

# Physicians in North Carolina: Sufficiency, Shortage or “Stress”

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# The Current Policy Context

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- **Demand side:** aging population, increase in chronic disease, insurance expansions, rising patient expectations
- **Supply Side:** health workforce overall is growing, professions operate in silos, turf wars abound, and productivity is lagging

**With, or without health reform, cost and quality pressures will change the physician workforce**



# Questions

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- Can we trust the numbers?
  - **YES**, North Carolina has the most accurate and trustworthy inventory of physician data
- What is a shortage of physicians?
  - Economic: When the prices of service rises because there is less of it available
  - Clinical: When people cannot get needed care because there aren't enough doctors
- How can we know a shortage exists?
  - Sick people get sicker? People take more time to get to a doctor?



# The State of the State: Let's Drown (or Swim) in a lot of Data



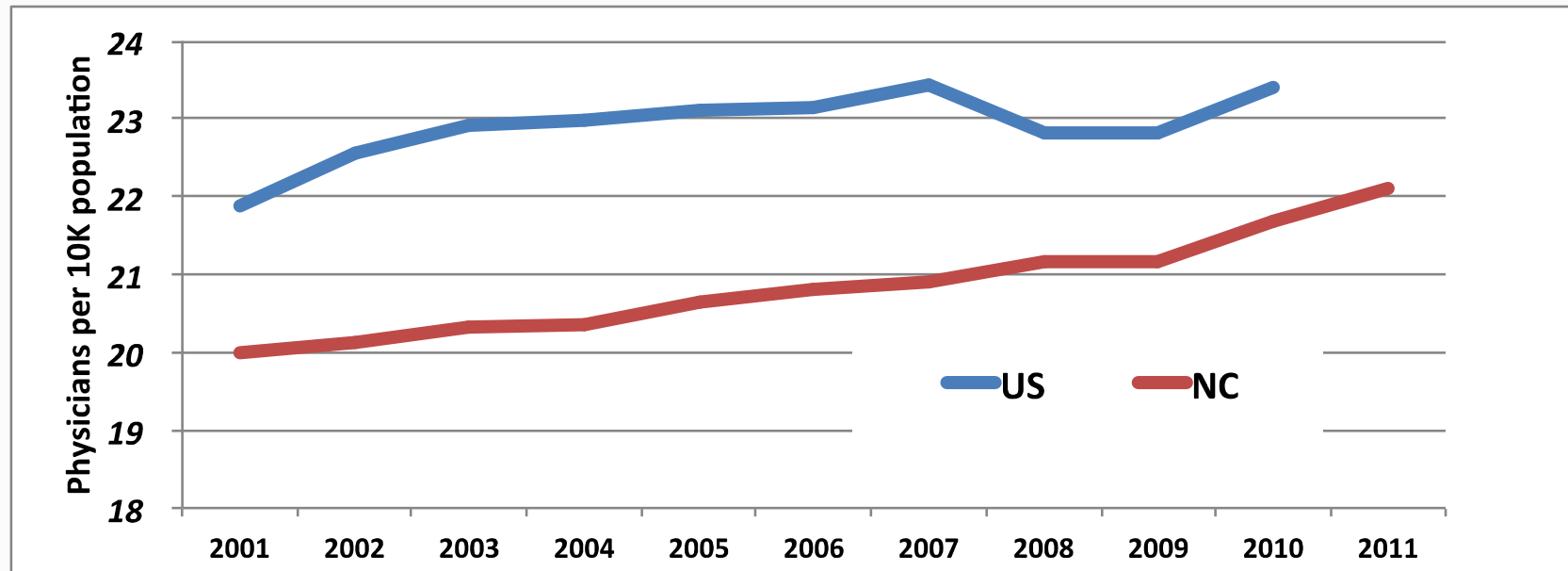
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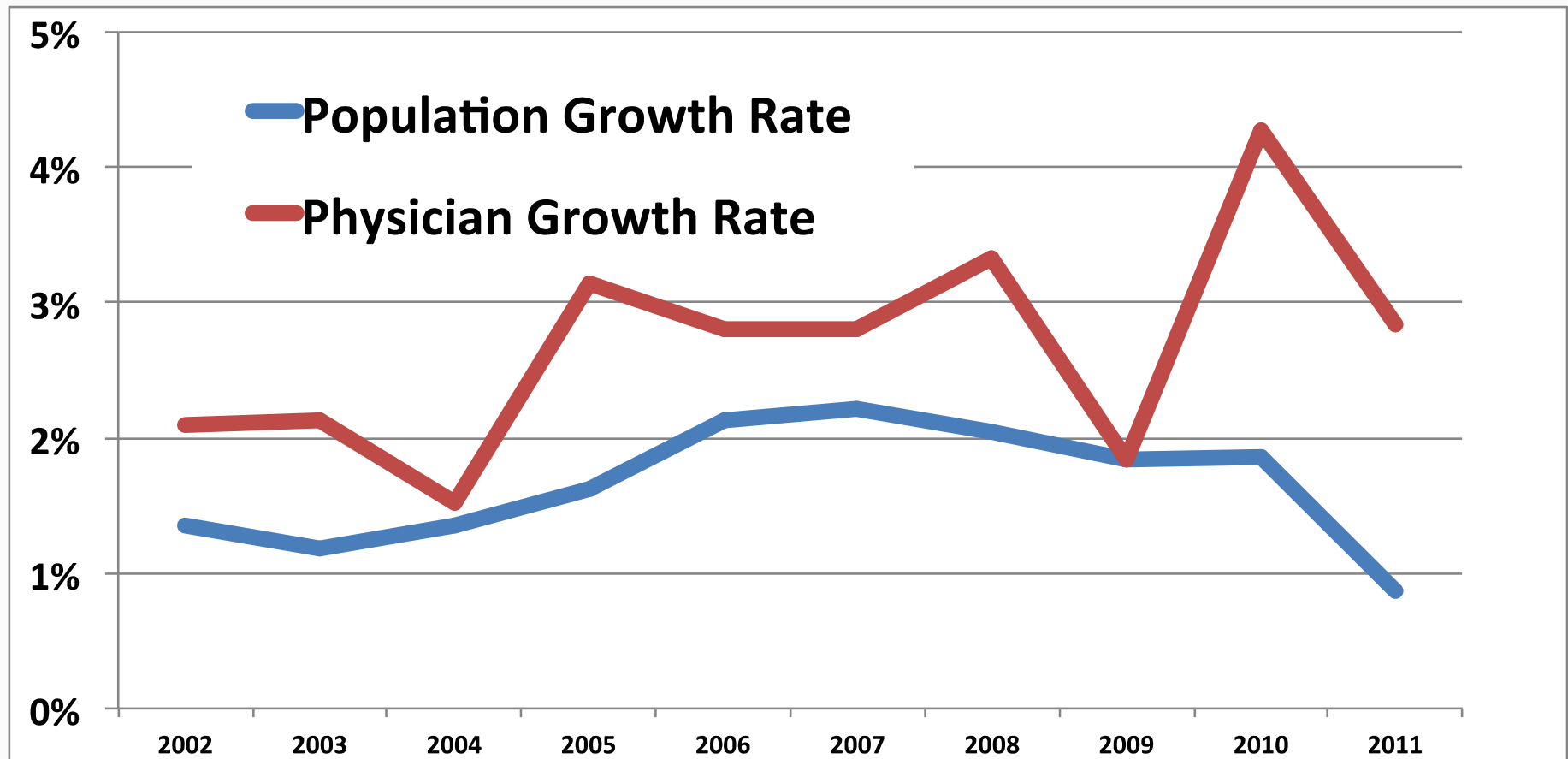
# NC Lags US in Physicians per Population

**US 23 per 10,000**

**NC 22 per 10,000**



# NC Doctor Supply has grown faster than NC Population



# Doctor Supply is Dynamic: 2002-2009

2002 Supply 16,734		<b>New Actives</b> 1,568 (returned to active 511 newly licensed 1,057)		<b>Left File</b> 1,212		2003 total 17,090 Net gain 356
2003 Supply 17,090		<b>New Actives</b> 1,430 (returned to active 487 newly licensed 943)		<b>Left File</b> 1,171		2004 total 17,349 Net gain 259
2004 Supply 17,349		<b>New Actives</b> 1,550 (returned to active 667 newly licensed 883)		<b>Left File</b> 1,004		2005 total 17,895 Net gain 546
2005 Supply 17,895		<b>New Actives</b> 1,951 (returned to active 630 newly licensed 1,321)		<b>Left File</b> 1,450		2006 total 18,396 Net gain 501
2006 Supply 18,396		<b>New Actives</b> 1,659 (returned to active 569 newly licensed 1,090)		<b>Left File</b> 1,142		2007 total 18,913 Net gain 533
2007 Supply 18,913		<b>New Actives</b> 1,822 (returned to active 461 newly licensed 1,361)		<b>Left File</b> 1,193		2008 total 19,542 Net gain 629
2008 Supply 19,542		<b>New Actives</b> 1,808 (returned to active 499 newly licensed 1,309)		<b>Left File</b> 1,449		2009 total 19,901 Net gain 359

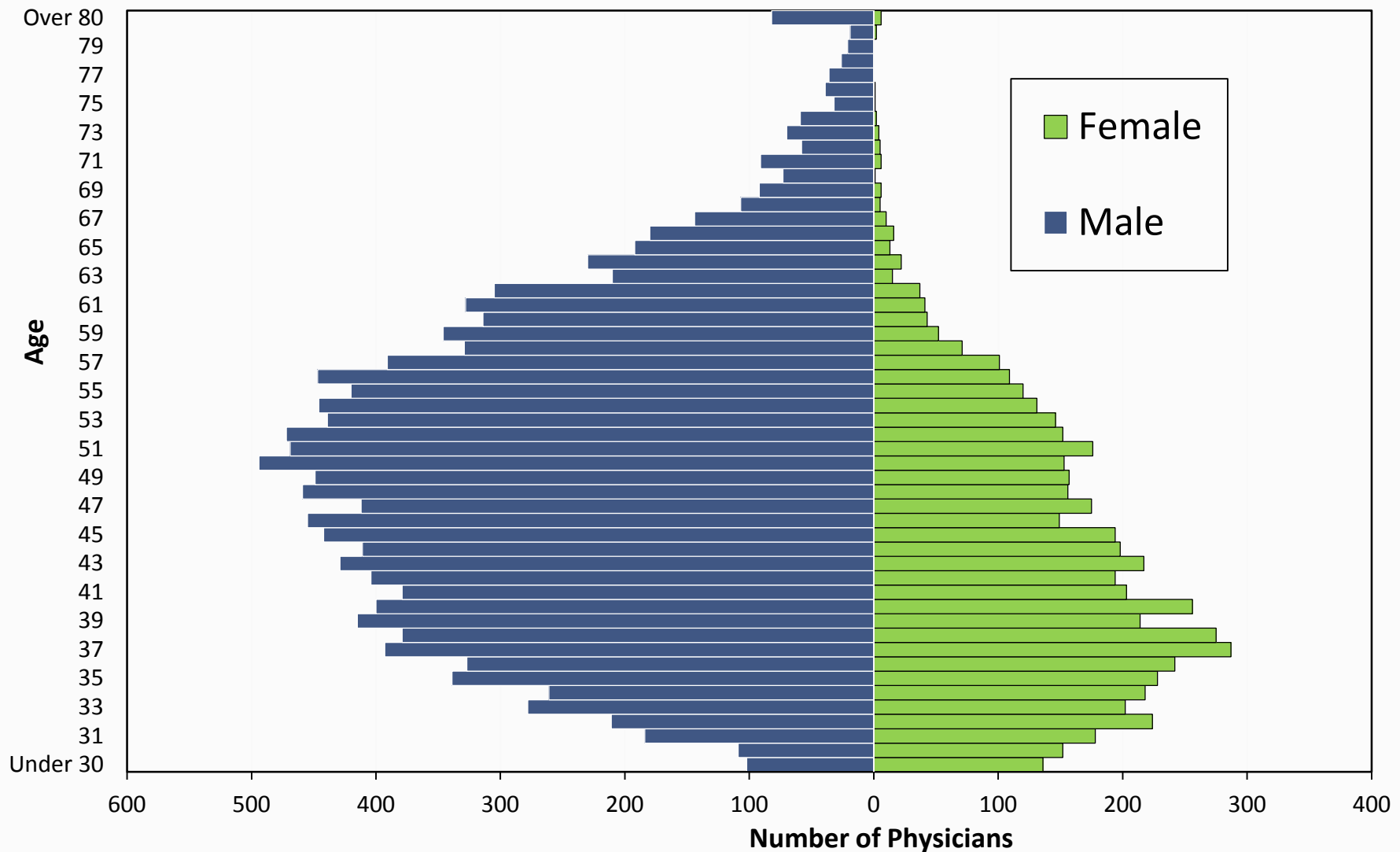
Source: North Carolina Health Professions Data System, with data derived from the North Carolina Medical Board, 2002-2009. Prepared 6/16/2010.

Counts include active, instate, non-federal physicians. Note: Newly licensed physicians are those who are new to file with a license date in the current or previous year. New Active physicians are those who were licensed in NC in an earlier year but were either inactive or active out of state in the previous year.



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# Doctor Supply is Older Males and Younger Females



Note: Figures include active, instate, nonfederal, non-resident-in-training physicians licensed in North Carolina as of October 31, 2009.

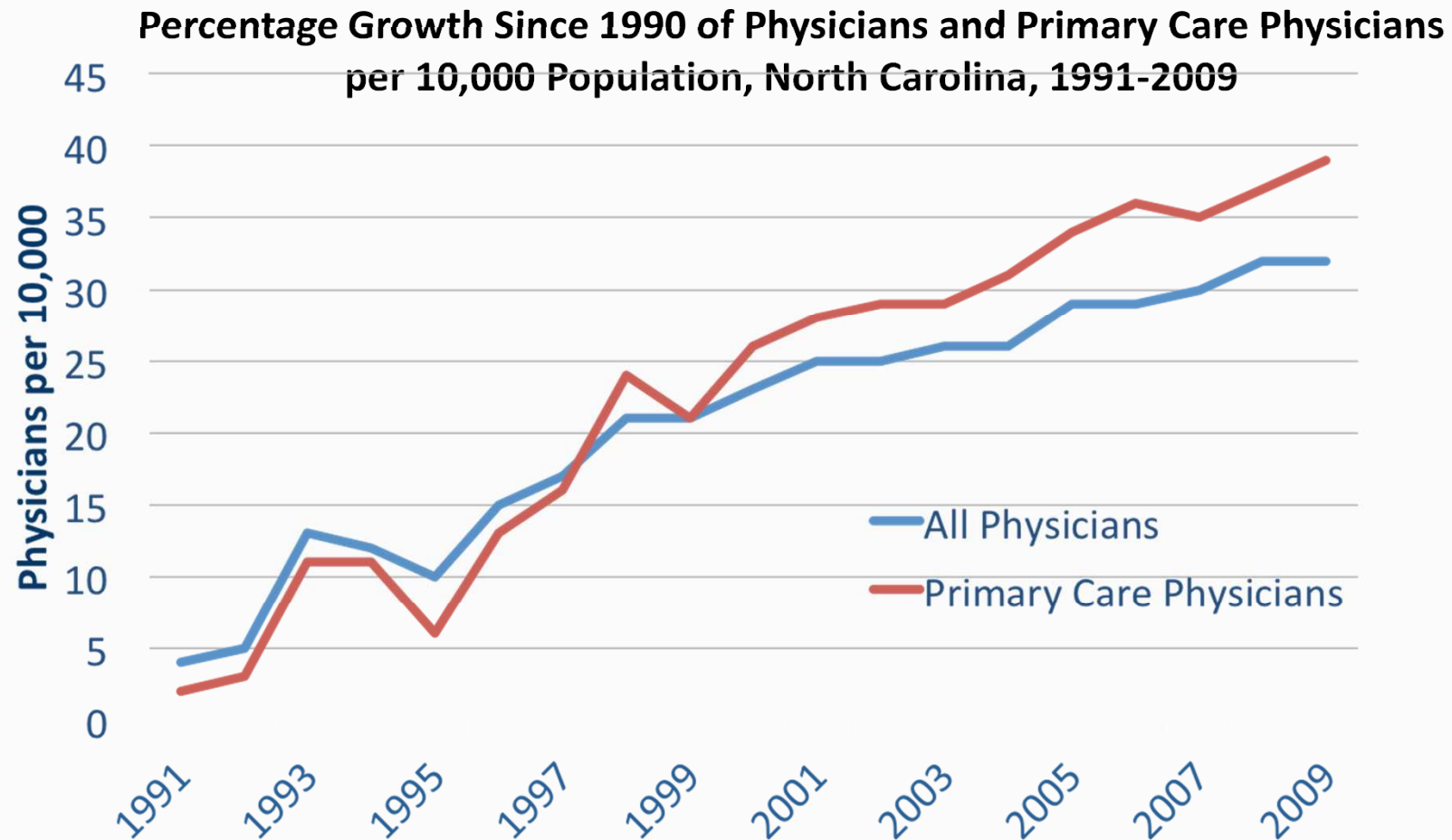
Source: North Carolina Health Professions Data System, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill, with data derived from the North Carolina Medical Board, 2009.



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# NC Bucks National Trend: More Rapid Increase in Primary Care Physicians



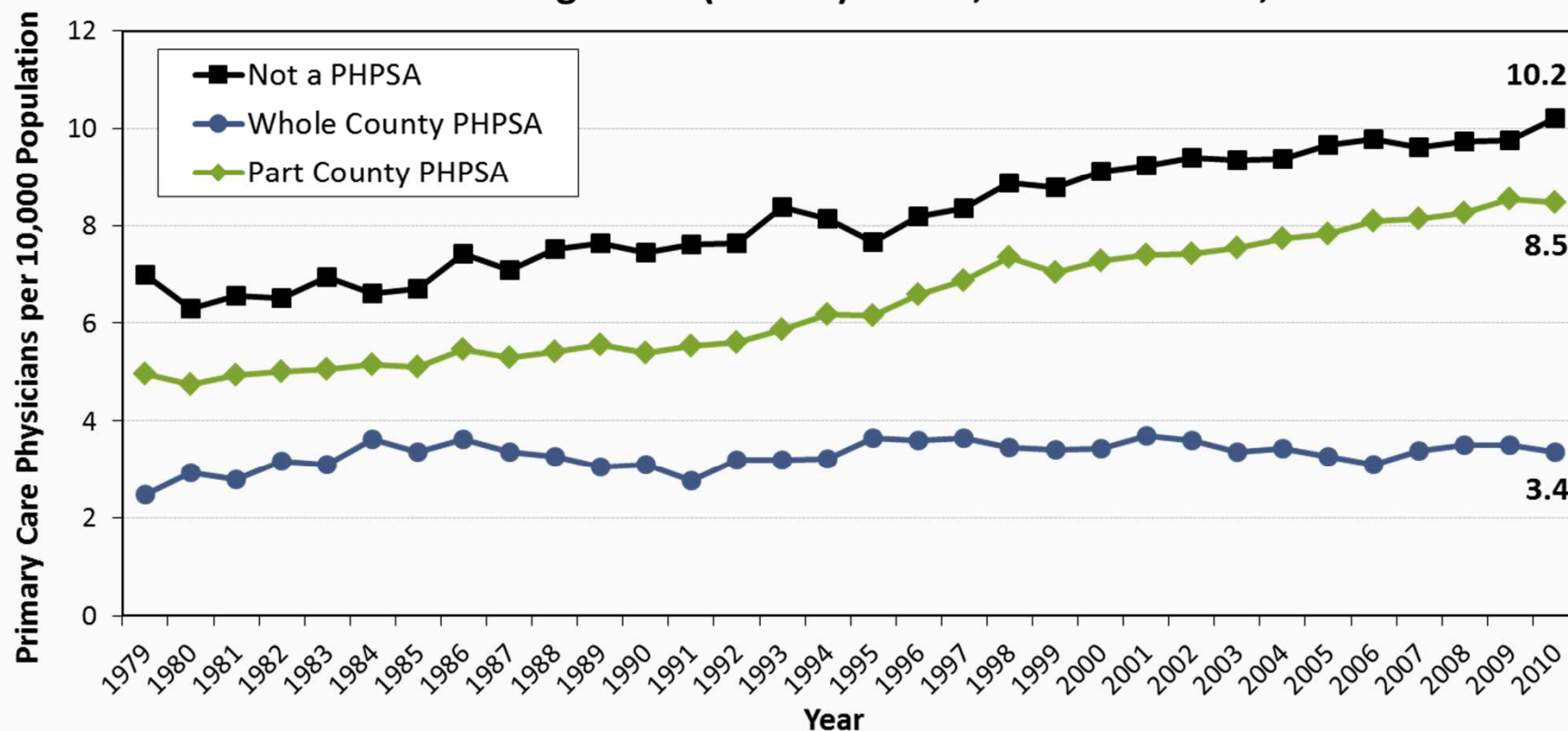
Sources: North Carolina Health Professions Data System with data derived from the North Carolina Medical Board, 1979 to 2009; North Carolina Office of State Planning. Figures include all licensed, active, instate, non-federal, non-resident-in-training physicians.



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# And Despite Overall Growth, Persistent Maldistribution

Primary Care Physicians per 10,000 Population by Persistent Health Professional Shortage Area (PHPSA) Status, North Carolina, 1979 to 2010



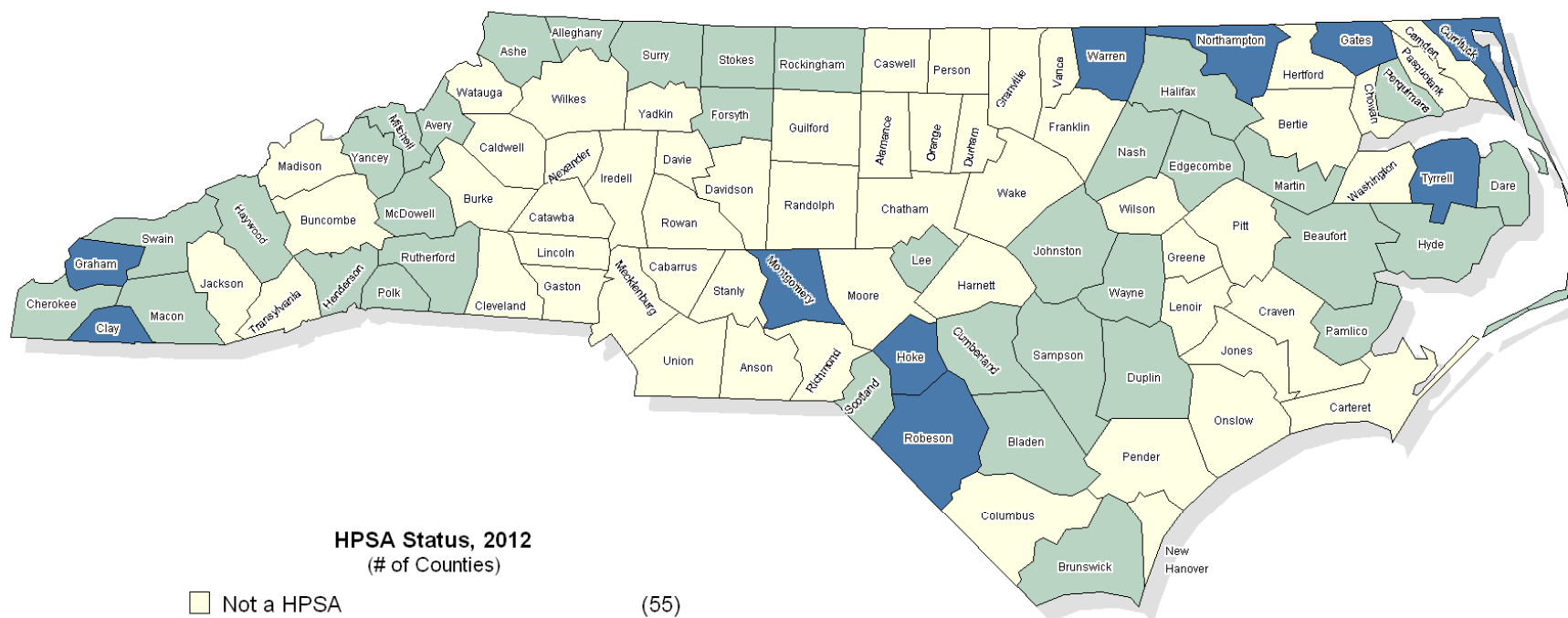
**Notes:** Figures include all active, instate, nonfederal, non-resident-in-training physicians licensed as of October 31st of the respective year. Primary care physicians include those indicating a primary specialty of family practice, general practice, internal medicine, Ob/Gyn or pediatrics. Persistent HPSAs are those designated as HPSAs by HRSA from 1999 through 2005, or in 6 of the last 7 releases of HPSA definitions.

Sources: North Carolina Health Professions Data System, 1979 to 2010; HRSA, Bureau of Health Professions; Area Resource File; US Census Bureau; North Carolina Office of State Planning. Figures include all licensed, active, instate, non-federal, non-resident-in-training physicians.



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## Primary Care Health Professional Shortage Areas (HPSAs) North Carolina, 2012



Source: Bureau of Health Professions, Shortage Designation Branch, HRSA, August 2012.

Produced by the North Carolina Rural Health Research and Policy Analysis Center, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill.



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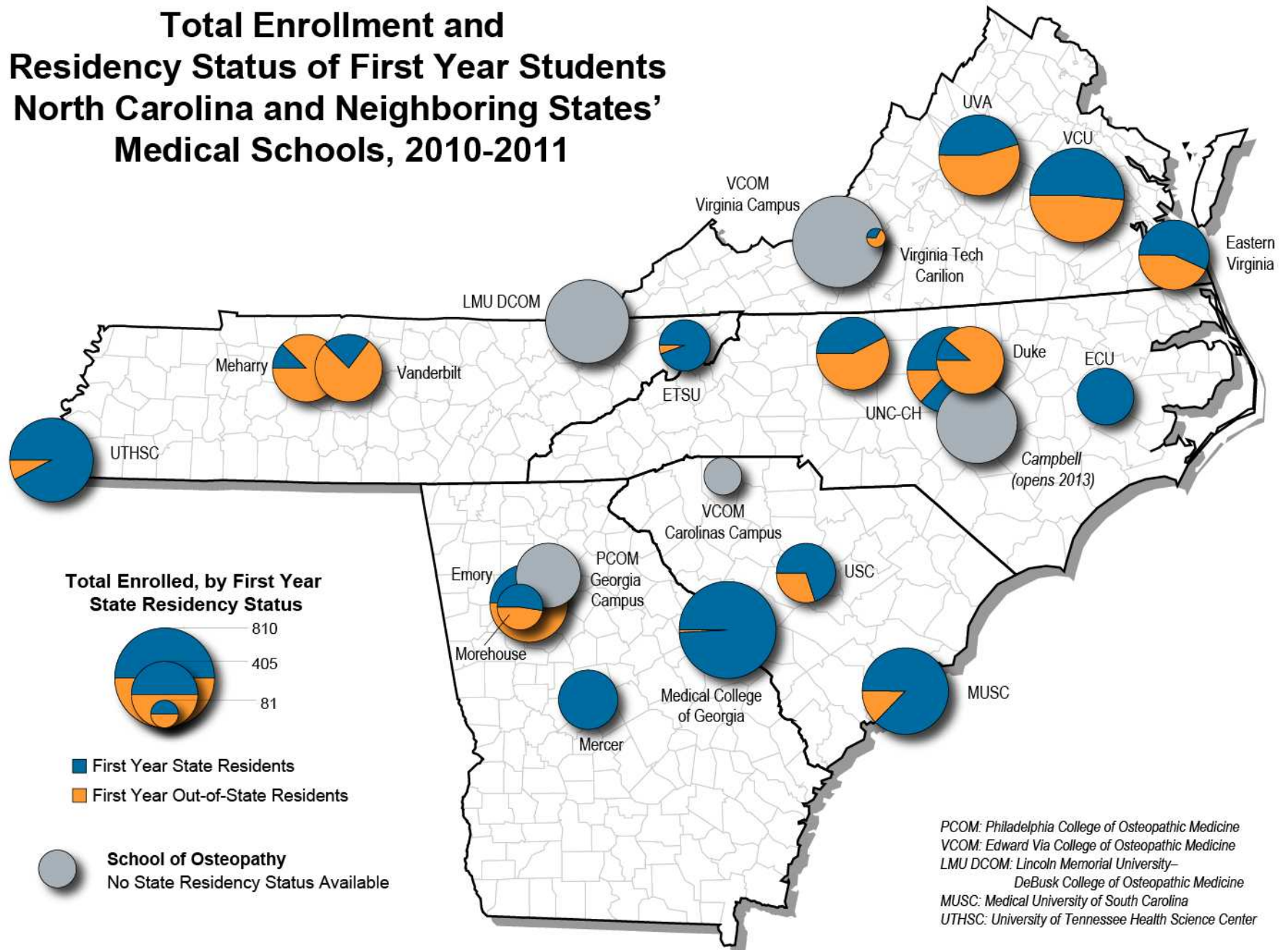
# **Where do doctors in North Carolina come from?**

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# Total Enrollment and Residency Status of First Year Students North Carolina and Neighboring States' Medical Schools, 2010-2011



Source: Campbell University, 2012; Barzansky B, Etzel SI. 2011. Medical Schools in the United States, 2010-2011. JAMA. 306(9): 1007-1014. Accessed 10/8/12.

Produced by the North Carolina Health Professions Data System, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill.

# Post Graduate Residency Programs: AKA “Teaching Hospitals”

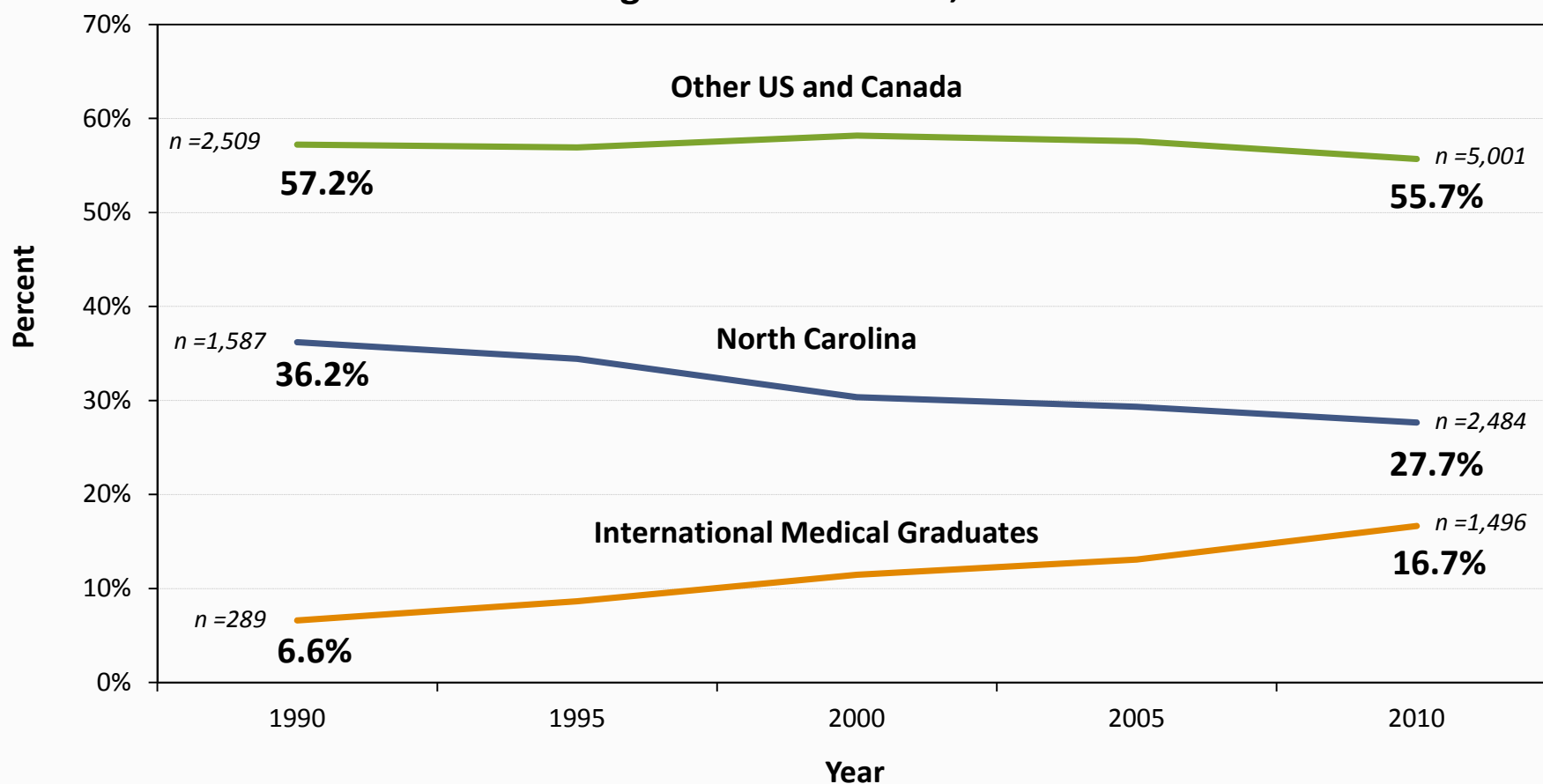
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- 10 programs in North Carolina.  
2,681 residents in training
  - UNC Hospitals 714
  - Duke Hospitals 709
  - Wake Forest Baptist 506
  - ECU Pitt County 294
  - Charlotte AHEC 254
  - Other AHECs 204
- Nationally 8,967 programs with 111,600 Trainees
  - 65% US Grads, 27% IMGs, 7% Dos



# North Carolina's Physicians Come from Outside the State

Medical School Location of Primary Care Physicians  
Practicing in North Carolina, 1990-2010



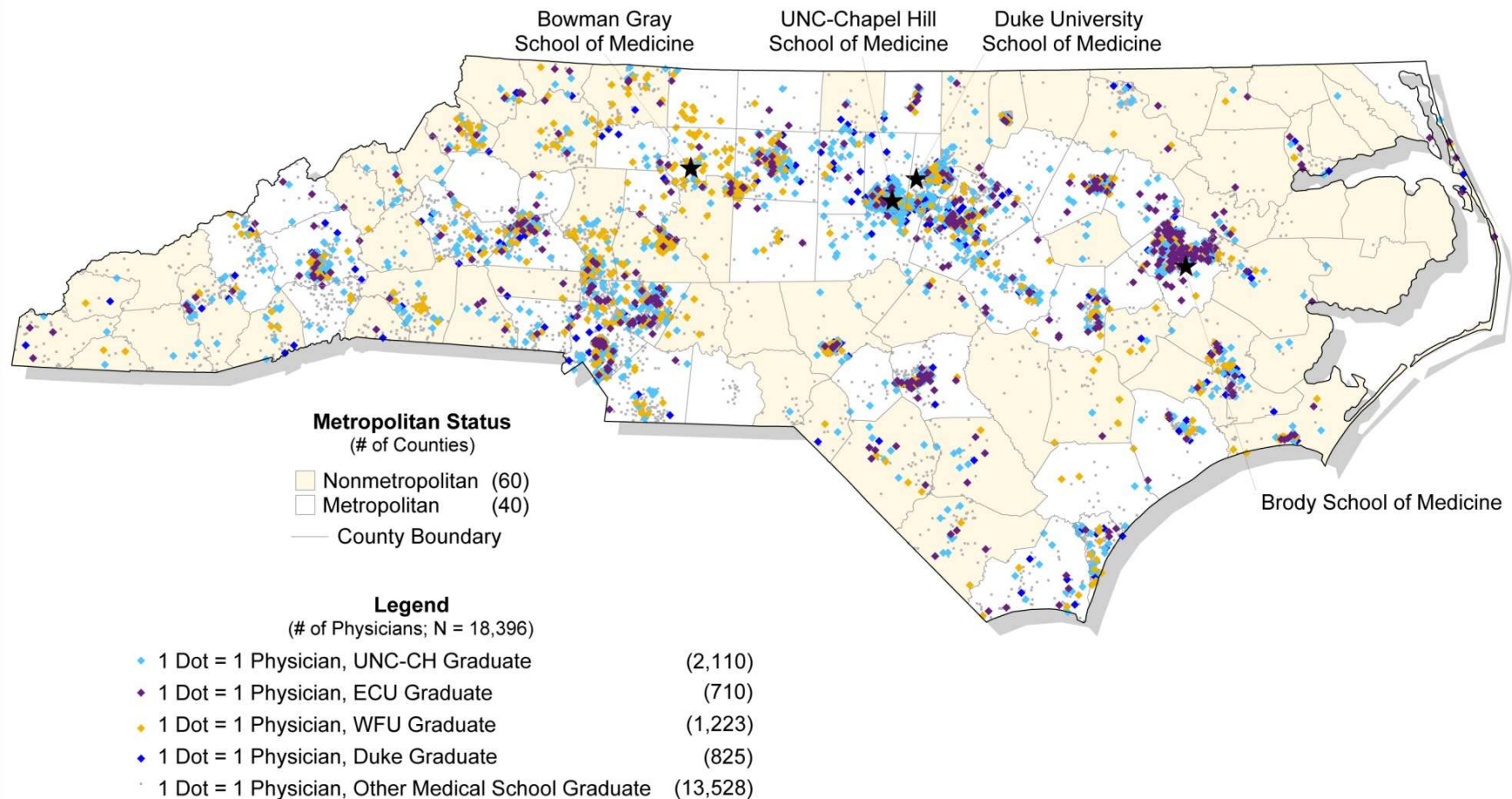
Sources: North Carolina Health Professions Data System with data derived from the North Carolina Medical Board, 1990 to 2010;  
Figures include all licensed, active, instate, non-federal, non-resident-in-training physicians.



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## Distribution of Physicians Active in 2006 Who Graduated from a North Carolina Medical School



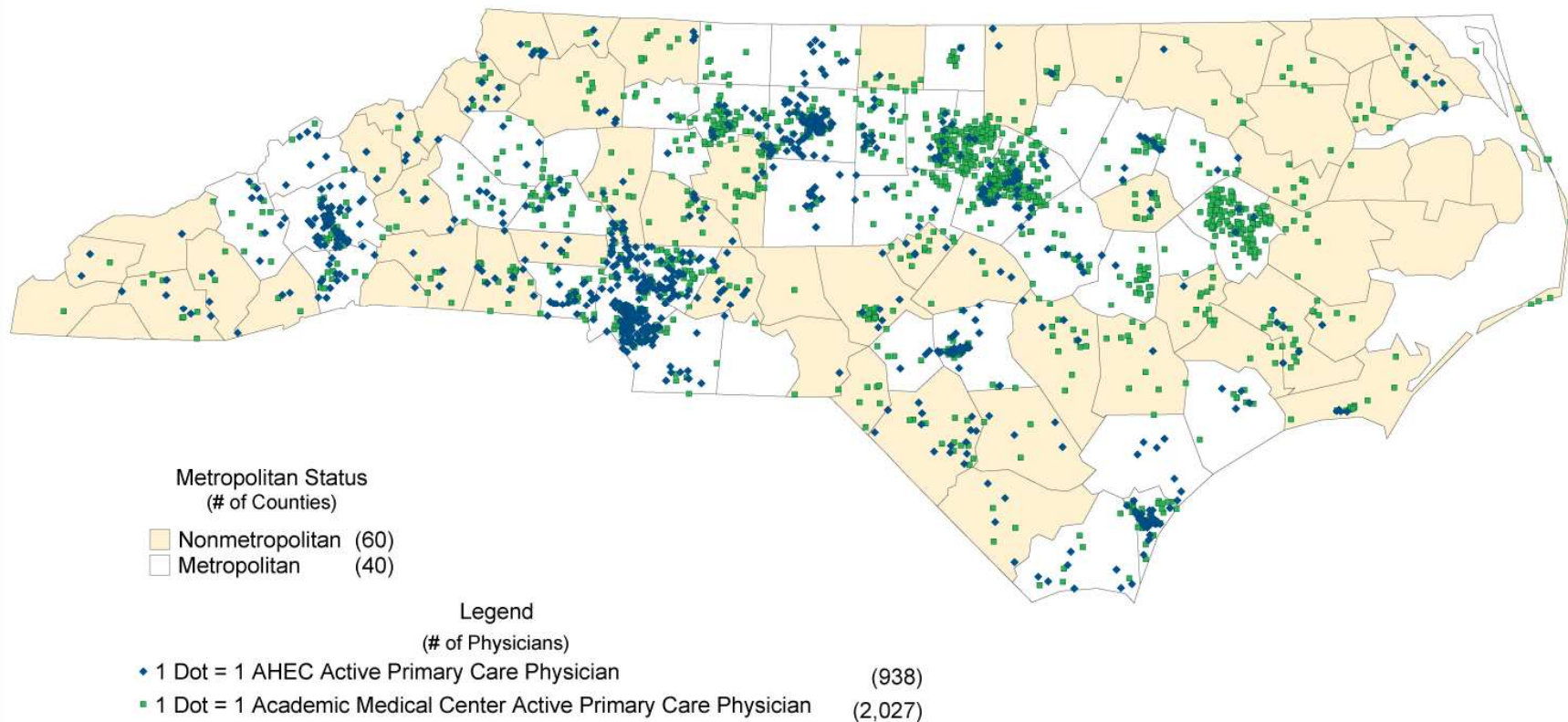
Source: NC Health Professions Data System with data derived from the NC Medical Board, 2006; AMA Masterfile, 2005; US Census Bureau, 2006.

Notes: Data are for active, in-state, non-federal, non-resident-in-training physicians who were licensed as of October 2006. Training data were missing for 55 physicians. Dots are scattered randomly within the zip code area (ZCTA). Different colored dots may overlap. One dot represents one physician.

Produced by: North Carolina Health Professions Data System, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill.



# **Distribution of Active Primary Care Physicians Who Graduated from a North Carolina Residency Program AHEC and Academic Medical Center Programs, North Carolina, 2006**



Produced by: North Carolina Health Professions Data System,

Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill.

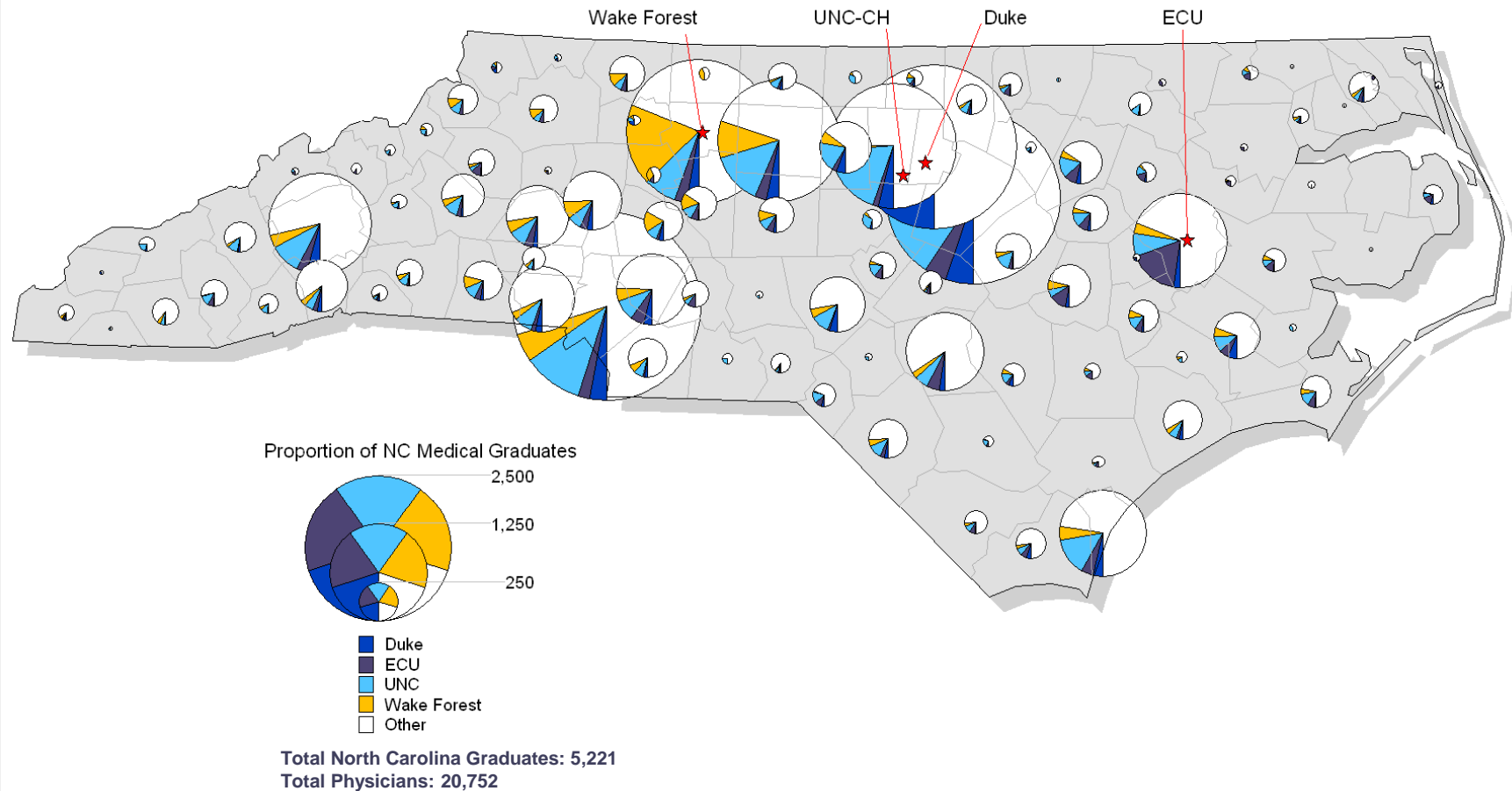
Source: NC Health Professions Data System; NC Area Health Education Centers Program, 2006; US Census Bureau, 2007.

Data are for active, in-state, non-federal, non-resident-in-training physicians indicating primary care specialties of FP, GP, IM, Ob/Gyn or Pediatrics, who were licensed as of October 2006 with residency graduation dates from 1972 and later. Internship data were used if residency data were missing.

\*Note: Core Based Statistical Areas are current as of the December 2006 update. Nonmetropolitan counties include micropolitan and counties outside of CBSAs.



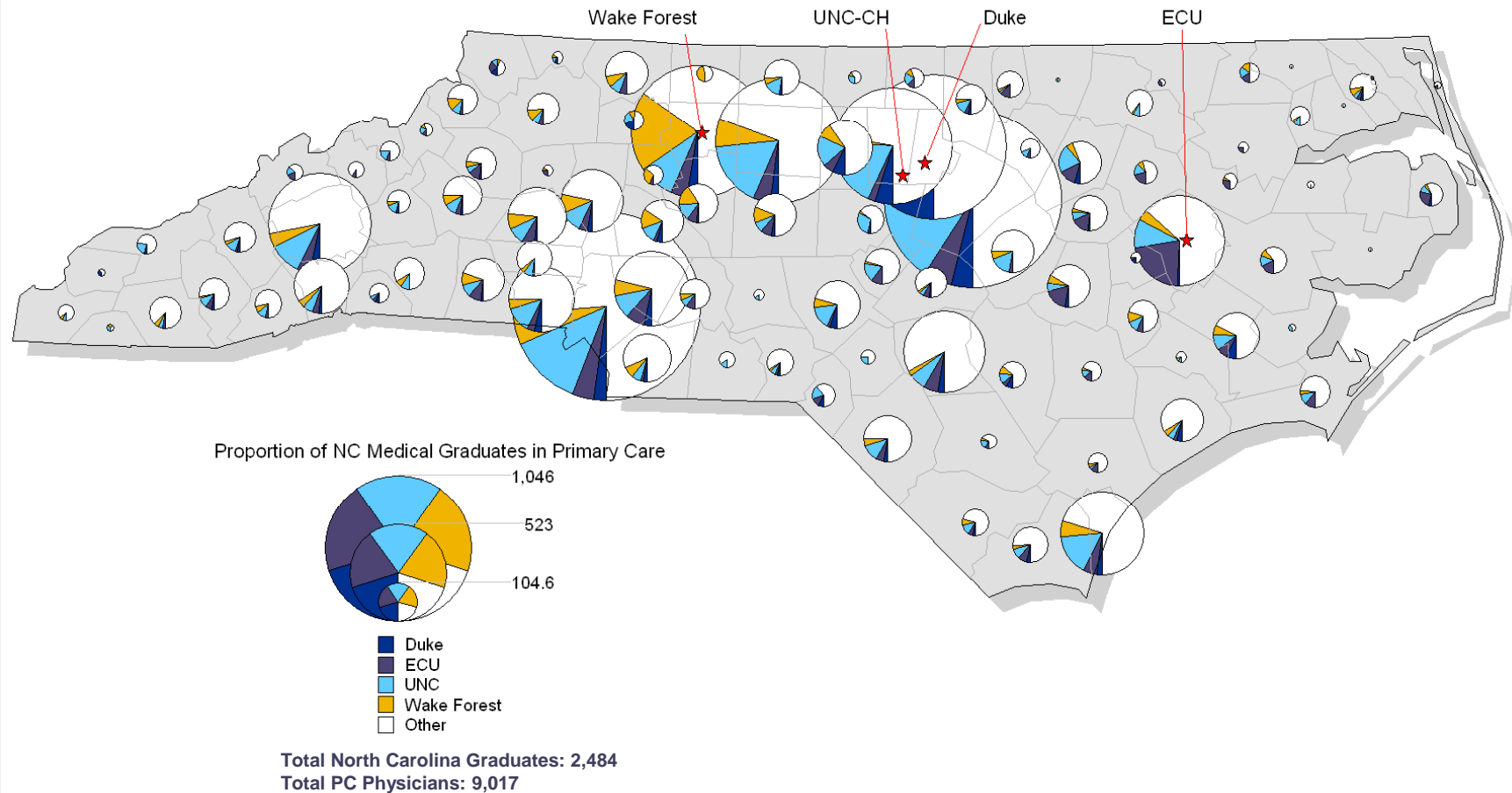
## Percent of All Active Physicians\* in 2010 who Graduated from a School of Medicine in North Carolina



Source: North Carolina Health Professions Data System, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill, with data derived from the North Carolina Medical Board, 2010.

\*Counts include active, instate, nonfederal, non-resident-in-training MDs and DOs currently practicing in North Carolina who graduated from ECU, Duke, UNC-CH or Wake Forest University Schools of Medicine. Graduates from schools outside of North Carolina are counted as "other."

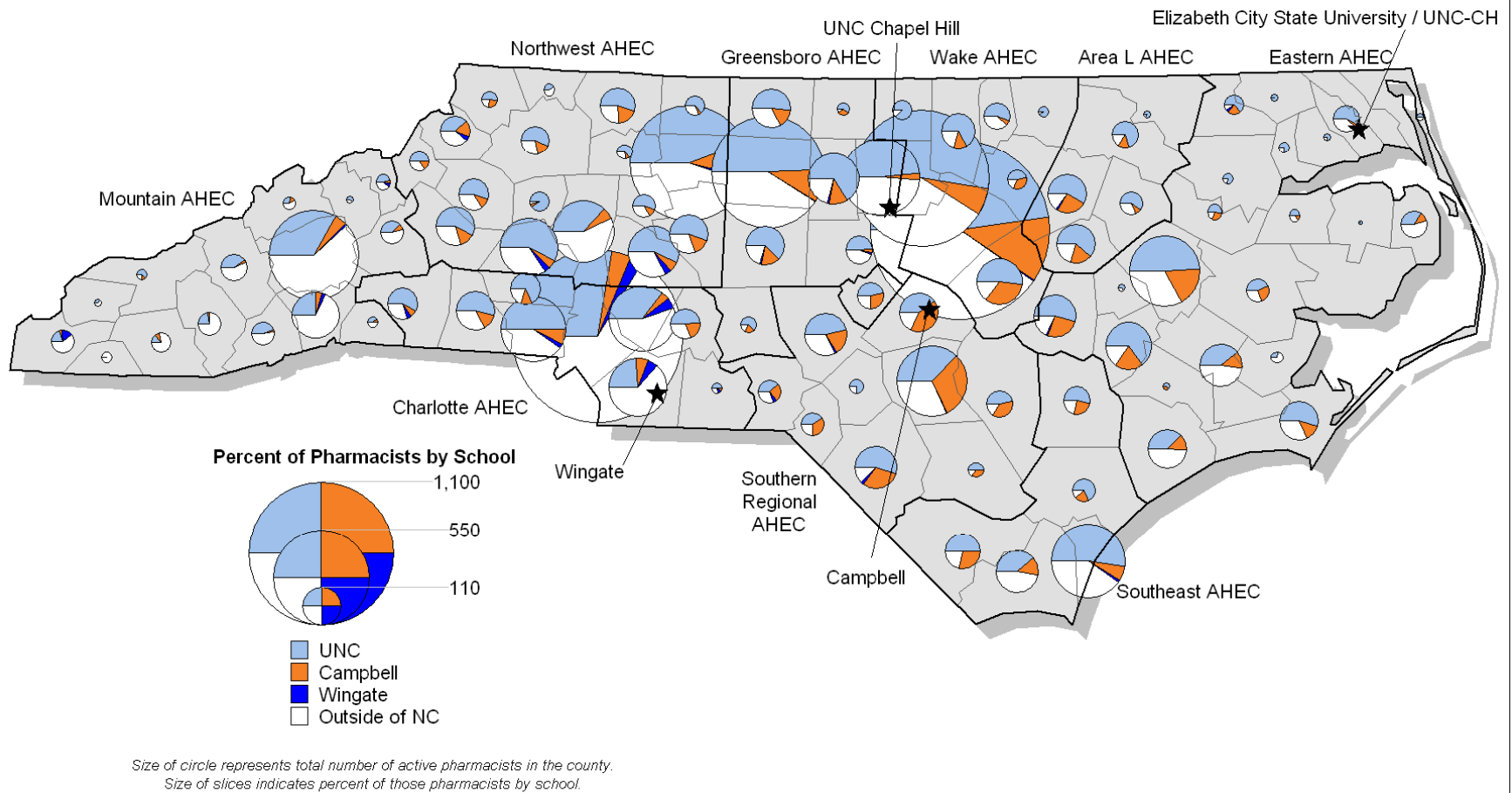
## Percent of All Active Primary Care Physicians\* in 2010 who Graduated from a School of Medicine in North Carolina



Source: North Carolina Health Professions Data System, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill, with data derived from the North Carolina Medical Board, 2010.

\*Counts include active, instate, nonfederal, non-resident-in-training MDs and DOs currently practicing in North Carolina who graduated from ECU, Duke, UNC-CH or Wake Forest University Schools of Medicine. Graduates from schools outside of North Carolina are counted as "other." Primary care physicians include physicians indicating a primary specialty of family practice, general practice, internal medicine, ob-gyn or pediatrics.

## Percent of Active Pharmacists in 2008 Graduating from a School of Pharmacy in North Carolina



\*Pharmacists included are active or have unknown activity status.

Source: North Carolina Health Professions Data System, with data derived from the North Carolina Board of Pharmacy, 2008.

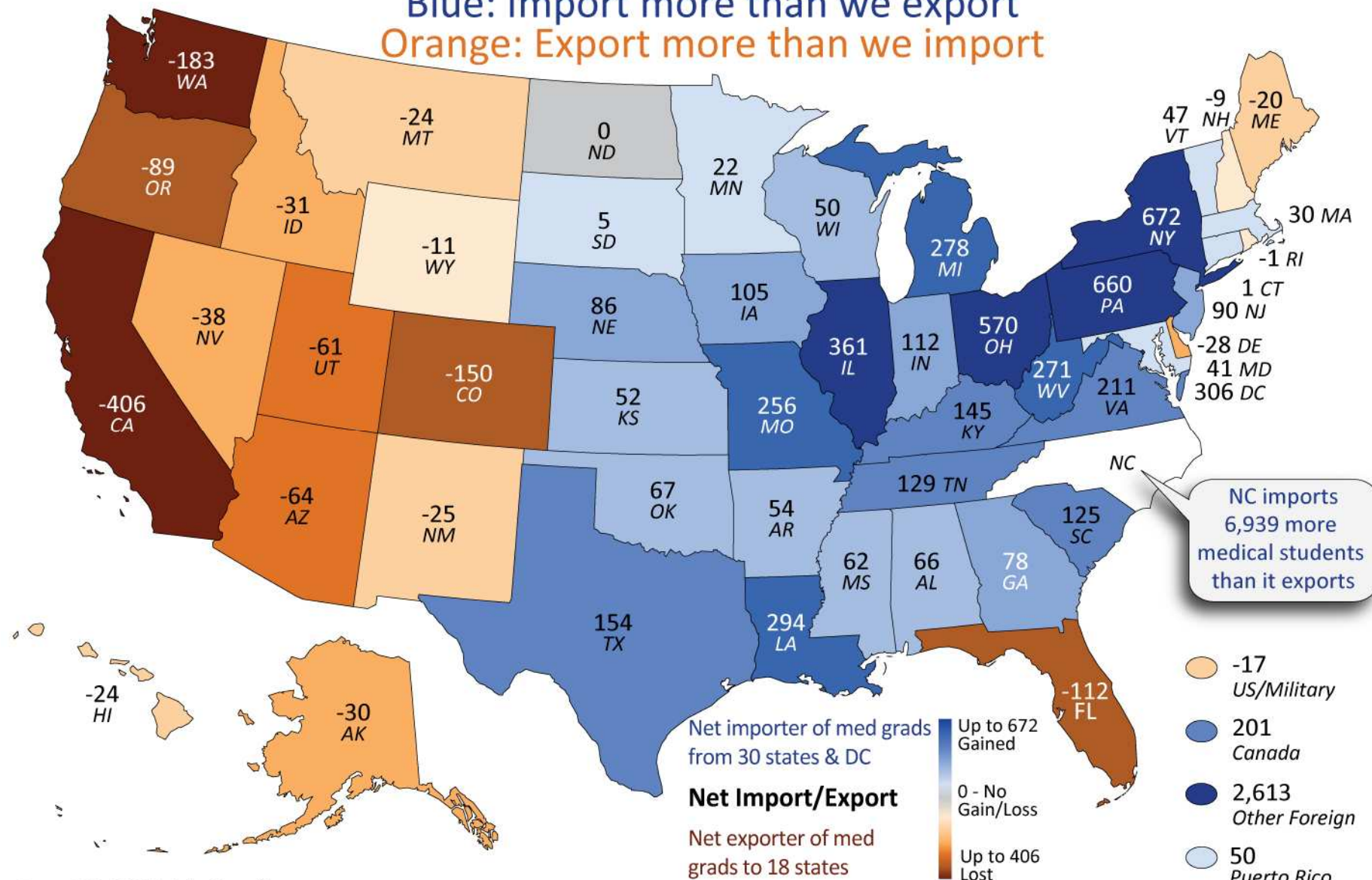
Produced by: North Carolina Health Professions Data System, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill.



# NC's Trade Surplus/Deficit: Medical Students

Blue: Import more than we export

Orange: Export more than we import



Data Source: AMA 2009 Physician Masterfile.

Notes: Includes only clinically active, non-federal, non-resident in training, non-locum tenens physicians. One physician practicing in North Carolina was missing medical school state.

Produced by: North Carolina Health Professions Data System, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill.

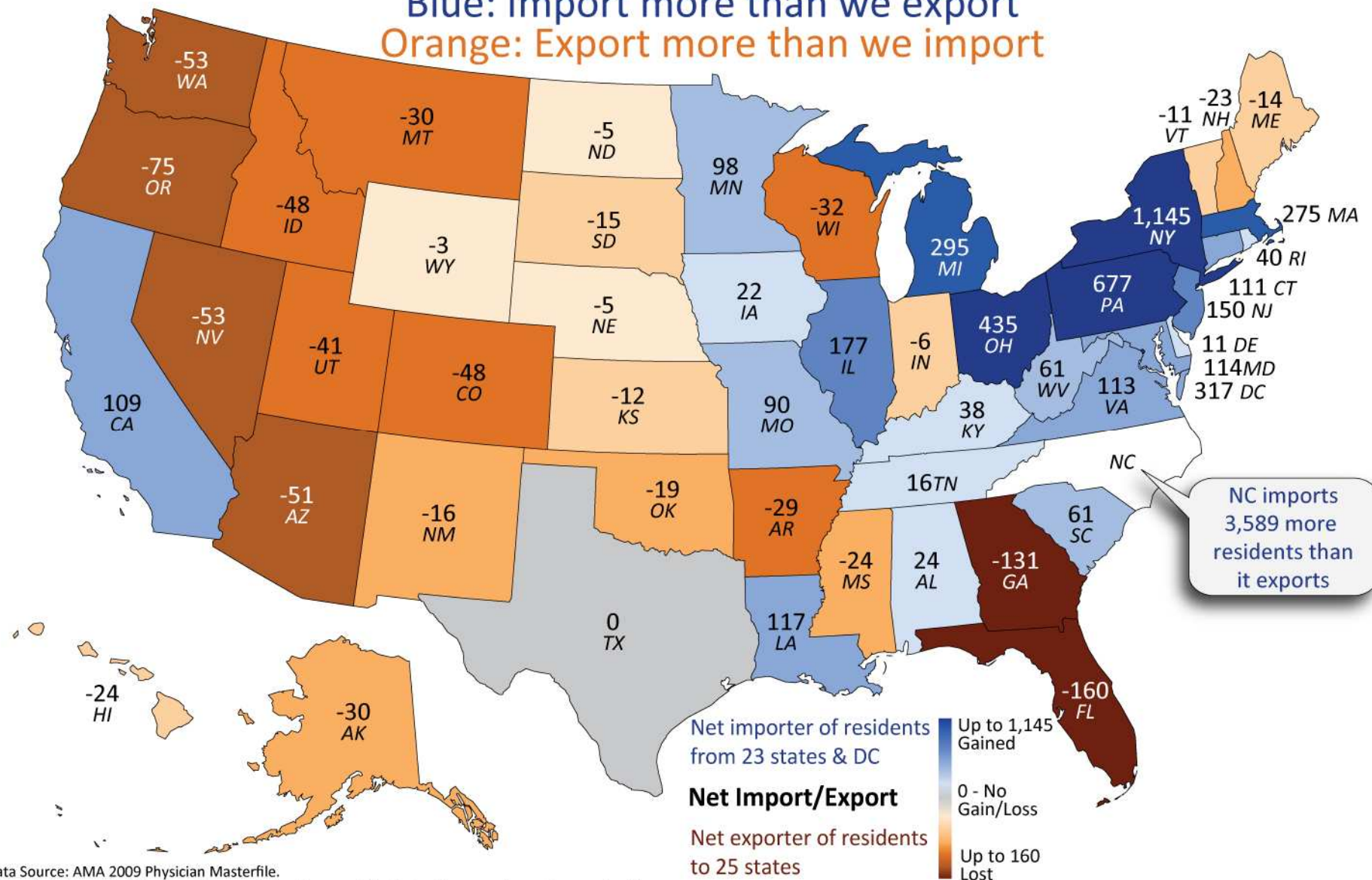


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# NC's Trade Surplus/Deficit: Resident Physicians

Blue: Import more than we export

Orange: Export more than we import



Data Source: AMA 2009 Physician Masterfile.

Notes: Includes only clinically active, non-federal, non-resident in training, non-locum tenens physicians.

Three physicians were missing practice state; 570 physicians practicing in North Carolina were missing residency state.

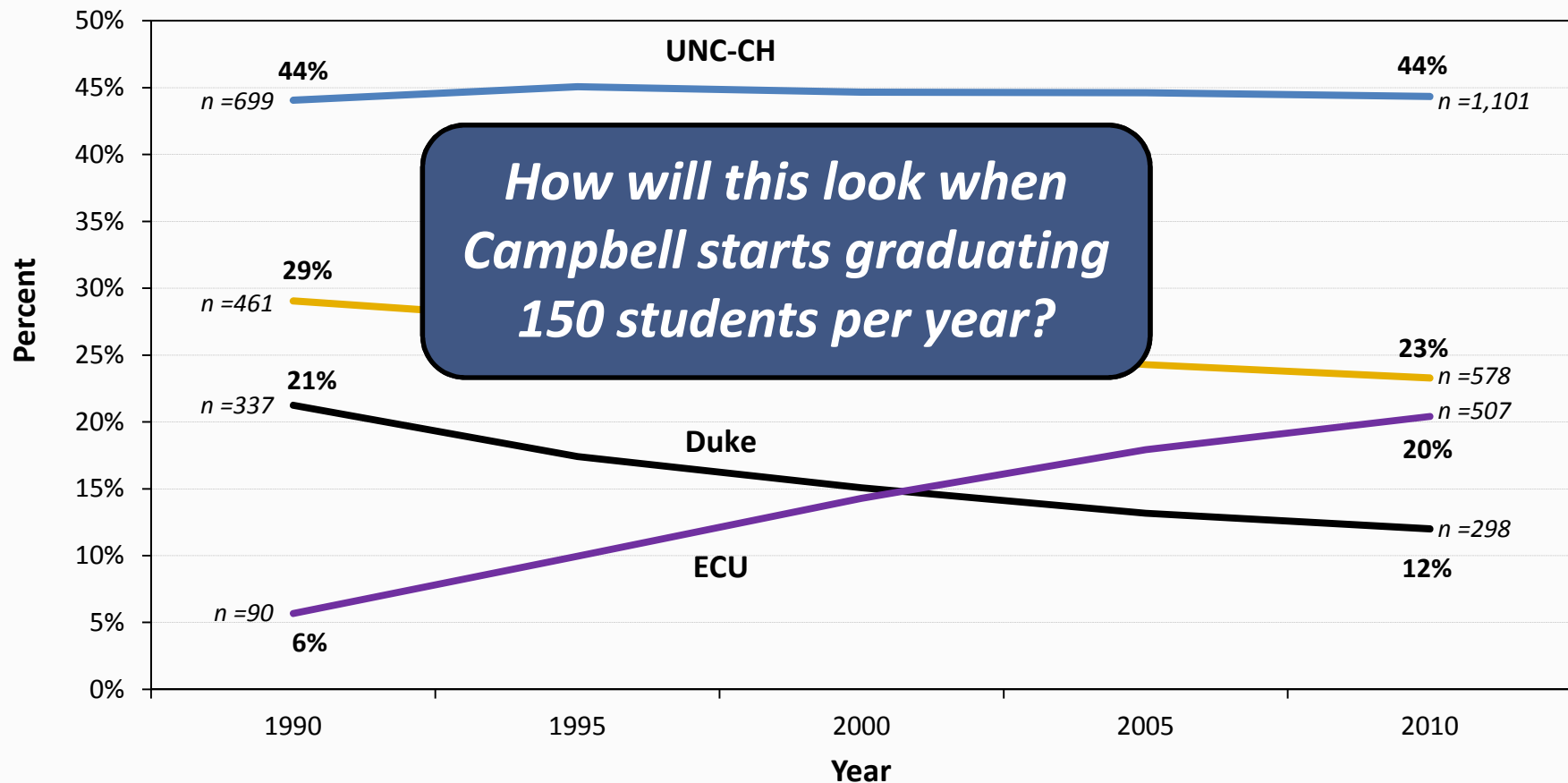
Produced by: North Carolina Health Professions Data System, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill.



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# Contribution of NC Medical Schools to NC Supply

## North Carolina Medical School for Primary Care Physicians Practicing in North Carolina, 1990-2010



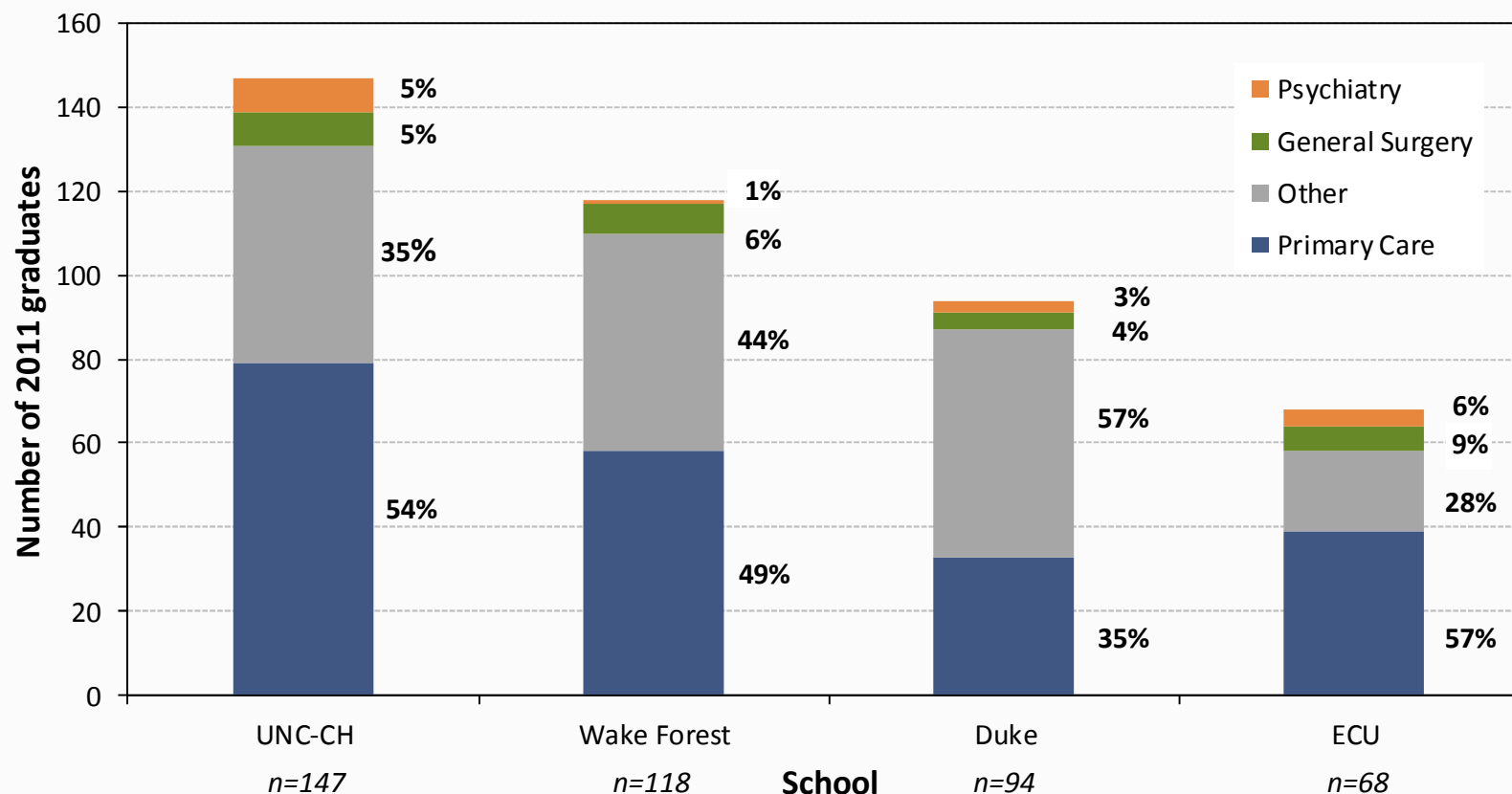
Sources: North Carolina Health Professions Data System with data derived from the North Carolina Medical Board, 1990 to 2010;  
Figures include all licensed, active, instate, non-federal, non-resident-in-training physicians.



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# Graduate Training by Med School Affiliated Hospitals

Class of 2011: Distribution of NC Medical Student Residencies



Prepared by the North Carolina Health Professions Data System and the North Carolina AHEC Program.

Source: Duke Office of Medical Education, UNC-CH Office of Student Affairs, ECU Office of Medical Education, Wake Forest University SOM Office of Student Affairs, Association of American Medical Colleges, and the NC Medical Board.



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# Why Do We Care Where Physicians Trained?

*Because it affects specialty choice,  
practice location and workforce diversity*

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# NC Medical Students: Retention of Graduates in Primary Care After Five Years

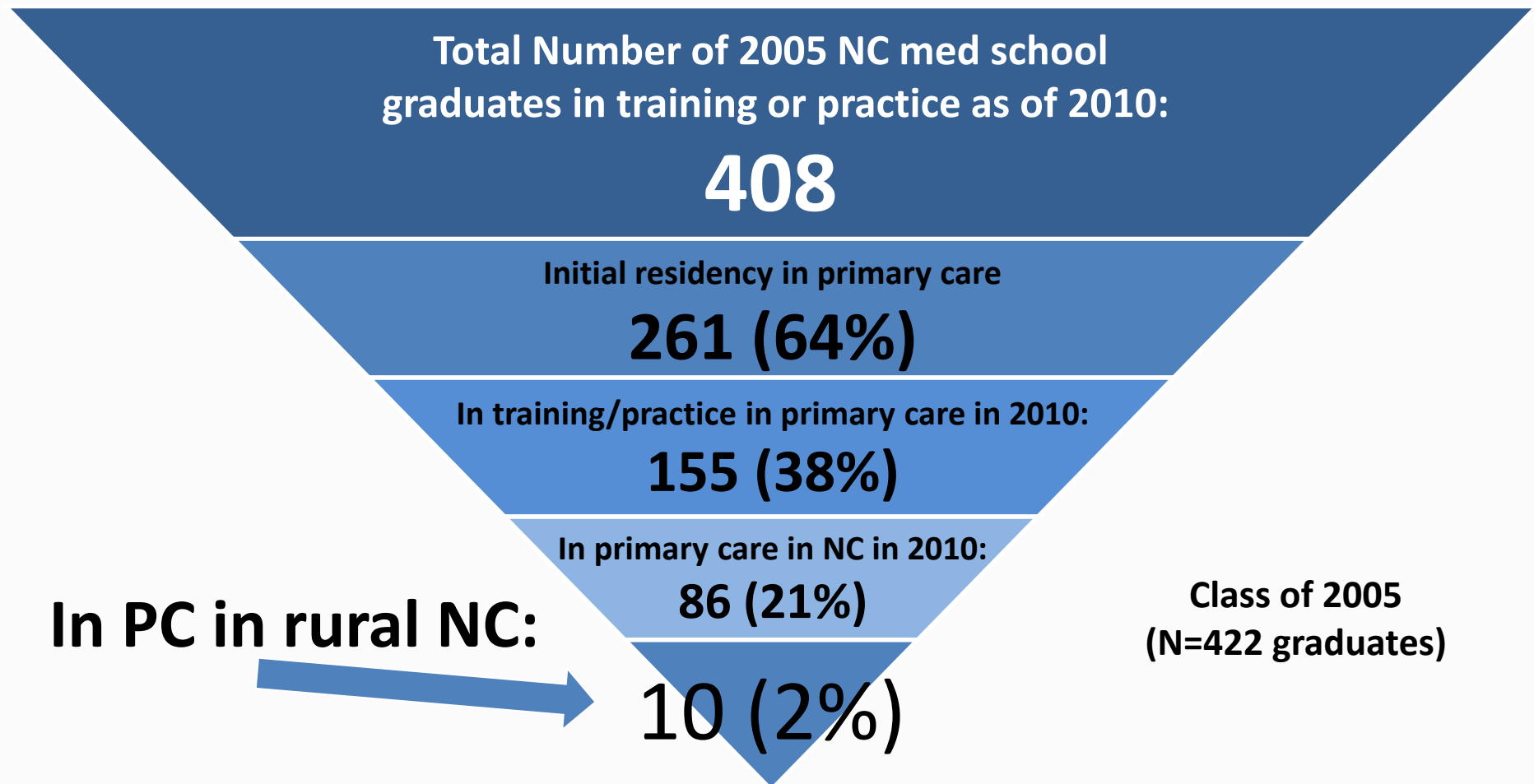
School	2005 Graduates	% Initially Selecting PC Specialty	2010: % in Primary Care (Anywhere in US)	2010: % in Primary Care (in NC)
Duke	78	60%	23%	8%
ECU	73	82%	59%	41%
UNC	152	60%	38%	21%
Wake Forest	105	60%	37%	17%
<b>Total</b>	<b>408</b>	<b>64%</b>	<b>38%</b>	<b>21%</b>

Prepared by the North Carolina Health Professions Data System and the North Carolina AHEC Program.

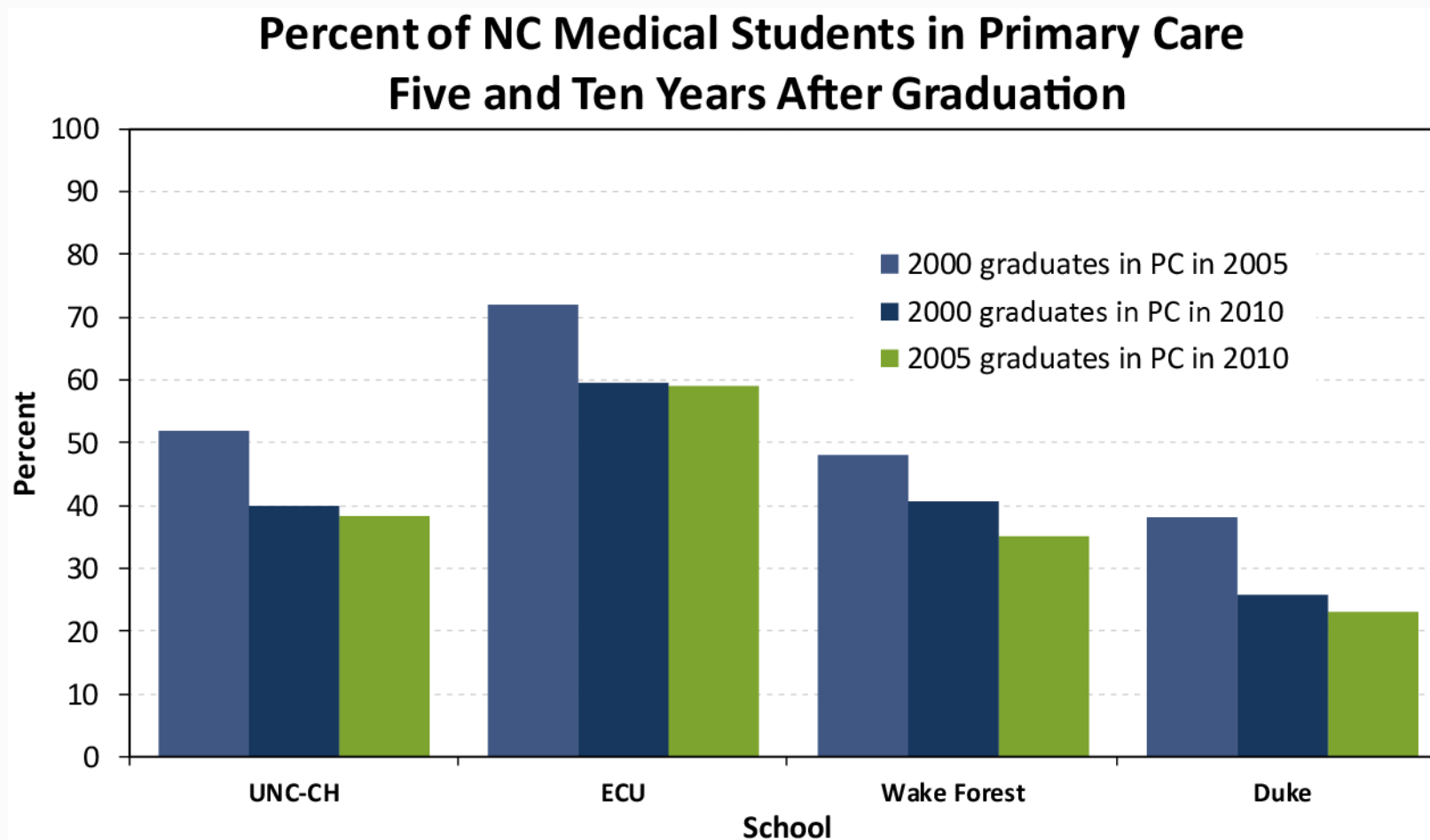
Source: Duke Office of Medical Education, UNC-CH Office of Student Affairs, ECU Office of Medical Education, Wake Forest University SOM Office of Student Affairs, Association of American Medical Colleges, and the NC Medical Board.

# Retention in North Carolina of Class of 2005 in 2010: Primary Care

## NC Medical Students: Retention in Primary Care in NC's Rural Areas



# Declining Interest in and “Leakage” from Primary Care Over Time



# And Where Physician Completed a Residency Even More Important Predictor of Retention in NC



**AHEC**

➤ **46% of physicians who complete an NC AHEC residency stay in North Carolina to practice**



**Non-AHEC**

*compared to*

➤ **31% of physicians who complete a non-AHEC residency stay in North Carolina to practice**

# AHEC-Trained Residents More Likely to Practice in Rural Areas

Specialty	Residency Type	Practicing in NC, 2011	
		% in Metro Area	% in Nonmetro Area
<b>ALL</b>	AHEC	85%	15%
	Non-AHEC	88%	12%
<b>Primary Care</b>	AHEC	85%	15%
	Non-AHEC	85%	15%
<b>General Surg</b>	AHEC	70%	<b>30%</b>
	Non-AHEC	81%	<b>19%</b>

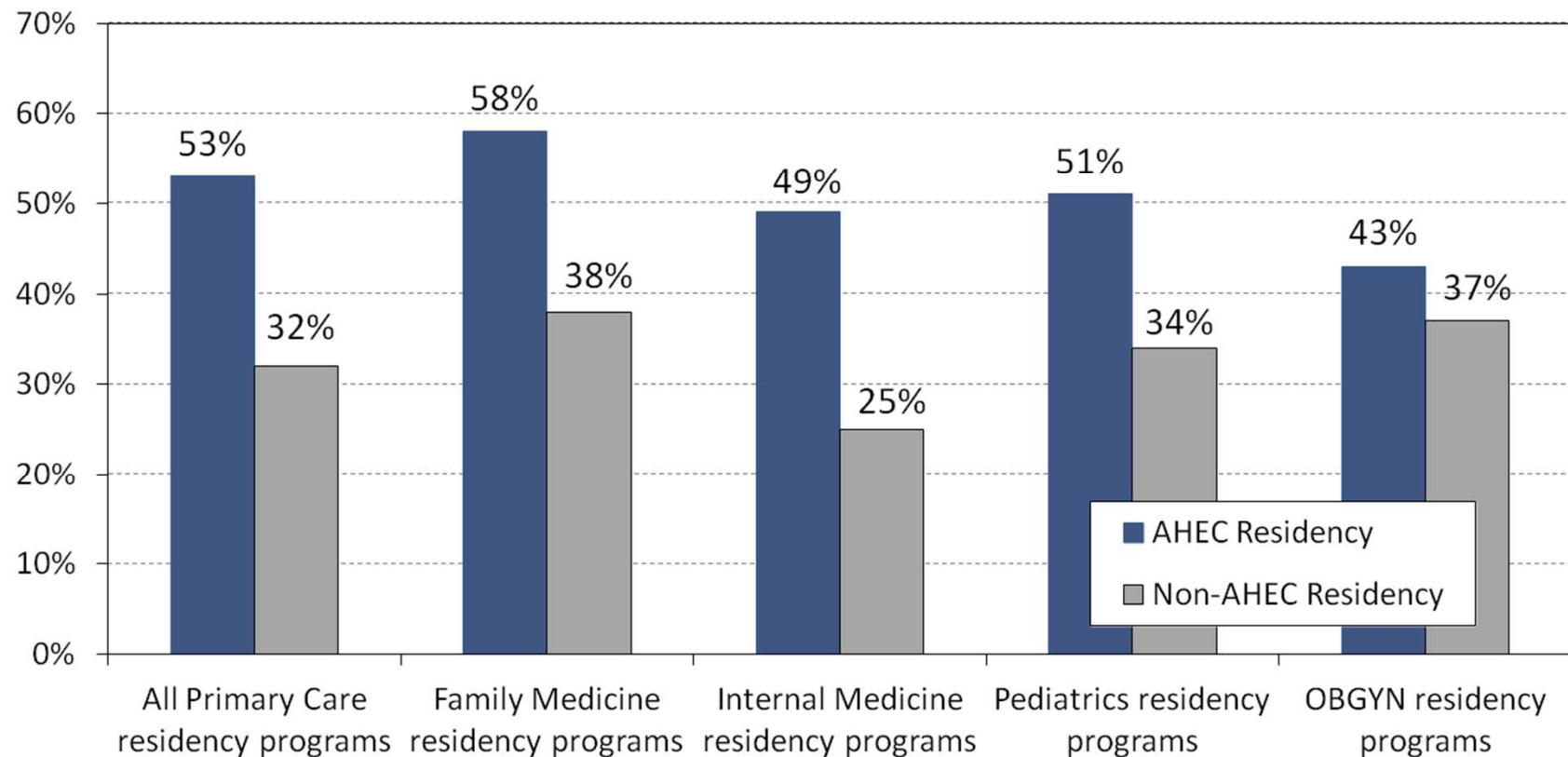
Of the active and practicing physicians who completed a NC AHEC residency, 1,491 (46%) are practicing in NC and 1,739 (54%) are practicing outside of NC.

Of the active and practicing physicians who completed a NC Non-AHEC residency, 6,092 (31%) are practicing in NC and 13,639 (69%) are practicing outside of NC.

Note: Primary Care includes the following specialties: Family Medicine, Internal Medicine, Obstetrics and Gynecology, and Pediatrics.

# And More Likely to Choose Primary Care

**Former North Carolina Residents Practicing in NC by  
Primary Care Residency Specialty, 2011**



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# **But Who Counts as “Primary Care”?**

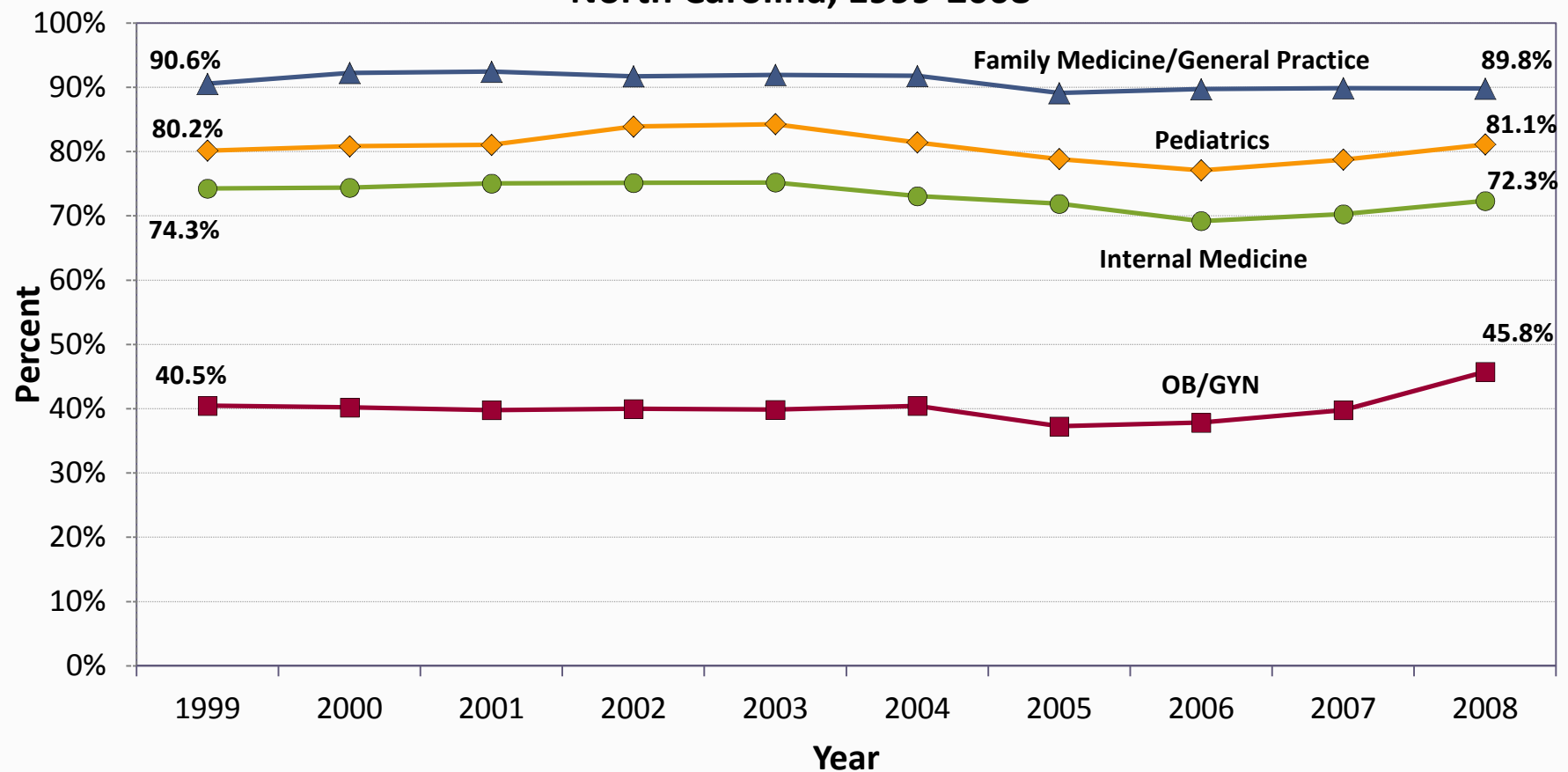
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# Who does Primary Care?

Percentage of Total Clinical Care Hours Spent in Primary Care  
North Carolina, 1999-2008



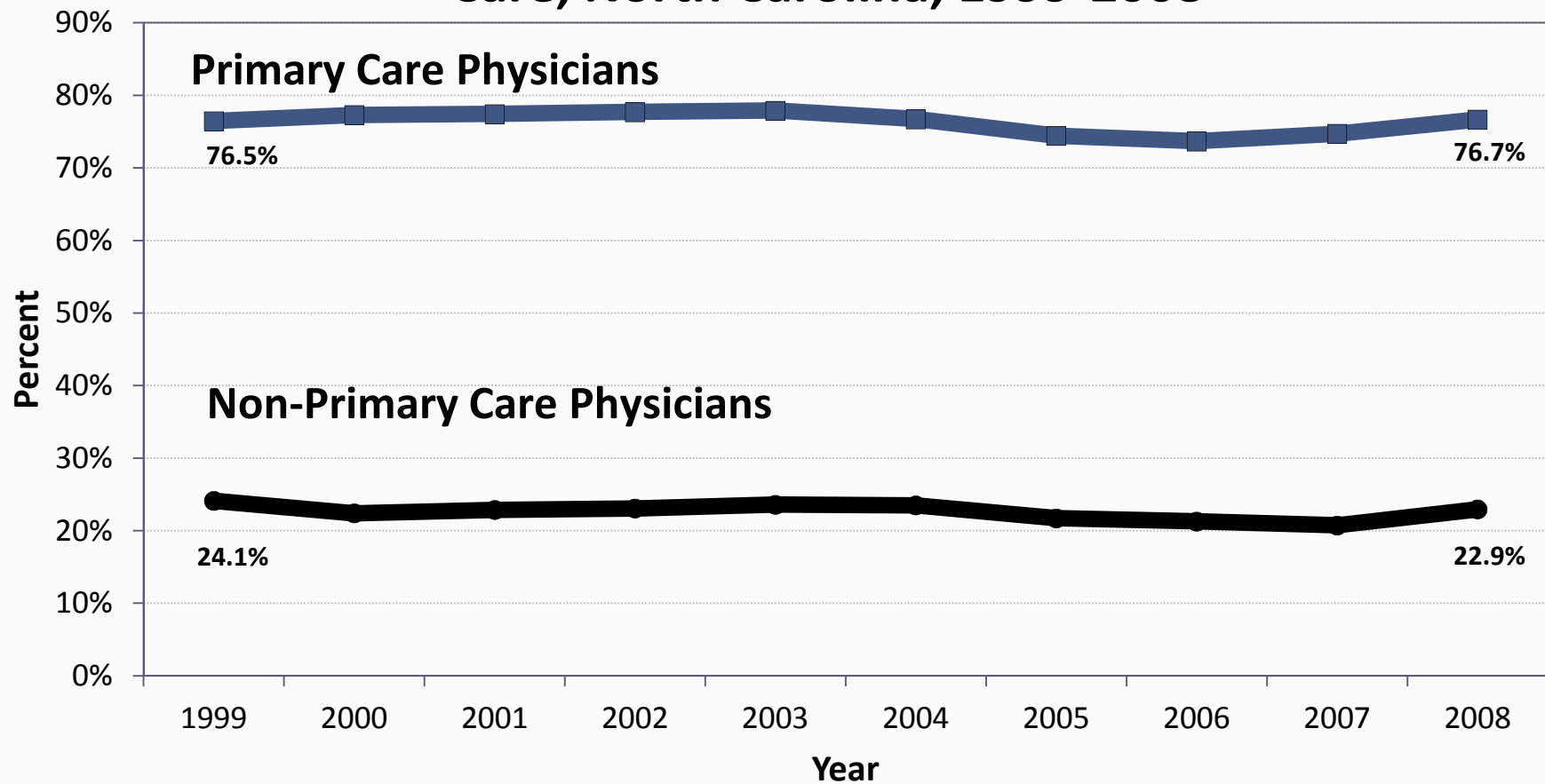
Source: NC Health Professions Data System with data derived from the North Carolina Medical Board. Data are for active, in-state, non-federal, non-resident-in-training physicians licensed by the NC Medical Board as of October of each year. Data are self-reported at time of initial licensure and subsequent renewal.



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# But, Specialists Also Provide Primary Care

**Percentage of Clinical Care Hours Spent in Primary  
Care, North Carolina, 1999-2008**



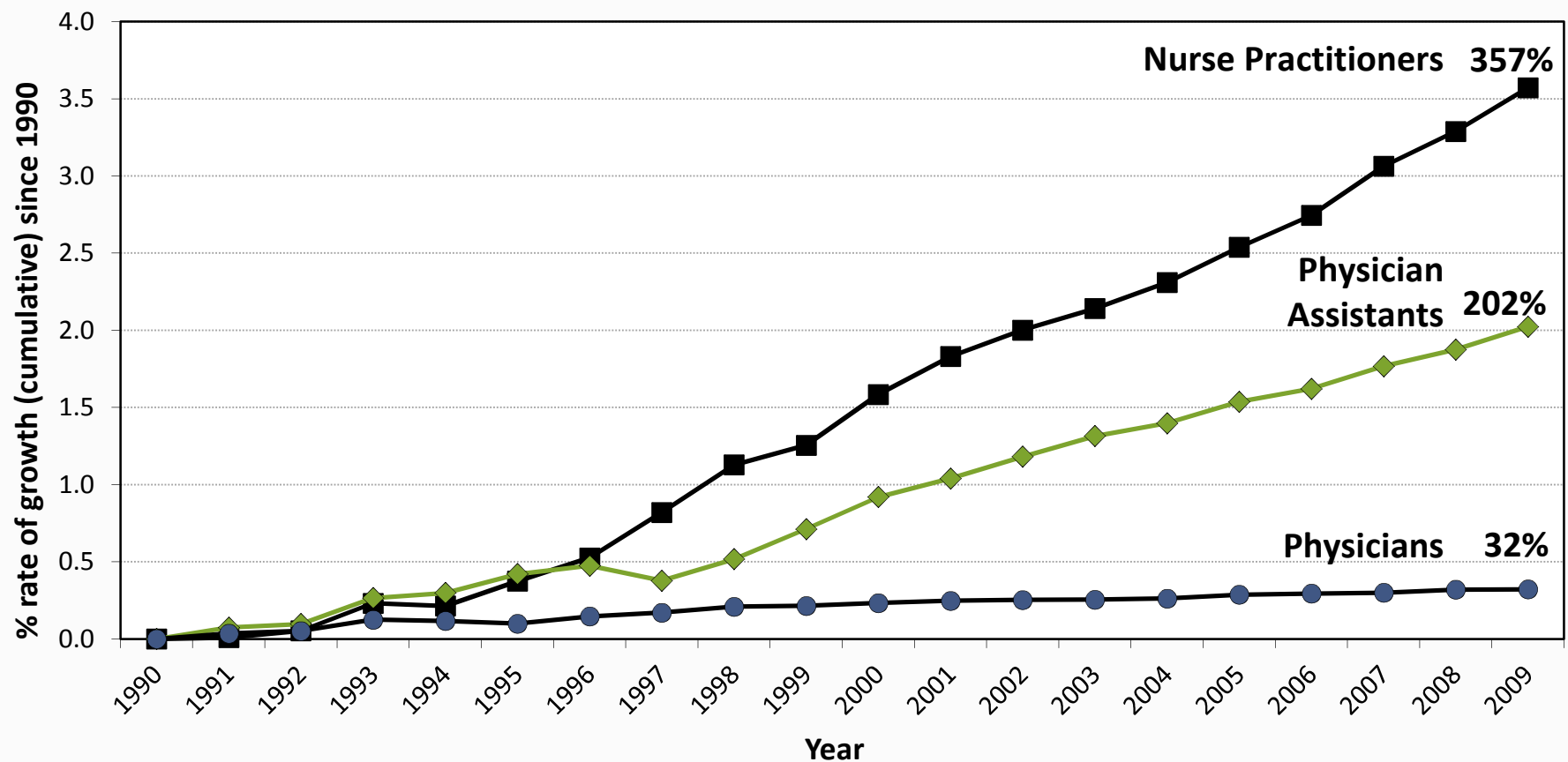
Source: NC Health Professions Data System with data derived from the North Carolina Medical Board. Data are for active, in-state, non-federal, non-resident-in-training physicians licensed by the NC Medical Board as of October of each year. Data are self-reported at time of initial licensure and subsequent renewal.



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# Are NPs and PAs the Answer to Physician Supply Stress?

Percentage Growth Since 1990 of Physicians, PAs and NPs per 10,000 Population, North Carolina, 1991-2009



Source: NC Health Professions Data System with data derived from the North Carolina Medical Board. Data are for active, in-state, non-federal, non-resident-in-training physicians licensed by the NC Medical Board as of October of each year. Data are self-reported at time of initial licensure and subsequent renewal.

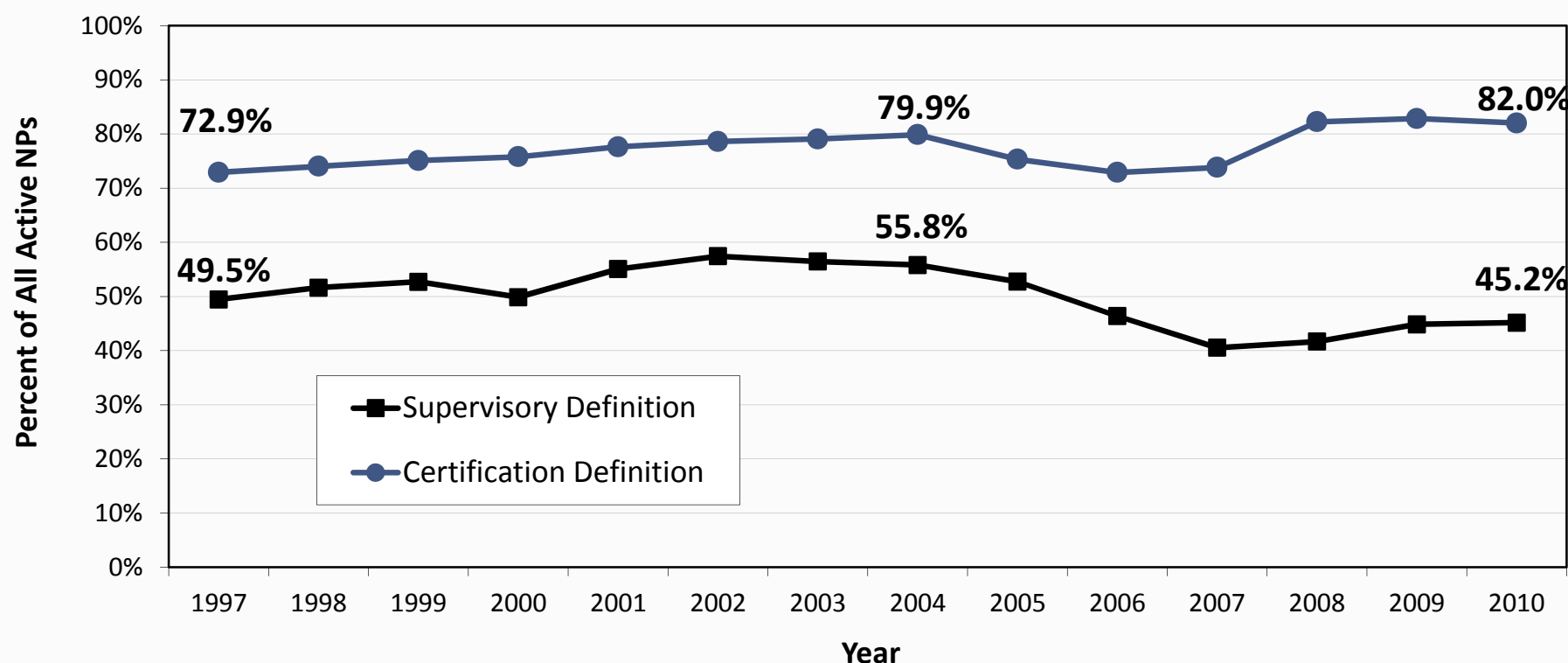


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# How Many NPs are in Primary Care?

## Depends on Definitions

### Defining Primary Care Nurse Practitioner Specialty, NC, 1997-2010: Comparison of Certification and Supervisory Definitions



**Notes:** Data for primary specialty ("supervisory") include active, in-state NPs indicating a primary specialty of family practice, general practice, internal medicine, Ob/Gyn, or pediatrics, who were licensed in NC as of October 31 of the respective year. Data for physician extender type ("certification") include active-instate NPs indicating a physician extender type of family nurse practitioner, adult nurse practitioner, ob/gyn nurse or pediatric nurse practitioner who were licensed as of October 31 of the respective year.

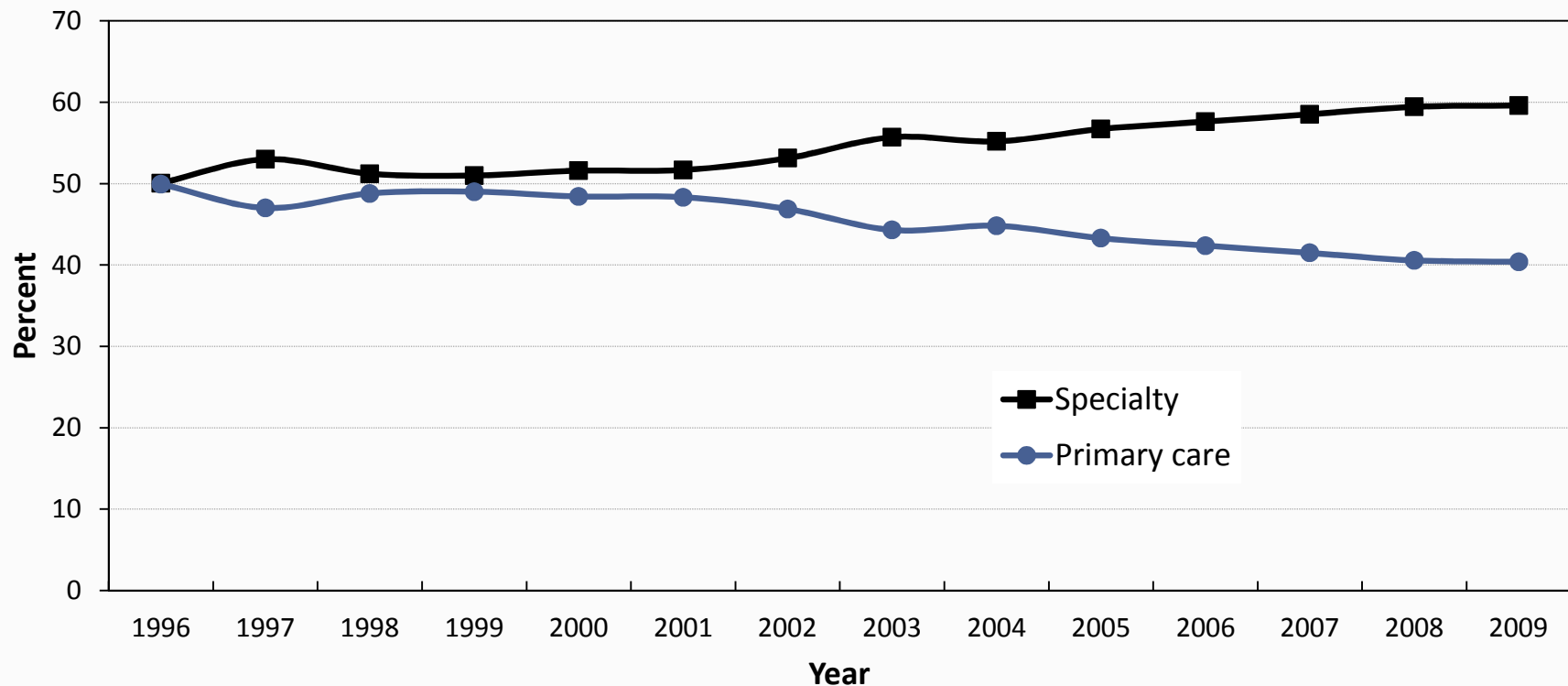
**Source:** North Carolina Health Professions Data System, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill, with data derived from the NC Medical Board.



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# And PAs are Increasingly Specializing

**Physician Assistants in Specialty vs. Primary Care,  
North Carolina, 1996-2009**

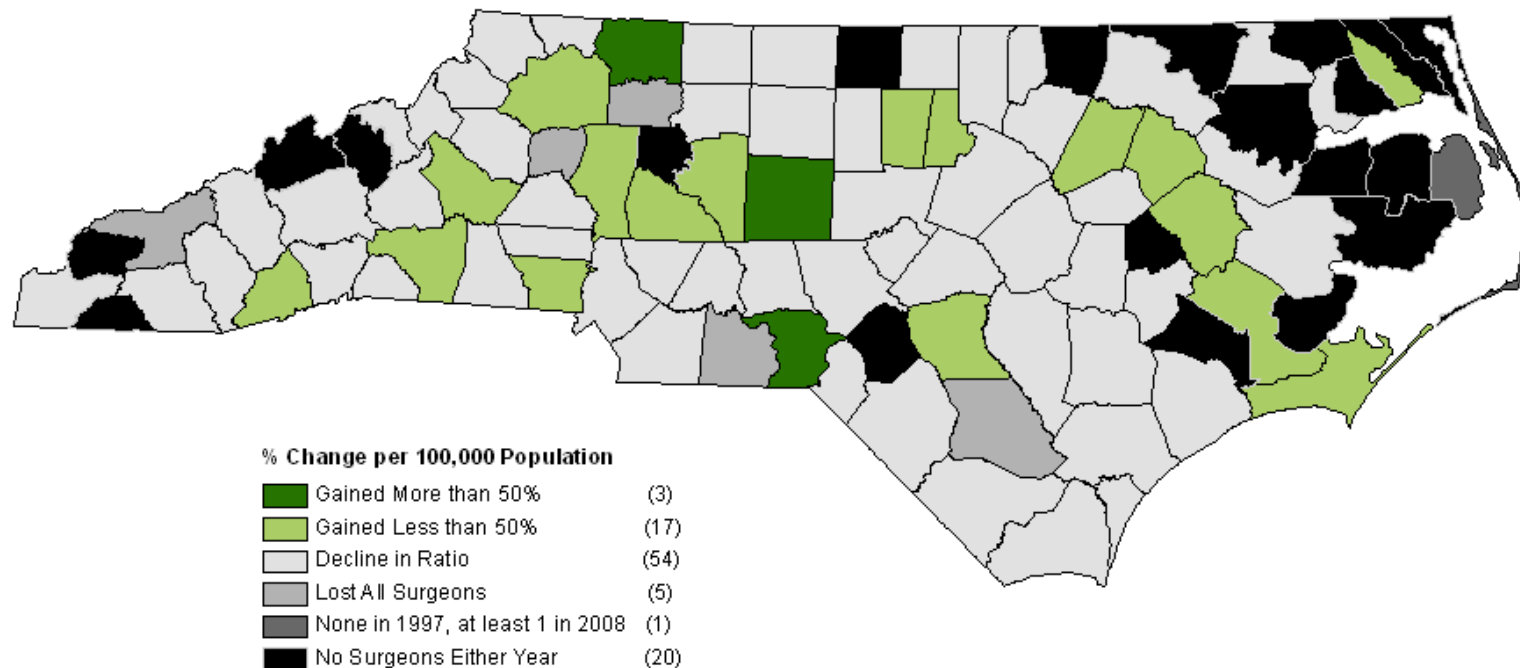


Notes: Data include active, instate physician assistants licensed in NC as of October 31 of the respective year.  
Primary care includes family practice, general practice, internal medicine, Ob/Gyn, or pediatrics.

Source: North Carolina Health Professions Data System, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill, with data derived from the NC Medical Board.

# General Surgery has both supply and distribution issues

Percent Change in Ratio of General Surgeons to Population 1997 - 2008  
North Carolina



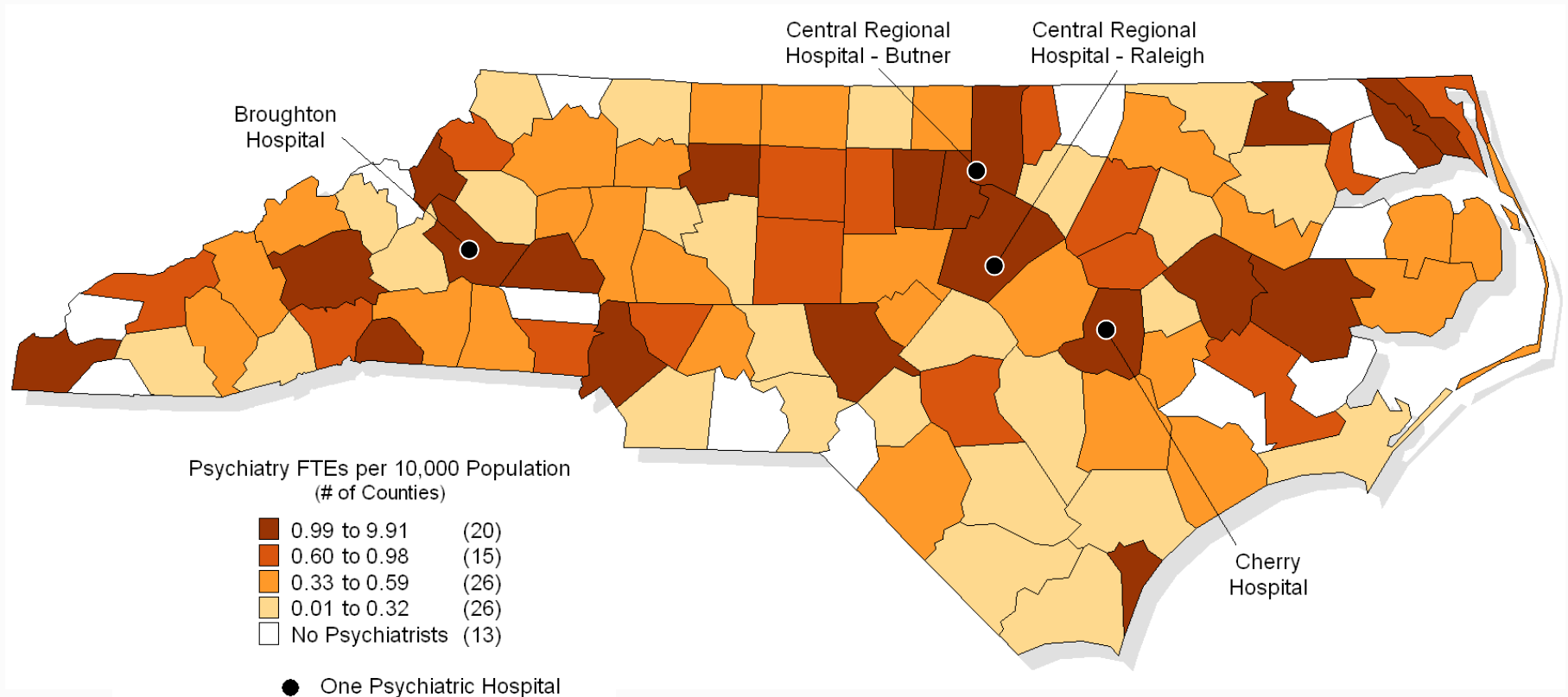
Notes: General Surgery includes Abdominal Surgery, Bariatric Surgery, Critical Care Surgery, General Surgery, Hand Surgery, Maxillofacial Surgery, Oral Surgery, Pediatric Surgery, Oncology Surgery, Traumatic Surgery, Abdominal Organ Transplantation, Vascular Surgery, and Cardiovascular Surgery.

Source: North Carolina Medical Board physician licensure data, 1997 - 2008; and 2010 Area Resource File for population data.

Produced by the Cecil G. Sheps Center for Health Services Research, UNC-CH, August 3, 2010.

# Half of NC's Counties Qualify as *Mental Health Professional Shortage Areas*

## Psychiatrist Full-Time Equivalents per 10,000 Population North Carolina, 2008



**Produced by:** North Carolina Health Professions Data System, Cecil G. 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 North Carolina Medical Board, 2008; LINC, 2010; NC DHHS, MHDDSAS, 2010. **Note:** Psychiatrists include active, instate, nonfederal, non-resident-in-training physicians who indicate a primary specialty of psychiatry, child psychiatry, psychoanalysis, psychosomatic Medicine, addiction/chemical dependency, forensic psychiatry, or geriatric psychiatry, and secondary specialties in psychiatry, child psychiatry and forensic psychiatry.



# Work Harder? More Health Workers are Doing Less

- Of \$2.6 trillion spent nationally on health care, 56% is wages for health workers
- Workforce is LESS productive now than it was 20 years ago...



Kocher and Sahni, "Rethinking Health Care Labor", *NEJM*, October 13, 2011.



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**IF WE NEED MORE PEOPLE, WHAT  
KINDS OF PEOPLE?**



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# Diversity and Workforce Needs

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**In context of emerging workforce shortfalls and maldistribution:**

- Are we adequately accessing a talented pool of workers?
- Is there access to education and upward job mobility?

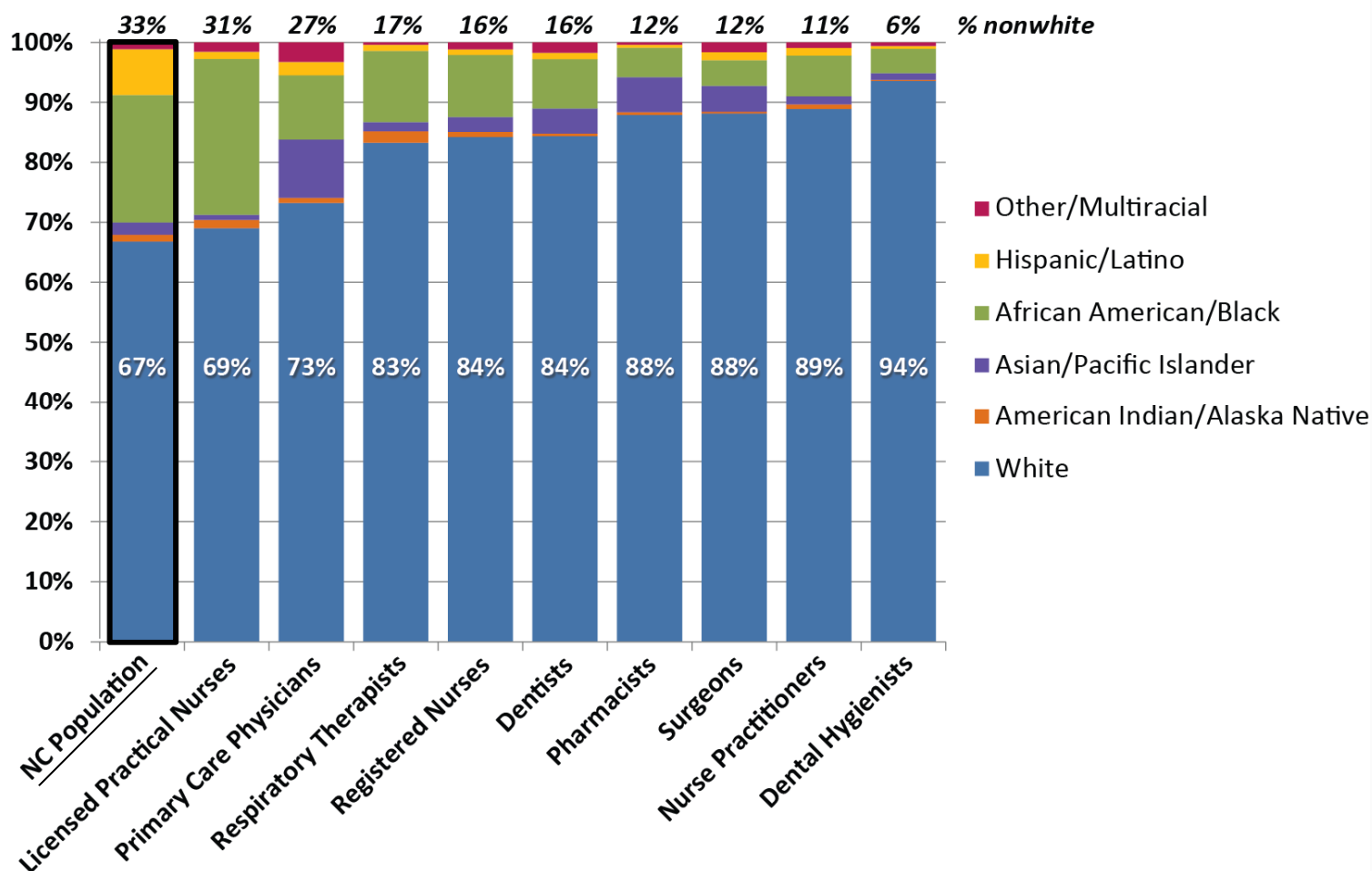
A transformed health care system will emphasize population health, reducing health disparities, and community-based models of care.

**Can we accomplish this system without increasing workforce diversity?**



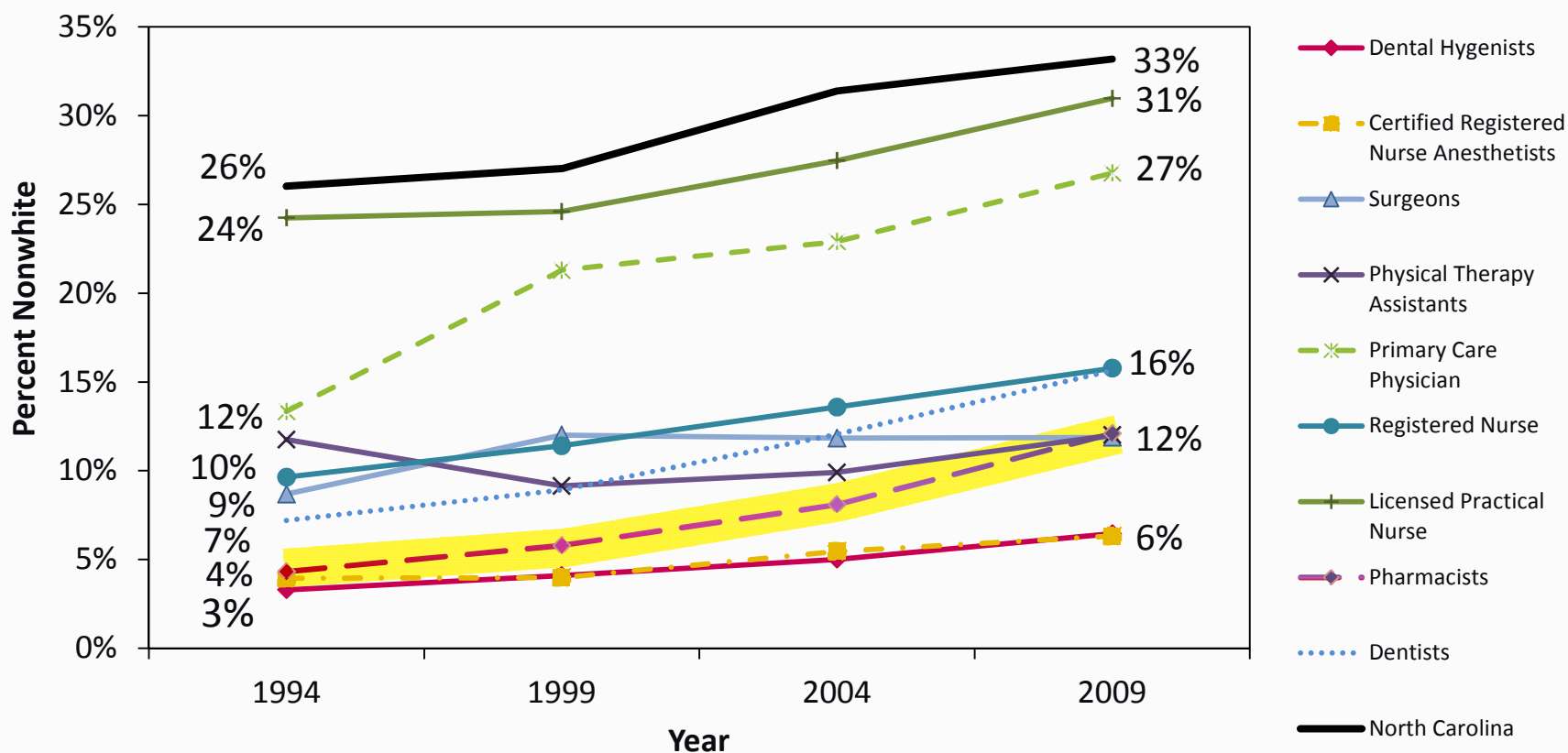
# Race/Ethnicity of Practitioners Falls Short of Matching Population Diversity

Diversity of North Carolina's Population vs. Diversity of Selected Health Professions, 2009



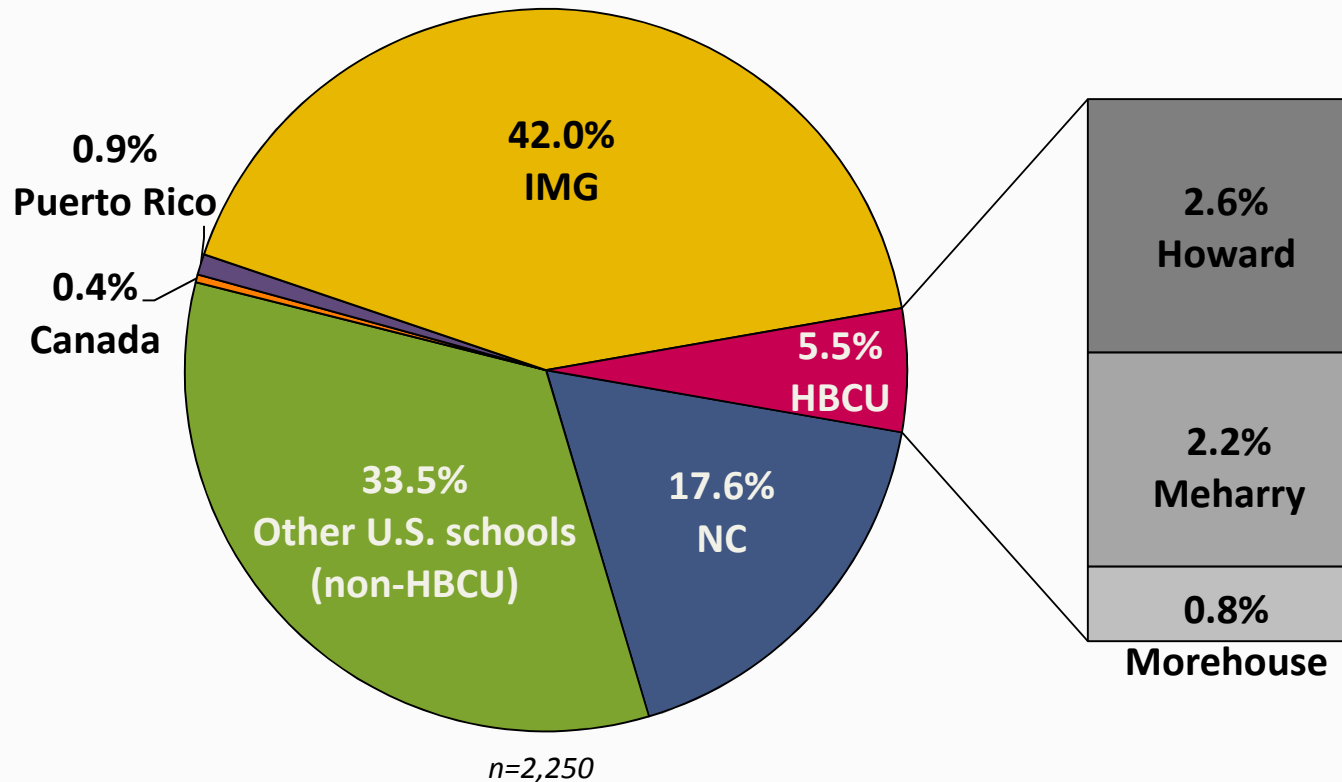
# Health Professions are Diversifying Over Time at Different Rates

Change in Non-White Diversity of Selected Health Professions,  
North Carolina: 1994-2009



# Majority of NC's Non-White Primary Care Physicians Educated in Other States and Countries

**Non-White Primary Care Physicians by School  
North Carolina, 2009**



# North Carolina does “planning” for workforce

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**State has long history of workforce planning:**

- Well-established AHEC
- Strong public community college and university system
- History of collaboration and trust
- Better data and analytical capacity than most states
- Strong base from which to move forward



# North Carolina's Workforce Planning: The Critique

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- Starts from professional, **silo-based** perspective
- Little accountability for matching workforce to population health needs
- Limited employer involvement
- Generally not interdisciplinary
- Reactive, heavy reliance on market
- Lacks coordination



# Health Workforce Planning in North Carolina the Traditional Way

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# Result is a “Compromised” Workforce Planning System

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- Resembles “a version of Goldilocks written by Albert Camus” with approaches that are either “too hot, or too cold, but never just right”  
(Grumbach, *Health Affairs* 2002; 21(5): 13-27)
- Often lurches from oversupply to shortage
- Generates “vigorous” disagreements about what constitutes an adequate supply, distribution and “right” mix of health providers
- Data not linked to policy action

