The Effect of Scope of Practice Reform on Population Health

Moiz Bhai, University of Arkansas At Little Rock and the University of Arkansas for Medical Sciences

January 24th, 2024

Why are Scope of Practice & NPs Important?

- High Rate of Growth
  - The supply of NPs grew at 9.4% versus 1.1% for primary care physicians (GAO, 2008)
  - Number of NPs doubled between 2007 and 2020
  - Predicted shortages of physicians of approximately 50,000 (AAMC, 2020)
- Policy Proposals to Increase Access to Care
  - Supply-side proposals have been rare, most access to care proposals focus on demand-side.
  - Since the 1980s a major shift in reducing occupational licensing barriers for NPs
    - ACA contains provisions that expand scope of practice for NPs
- Many states still have various Scope of Practice / Licensing Restrictions on NPs
  - Many states still maintain restrictions as 2024.

What are Nurse Practitioners?

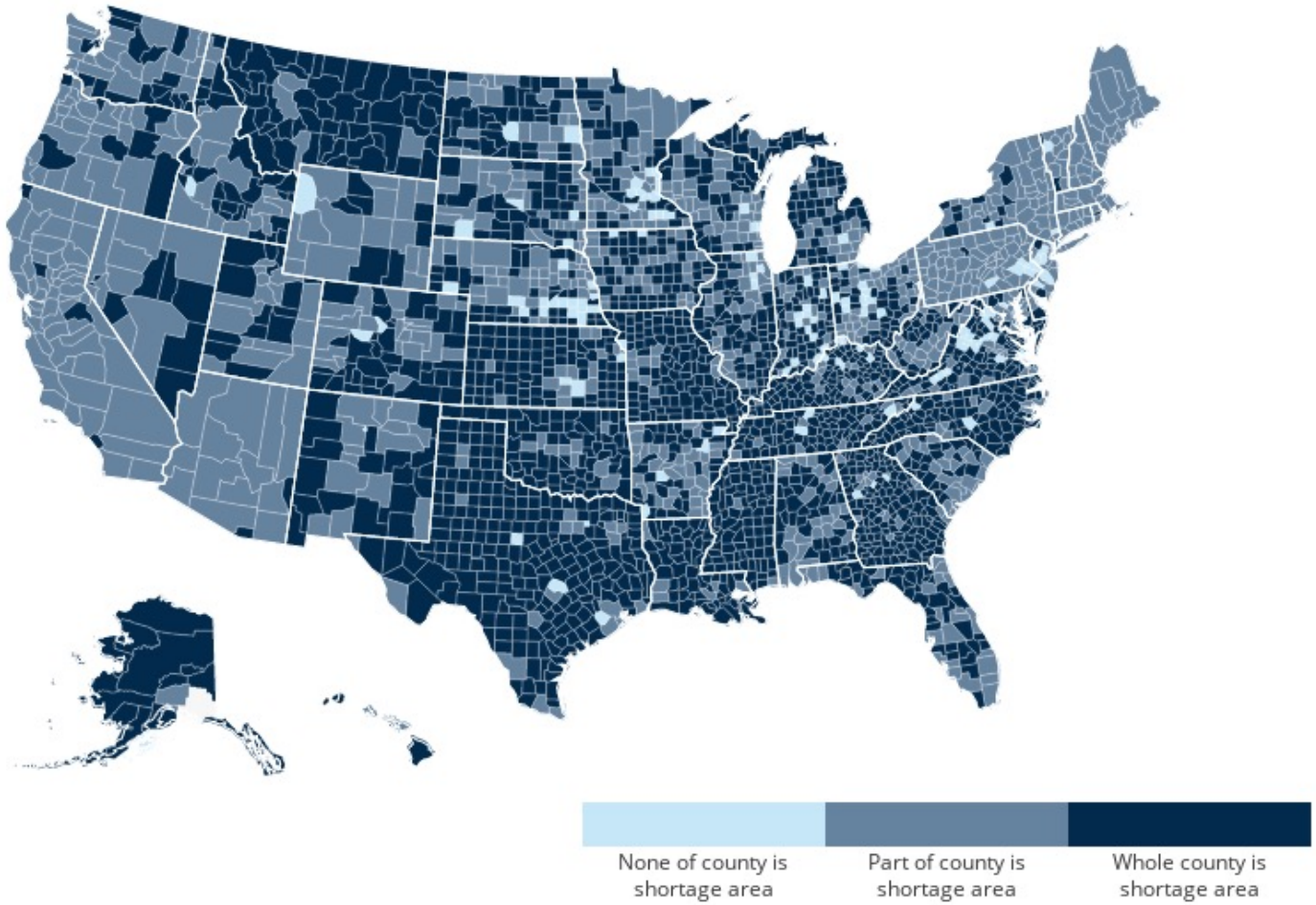
Originates in 1965 in Colorado as a means to address shortages of physicians (incidentally coincides with Medicare and Medicaid.)

APRN (Advanced Practice Registered Nurse)

- Registered nurses with additional degrees/certificate beyond the post-bac (about 95% with 17% holding doctoral degrees)
- Can perform 80% to 90% of tasks of a primary care physician (Kaiser Permanente, 2020)
- Can achieve additional voluntary board certification to signal quality based on peer review, and assessment of clinical outcomes.

Currently there are 290,000 nurse practitioners with 66% in primary care roles (about 484,000 primary care physicians in the U.S.)

Health Professional Shortage Areas: Primary Care, by County, 2022



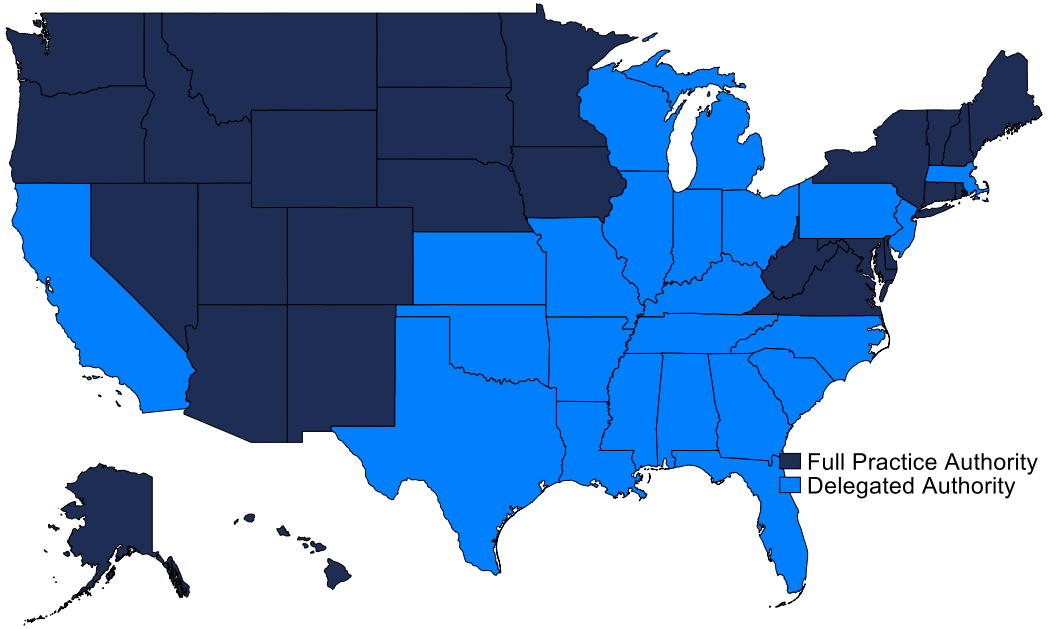
RHIhub
Rural Health Information Hub

Source: data.HRSA.gov, November 2022.

Scope of Practice Restrictions

- Considerable geographic variation in the U.S. on what tasks a nurse practitioners can perform – often determined by state boards.
- Geographic variation appears idiosyncratic as opposed to standards based on quality. (McMichael 2017)

Geographic Variation – Full Practice Authority (2022)



Scope of Practice Components

- **Physician Supervision.** - Physician involvement in evaluation, diagnosis, or treatment via collaborative practice agreement, written protocol, or other legislative means. Usually, a required Collaborative Practice Agreement
- **Prescriptive Authority** –Some states allow NPs to prescribe schedules II-V. But other states only allow III-V.

What Do We Know?

- General outcomes
  - Battaglia et. al (2009) finds NPs spend more time with patients.
  - Lenz et. al (2004) uses an RCT to find no difference in patient outcomes or satisfaction between NPs and primary care physicians.
  - Kleiner et. al (2016a) finds modest increase in hours worked for independent practice authority and no effect on infant mortality.
  - Timmons (2016) finds suggestive evidence of reduction in prices paid by Medicaid beneficiaries.
  - Kleiner et al (2016b) 8% reduction in costs for an E&M visit.
  - Hughes, Filar, Mitchell (2021) – finds that expanded scope of practice aids with chronic disease management. (Foot debridement for diabetes).

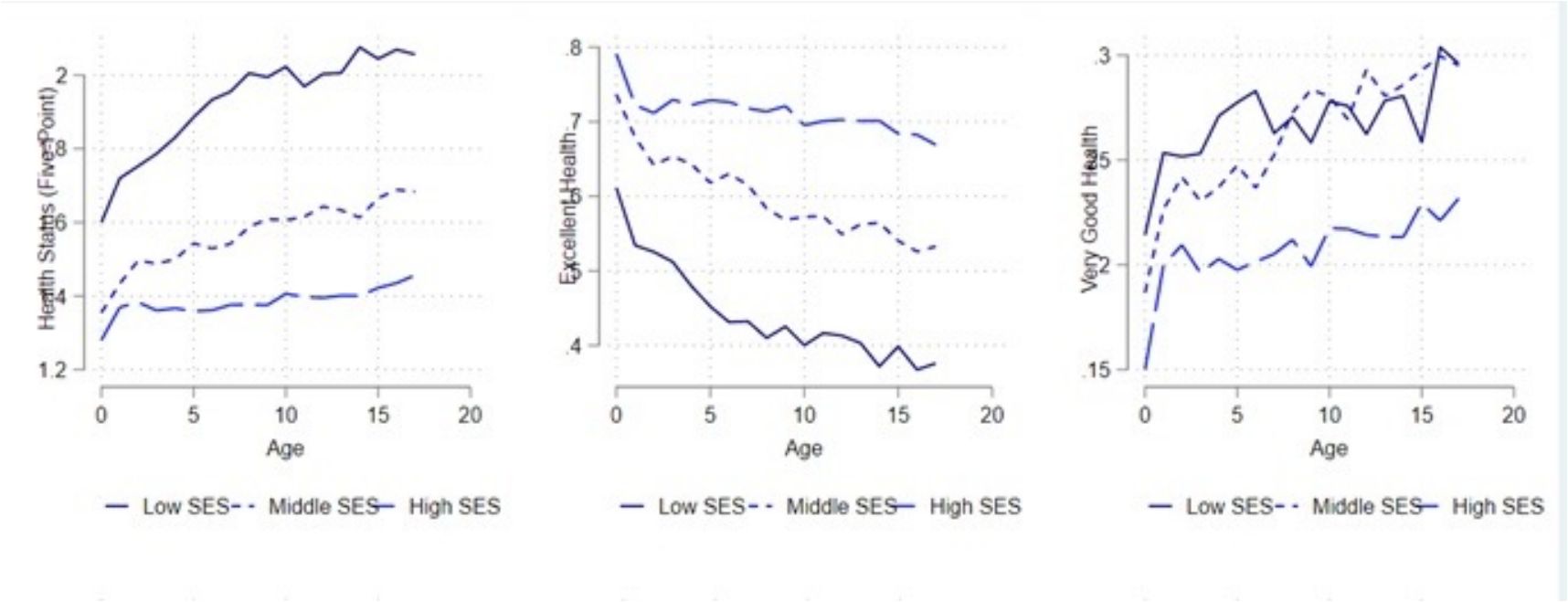
What Do We Know (cont'd)?

- Health Outcomes
  - Schnell and Alexander (2019) use expansion of prescriptive authority to show improvements in self-reported health (# bad days) and decline in mental-health related deaths including suicide.
  - Traczycinksi and Udalova (2018) finds independent authority improves frequency of primary care usage and decreases emergency department use.
  - Stange (2016) uses MEPS to find prescriptive authority has minimal impact on utilization, prescriptions, and prices.
  - Groover (2020) also uses MEPS to find prescriptive authority reduces prescriptions by 8% overall to 9% for unique prescriptions.

Research Question: Children's Health

- How does occupational licensing reform that grants fullpractice authority for nurse practitioners influence access to care and health outcomes for children?
- Contribution
  - One of the first few studies to look at child health
  - The health outcomes literature is still somewhat limited
  - Any sufficiently powered effect has policy implications
    - Positive or Zero effects suggest scope of practice should be expanded
    - Negative effects indicate that scope of practice should be restricted

Children's Health Status by Family Income



- We see health disparity
- Decreasing health over time.

National Survey of Children's Health

- A very large repeated cross-section national representative survey of American children from 0 to age 17.
- We append six waves of the NCHS from 2016 to 2022 to form our study sample
- NCHS surveyed parents on the health of a selected child. In nearly 78% of the cases, the mother was the respondent.
- About 400 to 1800 observations **per state per wave** with rich information on family background and socioeconomic status, medical history, and access to care. Larger samples for smaller states
- Concerns:
  - Only six waves

This data isn't perfect. Why use it?

- Not much good data on children
- C-NLSY (Children's NLSY) Limited sample size for small states.
- ADD **Health** (ADD Health National Longitudinal Study of Adolescent) Adolescents who were in grades 7-12. Limited sample size for small states.
- NHIS National Health Interview Survey. Limited sample size for small states.
- NHANES (National Health and Nutrition Examination Survey) Small sample sizes.
- There is data on infants: PRAMS (Pregnancy Risk Assessment Monitoring System)

- Start of an agenda.
- Children's health is important.
- Looking forward to your comments.

Scope of Practice and other Data

- McMichael and Markowitz (2023)
  - Compile a list of states with Independent Practice Authority and major revisions.
  - Includes Prescriptive Authority but our focus is on Independent Practice.
- Bureau of Labor Statistics
  - State-level macroeconomic variables (unemployment rate and log of per-capita income,)
  - Per-capita Health Care Spending and log of population

Empirical Strategy

- Generalized Differences-in-Differences Framework
  - Two-way fixed effects (state and time)
  - Intention to Treat – Reduced Form
- We compare how changes in occupational licensing reform through relaxation of scope of practice (i.e.) independent practice authority affects health status for children aged 0 to 17.

$$(1)\ Y_{ist} = \varphi_s + \tau_t + Scope_{ist}\beta + X_{ist}\Gamma \quad + \varepsilon_{ist}$$

  - Where Y represents outcome variables that capture various health outcomes
  - The vector X includes dummies for age, sex, macroeconomic characteristics and health care spending.
  - Regressions are estimated without weights and also with sampling weights from the NSCH.
  - Huber-White standard errors clustered at the level of the treatment (state)
  - Coefficient on Δ Scope is the key parameter of interest

Empirical Approach

- Identification Assumption: Parallel Trends
- Auxilliary Evidence in Support of our Analysis
  - State by Cohort Fixed Effects
  - Include a pre-trend to test for time-trend
- Concerns
  - Measurement Error – Parental responses
  - Other state-level policies that are associated with independent practice authority that might also influence child health.

Scope of Practice and Labor Supply of Nurse Practitioners

Two Way Fixed Effects Diff in Diff on NP hours and earnings.

	[1]	[2]	[3]	[4]
Panel A: Earnings and Hours				
Earnings	4503.53**	4068.30*	5162.34**	4265.98**
	(1902.47)	(2124.47)	(2324.83)	(1930.08)
Log Earnings	0.06**	0.05*	0.06**	0.06*
	(0.03)	(0.03)	(0.03)	(0.03)
Hours	0.94	0.79*	0.58	0.99*
	(0.61)	(0.40)	(0.59)	(0.50)
Log Hours	0.03**	0.03**	0.03*	0.04***
	(0.02)	(0.01)	(0.02)	(0.01)
Panel B: Other measures of Labor Supply				
Full time, Full Year	0.02	0.04***	0.05	0.02*
	(0.02)	(0.01)	(0.03)	(0.01)
Part Time, Full Year	-0.02	-0.03**	-0.04***	-0.02
	(0.01)	(0.01)	(0.01)	(0.01)
Full time, Part Year	0.00	-0.01	-0.01	0.00
	(0.01)	(0.01)	(0.01)	(0.01)
Part time, Part Year	-0.00	-0.00	0.01	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)

ACS data: 2010 – 2016. Huber-White standard errors clustered at the state level.

This doesn't include new NPs entering the profession or migration.

Scope of Practice and Labor Supply of Nurse Practitioners

	1	2	3	4
Panel A: Earnings and Hours				
Earnings	-800.49	-368.73	1284.00	226.48
	(3301.86)	(2708.36)	(3345.54)	(3091.70)
Log Earnings	0.01	0.02**	0.02*	0.01
	(0.01)	(0.01)	(0.01)	(0.01)
Hours	-0.45**	-0.30	-0.84**	-0.40**
	(0.17)	(0.20)	(0.39)	(0.18)
Log Hours	-0.01**	-0.01	-0.02**	-0.01*
	(0.00)	(0.01)	(0.01)	(0.00)
Panel B: Other measures of Labor Supply				
Full time, Full Year	0.00	0.01**	-0.00	0.00
	(0.01)	(0.00)	(0.00)	(0.01)
Part Time, Full Year	0.00	0.00	0.01*	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Full time, Part Year	-0.00	-0.01***	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Part time, Part Year	-0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)

	1	2	3
No ER visits	0.0067	0.0056	0.0067
	(0.0051)	(0.0084)	(0.0051)
Hospitalization	-0.0071**	-0.0095**	-0.0071**
	(0.0029)	(0.0040)	(0.0029)
Has a Provider (Doctor, NP, etc)	-0.0003	-0.0068	-0.0003
	(0.0071)	(0.0116)	(0.0071)
Difficulty in Mental Health	-0.0057	-0.0083	-0.0057
	(0.0040)	(0.0082)	(0.0040)
Controls	No	Yes	Yes
Weights	No	No	Yes

Economic and Policy Significance

- Policy Change is Cost-Effective
  - Most government interventions focus on the demand side with Medicare Part D, Affordable Care Act, CHIP, State-level Medicaid Expansions that are costly.
  - Unlike other government interventions, full practice independent authority is a supply side intervention at no cost for the government.
  - Potentially improves access to care by increasing providers and reducing costs of health (time and money)
  - Removing arbitrary licensing barriers reduces misallocation in the labor market and social loss.
  - Improve population health with implications for reducing disparities and inequality.

Findings to Remember

- We observe that NPs are likely to work about an hour more as a result of scope of practice reform.
- We also detect improvements in children's access to healthcare.
- On the whole, our findings suggest no harm to patients.

We need something besides physicians

- Access to Care Important for Health Disparities, But
- Predicted shortages of physicians of approximately 50,000 (AAMC, 2020)
- Harder to recruit physicians to high needs areas
- Physicians increasingly choose non-primary care specialty.
- Provider Shortages – Physicians would need 27 hours in a workday to appropriately treat chronic conditions (Porter et al 2022)
- Physician burnout rates increasing (West et al 2018; Patel et al 2018.) Physician labor supply falling (Goldman et al 2023)
- Read Disclaimer

Conclusion: Why don't all states have this?

- Policy Change is likely cost effective
  - Unlike other government interventions, full practice independent authority is *generally* no cost for the government
  - Improves access to care on geographic and price and health (treatment of chronic condition).
  - Reduces misallocation in the labor market and social loss.
  - Improve population health with implications for reducing disparities and inequality.
- Challenge for policymakers:
  - Hamilton Project Report (Markowitz, 2018) and National Academy for Medicine (2011) support full independent practice Authority but political headwinds, and the political will to engage in occupational licensing reform is lacking.

Thank you