

# Comparison of Specialty Distribution of Nurse Practitioners and Physician Assistants in North Carolina, 1997-2013

Perri Morgan, PhD, PA-C; Anna Johnson, PhD, MSPH; Erin Fraher, PhD, MPP  
Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill

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## I. Executive Summary/Key Findings

As healthcare demand in the United States is expected to grow, increased use of nurse practitioners (NPs) and physician assistants (PAs) is seen as a partial solution to potential physician shortages. Both NPs and PAs can be trained relatively quickly compared to physicians and they can address patient needs across the spectrum of health settings and medical specialties. NPs and PAs can change specialties throughout their careers and may constitute a flexible reservoir of health professionals to meet emerging healthcare needs.

With support from the National Center for Health Workforce Analysis, the Carolina Center for Health Workforce Analysis, housed at the Cecil G. Sheps Center for Health Service Research (Sheps Center) at the University of North Carolina at Chapel Hill, conducted a study of changes in NP and PA specialty distribution in North Carolina (NC) between 1997 and 2013. NP and PA licensure data from the NC Board of Nursing (NCBON) and NC Medical Board (NCMB), maintained in the NC Health Professions Data System at the Sheps Center, were used.

Results show that both professions more than tripled in size between 1997 and 2013, growing much faster than either the state's population or the number of practicing physicians. Due to this rapid growth, absolute numbers of NPs and PAs increased in most medical specialties. Both NPs and PAs reported practice in a wide range of medical specialties, but there were patterns specific to each profession. Over the time period studied, the proportion of PAs –but not NPs– reporting practice in primary care dropped significantly. PAs were more likely than NPs to report practice in urgent care, emergency medicine, and surgical subspecialties. The proportion of NPs practicing in obstetrics/gynecology and pediatrics also fell, while the proportion practicing in adult medical subspecialties grew. Overall, the findings indicate that the NPs and PAs practice in a wide variety of specialties and their specialty distribution in the workforce can change relatively quickly.

## CONCLUSIONS AND IMPLICATIONS FOR POLICY

- 1) Nurse practitioners and Physician Assistants are a flexible workforce that the nation can draw upon to meet emerging healthcare needs.**
- 2) There are important similarities and differences between NPs and PAs that should be considered in workforce policy design.**
- 3) Future research should advance understanding of mutable individual, educational, professional, and system level factors affecting specialty choice among NPs and PAs.**
- 4) Policies to attract NPs and PAs to specialties where they are most needed should be developed, tested, and implemented.**

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## II. Background

As the Affordable Care Act enables more people to access health care, and as the burden of disease increases due from an aging population and growing chronic disease prevalence, there are concerns about whether the US will have adequate numbers of healthcare providers to meet population needs.<sup>1</sup> A potential primary care shortage<sup>2,3</sup> has been the area of most concern, but other specialties such as oncology<sup>4</sup> and general surgery<sup>5</sup> may also face provider shortfalls. Increased use of NPs and PAs is a strategy that has been proposed to ameliorate forecast shortages in many of these specialties.<sup>4,6-8</sup>

NPs and PAs are healthcare providers who function either autonomously or with physician supervision or collaboration after training programs lasting two to three years. Although NPs train in broad categories, such as family medicine, adult medicine, women's health, and pediatrics, most training is relatively general for both NPs and PAs. Due to this generalist education and to a training pipeline that is shorter than that for physicians, the NP and PA professions have been able to adapt quickly to emerging workforce needs. This flexibility occurs both by changes in the specialty choices of new graduates and by the decisions of practicing NPs and PAs to change specialty during the course of their careers.<sup>9</sup> Currently, both NPs and PAs are present in all areas of healthcare in the US.<sup>10,11</sup>

Although NPs and PAs are similar in some ways, they differ with respect to their history, legal scope of practice, applicant characteristics, and training emphases.<sup>12-14</sup> Due to these differences, they may fill different niches in the healthcare workforce. For example, NPs are more prevalent in primary care settings and PAs are more prevalent in emergency settings, although both professions can and do practice in both specialties.<sup>10,11,15</sup> In 20 states, NPs may practice independently,<sup>16</sup> while PAs require a supervising physician in all states. Specialty distributions of NPs and PAs have changed over time, with the proportion of PAs and, to a lesser extent, NPs in primary care decreasing in recent years.<sup>15</sup>

This research brief compares NP and PA specialty distribution in North Carolina (NC) in 2013 and examines which specialties have experienced an increase or decrease in the use of NPs or PAs since 1997.

## III. Methods

The study uses self-reported specialty for active, licensed NPs and PAs practicing in NC in 1997 and 2013. We used 1997 and 2013 licensure data for NPs and PAs from the NC Health Professions Data System, which were derived from the NC Board of Nursing (NCBON) and NC Medical Board (NCMB). See [Appendix 1](#) for additional description of the data. The definition of primary care included family medicine, general internal medicine, general pediatrics (including adolescent medicine), or general geriatrics. All others specialties were classified as specialty care. We used descriptive statistics to analyze specialty distributions of NPs and PAs.

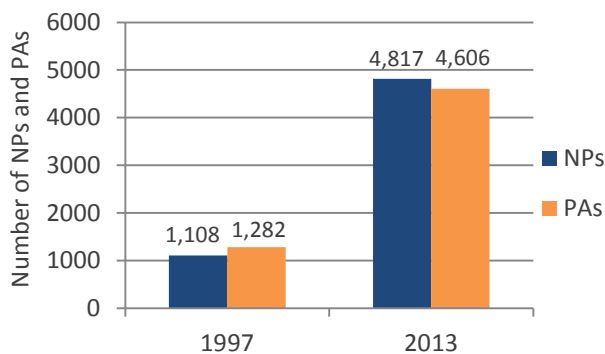
## IV. Results

### North Carolina Nurse Practitioner and Physician Assistant Workforce

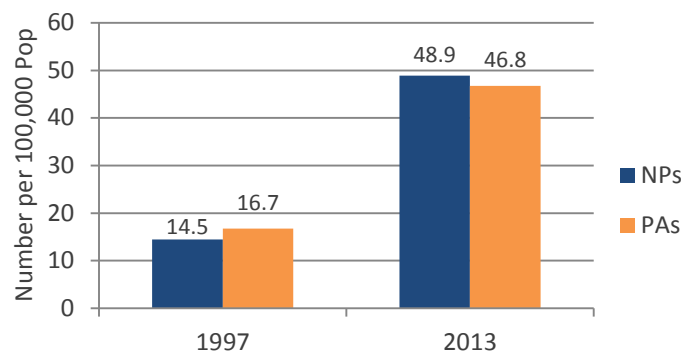
In 2013, there were 4,817 NPs and 4,606 PAs actively practicing in NC, an increase of 435% and 359%, respectively, from 1997 (**Figure 1**). Taking the state's population into consideration, there were 48.9 NPs and 46.8 PAs per 100,000 residents in 2013, a 338% increase for NPs and 279% increase for PAs from 1997 (**Figure 2**). The NP and PA workforces in NC have grown much more rapidly than the physician workforce. In 1997 there were 7.7 NPs and 8.6 PAs per 100 physicians in the state, but by 2013 these ratios increased to 21.5 NPs and 20.5 PAs per 100 physicians (**Figure 3**).

Approximately half of NPs reported practicing chiefly in primary care both in 1997 (52%) and in 2013 (50%). PAs were considerably more likely to report primary care practice in 1997 (46%) than they were in 2013 (29%) (**Figure 4**).

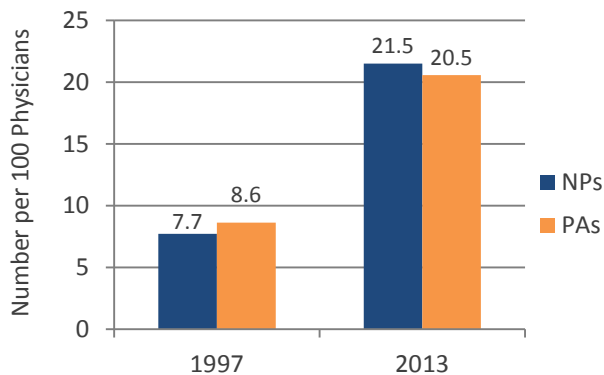
**Figure 1.** Number of active nurse practitioners (NPs) and physician assistants (PAs) practicing in North Carolina in 1997 and 2013



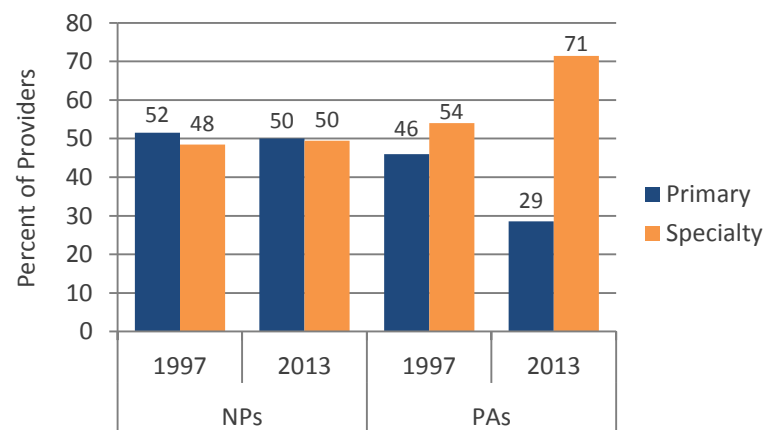
**Figure 2.** Number of active nurse practitioners (NPs) and physician assistants (PAs) per 100,000 population practicing in North Carolina in 1997 and 2013



**Figure 3.** Number of active nurse practitioners (NPs) and physician assistants (PAs) per 100 physicians practicing in North Carolina in 1997 and 2013



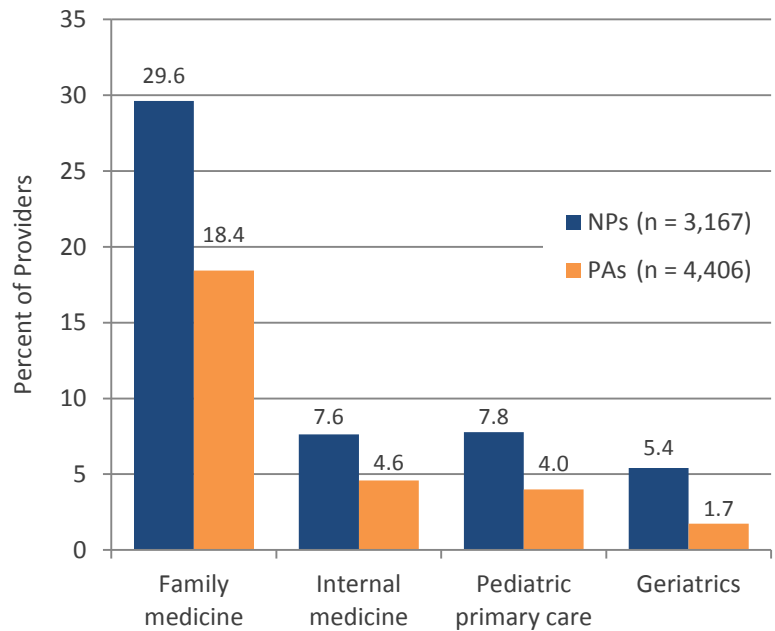
**Figure 4.** Percent of active nurse practitioners (NPs) and physician assistants (PAs) in North Carolina practicing in Primary Care v. Specialty Care in 1997 and 2013



A larger proportion of NPs than PAs reported working in each of the specialties within primary care (family medicine, general internal medicine, general pediatrics, and general geriatrics) (Figure 5).

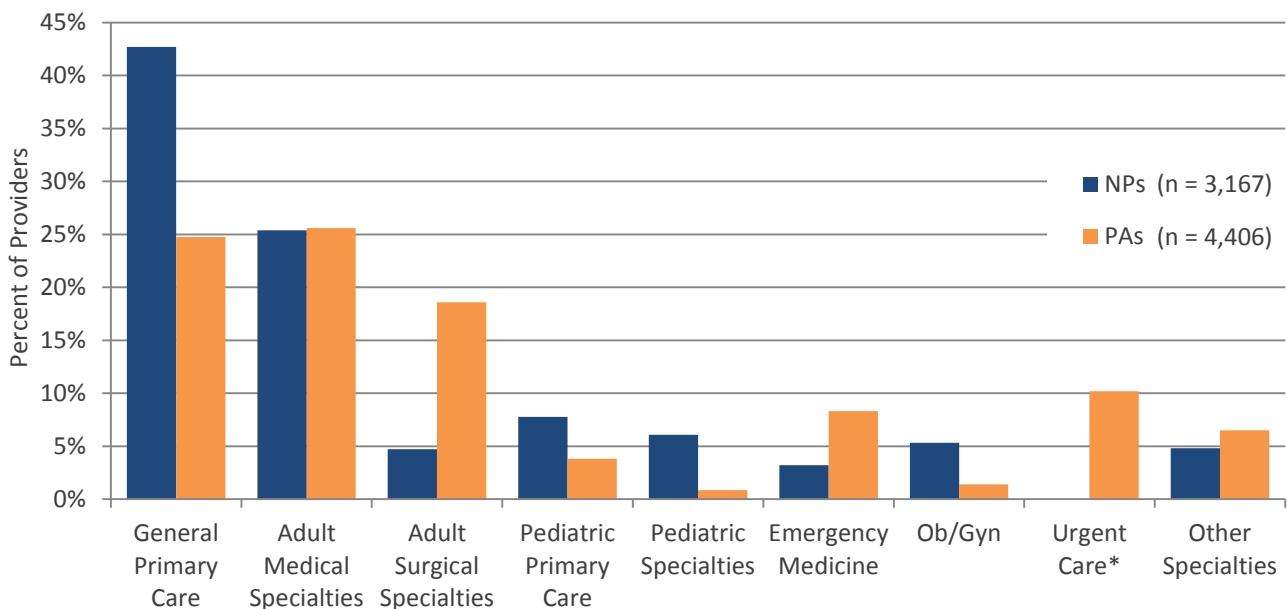
Figure 6 shows that the distributions of NPs and PAs differ from each other with respect to broad practice areas, with a larger proportion of NPs than PAs working in general primary care, pediatrics, and obstetrics/gynecology. A larger proportion of PAs than NPs report working in surgical subspecialties and emergency medicine. A relatively large proportion of PAs (10%) reported working in urgent care, but this specialty choice was not on the list of specialties offered to NPs.

**Figure 5.** Percent of active nurse practitioners (NPs) and physician assistants (PAs) in North Carolina practicing in each of the primary care specialties, 2013



\*Figures are % of active NPs and PAs reporting a specialty in 2013.

**Figure 6.** Percent active nurse practitioners (NPs) and physician assistants (PAs) by area of practice, 2013



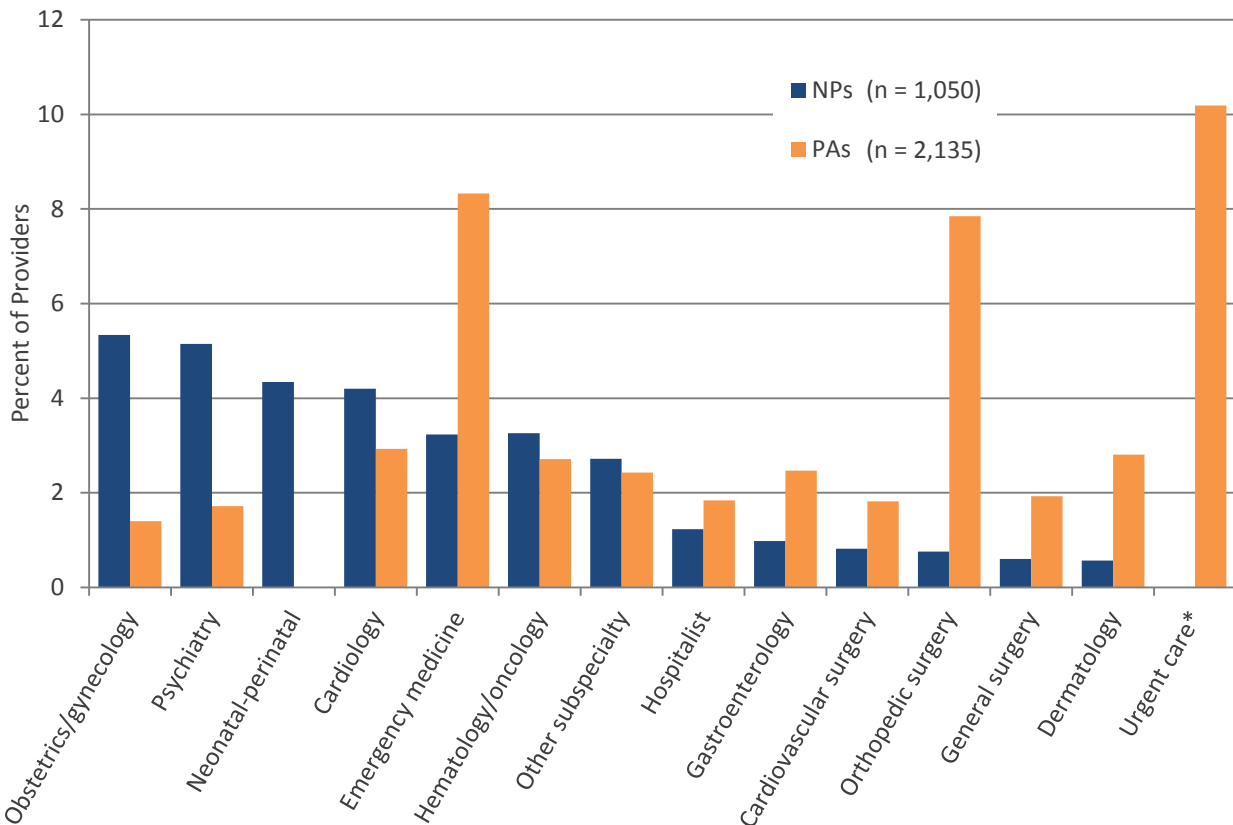
\*Urgent care category was not available for NPs to select.

Figures are % of active NPs and PAs reporting a specialty in 2013. Those reporting a specialty of "hospitalist" are included with adult medical specialties.



Comparing the distribution of NPs and PAs in specific subspecialties in 2013 reveals additional differences. NPs are much more likely to report practice in obstetrics/gynecology, psychiatry and neonatal/perinatal care, and are somewhat more likely to report practice in cardiology, compared to PAs. Reciprocally, PAs are more likely to report practice in surgical and emergency/urgent areas of care, as well as dermatology and gastroenterology (**Figure 7**).

**Figure 7.** Distribution of nurse practitioners and physician assistants among common subspecialties in North Carolina, 2013

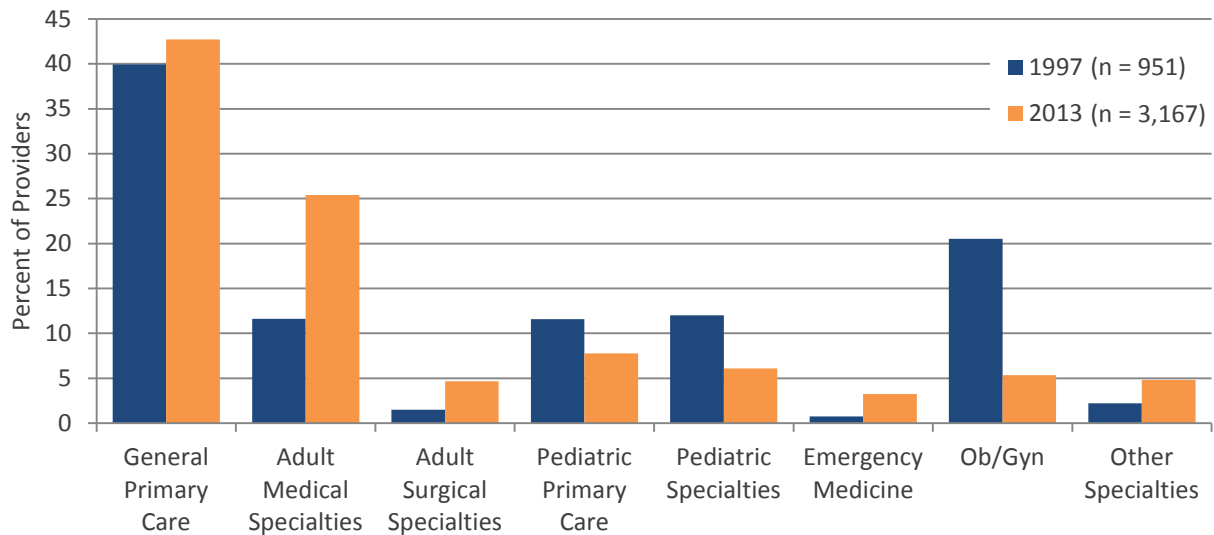


\*Urgent care category was not available for NPs to select.  
 Figures are % of active NPs (n=3,167) and PAs (n=4,406) reporting a specialty in 2013.

### NP Specialty Changes, 1997-2013

General primary care (excluding pediatric primary care) was the most common area of practice reported by NPs in both 1997 and 2013, accounting for 40% and 43% of all NPs, respectively (**Figure 8**). The proportion reporting obstetrics/gynecology practice dropped from 21% to 5%, and the proportion in pediatric primary and specialty care also decreased. The largest area of growth was in adult medical subspecialties, where the proportion of NPs doubled from 12% in 1997 to 25% in 2013. There was a notable decrease in the proportion of NPs practicing in neonatal/perinatal subspecialty from 10% in 1997 to 4% in 2013 (data not shown).

**Figure 8.** Distribution of specialty types reported by active nurse practitioners (NPs) in North Carolina in 1997 and 2013



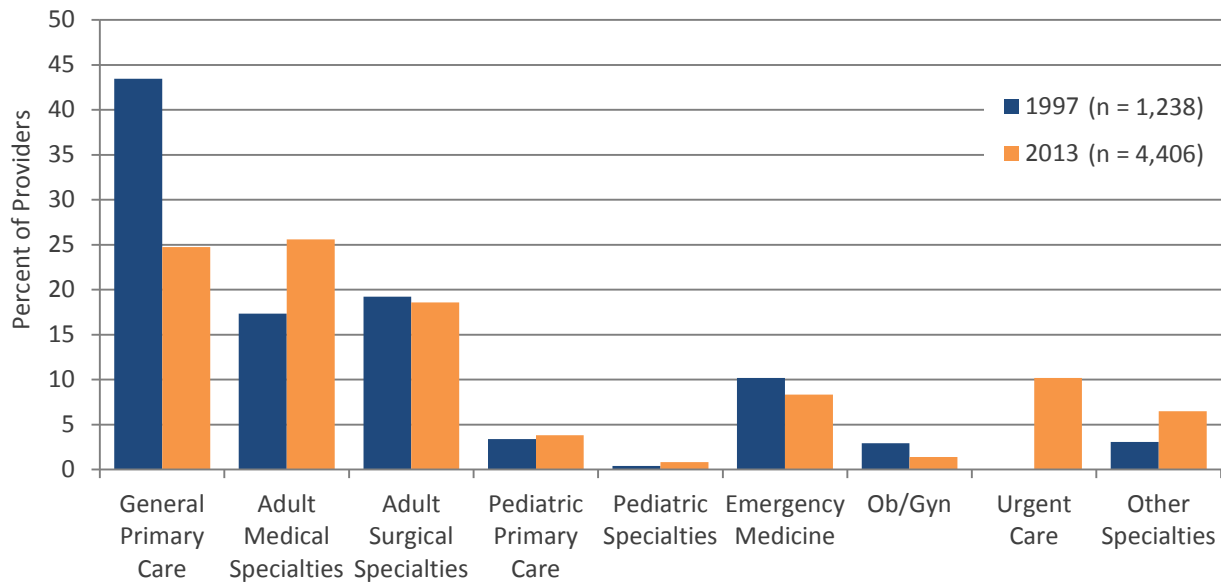
\*Urgent care category was not available for NPs to select.

Figures are % of active NPs reporting a specialty. Those reporting a specialty of "hospitalist" are included with adult medical specialties.

### PA Specialty Changes, 1997-2013

The proportion of the workforce in general primary care decreased among PAs from 43% in 1997 to 25% in 2013 (Figure 9). Reciprocally the percentage of PAs reporting practice in adult medical specialties increased from 17% in 1997 to 26% in 2013. Ten percent of PAs practiced in urgent care in 2013, a specialty that was not available for measurement in 1997.

**Figure 9.** Distribution of specialty types reported by active physician assistants (PAs) in North Carolina in 1997 and 2013



Figures are % of active PAs reporting a specialty. Those reporting a specialty of "hospitalist" are included with adult medical specialties.

## V. Discussion

Both the NP and PA professions grew dramatically between 1997 and 2013 in NC. By 2013, there was one NP or PA for every 2.4 physicians. Due to this striking growth, even specialties where the *proportions* of NPs or PAs decreased were likely to see an increase in *absolute numbers* of these providers.

Although there is significant overlap in specialty distribution of NPs and PAs in NC, there are specialties areas where each is more prominent. Larger proportions of NPs than PAs are found throughout the primary care specialties. Among the subspecialties, each profession has migrated to fill particular niches in the healthcare system. NC NPs are more likely than PAs to be found in psychiatry, obstetrics/gynecology, and neonatal/perinatal practice, while PAs are more likely to be found in emergency medicine, urgent care, and surgical subspecialties.

Our report cannot examine the reasons for these different specialty distributions, but there are a number of potential explanations. Individuals who enter each of these professions may have different skills, interests, and/or professional backgrounds. For example, NPs typically have prior nursing experience. PAs have often worked previously in a broad range of fields, many of which are procedure-oriented, such as emergency medical technician, athletic trainers, and combat medics. It is reasonable to speculate that a broad nursing background might influence an NP toward primary care, while experience in procedure-rich fields might lead PAs toward specialties such as emergency medicine, urgent care, and surgery. These influences should not be over-emphasized, however, since many NPs and PAs deviate from these patterns. Training programs also differ, with NP education based on a nursing model of care while PA training was designed to mirror that of physicians. The employment market might also be different for NPs and PAs, with practices and health systems tending to hire one or the other for specific roles.

The results of this analysis suggest that the NP and PA professions are quite adaptable. Both NPs and PAs reported practicing in a broad range of specialties, from the most general to the most highly specialized. Most specialties employ both NPs and PAs. The change in specialty patterns of NC NPs and PAs over the time period studied demonstrates the malleability of both professions, as considerable differences in specialty distribution were observed in both professions between 1997 and 2013. In sum, these findings indicate that NPs and PAs represent a flexible workforce capable of responding to emerging healthcare needs and opportunities.

**LIMITATIONS:** It is possible that some of the specialty changes that we detected are due to changes in data collection methodology, as detailed in [Appendix 1](#). These changes might have exaggerated trends identified in this report, particularly the decrease in the proportion of PAs reporting primary care practice in 2013. However, national data suggests that the proportion of PAs reporting primary care practice decreased by a similar magnitude as found in our analysis.<sup>17, 18</sup> Our analysis is also limited to a single state. In [Appendix 2](#), we compare these results from NC with national data in order to help readers assess the generalizability of our results.

## VI. Conclusions/Implications for Policy

1. Nurse practitioners and physician assistants are a flexible workforce that the nation can draw upon to meet emerging healthcare needs.
2. There are important similarities and differences between NPs and PAs that should be considered in workforce policy design.
3. Future research should advance understanding of mutable individual, educational, professional, and system level factors affecting specialty choice among NPs and PAs
4. Policies to attract NPs and PAs to specialties where they are most needed should be developed, tested, and implemented. ❖

### Authors

**Perri Morgan, PA-C, PhD**, is an Associate Professor in the Physician Assistant Program, in the Department of Community and Family Medicine at Duke University Medical Center.

**Anna Johnson, PhD, MSPH**, is a Research Associate with the Program for Health Workforce Research and Policy at the Cecil G. Sheps Center for Health Services Research at the University of North Carolina at Chapel Hill.

**Erin Fraher, PhD, MPP**, is Director of the Carolina Center for Health Workforce Analysis, an Assistant Professor in the Departments of Family Medicine and Surgery, and the Director of the Program for Health Workforce Research and Policy at the Cecil G. Sheps Center for Health Services Research at the University of North Carolina at Chapel Hill.



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## Appendix 1: About the data

When PAs and NPs registered or re-registered for state licensure in 1997, they were asked to indicate their first and second practice specialty using a list of codes developed by the North Carolina Medical Board. We coded specialty for each provider based on the first listed specialty if it was available, and the second listed specialty if the first was missing.

Data collection procedures changed before 2013 data were collected, and the methods were no longer uniform for the two professions. The lists of specialties that NPs and PAs could choose from were expanded from 120 for both professions in 1997 to 181 for NPs and 214 for PAs in 2013. The addition of a specialty code for “urgent care” for PAs—but not NPs—for the 2013 analysis is of particular relevance for this report. By 2013, 10% of all NC PAs reported urgent care as their specialty. If this choice had not been available, as was the case for NPs, these PAs would have chosen another specialty designation, such as family practice or emergency medicine. Therefore, the discrepancy in the lists of codes provided might have exaggerated the trend that we found indicating a large drop in the percent of PAs reporting primary care specialty and the small decrease that we found in PAs reporting emergency medicine specialty, compared to NPs.

Another change in data collection methods was that 1997 PAs were asked to indicate first and second choices of specialty, but 2013 PAs were asked to indicate a single “area of practice”. This same change was made in data collection for physicians in NC, and results showed a decrease in the selection of primary care specialties among physicians. It is not possible for us to determine whether this change would also exaggerate the decrease in the proportion of PAs indicating primary care practice. However, we suspect that this effect would be smaller for PAs than for physicians, since most physicians specialize through their training, while most PAs do not. Therefore, physicians would be more likely than PAs to have training specialties that differ from their active areas of practice. For example, a physician could have a training specialty of “family practice”, but an “area of practice” as a hospitalist. Since few PAs train within a specialty, the terms “specialty” and “area of practice” are more likely to be roughly synonymous for PAs than they are for physicians.

For 2013 NP data (N=4817), the registration questionnaire for NPs was changed to ask NPs to select up to seven “clinical primary care” specialties and up to seven “clinical specialty care” specialties. A large proportion (1650/4817= 34%) provided no response at all. The large majority of those who did respond listed the same specialty in the first position for both “clinical primary care” and “clinical specialty care” (3289, 95%), making their indication of specialty clear. When the NP’s responses to these two items conflicted (176), there were some cases where their intended specialty was clear and we assigned the obvious specialty for these (52). For the remaining 124 NPs who reported conflicting specialties, we were not able to discern a single specialty. In sum, missing responses for specialty were minimal among PAs in 2013 (4%) and 1997 (3%) and more frequent among NPs in 1997 (16%) and 2013 (34%). Our analysis of missing data for specialty shows that those who did report a specialty were similar to those who did not report a specialty with regard to age, sex, race, and year of graduation from PA or APN training. This suggests that bias due to missing specialty data is likely to be minimal.

## Appendix 2: Comparison of North Carolina and national specialty trends among nurse practitioners and physician assistants

### Nurse Practitioners

**Table A1.** National data from 2012 National Sample Survey of Nurse Practitioners (NSSNP) compared to 2013 North Carolina data for select specialty categories. Note that category definitions differ between the two data sources (details in footnotes).

<u>Specialty Category</u>	<u>NSSNP 2012</u>	<u>North Carolina 2013</u>
Primary Care <sup>1</sup>	48%	43%
Internal Medicine Subspecialties <sup>2</sup>	13%	24%
Surgical Subspecialties <sup>3</sup>	9%	5%
Pediatric Subspecialties <sup>4</sup>	3%	6%
Psychiatry/Mental Health	6%	5%
Neonatal/Perinatal	3%	4%
Emergency Medicine	3%	3%
Other	15%	10%

<sup>1</sup> For NSSNP 2012 data, “Primary Care” includes General Internal Medicine, Family Practice, Geriatrics, General Pediatrics, Adolescent Medicine, Obstetrics/Gynecology/Women’s Health, School Health, and Primary Care Unknown Specialty. For North Carolina 2013 data, “Primary Care” includes Family Medicine, General Internal Medicine, General Pediatrics, Adolescent Medicine and General Geriatrics.

<sup>2</sup> For NSSNP 2012 data, “Internal Medicine Subspecialties” includes Cardiology, Endocrinology, Gastroenterology, Hematology/Oncology, Infectious Disease, Pulmonary/Respiratory, Renal/Nephrology, Rheumatology, and Internal Medicine Unknown Subspecialty. For North Carolina 2013 data, “Internal Medicine Subspecialties” includes Addiction Psychiatry, Addiction/Chemical Dependency, Allergy & Immunology, Cardiology, Critical Care Medicine, Dermatology, Diabetes, Endocrinology, Gastroenterology, Hematology/Oncology, Hospitalist, Infectious Disease, Pulmonary Disease, Medicine/Psychiatry, Nephrology, Neurology, Occupational Medicine, Pain Medicine, Physical Medicine & Rehabilitation, Psychiatry, Public Health, Radiation Oncology, and Radiology.

<sup>3</sup> For NSSNP 2012 data, “Surgical Subspecialties” includes General Surgery, Urology, Orthopedics, Other Surgical Specialty, Surgical Anesthesia, Neurological Surgery, Cardiovascular Surgery, Thoracic Surgery, Vascular Surgery, Cardiothoracic Surgery. For North Carolina 2013 data, “Surgical Subspecialties” includes Transplant Surgery, Cardiothoracic Surgery, Neurological Surgery, Orthopedic Surgery, Otolaryngology, Otolaryngology, Otorhinolaryngology, Abdominal Surgery, Cardiovascular Surgery, Colon & Rectal Surgery, Critical Care Surgery, General Surgery, Plastic Surgery, Thoracic Surgery, Traumatic Surgery, Urology, and Vascular Surgery.

<sup>4</sup> For NSSNP 2012 data, respondents only had option to check one box labeled “Pediatric Subspecialties”. For North Carolina 2013 data, “Pediatric Subspecialties” includes Neonatal/perinatal, Neurological Pediatric Surgery, Child Neurology, Pediatric Critical Care, Pediatric Endocrinology, Pediatric Gastroenterology, Pediatric hematology/oncology, Pediatric Nephrology, Pediatric Neurosurgery, Pediatric Pulmonology, Pediatric Allergy, Pediatric Cardiology, Child Psychiatry, Pediatric Surgery, Pediatric Otolaryngology.

## Physician Assistants

**Table A2.** National data from the 2013 National Commission on Certification of Physician Assistants (NCCPA) compared to 2013 North Carolina data for select specialty categories. Note that category definitions likely differ between the two data sources; however, detailed information about how NCCPA specialty categories are defined was not available.

<b>Specialty Category</b>	<b>NCCPA 2013</b>	<b>North Carolina 2013</b>
Family/General Medicine	20.5%	18.4%
General Internal Medicine	5.4%	4.6%
Emergency Medicine	13.9%	8.3%
General Pediatrics	1.9%	3.8%
General Surgery	2.2%	1.9%
Internal Medicine Subspecialties	17.9%	25.6%
Pediatric Subspecialties	1.0%	0.8%
Surgical Subspecialties	21.5%	18.6%
Obstetrics and Gynecology	1.5%	1.4%
Occupational Medicine	1.3%	1.0%
Other	12.9%	15.6%