Virginia's Physician Workforce: 2009-2010

Healthcare Workforce Data Center

March 2012

Virginia Department of Health Professions
Healthcare Workforce Data Center
Perimeter Center
9960 Mayland Drive, Suite 300
Richmond, Virginia 23233
804-367-2115, 804-527-4466(fax)
E-mail: hwdc@dhp.virginia.gov

Healthcare Workforce Data Center
Advisory Council

Jeffrey S. Cribbs, Sr., Chair	President & CEO Richmond Memorial Health Foundation
Christopher Bailey	Senior Vice President, Virginia Hospital and Healthcare Association
The Honorable George Barker	Senate of Virginia
Peter Blake	Vice Chancellor for Workforce Services Virginia Community College System
Arthur Garson, Jr., MD, MPH	Vice President and Provost University of Virginia
JoAnne Kirk Henry, EdD, RNC	Emerita Faculty Virginia Commonwealth University School of Nursing
Michael Jurgensen	Senior VP, Health Policy & Planning Medical Society of Virginia
Timothy O. Kestner, MLA	Economist, Virginia Employment Commission
Daniel G. LeBlanc	Senior Advisor to the Governor for Workforce
William L. Lukhard	Executive Council, AARP
P. J. Maddox	Professor and Chair, Health Administration and Policy George Mason University
Tod Massa	Director of Policy Research and Data Warehousing State Council of Higher Education in Virginia
Susan Motley, CEO	Virginia Nurses Association
The Honorable John O'Bannon, III	Virginia House of Delegates
Sandra Whitley Ryals	Director, Virginia Department of Health Professions
David C. Sarrett, DMD, MS	Program Director, Area Health Education Centers (AHEC) Associate Vice President for Health Sciences Virginia Commonwealth University
The Honorable Marilyn Tavenner	Secretary of Health and Human Resources
Kathy H. Wibberly, Ph.D.	Director, Division of Primary Care and Rural Health Office of Minority Health and Public Health Policy Virginia Department of Health

Physician Workforce Advisory Committee

Chair	Vacant
Sandra A. Bell	Board of Medicine Physician Member Pediatrician, Manchester Pediatric Associates, P.C.
Stephen Bowman, J.D., M.P.P.	Senior Staff Attorney/Methodologist Joint Commission on Health Care
Robin Clair Cummings	Assistant Director of Health Policy & Research Medical Society of Virginia
Arthur Garson, Jr., MD, MPH	Vice President and Provost University of Virginia
William L. Harp, MD	Executive Director, Virginia Board of Medicine
Aileen Edwards Harris	Healthcare Workforce and "Acting" Rural Health Manager Division of Primary Care and Rural Health Office of Minority Health & Public Health Policy Virginia Department of Health
Roger A. Hofford, M.D.	Program Director Carilion Clinic Family Medicine Residency
Michael T. Lundberg	Executive Director, Virginia Health Information (VHI)
Dixie Tooke-Rawlins, D.O.,	Virginia College of Osteopathic Medicine Dean, VCOM

Staff:

Dr. Elizabeth Carter, Ph.D. *Executive Director*	Justin Crow, MPA *Research Analyst*	Laura Chapman *Operations Manager*	Mike Gallini *Data Manager*

Table of Contents

Healthcare Workforce Data Center 1
HWDC Survey Timetable 1
Methodology and Limitations 2
The 2010 Physician Workforce Survey 2
The Survey Instrument 2
Data Quality 2
Virginia's Physician Licensees 3
Virginia's Physician Workforce 3
Demographics 4
Age & Gender 4
Diversity 4
Practice Characteristics 5
Board Certification 5
Physician Practice Type 5
Indicators of Future Physician Loss 6
Retirement Plans 6
Work Hours 6
Work hours by Gender 7
Future Plans 7
Physician Recruitment and Retention 8
Medical School 8
Residency Training 8
J-1 Visa Status 9
Physician Supply 10
Full Time Equivalency Units 10
Physician Location 11
Comparison to Other Data Sources 13
Age 14
Gender 14
Board Certification 15
Physician Location 15
Endnotes 17
Appendices 18
Appendix A: The 2010 Physician Workforce Survey 18
Appendix B: Available Data. 23
Appendix C: Methods and Definitions: 34
Appendix D: Detailed Board Certification Information 36
Appendix E: Physician Location 45
Appendix F: AMA Physician Masterfile Comparisons 49

Healthcare Workforce Data Center

Virginia's Healthcare Workforce Data Center (HWDC) collects and disseminates workforce information on Virginia's licensed healthcare practitioners. The 2007 report of the Governor's Health Reform Commission recommended that the HWDC be established within the Department of Health Professions (DHP) due to its existing repository of licensure information for over 80 professions. In the spring of 2008, HWDC was launched with Workforce Investment Act grant funding and continues with the support from the Department and shared grant funding from the U.S. Health Resources Services Administration on behalf of the new Virginia Health Workforce Development Authority and other partner organizations.

With significant input and collaborative effort from key stakeholders and experts, HWDC has developed initial supply and demand forecasts for physicians and nurses, published results from existing physician and nursing workforce surveys originally developed by the Board of Medicine and Board of Nursing, updated and launched revised surveys as well as developed new workforce surveys as listed in the "Current Collection" in the HWDC Survey Timetable below. Beginning in the fall of 2011, HWDC began development of pharmacy and dentistry surveys which are poised for rollout later this fiscal year. Also planned for the remainder of FY2012 and into FY2013, work will begin on the rehabilitative professions listed.

This is the first report of results of a new HWDC survey instrument; the HWDC Physician Workforce survey collected information on Medical Doctors and Doctors of Osteopathy licensed in Virginia. In addition to the licensure renewal surveys, a new survey has been developed for use with online licensure application. HWDC will continue to roll out new surveys as they are developed.

HWDC Survey Timetable

In Current Collection:

Medical Doctors
Doctors of Osteopathy
Registered Nurses and Licensed Practical Nurses
Certified Nurse Aides
Physician Assistants
Nurse Practitioners
Licensed Professional Counselors
Clinical Psychologists
Licensed Clinical Social Workers

Projected 2011 Rollout:

Pharmacists
Pharmacy Technicians
Dentists
Dental Hygienists

Proposed:

Physical Therapists
Physical Therapy Assistants
Occupational Therapists
Occupational Therapy Assistants
Speech-Language pathologists
Audiologists

Methodology and Limitations

The 2010 Physician Workforce Survey

The Healthcare Workforce Data Center integrates its surveys into the online licensing process of individual regulatory Boards. For the 2010 renewal period, the Board of Medicine offered online licensing to renewing physicians only. New Virginia licensees and those returning from a long absence did not have access to the online survey.[1] Additionally, paper renewals were available. The survey was not offered to residents. Physicians renew biennially during the even year of each biennium. This survey was conducted during the 2010 renewal period and includes some renewals as early as December 9, 2009 and as late as March 11, 2011.

The Survey Instrument

The Department of Health Professions' Data Division administers the survey using online licensure software. The licensing software lacks much of the functionality of commercial survey software (e.g., skip logic, numeric field limits, and visual appeal). For some questions, open fields were used when seeking numeric information (e.g., hours worked), limiting the usefulness of the data received. The fact that the survey is integrated into the licensing process does not allow live beta testing. Overall, the survey instrument needs improvement. The HWDC continues to improve its processes, instruments and research products.

Data Quality

The survey's population is all licensees in Virginia. From this population, we are particularly interested in the population of physicians in Virginia-Virginia's physician workforce. Our sample is a convenience sample of physicians who choose to renew online. This sampling methodology excludes all new licensees. This creates a two year lag in incorporating new physicians into the results. The methodology also excludes physicians who choose to renew using paper renewals. These physicians may be older, less technologically savvy or, importantly, lack access to high speed internet (e.g., rural physicians).

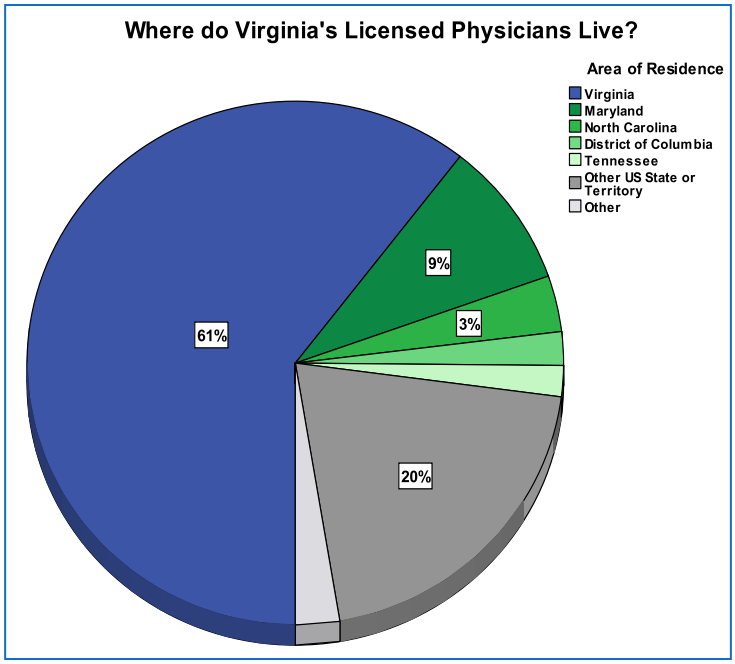
Statistic	Count
Renewing Physicians, 2010	30,381
New Licensees, 2009-2010 Biennium	5,359
New Physicians + Renewing Physicians	35,740
Completed Surveys	26,266
Response Rate, All Physicians	73.5%
Response Rate, Renewing Physicians	86.5%

The survey did not include questions related to practice location. To determine Virginia's Physician population (i.e., those physicians practicing in Virginia or who could readily practice in Virginia) and other information, we relied on the Board of Medicine's Online Physician Profile and the Address of Record in our licensee database. Although physicians must maintain their Physician Profile, they update the profile on their own initiative and some information may be out of date. Additionally, some physicians may have changed their information since completing the survey.

Physicians completed surveys over a period longer than one year. Physicians may change perspectives, practice location or work status in response to environmental changes during the course of a year. In particular, questions related to work hours and future work expectations may have been affected by the volatile economic climate that persisted throughout the renewal period. Overall, we received a high response rate of almost 87 percent from renewing physicians, and almost three quarters of all licensees, both new and renewing. Missing data is a concern for some questions. Information related to missing data is included in Appendix B: Available Data.

Virginia's Physician Licensees

Not all of Virginia's licensed physicians live or work in the state. Physicians maintain licenses in state for a variety of reasons. Physicians serving in the military or working for the Federal government must maintain a license, but may do so in any state. Almost nine percent of licensees report primary practice in the military or Department of Defense and an over two percent report primary practice in a Veteran's Administration facility. Retired physicians may maintain their licenses for prestige or occasional practice. Almost three percent of licensees report being retired or inactive in medicine. Physicians may consult or occasionally travel to Virginia to care for their patients, particularly physicians practicing in Virginia's border jurisdictions.



Almost 61 percent of licensees reside in Virginia. Almost 18 percent reside in one of Virginia's five border states or the District of Columbia. More than half of these are associated with Northern Virginia, in either DC or Maryland. Twenty percent live in some other US State or territory.

Virginia's Physician Workforce

The remainder of this report will focus on Virginia's physician workforce. The physician workforce consists of physicians who reported practicing or working and who listed a practice location in Virginia in their physician profile. If no practice location was available, the licensees' address of record or indicated state of residence was used as a proxy. Fewer than one percent of respondents (223 of the 26,265 respondents) failed to answer both of the relevant questions on work hours or practice status. These physicians were excluded from Virginia's physician workforce. Using this methodology, the HWDC identified 15,453 respondents in the physician workforce. Using simple proportional extrapolation, and assuming that all licensees resemble survey respondents, we estimate Virginia's physician workforce included approximately 19,500 to 21,500 physicians on June 30, 2010. New Virginia licensees likely participate in Virginia's physician workforce at a higher rate, so we feel this figure is conservative.

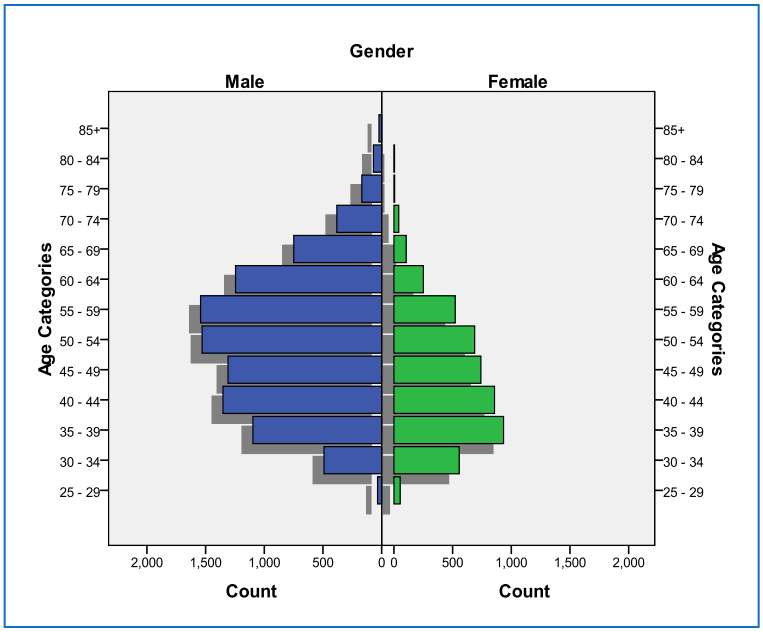
This methodology is different than the methodology the HWDC used in its previous report. Prior reports examined *location only*. The new methodology considers *workforce participation* as well and excludes those who are not likely to provide physician services now and in the future. Additionally, the new survey included a question on state of residence which provides a more accurate indication of residency than address of record. Nevertheless, the HWDC inferred practice locations from multiple sources, some of them external. This does not provide a sound basis for statistical estimates. Rather, it allows us to examine the characteristics of physicians who are likely part of Virginia's physician workforce. The next iteration of the survey will include direct questions about practice location and workforce participation. This will allow a more accurate count of Virginia's workforce and support statistical estimation techniques.

Demographics

Age & Gender

The median age of the Virginia's physician workforce, as of June 30, 2010 was 49, matching the median age of physicians nationally. For both the nation as a whole and the Commonwealth of Virginia, the median age of the civilian labor force is 42 years of age.[2] Over a third of physicians were age 55 and over, the point where total work and patient care hours begins to decline. Another 29 percent were age 45 to 54. The survey excludes residents and new physicians, so the physicians workforce is likely younger than the survey results indicate.

Over two-thirds of Virginia's physicians were male, compared to only 49 percent of Virginia's population. Women, however, are beginning to make up a greater share of the physician workforce. Among physicians under age 35, female physicians outnumbered male physicians. In the 30 to 34 year age cohort, women make up 53 percent of the physician workforce.



Diversity[3]

Combined, non-Hispanic Whites and Asians and Pacific Islanders made up 85 percent of Virginia's physician workforce in 2010. Non-Hispanic Whites are slightly overrepresented in Virginia's physician workforce. Asians and Pacific Islanders made up 15 percent of the physician workforce but only 6 percent of Virginia's population. Hispanics and non-Hispanic Blacks are both underrepresented in the physician workforce.

Unlike with gender, underrepresented groups are not making significant gains in younger cohorts. Among physicians in their thirties, only Asians and Pacific Islanders had significant proportional growth, accounting for 22 percent of this cohort. Non-Hispanic Whites switched from slightly over represented to slightly underrepresented and non-Hispanic Blacks and Hispanics remain underrepresented.

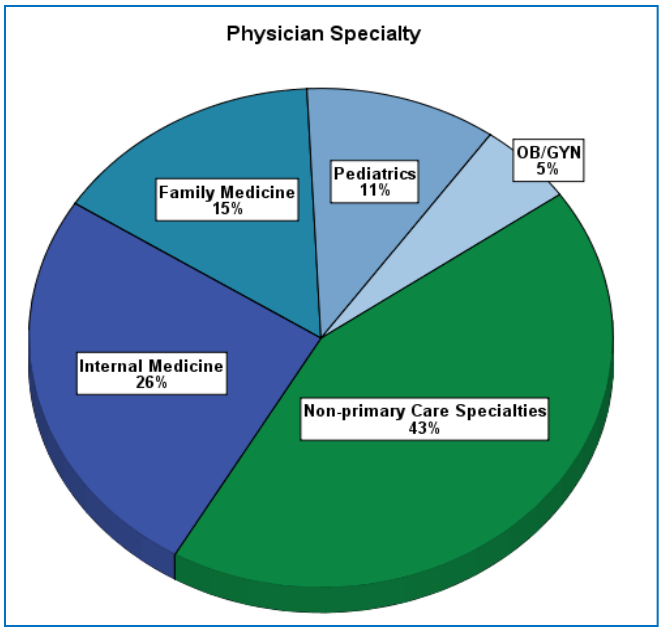
Race/ Ethnicity	2010 Virginia Population		Virginia Physicians		Virginia Physicians Age 30 to 39	
	Count	%	Count	%	Count	%
White, non-Hispanic	5186450	65%	9994	70%	1772	60%
Black, non-Hispanic	1523704	19%	984	7%	251	8%
Hispanic of any race	631825	8%	375	3%	68	2%
Asian or Pacific Islander	441359	6%	2166	15%	652	22%
Native American or Alaskan Native	20679	0%	37	0%	7	0%
Other Race	15338	0%	656	5%	176	6%
Two or more races	181669	2%	151	1%	43	1%

Practice Characteristics

Board Certification

Virginia licenses both Doctors of Osteopathy (DO's) and Medical Doctors (MDs). Medical Doctors accounted for 95.6 percent of Virginia's physician workforce in 2010 and Doctor's of Osteopathy accounted for the other 4.4 percent.

Almost 85 percent of physicians are Board-certified by one of the member Boards of the American Board of Medical Specialties. Of these, over half are Board-certified in a primary care related field. Some of these practitioners, however, may not practice primary care or have additional non-primary care specialties. An additional 25 percent of Virginia's physicians listed a second Board-certification, either as a subspecialty or in another field. Fewer than five percent listed three or more specialty or sub-specialty certifications. Less than 1.4 percent of respondents reported Board-certification in one of the geriatric subspecialties. Detailed information on physician specialty appears in Appendix D.



Physician Practice Type

About a third of Virginia's physicians' primary practice locations are part of group practices. Another 15 percent are solo practices. Almost a quarter locate their primary practices hospitals. A little over 5 percent of Virginia's physicians list primary practices in a medical school. The proportions are roughly equivalent across secondary and tertiary practices.

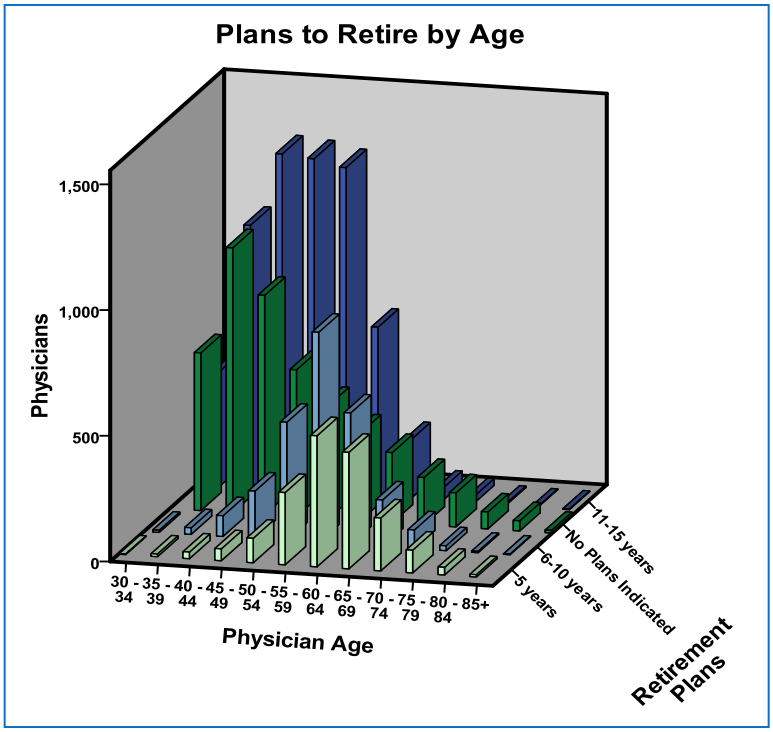
Practice Type	Primary Practice Type		Secondary Practice Type		Tertiary Practice Type	
	#	%	#	%	#	%
Solo	1916	15.2%	318	12.0%	96	11.4%
Group	4221	33.4%	930	35.1%	265	31.4%
FQHC	305	2.4%	40	1.5%	16	1.9%
Free Clinic	84	0.7%	55	2.1%	21	2.5%
Urgent Care Clinic	222	1.8%	80	3.0%	16	1.9%
Group/ Staff model HMO	340	2.7%	43	1.6%	22	2.6%
Insurance	12	0.1%	2	0.1%	0	0.0%
Hospital-Outpatient	645	5.1%	163	6.2%	38	4.5%
Hospital-Emergency	717	5.7%	111	4.2%	28	3.3%
Hospital-Inpatient	987	7.8%	217	8.2%	63	7.5%
Hospital-Other	619	4.9%	101	3.8%	30	3.6%
Long-term care	72	0.6%	45	1.7%	23	2.7%
State local govt	115	0.9%	23	0.9%	10	1.2%
Mental Facility	188	1.5%	64	2.4%	16	1.9%
Corrections	53	0.4%	28	1.1%	11	1.3%
Medical School	658	5.2%	57	2.2%	22	2.6%
Military	539	4.3%	21	0.8%	11	1.3%
VA	232	1.8%	41	1.5%	14	1.7%
Locum Tenens	65	0.5%	23	0.9%	11	1.3%
Other	652	5.2%	286	10.8%	132	15.6%
Total	12642	100.0%	2648	100.0%	845	100.0%
Missing	2811		12805		14608	

Indicators of Future Physician Loss

Retirement Plans

Almost 70 percent of Virginia's physicians indicated plans to retire within the next 15 years. This figure includes over 40 percent of physicians age 30 to 34 and almost half of physicians age 35 to 39, most of whom indicate retirement in ten to fifteen years.

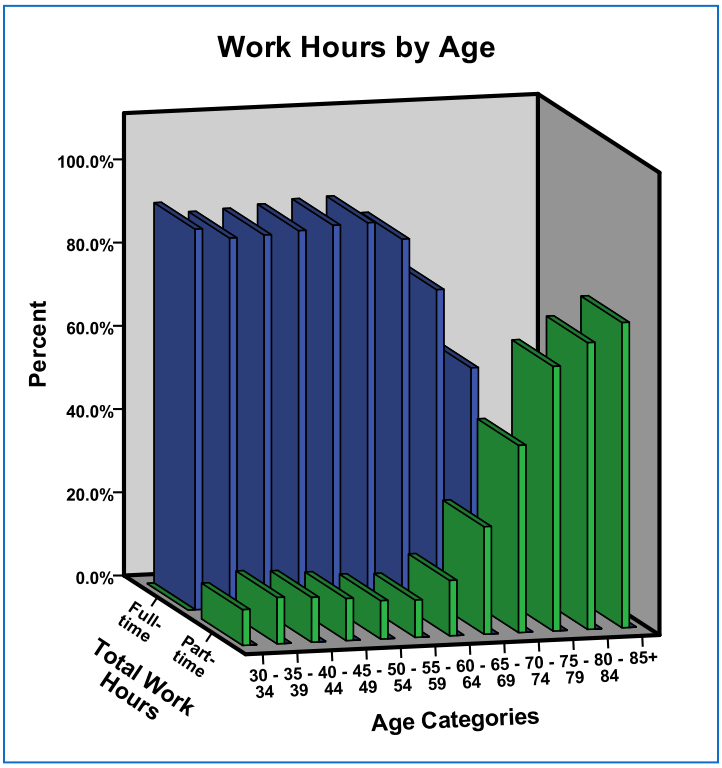
Almost 12 percent of physicians indicate plans to retire within five years, 90 percent of whom are age 55 or over. An additional 16 percent indicate plans to retire within the next 6 to 10 years. Ninety percent of these are over age 50. Of those physicians over the median age of 49, (age 50 and up), a full 80 percent intend to retire within in the next 15 years.



Work Hours

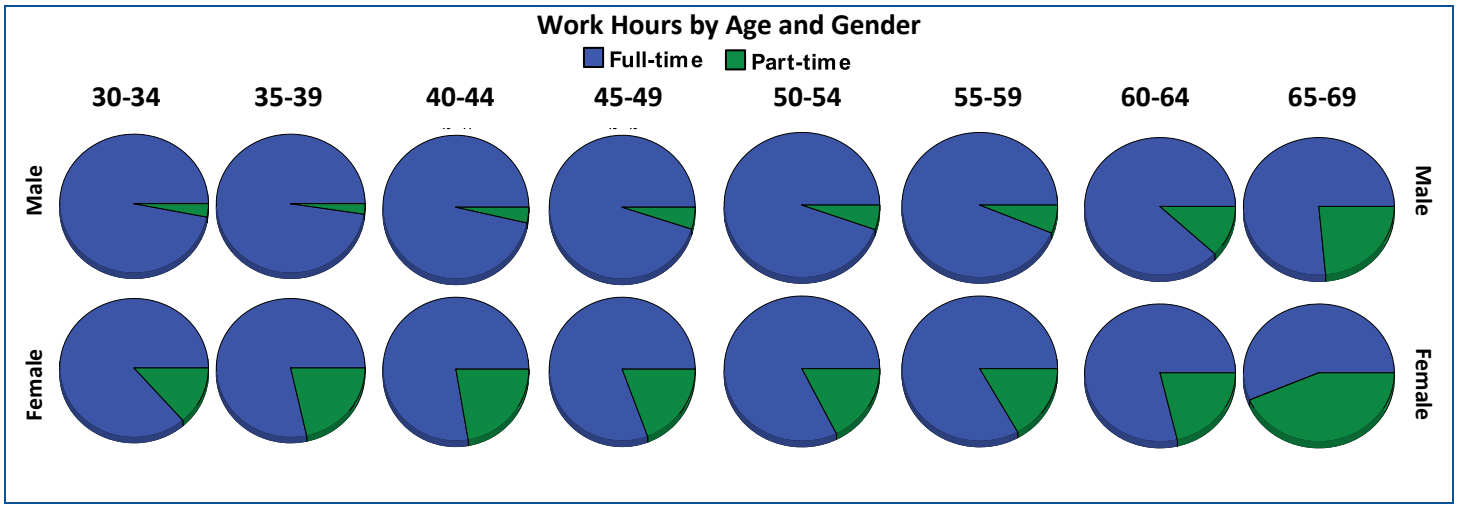
Age Category	Full Time Participation	
	2008	2010
30-34	91.1%	91.4%
35-39	89.1%	88.9%
40-44	90.0%	89.2%
45-49	91.9%	89.9%
50-54	93.0%	90.8%
55-59	90.0%	91.0%
60-64	84.1%	86.7%
65-69	67.6%	74.2%
70-74	45.9%	55.0%
75-79	29.9%	36.4%

Approximately 90 percent of Virginia's physicians who reported work hours reported working full-time, defined as 30 or more hours per week. Full-time participation peaked in the age 55-59 category at 91 percent full-time participation and declined sharply thereafter. In 2008, full-time participation peaked in the 50-54 age category at 93 percent and had begun to decline with the 55-59 age group. For the 2010 survey, full-time participation in all age groups above the 55-59 age group tracked higher than in 2008. The recession and the loss of retirement wealth are likely drivers of older physicians working more hours. However, it will be interesting to see if elevated levels of full-time participation among older physicians persist as baby-boomers enter retirement.



Work hours by Gender

Work participation varies by gender for all age categories below age 70, with more male physicians tending to work full-time than their female counterparts. Statistical tests indicate that the variation is meaningful for these age categories. Overall, about nine percent of male physicians in Virginia's workforce worked part-time in 2010, compared to 20 percent of female physicians.

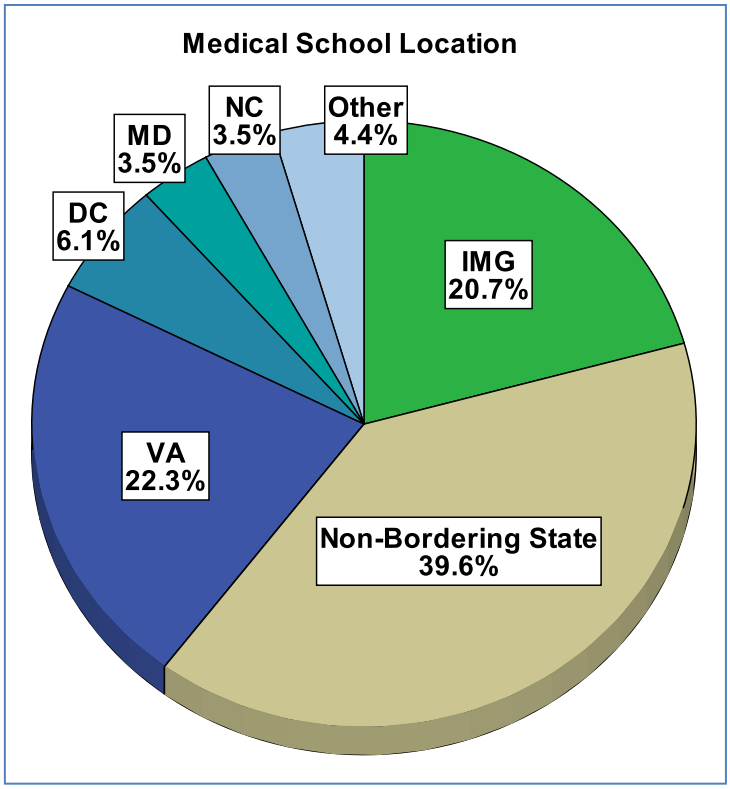


Future Plans

The survey asked physicians about their plans for the next 24 months (in real times, from the date the survey was taken through the same date in 2012). Almost two percent planned to move their practice out of state, almost five percent plan to significantly decrease hours working in patient care and two percent plan to retire from patient care entirely.

Medical School

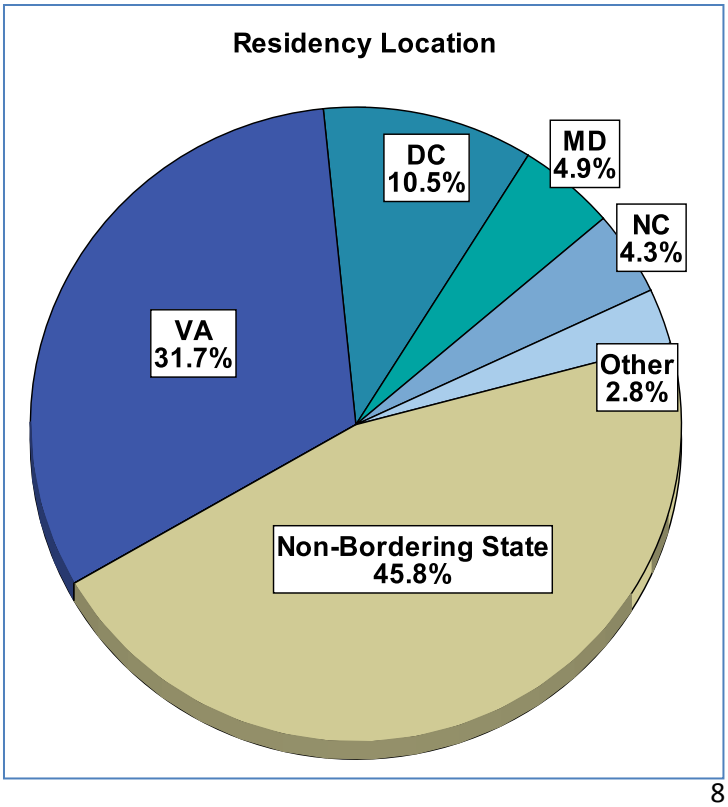
About 22 percent of Virginia's physician workforce graduated from medical schools in Virginia. Of these, over half graduated from the Virginia Commonwealth University School of Medicine (previously MCV) and almost one third from the University of Virginia School of Medicine. Most of the remainder graduated from Eastern Virginia Medical School. Seven members of Virginia's physician workforce graduated from the Edward Via Virginia College of Osteopathic Medicine. This school graduated its first class in 2007 and many graduates may be among the residents and new applicants that did not have access to the survey.



International Medical Graduates account for about 21 percent of Virginia's physician workforce, including one half of one percent who graduated from medical school in Canada. About 17.5 percent graduated from medical school in one of Virginia's five border states or the District of Columbia. Of these, a third graduated from schools in the District of Columbia, and twenty percent graduated from both Maryland and North Carolina. The remainder-almost 40 percent- graduated from medical schools in another US state. The top five non-border states are Pennsylvania (6.5%), New York (6.1%), Ohio (2.7%), Illinois (2.2%) and Texas (2.0%).

Residency Training

About one third of Virginia's physicians report completing their most recent residency in Virginia. Another 22 percent completed their residency in one of Virginia's border jurisdictions. Of these, almost half completed residencies in the District of Columbia, about 22 percent in Maryland and 19 percent in North Carolina.



Combined, almost 13 percent of Virginia's physicians completed both medical school and residencies in Virginia. An additional 41 percent completed either medical school or a residency in Virginia. A little over 26 percent completed both medical school and residency in Virginia or Virginia's border jurisdictions. Almost three quarters of Virginia's physicians completed either medical school or residencies in Virginia or one its border jurisdictions.

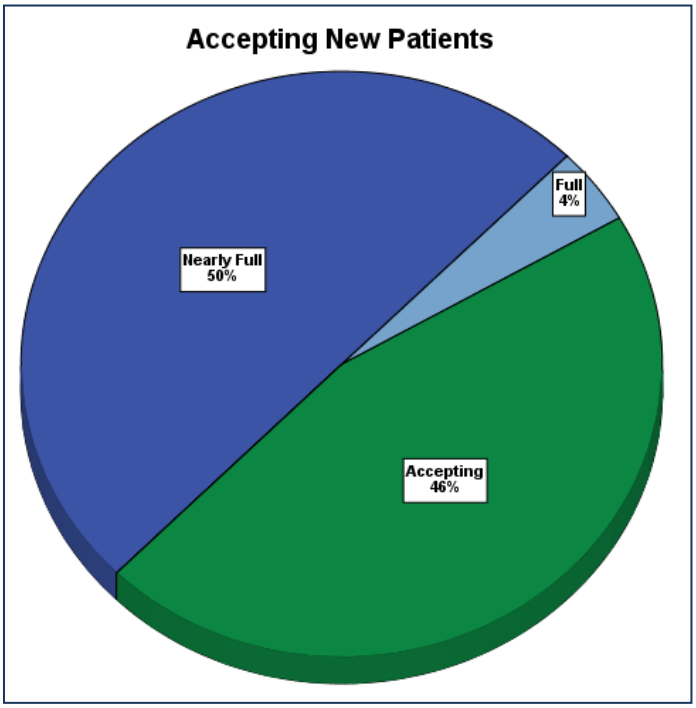
J-1 Visa Status

Foreign physicians who complete residencies in the United States may apply to stay beyond the end of their residencies if they agree to provide three years of primary care in a federally designated health professional shortage area or a medically underserved area. Of those respondents included in Virginia's physician workforce, 2.71 percent indicated they were in the US on a J-1 Visa.

Physician Supply[4]

Physicians in some types of practices may be capable of deciding to accept or to not accept new patients. Of those, 46 percent indicate that they are accepting new patients and their practice is far from full. An additional 50 percent indicated their practices were nearly full, but still accepting new patients. Only 4 percent indicated they were not able to accept new patients. Among physicians in a primary care specialty, only 5 percent indicated their practices were full, while 41 percent indicated their practices are far from full.

This is an indicator that physician supply was adequate to meet demand in 2010, but maldistribution may persist in some areas.



Full Time Equivalency Units

The HWDC estimated total physician work effort by using the concept of Full Time Equivalency units (FTE). This is a rough means of standardizing physician work effort without directly estimating work hours. Rather, physicians who report working full time are counted as one FTE. Those who report working less than full-time are discounted at a standardized rate. FTE's work well when making comparisons across geographic areas or other categories with a large number of physicians using broad categories. They are not an accurate measure of physician work hours and do not provide accurate comparisons when a small number of physicians are involved (e.g. comparing two rural counties). Readers are cautioned against using the FTE figures reported here for anything but the broadest of inferences.

Employment Status	Full Time Equivalency Units
Full Time	1.00
Part Time	0.50
Retired or Inactive	0.25
Missing	0.92

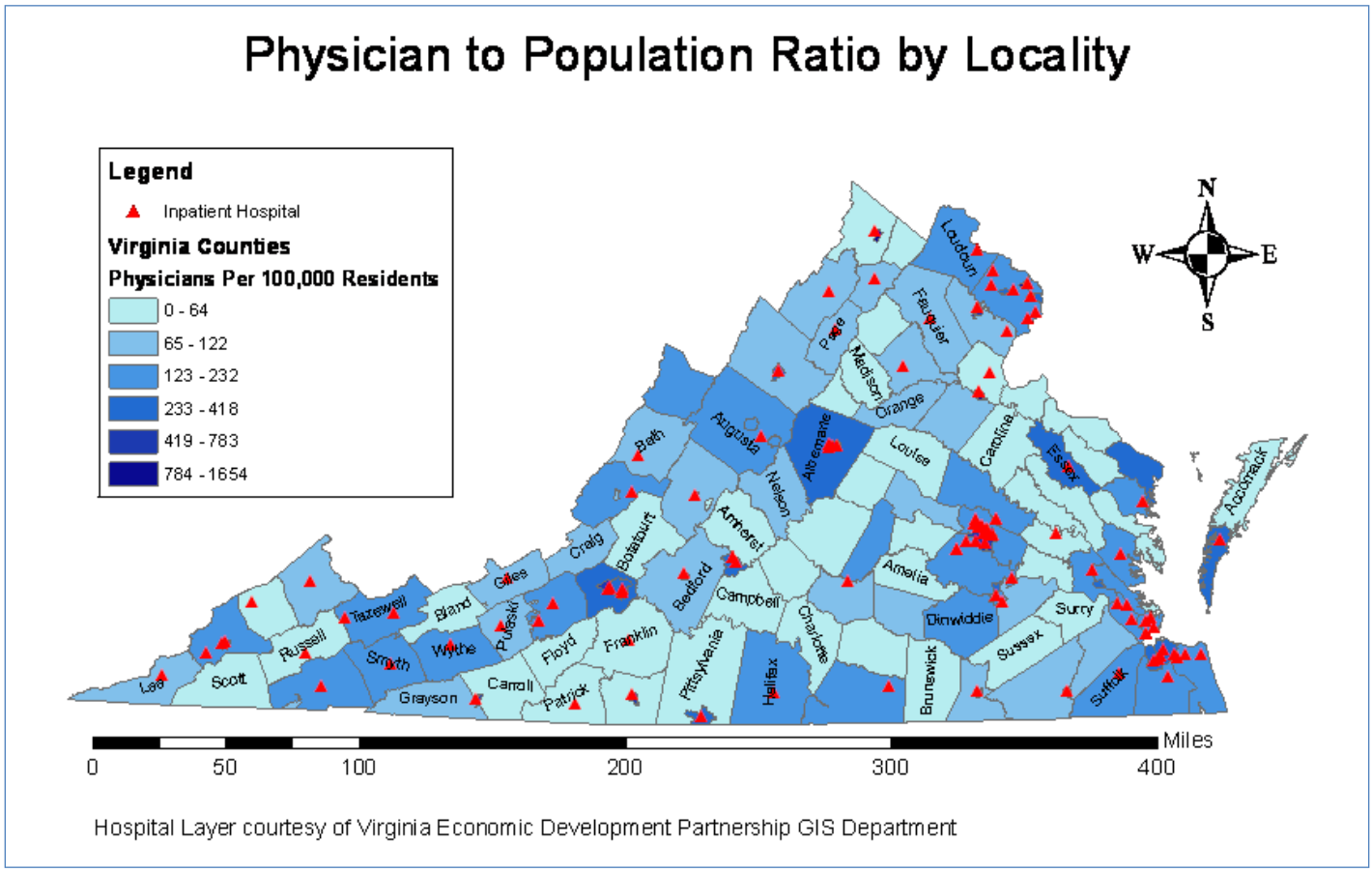
The 2010 physician workforce survey defined full time work as 30 or more hours per week. In open field areas, physicians often reported working over eighty hours per week and occasionally over one hundred hours per week. As noted above, full-time physicians are counted as one FTE. The survey defined part time work as less than 30 hours per week, which could be anywhere from one to 29 hours per week, or temporary, locum tenens or other types of occasional work. Part time physicians are counted as 0.5 FTEs in this analysis. Retired and inactive physicians, who are included in the workforce because they also indicated they were practicing, often reported working significant hours. These may be volunteer, locum tenens, consulting or other hours. Retired and inactive physicians are counted as 0.25 FTEs in this analysis. Finally, those who did not report an employment status were assigned 0.92 FTEs—the average for all reporting physicians rounded to two decimals.

Using these parameters, the 15,453 physicians included as Virginia's physician workforce provided 14,181.4 FTEs, or just under 0.92 FTE's per physician. Using the estimate of the total workforce included on page 1, the HWDC roughly estimates that Virginia's physician workforce provides between 17,750 and 19,750 FTEs.

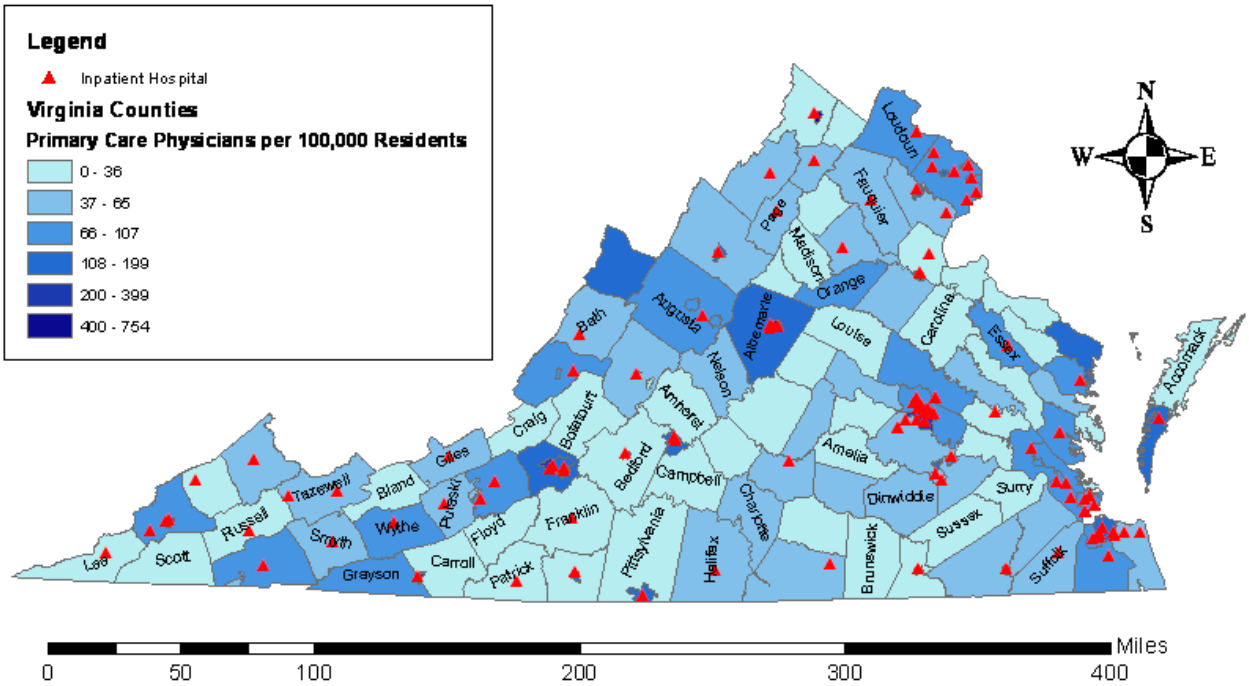
Physician Location

At first glance, measuring physician location appears to be a simple matter. However, physicians often work in more than one location, may work locum tenens or may not be employed. The HWDC provides three estimates of physician location. The first is referred to as, simply, physician location. This is the location of the physician's primary practice location or, if unavailable or out of state, the secondary or tertiary location or address of record. The physician location is the most likely place you'll find the physician in Virginia on any given day. The second uses a simple algorithm (see Data Definitions, Appendix C) to distribute physician FTE's across multiple practice locations, including out of state locations, to estimate the number of FTEs provided at each practice location. Lastly, a simple map is presented showing the location of all practice locations. Although practice locations may be "stacked" spatially this provides a quick visual sense of where physicians are concentrated.

Readers should keep in mind that the figures presented here are for *respondents only.* They are not estimates of the total physician population in each area, or of population ratios. These maps will assist policymakers in understanding the distribution of physicians and differences between areas, but are not an actual measure or an estimate of the number of physicians, FTEs or practices in any given area. Maps for physician location and for FTEs are presented as physician to population ratios. Tabular information is included in Appendix E. Population data is from 2010 US Census redistricting data.

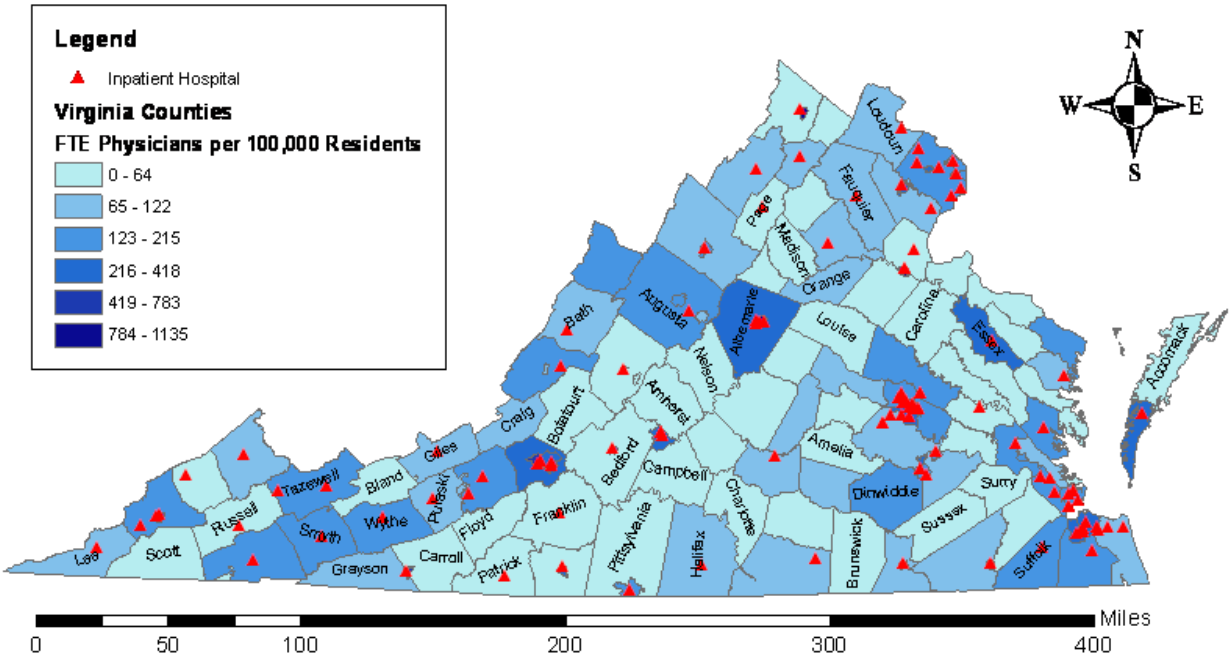


Primary Care Physician to Population Ratio by Locality

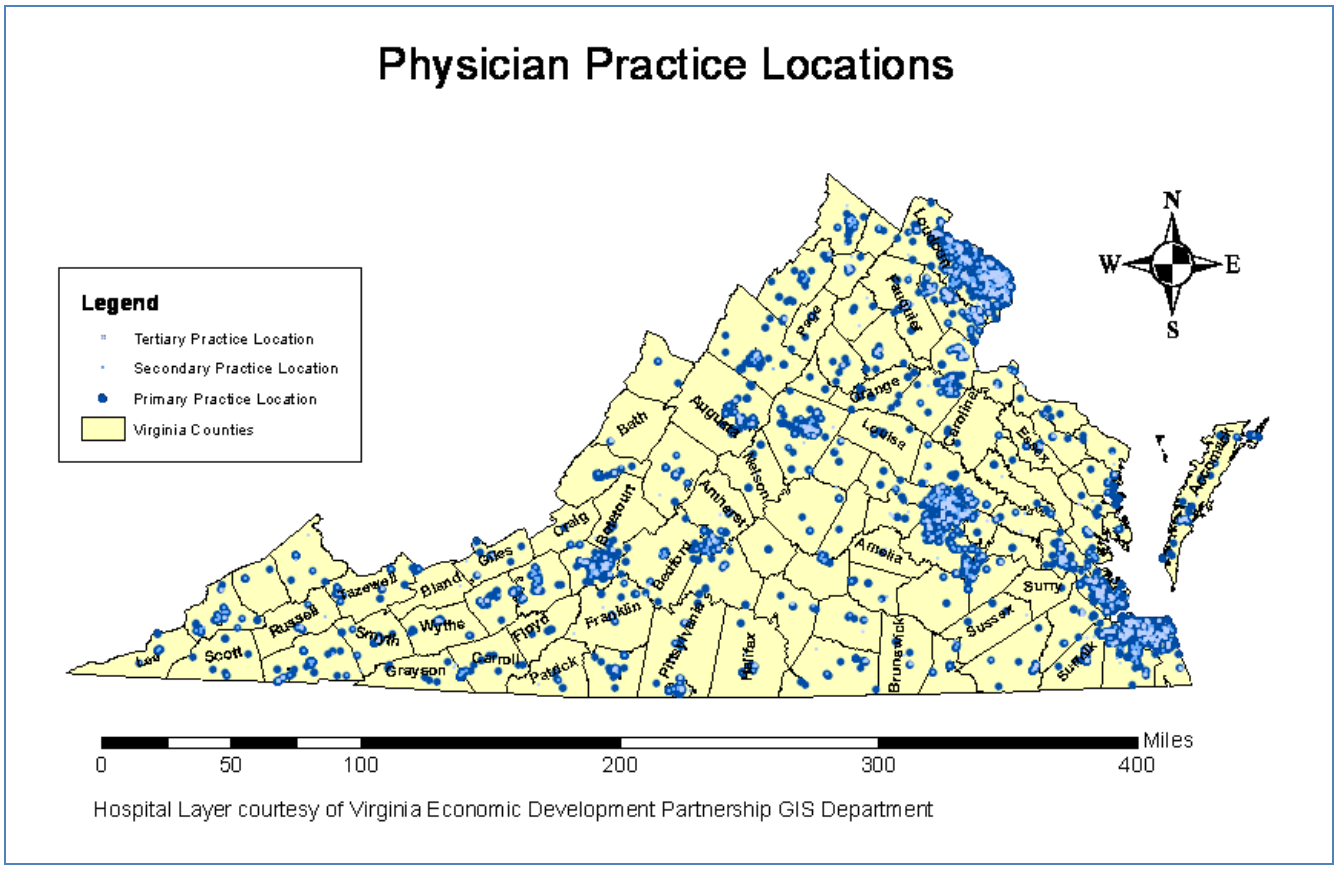


Hospital Layer courtesy of Virginia Economic Development Partnership GIS Department

FTE Physician to Population Ratio by Locality



Hospital Layer courtesy of Virginia Economic Development Partnership GIS Department


Physician Practice Locations
Legend
Tertiary Practice Location
Secondary Practice Location
Primary Practice Location
Virginia Counties
N
W
E
S
Page
Fauquier
Orange
Louisa
Caroline
Essex
Bath
Augusta
Nelson
Amherst
Bedford
Botetourt
Craig
Giles
Bland
Wythe
Grayson
Carroll
Patrick
Floyd
Franklin
Pittsylvania
Halifax
Amelia
Brunswick
Sussex
Surry
Lee
Scott
Russell
Smyth
Gazewell
Accomack
Miles
0
50
100
200
300
400
Hospital Layer courtesy of Virginia Economic Development Partnership GIS Department

Comparison to Other Data Sources

There are several national physician workforce data sets commonly used by the research community. These include the American Medical Association's Physician Profile, the Association of American Medical Colleges' Data Book and the American Board of Medical Specialties Certificate Statistics. All of these organizations publish at least some information broken out by state, allowing for a direct comparison to the HWDC's Physician Workforce survey.

The Physician Workforce Survey is in its first iteration, is the first survey conducted by the HWDC and was developed without the assistance of current staff. We have identified some areas of improvement in the current survey. A comparison with existing data sources may raise additional questions to help identify differences and guide further improvements. Since the HWDC's purpose is to provide more through and up-to-date data, our goal is not to match these other data sources, but to identify areas for further exploration.

Comparisons in this report refer to data published in the following works:

1) American Medical Association. *Physician Characteristics and Distribution in the US*. 2011 Edition. Compiled by Derek A. Smart, Division of Data and Survey Resources, this resource includes data from the AMA's Physician Profile as of December 31, 2009. This resource indicates there are 25,291 physicians in Virginia's physician population, significantly higher than our own estimates for Virginia's physician workforce. However, the AMA Physician Profile uses less restrictive criteria for determining the physician population. Additionally, researchers note that the AMA Physician Profile may overestimate the number of active physicians for a variety of reasons.[5]
2) Association of American Medical Colleges.
3) American Board of Medical Specialties. *2010 ABMS Certificate Statistics*. This resource contains statistics on Board Certification.

Age

The AMA Physician Masterfile's reference date for Age is December 31, 2009. The Physician Workforce Survey's reference date is June 30, 2010, a six month difference. This should have little affect on the broad age categories presented here. The AMA Physician Masterfile lists higher percentages of physicians in the youngest and the oldest age categories. The HWDC Physician Workforce Survey does not include many physicians who are likely to be younger, including new licensees and residents, likely creating an underestimate of the number of younger physicians. At the other end of the spectrum, the AMA Physician Masterfile tends to overestimate the number of practicing older physicians. This is due to the delays in receiving updates from physicians and various data sources, and in the rotating survey cycle the AMA uses. As the Department of Health Professions expands its online renewal process to new applicants and residents, the physician healthcare workforce survey should improve its age distribution data.

Age Group	AMA Physician Masterfile		HWDC Physician Survey	
Less than 35	3516	14%	1187	8%
35-44	5877	23%	4461	29%
45-54	5878	23%	4471	29%
55-64	4913	19%	3706	24%
Age 65 and over	5107	20%	1612	10%
Total	25291	100%	15437	100%

Gender

Both the AMA Physician Masterfile and the HWDC Physician Workforce survey report that a little over two-thirds of Virginia's Physicians are male. The age effects described above may counterbalance each other, with the HWDC Physician Workforce Survey excluding many young female physicians and many older male physicians. Within age categories, there is no significant difference in gender between the data sources.

Board Certification

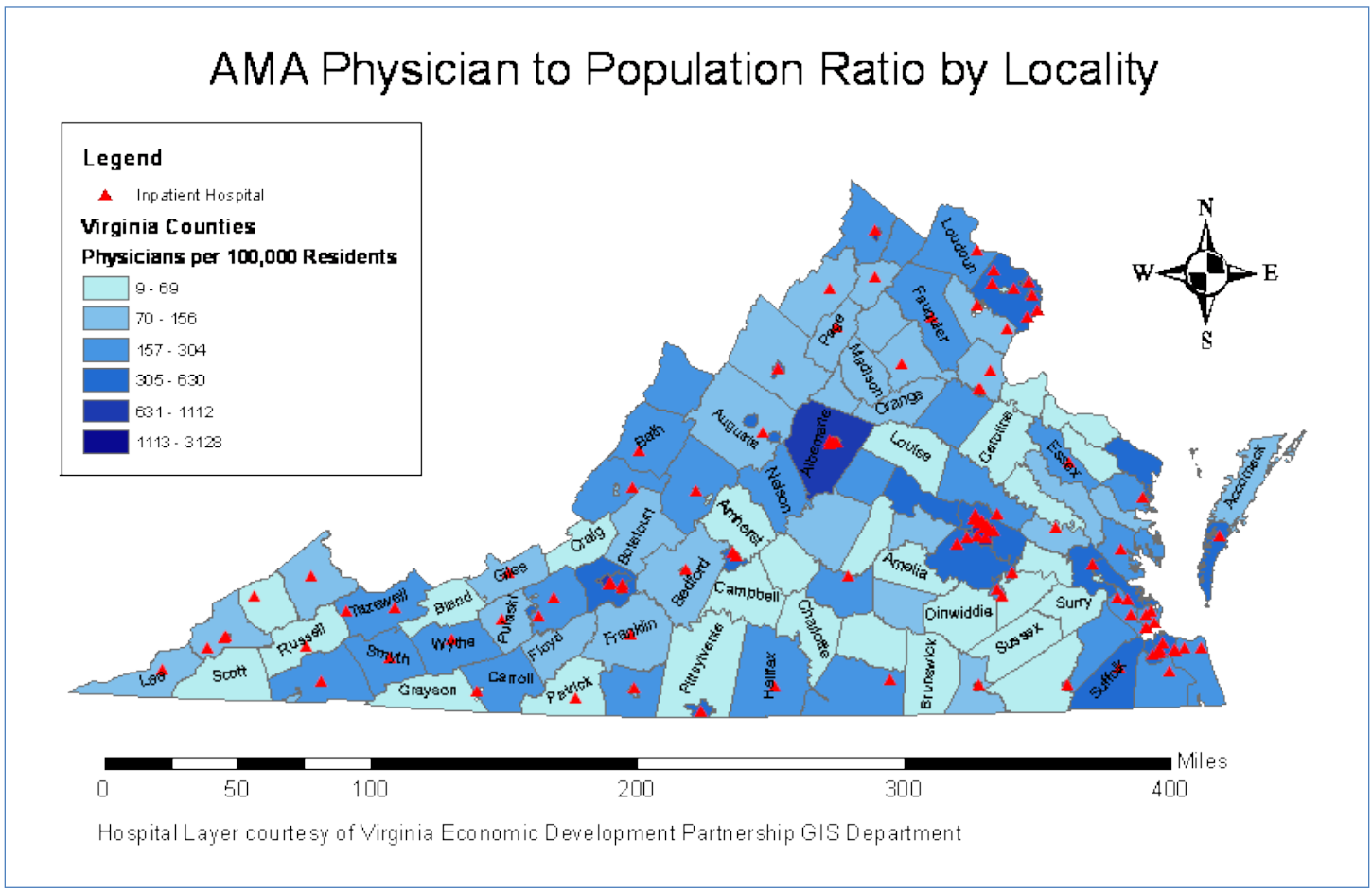
The ABMS reports that there are a total of 19,790 active general certificates from its member boards held by physicians in Virginia. Physicians may hold more than one general certificate. The Virginia Physician Workforce counts only 13,898 general certificates held by its members, only about 70 percent of ABMS reported figure. We note two potential causes for this difference: 1) the ABMS reports all certificates from all members with an address in Virginia, regardless of whether they work in Virginia or participate in Virginia's Physician Workforce, and, 2) Board Certification is self-reported to Virginia's Physician Profile, the source for this information, and some physicians may not update their certifications or update them on a timely basis.

The distribution of physicians among the specialties also differs between the two data sources. In particular, the Virginia Physician Workforce includes a marginally higher proportion of general certificates in the primary care specialties.

ABMS Member Board	HWDC Physician Survey		AMBS Certificant Statistics	
Allergy & Immunology	108	0.8%	129	0.7%
Anesthesiology	600	4.3%	1026	5.2%
Colon & Rectal Surgery	24	0.2%	46	0.2%
Dermatology	201	1.4%	288	1.5%
Emergency Medicine	698	5.0%	781	3.9%
Family Medicine	2032	14.6%	2394	12.1%
Internal Medicine	3536	25.4%	4730	23.9%
Medical Genetics	18	0.1%	49	0.2%
Neurological Surgery	68	0.5%	136	0.7%
Nuclear Medicine	64	0.5%	91	0.5%
Obstetrics & Gynecology	713	5.1%	1198	6.1%
Ophthalmology	330	2.4%	528	2.7%
Orthopaedic Surgery	404	2.9%	649	3.3%
Otolaryngology	197	1.4%	311	1.6%
Pathology	329	2.4%	529	2.7%
Pediatrics	1569	11.3%	2198	11.1%
Physical Medicine & Rehabilitation	147	1.1%	210	1.1%
Plastic Surgery	138	1.0%	160	0.8%
Preventive Medicine	128	0.9%	279	1.4%
Psychiatry & Neurology	1007	7.2%	1350	6.8%
Radiology	723	5.2%	1189	6.0%
Surgery	635	4.6%	1053	5.3%
Thoracic Surgery	68	0.5%	148	0.7%
Urology	161	1.2%	318	1.6%

Physician Location

The AMA publishes detailed information on physician location by county and independent city, although it leaves out a few of the smaller cities. Overall, the AMA physician count is 164 percent higher than the HWDC's Virginia Physician Workforce. The distribution between the two data sets correlates strongly (correlation coefficient of .98), indicating that both data sets predict similar distributions. Nevertheless, some counties had significant differences in physician count among the two datasets. Both data sets should be considered when examining physician counts at the local level. A map of the AMA physician counts is presented on the next page. More detailed information is presented in tabular form in Appendix F.


AMA Physician to Population Ratio by Locality
Legend
Inpatient Hospital
Virginia Counties
Physicians per 100,000 Residents
9 - 69
70 - 156
157 - 304
305 - 630
631 - 1112
1113 - 3128
N
W
E
S
Loudoun
Fauquier
Page
Madison
Orange
Augusta
Albemarle
Louisa
Caroline
Essex
Accomack
Bath
Nelson
Amherst
Craig
Botetourt
Giles
Bedford
Campbell
Amelia
Tazewell
Bland
Pulaski
Dinwiddie
Surry
Russell
Wythe
Smyth
Floyd
Franklin
Pittsylvania
Halifax
Charlotte
Sussex
Brunswick
Lee
Scott
Grayson
Carroll
Patrick
Suffolk
Miles
0
50
100
200
300
400
Hospital Layer courtesy of Virginia Economic Development Partnership GIS Department

Endnotes

[1] Military personnel may renew within 60 days of returning from an overseas deployment, as long as renewal occurs within five years of license expiration. All others must renew licenses biennially.

[2] National workforce information is provided by the Current Population Survey, administered by the US Bureau of Labor Statistics and the US Census Bureau. Age information appears in "Table 15: Employed persons by detailed occupation, sex and age, Annual Average 2010" for the 2010 Survey. Due to issues with sample size, median age information at the state level is not generally available, but was estimated at the request of the HWDC. Special thanks to Steve Hipple and Thomas Krolik of the Bureau of Labor Statistics for their assistance.

[3] The Physician Workforce Survey used different racial and ethnic categories than the 2010 US Census Survey. Instead of a separate category for Native Hawaiians and Pacific Islanders, the Physician Workforce Survey combined Pacific Islanders with Asian categories and did not include a Native Hawaiian category. For analysis, we combined the Asian and Native Hawaiian/Pacific Islander counts from the Census data. We do not feel this has a meaningful effect on the results. Future surveys will reflect Census methodology to allow for better comparisons.

[4] The 2010 Physician Workforce survey included several questions on work hours, including questions seeking exact hours worked. Due to limitations in the Department of Health Professions' licensure software, however, responses to these questions were open field. Due to the combination of missing and unusable data in these fields, we were unable to use this data for analysis. It was used to provide some insight for calculating FTEs. These problems will be addressed in future workforce surveys.

[5] Although though the AMA's Physician Masterfile is the national standard for physician information, there are often delays in updating the Physician Masterfile. For a discussion and list of resources related to the quality of Physician Profile data, see Staiger, Auerbach & Buerhaus. Oct. 21, 2009. "Comparison of Physician Workforce Estimates and Supply Projections". Journal of the American Medical Association. Vol. 32. No. 15. pp 1674-1680.

Appendices

Appendix A: The 2010 Physician Workforce Survey

2010 Medicine and Osteopathy Workforce Survey

Question Detail

Question #	Question	Answer
236	1. Where do you currently reside?	*Dropdown: Listing of States*
237	1a. Other Locale	*Fill in the blank*
238	2. Are you in the USA on a J-1 visa?	*Dropdown Yes/No*
239	3. In what state was your most recent residency training?	*Dropdown: Listing of States*
240	3a. Other Locale	*Fill in the blank*
241	4. What is your current practice status?	*Dropdown*
		Intern
		Resident
		Fellow
		Completed Post Graduate Training
		Practicing MD or DO
		Not a Practicing MD or DO
		Other
242	4a. Other practice status	*Fill in the blank*
243	4b. If you are currently in a residency in Virginia, do you plan to remain in Virginia after completing your residency?	*Dropdown Yes/No*
244	5. What are your current total practice work hours?	
		Dropdown
		Full-Time (30 hours or more per week)
		Part-time (less than 30 hours per week)
		Inactive in Medicine
		Retired
245	6. In Virginia, give the number of facilities where you have admitting privileges?	*Fill in the blank*
246	7. What percentage of your current patients area. Medicare patients?	*Fill in the blank*
247	b. Medicaid patients?	*Fill in the blank*

248	c. Private insurance patients?	*Fill in the blank*
249	d. "Self pay"patients?	*Fill in the blank*
250	8. If you are Inactive or Retired do you plan to return to the practice of medicine?	*Dropdown*
		No
		Yes
		If Yes, within the next year
		If Yes, within 2 years
		If Yes, within 3 years
		If Yes, I do not know when
251	9. Please select your sex/gender.	*Dropdown*
		Male
		Female
252	10. Please select the menu item that best describes your ethnicity/race.	*Dropdown*
		White (Non-Hispanic) / Caucasian
		Black / African American (Non-Hispanic)
		Hispanic / Latino (Puerto Rican)
		Asian / Pacific Islander
		American Indian / Alaska Native
		Two or More Races
253	10a. Other ethnicity/race	*Fill in the blank*
	If you are currently INACTIVE or RETIRED, please STOP Here. Thank you for your participation!	
	Practice Information	
	11. Primary Practice location	
254	a. In what state was your practice location prior to your current practice location?	*Dropdown: Listing of States*
255	b. List the average hours per week spent on site at this location.	*Fill in the blank*
256	c. Average patient care hours each week at this location. (Do not include on-call hours)	*Fill in the blank*
257	d. How many of these hours are primary care?	*Fill in the blank*
258	e. How many hours each week do you see patients in your specialty area?	*Fill in the blank*
259	f. Type of patient care practice setting.	*Dropdown*
		Solo practice
		Group practice - owner/partner
		Federally-funded health center or clinic

		Free clinic - not federally funded
		Urgent care clinic
		Staff or group model HMO
		Insurance company
		Hospital - outpatient dept.
		Hospital - emergency dept.
		Hospital - inpatient dept.
		Hospital - other
		Nursing home / extended care facility
		State or local health department
		Mental health facility
		Corrections
		Medical school or parent university
		Military / DoD facility
		Veterans administration facility
		Locum tenens
		Other setting
260	Other practice setting	*Fill in the blank*
261	12. Secondary Practice locationa. Do you have a Secondary Practice location?	*Dropdown Yes/No*
262	b. List the average hours per week spent on site at your secondary location.	*Fill in the blank*
263	c. Average patient care hours each week at secondary practice location. (Do not include on-call hours)	*Fill in the blank*
264	d. How many of the hours at secondary practice location are primary care?	*Fill in the blank*
265	e. How many hours each week do you see patients in your specialty area at this secondary location?	*Fill in the blank*
266	f. Type of patient care practice setting at secondary practice location.	*Dropdown*
		Solo practice
		Group practice - owner/partner
		Federally-funded health center or clinic
		Free clinic - not federally funded
		Urgent care clinic
		Staff or group model HMO
		Insurance company
		Hospital - outpatient dept.
		Hospital - emergency dept.
		Hospital - inpatient dept.
		Hospital - other
		Nursing home / extended care facility
		State or local health department

		Mental health facility
		Corrections
		Medical school or parent university
		Military / DoD facility
		Veterans administration facility
		Locum tenens
		Other setting
267	Other setting	*Fill in the blank*
268	13. Other Practice Locationa. Do you have another practice location?	*Dropdown Yes/No*
269	b. List the average hours per week spent on site at other practice location.	*Fill in the blank*
270	c. Average patient care hours each week at this practice location.(Do not include on-call hours)	*Fill in the blank*
271	d. How many of the hours at this practice location are primary care?	*Fill in the blank*
272	e. How many hours each week do you see patients in your specialty area?	*Fill in the blank*
273	f. Type of patient care practice setting at other practice location.	*Dropdown*
		Solo practice
		Group practice - owner/partner
		Federally-funded health center or clinic
		Free clinic - not federally funded
		Urgent care clinic
		Staff or group model HMO
		Insurance company
		Hospital - outpatient dept.
		Hospital - emergency dept.
		Hospital - inpatient dept.
		Hospital - other
		Nursing home / extended care facility
		State or local health department
		Mental health facility
		Corrections
		Medical school or parent university
		Military / DoD facility
		Veterans administration facility
		Locum tenens
		Other setting
274	Other type	*Fill in the blank*
275	14. Mark the response that best describes your current patient care practice status.	*Dropdown*

		a. I cannot accept new patients, my practice is full.
		b. I can accept some new patients, my practice is nearly full.
		c. I can accept many new patients my practice is far from full.
		d. Not applicable.
276	15. In your combined practice locations, please indicate the typical number of hours per week you spend in each of the following activities: (Enter a value of zero when appropriate.) a. Patient Care	*Fill in the blank*
277	b. Specialty	*Fill in the blank*
278	c. Administrative	*Fill in the blank*
279	d. Medical Record Reviews	*Fill in the blank*
280	e. Research	*Fill in the blank*
281	f. Teaching	*Fill in the blank*
282	g. Volunteer	*Fill in the blank*
283	h. Other	*Fill in the blank*
284	16. Are you practicing actively in the Military and stationed in VA?	*Dropdown Yes/No*
285	17. If yes, indicate the average number of patients who are civilians that you see each week.	*Dropdown*
		1-24
		25-74
		75-149
		150 or above
286	18. In the next 24 months, do you plan to: (Choose all that apply)	*Checkboxes*
		Retire from patient care
		Significantly reduce patient care hours
		Move your practice to another geographic location in Virginia
		Move your practice out of state
287	19. When do you think that you might retire?	*Dropdown*
		In the next 5 years
		In the next 6 - 10 years
		In the next 11- 15 years

Appendix B: Available Data.

Variables marked with an * were inappropriately open field

Question#	Source	Variable Label	SPSS ID	Response Codes	Response Values	Definition	Notes
				99=Missing		# missing in VA Physician Workforce	
1	License Data	License Number	LicNum			0	Virginia State Physician License Number
236	Survey	State of Residence	StRes	Postal State Codes (Column L)	Postal State Values (Column L)	19	US Postal Service State, Territory and Military Address Abbreviations
237	Survey	Other place of Residence	ORes				
238	Survey	J-1 Visa	J1	0	No	196	In US under Virginia's J-1 Visa program
				1	Yes		
239							
	Survey	Residency Training	StResTr	Postal State Codes (Column L)	Postal State Values (Column L)	908	US Postal Service State, Territory and Military Address Abbreviations
240							
	Survey	Other place of Residency Training	OResTr				
241							
	Survey	Practice Status	Status	1	Intern	27	
				2	Resident		
				3	Fellow		
				4	Post-Grad Completed		
				5	Practicing		
				6	Not Practicing		
				7	Other		
242	Survey	Other Practice Status	Ostatus				
243	Survey	Post-Residency Plans	PostRes	0	No	11814	Fewer than 1,000 respondents indicated they were residents, but over 6,000 respondents answered this question.
				1	Yes		
244							
	Survey	Total Work Hours	TotHour	2	Full-time	445	
				1	Part-time		
				0	Inactive		
				98	Retired		
245	Survey	Admitting Privileges	Admit			2820	

246	Survey	Percent Patients Medicare	Mcare			3465	
247	Survey	Percent Patients Medicaid	Mcaid			3593	
248	Survey	Percent Patients Private Insurance	Pins			3625	
249	Survey	Percent Self Pay	Spay			3904	
250	Survey	Plan to Return to Practice	PlRet			13679	
251	Survey	Gender	Gender	0	Male	684	
				1	Female		
252	Survey	Race/Ethnicity	Race	1	White	1090	
				2	Black		
				3	Hispanic		
				4	Asian		
				5	Native		
				6	Mix Race		
				7	Other		
253	Survey	Other Race/Ethnicity	ORace				
254	Survey	Previous Practice Location	PrevPr	Postal State Codes (Column L)		3712	
				99-missing			
255	Survey	Primary Practice Hours	PrHour			3309	
256	Survey	Primary Practice Patient Care Hours	PrPC			3717	
257	Survey	Primary Practice Primary Care Hours	PrPrC			4223	

258	Survey	Primary Practice Specialty Care Hours	PrSpC			4425	
259	Survey	Primary Practice Type	PrType			2811	
				1	Solo		
				2	Group		
				3	FQHC		
				4	Free clinic		
				5	Urgent care		
				6	Group HMO		
				7	Insurance		
				8	Hospital-Outpatient		
				9	Hospital-Emergency		
				10	Hospital-Inpatient		
				11	Hospital-other		
				12	Long-term care		
				13	State local govt		
				14	Mental Facility		
				15	Corrections		
				16	Medical School		
				17	Military		
				18	VA		
				19	Locum tenes		
				20	Other		
260	Survey	Other Primary Practice Type	OPrType				
261	Survey	Secondary Practice Location	SecPr			5392	
262	Survey	Secondary Practice Hours	SecHour			12746	
263	Survey	Secondary Practice Patient Care Hours	SecPC			12833	
264	Survey	Secondary Practice Primary Care Hours	SecPrC			12950	
265	Survey	Secondary Practice Specialty Care Hours	SecSpC			12936	
266	Survey	Secondary Practice Type	SecType			12805	
				1	Solo		
				2	Group		
				3	FQHC		

				4	Free clinic		
				5	Urgent care		
				6	Group HMO		
				7	Insurance		
				8	Hospital-Outpatient		
				9	Hospital-Emergency		
				10	Hospital-Inpatient		
				11	Hospital-other		
				12	Long-term care		
				13	State local govt		
				14	Mental Facility		
				15	Corrections		
				16	Medical School		
				17	Military		
				18	VA		
				19	Locum tenes		
				20	Other		
267	Survey	Other Secondary Practice Type	OSecType				
268	Survey	Other Practice Location	OPr			7943	
269	Survey	Other Practice Hours	OHour			14634	
270	Survey	Other Practice Patient Care Hours	OPC			14665	
271	Survey	Other Practice Primary Care Hours	OPrC			14674	
272	Survey	Other Practice Specialty Care Hours	OSpC			14668	
273	Survey	Other Practice Type	OType			14608	
				1	Solo		
				2	Group		
				3	FQHC		
				4	Free clinic		
				5	Urgent care		
				6	Group HMO		
				7	Insurance		
				8	Hospital-Outpatient		
				9	Hospital-Emergency		
				10	Hospital-Inpatient		
				11	Hospital-other		

				12	Long-term care		
				13	State local govt		
				14	Mental Facility		
				15	Corrections		
				16	Medical School		
				17	Military		
				18	VA		
				19	Locum tenes		
				20	Other		
274	Survey	Other Other Practice Type	OOType				
275	Survey	Accepting New Patients	Accept			6338	
				1	Full		
				2	Nearly Full		
				3	Accepting		
				4	NA		
276	Survey	Total Patient Care Hours	TotPC			7922	
277	Survey	Total Specialty Care Hours	TotSpC			7055	
278	Survey	Total Administrative Hours	TotAdmin			6891	
279	Survey	Total Medical Record Review Hours	TotMRR			7803	
280	Survey	Total Research Hours	TotRes			8310	
281	Survey	Total Teaching Hours	TotEd			7826	
282	Survey	Total Volunteer Hours	TotVol			8808	
283	Survey	Total Other Hours	TotO			11137	
284	Survey	Practice inMilitary	Mil			11691	
				0	No		
				1	Yes		
285	Survey	Number of Civilians Seen	MilCiv			14360	
				1	1-24		
				2	25-74		
				3	75-149		

				4	150+		
286	Survey	24 Month Plans	Plan			13794	
287	Survey	Plan to Retire	Retire			4712	
				1	5 years		
				2	6-10 years		
				3	11-15 years		
End of Survey							
54	License Data	Address of Record State	AORSt				
55	License Data	Address of Record Locality	AORLoc				
56	License Data	Current License Status	LicSta				
				1	Current Active		
				2	Current Inactive		
				3	Deceased		
				4	Expired		
				5	Revoked		
				6	Surrendered		
				7	Suspended		
57	License Data	Medical School	MedSch				
58	License Data	MedSchType	Medical School Type	0	Medical School		
				1	School of Osteopathy		
59	License Data	MedSchGrad	Medical School Year of Graduation			3200	
60	Physician Profile	PrAdd1	Primary Practice Address Line 1			1603	
61	Physician Profile	PrAdd2	Primary Practice Address Line 2				
62	Physician Profile	PrCity	Primary Practice Address City			1634	
63	Physician Profile	PrState	Primary Practice	Postal Codes		.1625 2 Invalid	

			Address State				
64	Physician Profile	PrZip	Primary Practice Zip Code			1744	
65	Physician Profile	Exp	Years of Experience				
66	License Data	DOB	Date of Birth				
67	License Data	Physician Type	PhysType	0=Medical Doctor		License Number Lowest to 0101999999 transformed to "0"	
				1=Doctor of Osteopathy		License Number 102000000 to Highest transformed to "1"	
68	Derived	Area of Residence	AreaRes			Transformed from StRes	
				1=Virginia			1
				2=Military Address			2,3,6
				3=Other US State or Territory			All Others
				12=District of Columbia			12
				24=Kentucky			24
				27=Maryland			27
				36=North Carolina			36
				52=Tennessee			52
				59=West Virginia			59
				61=Other			61
				System Missing			System Missing
69	Derived	Area of Residency Training	AreaResTr			Transformed from StResTr	
				1=Virginia			1
				2=Military Address			2,3,6
				3=Other US State or Territory			All Others
				12=District of Columbia			12
				24=Kentucky			24
				27=Maryland			27
				36=North Carolina			36
				52=Tennessee			52
				59=West Virginia			59
				61=Other			61
				System Missing			System Missing
70	Derived	Area of Previous Practice	AreaPrevPr			Transformed from PrevPr	
				1=Virginia			1
				2=Military Address			2,3,6
				3=Other US State or Territory			All Others
				12=District of Columbia			12
				24=Kentucky			24
				27=Maryland			27

				36=North Carolina			36
				52=Tennessee			52
				59=West Virginia			59
				61=Other			61
				99= Missing			99= Missing
71	Created	Reference Date	Date	30-Jun-10	Date of Reference		
72	Derived	Age June 30, 2010	Age				
73	Physician Profile	Secondary Practice Address Line 1	SecAdd1			11468	
74	Physician Profile	Secondary Practice Address Line 2	SecAdd2				
75	Physician Profile	Secondary Practice Address City	SecCity			11479	
76	Physician Profile	Secondary Practice Address State	SecSt			3665	
77	Physician Profile	Secondary Practice Address Zip	SecZip			11610	
78	Physician Profile	Other Practice Address Line 1	OthAdd1			14587	
79	Physician Profile	Other Practice Address Line 2	OthAdd2				
80	Physician Profile	Other Practice Address City	OthCity			14587	
81	Physician Profile	Other Practice Address State	OthSt			14588	
82	Physician Profile	Other Practice Address Zip	OthZip			14609	
83	Physician Profile	Primary Practice Type 2	PrType2				
				1	All Else		
				17	Military		
				18	Veterans Administration		
84	Derived using ArcGIS & Physician Profile Addresses	Primary Practice Location	PrimLoc	Virginia's cities and counties		2020	Virginia Only
85	Derived using ArcGIS	Secondary Practice Location	SecLoc	Virginia's cities and counties		11790	Virginia Only
86	Derived using ArcGIS	Tertiary Practice Location	TerLoc	Virginia's cities and counties		14695	Virginia Only

87	Derived	Primary Practice Location Exists	PrimLocEx	0	No	Missing PrimLoc=0. All else = 1	
				1	Yes		
88	Derived	Secondary Practice Location Exists	SecLocEx	0	No	Missing SecLoc=0. All else = 1	
				1	Yes		
89	Derived	Tertiary Practice Location Exists	TerLocEx	0	No	Missing TerLoc=0. All else = 1	
				1	Yes		
90	Derived	Count of VA Locations	VALocCount			PrimLocEx + SecLocEx + TerLocEx	
91	Derived	Primary Practice Outside of VA	PrimPracNoVA	0	No		
				1	Yes		
92	Derived	Secondary Practice Outside of Virginia	SecPracNoVA	0	No		
				1	Yes		
93	Derived	Tertiary Practice Outside of Virginia	TerPracNoVa	0	No		
				1	Yes		
94	Derived	Count of Locations	LocCount			VALocCount+PrimPracNoVa+SecPracNoVA+TerPracNoVa	
95	Derived	Full Time Equivalents	FTE	Arbitrary	From TotHours		
				0.25	Retired or Inactive		
				0.5	Part Time		
				1	Full Time		
				0.92	Missing		
96	Derived	AOR as Practice Locality	Address of Record as Practice Locality	Arbitrary			
97	Derived	LocCountProxy	Location Count Proxy				
98	Derived	PrimFTE	Primary Location FTE				
99	Derived	SecFTE	Secondary Location FTE				
100	Derived	TerFTE	Tertiary Location FTE				
101	Physician Profile	Spec.1	Spec.1: Specialty	1	Allergy & Immunology		
				2	Anesthesiology		
				3	Colon & Rectal Surgery		

				4	Dermatology		
				5	Emergency Medicine		
				6	Family Medicine		
				7	Internal Medicine		
				8	Medical Genetics		
				9	Neurological Surgery		
				10	Nuclear Medicine		
				11	Obstetrics & Gynecology		
				12	Ophthalmology		
				13	Orthopaedic Surgery		
				14	Otolaryngology		
				15	Pathology		
				16	Pediatrics		
				17	Physical Medicine & Rehabilitation		
				18	Plastic Surgery		
				19	Preventive Medicine		
				20	Psychiatry & Neurology		
				21	Radiology		
				22	Surgery		
				23	Thoracic Surgery		
				24	Urology		
102	Physician Profile	Spec.2	Spec.2: Specialty				
103	Physician Profile	Spec.3	Spec.3: Specialty				
104	Combined	PhysLoc	Physician Location Proxy				
105	Derived	PhysLocRegion	Physician Location Region				
106	Derived	PrimCare	Primary Care Specialty	0	No		
				1	Yes	Internal Medicine, Family Medicine or Pediatrics	
107	Derived	AgeCat	Age Categories	1	<=24		
				2	25-29		
				3	30-34		
				4	35-39		
				5	40-44		
				6	45-49		
				7	50-54		
				8	55-59		
				9	60-64		
				10	65-69		
				11	70-74		

				12	75-79		
				13	80-84		
				14	85+		
108	Physician Profile	DetSpec1	Detailed Specialty 1-7			Untruncated Specialties. Specialties unranked.	
109	Physician Profile	DetSpec2					
110	Physician Profile	DetSpec3					
111	Physician Profile	DetSpec4					
112	Physician Profile	DetSpec5					
113	Physician Profile	DetSpec6					
114	Physician Profile	DetSpec7					
115	License Data	MedSchSt	State of Med School	String			
116	Derived	MedSchArea	Med School Area	1	Virginia		
				2	Border States		
				3	Canada		
				4	IMG		
				5	Other US State		

Appendix C: Methods and Definitions:

Missing Data: Exclude cases pairwise. Assume non-respondents are like respondents unless otherwise noted.

Licensees: All persons holding a Virginia license to practice medicine or osteopathy. This is the study population.

Current Active Licensees: All licensees holding current active licenses.

Renewing Physicians: All physicians who renewed their licensees during the 2010 renewal period with cutoff points December 9, 2009 to March 11, 2011.

Survey sample: Renewing physicians who renewed online. *Only* renewing physicians using the online renewal process had access to the survey. This is a convenience sample and does not include new physicians seeking their first license or physicians who renewed using paper applications.

Respondents: Members of the Survey Sample who responded to the survey or, depending on context, specific questions.

Active Respondents: Respondents who renewed to active licenses at the time they took the survey.

"Current" Active Respondents: Respondents who held current active licenses as of March 11, 2011.

Physician Workforce: Respondents: Respondents who responded with something other than "not a practicing MD or DO in Status", or who reported working full-time or part-time in Tothours. (Excludes those who reported not practicing and who were also retired or inactive, exludes those with missing data in both columns. It includes those who may not consider themselves as practicing medicine, but who report working.)

Size: 24,944

Filter, entire dataset
(TotHour < 98 & TotHour > 0) | Status < 6 | Status = 7 (FILTER)

Virginia's Physician Workforce: Respondents: Respondents in the Physician Workforce who reported a primary practice, secondary practice, or other practice location in Virginia; or if practice location is unavailable, an AOR in Virginia (full-time, part-time in tot hours) or who indicated residence in Virginia (inactive in medicine or retired in tot hours). Note: This excludes retired Virginia physicians, working physicians w/o a practice location or AOR in Virginia or inactive physicians not residing in Virginia.

Size: 15453

Filter, Physician Workforce
(PrState = 1 | SecSt = 1 | OthSt = 1) | ((TotHour = 1 | TotHour = 2) & (MISSING(PrState) & MISSING(SecSt) & MISSING(OthSt) & AORst = 1)) | ((TotHour = 98 | TotHour = 0) & (MISSING(PrState) & MISSING(SecSt) & MISSING(OthSt) & StRes = 1))

Virginia's Physician Workforce, Estimated:

The use of multiple variables minimizes the influcence of missing data to 223 of 26,265 (missing both tothours and status). So, out of a total respondent base of 26,042, over 59 percent of the respondents are included in the Virginia

Physician Workforce Data Set. Extrapolated to the Total licensee population on June 30, 2010, (Medicine and Surgery: 32,707; Osteopathy and Surgery: 1738) we estimate (roughly) there were 20,439 licensees in Virginia's workforce.

VPW:E=[VPW:R/(Survey Respondents-(missing both tothour & status)]*(licensees as of June 30, 2010.

VPW:E= [15,453/(26,265-223)]*34,445

Full Time Equivalency Physicians (FTEs).

A standardized estimate of physician work hours based on full time, part-time or other ordinal statement of work effort as the unit of measure. One FTE is equivalent to one physician working "full time", defined in this study as 30 or more hours per week. FTE's are distributed as follows:

Employment Status	Full Time Equivalency Units
Full Time	1.00
Part Time	0.50
Retired or Inactive	0.25
Missing	0.92

Physician Location

Physician Location is determined by Virginia practice location, using the highest order among primary, secondary or tertiary locations. If practice location is unknown, then Address of Record is used.

Physician FTE Distribution

We used a simple algorithm to estimate FTE's provided across multiple practice locations, including out of state locations:

Primary Practice FTE's =

(Total FTEs / Number of Locations ^.75)

Secondary Practice FTE's =

(Total FTEs – Primary Practice FTEs)/((Number of Locations - 1) ^.75)

Tertiary Practice FTE's =

(Total FTEs-(Primary Practice FTEs + Secondary Practice FTEs))/((Total Locations-2)^.75)

Appendix D: Detailed Board Certification Information

First Listed Board Certification				
	Frequency	Percent	Valid Percent	Cumulative Percent
None	2406	15.6	15.6	15.6
Allergy And Immunology	104	.7	.7	16.2
Anesthesiology	592	3.8	3.8	20.1
Anesthesiology: Critical Care Medicine	2	.0	.0	20.1
Colon & Rectal Surgery	23	.1	.1	20.2
Dermatology	196	1.3	1.3	21.5
Dermatology: Dermatopathology	1	.0	.0	21.5
Emergency Medicine	685	4.4	4.4	25.9
Emergency Medicine: Medical Toxicology	1	.0	.0	25.9
Emergency Medicine: Pediatric Emergency Medicine	2	.0	.0	26.0
Family Medicine	1770	11.5	11.5	37.4
Family Medicine: Family Practice	115	.7	.7	38.2
Family Medicine: Geriatric Medicine	8	.1	.1	38.2
Family Medicine: Sports Medicine	2	.0	.0	38.2
Family Physicians	89	.6	.6	38.8
Family Physicians: Sports Medicine	1	.0	.0	38.8
Family Practice: Sports Medicine	1	.0	.0	38.8
Internal Medicine	3162	20.5	20.5	59.3
Internal Medicine: Adolescent Medicine	4	.0	.0	59.3
Internal Medicine: Cardiology	1	.0	.0	59.3
Internal Medicine: Cardiovascular Disease	54	.3	.3	59.7
Internal Medicine: Clinical Cardiac Electrophysiology	3	.0	.0	59.7
Internal Medicine: Critical Care Medicine	18	.1	.1	59.8
Internal Medicine: Endocrinology, Diabetes & Metabolism	14	.1	.1	59.9
Internal Medicine: Gastroenterology	42	.3	.3	60.2
Internal Medicine: Geriatric Medicine	2	.0	.0	60.2
Internal Medicine: Hematology	7	.0	.0	60.2
Internal Medicine: Hospice & Palliative Medicine	1	.0	.0	60.2
Internal Medicine: Infectious Disease	13	.1	.1	60.3
Internal Medicine: Medical Oncology	14	.1	.1	60.4
Internal Medicine: Nephrology	13	.1	.1	60.5
Internal Medicine: Pulmonary Disease	5	.0	.0	60.5
Internal Medicine: Rheumatology	9	.1	.1	60.6
Medical Genetics: Clinical Genetics (M.D.)	7	.0	.0	60.6
Medicial Genetics	9	.1	.1	60.7
Neurological Surgery	68	.4	.4	61.1
Neurology And Psychiatry: Neurology	15	.1	.1	61.2
Neurology And Psychiatry: Neurology/Psychiatry	2	.0	.0	61.2
Neurology And Psychiatry: Psychiatry	17	.1	.1	61.3
Neuromusculoskeletal Medicine: Special Proficiency In Neuro-Musculoskeletal Medi	3	.0	.0	61.4
Nuclear Medicine	43	.3	.3	61.6
Obstetrics & Gynecologic Surgery	8	.1	.1	61.7
Obstetrics & Gynecology	12	.1	.1	61.8
Obstetrics & Gynecology: Gynecologic Oncology	1	.0	.0	61.8
Obstetrics And Gynecology	665	4.3	4.3	66.1
Obstetrics And Gynecology: Gynecologic Oncology	2	.0	.0	66.1
Obstetrics And Gynecology: Maternal & Fetal Medicine	5	.0	.0	66.1
Obstetrics And Gynecology: Reproductive Endocrinology/Infertility	9	.1	.1	66.2

Ophthalmology	318	2.1	2.1	68.2
Ophthalmology & Otolaryngology-Head & Neck Surgery: Facial Plastic Surgery	1	.0	.0	68.2
Ophthalmology & Otolaryngology-Head & Neck Surgery: Ophthalmology	2	.0	.0	68.3
Ophthalmology & Otolaryngology-Head & Neck Surgery: Otolaryngology	1	.0	.0	68.3
Ophthalmology & Otolaryngology-Head &Neck Surgery: Ophthalmology	1	.0	.0	68.3
Ophthalmology & Otolaryngology-Head &Neck Surgery: Otolaryngology/Facial Plastic	1	.0	.0	68.3
Orthopaedic Surgery	390	2.5	2.5	70.8
Orthopaedic Surgery: Hand Surgery	4	.0	.0	70.8
Orthopedic Surgery	7	.0	.0	70.9
Otlaryngology	20	.1	.1	71.0
Otlaryngology: Otology/Neurotology	1	.0	.0	71.0
Otolaryngology	168	1.1	1.1	72.1
Otolaryngology: Neurotology	2	.0	.0	72.1
Otolaryngology: Pediatric Otolaryngology	2	.0	.0	72.1
Otolaryngology: Plastic Surgery Within The Head And Neck	2	.0	.0	72.1
Pathology: Anatomic Pathology	38	.2	.2	72.4
Pathology: Anatomic Pathology & Clinical Pathology	257	1.7	1.7	74.0
Pathology: Anatomic Pathology And Laboratory Medicine	2	.0	.0	74.1
Pathology: Blood Banking Transfusion Medicine	2	.0	.0	74.1
Pathology: Clinical Pathology	12	.1	.1	74.1
Pathology: Neuropathology	1	.0	.0	74.1
Pediatrics	1340	8.7	8.7	82.8
Pediatrics: Adolescent Medicine	1	.0	.0	82.8
Pediatrics: Neonatal-Perinatal Medicine	17	.1	.1	82.9
Pediatrics: Pediatric Cardiology	5	.0	.0	83.0
Pediatrics: Pediatric Critical Care Medicine	5	.0	.0	83.0
Pediatrics: Pediatric Emergency Medicine	2	.0	.0	83.0
Pediatrics: Pediatric Endocrinology	6	.0	.0	83.1
Pediatrics: Pediatric Gastroenterology	5	.0	.0	83.1
Pediatrics: Pediatric Hematology-Oncology	5	.0	.0	83.1
Pediatrics: Pediatric Infectious Diseases	4	.0	.0	83.1
Pediatrics: Pediatric Nephrology	1	.0	.0	83.1
Pediatrics: Pediatric Pulmonology	2	.0	.0	83.2
Physical Medicine & Rehabilitation	134	.9	.9	84.0
Physical Medicine & Rehabilitation: Pain Medicine	2	.0	.0	84.0
Plastic Surgery	126	.8	.8	84.9
Plastic Surgery: Hand Surgery	1	.0	.0	84.9
Preventive Medicine	3	.0	.0	84.9
Preventive Medicine: Aerospace Medicine	20	.1	.1	85.0
Preventive Medicine: Occupational Medicine	30	.2	.2	85.2
Preventive Medicine: Preventive Medicine/Occupational	1	.0	.0	85.2
Preventive Medicine: Preventive Medicine/Occupational-Environmental Medicine	1	.0	.0	85.2
Preventive Medicine: Public Health & General Prentive Medicine	1	.0	.0	85.2
Preventive Medicine: Public Health & General Preventive Medicine	16	.1	.1	85.3
Preventive Medicine: Undersea & Hyperbaric Medicine	1	.0	.0	85.3
Psychiatry & Neurology: Addiction Psychiatry	1	.0	.0	85.3
Psychiatry & Neurology: Child & Adolescent Psychiatry	6	.0	.0	85.4
Psychiatry & Neurology: Clinical Neurophysiology	1	.0	.0	85.4
Psychiatry & Neurology: Geriatric Psychiatry	3	.0	.0	85.4
Psychiatry & Neurology: Neurology	188	1.2	1.2	86.6
Psychiatry & Neurology: Neurology W/ Special Qual. In Child Neurology	4	.0	.0	86.6
Psychiatry & Neurology: Psychiatry	674	4.4	4.4	91.0
Radiology	111	.7	.7	91.7

Radiology: Angiography & Interventional Radiology	1	.0	.0	91.7
Radiology: Diagnostic Radiology	483	3.1	3.1	94.9
Radiology: Neuroradiology	1	.0	.0	94.9
Radiology: Radiation Oncology	67	.4	.4	95.3
Radiology: Vascular & Interventional Radiology	4	.0	.0	95.3
Special Proficiency In Osteopathic Manipulative Medicine: Sports Medicine	1	.0	.0	95.3
Surgery	470	3.0	3.0	98.4
Surgery: General	34	.2	.2	98.6
Surgery: Neurological Surgery	2	.0	.0	98.6
Surgery: Pediatric Surgery	1	.0	.0	98.6
Surgery: Plastic And Reconstructive Surgery	2	.0	.0	98.6
Surgery: Surgical Critical Care	2	.0	.0	98.6
Surgery: Thoracic Cardiovascular Surgery	1	.0	.0	98.6
Surgery: Urological Surgery	10	.1	.1	98.7
Surgery: Vascular Surgery	19	.1	.1	98.8
Thoracic Surgery	21	.1	.1	99.0
Urology	159	1.0	1.0	100.0
Total	15453	100.0	100.0	

Second Listed Board Certification

	Frequency	Percent	Valid Percent	Cumulative Percent
None	11682	75.6	75.6	75.6
Allergy And Immunology: Clinical & Laboratory Immunology	4	.0	.0	75.6
Allergy And Immunology: Clinical & Laboratory Immunology	1	.0	.0	75.6
Anesthesiology	2	.0	.0	75.6
Anesthesiology: Critical Care Medicine	16	.1	.1	75.7
Anesthesiology: Pain Management	1	.0	.0	75.8
Anesthesiology: Pain Medicine	55	.4	.4	76.1
Colon & Rectal Surgery	1	.0	.0	76.1
Dermatology	1	.0	.0	76.1
Dermatology: Clinical & Laboratory Dermatological Immunology	1	.0	.0	76.1
Dermatology: Dermatopathology	14	.1	.1	76.2
Dermatology: Pediatric Dermatology	1	.0	.0	76.2
Emergency Medicine	5	.0	.0	76.3
Emergency Medicine: Medical Toxicology	8	.1	.1	76.3
Emergency Medicine: Pediatric Emergency Medicine	16	.1	.1	76.4
Emergency Medicine: Undersea & Hyperbaric Medicine	4	.0	.0	76.4
Family Medicine	40	.3	.3	76.7
Family Medicine: Adolescent Medicine	3	.0	.0	76.7
Family Medicine: Family Practice	194	1.3	1.3	78.0
Family Medicine: Geriatric Medicine	56	.4	.4	78.3
Family Medicine: Hospice & Palliative Medicine	6	.0	.0	78.4
Family Medicine: Sports Medicine	18	.1	.1	78.5
Family Physicians	22	.1	.1	78.6
Family Physicians: Geriatric Medicine	2	.0	.0	78.6
Family Physicians: Sports Medicine	1	.0	.0	78.7
Internal Medicine	160	1.0	1.0	79.7
Internal Medicine: Addiction Medicine	1	.0	.0	79.7
Internal Medicine: Adolescent Medicine	3	.0	.0	79.7
Internal Medicine: Cardiology	7	.0	.0	79.8
Internal Medicine: Cardiovascular Disease	335	2.2	2.2	81.9
Internal Medicine: Clinical & Laboratory Immunology	1	.0	.0	81.9
Internal Medicine: Clinical Cardiac Electrophysiology	5	.0	.0	82.0
Internal Medicine: Critical Care Medicine	138	.9	.9	82.9
Internal Medicine: Endocrinology	1	.0	.0	82.9
Internal Medicine: Endocrinology, Diabetes & Metabolism	96	.6	.6	83.5

Internal Medicine: Gastroenterology	178	1.2	1.2	84.6
Internal Medicine: Geriatric Medicine	84	.5	.5	85.2
Internal Medicine: Hematology	61	.4	.4	85.6
Internal Medicine: Hospice & Palliative Medicine	17	.1	.1	85.7
Internal Medicine: Infectious Disease	100	.6	.6	86.3
Internal Medicine: Interventional Cardiology	7	.0	.0	86.4
Internal Medicine: Medical Oncology	41	.3	.3	86.6
Internal Medicine: Nephrology	138	.9	.9	87.5
Internal Medicine: Oncology	1	.0	.0	87.5
Internal Medicine: Pulmonary Disease	76	.5	.5	88.0
Internal Medicine: Pulmonary Diseases	3	.0	.0	88.1
Internal Medicine: Rheumatology	74	.5	.5	88.5
Internal Medicine: Sleep Medicine	6	.0	.0	88.6
Internal Medicine: Sports Medicine	3	.0	.0	88.6
Internal Medicine: Transplant Hepatology	1	.0	.0	88.6
Medical Genetics: Clinical Genetics (M.D.)	1	.0	.0	88.6
Medical Genetics: Clinical Molecular Genetics	1	.0	.0	88.6
Medicial Genetics	1	.0	.0	88.6
Neurology And Psychiatry: Neurophysiology	1	.0	.0	88.6
Neurology And Psychiatry: Psychiatry	1	.0	.0	88.6
Neuromusculoskeletal Medicine: Special Proficiency In Neuro-Musculoskeletal Medi	3	.0	.0	88.6
Nuclear Medicine	13	.1	.1	88.7
Nuclear Medicine: In Vivo And In Vitro Nuclear Medicine	1	.0	.0	88.7
NULL	1	.0	.0	88.7
Obstetrics & Gynecology: Gynecologic Oncology	2	.0	.0	88.8
Obstetrics & Gynecology: Maternal And Fetal Medicine	1	.0	.0	88.8
Obstetrics & Gynecology: Reproductive Endocrinology	1	.0	.0	88.8
Obstetrics And Gynecology	14	.1	.1	88.9
Obstetrics And Gynecology: Gynecologic Oncology	18	.1	.1	89.0
Obstetrics And Gynecology: Maternal & Fetal Medicine	24	.2	.2	89.1
Obstetrics And Gynecology: Reproductive Endocrinology/Infertility	21	.1	.1	89.3
Ophthalmology	6	.0	.0	89.3
Ophthalmology & Otolaryngology-Head &Neck Surgery: Ophthalmology	1	.0	.0	89.3
Orthopaedic Surgery	1	.0	.0	89.3
Orthopaedic Surgery: Hand Surgery	25	.2	.2	89.5
Orthopaedic Surgery: Sports Medicine	15	.1	.1	89.6
Orthopedic Surgery	5	.0	.0	89.6
Otlaryngology: Plastic Surgery Within The Head And Neck	1	.0	.0	89.6
Otolaryngology	13	.1	.1	89.7
Otolaryngology: Neurotology	5	.0	.0	89.7
Otolaryngology: Pediatric Otolaryngology	3	.0	.0	89.8
Otolaryngology: Plastic Surgery Within The Head And Neck	7	.0	.0	89.8
Otolaryngology: Sleep Medicine	3	.0	.0	89.8
Pathology: Anatomic Pathology	6	.0	.0	89.9
Pathology: Anatomic Pathology & Clinical Pathology	8	.1	.1	89.9
Pathology: Anatomic Pathology And Laboratory Medicine	2	.0	.0	89.9
Pathology: Blood Banking Transfusion Medicine	17	.1	.1	90.0
Pathology: Chemical Pathology	3	.0	.0	90.1
Pathology: Clinical Pathology	11	.1	.1	90.1
Pathology: Cytopathology	63	.4	.4	90.5
Pathology: Dermatopathology	8	.1	.1	90.6
Pathology: Forensic Pathology	20	.1	.1	90.7
Pathology: Hematology	22	.1	.1	90.9
Pathology: Medical Microbiology	2	.0	.0	90.9
Pathology: Molecular Genetic Pathology	2	.0	.0	90.9
Pathology: Neuropathology	6	.0	.0	90.9
Pathology: Pediatric Pathology	5	.0	.0	91.0

Pediatrics	167	1.1	1.1	92.0
Pediatrics: Adolescent Medicine	12	.1	.1	92.1
Pediatrics: Child Abuse Pediatrics	1	.0	.0	92.1
Pediatrics: Developmental-Behavioral Peds	10	.1	.1	92.2
Pediatrics: Hospice & Palliative Medicine	1	.0	.0	92.2
Pediatrics: Neonatal-Perinatal Medicine	98	.6	.6	92.8
Pediatrics: Neonatology	1	.0	.0	92.8
Pediatrics: Neurodevelopmental Disabilities	3	.0	.0	92.8
Pediatrics: Pediatric Allergy/Immunology	2	.0	.0	92.9
Pediatrics: Pediatric Cardiology	40	.3	.3	93.1
Pediatrics: Pediatric Critical Care Medicine	28	.2	.2	93.3
Pediatrics: Pediatric Emergency Medicine	10	.1	.1	93.4
Pediatrics: Pediatric Endocrinology	14	.1	.1	93.5
Pediatrics: Pediatric Gastroenterology	14	.1	.1	93.5
Pediatrics: Pediatric Hematology-Oncology	18	.1	.1	93.7
Pediatrics: Pediatric Infectious Diseases	12	.1	.1	93.7
Pediatrics: Pediatric Nephrology	11	.1	.1	93.8
Pediatrics: Pediatric Pulmonology	18	.1	.1	93.9
Pediatrics: Pediatric Rheumatology	2	.0	.0	93.9
Pediatrics: Sports Medicine	3	.0	.0	94.0
Physical Medicine & Rehabilitation	8	.1	.1	94.0
Physical Medicine & Rehabilitation: Neuromuscular Medicine	2	.0	.0	94.0
Physical Medicine & Rehabilitation: Pain Medicine	17	.1	.1	94.1
Physical Medicine & Rehabilitation: Pediatric Rehabilitation Medicine	1	.0	.0	94.1
Physical Medicine & Rehabilitation: Spinal Cord Injury Medicine	8	.1	.1	94.2
Physical Medicine & Rehabilitation: Sports Medicine	2	.0	.0	94.2
Plastic Surgery	6	.0	.0	94.2
Plastic Surgery: Hand Surgery	10	.1	.1	94.3
Plastic Surgery: Plastic Surgery Within The Head & Neck	4	.0	.0	94.3
Preventive Medicine	2	.0	.0	94.4
Preventive Medicine: Aerospace Medicine	9	.1	.1	94.4
Preventive Medicine: Occupational Medicine	23	.1	.1	94.6
Preventive Medicine: Preventive Medicine/Aerospace Medicine	3	.0	.0	94.6
Preventive Medicine: Preventive Medicine/Occupational-Environmental Medicine	2	.0	.0	94.6
Preventive Medicine: Preventive Medicine/Public Health	1	.0	.0	94.6
Preventive Medicine: Public Health & General Prentive Medicine	2	.0	.0	94.6
Preventive Medicine: Public Health & General Preventive Medicine	23	.1	.1	94.8
Preventive Medicine: Undersea & Hyperbaric Medicine	6	.0	.0	94.8
Psychiatry & Neurology: Addiction Psychiatry	42	.3	.3	95.1
Psychiatry & Neurology: Child & Adolescent Psychiatry	118	.8	.8	95.8
Psychiatry & Neurology: Clinical Neurophysiology	24	.2	.2	96.0
Psychiatry & Neurology: Forensic Psychiatry	25	.2	.2	96.1
Psychiatry & Neurology: Geriatric Psychiatry	26	.2	.2	96.3
Psychiatry & Neurology: Neurology	22	.1	.1	96.5
Psychiatry & Neurology: Neurology W/ Special Qual. In Child Neurology	16	.1	.1	96.6
Psychiatry & Neurology: Pain Medicine	2	.0	.0	96.6
Psychiatry & Neurology: Psychiatry	48	.3	.3	96.9
Psychiatry & Neurology: Psychosomatic Medicine	16	.1	.1	97.0
Psychiatry & Neurology: Sleep Medicine	11	.1	.1	97.1
Psychiatry & Neurology: Vascular Neurology	5	.0	.0	97.1
Radiology	5	.0	.0	97.1
Radiology: Angiography & Interventional Radiology	2	.0	.0	97.1
Radiology: Diagnostic Radiology	69	.4	.4	97.6
Radiology: Diagnostic Roentgenology	1	.0	.0	97.6
Radiology: Neuroradiology	34	.2	.2	97.8
Radiology: Nuclear Radiology	17	.1	.1	97.9
Radiology: Pediatric Radiology	10	.1	.1	98.0

Radiology: Radiation Oncology	10	.1	.1	98.1
Radiology: Vascular & Interventional Radiology	43	.3	.3	98.3
Special Proficiency In Osteopathic Manipulative Medicine: Sports Medicine	1	.0	.0	98.3
Surgery	66	.4	.4	98.8
Surgery: General	26	.2	.2	98.9
Surgery: General Vascular Surgery	9	.1	.1	99.0
Surgery: Neurological Surgery	1	.0	.0	99.0
Surgery: Pediatric Surgery	12	.1	.1	99.1
Surgery: Plastic And Reconstructive Surgery	1	.0	.0	99.1
Surgery: Surgery Of The Hand	1	.0	.0	99.1
Surgery: Surgical Critical Care	38	.2	.2	99.3
Surgery: Thoracic Cardiovascular Surgery	11	.1	.1	99.4
Surgery: Urological Surgery	15	.1	.1	99.5
Surgery: Vascular Surgery	30	.2	.2	99.7
Thoracic Surgery	44	.3	.3	100.0
Urology	2	.0	.0	100.0
Urology: Pediatric Urology	1	.0	.0	100.0
Total	15453	100.0	100.0	

Third Listed Board Certification

	Frequency	Percent	Valid Percent	Cumulative Percent
	14870	96.2	96.2	96.2
Allergy And Immunology: Clinical & Laboratory Immunology	1	.0	.0	96.2
Allergy And Immunology: Clinical & Laboratory Immunology	1	.0	.0	96.2
Anesthesiology: Critical Care Medicine	4	.0	.0	96.3
Anesthesiology: Pain Medicine	5	.0	.0	96.3
Dermatology: Dermatopathology	1	.0	.0	96.3
Dermatology: Pediatric Dermatology	2	.0	.0	96.3
Emergency Medicine: Pediatric Emergency Medicine	1	.0	.0	96.3
Family Medicine: Adolescent Medicine	1	.0	.0	96.3
Family Medicine: Geriatric Medicine	6	.0	.0	96.4
Family Medicine: Hospice & Palliative Medicine	1	.0	.0	96.4
Family Medicine: Sports Medicine	3	.0	.0	96.4
Family Physicians	1	.0	.0	96.4
Internal Medicine	2	.0	.0	96.4
Internal Medicine: Adolescent Medicine	1	.0	.0	96.4
Internal Medicine: Cardiovascular Disease	9	.1	.1	96.5
Internal Medicine: Clinical Cardiac Electrophysiology	28	.2	.2	96.7
Internal Medicine: Critical Care Medicine	7	.0	.0	96.7
Internal Medicine: Endocrinology, Diabetes & Metabolism	4	.0	.0	96.7
Internal Medicine: Geriatric Medicine	7	.0	.0	96.8
Internal Medicine: Hematology	2	.0	.0	96.8
Internal Medicine: Hospice & Palliative Medicine	7	.0	.0	96.8
Internal Medicine: Infectious Disease	13	.1	.1	96.9
Internal Medicine: Interventional Cardiology	80	.5	.5	97.4
Internal Medicine: Medical Oncology	47	.3	.3	97.7
Internal Medicine: Nephrology	3	.0	.0	97.8
Internal Medicine: Oncology	1	.0	.0	97.8
Internal Medicine: Pulmonary Disease	124	.8	.8	98.6
Internal Medicine: Pulmonary Diseases	6	.0	.0	98.6
Internal Medicine: Rheumatology	8	.1	.1	98.7
Internal Medicine: Sleep Medicine	9	.1	.1	98.7
Internal Medicine: Transplant Hepatology	3	.0	.0	98.7
Medicial Genetics	1	.0	.0	98.7
Neurology And Psychiatry: Child/Adolescent Neurology	1	.0	.0	98.8
Neuromusculosketal Medicine: Sports Medicine	1	.0	.0	98.8

Nuclear Medicine: Nuclear Cardiology	6	.0	.0	98.8
Obstetrics And Gynecology	2	.0	.0	98.8
Obstetrics And Gynecology: Hospice & Palliative Medicine	1	.0	.0	98.8
Obstetrics And Gynecology: Maternal & Fetal Medicine	3	.0	.0	98.8
Obstetrics And Gynecology: Reproductive Endocrinology/Infertility	1	.0	.0	98.8
Orthopaedic Surgery: Sports Medicine	1	.0	.0	98.8
Pathology: Anatomic Pathology & Clinical Pathology	1	.0	.0	98.9
Pathology: Blood Banking Transfusion Medicine	1	.0	.0	98.9
Pathology: Blood Banking/Transfusion Medicine	1	.0	.0	98.9
Pathology: Cytopathology	6	.0	.0	98.9
Pathology: Dermatopathology	4	.0	.0	98.9
Pathology: Forensic Pathology	2	.0	.0	98.9
Pathology: Hematology	5	.0	.0	99.0
Pathology: Immunopathology	3	.0	.0	99.0
Pathology: Medical Microbiology	1	.0	.0	99.0
Pathology: Pediatric Pathology	2	.0	.0	99.0
Pediatrics	4	.0	.0	99.0
Pediatrics: Adolescent Medicine	1	.0	.0	99.0
Pediatrics: Neonatology	1	.0	.0	99.1
Pediatrics: Neurodevelopmental Disabilities	2	.0	.0	99.1
Pediatrics: Pediatric Cardiology	3	.0	.0	99.1
Pediatrics: Pediatric Critical Care Medicine	3	.0	.0	99.1
Pediatrics: Pediatric Emergency Medicine	2	.0	.0	99.1
Pediatrics: Pediatric Endocrinology	1	.0	.0	99.1
Pediatrics: Pediatric Gastroenterology	1	.0	.0	99.1
Pediatrics: Pediatric Hematology-Oncology	2	.0	.0	99.1
Pediatrics: Pediatric Rheumatology	1	.0	.0	99.2
Pediatrics: Sleep Medicine	1	.0	.0	99.2
Pediatrics: Sports Medicine	1	.0	.0	99.2
Physical Medicine & Rehabilitation: Pain Medicine	4	.0	.0	99.2
Physical Medicine & Rehabilitation: Pediatric Rehabilitation Medicine	1	.0	.0	99.2
Physical Medicine & Rehabilitation: Spinal Cord Injury Medicine	3	.0	.0	99.2
Physical Medicine and Rehabilitation	1	.0	.0	99.2
Plastic Surgery: Hand Surgery	1	.0	.0	99.2
Plastic Surgery: Plastic Surgery Within The Head & Neck	1	.0	.0	99.2
Preventive Medicine: Occupational Medicine	5	.0	.0	99.3
Preventive Medicine: Preventive Medicine/Occupational-Environmental Medicine	1	.0	.0	99.3
Preventive Medicine: Public Health & General Preventive Medicine	2	.0	.0	99.3
Psychiatry & Neurology: Child & Adolescent Psychiatry	11	.1	.1	99.4
Psychiatry & Neurology: Clinical Neurophysiology	7	.0	.0	99.4
Psychiatry & Neurology: Forensic Psychiatry	13	.1	.1	99.5
Psychiatry & Neurology: Geriatric Psychiatry	14	.1	.1	99.6
Psychiatry & Neurology: Neurodevelopmental Disabilities	1	.0	.0	99.6
Psychiatry & Neurology: Neuromuscular Medicine	2	.0	.0	99.6
Psychiatry & Neurology: Pain Medicine	3	.0	.0	99.6
Psychiatry & Neurology: Psychiatry	2	.0	.0	99.6
Psychiatry & Neurology: Psychosomatic Medicine	4	.0	.0	99.7
Psychiatry & Neurology: Sleep Medicine	3	.0	.0	99.7
Psychiatry & Neurology: Vascular Neurology	1	.0	.0	99.7
Radiology	1	.0	.0	99.7
Radiology: Diagnostic Radiology	1	.0	.0	99.7
Radiology: Neuroradiology	6	.0	.0	99.7
Radiology: Nuclear Radiology	7	.0	.0	99.8
Radiology: Radiological Physics	2	.0	.0	99.8
Radiology: Vascular & Interventional Radiology	5	.0	.0	99.8
Surgery	2	.0	.0	99.8
Surgery: General	1	.0	.0	99.8

Surgery: General Vascular Surgery	2	.0	.0	99.9
Surgery: Pediatric Surgery	1	.0	.0	99.9
Surgery: Plastic And Reconstructive Surgery	4	.0	.0	99.9
Surgery: Surgery Of The Hand	1	.0	.0	99.9
Surgery: Surgical Critical Care	5	.0	.0	99.9
Surgery: Thoracic Cardiovascular Surgery	3	.0	.0	99.9
Surgery: Urological Surgery	1	.0	.0	100.0
Surgery: Vascular Surgery	4	.0	.0	100.0
Thoracic Surgery	2	.0	.0	100.0
Thoracic Surgery: Congenital Cardiac Surgery	1	.0	.0	100.0
Total	15453	100.0	100.0	

Fourth Listed Board Certification

	Frequency	Percent	Valid Percent	Cumulative Percent
	15380	99.5	99.5	99.5
Family Medicine: Hospice & Palliative Medicine	1	.0	.0	99.5
Internal Medicine: Cardiovascular Disease	1	.0	.0	99.5
Internal Medicine: Critical Care Medicine	1	.0	.0	99.5
Internal Medicine: Geriatric Medicine	1	.0	.0	99.6
Internal Medicine: Interventional Cardiology	1	.0	.0	99.6
Internal Medicine: Medical Oncology	4	.0	.0	99.6
Internal Medicine: Pulmonary Disease	2	.0	.0	99.6
Internal Medicine: Rheumatology	1	.0	.0	99.6
Internal Medicine: Sleep Medicine	22	.1	.1	99.7
Internal Medicine: Sports Medicine	1	.0	.0	99.8
Nuclear Medicine: Nuclear Cardiology	1	.0	.0	99.8
Obstetrics And Gynecology: Maternal & Fetal Medicine	2	.0	.0	99.8
Pathology: Clinical Pathology	1	.0	.0	99.8
Pathology: Forensic Pathology	1	.0	.0	99.8
Pathology: Immunopathology	1	.0	.0	99.8
Pathology: Laboratory Medicine	1	.0	.0	99.8
Pediatrics	1	.0	.0	99.8
Pediatrics: Pediatric Critical Care Medicine	1	.0	.0	99.8
Pediatrics: Pediatric Infectious Diseases	3	.0	.0	99.8
Pediatrics: Pediatric Rheumatology	1	.0	.0	99.8
Plastic Surgery: Hand Surgery	1	.0	.0	99.8
Preventive Medicine: Preventive Medicine/Occupational-Environmental Medicine	1	.0	.0	99.9
Preventive Medicine: Undersea & Hyperbaric Medicine	1	.0	.0	99.9
Psychiatry & Neurology: Addiction Psychiatry	1	.0	.0	99.9
Psychiatry & Neurology: Clinical Neurophysiology	1	.0	.0	99.9
Psychiatry & Neurology: Forensic Psychiatry	2	.0	.0	99.9
Psychiatry & Neurology: Geriatric Psychiatry	2	.0	.0	99.9
Psychiatry & Neurology: Neurodevelopmental Disabilities	2	.0	.0	99.9
Psychiatry & Neurology: Pain Medicine	1	.0	.0	99.9
Psychiatry & Neurology: Psychosomatic Medicine	3	.0	.0	99.9
Psychiatry & Neurology: Vascular Neurology	1	.0	.0	99.9
Radiology: Diagnostic Radiology	1	.0	.0	99.9
Radiology: Vascular & Interventional Radiology	3	.0	.0	100.0
Surgery: Surgery Of The Hand	1	.0	.0	100.0
Surgery: Surgical Critical Care	2	.0	.0	100.0
Surgery: Thoracic Cardiovascular Surgery	1	.0	.0	100.0
Surgery: Vascular Surgery	1	.0	.0	100.0
Total	15453	100.0	100.0	

Fifth Listed Board Certification

	Frequency	Percent	Valid Percent	Cumulative Percent
	15448	100.0	100.0	100.0
Medical Genetics: Medical Biochemical Genetics	1	.0	.0	100.0
Psychiatry & Neurology: Geriatric Psychiatry	1	.0	.0	100.0
Psychiatry & Neurology: Pain Medicine	1	.0	.0	100.0
Psychiatry & Neurology: Psychosomatic Medicine	2	.0	.0	100.0
Total	15453	100.0	100.0	

Appendix E: Physician Location

Locality	2010 Population	Physician Count	Primary Location FTE Total	Secondary Location FTEs	Tertiary Location FTEs	Address of Record FTEs	Total FTEs	Physicians Per FTE	Primary Care Physician Count	Physicians per 100,000 Residents
Accomack	33164	16	11.095	2.027	0	1.750	13.12159	1.2193648	10	48
Albemarle	98970	292	231.814	19.193	1.138	13.000	252.1448	1.1580649	137	295
Alexandria	139966	367	212.371	39.004	.569	49.500	251.944	1.456673	135	262
Alleghany	16250	32	23.789	.912	.455	1.250	25.156	1.2720622	11	197
Amelia	12690	1	1.000	.370	0	0	1.369576	0.7301528	1	8
Amherst	32353	10	9.595	1.347	.228	0	11.1694	0.895303	5	31
Appomattox	14973	4	4.000	0	0	0	4	1	3	27
Arlington	207627	436	280.909	27.707	3.509	52.750	312.1249	1.3968765	172	210
Augusta	73750	152	119.794	8.746	.949	6.000	129.4895	1.1738404	62	206
Bath	4731	4	2.000	.811	.341	0	3.152122	1.2689865	2	85
Bedford	68676	49	31.878	2.838	.228	7.500	34.94348	1.4022646	25	71
Bedford City	6222	22	17.973	3.127	0	0	21.09989	1.0426592	15	354
Bland	6824	0	0	.334	0	0	0.333756	0	0	0
Botetourt	33148	17	11.593	1.550	.455	0	13.59785	1.2501973	10	51
Bristol	17835	14	9.033	1.550	.443	1.000	11.02655	1.269663	8	78
Brunswick	17434	5	5.000	.405	.114	0	5.519173	0.9059329	4	29
Buchanan	24098	22	15.784	2.534	0	1.000	18.31754	1.2010347	9	91
Buckingham	17146	10	7.987	1.622	0	0	9.608095	1.0407891	6	58
Buena Vista	6650	1	.920	.334	0	0	1.253756	0.7976033	1	15
Campbell	54842	18	14.501	.572	.228	0	15.30094	1.1763984	9	33
Caroline	28545	8	6.500	.405	0	0	6.905396	1.1585142	4	28
Carroll	30042	10	9.000	2.531	0	0	11.531	0.8672271	8	33
Charles City	7256	3	2.595	.000	0	0	2.594604	1.156246	2	41
Charlotte	12586	7	5.595	.739	.114	.500	6.447532	1.0856867	5	56
Charlottesville	43475	645	473.723	18.210	1.138	82.000	493.0711	1.3081277	274	1484
Chesapeake	222209	355	248.607	53.511	1.707	43.750	303.8248	1.1684364	170	160
Chesterfield	316236	409	286.522	50.445	6.258	45.500	343.2242	1.1916408	192	129
Clarke	14034	7	3.689	1.073	0	2.000	4.762116	1.4699349	3	50
Colonial Heights	17411	52	39.434	3.958	.455	.500	43.84739	1.1859316	25	299
Covington	5961	5	4.435	.405	0	0	4.84	1.0330579	4	84
Craig	5190	5	4.515	.405	0	0	4.92	1.0162602	1	96
Culpeper	46689	57	44.800	6.405	.228	3.000	51.43252	1.1082482	23	122
Cumberland	10052	13	10.223	1.013	0	0	11.23599	1.1569961	4	129
Danville	43055	109	81.683	9.836	.228	9.000	91.74715	1.1880478	57	253
Dickenson	15903	8	4.892	1.145	0	1.000	6.036188	1.3253398	5	50
Dinwiddie	28001	52	43.865	3.982	.228	0	48.07488	1.081646	13	186
Emporia	5927	15	10.189	1.216	0	1.250	11.4054	1.3151669	7	253
Essex	11151	27	22.892	4.054	.228	2.000	27.17342	0.9936179	11	242

Fairfax	1081726	2513	1628.104	253.161	33.284	197.750	1914.549	1.3125808	1042	232
Fairfax City	22565	75	58.152	8.123	0	0	66.27491	1.1316499	33	332
Falls Church	12332	204	115.813	15.905	1.820	28.750	133.5378	1.5276569	93	1654
Fauquier	65203	73	58.758	13.477	1.575	2.750	73.80913	0.9890376	34	112
Floyd	15279	6	5.189	0	0	0	5.189207	1.156246	4	39
Fluvanna	25691	9	5.000	.811	.228	1.750	6.038345	1.4904745	6	35
Franklin	56159	33	23.982	5.127	.683	1.250	29.79144	1.1077009	20	59
Franklin City	8582	27	23.765	1.923	.683	0	26.37017	1.0238841	10	315
Frederick	78305	31	23.662	2.635	0	.500	26.29767	1.1788117	3	40
Fredericksburg	24286	250	197.646	13.160	.796	13.500	211.6027	1.1814593	97	1029
Galax	7042	38	29.860	4.180	0	.250	34.03963	1.1163459	21	540
Giles	17286	21	13.006	4.054	.455	.500	17.51487	1.1989815	11	121
Gloucester	36858	51	36.474	12.207	.569	2.000	49.24989	1.0355354	27	138
Goochland	21717	24	13.609	.811	.114	4.750	14.53326	1.6513844	12	111
Grayson	15533	19	14.223	.405	0	.500	14.62815	1.2988657	12	122
Greene	18403	4	2.500	0	0	1.000	2.5	1.6	3	22
Greensville	12243	9	7.689	1.881	0	0	9.569806	0.940458	4	74
Halifax	36241	51	40.160	3.413	.228	2.500	43.80125	1.1643503	21	141
Hampton	137436	272	217.595	15.976	2.276	6.000	235.8462	1.1532941	109	198
Hanover	99863	136	106.894	22.297	2.276	7.500	131.4663	1.0344854	79	136
Harrisonburg	48914	125	97.683	3.982	.455	8.500	102.1206	1.2240433	56	256
Henrico	306935	580	433.491	50.878	9.293	35.000	493.6628	1.174891	259	189
Henry	54151	23	19.454	.811	0	0	20.2646	1.134984	10	42
Highland	2321	4	2.642	.405	0	0	3.047035	1.3127515	3	172
Hopewell	22591	37	29.088	5.258	.228	0	34.57307	1.0701971	21	164
Isle of Wight	35270	28	12.784	2.027	.455	11.750	15.2659	1.8341535	14	79
James City	67009	94	79.123	10.802	1.365	0	91.29076	1.029677	47	140
King and Queen	6945	1	1.000		0	0	1	1	1	14
King George	23584	8	6.015	.978	.228	.500	7.219827	1.1080598	6	34
King William	15935	9	7.128	1.145	0	0	8.272447	1.0879489	9	56
Lancaster	11391	18	11.737	2.027	0	.500	13.76409	1.307751	8	158
Lee	25587	21	14.614	2.972	0	1.000	17.58663	1.194089	9	82
Lexington	7042	20	16.331	3.473	.228	0	20.031	0.9984522	14	284
Loudoun	312311	436	286.251	55.303	9.045	48.500	350.5992	1.2435854	209	140
Louisa	33153	10	7.500	.405	0	.750	7.905396	1.2649587	8	30
Lunenburg	12914	5	4.500	1.013	.228	0	5.741044	0.8709218	3	39
Lynchburg	75568	280	220.809	12.470	.740	16.000	234.0182	1.1964881	133	371
Madison	13308	7	5.250	.203	.228	0	5.680251	1.23234	2	53
Manassas*	37821	179	124.576	10.134	2.162	8.250	136.8716	1.3077952	65	473*
Manassas Park*	14273	0	0	.000	0	0	0	0	0	0*
Martinsville	13821	62	50.097	2.432	.683	1.500	53.21186	1.1651537	21	449
Mathews	8978	4	2.595	.572	0	.500	3.166878	1.2630736	2	45
Mecklenburg	32727	46	30.149	2.861	.228	3.500	33.23834	1.3839441	17	141
Middlesex	10959	7	4.595	.405	0	.750	5	1.4	6	64

Montgomery	94392	167	130.895	17.887	.683	8.000	149.4649	1.1173194	67	177
Nelson	15020	12	7.595	.608	0	.750	8.202698	1.4629333	9	80
New Kent	18429	9	2.175	1.073	.683	4.500	3.930251	2.2899302	6	49
Newport News	180719	401	313.567	38.466	7.719	14.500	359.752	1.1146568	177	222
Norfolk	242803	755	548.509	37.998	11.341	48.250	597.8478	1.2628633	322	311
Northampton	12389	35	27.101	3.303	1.138	1.250	31.54127	1.1096574	14	283
Northumberland	12330	32	22.798	3.446	.228	1.250	26.47184	1.2088319	20	260
Norton	3958	31	24.408	2.027	.000	.500	26.4346	1.1727053	9	783
Nottoway	15853	17	12.095	2.230	0	2.000	14.32428	1.1867958	7	107
Orange	33481	27	21.887	1.216	0	2.000	23.10322	1.168668	25	81
Page	24042	17	12.284	2.361	0	0	14.64455	1.1608415	12	71
Patrick	18490	5	2.845	.811	0	1.000	3.655396	1.3678407	3	27
Petersburg	32420	42	36.010	4.542	.228	0	40.7795	1.0299294	21	130
Pittsylvania	63506	33	24.926	4.924	.455	0	30.30559	1.0889079	16	52
Poquoson	12150	5	1.500	.000	0	1.250	1.5	3.3333333	1	41
Portsmouth	95535	399	332.012	13.438	2.958	26.500	348.408	1.1452092	89	418
Powhatan	28046	13	9.689	.906	.455	1.500	11.05034	1.1764341	9	46
Prince Edward	23368	23	19.234	5.199	0	1.500	24.43246	0.9413705	12	98
Prince George	35725	28	22.614	2.694	.228	1.000	25.53645	1.0964717	16	78
Prince William	402002	360	261.872	38.757	7.851	8.250	308.4794	1.1670147	185	90
Pulaski	34872	39	30.811	3.300	.683	0	34.79398	1.1208836	20	112
Radford	16408	22	12.364	1.386	.228	4.000	13.9779	1.5739131	10	134
Rappahannock	7373	4	1.392	.608	0	0	2	2	2	54
Richmond	9254	5	4.000	.405	.228	0	4.632949	1.0792262	3	54
Richmond City	204214	1079	752.931	80.106	8.761	116.000	841.7981	1.2817801	466	528
Roanoke	92376	345	232.207	16.815	1.575	46.000	250.5965	1.3767152	120	373
Roanoke City	97032	303	253.738	21.059	3.868	0	278.6652	1.0873263	128	312
Rockbridge	22307	16	11.472	2.328	0	1.000	13.80054	1.1593747	11	72
Rockingham	76314	82	71.068	2.563	0	2.250	73.63106	1.1136605	38	107
Russell	28897	17	9.426	4.185	.228	1.000	13.83837	1.2284682	8	59
Salem	24802	159	131.593	11.319	.796	5.000	143.7081	1.1064095	79	641
Scott	23177	10	6.500	.405	0	1.000	6.905396	1.4481428	6	43
Shenandoah	41993	40	31.676	2.400	.437	1.750	34.51316	1.1589782	19	95
Smyth	32208	57	41.307	3.547	.455	5.250	45.30919	1.2580229	21	177
Southampton	18570	14	11.223	1.478	0	0	12.70081	1.1022921	8	75
Spotsylvania	122397	85	66.288	7.249	.967	4.000	74.50417	1.1408758	46	69
Stafford	128961	52	35.513	19.454	3.072	4.250	58.03825	0.8959609	35	40
Staunton	23746	40	32.742	1.550	0	1.000	34.29225	1.1664443	16	168
Suffolk	84585	131	86.020	17.870	2.125	19.000	106.0153	1.2356711	51	155
Surry	7058	2	.595	0	0	.500	0.594604	3.3635857	1	28
Sussex	12087	5	5.000	.405	0	2.500	5.405396	0.9250015	3	41
Tazewell	45078	72	54.323	3.303	.455	0	58.08111	1.2396457	24	160
Virginia Beach	437994	657	465.102	49.127	10.813	67.500	525.0428	1.2513267	258	150
Warren	37575	43	34.157	4.892	.796	2.000	39.84528	1.0791742	19	114

Washington	54876	94	67.645	8.737	0	5.250	76.38189	1.2306582	37	171
Waynesboro	21006	30	20.223	1.792	.228	1.500	22.24216	1.3487901	20	143
Westmoreland	17454	7	5.939	.668	0	17.500	6.606204	1.0596101	6	40
Williamsburg	14068	51	19.837	2.027	.455	10.250	22.319	2.285049	15	363
Winchester	26203	263	213.628	11.489	.228	2.500	225.3442	1.1671037	125	1004
Wise	41452	69	49.074	6.343	.228	8.750	55.64488	1.2400063	35	166
Wythe	29235	45	35.662	3.649	.569	3.000	39.87916	1.128409	22	154
York	65464	86	60.179	6.382	.796	11.500	67.35766	1.2767665	51	131
	8001024	15444								193

Our Geocoding software placed Manassas Park physicians in Manassas. If the two independent cities are combined, the overall physician to population ratio is 344 per 100,000 Residents.

Appendix F: AMA Physician Masterfile Comparisons

The AMA Physician Masterfile count of Virginia's physicians is about 164 percent of the HWDC's Virginia Physician Workforce. Correlation between the two data sets is high (0.98 Correlation Coefficient). The Z-score is a measure of the proportional difference the HWDC and AMA physician counts. Those with a statistical background will understand the Z-score as the number of standard deviations the "AMA Count to HWDC Count Ratio" is from the mean of all ratios. A positive score indicates the AMA physician count is proportionally higher than the HWDC count in that locality. Readers without a statistical background may refer to the following table:

Z-Score	
Greater than +2	AMA count is significantly higher than the HWDC Count
Between +1 and +2	AMA count is higher than the HWDC Count
Between -1 and +1	AMA and HWDC counts are approximately the same
Between 1- and -2	AMA count is lower than the HWDC Count
Less than -2	AMA count is significantly lower than the HWDC Count

Locality	2010 Population	HWDC Physician Count	HWDC Physicians per 100,000 Residents	AMA Physician Masterfile Count	AMA Physician to Population Ratio	AMA Count to HWDC Count	Z-score
Accomack	33164	16	48.25	32	96.49	2.00	0.22
Albemarle	98970	292	295.04	776	784.08	2.66	0.76
Alexandria	139966	367	262.21	520	371.52	1.42	-0.27
Alleghany	16250	32	196.92	35	215.38	1.09	-0.53
Amelia	12690	1	7.88	3	23.64	3.00	1.04
Amherst	32353	10	30.91	15	46.36	1.50	-0.20
Appomattox	14973	4	26.71	3	20.04	0.75	-0.82
Arlington	207627	436	209.99	938	451.77	2.15	0.34
Augusta	73750	152	206.10	115	155.93	0.76	-0.81
Bath	4731	4	84.55	8	169.10	2.00	0.22
Bedford	68676	49	71.35	102	148.52	2.08	0.28
Bedford City	6222	22	353.58				
Bland	6824	0	0.00	3	43.96		
Botetourt	33148	17	51.29	47	141.79	2.76	0.85
Bristol	17835	14	78.50	14	78.50	1.00	-0.61
Brunswick	17434	5	28.68	7	40.15	1.40	-0.28
Buchanan	24098	22	91.29	19	78.84	0.86	-0.72
Buckingham	17146	10	58.32	15	87.48	1.50	-0.20
Buena Vista	6650	1	15.04	3	45.11	3.00	1.04
Campbell	54842	18	32.82	16	29.17	0.89	-0.70
Caroline	28545	8	28.03	15	52.55	1.88	0.11
Carroll	30042	10	33.29	60	199.72	6.00	3.53
Charles City	7256	3	41.35	4	55.13	1.33	-0.33

Charlotte	12586	7	55.62	6	47.67	0.86	-0.73
Charlottesville	43475	645	1483.61	1360	3128.23	2.11	0.31
Chesapeake	222209	355	159.76	676	304.22	1.90	0.14
Chesterfield	316236	409	129.33	1015	320.96	2.48	0.62
Clarke	14034	7	49.88	24	171.01	3.43	1.40
Colonial Heights	17411	52	298.66	71	407.79	1.37	-0.31
Covington	5961	5	83.88	9	150.98	1.80	0.05
Craig	5190	5	96.34	1	19.27	0.20	-1.27
Culpeper	46689	57	122.08	60	128.51	1.05	-0.57
Cumberland	10052	13	129.33	4	39.79	0.31	-1.18
Danville	43055	109	253.16	152	353.04	1.39	-0.28
Dickenson	15903	8	50.30	11	69.17	1.38	-0.30
Dinwiddie	28001	52	185.71	7	25.00	0.13	-1.33
Emporia	5927	15	253.08				
Essex	11151	27	242.13	24	215.23	0.89	-0.70
Fairfax	1081726	2513	232.31	4522	418.04	1.80	0.05
Fairfax City	22565	75	332.37	3	13.29	0.04	-1.40
Falls Church	12332	204	1654.23	118	956.86	0.58	-0.96
Fauquier	65203	73	111.96	119	182.51	1.63	-0.09
Floyd	15279	6	39.27	13	85.08	2.17	0.36
Fluvanna	25691	9	35.03	43	167.37	4.78	2.52
Franklin	56159	33	58.76	68	121.08	2.06	0.27
Franklin City	8582	27	314.61	34	396.18	1.26	-0.40
Frederick	78305	31	39.59	128	163.46	4.13	1.98
Fredericksburg	24286	250	1029.40	190	782.34	0.76	-0.81
Galax	7042	38	539.62				
Giles	17286	21	121.49	20	115.70	0.95	-0.65
Gloucester	36858	51	138.37	67	181.78	1.31	-0.35
Goochland	21717	24	110.51	70	322.33	2.92	0.98
Grayson	15533	19	122.32	9	57.94	0.47	-1.05
Greene	18403	4	21.74	15	81.51	3.75	1.67
Greensville	12243	9	73.51	19	155.19	2.11	0.31
Halifax	36241	51	140.72	75	206.95	1.47	-0.22
Hampton	137436	272	197.91	234	170.26	0.86	-0.73
Hanover	99863	136	136.19	199	199.27	1.46	-0.23
Harrisonburg	48914	125	255.55	237	484.52	1.90	0.13
Henrico	306935	580	188.97	1451	472.74	2.50	0.63
Henry	54151	23	42.47	99	182.82	4.30	2.12
Highland	2321	4	172.34	5	215.42	1.25	-0.40
Hopewell	22591	37	163.78	36	159.36	0.97	-0.63
Isle of Wight	35270	28	79.39	63	178.62	2.25	0.42
James City	67009	94	140.28	422	629.77	4.49	2.28
King and Queen	6945	1	14.40	6	86.39	6.00	3.53
King George	23584	8	33.92	10	42.40	1.25	-0.40

King William	15935	9	56.48	11	69.03	1.22	-0.43
Lancaster	11391	18	158.02	32	280.92	1.78	0.03
Lee	25587	21	82.07	20	78.16	0.95	-0.65
Lexington	7042	20	284.01				
Loudoun	312311	436	139.60	686	219.65	1.57	-0.14
Louisa	33153	10	30.16	15	45.24	1.50	-0.20
Lunenburg	12914	5	38.72	6	46.46	1.20	-0.44
Lynchburg	75568	280	370.53	427	565.05	1.53	-0.18
Madison	13308	7	52.60	14	105.20	2.00	0.22
Manassas*	37821	179	473.28	130	343.72	0.73	-0.84
Manassas Park*	14273	0	0*				
Martinsville	13821	62	448.59	16	115.77	0.26	-1.22
Mathews	8978	4	44.55	17	189.35	4.25	2.08
Mecklenburg	32727	46	140.56	56	171.11	1.22	-0.43
Middlesex	10959	7	63.87	15	136.87	2.14	0.34
Montgomery	94392	167	176.92	179	189.63	1.07	-0.55
Nelson	15020	12	79.89	36	239.68	3.00	1.04
New Kent	18429	9	48.84	17	92.25	1.89	0.13
Newport News	180719	401	221.89	463	256.20	1.15	-0.48
Norfolk	242803	755	310.95	1248	514.00	1.65	-0.07
Northampton	12389	35	282.51	47	379.37	1.34	-0.33
Northumberland	12330	32	259.53	55	446.07	1.72	-0.02
Norton	3958	31	783.22	44	1111.67	1.42	-0.26
Nottoway	15853	17	107.24	19	119.85	1.12	-0.51
Orange	33481	27	80.64	48	143.36	1.78	0.03
Page	24042	17	70.71	21	87.35	1.24	-0.42
Patrick	18490	5	27.04	11	59.49	2.20	0.38
Petersburg	32420	42	129.55	74	228.25	1.76	0.02
Pittsylvania	63506	33	51.96	6	9.45	0.18	-1.29
Poquoson	12150	5	41.15	40	329.22	8.00	5.18
Portsmouth	95535	399	417.65	380	397.76	0.95	-0.65
Powhatan	28046	13	46.35	25	89.14	1.92	0.15
Prince Edward	23368	23	98.43	39	166.89	1.70	-0.03
Prince George	35725	28	78.38	13	36.39	0.46	-1.05
Prince William	402002	360	89.55	476	118.41	1.32	-0.34
Pulaski	34872	39	111.84	49	140.51	1.26	-0.40
Radford	16408	22	134.08	57	347.39	2.59	0.71
Rappahannock	7373	4	54.25	8	108.50	2.00	0.22
Richmond	9254	5	54.03	2	21.61	0.40	-1.11
Richmond City	204214	1079	528.37	1573	770.27	1.46	-0.23
Roanoke	92376	345	373.47	479	518.53	1.39	-0.29
Roanoke City	97032	303	312.27	522	537.97	1.72	-0.01
Rockbridge	22307	16	71.73	59	264.49	3.69	1.61
Rockingham	76314	82	107.45	63	82.55	0.77	-0.80

Russell	28897	17	58.83	18	62.29	1.06	-0.56
Salem	24802	159	641.08	193	778.16	1.21	-0.43
Scott	23177	10	43.15	12	51.78	1.20	-0.44
Shenandoah	41993	40	95.25	44	104.78	1.10	-0.53
Smyth	32208	57	176.97	65	201.81	1.14	-0.49
Southampton	18570	14	75.39	7	37.70	0.50	-1.02
Spotsylvania	122397	85	69.45	196	160.13	2.31	0.47
Stafford	128961	52	40.32	119	92.28	2.29	0.46
Staunton	23746	40	168.45	81	341.11	2.03	0.24
Suffolk	84585	131	154.87	313	370.04	2.39	0.54
Surry	7058	2	28.34	2	28.34	1.00	-0.61
Sussex	12087	5	41.37	3	24.82	0.60	-0.94
Tazewell	45078	72	159.72	121	268.42	1.68	-0.05
Virginia Beach	437994	657	150.00	1323	302.06	2.01	0.23
Warren	37575	43	114.44	36	95.81	0.84	-0.75
Washington	54876	94	171.30	138	251.48	1.47	-0.22
Waynesboro	21006	30	142.82	74	352.28	2.47	0.60
Westmoreland	17454	7	40.11	9	51.56	1.29	-0.37
Williamsburg	14068	51	362.52	8	56.87	0.16	-1.31
Winchester	26203	263	1003.70	263	1003.70	1.00	-0.61
Wise	41452	69	166.46	47	113.38	0.68	-0.87
Wythe	29235	45	153.93	49	167.61	1.09	-0.54
York	65464	86	131.37	227	346.76	2.64	0.75
	8001024	15444	193.03	25291	316.10	1.64	-0.08