

The Sheps Center Program on Health Workforce Research and Policy

*Providing evidence to support
health workforce policy in North Carolina*

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Program on Health Workforce

MAHEC

March 13, 2018



UNC

THE CECIL G. SHEPS CENTER
FOR HEALTH SERVICES RESEARCH

This presentation in one slide

- Long history of using data and research to shape rural health and workforce policy in the state
- We often play the role of “data agitator”
- Tracking workforce outcomes of NC’s physician training programs to show state not producing health workforce needed
- Work is interprofessional
- Active nationally and internationally
- We are keen to hear about your workforce issues and how we might collaborate in the future



Core team

- Erin Fraher – Director, Program on Health Workforce Research and Policy and Carolina Health Workforce Research Center. Assistant Professor in FM and Research Assistant Professor in Surgery at UNC-CH
- Julie Spero – Director, NC Health Professions Data System
- Tom Bacon – Senior Policy Fellow
- Evan Galloway – Data Visualization Analyst
- Katie Gaul – Research Associate
- Sue Isley – Administrative Assistant
- Ryan Kandrack – Graduate Research Assistant
- Tom Ricketts – Senior Policy Fellow
- Jim Terry – Data Manager and Programmer

<http://www.shepscenter.unc.edu/programs-projects/workforce/people/meet-core-team/>

We are a soft money shop

Current sources:

- NC AHEC
- UNC System
- UNC-CH School of Medicine
- Data requests (very negligible)
- HRSA
- Physicians Foundation

Previous sources:

- The Duke Endowment (via NC AHEC)
- Robert Wood Johnson Foundation
- American Board of Medical Specialties
- American College of Surgeons
- National Governors Association
- NC Community College System
- NC Hospital Association

We house longitudinal data on many of licensed health professions

- Physicians (MDs and DOs)
- Physician Assistants
- Dentists
- Dental Hygienists
- Optometrists
- Pharmacists
- Physical Therapists
- Physical Therapist Assistants
- Respiratory Therapists (2004)
- Registered Nurses
- Nurse Practitioners
- Certified Nurse Midwives (1985)
- Licensed Practical Nurses
- Chiropractors
- Podiatrists
- Psychologists
- Psychological Associates
- Occupational Therapists (2006)
- Occupational Therapy Assistants (2006)

These data are available in an online, interactive data visualization tool

- Explore 15 years of data on over a dozen health professions in NC
- Total supply, supply per 10K, percent female, percent over 65, percent minority
- State and county-level data
- Interactive map and bar charts
- Can download data for use in presentations or for analysis
- nchealthworkforce.sirs.unc.edu

North Carolina

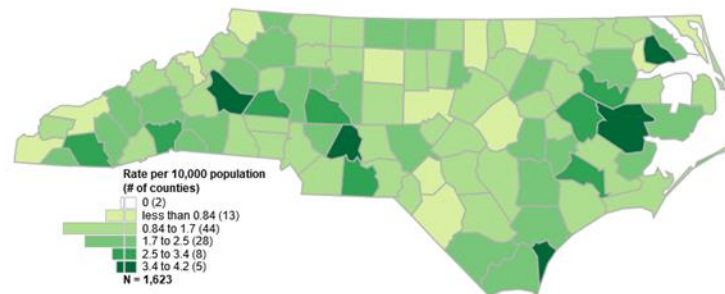
Health Professions Data System

[Home](#) [About](#) [Publications/Data](#) [Help](#)

Choose a profession

Occupational Therapy Assistant

Occupational Therapy Assistants per 10,000 Population in 2016

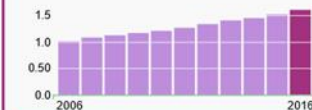


DOWNLOAD MAP AS IMAGE

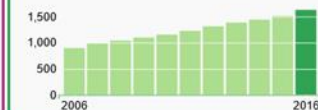
DOWNLOAD DATA

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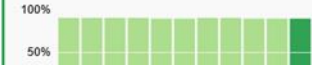
Occupational Therapy Assistants per 10,000 Population in North Carolina from 2006 to 2016



Total Number of Occupational Therapy Assistants in North Carolina from 2006 to 2016



Percent of Occupational Therapy Assistants who were Female in North Carolina from 2006 to 2016

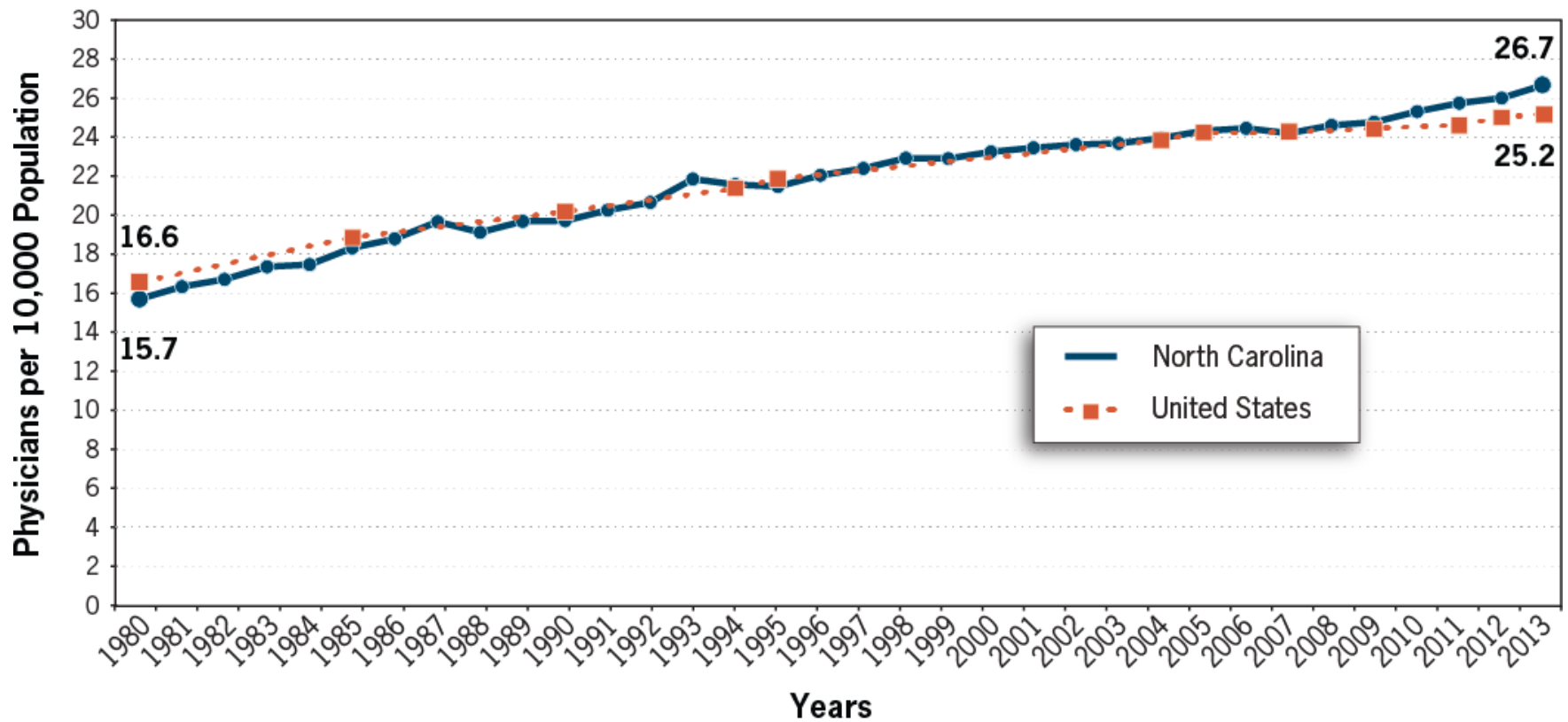


Percent of Occupational Therapy Assistants who were 65 or Older in North Carolina from 2006 to 2016



Fears of physician shortages create headlines but we see steady increase in supply in NC...

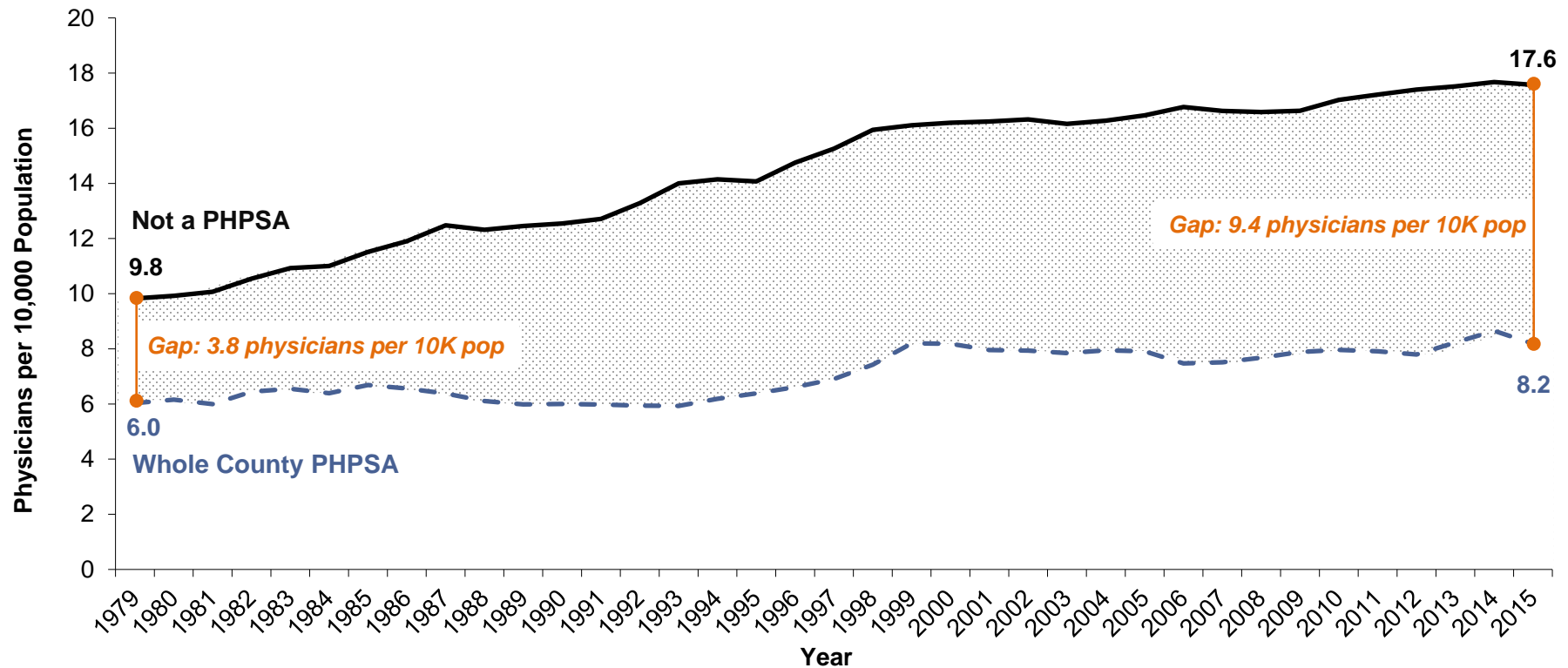
Physicians per 10,000 population, North Carolina and United States, 1980-2013



Sources: North Carolina Health Professions Data System, 1979 to 2013; American Medical Association Physician Databook, selected years; US Census Bureau; North Carolina Office of State Planning. North Carolina physician data include all licensed, active, physicians practicing in-state, inclusive of residents in-training and federally employed physicians, US data includes total physicians in patient care, which is inclusive of residents-in-training and federally employed physicians. US physician data shown for 1980, 1985, 1990, 1994, 1995, 2004, 2005, 2007, 2009, 2011, 2012, 2013; all other years imputed.

The real issue is maldistribution. Gap between shortage and non-shortage counties is growing

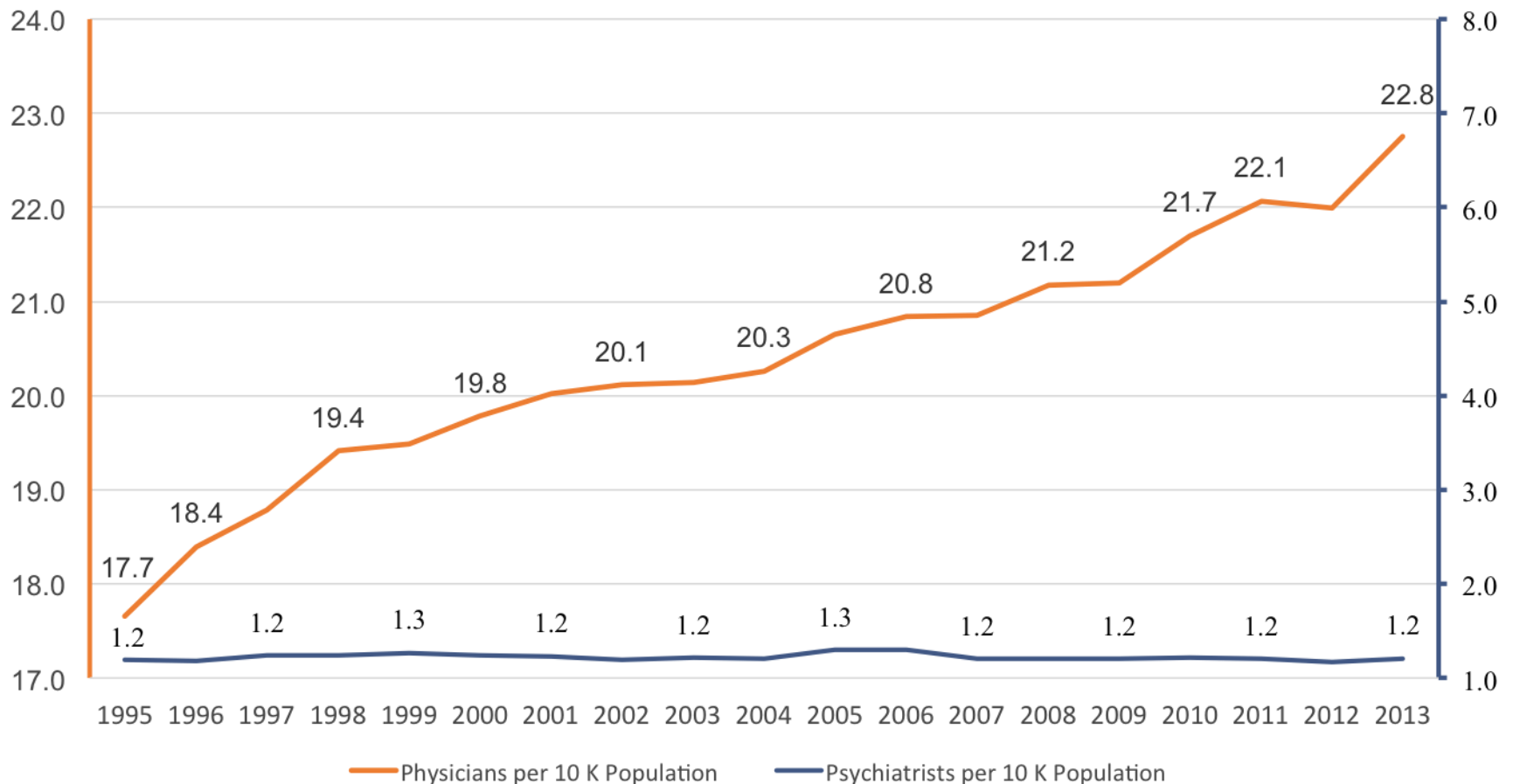
Physicians per 10,000 population by Persistent Health Professional Shortage Area (PHPSA) Status, North Carolina, 1980-2015



Notes: Figures include active, instate, nonfederal, non-resident-in-training physicians licensed as of October 31st of the respective year. North Carolina population data are smoothed figures based on 1980, 1990, 2000 and 2010 Censuses. Persistent HPSAs are those designated as HPSAs by HRSA in the Area Health Resource File using most recent 7 HPSA designations (2008-2013, 2015).
Sources: North Carolina Health Professions Data System, 1980 to 2015; North Carolina Office of State Planning; North Carolina State Data Center, Office of State Budget and Management; Area Health Resource File, HRSA, Department of Health and Human Services.

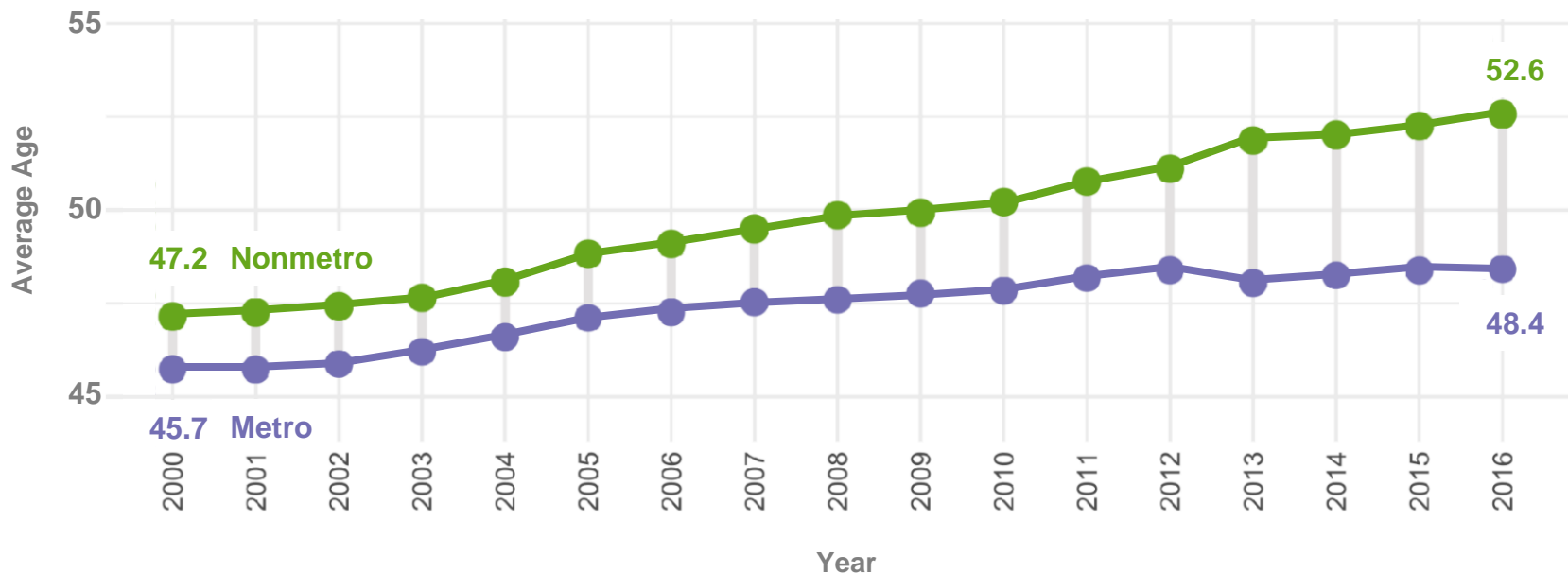
Why doesn't anyone want to become a psychiatrist?

Physicians and Psychiatrists per 10,000 Population, North Carolina, 1995-2013



And rural physician workforce is aging at faster pace than urban workforce

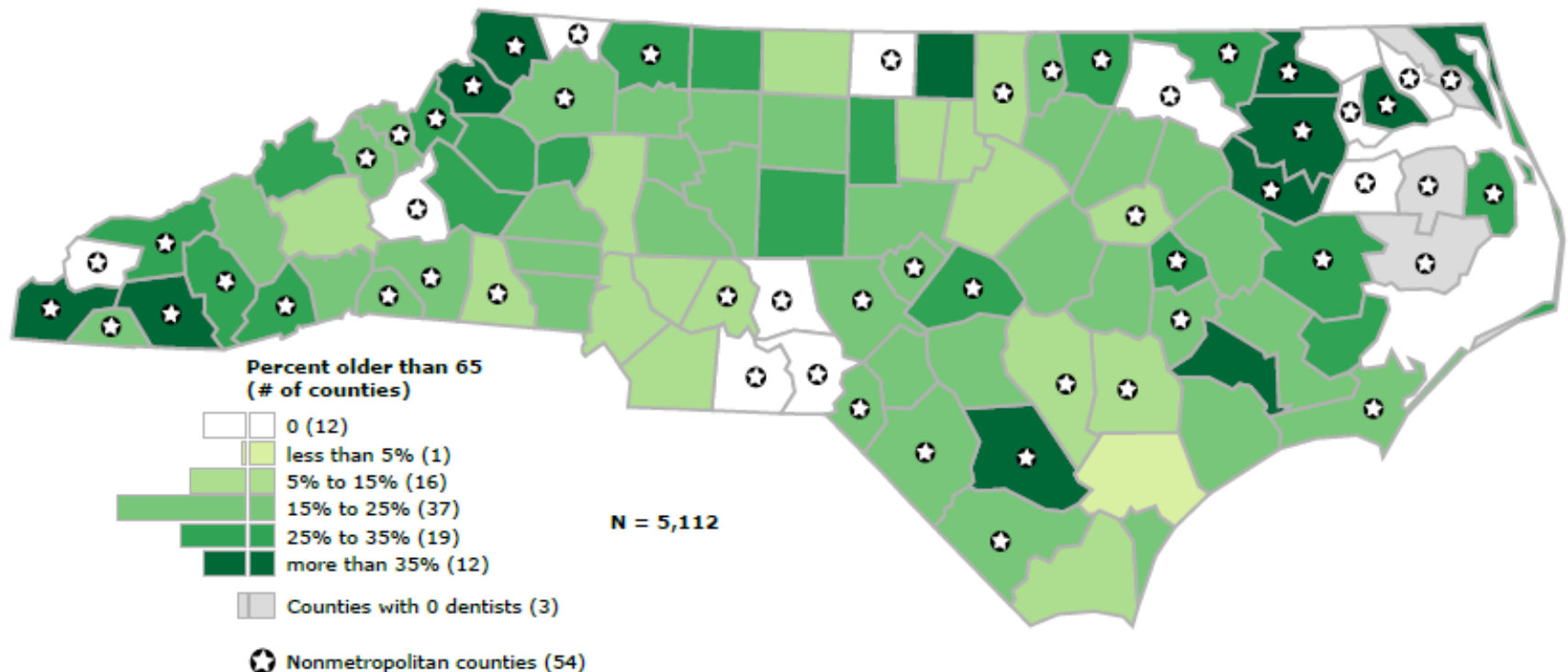
Average Age of North Carolina Physicians Over Time (Metro vs. Nonmetro)



Notes: Data include active, licensed physicians in practice in North Carolina as of October 31 of each year who are not residents-in-training and are not employed by the Federal government. Physician data are derived from the North Carolina Board of Medicine. Source: North Carolina Health Professions Data System, Program on Health Workforce Research and Policy, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill.

In 12 counties, one-third of the dentist workforce older than 65

Percent of Dentists in North Carolina Counties who were 65 or Older in 2017



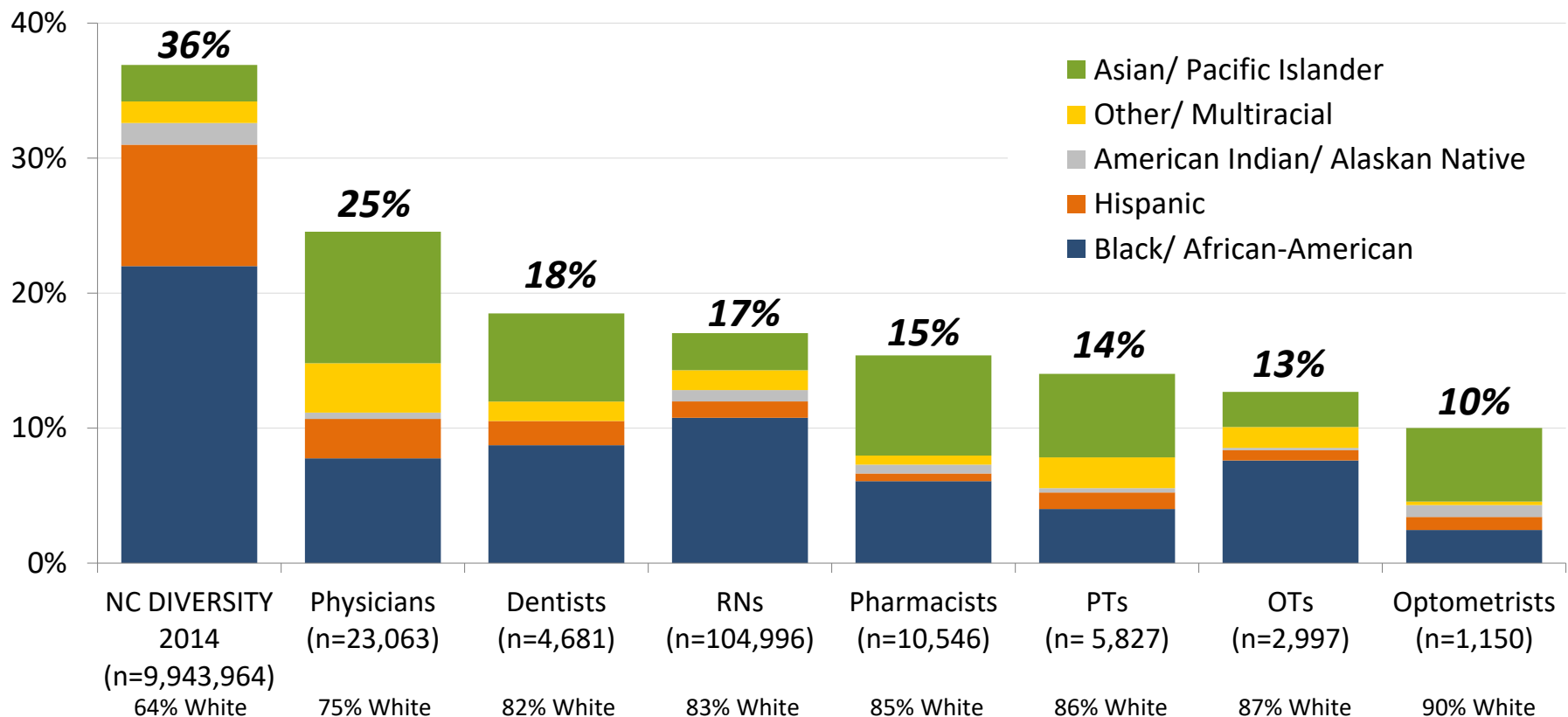
Note: Metro or nonmetro status is defined at the county level using Core Based Statistical Areas (CBSA), the Office of Management and Budget's collective term for Metropolitan and Micropolitan Statistical Areas. Here, nonmetropolitan counties include micropolitan and counties outside of CBSAs. Data include active, in-state dentists licensed and practicing in NC as of October 31, 2017.

Source: North Carolina Health Professions Data System, <https://nchealthworkforce.sirs.unc.edu>, with data derived from the North Carolina State Board of Dental Examiners; 2010 Office of Management and Budget (OMB) Standards for Delineating Metropolitan and Micropolitan Statistical Areas, July 2015 Delineation File.

Produced by: Program on Health Workforce Research and Policy, Cecil G. Sheps Center for Health Services Research, UNC-CH.

Diversity of workforce has improved but still lagging

**Diversity of NC Population versus Select Health Professions
North Carolina, 2014**

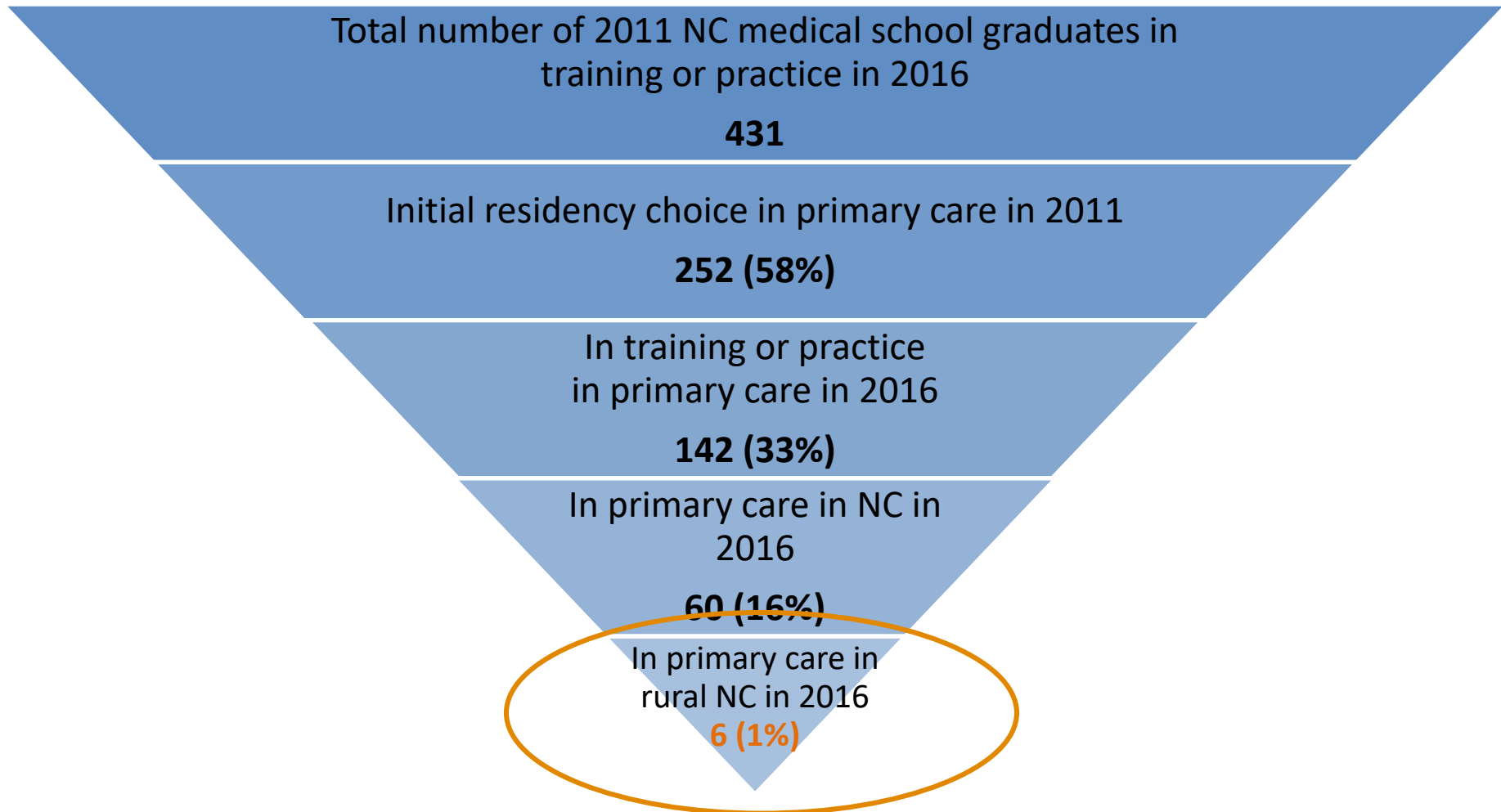


Sources: North Carolina Health Professions Data System with data derived from North Carolina licensing boards, 2014. Figures include active, instate, dentists, nurses, pharmacists, PTs, OTs and optometrists and active, instate non-federal, non-resident-in-training physicians licensed as of October 31 of the respective year.

Produced by: Program on Health Workforce Research and Policy, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill.



2011 NC Medical School Graduates: Retention in Primary Care in NC's Rural Areas **5** years later



Produced by the Program on Health Workforce Research and Policy, Sheps Center for Health Services Research, University of North Carolina at Chapel Hill.

Source: North Carolina Health Professions Data System with data derived from the Association of American Medical Colleges, and the NC Medical Board, 2016.

Rural source: US Census Bureau and Office of Management and Budget, July 2015. "Core Based Statistical Area" (CBSA) is the OMB's collective term for Metropolitan and Micropolitan Statistical areas. Here, nonmetropolitan counties include micropolitan and counties outside of CBSAs.



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Ongoing Collaboration with UNC School of Medicine

- Sheps is working with UNC SOM to track outcomes of graduates from longitudinal curriculum
 - Asheville Campus
 - Charlotte Campus
 - Wilmington Campus
- Sheps will also track outcomes for special programs
 - Kenan Primary care Medical Scholars
 - FIRST Program

Residency training pipeline is leaky

We tracked the outcomes five years after graduation for:
3,762 physicians who graduated from NC residency programs in 2008, 2009, 2010 or 2011

1,469 (39%) were in practice in North Carolina five years after graduation

108 (3%) were in practice in rural North Carolina counties five years after graduation

12 (0.3%)
Family
Medicine

4 (0.1%)
General
Pediatrics

4 (0.1%)
General
Surgery

4 (0.1%)
General Internal
Medicine

4 (0.1%)
Obstetrics &
Gynecology

15* (0.4%)
General
Psychiatry

65 (1.7%)
Other
specialties*

Notes: The workforce outcomes of four cohorts of residents who completed training in 2008, 2009, 2010, or 2011 were analyzed. We used North Carolina Medical Board licensure data to determine the location and primary area of practice for each physician five years after graduation, e.g., for a resident who completed training in 2008, we used 2013 NC Medical Board data to determine his/her location and primary area of practice. *Central Regional Hospital and affiliated state psychiatric facilities are located in Granville County, which is a nonmetro county. At least 6 of these psychiatrists were employed by the state in Granville County. If a physician completed both a residency and a fellowship in North Carolina within the range of cohort years, they would be counted once for each program. Source: NC Health Professions Data System, Cecil G. Sheps Center for Health Services Research, UNC-CH, with data derived from the North Carolina Medical Board.



Resident Retention Five Years After Graduation for Residents Graduating in 2008, 2009, 2010 or 2011

Institution	Total # Residents	Retention of Residents in NC After 5 Years		Retention of Residents in Rural NC After 5 Years	
		#	%	#	%
Carolinas HealthCare System-Northeast (Northeast-Cabarrus) Program	33	20	60.61%	1	3.03%
Carolinas Medical Center Program	269	116	43.12	9	3.35
Carolinas Medical Center Union Program	8	5	62.50	0	0.00
Cone Health Program	74	49	66.22	3	4.05
Duke University Hospital Program	1115	392	35.16	10	0.90
MAHEC Program	48	29	60.42	3	6.25
MAHEC Program - Hendersonville	12	3	25.00	0	0.00
New Hanover Regional Medical Center Program	76	28	36.84	5	6.58
Southern Regional AHEC/Duke Univ. Hosp. Program	24	10	41.67	1	4.17
UNC Hospitals Program	863	360	41.71	30	3.48
Vidant Medical Center/ECU Program	402	149	37.06	20	4.98
Wake Forest University School of Medicine Program	784	299	38.14	24	3.06
Total	3762	1469	39.05%	108	2.87%

Retention of MAHEC residency graduates in NC varied by program location and specialty.

Percent of residents practicing in NC five years after graduation for the graduating classes of 2008, 2009, 2010, 2011

Residency Program	Percent Retained in NC - MAHEC	Percent Retained in NC – State Average
Family Medicine – Asheville	74% (23 of 32 residents)	50% (174 of 351 residents)
Family Medicine - Hendersonville	25% (3 of 12 residents)	50% (174 of 351 residents)
Obstetrics & Gynecology	33% (5 of 15 residents)	35% (50 of 145 residents)
Geriatric Medicine (FM Fellowship)	50% (1 of 2 residents)	



Retention of MAHEC residency graduates in Rural NC varied by program location and specialty.

Percent of residents practicing in Rural NC five years after graduation for the graduating classes of 2008, 2009, 2010, 2011

Residency Program	Percent Retained in NC - MAHEC	Percent Retained in NC – State Average
Family Medicine – Asheville	3% (1 of 31 residents)	5% (17 of 351 residents)
Family Medicine - Hendersonville	0% (0 of 12 residents)	5% (17 of 351 residents)
Ob/Gyn - Asheville	7% (1 of 15 residents)	3% (4 of 145 residents)
Geriatric Medicine (FM Fellowship)	50% (1 of 2 residents)	



We are one of seven federally funded Health Workforce Research Centers

The Sheps Center houses the **Carolina Health Workforce Research Center**

Center's Mission: conduct and disseminate timely and policy-relevant research that enables policy makers to swiftly respond to the challenge to train, retrain, deploy and retain a highly skilled, culturally competent, diverse and high value health workforce.

Director: Erin Fraher, PhD, MPP

Deputy Director: Thomas Ricketts, PhD, MPH

Investigators: Multi-disciplinary group of researchers representing health policy, medicine, nursing, public health, social work, allied health and other professions

Funding: From the Bureau of Health Workforce, Health Resources and Services Administration, \$4.3 million, plus one-time supplements; 2013-2022

<http://www.shepscenter.unc.edu/programs-projects/workforce/projects/carolina-health-workforce-research-center/>

Our Center seeks to provide policymakers with better data and research to shape GME investment decisions

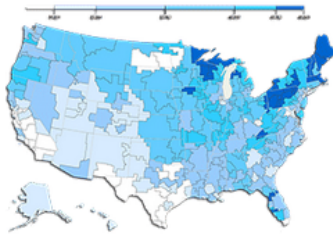
GME projects completed 2013-2017

1. A Methodology for Using Workforce Data to Target GME Expansions by State and Specialty
2. Lessons Learned from State Efforts to Reform Medicaid GME
3. Mapping the Flows of Residents from Training to Practice

In progress, 2017-2018

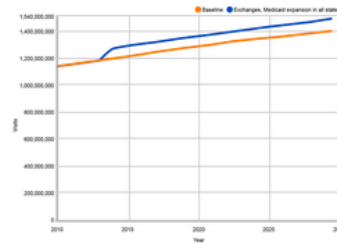
4. Exploring the Magnitude and Timing of Physician Specialty Changes During Training
5. GME Policy Toolkit that States Can Use to Evaluate ROI for Public Funds Invested in GME Training
6. Assessing the ROI of Pediatric Residency Programs

FutureDocs Forecasting Tool

[HOME](#)[ABOUT THE PROJECT](#)[THE MODEL](#)[HELP](#)[CONTACT](#)

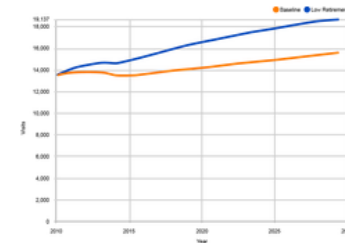
VISUALIZE DATA AT STATE AND SUB-STATE LEVELS

Use the tool to view physician supply, healthcare service use, and shortages/surpluses at the national, state, and sub-state levels.



PROJECT THE EFFECT OF MEDICAID EXPANSION

Use the tool to project how the utilization of health care services will change under different assumptions about Medicaid expansion.

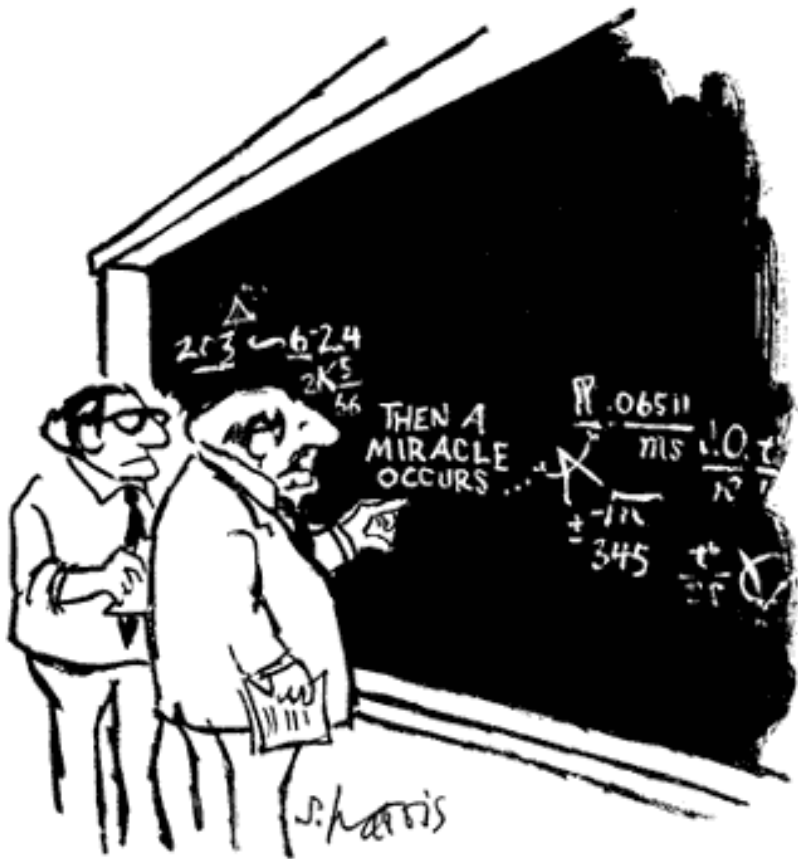


UTILIZATION, SUPPLY, SHORTAGE/SURPLUS TO 2030

Use the tool to examine how physician supply, healthcare service use, and shortages/surpluses will change between 2011-2030 under different scenarios.

[BUILD YOUR MODEL](#)

“Plasticity matrix” brings supply and utilization together by mapping physicians to services



“I think you should be more explicit here in step two.”

- **Starting question:** what health services will patients need?
- **Next question:** which physician specialties can provide those services?
- **Innovation:** plasticity matrix maps services provided by physicians in different specialties to patients’ visits

Plasticity—Providers and Services:

A sample matrix for outpatient settings

Number of outpatient visits, select specialties and CSAs

Specialties	Circulatory	Digestive	Endocrine/ Immunity	Genitourinary	Infectious	Neoplasms	Respiratory	Other CSAs
Cardiology	24%	213,801	555,052	96,113	22,694	141,362	482,472	6,961,828
Dermatology	0%	95,999	59,350	44,899	1,800,000	12,000,000	166,972	16,940,570
Internal Medicine	16%	2,800,000	7,600,000	1,600,000	830,328	1,500,000	5,000,000	30,572,797
Endocrinology	0%	140,846	8,300,000	110,968	20,264	599,928	70,317	1,948,831
Family Medicine	48%	12,000,000	26,000,000	8,100,000	5,200,000	3,300,000	35,000,000	146,877,717
Gastroenterology	0%	8,700,000	242,921	129,172	659,723	1,100,000	89,227	6,929,699
Other specialties	11%	12,938,816	10,304,506	32,984,241	7,436,774	39,439,345	40,083,489	413,929,716
Total visits	100%	36,889,462	53,061,829	43,065,393	15,969,783	58,080,635	80,892,477	624,161,158

Within a CSA, how are outpatient visits distributed across specialties?

Plasticity—Providers and Services:

A sample matrix for outpatient settings

Number of outpatient visits provided per FTE
per year, select specialties and CSAs

	Circulatory	Digestive	Endocrine/ Immunity	Genitourinary	Infectious	Neoplasms	Respiratory	Other CSAs	Total
Cardiology	83%	0%	2%	0%	0%	0%	1%	15%	100%
Dermatology	32	0	0	0	317	2116	0	2936	5401
Internal Medicine	322	47	128	0	0	0	84	440	1021
Endocrinology	163	39	2328	31	0	168	0	442	3171
Family Medicine	20%	4%	9%	3%	2%	1%	12%	49%	100%
Gastroenterology	58	1108	30	0	84	140	0	796	2216

Within a specialty, how are visits distributed across CSAs?

Takeaways from plasticity

- Model currently accounts for between specialty plasticity
- Plasticity matrix based on national practice patterns
- But we know there are local differences due to variation in:
 - local supply and balance of care provided by specialty vs generalist physicians
 - supply and scope of practice of Nurse Practitioners and Physician Assistants
 - institutional/practice-level decisions about deployment of health workforce



Future research needed:

The local and dynamic nature of plasticity

- Can we use claims data to better understand factors that drive variations in local plasticity?
- Need to design quantitative and qualitative studies to understand how plasticity changes:
 - over time as the balance of services between generalists/specialists and between professions shifts
 - when new practitioners enter/exit practice in a local area
 - as care delivery and payment models change incentives
 - technology creates new roles and eliminates others

Future research needed:

How does plasticity vary within specialty/profession?

Individuals within same specialty/profession will have different scopes of services depending on:

- demographic characteristics (age, gender) and personal preferences
- length of time since completing training, certifications held
- rural/urban location
- proximity to other providers with overlapping and/or competing services
- patient population served
- organizational/practice level deployment decisions



Contact info

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