# 2015



Trends in Demand for New Physicians, 2011-2015 A Summary of Demand Indicators for 34 Physician Specialties



School of Public Health University at Albany, State University of New York

## Trends in Demand for New Physicians, 2011-2015 A Summary of Demand Indicators for 34 Physician Specialties

**March 2017** 



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## PREFACE

This data book presents profiles for 34 specialties. Each specialty profile summarizes trends in 5 key areas related to physician supply and demand: starting income, job offers, having to change plans due to limited practice opportunities, relative demand, and numbers of graduates. Data on starting income, job offers, having to change plans, and relative demand are based on responses to the Resident Exit Survey in New York (for the years 2011 to 2015).

This report was prepared by the Center for Health Workforce Studies (CHWS) staff, David Armstrong, Yuhao Liu, and Gaetano Forte, with layout design by Leanne Keough. Funding for this report was provided by the New York State Department of Health.

Established in 1996, CHWS is an academic research organization, based at the School of Public Health, University at Albany, State University of New York (SUNY). The mission of CHWS is to provide timely, accurate data and conduct policy relevant research about the health workforce. The research conducted by CHWS supports and promotes health workforce planning and policymaking at local, regional, state, and national levels. Today, CHWS has established itself as a national leader in the field of health workforce studies.

The views expressed in this report are those of CHWS and do not necessarily represent positions or policies of the School of Public Health, University at Albany, SUNY, or the New York State Department of Health.

March 2017

## ACKNOWLEDGMENT

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## TABLE OF CONTENTS

BACKGROUND	2
KEY FINDINGS	4
SPECIALTIES	
Family Medicine	
General Internal Medicine	
General Pediatrics	
Internal Medicine and Pediatrics (Combined)	9
Obstetrics/Gynecology	
Cardiology	11
Critical Care Medicine	12
Endocrinology and Metabolism	13
Gastroenterology	14
Geriatrics	
Hematology/Oncology	
Infectious Disease	
Nephrology	
Pulmonary Disease	
Rheumatology	
General Surgery	
Neurosurgery	
Ophthalmology	
Orthopedic Surgery	
Otolaryngology	
Cardio-Thoracic Surgery	
Urology	
Anesthesiology	
Pain Management	
Pathology	
Radiology	
Adult Psychiatry Child and Adolescent Psychiatry	ےد
Alleray and Immunology	دد ۲۷
Allergy and Immunology Dermatology	
Emergency Medicine	
Neurology	
Pediatric Subspecialties	ירב אב
Physical Medicine and Rehabilitation	39
	/1
APPENDIX A	
APPENDIX B	47
APPENDIX C	49

## BACKGROUND

The Center for Health Workforce Studies (CHWS) conducts an annual survey of all physicians completing a residency or fellowship training program in the State of New York (the Resident Exit Survey). The survey instrument (see Appendix C) was developed by CHWS in collaboration with teaching hospitals in New York. The survey provides the medical education community with valuable information on both outcomes of training and demand for new physicians in different specialties.

Each spring, CHWS distributes the surveys to Graduate Medical Education (GME) directors and administrators at teaching hospitals in New York. In most cases, surveys are then forwarded to individual GME departments at each hospital. These departments assume the responsibility of ensuring graduating residents and fellows fill out the surveys in the weeks prior to program completion. The surveys are then returned to CHWS for data entry and analysis.

The year 2015 marked the sixteenth year of the survey. Through excellent collaboration of teaching hospitals throughout the state, *an aggregated total of 47,905 of the 78,585 graduates have completed the survey (61% response rate)* in the 16 years the survey has been conducted (1998-2003, 2005, 2007-2015). During the last 5 years the survey has had the following annual response rates: 2011 (64%), 2012 (61%), 2013 (57%), 2014 (56%), and 2015 (55%). Many of the questions on the Resident Exit Survey are designed to assess demand for physicians in general and by specialty. In any given year, the Resident Exit Survey provides a snapshot of the physician marketplace at a specific point in time. By conducting the survey on a regular basis, trends may be observed which are useful in projecting future supply and demand.

This data book presents profiles for 34 specialties. Each specialty profile summarizes trends in 5 key areas related to physician supply and demand: starting income, job offers, having to change plans due to limited practice opportunities, relative demand, and numbers of graduates. Data on starting income, job offers, having to change plans, and relative demand are based on responses to the Resident Exit Survey in New York (for the years 2011 to 2015). Data on GME graduates are from the annual medical education issues of the *Journal of the American Medical Association (JAMA*), and summarize the numbers of residents (or fellows) completing allopathic GME training programs in the specialty in the US from 2005 to 2014.

Definitions of the 5 areas are as follows:

• **Starting income:** The median starting income of survey respondents with confirmed plans to enter patient care/clinical practice in the US following completion of their training program. Starting incomes included respondents' base salaries plus their expected incentive/bonus

income. Starting incomes in the years 2011–2015 were adjusted for inflation to reflect 2015 dollars and are reported in \$1,000s.

- Job offers: The mean number of job offers for employment/practice positions of survey respondents who had actively searched for a practice position, excluding international medical graduates (IMGs) on temporary visas. Respondents with temporary citizenship status were excluded from this analysis because they were much more likely to experience difficulty in finding practice positions due to visa restrictions.
- *Having to change plans due to limited practice opportunities:* The percentage of respondents who had actively searched for a job (excluding IMGs on temporary visas) and who had to change their plans due to limited practice opportunities.
- **Relative demand:** Using several questions pertaining to the job market experiences and perceptions of survey respondents who had actively searched for a practice position (excluding IMGs on temporary visas), a composite score was computed to assign an overall rank (or relative demand score) for each specialty in each year that the survey was conducted. The percentages presented are the percentile rank of the specialty amongst all specialties in a given year. A percentile rank of 100% identifies the specialty highest in demand, and the lowest percentile rank would correspond to the specialty with the lowest relative demand score. Appendix A provides a detailed explanation of the methodology used to assess relative demand.
- **Numbers of graduates of allopathic GME training programs in the US:** The American Medical Association's (AMA) data on the number of residents completing training was compiled to observe how the number of new entrants to the physician marketplace has changed over time.

#### **Important Note:**

For each specialty, the number of responses by year is listed at the bottom of the page in the report. Care should be taken when interpreting outcomes based on small samples because the measures may fluctuate greatly from year to year.

### **KEY FINDINGS**

#### Overall, the job market for new physicians continues to be strong.

An analysis of trends in variables pertaining to the physician job market revealed that opportunities for physicians entering practice in most specialties have improved or remained stable over the period of time that CHWS has been conducting this survey.

#### In 2015, demand for primary care physicians (generalists) was stronger than the demand for nonprimary care physicians (specialists).\*

Historically, resident exit survey data showed that demand for generalists has been lower compared to demand for specialists. However, since 2008 demand for generalist has surpassed demand for specialists. In 2015, primary care physicians received more job offers than specialists and were less likely to have to change plans due to limited practice opportunities.

## There are important differences in the job market experiences and assessments for different specialties.

Although the overall marketplace appears relatively good for new graduates, there exist important differences in demand for individual specialties. In New York, specialties experiencing the strongest and weakest relative demand were as follows:

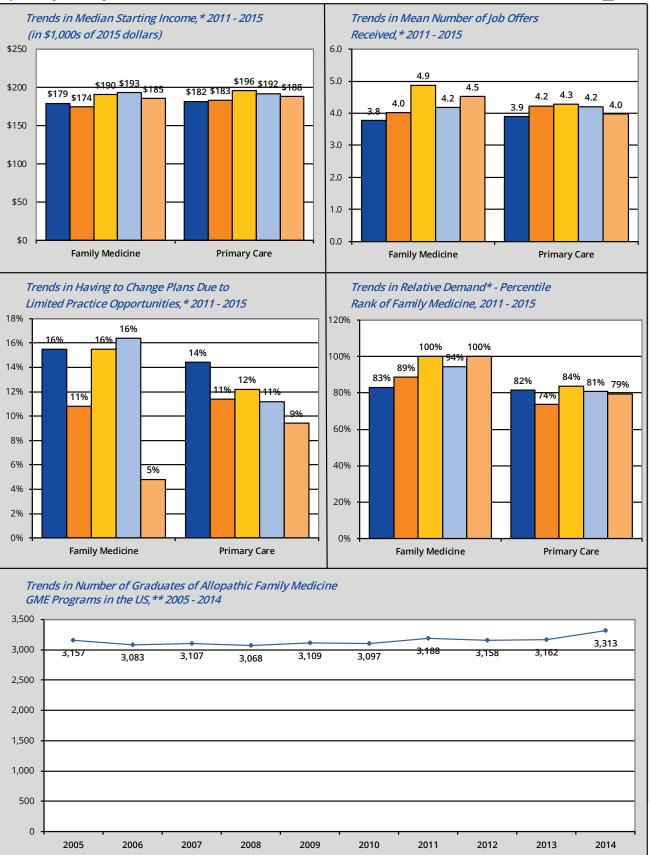
- *Strongest relative demand:* family medicine, emergency medicine, adult psychiatry, dermatology, general internal medicine, critical care medicine, and child and adolescent psychiatry.
- *Weakest relative demand:* pathology, radiology, cardio-thoracic surgery, allergy and immunology, cardiology, pediatric subspecialties, and infectious disease.

<sup>\*</sup> Primary care (or generalists) specialties include family medicine, general internal medicine, general pediatrics, and internal medicine and pediatrics (combined).

# Specialties

#### **Specialty: Family Medicine**

Legend: 2011 2012 2013 2014 2015



Number of responses: 2011: n = 74, 2012: n = 76, 2013: n = 72, 2014: n = 70, 2015: n = 92. \*Source: CHWS, Survey of Residents Completing Training in New York, 2011 - 2015. \*\*Source: JAMA Medical Education Issues, 2005 - 2014.

#### Specialty: General Internal Medicine

#### Legend: 2011 2012 2013 2014 2015



Number of responses: 2011: n = 254, 2012: n = 222, 2013: n = 237, 2014: n = 292, 2015: n = 219. \*Source: CHWS, Survey of Residents Completing Training in New York, 2011 - 2015. \*\*Source: JAMA Medical Education Issues, 2005 - 2014.

#### **Specialty: General Pediatrics**

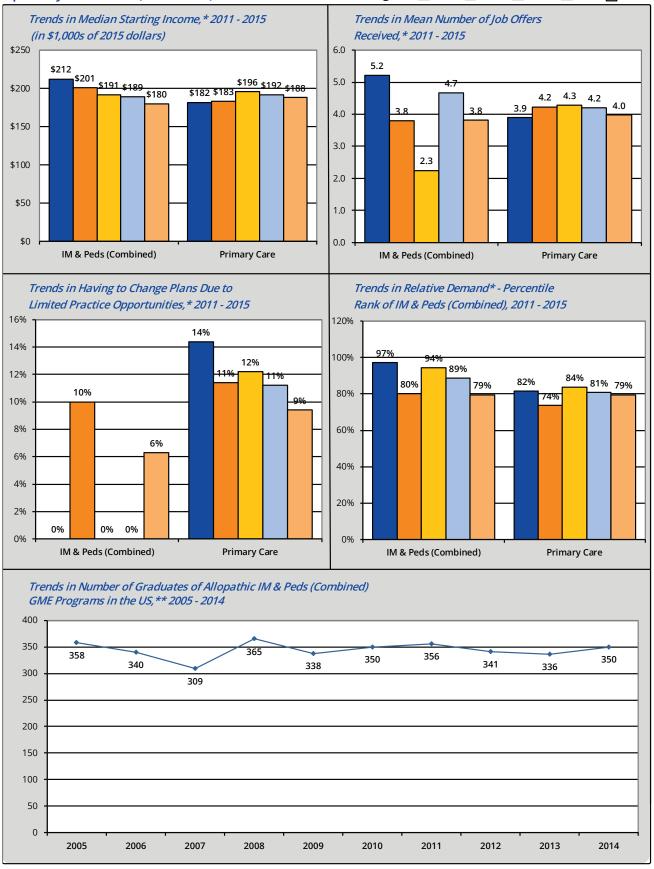
#### Legend: 2011 2012 2013 2014 2015



Number of responses: 2011: n = 90, 2012: n = 79, 2013: n = 84, 2014: n = 95, 2015: n = 87. \*Source: CHWS, Survey of Residents Completing Training in New York, 2011 - 2015. \*\*Source: JAMA Medical Education Issues, 2005 - 2014.

#### Specialty: IM & Peds (Combined)

Legend: 2011 2012 2013 2014 2015



Number of responses: 2011: n = 10, 2012: n = 10, 2013: n = 5, 2014: n = 3, 2015: n = 16. \*Source: CHWS, Survey of Residents Completing Training in New York, 2011 - 2015. \*\*Source: JAMA Medical Education Issues, 2005 - 2014.

#### Specialty: Obstetrics/Gynecology

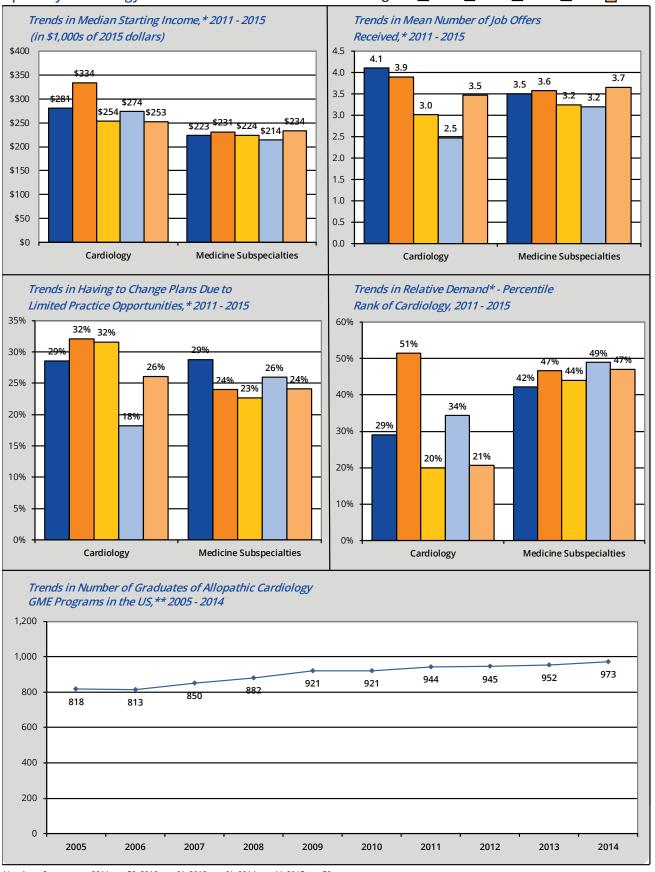
Legend: 2011 2012 2013 2014 2015



Number of responses: 2011: n = 77, 2012: n = 82, 2013: n = 67, 2014: n = 79, 2015: n = 71. \*Source: CHWS, Survey of Residents Completing Training in New York, 2011 - 2015. \*\*Source: JAMA Medical Education Issues, 2005 - 2014.

#### **Specialty: Cardiology**

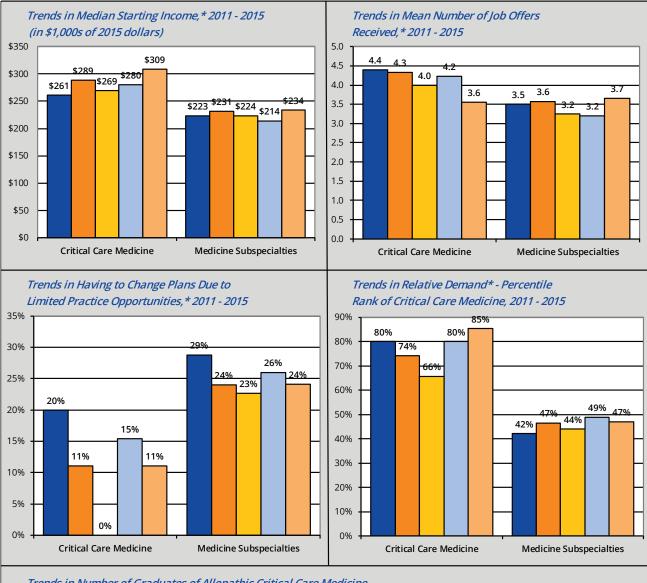
#### Legend: 2011 2012 2013 2014 2015



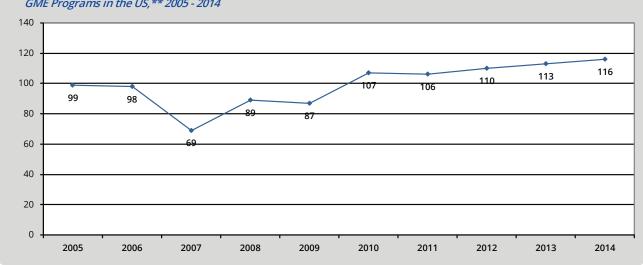
Number of responses: 2011: n = 58, 2012: n = 61, 2013: n = 61, 2014: n = 44, 2015: n = 50. \*Source: CHWS, Survey of Residents Completing Training in New York, 2011 - 2015. \*\*Source: JAMA Medical Education Issues, 2005 - 2014.

#### **Specialty: Critical Care Medicine**

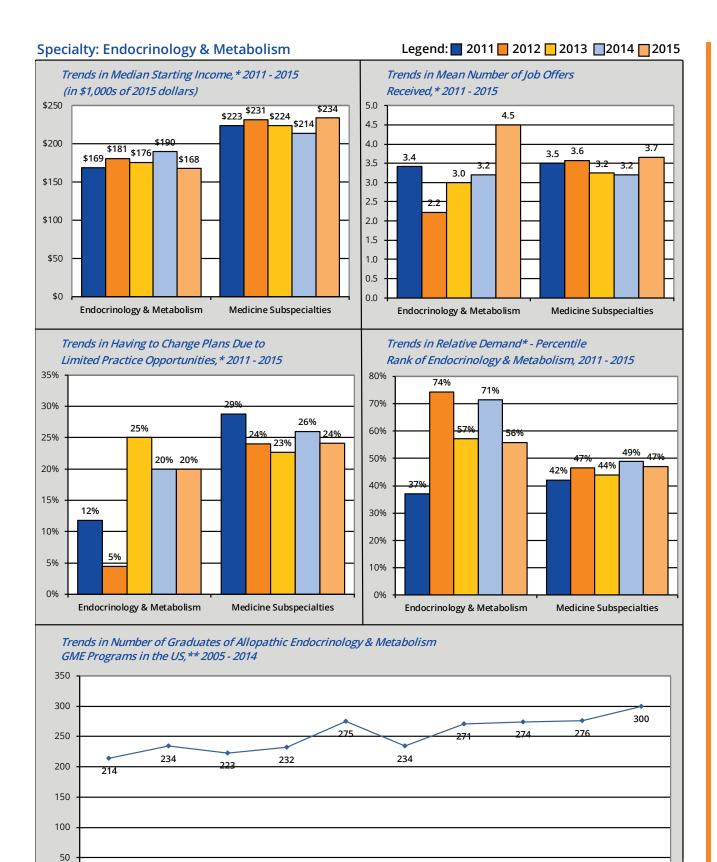
Legend: 2011 2012 2013 2014 2015



*Trends in Number of Graduates of Allopathic Critical Care Medicine GME Programs in the US,\*\* 2005 - 2014* 



Number of responses: 2011: n = 11, 2012: n = 9, 2013: n = 12, 2014: n = 13, 2015: n = 9. \*Source: CHWS, Survey of Residents Completing Training in New York, 2011 - 2015. \*\*Source: JAMA Medical Education Issues, 2005 - 2014.



2011

2012

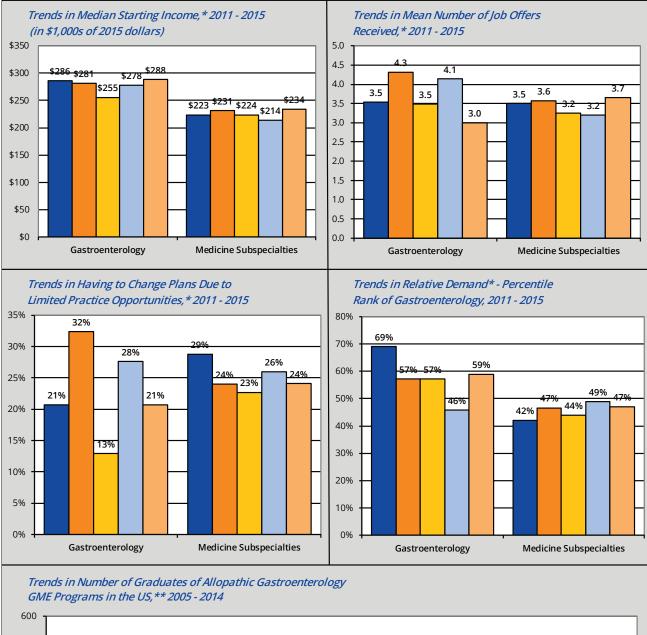
2013

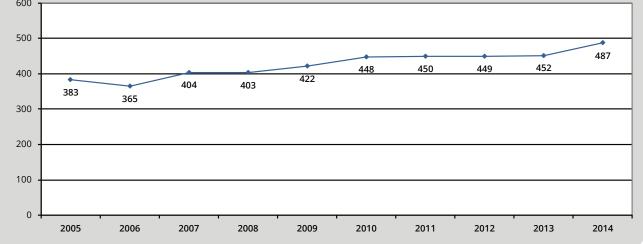
0 2005 2006 2007 2008 2009 2010

Number of responses: 2011: n = 18, 2012: n = 23, 2013: n = 17, 2014: n = 15, 2015: n = 20. \*Source: CHWS, Survey of Residents Completing Training in New York, 2011 - 2015. \*\*Source: *JAMA Medical Education Issues*, 2005 - 2014. 2014

#### Specialty: Gastroenterology

Legend: 2011 2012 2013 2014 2015

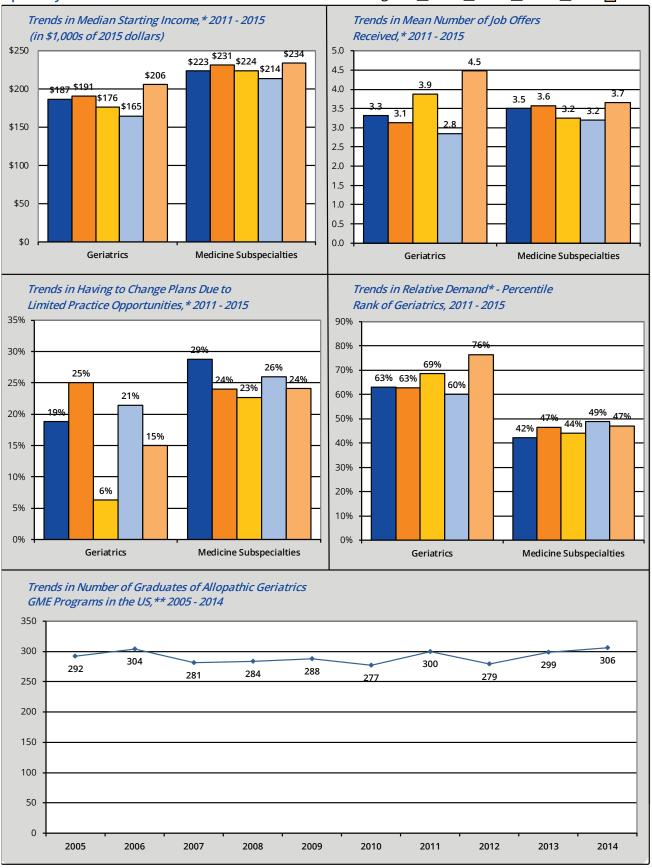




Number of responses: 2011: n = 31, 2012: n = 36, 2013: n = 33, 2014: n = 30, 2015: n = 31. \*Source: CHWS, Survey of Residents Completing Training in New York, 2011 - 2015. \*\*Source: JAMA Medical Education Issues, 2005 - 2014.

#### **Specialty: Geriatrics**

#### Legend: 2011 2012 2013 2014 2015

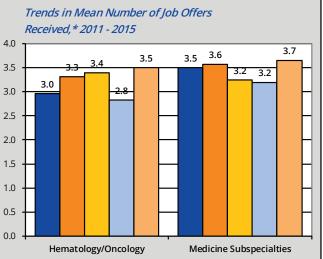


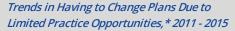
Number of responses: 2011: n = 19, 2012: n = 9, 2013: n = 17, 2014: n = 15, 2015: n = 20. \*Source: CHWS, Survey of Residents Completing Training in New York, 2011 - 2015. \*\*Source: *JAMA Medical Education Issues*, 2005 - 2014.

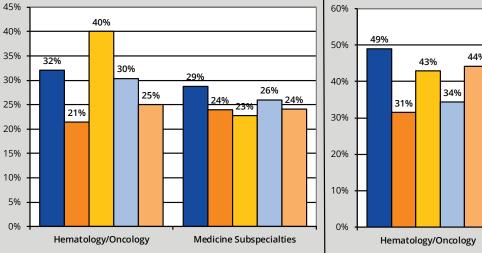
#### Specialty: Hematology/Oncology

#### Trends in Median Starting Income, \* 2011 - 2015 (in \$1,000s of 2015 dollars) \$300 \$285 \$255 <sub>\$250</sub> \$244 \$223 \$231 \$224 \$214 \$250 \$23 \$212 \$200 \$150 \$100 \$50 \$0 **Medicine Subspecialties** Hematology/Oncology

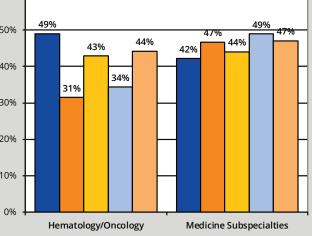
#### Legend: 2011 2012 2013 2014 2015

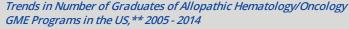


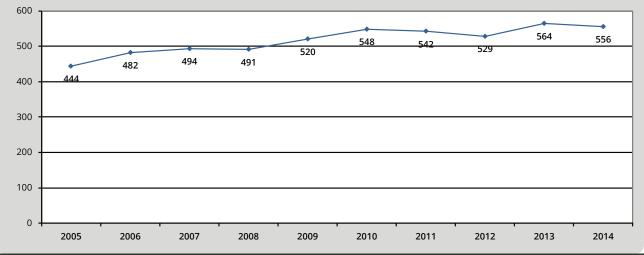








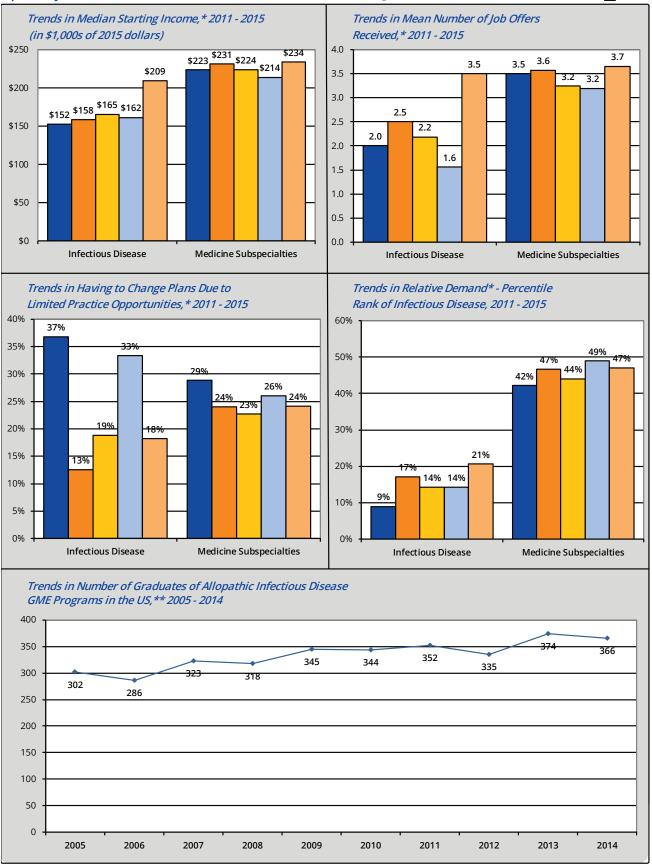




Number of responses: 2011: n = 30, 2012: n = 34, 2013: n = 26, 2014: n = 24, 2015: n = 17. \*Source: CHWS, Survey of Residents Completing Training in New York, 2011 - 2015. \*\*Source: JAMA Medical Education Issues, 2005 - 2014.

#### **Specialty: Infectious Disease**

#### Legend: 2011 2012 2013 2014 2015



Number of responses: 2011: n = 21, 2012: n = 17, 2013: n = 17, 2014: n = 10, 2015: n = 12. \*Source: CHWS, Survey of Residents Completing Training in New York, 2011 - 2015. \*\*Source: JAMA Medical Education Issues, 2005 - 2014.

#### Specialty: Nephrology

#### Trends in Median Starting Income, \* 2011 - 2015 Trends in Mean Number of Job Offers (in \$1,000s of 2015 dollars) Received, \* 2011 - 2015 \$250 4.5 \$223 \$231 \$224 \$234 4.2 \$214 4.0 3.7 3.7 3.6 3.5 \$200 3.4 \$180 <sup>\$185</sup> \$186 \$179 3.5 3.Z 3.2 3.0 2.7 \$150 2.5 2.0 \$100 1.5 1.0 \$50 0.5 \$0 0.0 Nephrology Medicine Subspecialties Nephrology Medicine Subspecialties Trends in Having to Change Plans Due to Trends in Relative Demand\* - Percentile Limited Practice Opportunities, \* 2011 - 2015 Rank of Nephrology, 2011 - 2015 80% 60% 70% 679 49% 50% 47% 44% 60% 42% 40% 35% 50% 45% 40% 39% 40% 30% 26% 26% 29% 30% 20% 25% 26% 24% 24% 23% 20% 20% 11% 10% 10% 0% 0% Nephrology **Medicine Subspecialties** Nephrology **Medicine Subspecialties** Trends in Number of Graduates of Allopathic Nephrology

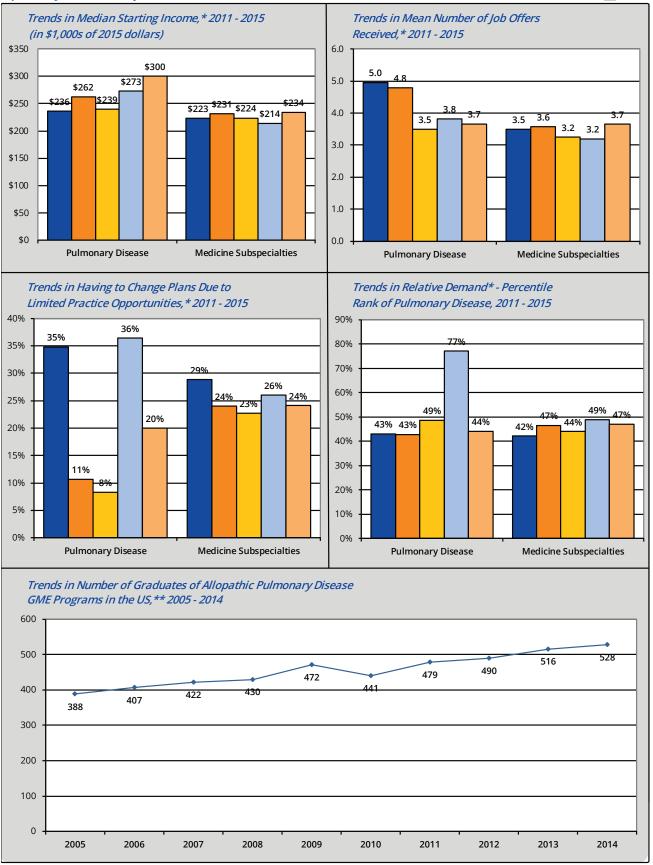
Number of responses: 2011: n = 32, 2012: n = 27, 2013: n = 10, 2014: n = 16, 2015: n = 19. \*Source: CHWS, Survey of Residents Completing Training in New York, 2011 - 2015. \*\*Source: JAMA Medical Education Issues, 2005 - 2014.

#### Legend: 2011 2012 2013 2014 2015

GME Programs in the US, \*\* 2005 - 2014 500 450 448 439 441 400 407 399 395 391 350 366 368 300 250 200 150 100 50 0 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014

#### Specialty: Pulmonary Disease

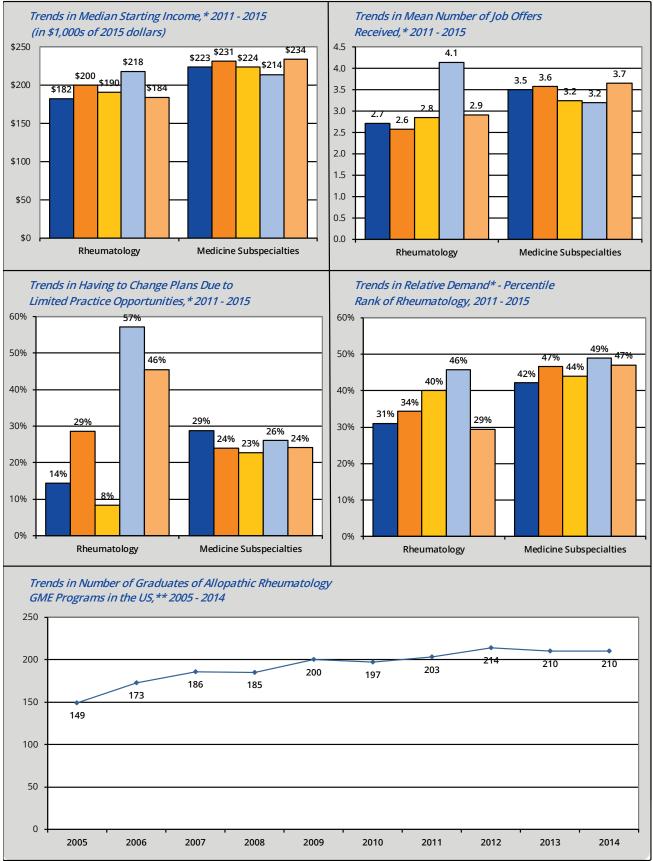
#### Legend: 2011 2012 2013 2014 2015



Number of responses: 2011: n = 25, 2012: n = 30, 2013: n = 25, 2014: n = 23, 2015: n = 15. \*Source: CHWS, Survey of Residents Completing Training in New York, 2011 - 2015. \*\*Source: JAMA Medical Education Issues, 2005 - 2014.

#### Specialty: Rheumatology

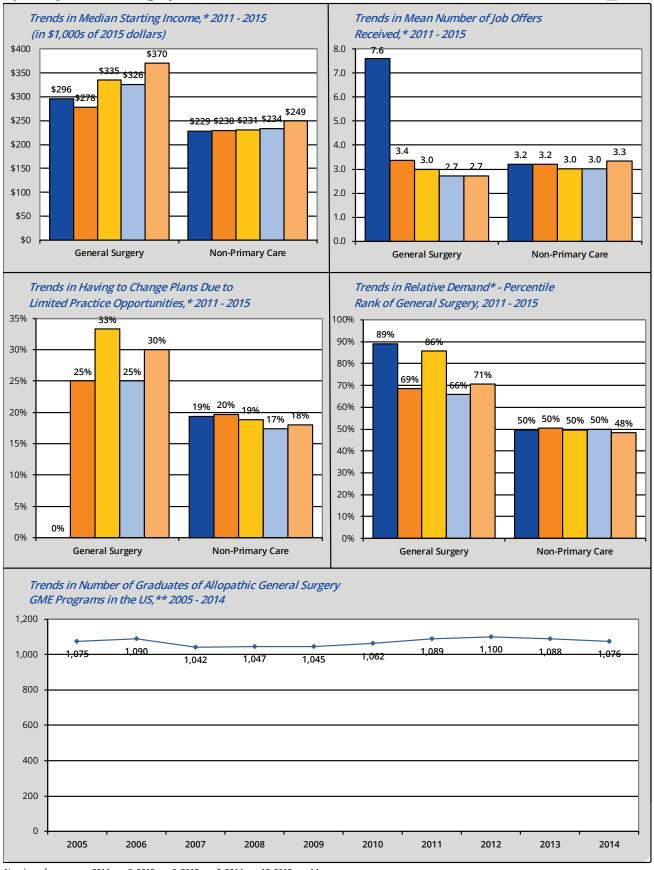
#### Legend: 🗾 2011 📃 2012 📃 2013 📃 2014 🔲 2015



Number of responses: 2011: n = 7, 2012: n = 8, 2013: n = 13, 2014: n = 7, 2015: n = 14. \*Source: CHWS, Survey of Residents Completing Training in New York, 2011 - 2015. \*\*Source: JAMA Medical Education Issues, 2005 - 2014.

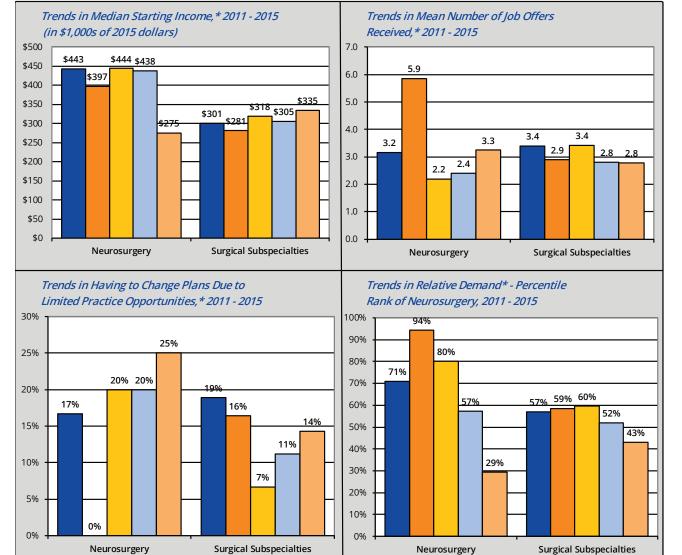
#### **Specialty: General Surgery**

#### Legend: 2011 2012 2013 2014 2015

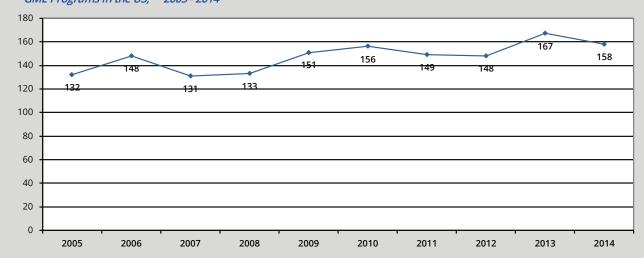


Number of responses: 2011: n = 8, 2012: n = 9, 2013: n = 9, 2014: n = 18, 2015: n = 14. \*Source: CHWS, Survey of Residents Completing Training in New York, 2011 - 2015. \*\*Source: JAMA Medical Education Issues, 2005 - 2014.

#### Specialty: Neurosurgery



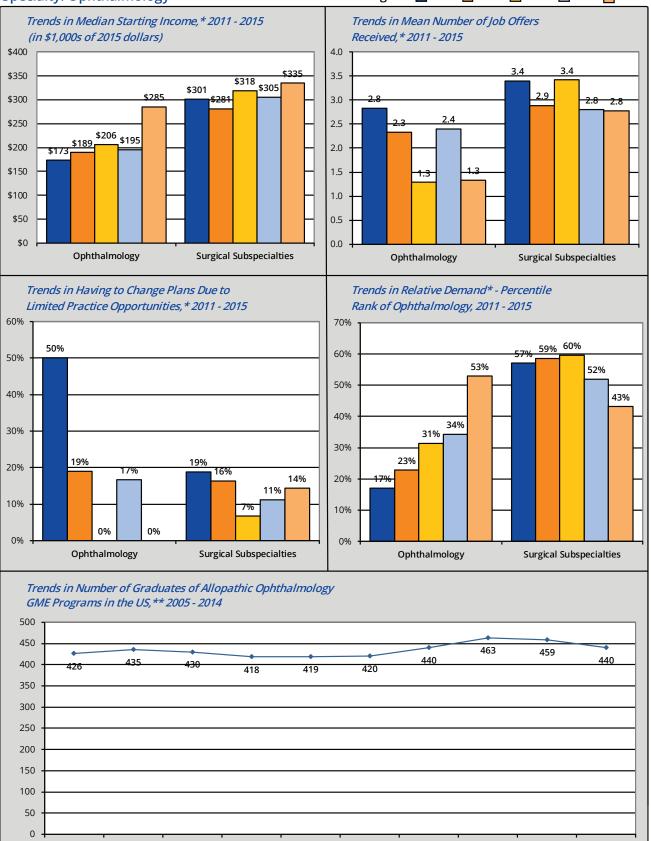
*Trends in Number of Graduates of Allopathic Neurosurgery GME Programs in the US,\*\* 2005 - 2014* 



Number of responses: 2011: n = 6, 2012: n = 7, 2013: n = 6, 2014: n = 5, 2015: n = 5. \*Source: CHWS, Survey of Residents Completing Training in New York, 2011 - 2015. \*\*Source: JAMA Medical Education Issues, 2005 - 2014. Legend: 2011 2012 2013 2014 2015

#### Specialty: Ophthalmology

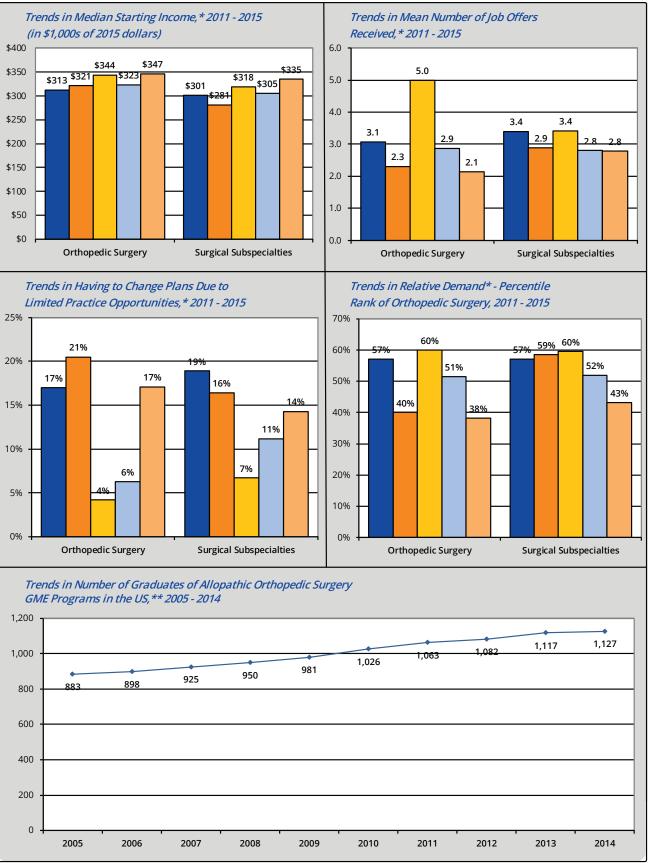
#### Legend: 2011 2012 2013 2014 2015



Number of responses: 2011: n = 12, 2012: n = 23, 2013: n = 9, 2014: n = 14, 2015: n = 3. \*Source: CHWS, Survey of Residents Completing Training in New York, 2011 - 2015. \*\*Source: *IAMA Medical Education Issues*, 2005 - 2014.

#### Specialty: Orthopedic Surgery

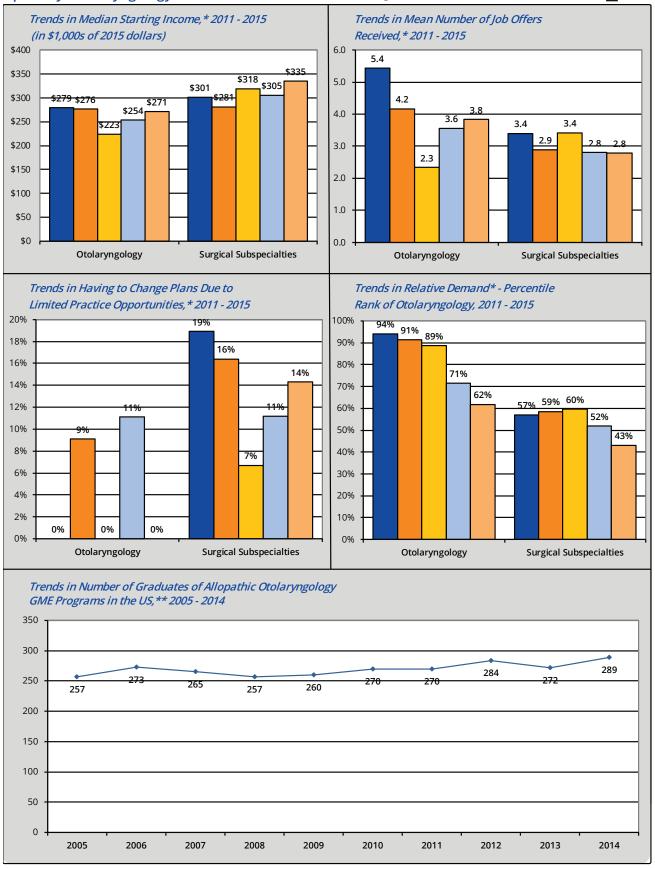
#### Legend: 2011 2012 2013 2014 2015



Number of responses: 2011: n = 51, 2012: n = 42, 2013: n = 24, 2014: n = 35, 2015: n = 35. \*Source: CHWS, Survey of Residents Completing Training in New York, 2011 - 2015. \*\*Source: JAMA Medical Education Issues, 2005 - 2014.

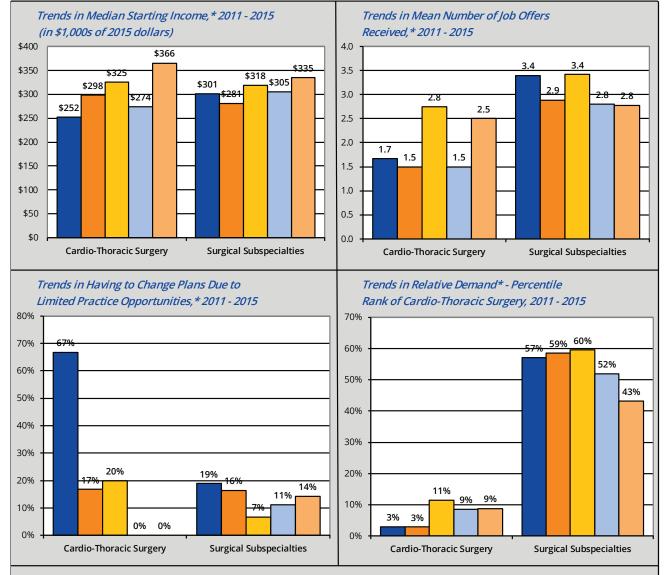
#### Specialty: Otolaryngology

#### Legend: 2011 2012 2013 2014 2015

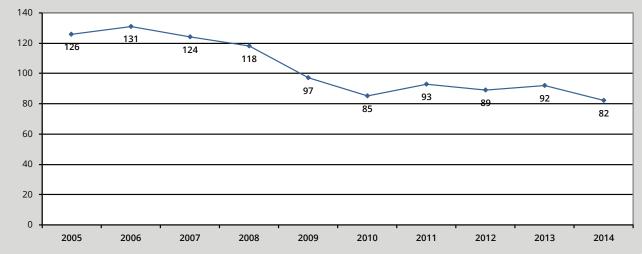


Number of responses: 2011: n = 7, 2012: n = 13, 2013: n = 9, 2014: n = 10, 2015: n = 6. \*Source: CHWS, Survey of Residents Completing Training in New York, 2011 - 2015. \*\*Source: JAMA Medical Education Issues, 2005 - 2014.

#### Specialty: Cardio-Thoracic Surgery



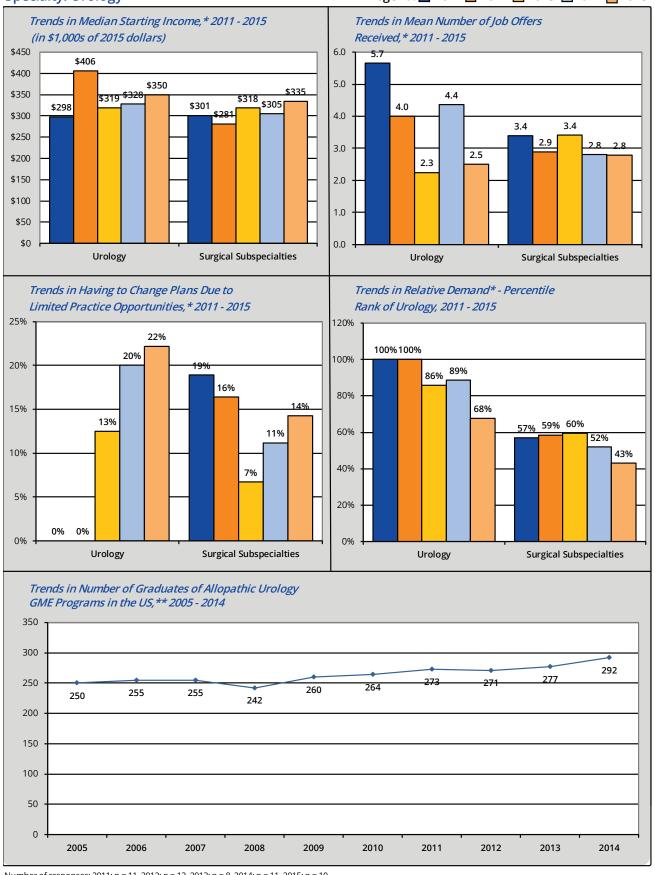
*Trends in Number of Graduates of Allopathic Cardio-Thoracic Surgery GME Programs in the US,\*\* 2005 - 2014* 



Number of responses: 2011: n = 3, 2012: n = 6, 2013: n = 5, 2014: n = 3, 2015: n = 3. \*Source: CHWS, Survey of Residents Completing Training in New York, 2011 - 2015. \*\*Source: JAMA Medical Education Issues, 2005 - 2014. Legend: 2011 2012 2013 2014 2015

#### **Specialty: Urology**

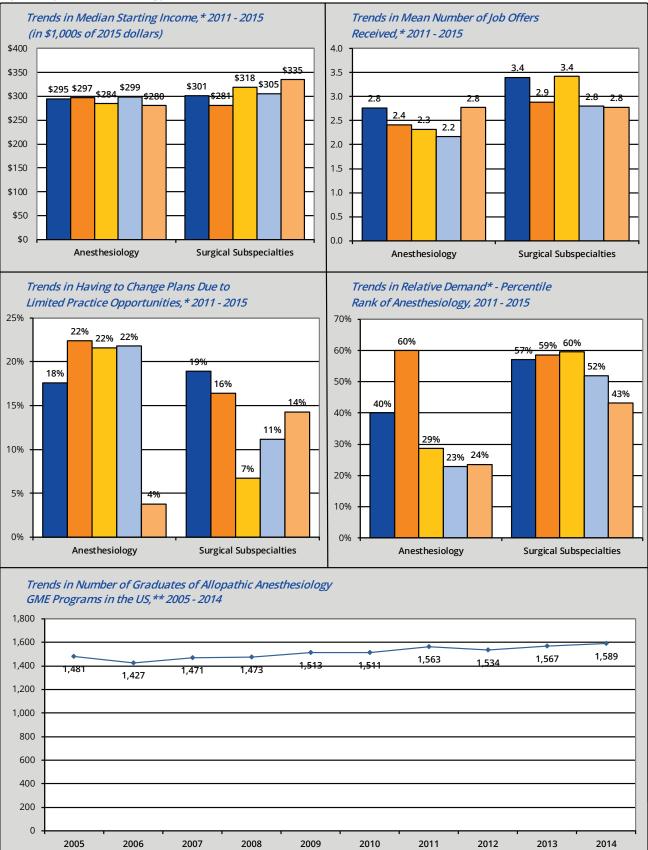
#### Legend: 2011 2012 2013 2014 2015



Number of responses: 2011: n = 11, 2012: n = 13, 2013: n = 8, 2014: n = 11, 2015: n = 10. \*Source: CHWS, Survey of Residents Completing Training in New York, 2011 - 2015. \*\*Source: JAMA Medical Education Issues, 2005 - 2014.

#### Specialty: Anesthesiology

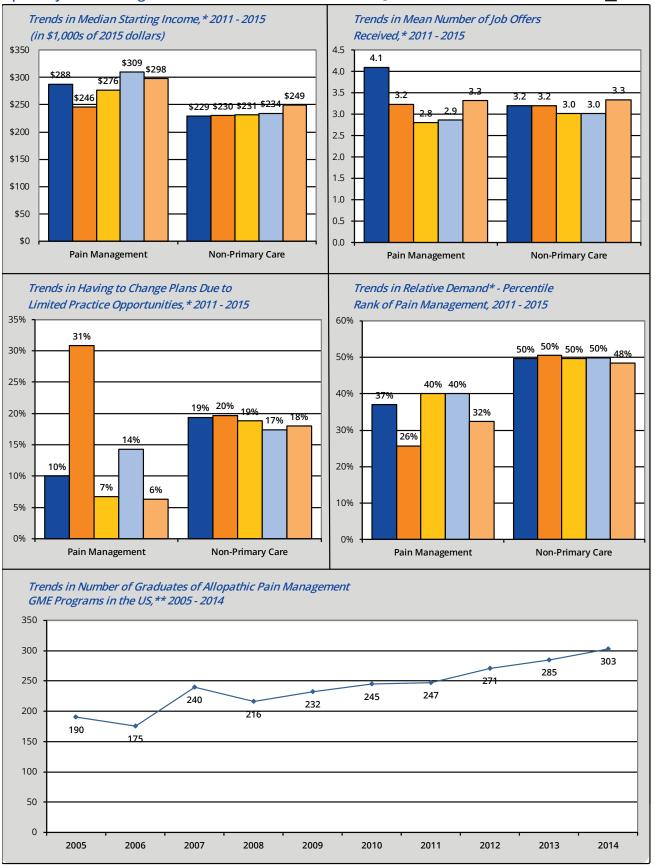
Legend: 2011 2012 2013 2014 2015



Number of responses: 2011: n = 70, 2012: n = 60, 2013: n = 41, 2014: n = 56, 2015: n = 28. \*Source: CHWS, Survey of Residents Completing Training in New York, 2011 - 2015. \*\*Source: JAMA Medical Education Issues, 2005 - 2014.

#### Specialty: Pain Management

#### Legend: 2011 2012 2013 2014 2015



Number of responses: 2011: n = 10, 2012: n = 13, 2013: n = 15, 2014: n = 22, 2015: n = 16. \*Source: CHWS, Survey of Residents Completing Training in New York, 2011 - 2015. \*\*Source: *JAMA Medical Education Issues*, 2005 - 2014.

#### **Specialty: Pathology**

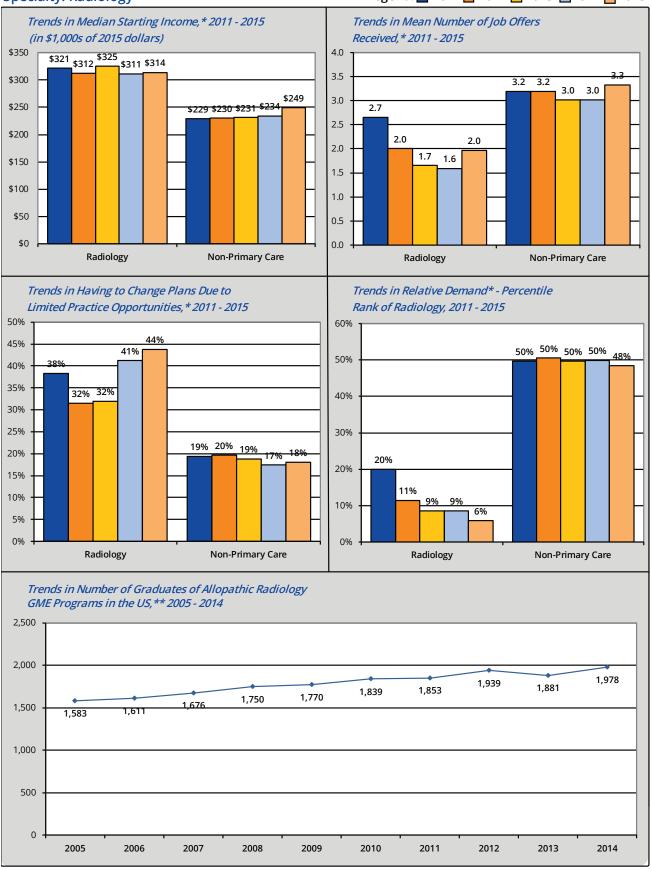


Number of responses: 2011: n = 33, 2012: n = 32, 2013: n = 35, 2014: n = 33, 2015: n = 22. \*Source: CHWS, Survey of Residents Completing Training in New York, 2011 - 2015. \*\*Source: JAMA Medical Education Issues, 2005 - 2014.

#### Legend: 2011 2012 2013 2014 2015

#### **Specialty: Radiology**

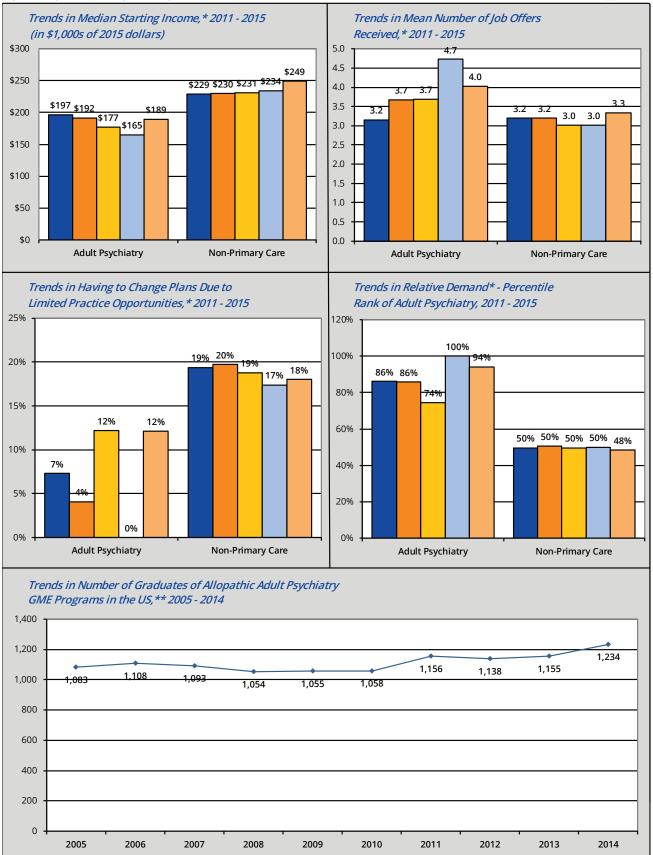
#### Legend: 2011 2012 2013 2014 2015



Number of responses: 2011: n = 53, 2012: n = 57, 2013: n = 54, 2014: n = 39, 2015: n = 35. \*Source: CHWS, Survey of Residents Completing Training in New York, 2011 - 2015. \*\*Source: JAMA Medical Education Issues, 2005 - 2014.

#### Specialty: Adult Psychiatry

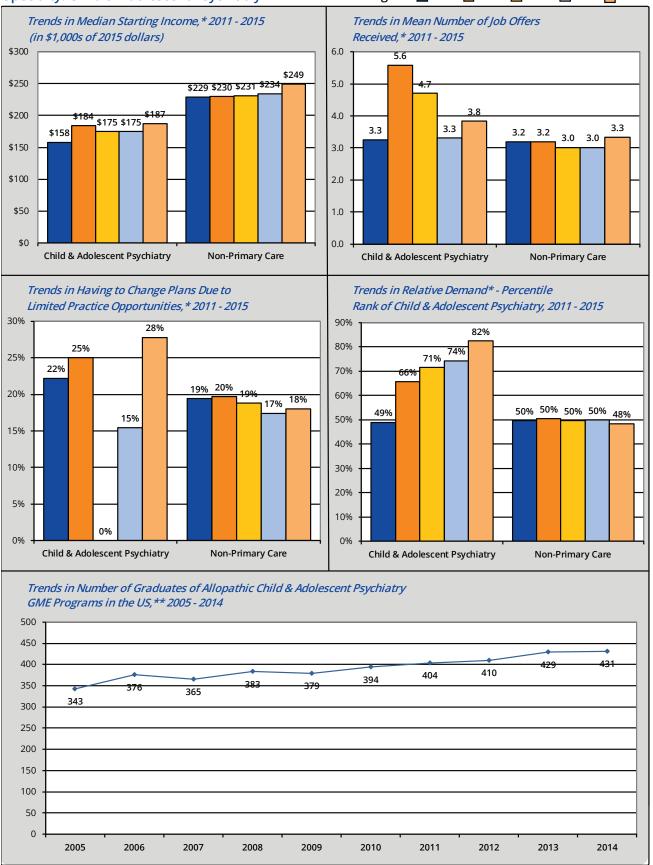
#### Legend: 2011 2012 2013 2014 2015



Number of responses: 2011: n = 48, 2012: n = 56, 2013: n = 44, 2014: n = 40, 2015: n = 38. \*Source: CHWS, Survey of Residents Completing Training in New York, 2011 - 2015. \*\*Source: JAMA Medical Education Issues, 2005 - 2014.

#### Specialty: Child & Adolescent Psychiatry

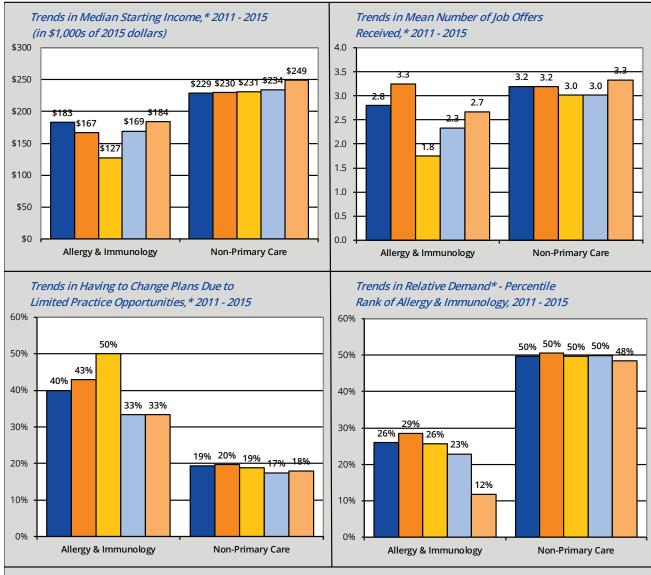
#### Legend: 2011 2012 2013 2014 2015



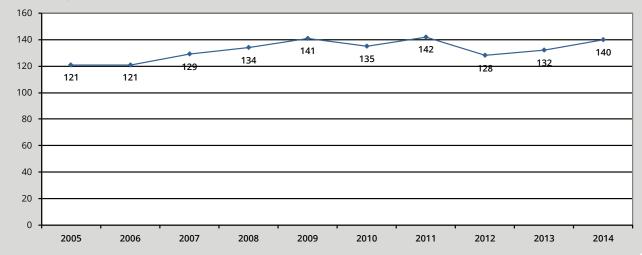
Number of responses: 2011: n = 27, 2012: n = 15, 2013: n = 11, 2014: n = 29, 2015: n = 20. \*Source: CHWS, Survey of Residents Completing Training in New York, 2011 - 2015. \*\*Source: *JAMA Medical Education Issues*, 2005 - 2014.

#### Specialty: Allergy & Immunology

Legend: 2011 2012 2013 2014 2015



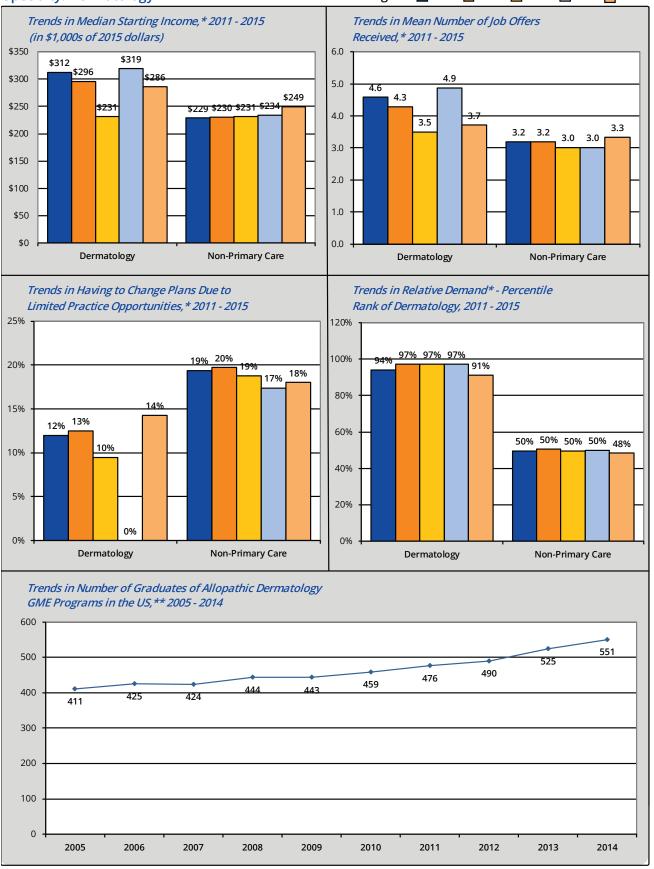
*Trends in Number of Graduates of Allopathic Allergy & Immunology GME Programs in the US,\*\* 2005 - 2014* 



Number of responses: 2011: n = 5, 2012: n = 9, 2013: n = 4, 2014: n = 6, 2015: n = 6. \*Source: CHWS, Survey of Residents Completing Training in New York, 2011 - 2015. \*\*Source: JAMA Medical Education Issues, 2005 - 2014.

#### **Specialty: Dermatology**

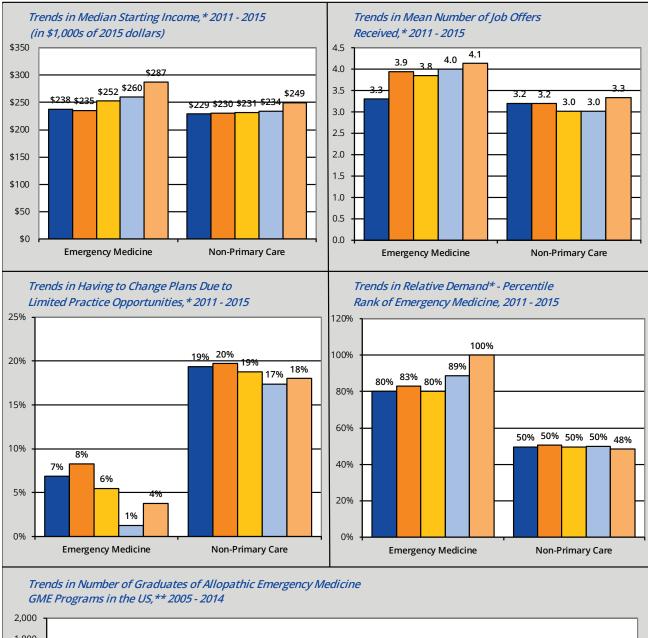
#### Legend: 2011 2012 2013 2014 2015

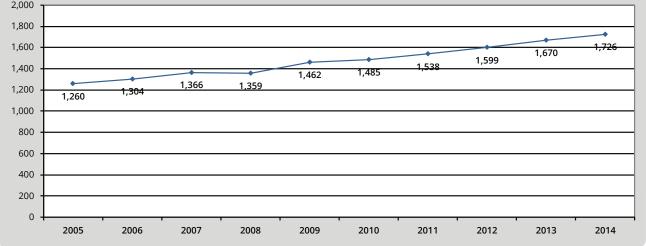


Number of responses: 2011: n = 25, 2012: n = 17, 2013: n = 21, 2014: n = 19, 2015: n = 14. \*Source: CHWS, Survey of Residents Completing Training in New York, 2011 - 2015. \*\*Source: JAMA Medical Education Issues, 2005 - 2014.

#### **Specialty: Emergency Medicine**

Legend: 2011 2012 2013 2014 2015

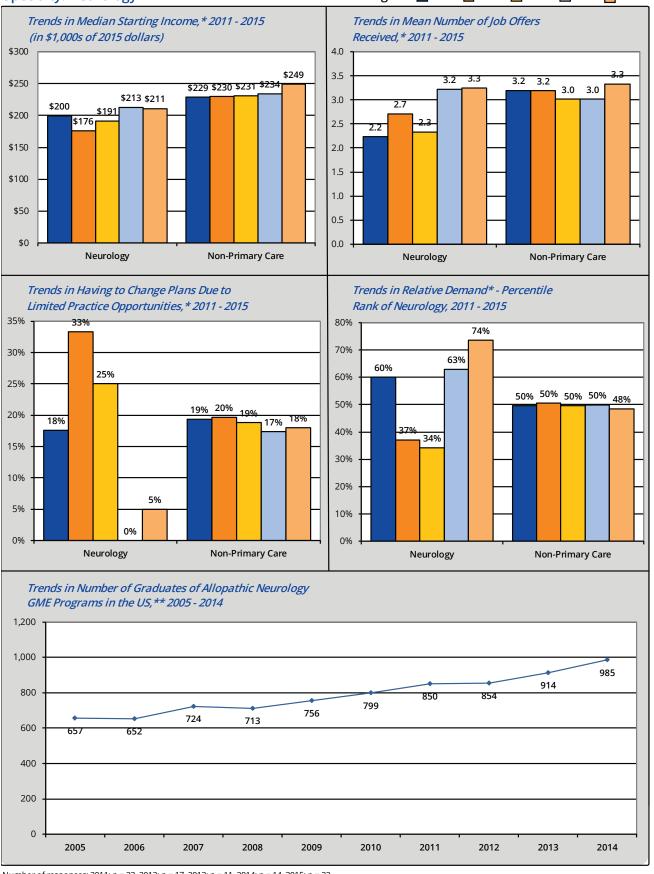




Number of responses: 2011: n = 109, 2012: n = 119, 2013: n = 99, 2014: n = 88, 2015: n = 138. \*Source: CHWS, Survey of Residents Completing Training in New York, 2011 - 2015. \*\*Source: JAMA Medical Education Issues, 2005 - 2014.

#### **Specialty: Neurology**

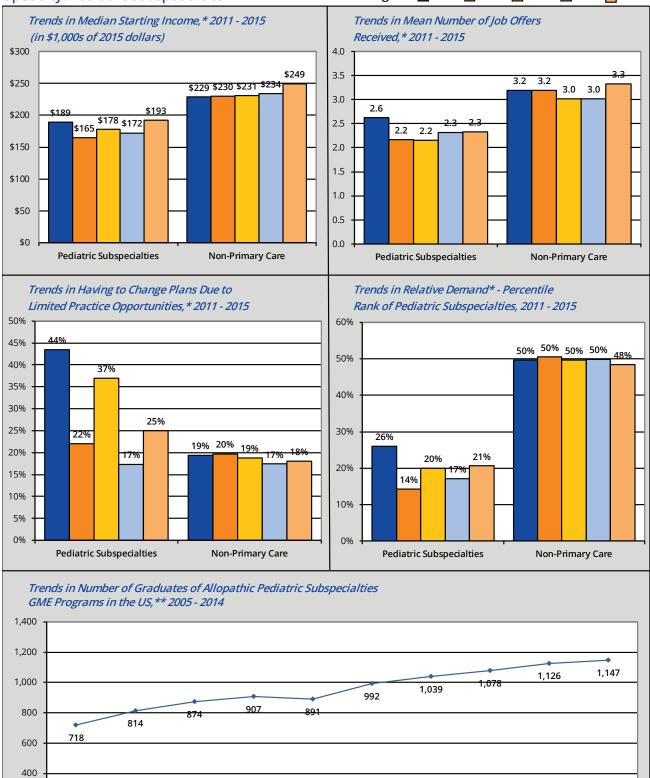
#### Legend: 2011 2012 2013 2014 2015



Number of responses: 2011: n = 23, 2012: n = 17, 2013: n = 11, 2014: n = 14, 2015: n = 22. \*Source: CHWS, Survey of Residents Completing Training in New York, 2011 - 2015. \*\*Source: JAMA Medical Education Issues, 2005 - 2014.

#### **Specialty: Pediatric Subspecialties**

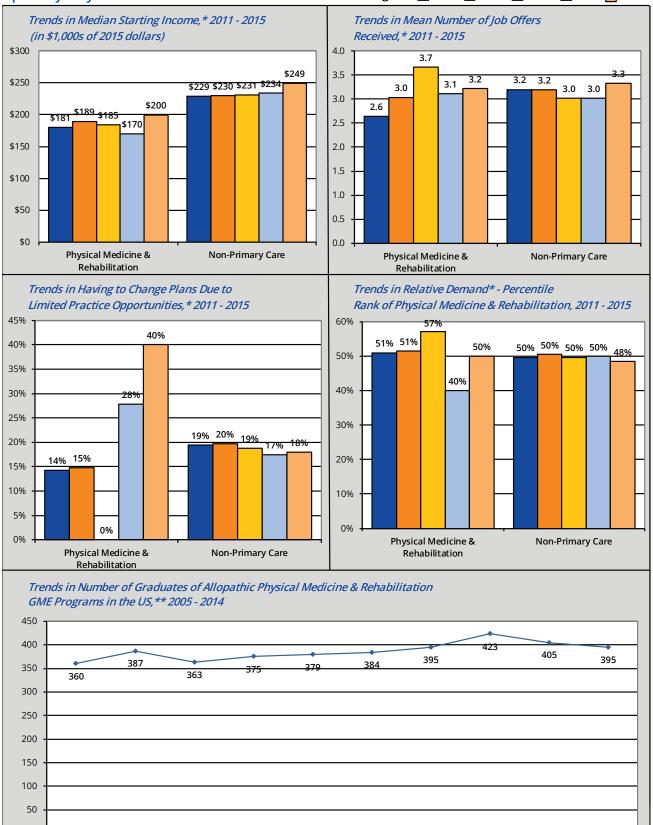
Legend: 2011 2012 2013 2014 2015



Number of responses: 2011: n = 49, 2012: n = 46, 2013: n = 50, 2014: n = 54, 2015: n = 56. \*Source: CHWS, Survey of Residents Completing Training in New York, 2011 - 2015. \*\*Source: JAMA Medical Education Issues , 2005 - 2014.

#### **Specialty: Physical Medicine & Rehabilitation**

#### Legend: 2011 2012 2013 2014 2015



Number of responses: 2011: n = 16, 2012: n = 28, 2013: n = 16, 2014: n = 19, 2015: n = 15. \*Source: CHWS, Survey of Residents Completing Training in New York, 2011 - 2015. \*\*Source: *JAMA Medical Education Issues*, 2005 - 2014.

# Appendix A

### METHODOLOGY USED TO MEASURE RELATIVE DEMAND

The Resident Exit Survey cannot be used to determine *absolute* demand for new physicians in different specialties (ie, it cannot be used to determine the number of physicians necessary to serve a given population). However, by analyzing several questions pertaining to job market experiences and perceptions of new physicians and comparing responses over time, in different geographical locations, and between specialties, it is possible to assess whether respondents from certain specialties or in certain locations are finding more or fewer practice opportunities (ie, it measures *relative* demand).

The implication is that while a specialty, such as pathology, may be in low demand relative to other specialties in an absolute sense, there may still be good opportunities for pathologists, but not as good or as many as another specialist that is seeing higher demand (such as child and adolescent psychiatry). In addition, it is not possible to measure the magnitude of the difference in demand between different specialties. So, if the percentile rank of general internal medicine in New York in 2015 was 91% (ie, general internal medicine had a relative rank equal to or better than 91% of the 34 specialties that were ranked), and the percentile rank of pain management was 32%, this *does not* imply that demand for general internal medicine was more than twice as strong as for pain management. The scale is at the ordinal level of measurement.

To measure demand for a given year, a composite score was computed by taking the median of the ranks (ie, where each specialty stood relative to all 35 specialties) scored by each specialty on each of the demand indicators for data from the previous 4 years of the survey. Data from more recent years of the survey received a greater weight than data from earlier years. For example, when calculating the demand score for 2015, data from 2015 were weighted .40, data from 2014 were weighted .30, data from 2013 were weighted .20, and data from 2012 were weighted .10. The following variables were used as indicators of demand:

- Percentage of respondents having difficulty finding a satisfactory practice position
- Percentage of respondents having to change plans due to limited practice opportunities
- Mean number of job offers received by respondents
- Respondents' mean Likert score summarizing their assessment of the regional job market
- Respondents' mean Likert score summarizing their assessment of the national job market
- Trend (ie, average annual change) in median starting income

None of these indicators used alone will provide a perfect picture of demand. However, considered together, they provide a good picture of relative demand by specialty. There was a high degree of correlation between the "percentage of respondents with difficulty finding a satisfactory practice position" variable and the "percentage of respondents having to change plans due to limited practice opportunities" variable (ie, a respondent reporting "difficulty..." was much more likely to also report "having to change plans..."). There was also a high degree of correlation between respondents' assessments of the "regional job market" and the "national job market." To compensate for these observed correlations, the "job offers" variable and the "trends in starting income" variable were each double weighted in computing a composite demand score.

Table 1 summarizes the rank of each specialty (ranked among 34 specialties) on each demand indicator. The variables are:

- Difficulty: Rank of each specialty based on the percentage of respondents reporting difficulty finding a satisfactory practice position → eg, the specialty with the lowest percentage of respondents reporting difficulty (emergency medicine) ranked #1 and the specialty with the highest percentage of respondents reporting difficulty (pathology) ranked #34.
- Change Plans: Rank of each specialty based on the percentage of respondents that had to change plans due to practice opportunities → eg, the specialty with the lowest percentage of respondents having to change plans (adult psychiatry) ranked #1 and the specialty with the highest percentage of respondents reporting difficulty (pathology) ranked #34.
- Job Offers: Rank of each specialty in terms of the mean number of job offers received by respondents (this variable was double weighted in computing the overall demand score) → eg, the specialty with the most job offers (general internal medicine) ranked #1 and the specialty with the fewest job offers (plastic surgery) ranked #34.
- Regional Market: Rank of each specialty in terms of the mean Likert score summarizing respondents' assessments of the regional job market for their specialty → eg, the specialty with the most positive assessment of the regional job market (emergency medicine) ranked #1 and the specialty with the least positive assessment of the regional job market (pathology) ranked #34.
- National Market: Rank of each specialty in terms of the mean Likert score summarizing respondents' assessments of the national job market for their specialty → eg, the specialty with the most positive assessment of the national job market (adult psychology) ranked #1 and the specialty with the least positive assessment of the national job market (pathology) ranked #34.

Income Trend: Rank of each specialty in terms the average annual change (or trend) in median starting income levels of respondents from each specialty → eg, the specialty with the strongest trend in median starting income (general surgery) ranked #1 and the specialty with the weakest trend in median starting income (cardio-thoracic) ranked #34.

Chocialty	Difficultur	Change Plans	Job Offerre <sup>®</sup>	Regional	National	Income	Median	Overall	Percentile Rank <sup>b</sup>
Specialty	Difficulty	Plans	Offers <sup>a</sup>	Market	Market	Trends <sup>a</sup>	Rank	Rank	Rank
Family Medicine	4	11	2	3	3	20	3.5	1.0	100%
General Internal Medicine	7	10	1	6	6	16	6.5	4.0	91%
General Pediatrics	8	8	24	7	13	27	18.5	19.0	47%
Internal Medicine and Pediatrics (Combined)	2	4	10	10	18	33	10.0	8.0	79%
Ob/Gyn	13	16	15	9	11	18	15.0	13.0	65%
Cardiology	23	25	19	29	29	30	27.0	28.0	21%
Critical Care Med	17	6	6	19	10	7	7.0	6.0	85%
Endocrinology and Metabolism	24	20	13	12	14	23	17.0	16.0	56%
Gastroenterology	20	22	14	15	16	17	16.5	15.0	59%
Geriatrics	12	13	7	13	15	12	12.0	9.0	76%
Hematology/Oncology	27	29	17	27	21	9	19.0	20.0	44%
Infectious Disease	28	23	27	30	31	3	27.0	28.0	21%
Nephrology	26	30	11	26	30	14	20.0	23.0	35%
Pulmonary Disease	25	24	8	22	9	19	19.0	20.0	44%
Rheumatology	30	33	20	25	25	21	23.0	25.0	29%
General Surgery	3	28	26	20	8	4	14.0	11.0	71%
Neurosurgery	14	9	23	28	17	34	23.0	25.0	29%
Ophthalmology	11	18	32	17	23	1	17.5	17.0	53%
Orthopedic	16	15	25	23	24	11	19.5	22.0	38%
Otolaryngology	19	3	12	11	19	26	15.5	14.0	62%
Cardio-Thoracic Surg	31	12	31	33	32	2	31.0	32.0	9%
Urology	15	17	16	14	12	5	14.5	12.0	68%
Anesthesiology	9	19	29	16	26	24	24.0	27.0	24%
Pain Management	21	14	22	21	22	29	22.0	24.0	32%
Pathology	34	34	34	34	34	32	34.0	34.0	3%
Radiology	33	31	33	32	33	28	32.5	33.0	6%
Adult Psychiatry	5	2	4	2	1	31	4.0	3.0	94%
Child and Adolescent Psychiatry	18	21	9	4	5	6	7.5	7.0	82%
Allergy and Immunology	32	32	28	24	27	13	27.5	31.0	12%
Dermatology	6	7	3	5	7	25	6.5	4.0	91%
Emergency Medicine	1	1	5	1	2	8	3.5	1.0	100%
Neurology	10	5	21	8	4	15	12.5	10.0	74%
Pediatric Subspecialties	22	26	30	31	28	22	27.0	28.0	21%
Physical Medicine and Rehabilitation	29	27	18	18	20	10	18.0	18.0	50%

#### Table 1. Summary of Ranks and Demand Indicators

<sup>a</sup> The job offers variable and the income trend variable were each double weighted in computing the median rank. <sup>b</sup> The percentile rank is the percentage of all 34 specialties with a median demand rank equal to or lower than each specialty.

# The following example illustrates how the demand score was calculated for General Internal Medicine in New York in 2015:

Median Rank<sub>GIM</sub> = median (difficulty, change plans, job offers, job offers, regional market, national market, income trends, income trends)

Median Rank<sub>GIM</sub> = median (7, 10, 1, 1, 6, 6, 16, 16)

Median Rank<sub>GIM</sub> = 6.5

With a median rank of 6.5, General Internal Medicine ranked 4th out of 34 specialties.

The *percentile rank* is computed as:

%rank<sub>GIM</sub> = { 1 – (RankGIM / #Specs) + (1 / #Specs) }

"#Specs" = the number of specialties being ranked

In New York in 2014, there were 34 specialties being ranked, so the percentile rank of General Internal Medicine is:

%rank<sub>GIM</sub> = { 1 - (4 / 34) + (1 / 34) } = **91%**.

# Appendix B

## SPECIALTY COMPARISON GROUPS

Specialty	Comparison Group <sup>a</sup>			
Family Medicine	Primary Care			
General Internal Medicine	Primary Care			
General Pediatrics	Primary Care			
Internal Medicine and Pediatrics (Combined)	Primary Care			
Obstetrics/Gynecology	Non-Primary Care			
Cardiology	Medicine Subspecialties			
Critical Care Medicine	Medicine Subspecialties			
Endocrinology and Metabolism	Medicine Subspecialties			
Gastroenterology	Medicine Subspecialties			
Geriatrics	Medicine Subspecialties			
Hematology/Oncology	Medicine Subspecialties			
Infectious Disease	Medicine Subspecialties			
Nephrology	Medicine Subspecialties			
Pulmonary Disease	Medicine Subspecialties			
Rheumatology	Medicine Subspecialties			
General Surgery	Non-Primary Care			
Neurosurgery	Surgical Subspecialties			
Ophthalmology	Surgical Subspecialties			
Orthopedic Surgery	Surgical Subspecialties			
Otolaryngology	Surgical Subspecialties			
Cardio-Thoracic Surgery	Surgical Subspecialties			
Urology	Surgical Subspecialties			
Anesthesiology	Non-Primary Care			
Pain Management	Non-Primary Care			
Pathology	Non-Primary Care			
Radiology	Non-Primary Care			
Adult Psychiatry	Non-Primary Care			
Child and Adolescent Psychiatry	Non-Primary Care			
Allergy and Immunology	Non-Primary Care			
Dermatology	Non-Primary Care			
Emergency Medicine	Non-Primary Care			
Neurology	Non-Primary Care			
Pediatric Subspecialties	Non-Primary Care			
Physical Medicine and Rehabilitation	Non-Primary Care			

<sup>a</sup> In each specialty profile, statistics for the specialty are presented next to the average of all specialties in the group to which the specialty belongs (ie, the comparison group). As an example, the starting median of family practice is compared to the median starting income of all primary care. Likewise, the relative demand (or percentile rank) of cardiology is compared against the average percentile rank of all medicine subspecialties. Appendix C

### NY RESIDENT EXIT SURVEY INSTRUMENT

<ul> <li>Use a No. 2 pencil or blue or black ink pen only.</li> <li>Do not use pens with ink</li> </ul>	Survey of Resid	Center versity a 1 Ur	for Heal It Albany niversity	leting th Workfo 7, School Place / S NY 1214	orce Stu of Publ uite 22	idies ic Hea 0		n 2015	
<ul> <li>that soaks</li> <li>through the paper.</li> <li>Make solid</li> </ul>	ACGME Residency Program #	-				-		For Of	
marks that fill the oval completely. Make no stray	This question residency/fellows training positions,	nip traini							
marks on this form. Do not fold,	LAST NAME								
Z tear, or mutilate this form.	FIRST NAME Main Hospital at								'
	Which You Did – Your Training:								
	For each question <i>m</i>	ark on	ly one a	<b>answer</b> u	nless o	otherv	vise dire	cted.	
A. BACKGRO	DUND		<b>B.</b> <i>M</i>	EDICAL	EDUC	ATIO	N AND <sup>-</sup>	<b>FRAININ</b>	G
1. Gender:	○ Male ○ Female		8	many tol you have	tal years e compl	s of po	st-graduat the (I.S.?	of training, left training, left training $\sqrt{5}$	will
	nip Status:	0							more
	<ul> <li>Native born U.S.</li> <li>Naturalized U.S.</li> <li>33</li> </ul>			9. Type of Medical Education: O Allopathic (M.D.) O Osteopathic (D.O.)					)
🔿 Perma	nent resident	44	10						
	I-2, H-3 Temporary worker 2 Exchange visitor	55 66	10.				ed: lete below)	) 🔿 Cana	ada
4. A. Are you of Hispanic/Latino origin?				O Other Specify i	state in t f in NY:	he U.S.		O Othe	
<mark>○ Ye</mark> s B. What	is your race? (mark all that apply)	9		<ul><li>○ Albany</li><li>○ Albert</li></ul>			ie Med of Yesł	niva Univ	
O Am	nerican Indian/Alaska Native						l of Phys an		
	an or Pacific Islander ck/African American			O Horstra			School of <i>I</i> dicine	viedicine	
				O New Y	ork Colle	ege of C	steo Med a		
0 Oth	ner			O New Y O New Y			ege (Valhal :h of Med	lla)	
	best describes your current			O Stony	Brook Un	niv Med	Ctr Sch of I		
	onship status? w Married						ed & Biome Ctr Col of <i>N</i>		
O In L	.ong-term Relationship			O Touro	College o	of Osteo	opathic Me		
	orce/Separated (Skip to 6) ver Married/Single (Skip to 6)			O Univer			rsity, SUNY		
B. If curr	ently married or in a long-term			O Weill (					
relatio O Yes	onship, is your partner also a phy No Question does not		11	What is v	VOUT CUT	rrent le	vel of edu	cational de	•bt?
				O None			○ \$150,0	00–\$174,999	9
6. Do you l ○ Yes	nave any dependent children?			○ Less th ○ \$25,00				00—\$199,999 00—\$224,999	
				<ul><li>○ \$20,00</li><li>○ \$50,00</li></ul>				00-\$249,999 00-\$249,999	
7. Where d high sch	id you live when you graduated t ool?	rom		<ul><li>○ \$75,00</li><li>○ \$100,0</li></ul>				00—\$274,999 00—\$299,999	
O New )				O \$100,0 O \$125,0				00–\$299,999 00 and over	
○ Other	U.S. O Other country			,		·	inue		
	000000000000000000000000000000000000000		0000	0000			SERIAL	#	
	PLEASE DO NOT WRITE								•

14. If you are going on for additional
training/fellowship, please answer the followi
A. Why are you subspecializing/continuing
training? (mark all that apply)
O To further your medical education
<ul> <li>Unable to find a job you are happy with</li> </ul>
O Unable to find <u>any</u> job
O To stay in the U.S. (i.e., due to visa status)
O Other (specify):
<ul> <li>Always intended to subspecialize</li> </ul>
Question does not apply
B. If you are leaving NY to continue your
training, do you plan to return to NY to
practice when your training is complete?
○ Yes ○ Don't know yet
O No O Question does not apply
-
15. In your upcoming position, how many hour
per week do you expect to spend in each of
the following activities?
None 1-9 10-19 20-29 30-39 40-49 50-59
Direct patient care O O O O O O
_ Research OOOOOO
Teaching OOOOOO
Administration O O O O O O
Volunteering/Community
-
16. Where is the location of your primary activity
after completing your current training positi
<ul> <li>Same city/county as current training</li> </ul>
O Same region within NY, but different city/coun
O Other area within NY
O Other state
Outside the U.S.
○ Don't know yet
-

18. How important is it for you to have control over the following job characteristics:

	Not important at all	Of little importance	Important	Very important
Predictable start and en	d			
time each workday	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$
Length of each workday	$\prime$ O	$\bigcirc$	$\bigcirc$	$\bigcirc$
Frequency of				
overnight calls	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$
Frequency of weekend duties	$\bigcirc$	0	0	0

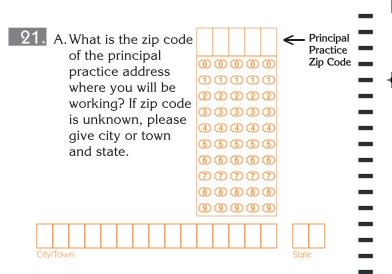
- 19. If you are planning to enter or have considered entering patient care/clinical practice:
  - A. Have you actively searched for a job?
    - O Yes
    - O No, not yet
    - No, I will be self-employed
  - B. Have you been offered a job?
    - Yes, and I have accepted an offer
    - $\bigcirc$  Yes, but I declined the offer(s) and am still searching (Skip to Question 27)
    - O No, but I have not actively searched yet (Skip to Question 27)
    - No, I have not yet been offered a practice position (Skip to Question 27)

#### **D. PRACTICE PLANS**

#### If you have accepted a position in patient care/clinical practice please answer the following questions, if not, skip to Question 27.

20. Which best describes the type of patient care practice you will be entering?

Principal <u>Practice Setting</u> (mark only one)	Secondary <u>Practice Setting(s)</u> (mark all that apply)
Ö	ÓSolo practice
0	OPartnership (2 people)
0	O Group practice (owner/partner)
0	O Group practice (employee)
0	OHospital—Inpatient
Ο	OHospital—Ambulatory care
Ο	OHospital—Emergency room
Ο	
Ο	Nursing home
0	O Other:



- B. Is this principal practice address located in a federally designed Health Professional Shortage Area? ○ Yes ○ No ○ I don't know
- C. If you are not going to practice in New York, please indicate the reasons why. In the first column, indicate all of the reasons why (mark all that apply). In the second column, indicate the main reason why (mark only one).

A 11

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Practice Reasons	All <u>Reasons</u> (mark all that apply)	Main <u>Reason</u> (mark only one)
Overall lack of jobs/practice		
opportunities in New York	$\bigcirc$	$\bigcirc$
Better jobs/practice opportunities i	n	
desired locations outside New Y		$\bigcirc$
Better jobs/practice opportunities i		
practice setting (e.g., hospital, gr		
practice, etc.) outside New York	· 🔾	$\bigcirc$
Better jobs/practice opportunities		
outside New York that meet visa		
status requirements	$\bigcirc$	$\bigcirc$
Financial Reasons		
Better salary/compensation offered		
outside New York	$\bigcirc$	$\bigcirc$
Cost of malpractice insurance in		
New York	0	$\bigcirc$
Cost of establishing a medical prac		
in New York	$\bigcirc$	$\bigcirc$
Taxes in New York	0	0
Cost of living in New York	$\bigcirc$	$\bigcirc$
Personal Reasons		
Proximity to family	0	0
Better employment opportunities f		_
spouse/partner outside New Yor		0
Climate (e.g., weather)	$\bigcirc$	$\bigcirc$
Other Reasons		
Never intended to practice in		
New York	0	
Other reason:	_ 0	
contin	110	Page 3

22. How many years do you	u expect to b	oe at	<b>26.</b> What is your level of satisfaction with your			
your principal practice?			salary/compensation?			
$\bigcirc 1 \bigcirc 2 \bigcirc 3$	$\bigcirc 4 \bigcirc 5$	or more	○ Very dissatisfied ○ Somewhat satisfied			
23. Which best describes the	e demogran	hice of	<ul> <li>Somewhat dissatisfied</li> <li>Very satisfied</li> </ul>			
the area in which you w	vill be practic	rina?	E. EXPERIENCE IN JOB MARKET			
$\bigcirc$ Inner city	in be proceed					
O Other area within major	r city		(If you are going into patient care or have <u>considered</u> going into patient care, please			
O Suburban			complete the following.)			
O Small city (population I	ess than 50,00	0)				
⊂ Rural			27. A. Did you have difficulty finding a practice			
24. A.Please identify all of the incentives you			position you were satisfied with?			
received for accepting			○ Yes ○ No ○ Haven't looked yet			
(mark all that apply)			(Skip to Question #30)			
the most influential in		our decision				
to accept this practice	•	Most	B. If Yes, what would you say was the			
(mark only one).	Incentives	Influential	main reason? ( <u>mark only one</u> ) Overall lack of jobs/practice opportunities			
	Received	Incentive	<ul> <li>Overall lack of jobs/practice opportunities</li> <li>Lack of jobs/practice opportunities that meet visa</li> </ul>			
H-1 visa sponsorship	0	$\bigcirc$	status requirements			
J-1 visa waiver	$\bigcirc$	0	<ul> <li>Lack of jobs/practice opportunities in desired</li> </ul>			
Sign-on bonus	$\bigcirc$	$\bigcirc$	locations			
Income guarantees	0	0	Lack of jobs/practice opportunities in desired practice			
On-call payments Relocation allowances			setting (e.g., hospital, group practice, etc.)			
Spouse/Partner job transition assist		0	<ul> <li>Inadequate salary/compensation offered</li> <li>Lack of employment opportunities for spouse/partner</li> </ul>			
Support for maintenance of certific		<u> </u>	<ul> <li>Other (specify):</li> </ul>			
and continuing medical educat		$\bigcirc$				
Career development opportunitie	s O	$\bigcirc$	<b>28.</b> Did you have to change your plans			
Educational loan repayment	0	0	because of limited practice opportunities?			
Other, specify: None	_ 0	$\bigcirc$	$\bigcirc$ Yes $\bigcirc$ No $\bigcirc$ Haven't looked yet			
B. If you received any ind	centives, how	r	(Skip to Question #30)			
important were they in			29. How many offers for practice positions did			
accept this practice p	osition?		you receive ( <i>excluding fellowships, chief</i> residency, and other training positions)?			
○ Not at all important	O Importa					
O Of little importance	○ Very im	portant	$\bigcirc$ None $\bigcirc$ 1 $\bigcirc$ 2 $\bigcirc$ 3			
			○ 4 ○ 5 ○ 6–10 ○ Over 10			
25. Expected gross income	during first ye	ear of	30. What is your overall assessment of practice			
practice:	B. Anticipated	d Additional	opportunities in <b>your specialty, and within</b> <b>50 miles of the site where you trained?</b>			
A. <u>Base Salary/Income</u>	Incentive Ir	ncome				
○ Less than \$75,000	O None	- FE 000	O No jobs O Some jobs			
<pre>\$75,000-\$99,999</pre> \$124,999	<ul><li>○ Less tha</li><li>○ \$5,000-</li></ul>		<ul> <li>Very few jobs</li> <li>Many jobs</li> <li>Few jobs</li> <li>Unknown</li> </ul>			
○ \$100,000-\$124,999	<ul><li>○ \$5,000-</li><li>○ \$10,000</li></ul>					
○ \$150,000-\$174,999	○ \$15,000		31. What is your overall assessment of practice			
○ \$175,000-\$199,999	○ \$20,000	)—\$24,999	opportunities in your specialty nationally?			
○ \$200,000-\$224,999	○ \$25,000		🔿 No jobs 💦 🔿 Some jobs			
○ \$225,000-\$249,999	○ \$30,000		O Very few jobs O Many jobs			
<pre>\$250,000-\$274,999 \$275,000-\$299,999</pre>	<ul><li>\$35,000</li><li>\$40,000</li></ul>		O Few jobs O Unknown			
$\bigcirc$ \$275,000-\$299,999 $\bigcirc$ \$300,000-\$324,999	○ \$40,000					
○ \$325,000-\$349,999	○ \$50,000		THANK YOU FOR COMPLETING			
○ \$350,000-\$374,999	○ \$55,000	)—\$59,999	THIS IMPORTANT SURVEY.			
		) and over				
○ \$375,000 and over	$\bigcirc$ $\psi 00,000$					
	,					
Page 4. SCANTRON Mark Reflex	<sup>®</sup> EM-211568-17:654	321 ED99	CEDIAL #			
Page 4 SCANTRON Mark Reflex	<sup>®</sup> EM-211568-17:654	321 ED99	AREA SERIAL #			

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Dr. Armstrong oversees CHWS projects which monitor the supply and distribution of the health workforce in New York and other states. In collaboration with professional health organizations in the state, he also administers provider recruitment and retention surveys to monitorhealth workforce demand. Dr. Armstrong also is the director of the Health Workforce Technical Assistance Center, which provides technical assistance to individuals, hospitals, and various states and organizations.

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Mr. Liu specializes in data collection, analysis, and visualization, as well as relational database management, public policy research, and fi nancial analysis. He holds an MPA with concentrations in Statistics and Information Strategy and Management from the University at Albany, SUNY.



#### Gaetano J. Forte

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Mr. Forte is a veteran health services researcher having spent nearly 2 decades studying the health workforce. As Director of Operations, Mr. Forte oversees all research projects at CHWS, working with the project directors to ensure that research is conducted at the highest level of quality, in a timely manner, and in accordance with the agreements between CHWS and its funders.



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