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Benefits of Less Restrictive Regulation of Advance Practice Registered Nurses in Florida

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ABSTRACT

Background: Advanced Practice Registered Nurses (APRNs) provide access to cost-effective, high quality care. APRNs are underutilized in states that restrict their practice. Removing restrictions could expand access to quality health care, cost-effectively relieve the physician shortage, and contribute economically.

Purpose: This study forecasts the health system and economic impacts of reducing practice restrictions for Florida APRNs.

Methods: The analysis utilized a number of data sources and IMPLAN software and estimated changes in APRN supply given less restrictive practice laws, and consequential health system and economic benefits.

Findings: Between 2013 and 2025 APRN full time equivalents could increase an additional 11% with less restrictive practice regulations. This could eliminate or reduce the shortage of different types of physicians. Health care cost-savings could be $50 to $493 per resident. There would be a number of general economic benefits.

Discussion: A number of health system and economic benefits would ensue from less restrictive APRN regulation.

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Introduction

Shortages of health care providers, particularly primary care providers and those that practice in underserved areas, is a growing impediment for access to health care in the United States (HRSA, n.d.). Advanced Practice Registered Nurses (APRNs) provide access to cost-effective, high quality care in primary care/family practice, OB-GYN, anesthesia, and inpatient care (Newhouse et al., 2011). Despite evidence that outcomes from patients who receive care from APRNs are equivalent to those receiving care from physicians, while APRN care is less expensive than the equivalent physician-based care, a number of states restrict APRN practice. Removing restrictions in these states could expand access to quality health care, cost-effectively relieve the physician shortage, and contribute economically. This study examines the impact on access to health care and the economy

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of reducing restrictions in the practice of APRNs in Florida.

Background

Advanced Practice Registered Nurse (APRN) Value

APRNs are licensed practitioners who have advanced education in nursing, and receive training in advanced health assessment, physiology, pharmacology, and counseling, and who can provide many of the same services as medical doctors (MDs) (Moore, 2017; National Governors Association, NGA, 2012). Certification is also required in most states. There are four types of APRNs: (a) nurse practitioners (NPs), practicing in primary care/family practice, pediatrics, and geriatrics; (b) certified nurse midwives (CNMs), practicing in obstetrics-gynecology; (c) certified registered nurse anesthetists (CRNAs), practicing in anesthesia; and (d) clinical nurse specialists (CNSs), commonly practicing in institutional settings such as hospitals.

There are over 354,000 Advanced Practice Nurse Practitioners (APRN) in the United States (Phillips, 2018). Of those, over 226,000 are licensed NPs (Phillips, 2018), most (83%) of whom are certified in an area of primary care (AANP, 2016). In 2012 NPs comprised 20% of primary care providers in the United States (Poghosyan et al., 2013). NPs are more likely than physicians to practice in underserved areas (Hansen-Turton, Ware, & McClellan, 2010; Newhouse et al., 2011; Sonenberg, Knepper, & Pulcini, 2015). Between 2006 and 2010 21% of patient visits to community health centers were to NPs (Morgan, Everett & Hing, 2014). In anesthesia, CRNAs provide the majority of care in rural areas (AANA (American Association of Nurse Anesthetists), 2017) and care for more vulnerable populations (Liao, Quraishi, & Jordan, 2015). CNMs bring obstetric and primary care services to underserved areas (Phillipi & Barger, 2015).

Studies indicate that care from APRNs is equivalent to, or better than, that from comparable physicians (Bauer, 2010; Brooten, Youngblut, Kutcher, & Bobo, 2004; Carter & Chochinov, 2007; DesRoches et al., 2013; Fletcher, Copeland, Lowery, & Reeves, 2011; Gielen, Dekker, Francke, Mistiaen, & Kroezen, 2014; Jennings, Clifford, Fox, Oconnell, & Gardner, 2015; Kleiner, Marier, Park, & Wing, 2014; Kurtzman & Barnow 2017; McDonnell et al., 2014; Naylor & Kurtzman, 2010; Newhouse et al., 2011; Oliver, Pennington, Revelle, & Rantz, 2014; Regan & Salsberry, 2013; Stanik-Hutt et al., 2013). A review of a 37 studies by Newhouse et al. (2011) found that APRNs provide high quality clinical services that result in positive patient outcomes, proper diagnoses, appropriate management, and accurate treatment. Among many of their results, they found that NPs had patient outcomes similar to or better than that of physicians for patient satisfaction, self-reported perception of health, functional status, glucose, lipid and blood pressure control, ED visits, and hospitalization rates. CNM care exceeded that of obstetricians in lower rates of cesarean section, epidural use, episiotomies, perineal lacerations, and instrumented vaginal births. Studies find no difference in anesthesia complications between anesthesia care delivered by CRNAs vs. anesthesiologists (Dulisse & Cromwell, 2010; Needleman & Minnick, 2009; Negrusa, Hogan, Warner, Schroeder, & Pang, 2016).

APRN care tends to result in lower costs compared to physicians (Xue, Ye, Brewer, & Spetz, 2016) because their training costs are lower (AANP, 2013; Hogan, Seifert, Moore, & Simonson, 2010), they tend to be compensated at lower levels (AANP, 2013; BLS, 2017; Hogan et al., 2010; Kleiner et al., 2014; Perryman Group, 2012), and the health care utilization of their patients is often lower (e.g., fewer tests and diagnostic procedures; AANP, 2013; Johantgen et al., 2012; Newhouse et al., 2011). APRNs have lower rates of malpractice claims, lower malpractice insurance premiums, and lower costs per claim (Bauer, 2010; Kleiner et al., 2014). In urban areas, the addition of APRNs to emergency room staff reduced emergency room wait times, readmission rates, and lengths of stay, which led to a greater number of available beds in hospitals for new patients (Carter & Chochinov, 2007). Hospitals utilizing CNSs have lower lengths of stays and cost of care (Newhouse et al., 2011). Also, the salaries of NPs compared to MDs tend to be lower (Manion & Odiaga, 2014). A study conducted in Massachusetts by the Rand Corporation found that the average cost of a NP/physician assistant visit is 20% to 25% lower than a physician's visit (Martsolf, Auerbach, & Arifkhanova, 2015). Per year, the savings could be $4.2 to $8.4 billion between 2010 and 2020.

Since APRN care is comparable to and less expensive than physician-based care, greater use of APRNs could help relieve the considerable shortage of primary care and other physicians. In 2015 there was a shortage of around 8,400 primary care physicians (AAMC, 2017), particularly physicians working in underserved areas. This is evidenced by the 6,100 Health Professional Shortage Areas in the United States in which there were not adequate primary care services (HRSA, n.d.). An aging population and the continuation of the Affordable Care Act (ACA) suggest that the problem of primary care shortages will only worsen (Fontenot, 2014). It is predicted that there will be a continued, or much greater, shortage by 2030 (7,300 to 66,600 depending upon the scenario; AAMC, 2017).

There are also shortages of OB-GYNs and anesthesia professionals. In 2010, close to 50% of US counties lacked an OB-GYN (Rayburn, 2017). The American Congress of Obstetricians and Gynecologists (ACOG) projects that the United States could face a shortage of 6,000 to 8,000 OB-GYNs by 2020 and a shortage of 22,000 by 2050 (Rayburn, 2017). Both anesthesiologists and CRNAs report open positions and other

indicators of shortages of anesthesia personnel (Daugherty, Fonseca, Kumar, & Michaud, 2010).

APRN Regulation and Restrictions on Practice

APRNs could cover many of the services of primary care physicians (Auerbach et al., 2013), OB-GYNs and other physicians, such as anesthesiologists, yet this opportunity is not fully taken advantage of in half of US states because state regulations restrict APRN scope of practice to some degree (Pohl, Hanson, Newland, & Cronenwett, 2010; Sonenberg & Knepper, 2017). APRN practice is regulated by each state which establishes their licensing requirements and scope of practice within that state. These regulations form a continuum. On the least restrictive end of the continuum, APRNs may practice as a patient's primary provider, completely independent of any supervision by physicians. As independent practitioners, APRNs may write prescriptions, administer medications, and establish treatment modalities for chronic conditions. When independent, APRNs are also able to bill Medicaid, Medicare, or private insurance plans. As of December 2017, APRNs were allowed to practice without physician supervision in 25 states (Phillips, 2018).

In the more restrictive states APRNs are limited in the services they are allowed to provide, and they cannot practice to their full educational level and training. The restrictions vary from state to state, the most common involving limitations on prescribing medications, limitations with regard to receiving independent reimbursement, and requirements to work under the supervision of an MD (AANP, 2017; Kleiner et al., 2014).

Benefits of Removing Restrictions to APRN Practice

Removing restrictions to full ARPN practice not only allows existing APRNs to practice to their full capabilities, but could also increase the supply of APRN full time equivalents (FTEs). Studies have found that States with less restrictive APRN practice environments have a greater number of APRNs per capita (Adams et al., 2003; Kalist & Spurr, 2004; Kleiner et al., 2014; Kuo, Loresto, Rounds, & Goodwin, 2013; Reagan & Salisbury, 2013; Xue et al., 2016). States such as Arizona, Montana, New Mexico, and Utah that have fewer APRN practice restrictions have a larger supply of APRNs than States with restrictions (Conover & Richards, 2015a, 2015b). Recent research indicates that States with full practice of NPs have lower hospitalization rates and better health outcomes (Oliver et al., 2014).

Taken together, the full APRN practice and expanded APRN supply that could occur from removal of scope of practice restrictions could expand access to health care and help relieve the physician shortage. This could occur through: (a) the elimination of physician supervision time, thus freeing up more time for physicians to provide direct patient care; (b) APRN substitution for physician care to the extent APRN training allows; (c) increased population access to primary care which would reduce the need for hospitalization and the companion physician care that otherwise would be needed (Conover & Richards, 2015a, 2015b).

Removing state restrictions on APRN scope of practice has additional benefits. It would have both direct and indirect economic benefits. The direct economic effect of removing restrictions to APRN practice can be measured through the value of the wages, benefits, and taxes created by the expansion of APRN practices, while the indirect effects can be seen through the additional wages, benefits and taxes that are produced through the increased spending in the economy due to the direct benefits. For example, expansion of APRN practices would result in the employment of more APRNs as well as support staff, the increase in the use of supplies, and other physician resources. The greater employment would lead to more spending and therefore an increase in jobs, and in turn, more spending by these workers. The greater use of physical resources would also lead to an increase in jobs and spending by those employed in the industries producing the resources. Thus the increase in employment and production due to expanded APRN practice would have a ripple (or multiplier) effect far beyond the initial expansion of APRN practices. Other ways to measure effects are to count the number of jobs created or to add up total output, in both cases taking into account the multiplier effects.

Two prior studies have examined these economic benefits using the IMPLAN software program. The Perryman Group (2012) found that expanding APRN scope of practice in Texas produced $8 billion in additional output and 97,205 additional permanent jobs. Conover and Richards (2015a, 2015b, 2015c) found that in North Carolina the economic benefits would be an increase in output of $477 million and 3,800 to 7,128 additional jobs.

In Florida, the benefits of expanding APRN scope of practice could be great. Half of Florida physicians will reach retirement age over the next 5 to 10 years while the pool of new physicians into primary care is growing very slowly, at just three percent of medical students (MidlevelU, 2013). Utilizing APRNs could help reduce the primary care shortage, yet Florida is one of the more restrictive states with regard to APRN practice (Kung & Rudner Lugo, 2014). Among many of the regulations, Florida NPs must be supervised by physicians who must be available for consultation by phone or in person when the NP is working (MidlevelU, 2013). There are also restrictions on the number of practices at which a given physician may supervise APRNs and how far those practices can be from the main practice. Insurance companies are not required to bill APRNs directly. Finally, APRNs were not allowed to prescribe some controlled substances without physician supervision until only recently (FBN, 2017).

To date, there has been only one analysis of benefits of expanding scope of practice of APRNs in Florida. In 2010 Florida's Office of Program Policy Analysis and Government Accountability (OPPAGA) estimated that

if scope of practice for APRNs and PAs were expanded costs savings could be between $7 and $44 million for Medicaid, $75,000 to $2 million for state employee health insurance, and $339 million across the state (OPPAGA, 2010). These estimates were based entirely on the difference in reimbursement to APRNs vs. physicians, and did not examine other benefits such as improved accessed to care, or the effect on the economy as a whole. This study predicts the impact of reducing restrictions in the practice of APRNs in Florida on health care workforce supply, access and costs, and economic activity.

Methods

Study Aims and Design

This study utilizes economic models to: (a) predict the changes in health care demand and APRN supply in Florida between 2013 and 2025 given the elimination of restrictions on APRN practice; (b) estimate the extent to which the changes in supply given changes in demand will improve access to care and relieve physician shortages in Florida; (c) estimate cost savings to the Florida health care system; and (d) estimate additional economic activity and revenue in Florida that could come about from the changes. Standard labor supply and demand models and assumptions were employed for the first three aims. An input–output modeling system, IMPLAN was used for the fourth aim. The study closely followed two prior analyses of APRN practice expansion, one in North Carolina (Conover & Richards, 2015a,b,c) and the other in Texas (Perryman Group, 2012), and of physician supply in Maryland (Lewin Group, 2011). The estimated changes were for the years 2013 to 2025. State, geographical region, workforce region, and county level analyses were conducted (this paper reports primarily state results). Calculations were for the entire period, not year-to-year changes, since the exact change on a year-to-year basis was not the purpose of the study and predictions would not be very accurate. In the following sections we briefly describe the data sources, data entry, and calculations performed to achieve the aims. A more detailed technical report is available online (see Unruh, Rutherford, & Schirle, 2016).

Data

Data were obtained for the baseline year of 2013 (using 2013 or a year as close to 2013 as possible). Data for predicting 2025 values were obtained either by an outside source or authors own projections. Seven primary data sources were used in this assessment:

1. **Area Health Resource File** from the US Department of Health and Human Services' Health Resources and Service Administration provided 2013 county-level data on population counts and demographics, and the total number of physicians by specialty (HRSA, 2014).
2. **Florida Center for Nursing** (http://www.flcenterfornursing.org/) provided county and state level data regarding the number of active APRNs [NPs, CNMs, CRNAs, and CNSs] in 2013. This data provided information on the number of total active APRNs, the number of APRNs in different occupational settings (primary care, hospital emergency departments, all other hospital based, and long-term care), and the FTE hours worked.
3. **Florida Demographic Estimating Conference Bulletin 171—Projections of Florida Population** provided 2014 to 2040 estimates of total population for each Florida county (Florida Demographic Estimating Conference, 2014).
4. **Dartmouth Atlas of Health Care** provided a standardized way of comparing medical prices across counties and at the state level (Dartmouth Atlas of Health Care, 2013).
5. **IMPLAN** (IMpact analysis for PLANning) provided multipliers to determine the economic output, labor compensation (wages and benefits), and employment for industries by geographic regions (state, workforce region, regional workforce boards, and counties (IMPLAN, 2013). IMPLAN uses an input–output social accounting modeling system developed by the Minnesota IMPLAN Group.
6. **Salary Wizard** at Salary.com provided detailed data on annual compensation (salary plus bonus, Social Security, and all other fringe benefits) for several categories of NPs, CRNAs, CNMs, and two categories of CNSs as of May 2016.
7. **Small Area Health Insurance Estimates (SAHIE)** provided 2013 estimates of the uninsured by county for four age categories (0–64, 18–64, 40–64, and 50–65) and two income breakdowns: 0% to 138% poverty and 138% to 400% poverty (Census Bureau, 2014).

A number of other sources were used in the analysis. These are noted in the *Technical Report* in Unruh et al. (2016).

Data Entry in Excel

For health care demand, age- and gender-adjusted population data by county for 2014 (closest data to 2013) and projected data for 2025 were entered into an Excel file. An age- and gender-specific Health Care Index for 2013 was obtained by Yamamoto (2013) and projected for 2025 and entered next to population numbers. ACA spending entries were amounts spent on ACA subsidies and projections on what would be spent on Medicaid expansion given the Florida population in each poverty level.

For APRN supply, the total numbers of four types of APRN FTEs (NPs, CRNAs, CNMs, and CNSs) practicing in each county in 2013 were entered into Excel. The

average compensation received by each of these types of APRNs, including salary, social security, and other benefits, was another set of entries. Finally, for 2013 we recorded the average of each type of APRN practice expense, assuming that each type had a proportion of expenses of comparable physicians (Family Medicine, Obstetrics/Gynecology, Anesthesiologists, and Internal Medicine). These were estimated based on differences in expenses in nonmetro, smallmetro, and largemetropolitan areas. Multipliers were inputted for the increase in APRN supply between 2013 and 2025 due to the elimination of practice restrictions. Multipliers were obtained from other state experiences such as Arizona, Montana, New Mexico, and Utah.

Most of the data for the estimates of the impact of APRN expanded scope of practice on health care access and the physician shortage were obtained by calculations of the authors given aforementioned data sources and other additional sources. One notable exception was the prediction of physician shortages by 2025, which was an estimate of the percent of APRN supply that could be substituted for each comparable physician group, obtained from the Robert Graham Center (n.d.).

For the estimation of the impacts of ARPN expanded scope of practice on the economic output in Florida, input–output multipliers for total economic output, value added, payroll, and employment were obtained from the IMPLAN software. These were entered into the Excel file and multiplied times the projected increases in expenditures in the four types of APRNs.

Calculations

Four sets of calculations were performed using Excel. The first set estimated changes in demand for health care and the increase in APRN supply that would result from the change in restriction on practice from 2013 to 2025. Estimating what would happen to the demand for health care was necessary for understanding the need for APRNs by 2025 and for estimating the impacts of APRN expansion of practice on access to health care and provider shortages.

The second set of calculations projected the degree to which the increased demand for health care would be met by the increased supply, and the effect of the increase in APRN supply due to the less restrictive regulation on the physician shortage. The third set projected the cost savings to the health care system by expanding APRN scope of practice.

The fourth and final set of calculations looked at the economic impact of the changes at the state and workforce region levels. This included the direct impact of the value of output, jobs, wages, and benefits that are produced from patient care activities provided by APRNs as well as the indirect effect of the output, jobs, wages, and benefits generated in the industries that are supported by the organizations in which APRNs practice. Consideration was given to the induced effects of APRN spending on local businesses, which positively affects employment in those businesses, and which allows those employees to purchase more goods and services and pay taxes, etc., in a continuing "multiplier effect" across the economy.

1. *Demand and supply calculations*

All demand effects were calculated as percentage change in health care expenditures from the 2013 baseline to the year 2025. Future demand for APRNs depends in large part upon demographics and financial access to health care. In our model the expected change in demand due to demographics took into account population growth and aging. Population demographics were transformed into expenditures using a Health Spending Index for both 2013 and 2025, and the percentage change in expenditures due to population growth and aging was then calculated.

Much of future financial access depends upon the future of the ACA or other state or federally mandated or sponsored health insurance. For demand related to financial access we assumed a continuation of the ACA. Since Florida had not yet implemented the Medicaid expansion but could in the future, ACA expansion was estimated in two ways: (a) expansion in demand due to ACA subsidies only; and (b) expansion in demand due to subsidies + Medicaid expansion. The percentage change in ACA demand was calculated in terms of expenditures on subsidies only and on subsides + Medicaid expansion.

Estimates of the increase in APRN supply were based on what would result from less restrictive APRN regulations from 2013 to 2025. This was done in two ways: increases in compensation only; and increases in compensation plus practice expenses. The model assumed that average salaries and benefits would not change from the baseline year. Average APRN compensation and practice expenses were multiplied times the number of FTEs per county in 2013 and those projected in 2025. The county-level APRN compensation (lower bound) and compensation plus practice (upper bound) in 2025 was subtracted from those values in 2013 to arrive at the lower and upper bound of APRN supply increases due to the expansion of practice.

2. *Health care access and physician shortages calculations*

Next, we compared the projected increased health care demand in 2025 with the increased APRN supply. Since not all health care demand would be for APRN care, we first needed to estimate the proportion of health care demand that would be for APRNs. This was estimated by multiplying the percentage change in health care demand (due to demographic changes and the ACA, without and with Medicaid expansion) times 2013 APRN compensation expenses. From this we estimated the degree to which the increased APRN supply by 2025 could meet the increase in APRN demand. This was represented by the percentage of APRN supply

Table 1 – Projected Percentage Changes in Florida Health Care Demand and APRN Supply by 2025

Demand Increase due to Demographic Changes 2013–2025	Health Care Demand Increase due to Federal ACA Spending 2013–2025		Potential Increase in APRN Supply due to Less Restrictive Regulation 2013–2025
	Without Medicaid Expansion	With Medicaid Expansion	
21.73%	3.09%	4.74%	11%

APRNs, Advanced Practice Registered Nurses.

increases per APRN demand increases [(APRN supply expenditure increases/APRN demand expenditure increases) × 100].

We also estimated the extent of the physician shortage that could be reduced by increasing APRN supply. The increased number of APRNs in each category in 2025 was multiplied times an MD substitution ratio for each category, based on the extent of MD practice APRNs can cover. This was divided by the number of physicians needed in 2025 to not have a shortage. This was then expressed as a percentage of MD shortage that would be covered by the increase in APRNs.

3. ***Health care cost savings calculations***

The potential health system savings that might result from expanded APRN use was estimated using prior studies. The literature indicates that using APRNs to their full potential can reduce health expenditures. As Conover and Richards (2015a) report, net health system savings from expanded use of APRNs range from 0.63% for the State of Massachusetts (lower bound estimate) to 6.2% for the State of Texas. The Massachusetts figure was based on estimates of using the cost difference between an average physician visit and an average visit with an NP or PA (Eibner, Hussey, Ridgely, & McGlynn, 2009). The Texas amount was based on a review of studies that estimated the savings on a conservative basis (Perryman Group, 2012). We estimate health expenditure savings in Florida using this broad range. We multiplied each of these two numbers times the total health expenditures in Florida in 2013 to get a range of savings.

4. ***Impact on broader economy calculations***

Using a software application (IMPLAN) the economic impact to the state and workforce regions of less restrictive APRN practice on total output, value added, wages and benefits, and jobs was conducted. We estimated these impacts in two ways. Conservative lower-bound estimates were constructed based exclusively on the projected increase in APRN compensation (salary and benefits). Upper-bound estimates included both APRN compensation and practice expenses, including the ancillary medical services (e.g., lab tests and medications) and personnel (e.g., nonmedical and medical support staff) that each APRN would support.

Findings

Results are presented in four tables below. Table 1 shows the projected percentage increases in health care demand in Florida between 2013 and 2025 due to demographic and health system changes, and increases in APRN supply given the elimination of restrictions on APRN practice. Table 2 displays the increased amount of APRN care demanded and supplied by 2025 (both indicated by expenditures), and indicates the impact of these changes on health care access in 2025. Table 3 presents the impact of these changes on physician shortages. Table 4 shows the impact on the overall economic system in Florida.

Increased Demand for Health Care

As Table 1 shows, between 2013 and 2025 demand for health care in Florida statewide is projected to increase by 22%. Thirteen percent of this would be due to projected increases in the population and 9% to assumed changes in the age of Floridians. If the ACA is continued, the increase in spending will be an additional 3% without Medicaid expansion and 5% with Medicaid expansion. Therefore, given no other changes there will be a 25% to 27% increase in the demand for health care in Florida. This includes demand for APRNs and other health providers.

Supply of APRNs in 2013 and Increase by 2025 due to Less Restrictive Regulation

In 2013 there were 18,931 active APRNs (17,343 FTEs). In terms of compensation, APRNs were a $2.5 billion market within the health industry in Florida. This is a conservative figure that does not include practice expenses which, in 2013, were estimated to be $3.3 billion. Including both compensation and practice expenses, the total size of the APRN market sector in 2013 was close to $6 billion.

As Table 1 indicates, between 2013 and 2025, the number of APRN FTEs could increase by an additional 11% if Florida adopted the least restrictive practice regulations such as in Arizona, Montana, New Mexico, and Utah. For new APRNs who otherwise would not have gone into advanced practice nursing or who would have practiced elsewhere in the Unitd States, or for APRNs who would increase their FTEs due to the new regulation, this would result in close to

Table 2 – Projected Increases in Florida APRN Demand and Supply, and Impact on Health Care Access by 2025

	Increase in APRN Demand due to ACA (million of $)		Total Increase in Demand by 2025 (million of $)		Potential Increase in APRN Supply due to Less Restrictive Regulation (millions of $)		Percentage APRN Demand Increase covered by Supply Increase			
Increase in APRN Demand due to Demographic Changes (millions of $)	Without Medicaid Expansion	With Medicaid Expansion	Without Medicaid Expansion	With Medicaid Expansion	Lower Bound (based on APRN compensation)	Upper Bound (based on APRN Compensation + Practice Expense)	Without Medicaid Expansion: Lower Bound	Without Medicaid Expansion: Upper Bound	With Medicaid Expansion: Lower Bound	With Medicaid Expansion: Upper Bound
$548	$359	$550	$907	$1,098	$273	$628	30%	69%	25%	57%

APRNs, Advanced Practice Registered Nurses.

Table 3 – Potential Impact of Less Restrictive Regulation of APRNs on Florida Physician Shortages by 2025

Type of Physician	Number of Active MDs in Florida, 2013	Physician Shortage in 2025		APRN Comparator	FTE APRNs in Florida, 2013		MD Substitution Ratio	Increase in MD Equivalents Under Less Restrictive APRN Regulation		
		As a % of Supply	Number Needed to Eliminate Shortage		Current Number	Increase Under Less Restrictive Regulation of APRNs		Total Number	As a % of 2013 MD Supply	As a % of MD Shortage
		Estimate	Estimate						Estimate	Estimate
Primary Care MDs	14,502	28.9%	1,060	NPs	13,530	1,464	75%	1,098	7.6%	103.6%
				CNSs	103	11	50%	6	0.0%	0.5%
				Subtotal	13,633	1,475	70%	1,104	7.6%	104.1%
OB/GYNs	1,851	18%	450	CNMs	794	86	80%	69	3.7%	15.3%
Anesthesiologists	2,322	8.3%	650	CRNAs	2,915	315	76%	240	10.3%	36.9%
All Comparator Phys	18,675		2,160	All APRNs	17,343	1,876	72%	1,351	7.2%	62.5%

APRNs, Advanced Practice Registered Nurses; CRNAs, certified registered nurse anesthetists; CNMs, certified nurse midwives; CNSs, clinical nurse specialists; NPs, nurse practitioners; MD, medical doctor.

Table 4 – Annual Economic Impact of Less Restrictive APRN Regulations by 2025, by Workforce Region

Workforce Regions	Potential Increase In Spending On APRNs Due To Less Restrictive Regulation (in millions of $)		Total Output Multipliers (From Implan)				Net Economic Impact in FLORIDA (in millions of $ and #s of jobs)							
							Lower-Bound Estimate				Upper-Bound Estimate			
	Lower Bound (Based on APRN Compensation)	Upper Bound (Based on APRN compensation + Practice Expenses)	Output	Value Added	Labor Income	Employment	Total Expenditures (Output)	Value Added (Gross Product)	Labor Income (Wages & Benefits)	Employment (Permanent Jobs)	Total expenditures (output)	Value Added (Gross Product)	Labor Income (Wages & Benefits)	Employment (Permanent Jobs)
Statewide	$273	$628	1.99	1.24	0.87	16.56	$543	$340	$238	4,518	$1,248	$781	$547	10,390
Northwest	$15	$33	1.99	1.25	0.87	16.59	$31	$20	$13	255	$67	$42	$29	554
North Central	$23	$55	1.99	1.25	0.87	16.59	$45	$28	$20	379	$110	$69	$48	918
Northeast	$4	$8	1.99	1.24	0.87	16.58	$7	$5	$3	61	$16	$10	$7	137
East Central	$5	$12	1.98	1.24	0.87	16.55	$11	$7	$5	88	$24	$15	$11	202
West Central	$69	$156	2.00	1.25	0.89	16.51	$138	$86	$61	1,135	$312	$195	$138	2,571
Southeast	$26	$61	1.98	1.24	0.87	16.53	$52	$33	$23	436	$121	$76	$53	1,010
Southwest	$16	$35	1.99	1.24	0.87	16.55	$32	$20	$14	264	$69	$43	$30	573
South	$59	$140	1.98	1.24	0.87	16.55	$116	$73	$51	972	$277	$173	$121	2,317

APRNs, Advanced Practice Registered Nurses.

$273 million annually in additional APRN compensation and $628 million annually in additional APRN compensation plus practice expenses.

Impact on Health Care Access

Table 2 reports estimate of the increases in APRN demand and supply expressed in expenditures. With a continuation of the ACA but no Medicaid expansion in Florida the total increase in demand by 2025 would be $907 million. With Medicaid expansion it would be $1,098 million. Based on compensation only, APRN supply would increase by $273 million. If practice expenses are included in supply calculations, the increase would be $628 million. These demand and supply amounts are then used to examine the impact of the expanded APRN practice on health care access. The columns under "Percentage APRN Demand Increase Covered by Supply Increase" show that depending upon whether there is Medicaid expansion or not and whether APRN practice expenses are taken into account, APRN supply increases could meet 25% to close to 70% of APRN demand increases.

Reduction in Physician Shortage

Table 3 shows that between 2013 and 2025 less restrictive regulation of APRNs would result in a net increase of 1,876 full-time-equivalent APRNs relative to the 2013 supply of 17,343. Taking into account the extent to which APRNs can reduce the need for physicians either directly (by substituting for doctors to the extent their training allows, or diverting physician supervision time into patient care) or indirectly (e.g., by reducing the need for hospitalization and the companion physician care that otherwise would be needed), we estimate the less restrictive regulation of APRNs could:

- completely eliminate the shortage of primary care (non-OB/GYN) doctors.
- reduce the shortage of OB-GYNs by 15.3%.
- reduce the shortage of anesthesiologists by 37%.
- reduce the shortage of all of these types of physicians by 62%.

Health System Savings from Less Restrictive APRN Practice

Using the range of reported health system savings from expanding the use of APRNs of 0.63% for the State of Massachusetts to 6.2% for the State of Texas, and multiplying this by the total health expenditures in Florida in 2013 of $153.6 billion, we estimate that the cost reductions by 2025 could be from $968 million to $9.5 billion. This translates into $50 to $493 per Florida resident.

Economic Benefits of Less Restrictive APRN Practice

The economic impact of the expansion in APRN supply due to less restrictive regulation (including direct,

indirect, and induced effects on the broader economy) was estimated in two ways: based on APRN compensation alone (lower bound); and based on APRN compensation plus practice expenses (upper bound). As Table 4 shows, the economic impact for the State of Florida is as follows:

- An annual increase in economic output of at least $542 million, possibly up to $1.25 billion.
- An additional $340 to $371 in value added to the economy due to spending on goods and services.
- The addition of $238 to $547 million in wages and benefits annually that can be spent on housing, goods, and services, and a source of state and local tax revenue.
- The addition of 4,518 to 10,390 new jobs.

The table also shows how this will vary by workforce region. The northeast and northwest regions will have the lowest amounts of benefits while the west central and southwest regions the most. These variations appear to be based on differences in population, rural vs. urban status, and resulting spending on health care.

Discussion and Recommendations

This study projects that eliminating restrictions on the scope of APRN practice in Florida would increase APRN supply by 11% by 2025. Demand for APRNs would increase even more in this time period, so the increase in supply would be fully absorbed by demand. The expansion of APRN supply would meet 25% to 70% of APRN demand. The fuller utilization of APRNs would relieve pressure on physician supply, reducing shortages of primary care physicians, OB-GYNs, and anesthesiologists. The expanded APRN care would produce health system cost savings in that APRN care tends to cost less than physician care, the improved access to primary care could reduce utilization of high-cost acute care, and physician administrative costs could be lower. Finally, eliminating restrictions on APRN practice would infuse additional value into the economy, providing additional revenue and jobs for APRNs and their practices, and additional jobs and spending throughout the economy due to a multiplier effect.

These results support those of Conover and Richards (2015c) regarding the benefits of eliminating restrictions on APRN practice in North Carolina. However, while those authors only reported the economic benefits in their 2015 paper, they did actually conduct the same analyses of growth in APRN demand and supply, impact on access to care, and cost savings (Conover & Richards, 2015a, 2015b) that we present here to arrive at those economic results. In following their format to arrive at the economic benefits we found the health care system benefits to be as important to report as the economic benefits.

Study results indicate that states with restrictions on APRN scope of practice could cost-effectively improve access to health care if they revised their regulations to allow APRNs to practice to their full educational level and training. In order to support this regulatory change states would need to increase APRN educational programs and opportunities. In some states the need for educational expansion may exist even with current levels of demand. In Florida, for example, even without full scope of practice nursing schools are turning away applicants in their APRN programs (Florida Center for Nursing, 2018). In those states, APRN educational programs would need to significantly expand to meet the increased demand for APRNs.

Such professional and educational expansion could be justified economically by the lower costs of educating APRNs compared to primary care and family practice physicians, obstetricians, and anesthesiologists. Further study could compare the cost for education of APRNs, such as NPs, to that of family practice physicians, taking into consideration return on the investment in terms of patient outcomes, cost of health care delivered, and patient satisfaction. A cost-benefit analysis (CBA) of utilizing APRN fully could find that the gains in improved access and quality of life for residents outweighs the cost to educate and hire new faculty and could demonstrate to fiscal conservatives that there is a need for regulatory and educational reform.

While this study performed a rudimentary analysis of the health system cost savings that was based simply on that found in other studies, a more detailed analysis of cost savings that specifically would accrue from the Florida situation should be conducted. Also, the prior studies looked only at the cost savings to the health care system. Yet cost savings could accrue to the broader society by keeping people healthier and therefore more productive. So a broader analysis of the benefits due to cost savings should be conducted.

Other limitations of the study are that a number of simplifications and assumptions were made in order to estimate both the future demand for health care and future APRN supply. For demand, only population growth, aging, and the continuation or expansion of the ACA were considered in the estimations of future demand. Many other demographic and health care system factors, such as technology and utilization patterns, play a role in demand. Most importantly, the accuracy of the model depends on the stability of policy both at the national and state level, and these are unstable times. If the ACA is repealed, demand for health care under the new plan may not be as great.

For APRN supply, estimations of the increases that would occur with elimination of restrictions on practice were from what occurred in other states. A better estimate could have been made if state-specific contributors to the increases had been taken into account.

Also, in establishing the effect that the supply changes would have on access to care and physician shortages, it was assumed that APRNs will be distributed properly by both their role (in other words, the right proportion of APRNs would fill the corresponding physician roles) and geography (they would work in areas needing APRN care).

Estimates of the impacts of expanding scope of APRN practice would be more powerful if a multistate, rather than single state, approach were taken. Studying a sample of the states that restrict APRN practice would provide more generalizable information regarding removing restrictions and could expedite policy changes among the states.

While this study indicates that there are many benefits to eliminating APRN practice restrictions, it must be noted that the costs of achieving this were not included in the analysis. This is a major limitation of the study—it focuses on the benefits without considering the costs. Therefore, the net benefits, especially the economic ones, may not be as extensive as appears here once costs are taken into account. Such costs would include those for educating new APRNs and for the education and employment of the additional nursing faculty needed for their education. These educational costs would be dependent upon the need for new APRNs vs. expansion of the employment of existing APRNs. Net benefits might also differ depending on the perspective of who is paying for the expansion (federal, state, and businesses), and how much they are paying. From the perspective of Florida, if the federal government is the primary payer, the costs will be low. On the other hand, the economic benefits do not include any residual impact from health care cost savings, i.e., lower expenditures on health care from utilizing APRNs add to the economic gains. The net effect of including costs and adding these benefits is unknown.

A more complete analysis of the benefits of eliminating APRN practice restrictions would involve a cost-effectiveness analysis (CEA) and/or CBA. A CEA analyses the costs and effects of two or more interventions and services. In this case, the costs and effects of eliminating APRN practice restrictions vs. full restrictions could be assessed. In CEA effects are not monetized but are measured with a consistent natural unit of measure. In this case a number of population outcomes could serve as the effects. The interventions can then be compared as costs per unit of effect.

If a CBA was conducted, both costs and benefits would be monetized and the total costs could be subtracted from the total benefits to find the net benefit of the intervention. Benefits could be monetized by estimating the cost savings that occur with the elimination of APRN restrictions.

Despite these limitations, we believe that this study is a starting point for the deeper, more detailed analysis that includes both costs and benefits (or effects). Such research may find that benefits outweigh costs and would be even stronger evidence for eliminating the restrictions.

Conclusion

In sum, results indicate that removing restrictions to APRN practice has benefits, both to the health care system and to the overall economic system. This alone indicates that state restrictions on APRNs should be eliminated. Future CEA or CBA may find that the change would actually result in a net benefit to society, which would provide even greater evidence for allowing APRNs to practice to their full extent.

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Supplementary material

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