The Sticky Wicket of Projecting Physician Workforce Needs

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Presentation Overview

- The lure of the shortage rhetoric
- Why don't workforce models agree?
- Case study: our workforce projection model
- Using models as tools to simulate policy change, rather than the "answer"
  - Understand effect of overlapping/shifting roles on workforce needs
  - Targeting GME by specialty and state
- Challenges and future directions

This project is funded by a grant from The Physicians Foundation.

Fears of physician shortages grab headlines

The New York Times

Tuesday, April 22, 2014 | Today's Paper | Personalize Your Weather

Doctor Shortage Likel

By ANN

Publish

DOCTORS

Lots of New

By DANIELLE OFRI, M.D

Doctor shortage, increased demand could crash health care system

By **Jen Christensen**, CNN

updated 5:37 PM EDT, Wed October 2, 2013

SHUTTERSTOCK/FILE

Some doctors worry patients who can't get in to see primary care physicians will clog up hospital emergency rooms.

Success of health reform hinges on hiring 30,000 primary care doctors by 2015

ashington Post

J.S., Put More

austed Physicians

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And shortage rhetoric used as rationale for wide range of policy change

- Increasing residency positions
- Expanding scope of practice
- Shortening medical school
- Allowing “assistant physicians” to practice in underserved communities
- Opening new medical schools

Are we sure the nation faces a shortage?

Is the overall shortage of physicians the real issue?

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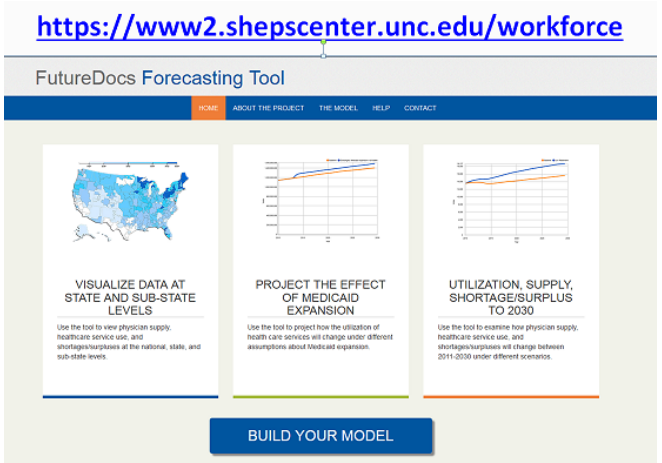
Experts disagree about whether the United States will face a shortage

- AAMC projects shortfalls of between 12,500 and 31,000 primary care physicians and 46,100 and 90,400 total physicians by 2025[1]
- Federal government (HRSA) forecasts shortage of 6,400 primary care physicians in 2020[2] with increased use of NPs and PAs
- We released model in July 2014 that suggests overall supply will be adequate, more pressing issue is maldistribution



[1] AAMC, https://www.aamc.org/download/426242/data/ihsreportdownload.pdf?cm_mmc=AAMC-_-ScientificAffairs-_-PDF-_-ihsreport
[2] HRSA, http://bhpr.hrsa.gov/healthworkforce/supplydemand/usworkforce/primarycare/projectingprimarycare.pdf

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Why don't models agree (1)?

On the supply side alone, there are many reasons for differences…

Modeling Attributes	**Assumptions**
How many physicians at baseline?	Include federal physicians? What is age cutoff? How to define active?
What is unit of geography?	National, state or sub-state? Does model allow for physician/resident migration?
When do physicians retire?	Is probability of exiting the workforce adjusted by age/gender/generation?
How does model handle new entrants?	Does it include DOs? How does it handle specialization? At what percent does GME grow per year?

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Why don't models agree (2)?

On the supply side alone, there are many reasons for differences…

Model Attributes	**Data/Assumptions**
How is FTE calculated?	What data source? Total hours worked or hours in clinical care? How is productivity measured?
How are specialties grouped?	Particular issue for internal medicine (hospitalists), general surgery and general pediatrics
Does model allow for substitution?	NPs? PAs? Other providers?
How does the model handle uncertainty?	Confidence intervals? "What if" scenarios?
Modeling approach	Per population trend, stock and flow, microsimulation, systems dynamics

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A Case Study:

The FutureDocs Forecasting Tool

We developed a model that turns workforce modeling upside down

- Model does not produce estimate of ***counts of physicians needed*** by specialty
- Instead, it asks: what are patients' needs for care **and how can those needs be met (or not!) by different workforce configurations in local areas**?

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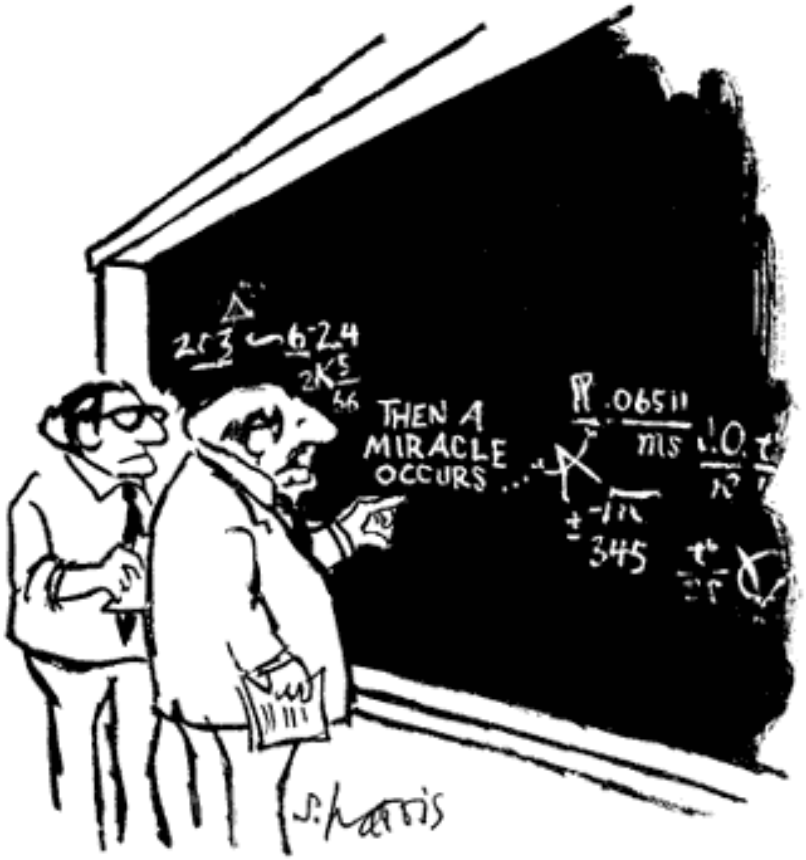
“Plasticity matrix” brings supply and demand together by mapping physicians to services



“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

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Plasticity—Providers and Services: A sample matrix for outpatient settings

Number of outpatient visits, select specialties and health care services

Specialties	Circulatory	Digestive	Endocrine/ Immunity	Genitourinary	Infectious	Neoplasms	Respiratory	Other CSAs
Cardiology	29,000,000	213,801	555,052	96,113	22,694	141,362	482,472	6,961,828
Dermatology	182,456	95,999	59,350	44,899	1,800,000	12,000,000	166,972	16,940,570
Internal Medicine	19,000,000	2,800,000	7,600,000	1,600,000	830,328	1,500,000	5,000,000	30,572,797
Endocrinology	580,980	140,846	8,300,000	110,968	20,264	599,928	70,317	1,948,831
Family Medicine	57,000,000	12,000,000	26,000,000	8,100,000	5,200,000	3,300,000	35,000,000	146,877,717
Gastroenterology	458,087	8,700,000	242,921	129,172	659,723	1,100,000	89,227	6,929,699
Other specialties	12,813,059	12,938,816	10,304,506	32,984,241	7,436,774	39,439,345	40,083,489	413,929,716
Total visits	119,034,582	36,889,462	53,061,829	43,065,393	15,969,783	58,080,635	80,892,477	624,161,158

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Plasticity—Providers and Services: A sample matrix for outpatient settings

Number of outpatient visits, select specialties and health care services

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

How are outpatient visits for health care services distributed across specialties?

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Plasticity—Providers and Services: A sample matrix for outpatient settings

Number of outpatient visits provided per FTE per year, select specialties and health care services

	Circulatory	Digestive	Endocrine/ Immunity	Genitourinary	Infectious	Neoplasms	Respiratory	Other CSAs	Total
Cardiology	2,095	0	40	0	0	0	34	368	2,537
Dermatology	32	0	0	0	317	2,116	0	2,936	5,401
Internal Medicine	322	47	128	0	0	0	84	440	1,021
Endocrinology	163	39	2,328	31	0	168	0	442	3,171
Family Medicine	936	197	427	133	85	54	575	2,356	4,763
Gastroenterology	58	1,108	30	0	84	140	0	796	2,216

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Plasticity—Providers and Services: A sample matrix for outpatient settings

Number of outpatient visits provided per FTE per year, select specialties and health care services

	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 health care services?

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Mapping of supply to demand using plasticity matrix produces "Relative Capacity" measure

"Relative Capacity"

a measure of how well physician supply matches demand for 19 types of health care services in 293 TSAs (sub-state area based on Dartmouth's Hospital Referral Regions)

$$= \frac{\text{supply of visits physicians in that TSA can provide}}{\text{utilization of visits needed by population in TSA}}$$

<.85=shortage .85-1.15=in balance >1.15=surplus

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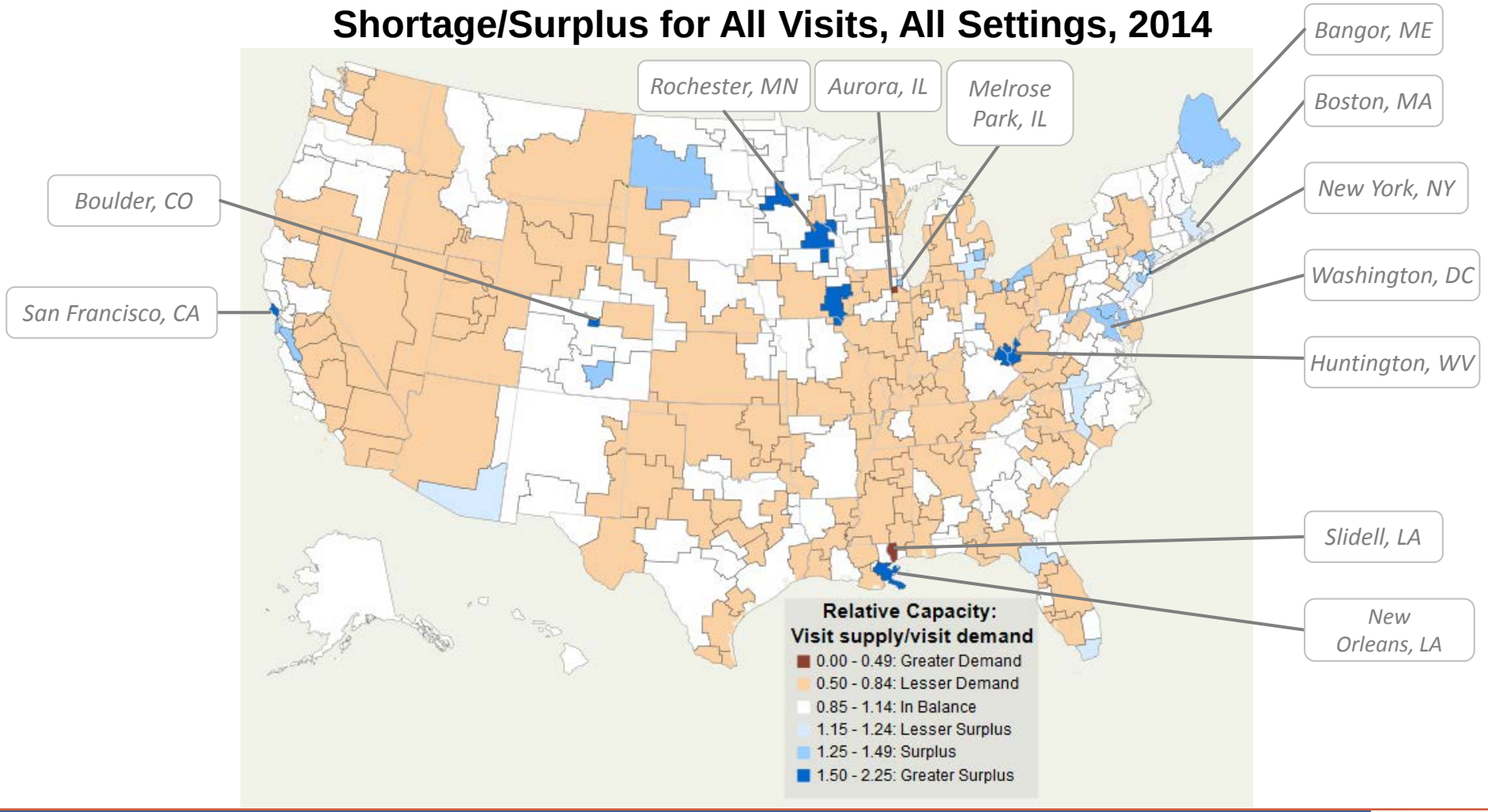
You end up with a picture of the capacity of workforce to meet demand in local areas



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We used the model to determine where to target GME by specialty

- Current proposals suggest increasing GME by 3,000 PGY1 slots for 5 years
- We used model's plasticity matrix to determine how to target GME to meet anticipated shortages. Model suggests some expected and unexpected findings:
- Expected findings:
  - Expand GME in "first certificate" programs—Family Medicine, Internal Medicine, General Surgery, Psychiatry etc.
  - Expand cardiology slots positions
- Unexpected findings:
  - Relatively small GME expansion in geriatrics
  - Relatively large GME expansions in ped. surgical and non-surgical specialties

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Why the unexpected findings?

- Plasticity matrix is based on current, national distribution of visits across specialties
  - Currently, small number of geriatricians providing care for elderly relative to internists
  - Specialists are providing “generalist” care
- Plasticity matrix could be adapted to model the effect of shifting care from:
  - Specialists to generalists
  - Physicians to physician assistants and nurse practitioners
  - Traditional health care workers to community-based workers

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We also used the model to determine where to target GME by state

- Findings suggest expanding GME in states with:
  - Poor health outcomes and high health care utilization (Arkansas, Mississippi and Alabama)
  - Large, growing populations (Texas and California)
  - Aging populations (Florida)
  - Low resident/population numbers (Idaho, Wyoming, Montana, Alaska and Nevada)
- 5 states (Connecticut, Delaware, New Hampshire, Rhode Island and Vermont) and the District of Colombia receive no GME slots because they are already well supplied

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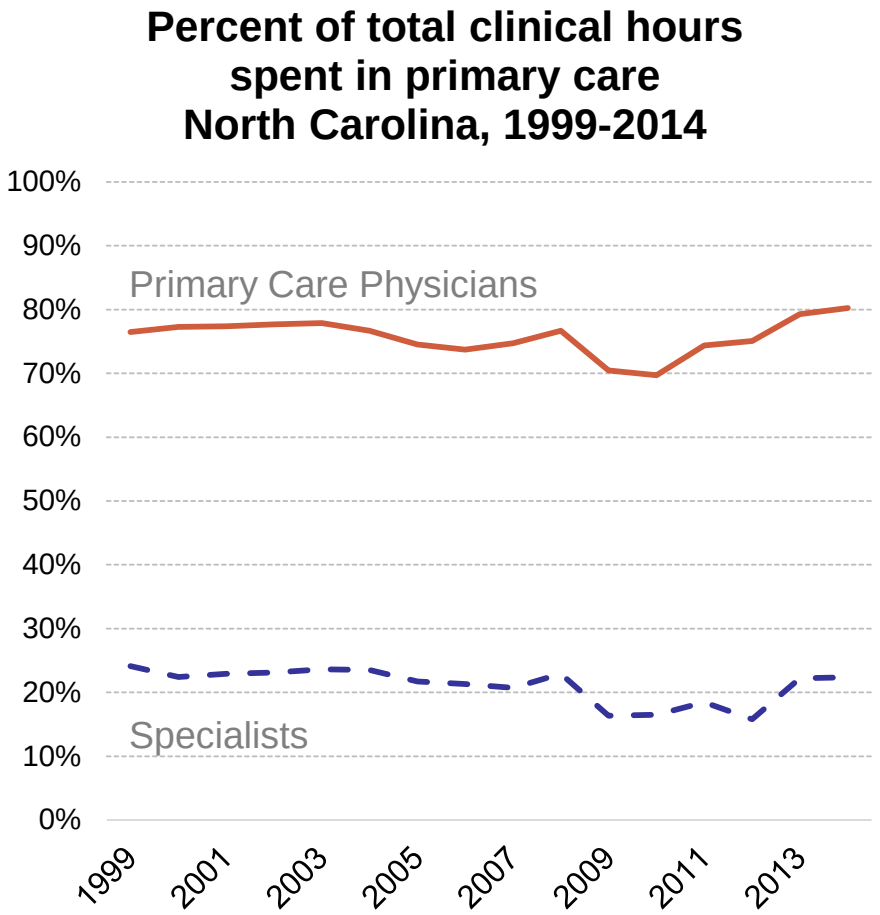
Modeling challenges for the future

- Our plasticity estimates are “rough”
- Based on secondary data sources (MEPs)
- We don’t have clear idea of who is providing what services
- Plasticity matrix needs to be:
  - Regularly updated to capture changing care delivery patterns
  - Adapted to local labor markets



Source: NC HPDS, with data derived from the NC Medical Board.

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