
A Census of Actively Licensed Physicians in the United States, 2010

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ABSTRACT: As part of their ongoing effort to protect the public, the nation's 70 state and territorial medical and osteopathic boards regularly collect and disseminate information about actively licensed physicians in their jurisdictions to the FSMB's Federation Physician Data Center. This article summarizes results from the first-ever comprehensive analysis by FSMB of this information, from state boards and additional sources, to present a census of actively licensed physicians in the United States and the District of Columbia in 2010. While noting the value to state boards and multiple stakeholders of an accurate count of physicians — including information about their gender, age, specialty certification and location by region — the article acknowledges opportunities for future collaboration among organizations and agencies to better define current physician supply in order to better predict future physician needs for a growing and aging national population.

Keywords: Physician Workforce, Medical Licensure Data, Physician Supply Estimates, Health Workforce Planning

Introduction

Each of the 70 state and territorial medical and osteopathic boards in the United States are governed by statutes and regulations in a medical practice act, which contains legislated policies and procedures establishing a board's rights and responsibilities to license and discipline physicians. Because an active license is required to legally practice medicine and physicians can have more than one license or move from one state to another over time, accurate information about physicians' credentials and license status is vital to state boards to enable them to effectively carry out their primary mission: to protect the public. Accurate information about physicians' credentials and license status is also of critical value to researchers, medical regulators, policymakers and local, state and federal governments interested in health care workforce assessments, decisions and planning.

This article provides a summary of data collected during 2010 from each of the state medical and osteopathic boards in the United States and the District of Columbia by the Federation of State Medical Boards (FSMB). In aggregate, the information offers

a useful and current snapshot of the number, gender, age, specialty certification, and location by region of all physicians with an active license to practice medicine. The findings, which represent the first time that the FSMB has comprehensively analyzed and reported such information from all of its data sources, also suggest ways in which state licensing boards may wish to modify their own data collection in the future to further enhance the value of a national physician census to them and other stakeholders.

Methodology

The FSMB maintains a comprehensive central repository of state-based data that contains biographical, educational and disciplinary information about physicians licensed in jurisdictions throughout the United States and its territories. The repository is unique in that it is the only national database that contains up-to-date information about which jurisdictions have granted physicians a license to practice medicine. The complete database, formally known as the Federation Physician Data Center (FPDC) since its development in 2004, is continuously updated and currently contains

more than 1.6 million physician records, including information about physicians who are currently licensed, no longer licensed or deceased. To obtain an accurate count and the most precise information about physicians with an active license to practice medicine in the United States, we conducted a census using the most recent data obtained by the FPDC during the 2010 calendar year, with a cutoff date of November 30, 2010.

Licensure data is continuously provided by the 51 state medical and 14 state osteopathic boards

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in the United States and the District of Columbia. Four additional territorial medical boards (Guam, U.S. Virgin Islands, Northern Mariana Islands and Puerto Rico) are also members of the FSMB, but their physician data was excluded from the current analysis because 2010 data from these jurisdictions was not available. Because of differing capabilities and resources, state and territorial medical and osteopathic boards submit information to the FPDC at varying intervals throughout the year. The majority (89%) of state boards provide medical licensure information to the FPDC on a monthly or quarterly basis.

A physician record in the FPDC is initiated when a U.S. medical school student or an international medical graduate (IMG) first registers to take the United States Medical Licensing Examination (USMLE)*, which is required of U.S. and IMG allopathic physicians for licensure eligibility by state medical boards. The USMLE is administered in three steps, the first two usually during medical school and the third step after graduation from medical school. For U.S. osteopathic medical students who do not register for the USMLE** and for physicians who were first licensed prior to the introduction of the USMLE and the Comprehensive

Osteopathic Medical Licensing Examination (COMLEX-USA) in the early 1990s, licensure files from state medical and osteopathic boards serve as the primary source for a physician's record of successful completion of a licensure examination.

When the FPDC receives physician licensure or disciplinary data, each record is matched to a master physician identity table using a set of algorithms developed by the FSMB. The five data elements used for matching the information to ensure that it is accurate include: name, date of birth, Social Security number, medical school name and medical school graduation year. If there is a physician record match with three of the five data elements, the information is automatically entered. When there are fewer than three data elements available for matching, the record is sent to the FSMB's All Licensed Physicians (ALP) department for manual review; typically, more than 90% of physician records received in files from state boards are matched automatically. This systematic process also allows the FSMB to track the same individual across multiple jurisdictions if more than one state license is sought by a physician. While most of this information is transmitted to the FPDC electronically, a small number of state boards send their information via CD-ROM by traditional mail.

Though physicians in the United States are not licensed based upon their specialty or practice focus and specialty board certification is not a requirement for medical licensure, the FPDC receives and supplements licensure data provided by state boards with specialty and subspecialty certification information from the American Board of Medical Specialties (ABMS).† Deceased physicians are identified and flagged in the FPDC by cross-referencing physician records on a quarterly basis with the Death Master File of the Social Security Administration (SSA), a federal database that contains more than 86 million records of deaths reported to the SSA.

Results

There were 850,085 physicians in 2010 with an active license to practice medicine in the United States and District of Columbia, according to an analysis of the FSMB's database. Ninety-three

* The USMLE is offered in a partnership between the FSMB and the National Board of Medical Examiners.

** Doctors of Osteopathic Medicine usually take the Comprehensive Osteopathic Medical Licensing Examination (COMLEX-USA), which is offered by the National Board of Osteopathic Medical Examiners and accepted equally for licensure eligibility.

† Doctors of Osteopathic Medicine are also specialty certified by the American Osteopathic Association's Bureau of Osteopathic Specialists (AOA-BOS). That information is not contained in the FPDC database at this time.

percent of these physicians held an M.D. (doctor of medicine) degree and 7% held a D.O. (doctor of osteopathic medicine) degree (Table 1). The physicians identified in our census graduated from a total of 1,926 medical schools in 161 countries around the world. Some 76% of physicians graduated from a U.S. medical school (allopathic or osteopathic) or from a Canadian medical school, 22% graduated from a medical school outside the United States or Canada and for 2% of the physicians in our database the medical school of graduation could not be determined.

Of the 188,402 international medical graduates (IMGs) who graduated outside the United States or Canada, more graduated from medical schools in India (23%) than any other country in the world. IMGs from schools in the Philippines were a distant second, at 8%; while Pakistan (5%), Mexico (5%), and Grenada (3%) rounded out the top five. Our census also revealed 12% of IMGs with an active license to practice medicine in the U.S. graduated from a medical school in the Caribbean.

Table 1
Population Characteristics

Physicians with an Active License to Practice Medicine in the United States and the District of Columbia	Counts	Percentages
Total	850,085	100.0%
Degree Type		
Doctor of Medicine (M.D.)	789,788	92.9%
Doctor of Osteopathic Medicine (D.O.)	58,329	6.9%
Unknown	1,968	0.2%
Medical School Type		
United States Medical Graduates (M.D. or D.O.) and Canadian Graduates	641,815	75.5%
International Medical Graduates	188,402	22.2%
Unknown	19,868	2.3%
Age		
Less than 30 years	16,285	1.9%
30–39 years	193,267	22.7%
40–49 years	210,196	24.7%
50–59 years	207,129	24.4%
60–69 years	125,385	14.8%
70 + years	64,717	7.6%
Unknown	33,106	3.9%
Gender		
Male	568,501	66.9%
Female	246,314	29.0%
Unknown	35,270	4.1%
Certified by an ABMS Specialty Board		
Yes	633,733	74.5%
No	216,352	25.5%
Number of Active Licenses		
1	657,208	77.3%
2	142,423	16.8%
3 or more	50,454	5.9%

Source: 2010 FSMB Census of Licensed Physicians

Forty-seven percent of all physicians with an active license in 2010 were 50 years of age or older and 22% were 60 years of age or older. More than two-thirds of licensed physicians were male. Sixty-six percent of female physicians were 50 years of age or younger, compared to 44% of males (Figure 1). This shift in gender composition could have a considerable impact on workforce given the different work patterns ascribed, even in contemporary studies, to male and female physicians.

THE PHYSICIANS IDENTIFIED IN OUR CENSUS GRADUATED FROM A TOTAL OF 1,926 MEDICAL SCHOOLS IN 161 COUNTRIES AROUND THE WORLD. SOME 76% OF PHYSICIANS GRADUATED FROM A U.S. OR CANADIAN MEDICAL SCHOOL.

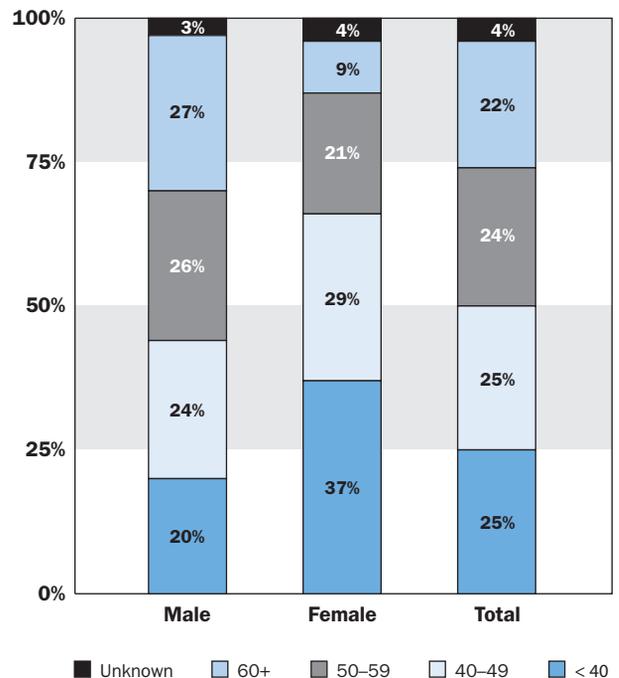
Research conducted with data from the U.S. Census Bureau's Current Population Survey (CPS) indicates that male physicians are generally less active than their female counterparts in the latter part of their careers (55 to 64 years) while female physicians are less active in the early stages of their career (25 to 34 years).¹

The ABMS represents 24 independent specialty boards^{††} that certify physicians (both MDs and DOs) in more than 145 specialties and subspecialties of medicine and surgery.² Overall, 75% of physicians with an active license were certified in 2010 by at least one ABMS specialty board. While 77% of MDs and 38% of DOs were found to hold ABMS certification, the count is considerably lower for DOs because osteopathic physicians also have the option of pursuing specialty board certification through the 18 specialty boards of the American Osteopathic Association's Bureau of Osteopathic Specialists (AOA-BOS); nearly 40% of DOs have this certification, according to published data from 2008.³ There were no meaningful differences in specialty certification between male and female physicians, but U.S. medical school graduates (both MDs and DOs) are more likely than IMGs to have specialty certification from an ABMS board (77% vs. 70%). In addition, a strong relationship

exists between specialty certification and age. The percentage of physicians certified increases dramatically for physicians aged 30 to 39, peaks for physicians aged 40 to 49, and decreases beginning with the 50–59 age range (Figure 2).

In 2010, 77% of physicians had only one active license to practice medicine granted by a state medical or osteopathic board, 17% had active licenses in two jurisdictions and 6% had active licenses in three or more jurisdictions. Twenty-five percent of male physicians, compared to 20% female physicians, had a license to practice medicine in more than one jurisdiction. Physicians with specialty certification from an ABMS board were more likely to have two or more active licenses; 25% compared to 17% for those with no certification. What is not known at the present time is which of the physicians who are specialty certified by an ABMS or an AOA-BOS board possesses a certificate that is time-limited or non time-limited. The actual number of physicians listed as certified by the ABMS or AOA-BOS is likely to be less than we report if physicians' active certificates have expired.

Figure 1
Physicians with an Active License by Gender and Age



Source: 2010 FSMB Census of Licensed Physicians

^{††} Though both the ABMS and FSMB have member boards, the ABMS has independent specialty boards, while the FSMB's member boards are state-regulated, licensing and discipline boards.

Because many of the physicians with multiple licenses are typically licensed in contiguous states, we analyzed regional data. An analysis of the nine geographic divisions of the United States as defined by the U.S. Census Bureau (Figure 3) was used to demonstrate the location of actively licensed physicians in the United States in 2010. The South Atlantic, Pacific,

in the New England (397) and Middle Atlantic (335) divisions than in the Mountain (229) and West South Central (219) divisions (Figure 5).

FORTY-SEVEN PERCENT OF ALL PHYSICIANS WITH AN ACTIVE LICENSE IN 2010 WERE 50 YEARS OF AGE OR OLDER AND 22% WERE 60 YEARS OF AGE OR OLDER.

Middle Atlantic and East North Central divisions accounted for 66% of the physicians in the United States with an active license to practice medicine in 2010 (Figure 4).

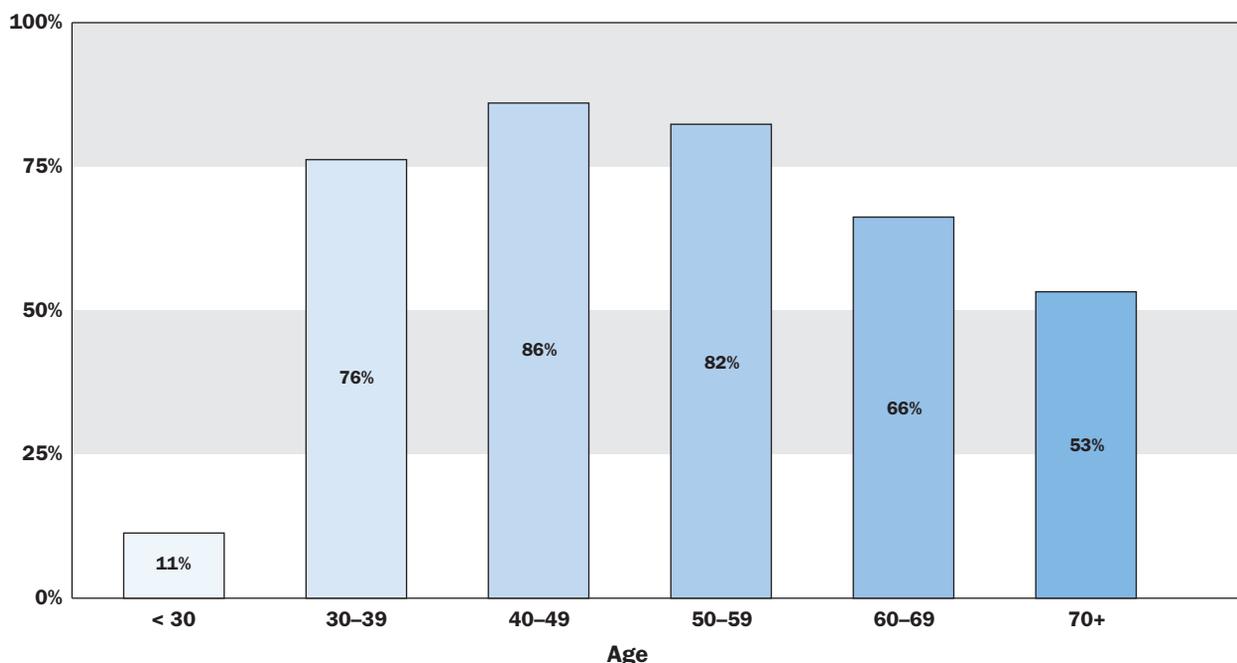
The 850,085 physicians with an active license to practice medicine represent a physician-to-population ratio of 277 actively licensed physicians for every 100,000 people in the United States. The physician-to-population ratio was much higher

Discussion

Rationale for a Census

A census is the primary source of data on a discrete population's size, distribution and demographic structure. This systematic approach to gathering information on every person within a particular group has been employed for thousands of years.⁴ Ancient civilizations such as Egypt, Babylonia, China, India and Rome were among the earliest to undertake a census.⁵ The Romans are said to have first coined the term⁶ and used their census for taxation, the distribution of military obligations and the determination of a territory's political status.⁷ The United States has a decennial census that is mandated by the U.S. Constitution,⁸ and the first U.S. Census was taken shortly after the inauguration of President George Washington in 1790.⁹ The U.S. Census provides population counts to determine seats in the U.S. House of Representatives and state legislative district boundaries and ultimately impacts how billions of dollars in federal and state funds are allocated.¹⁰

Figure 2
Percentage with Active License and ABMS Board Certified by Age



Source: 2010 FSMB Census of Licensed Physicians

Figure 3
Divisions of the United States; U.S. Census Bureau 2010

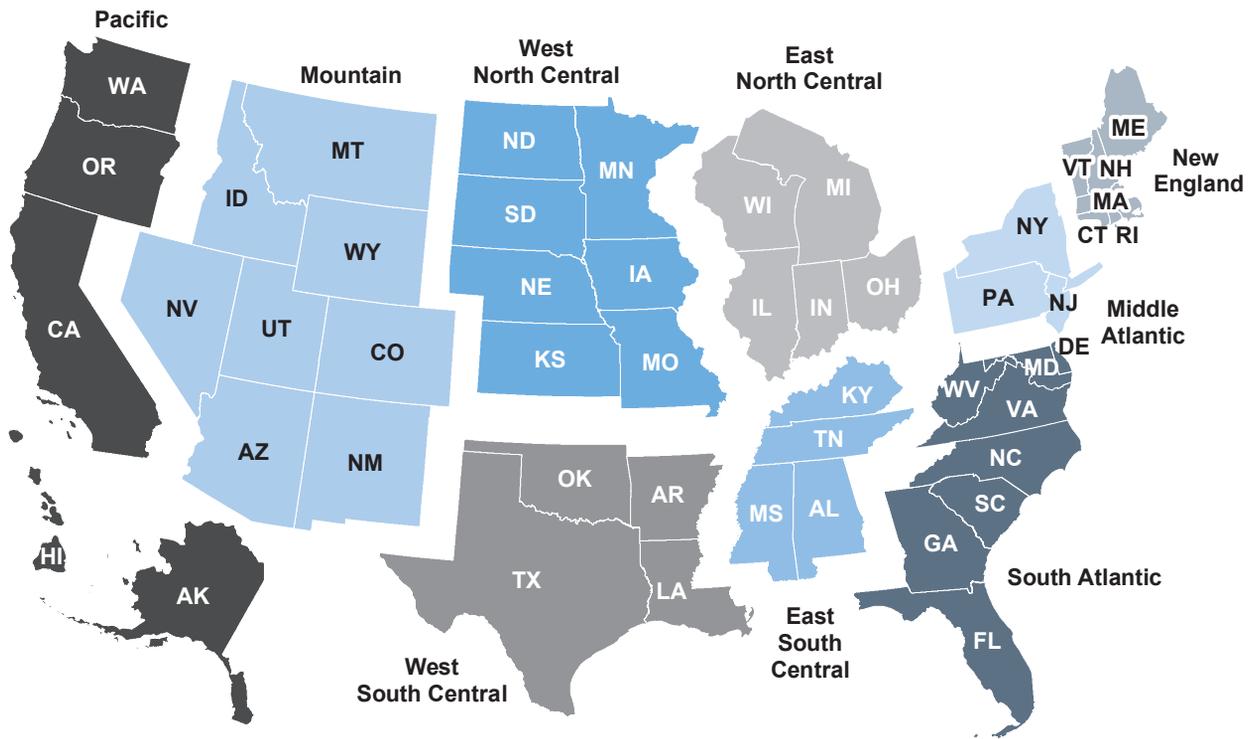
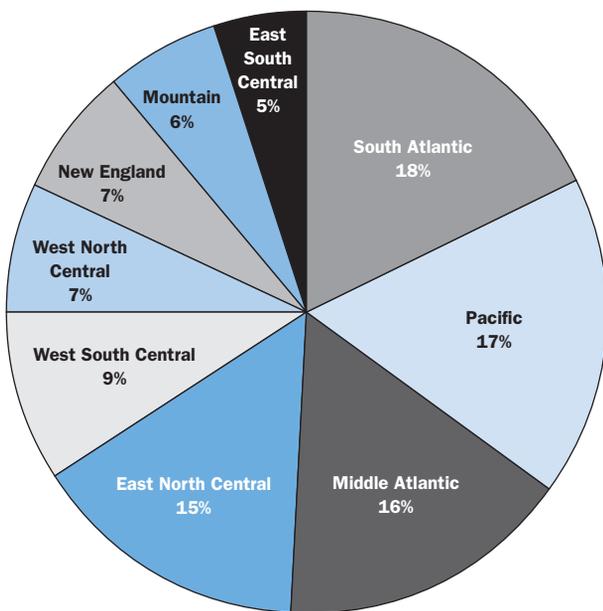


Figure 4
Distribution of Physicians with an Active License by U.S. Census Bureau Division



Source: 2010 FSMB Census of Licensed Physicians

From a methodological point of view, a census is more accurate than sampling a population because there is little sampling variance, though it generally costs more and takes longer to complete. Because the FPDC already collects licensure data on a regular basis from state boards to support the FSMB’s Disciplinary Alert Service, the infrastructure required for a physician census already existed.

FSMB Data and Information Exchange

For nearly a hundred years the FSMB has collected and disseminated information on behalf of and among state medical and osteopathic boards related to formal disciplinary actions taken against licensed physicians.¹¹ The FSMB also collects disciplinary actions from the United Kingdom, Canada, Australia and New Zealand, as well as the U.S. Department of Defense, the U.S. Drug Enforcement Administration and the Office of Inspector General in the U.S. Department of Health and Human Services. Board actions were first published in the FSMB’s *Bulletin* (a predecessor to this publication) in 1915, and by 1971 a monthly Disciplinary Action Report

was created to improve communication about board actions among state boards. With the advent of the Information Age and a burgeoning, increasingly

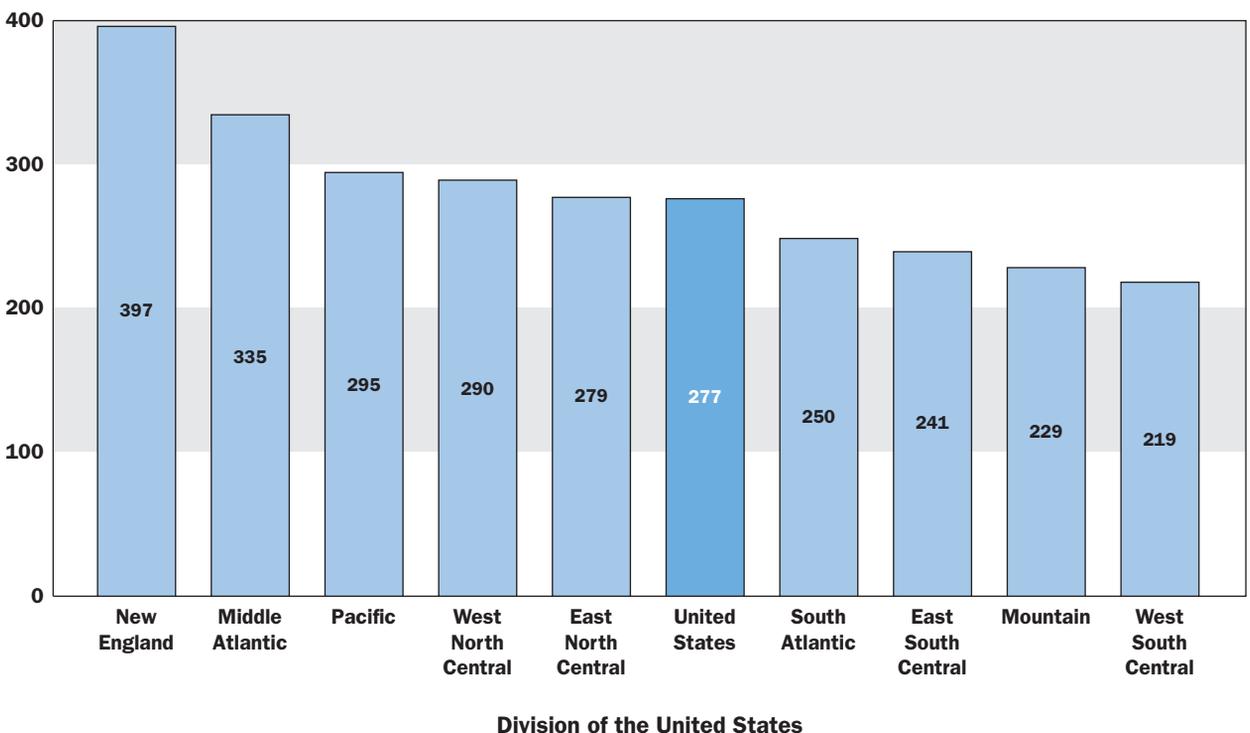
THE 850,085 PHYSICIANS WITH AN ACTIVE LICENSE TO PRACTICE MEDICINE REPRESENT A PHYSICIAN-TO-POPULATION RATIO OF 277 ACTIVELY LICENSED PHYSICIANS FOR EVERY 100,000 PEOPLE IN THE UNITED STATES.

mobile physician population, the FSMB automated its disciplinary database, and by the late 1980s the FSMB's Disciplinary Data Bank was an essential tool to enable state boards to effectively oversee medical regulation (licensure and discipline) and contribute to information exchange.¹²

In 2000, the FSMB launched its All Licensed Physicians (ALP) Project in an effort to further expand its physician data to also include biographical, educational and licensure information for all

physicians. As with prior efforts at automation and information exchange, the ALP project was primarily designed to support a Disciplinary Alert Service to quickly notify state medical and osteopathic boards when another jurisdiction has taken a board action against one of their licensees. This end result remains its primary purpose today and more than 50,000 alerts have been sent to state medical and osteopathic boards since January 2000. As the scope of the ALP project continued to expand, its data elements were combined in 2004 with the FSMB's board action information to form the Federation Physician Data Center (FPDC).¹³ The aggregate comprehensive data contained in the FPDC was recognized last year by FSMB's leadership and staff as being valuable to both state boards and health policy researchers struggling to achieve a consensus on current and future physician workforce needs. An accurate indicator of the current supply of physicians, writes Thomas Ricketts, is "a critical component of market dynamics, as well as a mechanism to achieve social goals, including promoting a healthy population."¹⁴

Figure 5
Physicians with an Active License Per 100,000 Population



Sources: 2010 FSMB Census of Licensed Physicians and U.S. Census Bureau, 2009 American Community Survey

Physician Workforce Planning

The passage of the Patient Protection and Affordable Care Act, the aging of the population, and the growth of the population have been described as three of the most important factors why a better understanding and accurate assessment of the current supply of physicians are critical to understanding the immediate and long-term needs of the residents of the United States.

During the last half of the 20th century, baby boomers—those born between 1946 and 1964—had a profound impact on social systems in the United States. This rather large group crowded public

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school systems after World War II and flooded the labor market in the 1970s and 1980s. This year, baby boomers start turning 65, and each day for the next 19 years an estimated 10,000 boomers will reach age 65.¹⁵ By 2030, all boomers will be 65 years of age or older, representing nearly 20% of the total population.¹⁶ According to a report published by the Institute of Medicine (IOM), individuals who are 65 years and over currently represent only 12% of the U.S. population, but account for 26% of all physician office visits, 34% of all prescriptions and 38% of the emergency medical services responses.¹⁷ Those percentages are almost certain to increase as the population ages in the next few decades.

The full impact of, and ultimate funding for, the health reform act signed into law by President Obama in March 2010 is yet to be finalized, but the bill does include provisions to extend health insurance coverage to millions more Americans. The ability of young adults to enroll in a parent's health plan up to age 26 was a provision which went into effect in September 2010, and significant expansion in eligibility for Medicaid and the creation of health insurance exchanges with subsidized private insurance for people with low and moderate incomes could begin in 2014.¹⁸ It is estimated that by 2019, an additional 32 million Americans may be insured under the new law.¹⁹ Healthcare reform and an aging population, combined with a projected total population growth by 60 million to a total of

373 million by 2030²⁰ and projected physician shortages as high as 130,000 by 2025,²¹ underscore the importance of knowing as much as possible about the current physician workforce.

Other Surveys of Physicians

Historically, the American Medical Association's (AMA) Physician Masterfile (Masterfile) has been the main source for many research publications and surveys of physicians in the United States. A recent literature search with PubMed^{†††} using the search terms "AMA Masterfile AND Physician Workforce" yielded 71 articles published between 1991 and 2011. A few of the more recent areas explored by researchers using data from the Masterfile included a survey of inactive physicians,²² migration trends for surgeons²³ and the emergency physician workforce.²⁴ Additionally, the Center for Workforce Studies at the Association of American Medical Colleges (AAMC) regularly uses the AMA Masterfile for U.S. physician supply projections.²⁵ In its March 2011 report on physician workforce, which used July 1, 2009, population estimates from the U.S. Census Bureau as well as Masterfile data current to December 31, 2009, the number of "total active physicians" in the United States in 2009 was listed as 785,326 and the average ratio of active physicians per 100,000 population was listed as 255.8.²⁶ In June of 2006, following a similar analysis of U.S. Census Bureau and Masterfile data, AAMC recommended a 30% increase in U.S. medical school enrollment and an expansion of Graduate Medical Education (GME) positions to accommodate this growth to address an impending physician shortage.²⁷

The Masterfile was initially utilized by the AMA for membership record-keeping and mailings and today it contains demographic, educational and professional activity information for both AMA members and nonmembers, osteopathic physicians and graduates from foreign medical schools. A record is created when individuals first enter medical school or, in the case of IMGs, when they first enter the country. Physician records are updated by use of a rotating census where approximately one fourth of all physicians are surveyed each year.²⁸

††† PubMed comprises over 20 million citations for biomedical literature from MEDLINE, life science journals and online books. It is a free resource developed and maintained by the National Center for Biotechnology Information (NCBI) at the U.S. National Library of Medicine (NLM), located at the National Institutes of Health (NIH).

Though the Masterfile provides a broad set of valuable information on physicians in the United States, and it has undergone a number of improvements in recent years, it sometimes lags in identifying and updating changes to physician records, such as a change in a physician's specialty, retirement or licensure status.¹ Some researchers claim the lag results in an overestimation of the number of active physicians in the older age range.^{29, 30, 31, 32} Douglas Staiger and his colleagues used the Masterfile and data from the U.S. Census Bureau's Current Population Survey (CPS) to conduct parallel retrospective cohort analyses of trends in the number of active physicians, and found that compared with CPS data, the Masterfile showed fewer young physicians entering the workforce and more active older physicians remaining in the workforce.¹

The FSMB's 2010 census count of actively licensed physicians in the United States (850,085) reported here is less than the number predicted as needed (871,000) by 2010 in a Health Resources and Services Administration report from 2006.³³ Noting that "past projections of impending physician shortages and surpluses have influenced policies and programs that, in turn, helped determine the number and specialty composition of physicians being trained," the discrepancy between the report's predictions and actual numbers from our census suggest the nation may be further behind in addressing current and future physician supply needs.

Opportunities for the Future

A limitation of the 2010 FSMB Census data is that it does not contain information about a physician's primary or sole professional activity (e.g., patient care, administration, medical teaching). The Health Resources and Services Administration (HRSA) has historically defined "active physicians" as those physicians involved in patient care or non-patient care (teaching, research, administration or other professional activities) for more than 20 hours a week and also included in that count unclassified physicians, defined as physicians whose activity status or present employment setting are not known.³⁴ As we set the groundwork for the next census, state boards have a unique opportunity to contribute to accurate workforce planning by collecting information about a physician's activities at the time of renewal of a physician's license. Currently, 26% of state boards require physicians to renew their license every year and another 66% require renewal once every two years.³⁵ The remaining boards require renewal every three years or more. The time of renewal

is an excellent opportunity to collect physician workforce information regarding the hours worked in patient care, practice location and practice setting (i.e., solo, group, hospital, etc.).

In North Carolina,³⁶ Iowa,³⁷ South Carolina³⁸ and New York,³⁹ physician workforce information has been collected, maintained and reported through cooperatives between licensing bodies, universities and state agencies for a number of years.⁴⁰ Other licensing bodies collect a broad range of information from physicians but currently there are no uniform minimal data elements collected by all state medical and osteopathic boards. Research and development is needed in this area as well as more analysis of license portability and physician migratory patterns. Further, research that cross-references redacted FSMB licensure data with data from the Centers for Medicare and Medicaid Services (CMS) could further help identify physician practice patterns and even help prevent fraud.

Uniformity of the questions that are asked across jurisdictions during licensure renewal and sharing of that updated information with the FPDC on a regular basis would yield a better understanding of the current supply of physicians to meet the needs of a growing and aging population, locally, statewide and nationally. The frequency and regularity with

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which a state board provides current licensure data to the FPDC has already improved considerably through the communication linkages strengthened as a result of this census, though further improvements will be limited by state resources impacted by a slow economic recovery from the Great Recession of 2007–2009. As state medical and osteopathic boards begin to implement Maintenance of Licensure (MOL), whose framework was adopted by the FSMB's House of Delegates in 2010, standardized data about practicing physicians may become routine over time because it would be required.

The FSMB is embarking on efforts of its own, on behalf of state medical and osteopathic boards,

to collaborate and partner with a number of organizations to further improve the accuracy of its physician database. Inclusion of data on deceased physicians from the Social Security Administration's Death Masterfile, for instance, has enabled the FSMB to update its database and alert state boards of a physician's death before they are notified by an employer, next of kin or representative. Last year, the FSMB began discussions with the American Osteopathic Association, the National Board of Osteopathic Medical Examiners and the American Association of Colleges of Osteopathic Medicine to explore multilateral data-sharing opportunities for research purposes. For a number of years the FSMB has had a similar arrangement with NBME (National Board of Medical Examiners) and AAMC (Association of American Medical Colleges) for research purposes that could expand our census capabilities. Furthermore, accuracy of data about physicians currently engaged in patient care activities should better inform the current and future supply and demand needs of the United States for primary care physicians and other physician specialists, nurses and other health care practitioners.

By its very nature, medicine is necessarily people-intensive and good medicine requires trained, licensed, professionals located in a relatively close proximity to the population needing their services.⁴⁰ While this is the first time that the FSMB has systematically collated and analyzed all of its data to determine an accurate count of the number, gender, age, specialty certification and location by region of actively licensed physicians in the United States and the District of Columbia, there exist multiple additional opportunities for future analyses that leverage continued collaboration among the FSMB, state medical and osteopathic boards and several other organizations and entities. ■

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References

1. Staiger, Douglas O, Auerbach, David I and Buerhaus, Peter I. Comparison of Physician Workforce Estimates and Supply Projections. *JAMA*. 2009, Vol. 302.
2. American Board of Medical Specialties. [Online] March 2011. http://www.abms.org/About_ABMS/member_boards.aspx.
3. *Osteopathic Specialty Board Certification*. Ayres, R E, et al. 3, March 2009, Journal of the American Osteopathic Association, Vol. 109.
4. Weeks, John R. *Population: An Introduction to Concepts and Issues Seventh Edition*. Belmont : Wadsworth Publishing Company, 1999. 98-39201.
5. Shryock, H., J. Siegel and associates. *The Methods and Materials of Demography*. Washington D.C. : Government Printing Office, 1973.
6. *The Encyclopedia Britannica a Dictionary of Arts, Sciences, and General Literature*. Henry G. Allen and Company, 1833. Vol. V.
7. Starr, P. The Sociology of Official Statistics. [ed.] W. Alonso and P. Starr. *The Politics of Numbers*. Russell Sage Foundation, 1987.
8. Constitution of the United States, Article 1, Section 2. "The actual Enumeration shall be made within three Years after the first Meeting of the Congress of the United States, and within every subsequent Term of ten Years, in such Manner as they shall by Law direct."
9. History. [Online] United States Census Bureau. http://www.census.gov/history/www/census_then_now/.
10. United States Census Bureau. <https://ask.census.gov>. Accessed on February 15, 2011.
11. Breaden, DG. The Physician Disciplinary Data Bank: A National Perspective. *Illinois Medical Journal*. 1987, Vol. 172, 3, pp. 197-200.
12. Galusha, BL and Breaden, DG. Official 1986 Federation Summary of Reported Disciplinary Actions. *Federation Bulletin*. February 1988, Vol. 75, 2, pp. 41-43.
13. Sutton, JH. Physician data profiling proliferates. *Bulletin of the American College of Surgeons*. May 2001, Vol. 86, 5, p. 22.
14. Ricketts, TC. How Many Physicians? How Much Does It Matter? *JAMA*. 302(15):1701-1702. October 21, 2009.
15. Cohn, D'Vera and Taylor, Paul. *Baby Boomers Approach Age 65 – Glumly: Survey Findings about America's Largest Generation*. Pew Research Center, 2010.
16. *Projections of the Population by Selected Age Groups and Sex for the United States: 2010 to 2050 (NP2008-T2)*. Population Division, U.S. Census Bureau, 2008.
17. *Retooling for an Aging America: Building the Health Care Workforce*. Washington D.C. : The National Academies Press, 2008.
18. *Health Care and Education Reconciliation Act of 2010 (H.R. 4872)*. 2010.
19. *H.R. 4872, Reconciliation Act of 2010 (Final Health Care Legislation)*. Congressional Budget Office, 2010.
20. *Projections of the Population and Components of Change for the United States: 2010 to 2050 (NP2008-T1)*. Population Division, U.S. Census Bureau, 2008.

21. *Physician Shortages to Worsen Without Increases in Residency Training*. AAMC Center for Workforce Studies, 2010.
22. Jewett, EA, Brotherton, SE and Ruch-Ross, H. A national survey of 'inactive' physicians in the United States of America: enticements to reentry. *Human Resources for Health*. February 2011.
23. Ricketts, Tom C. The migration of surgeons. *Annals of Surgery*. February 2010, Vol. 251, 2, pp. 363-7.
24. Ginde, AA, Sullivan, AF and Camargo, CA Jr. National study of the emergency physician workforce, 2008. *Annals of Emergency Medicine*. September 2009, Vol. 54, 3, pp. 349-59.
25. Studies, Center for Workforce. *The Complexities of Physician Supply and Demand: Projections Through 2025*. Association of American Medical Colleges, 2025.
26. *2011 State Physician Workforce Data Release*. Center for Workforce Studies. March, 2011. Association of American Medical Colleges. Washington, D.C.
27. Association of American Medical Colleges. 2006. "AAMC Statement on the Physician Workforce, June 2006." <http://www.aamc.org/workforce/workforceposition.pdf>. Accessed on March 24, 2011.
28. *Physician Characteristics and Distribution in the US*. American Medical Association, 2011.
29. *Physician workforce data: when the best is not good enough*. Kletke, PR. 5, October 2004, Health Service Research, Vol. 39, pp. 1251-1255.
30. *No exit: an evaluation of measures of physician attrition*. Rittenhouse, DR, et al. 5, October 2004, Health Services Research, Vol. 39, pp. 1571-1588.
31. *Research Advisory Committee of American Board of Pediatrics. Counting physicians: inconsistencies in a commonly used source for workforce analysis*. Freed, GL, Nahra, TA and Wheeler, JRC. 9, 2006, Academic Medicine, Vol. 81, pp. 847-852.
32. *Will generalist physician supply meet demands of an increasing and aging population?* Colwill, JM, Cultice, JM and Kruse, RL. 3, Millwood: s.n., 2008, Health Affairs, Vol. 27, pp. w232-w241.
33. *Physician Supply and Demand: Projections to 2020*. Health Resources and Services Administration. U.S. Department of Health and Human Services. September, 2006. Exhibit 29. pp. 34.
34. <http://bhpr.hrsa.gov/healthworkforce/reports/factbook02/FB201.htm>. Accessed on March 24, 2011.
35. *State Medical Licensure Requirement and Statistics*. American Medical Association, 2011. 978-1-60359-224-6.
36. <http://www.shepscenter.unc.edu/hp/>. Accessed on March 2, 2011.
37. http://www.medicine.uiowa.edu/oscep/data_reports/index.html. Accessed on March 2, 2011.
38. <http://ors.sc.gov/hd/manpower1.php>. Accessed on March 2, 2011.
39. <http://chws.albany.edu/>. Accessed on March 2, 2011.
40. Ricketts, Thomas C. The Health Care Workforce: Will It Be Ready as the Boomers Age? A Review of How We Can Know (or Not Know) the Answer. *Annual Review of Public Health*. 2011, Vol. 32.