number of deficiencies in the system, it only addressed contributing factors while ignoring the main highway from which they are driven. Without payment reform, physicians will continue to work in silos and maximize profits by choosing to engage in activities that only provide direct rewards for use of their own time or for services delivered only by them and not by others on their team. This paper showed that even though the ACA made substantial investments toward expanding insurance coverage, increasing the affordability of basic health care services, in measures boosting the nursing workforce and promoting the adoption of alternative payment models, these pushes were not sufficient to effect structural changes in RN labor participation in primary care settings where they may potentially have the largest impact.

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Chapter 2

Tables

Table 2.1: Demographics Table

Variables (%)						
	Health Care Setting (N=233,758)					
	Hospital		Outpatient Care		Physician Office	
	Expanded	Not Expanded	Expanded	Not Expanded	Expanded	Not Expanded
Overall	90.0	88.0	6.0	6.4	4.30	5.70
Female	89.1	89.1	91.5	92.1	96.8	96.2
Married	61.0	61.5	64.7	63.9	67.7	68.3
Black	8.30	11.1	7.1	12.0	4.44	6.30
Hispanic	6.22	5.01	6.96	5.41	5.67	4.65
Full Time	83.5	85.0	79.0	82.2	72.1	79.0
Has BA	60.2	56.9	52.8	46.1	46.4	40.3
Has Child*	21.4	20.8	21.5	25.1	25.9	26.9
Age (mean)	44	43	48	46	48	47
Age Group (% worked in each setting)						
18-35	91.0	91.0	4.80	4.80	4.30	4.30
35-39	88.0	88.0	6.50	6.50	5.0	5.0
50 & up	86.0	86.0	7.60	7.60	6.0	6.0
	Restricted to unmarried female registered nurses with young child (N=2,152)					
Overall	88.0	91.0	4.10	7.50	4.90	5.00
Black	13.1	24.5	37.9	13.3	14.4	13.4
Hispanic	11.0	6.2	0	31.2	19.2	7.2
Full Time	87.5	87.4	69.0	82.7	99.0	95.8
Has BA	53.6	54.3	46.8	28.8	53.3	45.2
Age (mean)	32.1	31.4	33.2	29.9	30.7	31.1

Table 2.2: Effect of ACA on Labor Supply of Registered Nurses with young child(ren) in Outpatient Clinics

Female RNs with young child(ren) working in an outpatient care clinic					
	All		Not Married	Married	
	(1)	(2)	(3)	(4)	(5)
PolicyYear$_t$ X Expansion$_s$	0.0068	0.0129	0.0648**	0.0073	0.0026
	(0.0085)	(0.0099)	(0.0299)	(0.0101)	(0.0169)
Demographics	Y	Y	Y	Y	Y
State Fixed Effects	Y	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y
Age Restriction	N	21-35	21-35	21-35	21-35
HH Income Restriction	N	N	N	N	Y
Observations	12,009	9,432	1,161	8,271	4,477
R-squared	0.0167	0.0191	0.0736	0.0197	0.0303

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

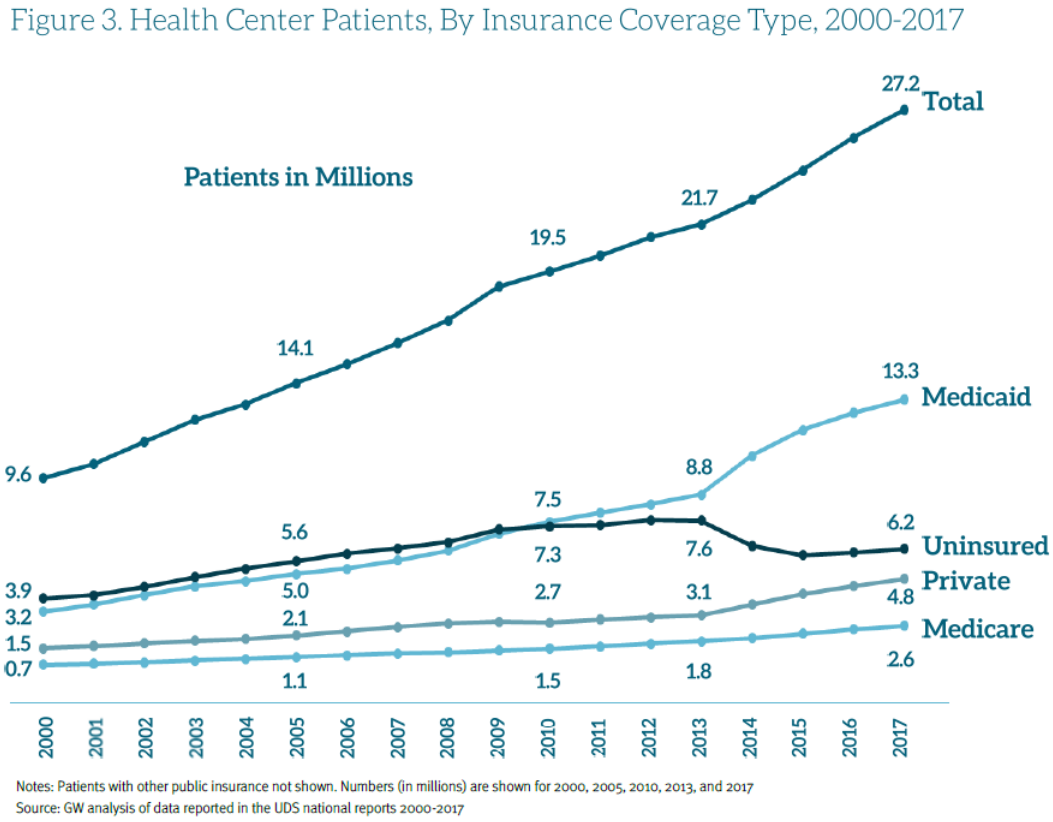

Figure 2-1: Health Center Patients, By Insurance Coverage Type, 2000-2017

Figure 2-2: Line chart depicting proportion of RNs working in Outpatient Care Centers. Based on weighted estimates calculated from PUMS 2010-2017