



Projecting the Supply and Demand for Primary Care Practitioners Through 2020

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List of Acronyms

Acronym	Definition
AACN	American Association of Colleges of Nursing
AAMC	Association of American Medical Colleges
AAPA	American Academy of Physician Assistants
AMA	American Medical Association
BRFSS	Behavioral Risk Factor Surveillance System
CBO	Congressional Budget Office
CDC	Centers for Disease Control and Prevention
EHR	Electronic Health Record
FTE	Full-time equivalent
HIT	Health information technology
HPSA	Health Professional Shortage Area
HRSA	Health Resources and Services Administration
NAMCS	National Ambulatory Medical Care Survey
NCCPA	National Commission on Certification of Physician Assistants
NH	Non-Hispanic
NHAMCS	National Hospital Ambulatory Medical Care Survey
NIS	Nationwide Inpatient Sample
NP	Nurse Practitioner
NSSRN	National Sample Survey of Registered Nurses
PA	Physician Assistant
PCP	Primary Care Practitioner

I. EXECUTIVE SUMMARY

This study examines the adequacy of the future supply of primary care practitioners (PCPs) to meet the future demand for primary care services. Data on supply and demand for primary care services in 2010, with demand adjusted for physician shortages in Health Professional Shortage Areas (HPSAs), are used as a baseline to project supply and demand in 2020 for physicians, nurse practitioners (NPs), and physician assistants (PAs). The model assumes continuation of key trends in service utilization, practitioner practice patterns, and practitioner production. The model also accounts for aging and population growth and the expansion of coverage under the Affordable Care Act. The impact of the Affordable Care Act is modeled under the assumption that all states expand Medicaid. Therefore, the numbers reported here overestimate the demand for primary care services, until such time as all states fully implement the law. Projections of demand for each type of practitioner are based on how these practitioners are currently deployed to provide services.

Demand for primary care services is projected to increase through 2020, due largely to aging and population growth and, to a much lesser extent, the expanded insurance coverage implemented under the Affordable Care Act, which includes a number of investments that strengthen the primary care workforce. Consistent with prior studies, this analysis finds that demand for primary care physicians will grow more rapidly than the physician supply, resulting in a projected shortage of approximately 20,400 full-time equivalent (FTE) physicians.

The supply of NPs and PAs, however, is projected to grow rapidly and could mitigate the projected shortage of physicians if NPs and PAs continue to be effectively integrated into the primary care delivery system. In order for this integration to occur, patient and health system acceptance is necessary and the dissemination of more effective models of workforce deployment must continue. New models that allow for an increased role of NPs and PAs in the provision of primary care services, such as patient-centered medical homes that emphasize team-based care, have the potential to help address the projected shortage of primary care physicians.

Under a scenario assuming full deployment of available NPs and PAs, the projected shortage of PCPs in 2020 is only 6,400 FTEs. Physicians would remain the dominant provider of primary care services, decreasing from 77 percent of primary care services in 2010 to 72 percent in 2020.

A. Key Findings

Demand for primary care services is projected to grow, mostly due to population aging and growth.

- Aging and population growth are projected to account for 81 percent of the change in demand between 2010 and 2020.

- The remainder of the projected change in demand is associated with the estimated expansion of health insurance coverage under the full implementation of the Affordable Care Act, including an assumption that all states expand Medicaid.

Based on current utilization patterns, demand for primary care physicians is projected to grow more rapidly than physician supply.

- The number of primary care physicians is projected to increase from 205,000 FTEs in 2010 to 220,800 in 2020, an 8-percent increase.
- The total demand for primary care physicians is projected to grow by 28,700, from 212,500 FTEs in 2010 to 241,200 FTEs in 2020, a 14-percent increase.
- Without changes to how primary care is delivered, the growth in primary care physician supply will not be adequate to meet demand in 2020, with a projected shortage of 20,400 physicians. While this deficit is not as large as has been found in prior studies, the projected shortage of primary care physicians is still significant.

The primary care NP and PA workforces are projected to grow far more rapidly than the physician supply.

- The supply of primary care NPs is projected to increase by 30 percent, from 55,400 in 2010 to 72,100 in 2020. The supply of primary care PAs is projected to increase by 58 percent, from 27,700 to 43,900 over the same period.
- Assuming that NPs and PAs provide the same proportion of services in 2020 that they did in 2010, the combined demand for NPs and PAs would increase by only 17 percent. If NPs and PAs are used to provide a greater proportion of primary care services, their projected demand will be higher.

Increased use of NPs and PAs could somewhat alleviate the projected primary care physician shortage if they are effectively integrated into the health care delivery system.

- Under a scenario in which the rapidly growing NP and PA supply can effectively be integrated, the shortage of 20,400 physicians in 2020 could be reduced to 6,400 PCPs.
- If fully utilized, the percent of primary care services provided by NPs and PAs will grow from 23 percent in 2010 to 28 percent in 2020. Physicians would remain the dominant providers of primary care, only decreasing from 77 percent of the primary care services in 2010 to 72 percent in 2020.

B. Conclusions

The extent to which the national supply of PCPs will come close to meeting the national demand in 2020 will depend on a number of factors. Given the rapid growth in the NP and PA workforce, as well as ongoing efforts to effectively integrate these providers into the primary care delivery system, the projected physician shortage could be somewhat alleviated. Efficient use of NPs and PAs will require patient and health system acceptance and the continued dissemination of more effective models of workforce deployment. There are indications of the acceptance of these practitioners by patients.

The projections do not account for new programs and policies included in the Affordable Care Act. To help strengthen access to the primary care workforce, the Affordable Care Act invests in health workforce training, including: a \$1.5 billion investment in the National Health Service Corps Scholarship and Loan Repayment programs over five years; a substantial expansion of Community Health Centers; and \$230 million over five years to primarily train medical residents in community-based settings. The Affordable Care Act also includes incentives that encourage greater emphasis on initiatives (i.e., Primary Care Medical Homes and Accountable Care Organizations) which are anticipated to result in more effective use of providers in care delivery. Such programs and policies are designed to increase the supply of PCPs and increase the effectiveness of their use through models emphasizing team-based care. Such changes could further integrate NPs and PAs in the provision of primary care services and have the potential to somewhat alleviate the projected shortage of primary care physicians.

Finally, the national averages reported here mask substantial distributional disparities across the United States. It is anticipated that some communities will continue to face significant shortages. Ensuring patient access to primary care will continue to require programs and policies to address the maldistribution of the primary care workforce.

Given the importance of access to primary care for an effective health care system, the Health Resources and Services Administration (HRSA) will continue to monitor the supply and distribution of PCPs. HRSA also will periodically update these projections as new data and information become available.

C. Limitations of These Projections

Numerous factors will influence future supply and demand for PCPs. The baseline projections in this report do not account for new programs and policies that may help grow the supply of PCPs or reform the health care delivery system. However, these projections do consider the estimated impact of expanded health insurance coverage associated with full implementation of the Affordable Care Act.

Further, this study does not address provider shortages at subnational levels of geography. National projections represent the average adequacy of supply: some areas have a supply of

PCPs well above the national norm or average; other areas have a supply that is inadequate to meet the need for PCPs. Geographic maldistribution of practitioners will mean some local areas will face practitioner shortages.

This study assumes that the supply and demand for PCPs was balanced in 2010 except for the number of physicians that would be needed to de-designate HPSAs. The HPSA shortfall is used as a proxy for the base-year national shortfall since it is the only federal measure of shortage available at this time. Shortages may exist in areas that are not designated as HPSAs or in professions not currently covered by HPSAs (such as NPs and PAs).

II. INTRODUCTION

The availability of primary care services is essential for an effective and efficient health care system. Having an adequate supply and distribution of well-prepared primary care practitioners (PCPs) will help ensure the availability of primary care services for the nation. This study was undertaken to assess whether the future supply of PCPs is likely to be sufficient to meet the future demand for primary care. In order to make this assessment, the study examines the projected supply of physicians, NPs, and PAs.

The national demand for primary care *services* can be defined as the quantity and mix of services that society is willing to pay for based on population needs, economic constraints such as income and prices, and technological considerations for what is possible to provide. It reflects the realities of the current health care system with its reimbursement structure, incentives and disincentives for health care use and delivery patterns, public expectations, and other personal and systematic economic considerations.

The demand for primary care *practitioners* is the number and mix of clinicians needed to meet the demand for services. Demand for practitioners in specific disciplines is influenced by practitioner productivity, scope of practice, and the structure and financing of the health care delivery system. A variety of configurations of PCPs can meet the demand for primary care services.

The development of a baseline for supply and demand is based upon recent patterns of use of services stratified by population characteristics, trends in the education and training of PCPs (where 2010 data are not available), and recent practice patterns of current PCPs. Using the typical projection model method, the study assumes that supply and demand are in balance in the base year (2010), except for the added demand for the number of primary care physicians needed to de-designate primary care HPSAs. From this baseline, the study considers a variety of potential changes in the future and their possible impact on both supply and demand. Some of these changes can be predicted with reasonable confidence, like the aging of the population. Others, such as changes in productivity, practice hours, and retirement patterns, are less certain.

The projections in this report take into consideration the estimated impact of expanded health insurance coverage associated with the full implementation of the Affordable Care Act, including an assumption that all states expand Medicaid. However, these projections do not account for new programs and policies that will help grow the supply of PCPs or reform the health care delivery system. Many provisions included in the Affordable Care Act, for example, broad implementation of patient-centered medical homes, are designed to implement change in the health care delivery system. The impact of such provisions, at this point, is difficult to quantify in a projection model. Thus, the projection model predicts future demand fundamentally on the utilization patterns in the delivery system of the recent past for which there are data.

National projections of supply and demand can assist policymakers and practitioners in assessing the adequacy of supply for the nation as a whole. National projections, however, do not reveal problems that exist in specific geographic areas, because they represent the average adequacy of supply across the nation. While some areas have a supply of PCPs well above the national average, other areas have a supply that is inadequate to meet the need for primary care services. Hence, the national projections in this report do not provide a complete picture of the adequacy of the supply of PCPs needed to ensure patient access to care. More detailed analysis of the adequacy of supply within local geographic areas—whether counties, cities, townships, or neighborhoods—is needed to fully understand the adequacy of the primary care workforce and how that workforce would need to be distributed across the nation to ensure access.

A. Definition of Primary Care

The Institute of Medicine’s Committee on the Future of Primary Care defined primary care as: “The provision of integrated, accessible health services by clinicians who are accountable for addressing a large majority of personal health care needs, developing a sustained partnership with patients, and practicing in the context of family and community.”¹ Medical specialties that could meet the criteria for a PCP include general and family medicine, general pediatrics, general internal medicine, and geriatrics. While the majority of the nation’s hospitalists—practitioners who mainly provide care to hospitalized patients—are trained in primary care specialties, they are excluded from practitioner counts in this study because they are not engaged in activities that meet the definition of primary care.² Disciplines generally considered in the definition of PCPs may include physicians, NPs, and PAs who trained and practice in primary care specialties.

A broader definition of primary care capacity could consider primary care services provided by physicians in other specialties. Some examples include internal medicine subspecialists like cardiologists or endocrinologists with whom a patient may have a long-term relationship and who may be the primary source of care for a chronic condition. Obstetrician/gynecologists also provide some primary care services and may be the principal source of care for some women. Similarly, a certified nurse midwife may provide some primary care for women. While these practitioners provide important services, this study excludes primary care services provided by these specialists. On the other hand, many primary care physicians also provide some specialty services that are often provided by specialists. For this study, these services are

¹Donaldson, M. S., Yordy, K. D., Lohr, K. N., & Vanselow, N. A. (Eds.); Institute of Medicine, Division of Health Care Services, Committee on the Future of Primary Care. (1996). *Primary care: America’s health in a new era*. Washington, DC: National Academy Press. Available online at: www.nap.edu/catalog.php?record_id=5152.

²Society of Hospital Medicine. (2010, June). 2010 Society of Hospital Medicine media kit. Available online at: www.hospitalmedicine.org/AM/Template.cfm?Section=Home&CONTENTID=23077&TEMPLATE=/CM/ContentDisplay.cfm.

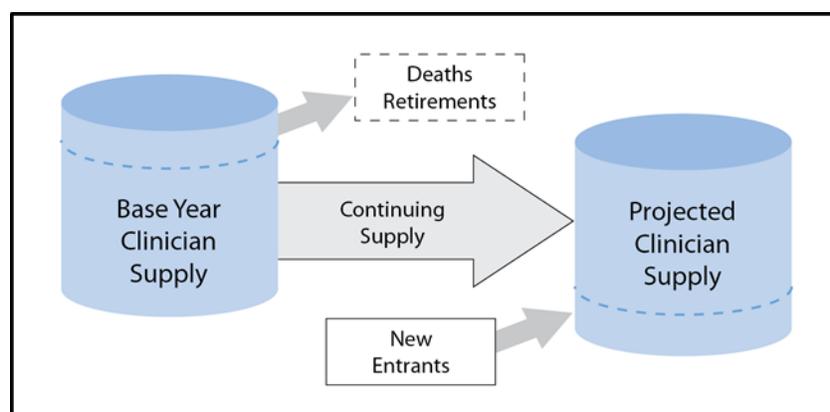
implicitly included because it is not possible to estimate the proportion of time primary care physicians spend providing specialty services.

III. PRIMARY CARE PHYSICIAN SUPPLY

A. Overview of the Supply Model

The starting point for projecting future supply is the current supply (see Exhibit 1). Projecting forward from the baseline, a number of factors are taken into account. Each year, new physicians enter the workforce after completing the required education and training and after other physicians retire. In addition, clinicians in the workforce may change their level of activity (i.e., average hours worked) or their area of practice.

Exhibit 1. Projecting Primary Care Physician Supply



Two measures commonly used to track clinician supply are: (1) the number of clinicians actively engaged in patient care activities (*active supply*) and (2) a measure that takes into account productivity (*FTE supply*). In this report, both supply and demand projections are calculated as FTEs rather than as persons or headcounts. For example, a clinician who works half the time of the typical physician counts as 0.5 FTE.

B. Estimating the Active Supply of Primary Care Physicians in 2010

Estimates of the number of primary care physicians engaged in patient care activities are based on data from multiple sources.³ The American Medical Association (AMA) Masterfile, one of the most complete national sources of information on current physician supply, contains birth year, sex, self-reported primary specialty, primary activity (e.g., direct patient care, non-patient care, or resident), and other information. This source provides estimates of the number of active physicians by self-reported primary specialty, age, and sex.

³Estimates were developed in collaboration with the Agency for Healthcare Research and Quality, the Office of the Assistant Secretary for Planning and Evaluation, and the Robert Graham Center, from January through March 2011.

There are limitations to the AMA Masterfile data. For example, there is a time lag between when a physician's activity status changes and when the information is updated in the Masterfile. The AMA updates the Masterfile using multiple sources, including licensure information, and attempts to contact about one-third of physicians each year. However, if physicians' status changes, there can be up to a three-year lag before their information in the Masterfile is corrected. Additionally, some physicians choose not to respond to AMA's request for information, which contributes further to the uncertainty of whether an individual physician is active or retired. The time lag in updating physicians' activity status creates the likelihood that the Masterfile overestimates the supply of active physicians—especially for older physicians.⁴ This study excluded physicians age 75 and older listed as active in the AMA Masterfile, reflecting concerns about the accuracy of the AMA Masterfile regarding the activity status of older physicians.

In addition, comparison of physician self-reported activity status in the 2006 AMA Masterfile with the 2006 Association of American Medical Colleges (AAMC) survey of physicians from 50 to 74 years old suggests that activity status in the Masterfile for some of these physicians may be incorrect. Some physicians in this age group listed as active in the Masterfile reported in the AAMC survey that they are currently inactive, and vice versa.⁵ The Masterfile lists as active only physicians working more than 20 hours per week in professional activities. The AAMC survey collected hours worked data on physicians working fewer than 20 hours. This study used an algorithm to adjust the estimated number of active physicians in the 2010 Masterfile. Using logistic regression analysis with activity status from the AAMC survey as the dependent variable, the analysis determined the probability that each physician age 51 to 74 in the Masterfile is active based on age, sex, specialty, and activity status in the Masterfile. Application of this retirement algorithm removes from the Masterfile active physician count approximately 20,000 physicians primarily engaged in patient care activities. The algorithm also adds to the count 17,000 physicians listed as "semi-retired" or "retired" (which includes those working fewer than 20 hours per week in professional activities).⁶

Estimates from the Robert Graham Center are that approximately 10,500 primary care physicians whose status is "unclassified" in the 2010 Masterfile are likely active in patient care. This analysis used estimates of primary care consistent with the Robert Graham Center's supply estimates, and it includes these unclassified physicians in the primary care category.⁷

⁴Staiger, D. O., Auerbach, D. I., & Buerhaus, P. I. (2009). Comparison of physician workforce estimates and supply projections. *Journal of the American Medical Association*, 302(15), 1674–1680.

⁵Jewett, E. A., Brotherton, S. E., & Ruch-Ross, H. (2011). A national survey of "inactive" physicians in the United States of America: Enticements to reentry. *Human Resources for Health*, 9(7).

⁶The appendix of the following report outlines additional detail on applying this type of retirement algorithm: Dill, M. J., & Salsberg, E. S. (2008). *The complexities of physician supply and demand: Projections through 2025*. Washington, DC: Association of American Medical Colleges, Center for Workforce Studies.

⁷Personal communication with Stephen Pettersen and Robert Phillips at the Robert Graham Center on analysis conducted by the Robert Graham Center regarding the application of the AMA Masterfile to estimation of primary

The analysis classifies physician specialty based on self-reported primary specialty. Physicians without a reported specialty are proportionally reallocated across the other specialties based on the specialty distribution within their age, gender, and education type. The AMA Masterfile only recently added the specialty of “hospitalist” to its survey of physicians, and very few physicians self-reported as hospitalists. The Society of Hospital Medicine estimates that among the 28,000 hospitalists in practice in 2010, 82.3 percent are trained in general internal medicine, 6.5 percent in general pediatrics, 4.0 percent in an internal medicine subspecialty, 3.7 percent in family practice, 3.1 percent in general pediatrics, and 0.4 percent in a pediatrics subspecialty.⁸ Estimates of the specialty distribution for hospitalists, as reported by the Society of Hospital Medicine, were used to remove hospitalists from the primary care supply estimates.

Finally, estimates of practicing primary care physicians from sample surveys of physicians, in particular the National Ambulatory Medical Care Survey (NAMCS) and the Health Tracking Physician Survey,⁹ suggest that there may be fewer primary care physicians. That is, additional physicians classified as active in the Masterfile may be either inactive or no longer practicing in primary care settings. For example, during the data collection for the NAMCS and the Health Tracking Physician Survey, a greater proportion of physicians were found to be inactive (e.g., retired or deceased) than from initial adjustments to the AMA Masterfile. Others have used findings from the NAMCS, for example, to adjust estimates from the AMA Masterfile downward.¹⁰ The NAMCS is an ongoing annual survey that uses the AMA Masterfile for its sampling frame. Based primarily upon review of this survey, the study reduces the preliminary estimate from the AMA Masterfile by 8 percent to account for additional inactive and non-primary care physicians.¹¹

care physician counts. For more information about the Robert Graham Center, see www.graham-center.org/online/graham/home.html.

⁸Society of Hospital Medicine. (2010, June). *Society of Hospital Medicine 2010 media kit*. Available online at: www.hospitalmedicine.org/AM/Template.cfm?Section=Home&CONTENTID=23077&TEMPLATE=/CM/ContentDisplay.cfm.

⁹National Center for Health Statistics, Division of Health Care Statistics. (n.d.). *2008 NAMCS micro-data file documentation*. Hyattsville, MD: Author. Available online at: [ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/NAMCS/doc08.pdf](http://ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/NAMCS/doc08.pdf); Center for Studying Health System Change. 2008 Health Tracking Physician Survey. Washington, DC: Author. Available online at: www.hschange.com/index.cgi?data=04.

¹⁰Colwill, J. M., Cultice, J. M., & Kruse, R. L. (2008, May-June). Will generalist physician supply meet demands of an increasing and aging population. *Health Affairs*, 27(3), w232–w241.

¹¹In reviewing the NAMCS, as well as the Health Tracking Physician Survey, a number of issues were considered. These surveys use the AMA Masterfile to develop their sampling frames, but data collection for the surveys occurs between 6 months to a year from when the frame was developed. Thus, for example, some cases out of scope at data collection (e.g., retired, deceased, unlicensed, or having left the United States) that were active on the frame may have become out of scope between frame development and data collection. Similarly, with its focus on office-based practice, some cases in the NAMCS defined as out of scope, such as physicians in institutional settings like school-based clinics, might appropriately be counted in estimates of PCPs. Nonetheless, even with these qualifications, the annual NAMCS—coupled with findings in the single Health Tracking Physician Survey—indicated further

After all adjustments were made, the study estimates that there were 205,000 practicing primary care physicians in 2010. Of these, 91,300 are in family practice, 65,600 in general internal medicine, 44,800 in pediatrics, and 3,300 in geriatrics.

C. Projecting the Future Supply of Primary Care Physicians

The main drivers of the future number of active practitioners are the number of newly trained practitioners entering the workforce (entrants) and the number of practitioners leaving the workforce because of retirement, disability, or death (attrition). The projection also adjusted for changes over time in physician characteristics that are associated with patient care hours worked per week.

1. Entrants

Training new practitioners is a vital component of maintaining an adequate long-term supply of health professionals. This study projects supply using best estimates of the number of new primary care physicians who will be trained between 2010 and 2020, given current plans by educational institutions to expand education and training capacity.¹²

In order to become a physician licensed to practice medicine in the United States, some accredited graduate medical education is required. Physicians enter graduate medical education through one of three routes: graduation from a U.S. school of allopathic medicine (i.e., U.S.-trained Medical Doctors), graduation from a U.S. school of osteopathic medicine (i.e., Doctors of Osteopathic Medicine), or graduation from an international medical school (i.e., International Medical Graduates).

The number of physicians beginning their graduate medical education in the United States in 2010 was approximately 26,000—up from around 24,000 in 2004.¹³ Using graduate medical education completion data published from the AMA and American Osteopathic Association statistics, the study calculates that the nation produces approximately 8,700 primary care physicians annually, with the number projected to rise slightly each year over the next decade.^{14,15}

downscaling of the physician estimate was appropriate. Depending on the categories out of scope in these surveys, the estimate of primary care physicians in 2010 ranges between 200,000 and 210,000. The midpoint of this range represents an 8-percent reduction to the preliminary estimate, yielding a final estimate of 205,000 for a baseline in modeling projections.

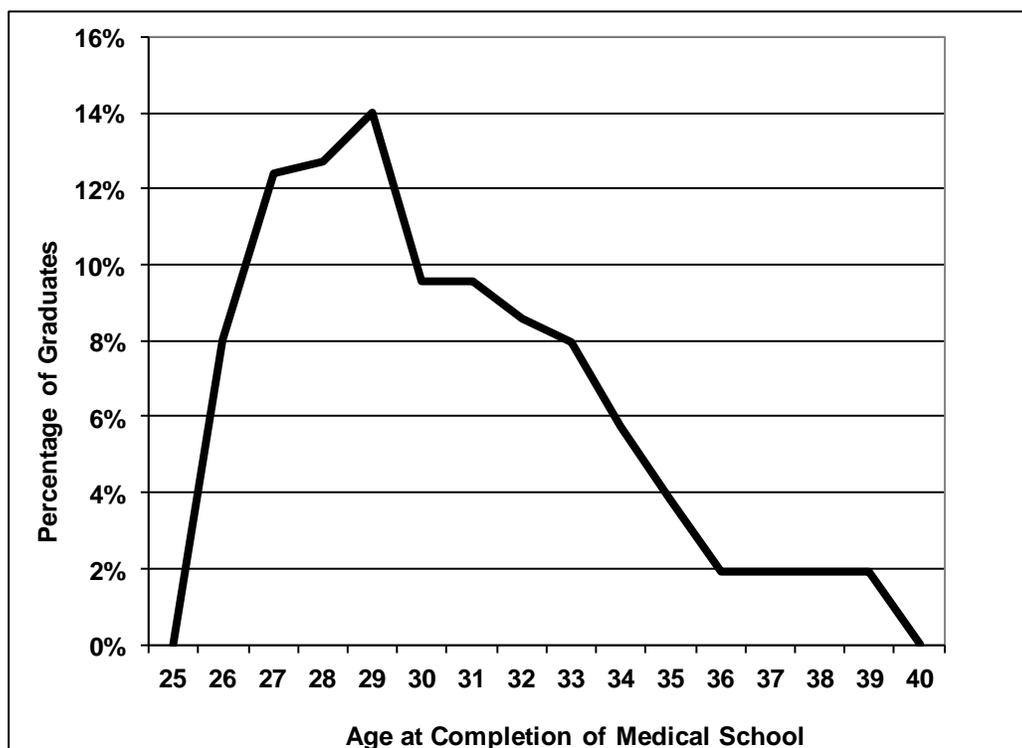
¹²Association of American Medical Colleges, Center for Workforce Studies. (2009, May). Medical school enrollment plans through 2013: Analysis of the 2008 AAMC survey. Washington, DC: Author.

¹³Brotherton, S. E., & Etzel, S. I. (2010). Graduate medical education, 2009-2010. *Journal of the American Medical Association*, 304(11), 1255–1270.

¹⁴Jolly, P., Erikson, C. & Garrison, G. (2013). U.S. graduate medical education and physician specialty choice. *Academic Medicine*, 88(4), 468-474.

The distribution of sex and specialty choice of new entrants to the physician workforce is modeled using recently published data for Accreditation Council for Graduate Medical Education programs.¹⁶ The age distribution of physicians completing medical school in 2009 comes from the Medical School Graduation Questionnaire: 2013 All Schools Summary Report.¹⁷ When the age distribution of physicians completing graduate medical education is calculated (see Exhibit 2), the study adds the average post-graduate training (residency/fellowship) duration to the age distribution. This simplifying assumption may misrepresent the actual age distribution of new physicians for some specialties to the extent that older medical school graduates, for example, are more likely to choose a specialty with a shorter residency.

Exhibit 2. Physician Age Distribution at Completion of Medical School, 2009



Data Source: AAMC Medical School Graduation Questionnaire: 2013 All Schools Summary Report.

¹⁵ DeRosier, A. & Lischka, T.A. (2012). Osteopathic graduated medical education 2012. *Journal of the American Osteopathic Association*, 112(4), 196-203.

¹⁶ Brotherton, S. E., & Etzel, S. I. (2010). Graduate medical education, 2009-2010. *Journal of the American Medical Association*, 304(11), 1255-1270.

¹⁷ Association of American Medical Colleges. Medical School Graduation Questionnaire: 2013 All schools summary report. (2013). Washington, DC: Author. Available online at: www.aamc.org/download/350998/data/2013gqallschoolssummaryreport.pdf.

2. Retention

In some medical specialties, a relatively large proportion of physicians are approaching traditional retirement age. The 2006 AAMC Survey of Physicians Over Age 50 collected information on age of retirement (if retired) or age expecting to retire (if still active). Historical retirement rates and expected retirement rates by physician age, sex, and medical specialty are calculated using these data. These rates are combined with data on mortality rates for men and women in the United States obtained from the Centers for Disease Control and Prevention (CDC). The mortality rates take into consideration that people in professional occupations tend to have lower mortality rates through age 65, as compared with national mortality rates.¹⁸ Age-adjusted mortality rates for White males in professional and technical occupations are approximately 25 percent lower than national rates; for White females, the mortality rates for professional and technical occupations are 15 percent lower than overall rates.

3. Projected Changes in Patient Care Hours Worked

The study adjusts average hours worked for changes over time in the distribution of physician age and sex, because these characteristics are associated with the average patient care hours worked per week. Average hours tend to be lower for women than for men, especially during child-rearing ages. While hours worked by male physicians start to decline in the late 50s, the decline for women, on average, starts in the early 60s.

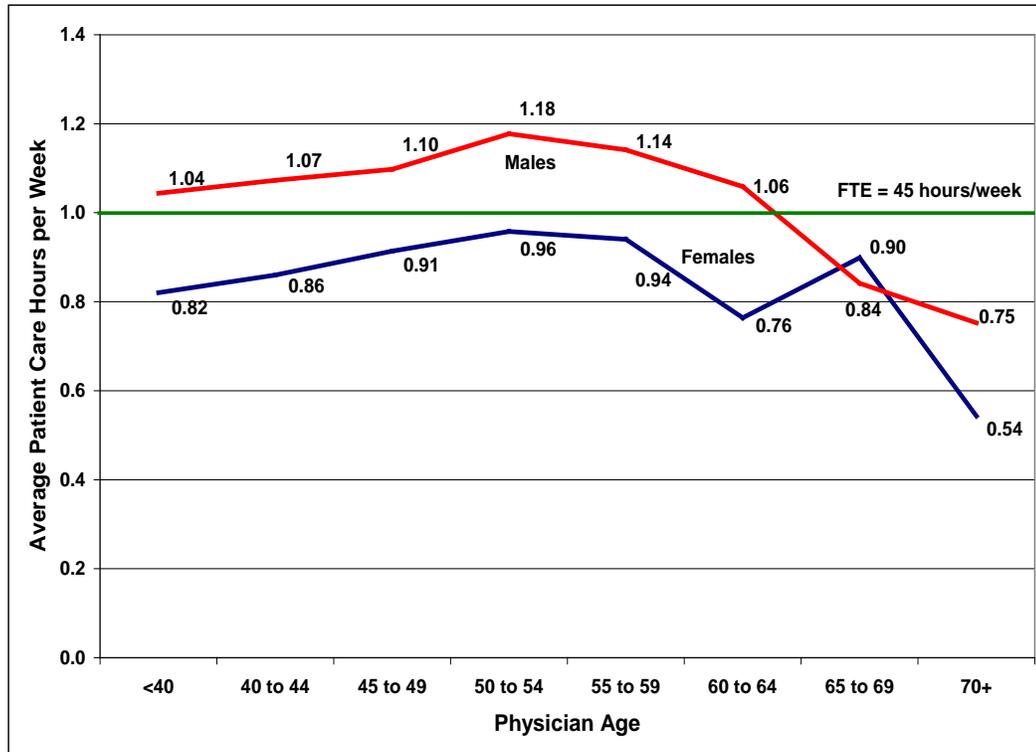
Physician-level data on patient care hours worked per week comes from two sources: (1) the 2006 AAMC Survey of Physicians Over Age 50, which provided information for approximately 9,000 respondents, and (2) a survey sponsored by HRSA during 2002 and 2003, which collected information for approximately 46,800 physicians. The AAMC survey data are used for the specialties in which the AAMC oversampled physicians and for physicians older than age 50. For all other specialties and for physicians younger than age 50, the study uses data from the HRSA-sponsored survey. Data are unavailable for geriatric medicine, so the study assumes that patterns of hours worked in geriatric medicine are similar to patterns for general internal medicine.

Dividing average hours worked by practitioners of a given age and sex by the average hours worked in that profession provides an estimate of the average FTE by demographic group. When general internists are used as an example, the patient care hours in the profession average about 45 hours per week (see Exhibit 3). Men age 50 to 54 work, on average, 53 patient care hours per week (or approximately 18 percent higher than the overall average of 45), while men age 70 to 74 who are still working average 34 patient care hours per week (or 75 percent of the average). Therefore, when FTEs for general internal medicine are calculated in this example, the study counts each male physician age 50 to 54 as 1.18 FTE and each male physician age 70 to 74

¹⁸Johnson, N. J., Sorlie, P. D., & Backlund, E. (1999). The impact of specific occupation on mortality in the U.S. National Longitudinal Mortality Study. *Demography*, 36(3), 355–367.

as 0.75 FTE. This approach adjusts the FTE count over time as the demographic composition of the health workforce changes.

Exhibit 3. Average Patient Care Hours Worked per Week: General Internal Medicine



Data Sources: Analysis of HRSA 2002-2003 Survey and AAMC 2006 Survey of Physicians Over Age 50.

D. Projected Change in Primary Care Physician Supply, 2010 Through 2020

The final projection is that there will be 220,800 FTE primary care physicians in 2020, an increase from 205,000 FTEs in 2010. This is an absolute increase of 15,800 FTE and is an 8-percent increase in overall supply.

IV. NP SUPPLY

A. Estimating the Active Supply of NPs in 2010

Approximately 55,400 NPs were clinically active in primary care in 2010. Estimates were derived from analysis and comparison of data from multiple sources, because there is no single comprehensive source of data on NPs. Estimates of clinically active NPs and the proportion practicing in primary care generated using the 2008 National Sample Survey of Registered Nurses (NSSRN) were similar to those recently reported by the Agency for Healthcare Research and Quality.¹⁹ Based on the 2008 NSSRN, projected forward to 2010, it is estimated that there were approximately 110,800 clinically active NPs, of which half (55,400) were practicing in primary care.

B. Projecting the Future Supply of NPs

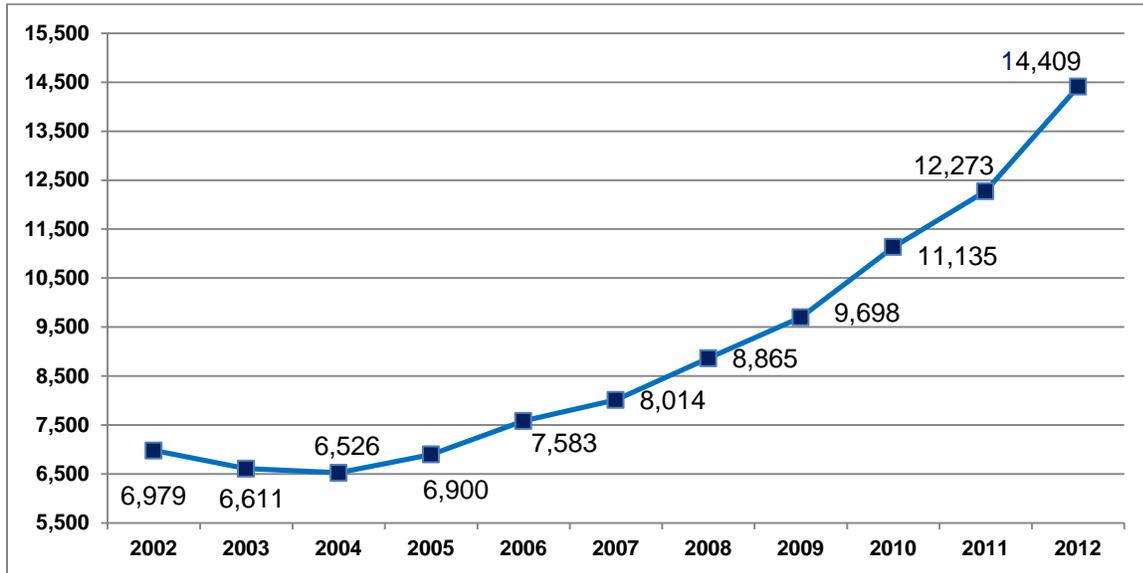
According to the American Association of Colleges of Nursing (AACN), more than 11,100 NPs graduated at the master's or post-master's level in academic year 2009 to 2010. This number increased to more than 14,400 in 2012.²⁰ Moreover, the number of NP graduates has increased steadily over the past eight years and more than doubled between 2002 and 2012 (see Exhibit 4). An analysis performed by HRSA's National Center for Health Workforce Analysis (the National Center) suggests that a portion of newly trained NPs may not practice in the NP role, instead serving in registered nursing positions not requiring NP training. The current study projects a moderation of the recent rapid growth. It further estimates that 50 percent of these NPs will practice in primary care specialties.²¹

¹⁹ Agency for Healthcare Research and Quality. (2011, October). *The number of nurse practitioners and physician assistants practicing primary care in the United States: Primary care workforce facts and stats no. 2* (AHRQ Publication No. 12-P001-3-EF). Rockville, MD: Author. Available online at: www.ahrq.gov/research/pcwork2.pdf

²⁰Fang, D., Tracy, C., & Bednash, G. D. (2012). *2011-2012 enrollment and graduations in baccalaureate and graduate programs in nursing*. Washington, DC: American Association of Colleges of Nursing.

²¹Analysis of the 2008 National Sample Survey of Registered Nurses by HRSA's National Center. See also Health Resources and Services Administration. (2010, September). Advanced practice registered nurses [Chapter 5]. In *The registered nurse population: Findings from the 2008 National Sample Survey of Registered Nurses*. Rockville, MD: Author. Available online at: <http://bhpr.hrsa.gov/healthworkforce/rnsurveys/rnsurveyfinal.pdf>; Agency for Healthcare Research and Quality. (2011, October). *The number of nurse practitioners and physician assistants practicing primary care in the United States: Primary care workforce facts and stats no. 2* (AHRQ Publication No. 12-P001-3-EF). Rockville, MD: Author. Available online at: www.ahrq.gov/research/pcwork2.pdf.

Exhibit 4. Annual Number of Graduates From NP Programs: Master's and Post-Master's Graduates, 2002 Through 2012



Data Source: HRSA compilation of data from the AACN Annual Survey (in collaboration with the National Organization of Nurse Practitioner Faculties for collection of nurse practitioner data). Note: Counts include master's and post-master's degree NP and NP/clinical nurse specialist graduates as well as bachelor's-to-doctorate of nursing practice graduates.

In total, the supply of NPs delivering primary care is projected to increase by 30 percent, from 55,400 in 2010 to 72,100 in 2020. This is an increase of 16,700 practitioners.

V. PA SUPPLY

A. Estimating the Active Supply of PAs in 2010

There were an estimated 27,700 PAs clinically active in primary care in 2010. This estimate is based on the 2008 American Academy of Physician Assistants (AAPA) Physician Assistant Census. It is projected forward to 2010 based on the addition of approximately 12,000 new graduates over the two years and the subtraction of 3 percent of PAs annually for expected attrition. Of the 84,000 PAs the current study estimates as clinically active in 2010, approximately one-third (27,700) are in primary care, and two-thirds (56,300) are in non-primary care specialties.

B. Projecting the Future Supply of PAs

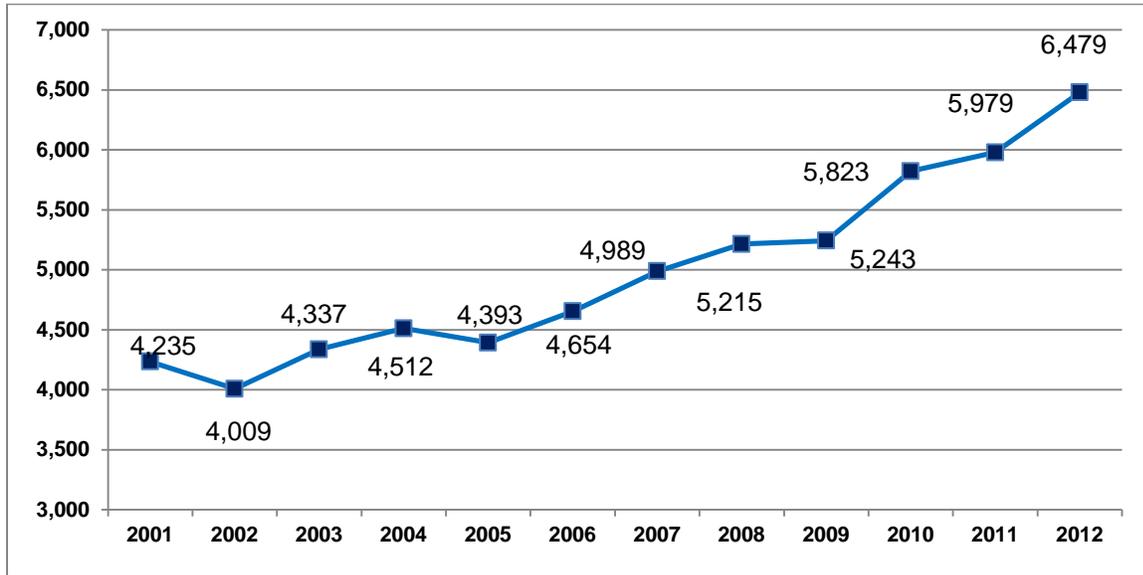
The projection assumes that the number of new PA graduates will increase by 200 annually, from approximately 6,000 in 2010 to 8,000 by 2020.²² The number of accredited PA programs has steadily risen over the past decade from 134 in 2003 to 173 in 2013, with anticipated additional growth in the near future.²³ The number of certified PAs has also risen over the past decade (see Exhibit 5). Approximately one-third of new PA graduates are assumed to enter a primary care specialty.²⁴

²²In 2006, there were an estimated 4,800 new PA graduates, growing to about 6,000 in 2010, representing a mean annual increase in new graduates of 240. A constant increase of 200 new graduates annually was applied in the projection with the assumption that the rate of growth between 2006 and 2010 may decline slightly after 2010. See Physician Assistant Education Association. (2010, October). *26th annual report on physician assistant educational programs*. Presentation on preliminary data, 2009-2010. Baltimore, MD: Author. Available online at: www.paeaonline.org/index.php?ht=a/GetDocumentAction/i/114396; Physician Assistant Education Association. (2008). *23rd annual report on physician assistant educational programs in the United States, 2006-2007* (p. 52). Alexandria, VA: Author. Available online at: www.paeaonline.org/index.php?ht=a/GetDocumentAction/i/3520.)

²³Program data from the Accreditation Review Commission on Education for the Physician Assistant, Inc. are available online at: www.arc-pa.org/acc_programs/program_data.html.

²⁴From a sample of PAs, AAPA estimated the universe of PAs around 83,500 in 2010, of which 31 percent were in primary care with 2 percent with specialty unknown. (American Academy of Physician Assistants. (2011). *Physician assistant census report: Results from the 2010 AAPA census*. Alexandria, VA: Author. Available online at: www.aapa.org/uploadedFiles/2010%20Census%20Report%20National%20_Final.pdf.)

Exhibit 5. Annual Number of Newly Certified PAs, 2001 Through 2012



Data Source: National Commission on Certification of Physician Assistants (NCCPA), "Certified Physician Assistant Population Trends"; 2012 data from personal communication with NCCPA, January 16, 2013.

Taking new graduates into account, the supply of PAs delivering primary care is projected to increase by 58 percent, from 27,700 in 2010 to 43,900 in 2020.

VI. PRIMARY CARE DEMAND

A. Background

The national demand for *primary care services* can be defined as the quantity and mix of services that society is willing to pay for based on population needs, economic constraints such as income and prices, and technological considerations of what is possible to provide. The demand for *primary care practitioners* (PCPs) is the number and mix of clinicians needed to meet the demand for services. Therefore, practitioner productivity, scope of practice, and how the health care system is structured for care delivery influence the demand for practitioners in specific disciplines. In reality, different configurations and mixes of PCPs can meet demand for primary care services. This study projects future demand for *primary care services* using the current utilization patterns and rates by population characteristic. Those estimates are then used to project the demand for PCPs. Both the demand for services and the resulting demand for practitioners are influenced by the complex interaction of the following determinants:

- **Population needs** are highly correlated with demographics such as the size and age of the population and the prevalence of chronic conditions. Projected increases in population, especially growth in the older population, portends strong growth in demand for primary care services for adults. Geographic variation and trends over time in chronic diseases and risk factors (e.g., obesity) affect the need for primary care services.
- **Economic constraints and prices** affect the ability and willingness of consumers to pay for services and influence how the health care system evolves to provide such services. Expanded health insurance coverage that will occur because of the Affordable Care Act is anticipated to increase demand for primary care services by reducing financial barriers to accessing care.
- **Technological and medical innovations** influence the services provided and care delivery. Since many medical advances improve survival and lifestyle for those with chronic illness, demand will likely increase. At the same time, advances in technology could increase practitioner productivity, requiring fewer practitioners to care for a given population.
- **System-induced demand** is the portion of health care use generated by health care practitioners that includes practitioner referrals for tests, procedures, and follow-up visits.²⁵

²⁵According to findings from the 2007 NAMCS, in 67.6 percent of all visits to physician offices, the patient was to return for another visit at a specified time. The visit disposition in 25.1 percent of the visits was to return if needed, while in 7.4 percent of the visits, the patient was referred to another physician. See Hsiao, C. J., Cherry, D. K., Beatty, P. C., & Rechtsteiner, E. A. (2010). National Ambulatory Medical Care Survey: 2007 summary. *National health statistics reports* (No. 27, Table 27). Hyattsville, MD: National Center for Health Statistics.

- **Public perceptions and expectations** regarding appropriate use of health care services and the ability of health care to improve health influence the public's demand for services.

B. Estimate of PCP Demand in 2010

The typical projections methodology used in this study assumes supply equals demand in the base year. This methodology was modified to account for unmet need in primary care HPSAs. It is estimated that there were 205,000 primary care physicians in 2010. The estimated shortfall of 7,500 primary care physicians needed to de-designate primary care HPSAs was added,²⁶ yielding a demand of 212,500 physicians in 2010. The current shortfall is assumed to be for general practice, family medicine, and general internal medicine.^{27,28}

Consistent with the projections methodology, the supply of NPs and PAs in 2010 is assumed to be equal to the demand for these practitioners. Therefore, 2010 demand for NPs is set at 55,400 and 27,700 for PAs.

C. Estimating Demand in 2020

Drivers of the projected demand for primary care services in 2020 include population growth and associated demographic changes. Drivers also include the expanded health insurance coverage that will result from the implementation of the Affordable Care Act in 2014. Before projections of future demand, a number of analyses were performed to understand the components of demand for primary care services in the base year.

1. Baseline Patterns of Health Care Use

i. Data Sources

Current patterns of health care use and delivery provide a starting point for understanding demand for primary care services. Using national data sources, the study estimates the proportion of primary care clinician time spent providing care to different subsets of the population in different health care delivery settings: (1) visits to practitioner offices and community health centers; (2) visits to hospital/clinic outpatient, emergency departments; and (3) hospital rounds. A small portion of care is provided in other settings (e.g., nursing homes and home health).

Data sources for analyzing encounter rates by patient characteristics include the 2005 to 2007 NAMCS, 2005 to 2007 National Hospital Ambulatory Medical Care Survey (NHAMCS), and 2007

²⁶For information on HPSA designation, see www.hrsa.gov/shortage.

²⁷Freed, G. L., & Stockman, J. A. (2009). Oversimplifying primary care supply and shortages. *Journal of the American Medical Association*, 301(18), 1920–1922.

²⁸Shipman, S. A. (2010, February). Attempting to meet our nation's pediatric workforce needs. *Pediatric Annals*, 39(2), 89–96.

Nationwide Inpatient Sample (NIS).²⁹ Rather than focusing on total encounters, the analysis estimated the proportion of office-based services provided to each population defined by seven age groups, sex, four race/ethnicity groups, and three insurance categories.³⁰ This usage information, combined with estimates of the number of FTE primary care clinicians providing office-based care (discussed later), forms the basis for constructing national practitioner-to-population ratios.

Many physicians trained in primary care participate in patient care activities outside of office visits—such as hospital rounds and ambulatory visits in clinics, hospital outpatient clinics, emergency departments, and urgent care centers. The analysis utilizes patient diagnosis codes and demographics found in the NIS (used to model hospital inpatient care) and the NHAMCS (used to model hospital outpatient and emergency care) for its estimates. With these data, the analysis estimates the patients most likely to be seen in the hospital by a family practitioner or general internist, a pediatrician, or a geriatrician. This information, in combination with estimates of the portion of physician time spent in hospital rounds and hospital outpatient or emergency departments, informed the estimates of practitioner-to-population ratios for inpatient care and for outpatient/emergency-based care.

Information from the following sources contributed to the estimate of the average proportion of time physicians spend providing care in different settings:

- The Medical Group Management Association’s Physician Compensation and Production Survey (2009 report based on 2008 data), which contains information on average volume of services provided in each setting;
- The American Board of Internal Medicine’s Practice Characteristics Survey combined across multiple years, which provides estimates of the proportion of physician time engaged in different care activities; and
- AMA’s 2003 Physician Socioeconomic Statistics, which provides estimates of the amount of time and services provided in different care delivery settings.

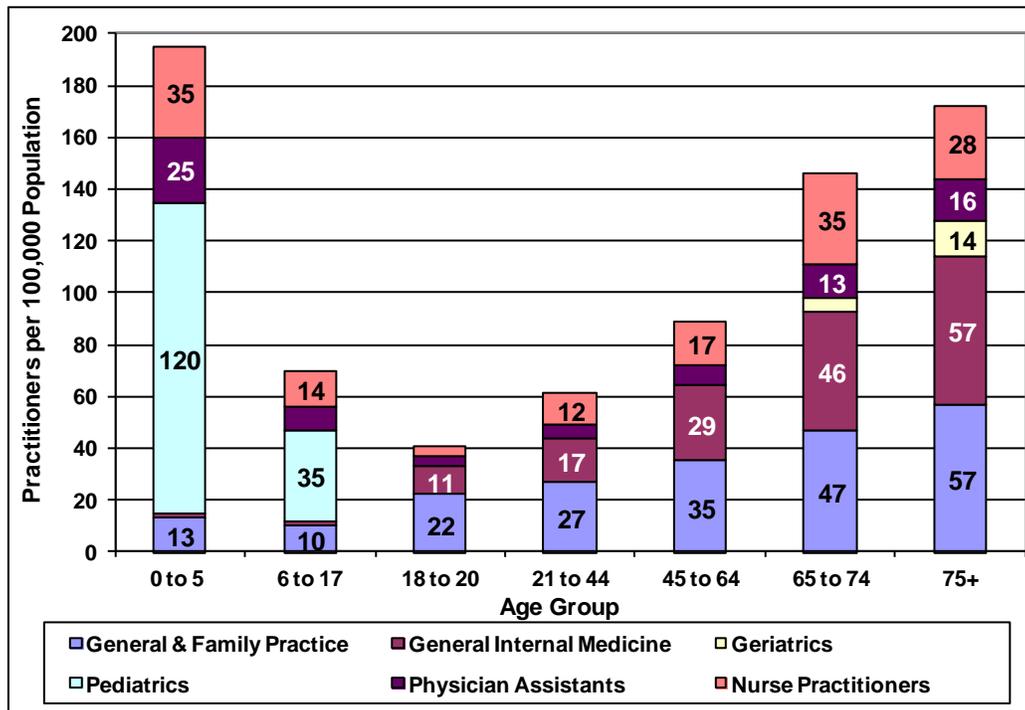
²⁹National Center for Health Statistics (NCHS), Division of Health Care Statistics. National Ambulatory Medical Care Survey. Hyattsville, MD: Author. Available online at: www.cdc.gov/nchs/ahcd.htm. See also National Center for Health Statistics, Division of Health Care Statistics. (n.d.). National Hospital Medical Care Survey. Hyattsville, MD: Author. Available online at: www.cdc.gov/nchs/ahcd.htm and Agency Healthcare Research and Quality, Healthcare Cost and Utilization Project. *Nationwide Inpatient Sample*. Rockville, MD: Author. Available online at: www.hcup-us.ahrq.gov/nisoverview.jsp.

³⁰The age categories are 0 to 5, 6 to 17, 18 to 20, 21 to 44, 45 to 64, 65 to 74, and 75 years and older. The race/ethnicity categories are non-Hispanic (NH) White, NH Black, NH other, and Hispanic. The insurance categories are commercially insured under age 65, publically insured (with the age 65 and older population primarily consisting of Medicare patients), and uninsured.

ii. *Practitioner-to-Population Ratios*

Estimates of FTE practitioners per 100,000 persons in each age group (see Exhibit 6) produce the practitioner-to-population ratio estimates. These ratios reflect: (1) patient encounters and physician time across different settings of care (based upon analysis of the multiple data sources outlined above); and (2) how the current primary care workload is distributed across patients (by age) and primary care discipline. At the national level, there are an estimated 98 FTE PCPs actively engaged in patient care per 100,000 population. Aggregate estimates range from a low of 41 FTE practitioners per 100,000 persons age 18 to 20 years to a high of 194 FTEs per 100,000 persons age zero to 5 years.

Exhibit 6. Estimated Use of PCPs (FTEs) per 100,000 Persons Within Each Age Group, 2010



Data Source: Analysis of the multiple sources of data outlined in this report on patient utilization by setting (e.g., the NAMCS, NHAMCS, and NIS) and those on physician time allocation across settings of care.

2. Key Determinants of Future Demand

To estimate future demand for primary care services, national practitioner-to-population ratios to the projected future population are applied—adjusting for demographics, obesity rates, and insurance coverage (including the anticipated expansion of health insurance coverage

due to the passage of the Affordable Care Act³¹). This section discusses these key demand determinants and trends.

i. Population Aging and Growth

Projections of the population developed by the U.S. Census Bureau for 2008 through 2050 (based on the 2000 Census and released in 2008) for age, sex, and race/ethnicity informed the study projections. U.S. Census Bureau projections suggest that the overall U.S. population will grow by approximately 10 percent over the next decade. However, the projected growth rate is much higher for the populations age 65 to 74 (50-percent growth) and age 75 and older (20 percent). The growth rate is lower for the age group zero to 17 (9 percent) and the age 18 to 64 population (5 percent). Since the amount of primary care services sought by patients varies substantially by age, these demographics suggest a growing demand for geriatrics. The demographics also suggest that a greater percentage of the patients seen by family physicians and general internists will be older individuals who require significantly more services. The study makes similar projections of demand for primary care services stratified by sex and race/ethnicity.³²

ii. Health Insurance Coverage

Using the 2007 and 2008 American Community Survey,³³ the study estimates the proportion of the population uninsured in each demographic group. Applying these rates to the 2010 population suggests that 44.5 million people lack insurance coverage.

The Affordable Care Act extends coverage to many uninsured individuals beginning in 2014. The Congressional Budget Office (CBO) estimated that 8 percent of the U.S. population younger than 65 years of age would remain uninsured after implementation of the Affordable Care Act, assuming complete Medicaid expansion across U.S. states.³⁴ In order to model the

³¹These projections assume that all states will expand Medicaid coverage as authorized by the Affordable Care Act because the projections were developed before the decision of the Supreme Court making the expansion optional. Since the number of states that will expand eligibility for Medicaid is unknown, the projections have not been revised. To the extent that some states do not expand eligibility, the projections will overestimate primary care demand.

³²Since preparation of these projections, in December of 2012, the U.S. Census Bureau has published new projections of the U.S. population for 2020. The newer projections project a slightly slower rate of overall population growth. Consequently, the projections may slightly overestimate the growth in demand in 2020.

³³U.S. Census Bureau. American Community Survey. Available online at: www.census.gov/acs/www/.

³⁴Douglas W. Elmendorf. CBO's Analysis of the Major Health Care Legislation Enacted in March 2010. Testimony before the Subcommittee on Health, Committee on Energy and Commerce, and U.S. House of Representatives, March 30, 2011. Available online at: www.cbo.gov/publication/22077. The CBO modified its estimate of insurance coverage after the Supreme Court decision on June 28, 2012, that lessened the requirement of states to expand Medicaid in the manner outlined in the Affordable Care Act. The most recent CBO estimate, released in May 2013, has 11 percent ultimately remaining uninsured rather than the 8 percent estimate released at the time that analysis for this report was conducted (see www.cbo.gov/sites/default/files/cbofiles/attachments/44190_EffectsAffordableCareActHealthInsuranceCoverage_2.p

implications of the Affordable Care Act, the study uses estimates of the proportion uninsured in each demographic who are non-citizens as a proxy for undocumented immigrants who may remain uninsured. The study also scales the proportion of citizens remaining uninsured in each demographic based upon the CBO estimate of 8-percent uninsured among the population younger than 65.

For modeling primary care demand, the study assumes that newly insured individuals will take on the health care use patterns of the commercially insured population within their demographic. Therefore, the anticipated increase in demand for primary care services reflects the difference between patterns for the commercially insured and patterns for the uninsured, controlling for age, sex, and race/ethnicity.

It is important to note that the demand for primary care services will likely also change because of other provisions included in the Affordable Care Act, such as changes in reimbursement rates and practice design. However, there is insufficient information to quantify the effect of these changes.

iii. Disease Risk Factors: Obesity Rates

The demand projections reflect variation in obesity rates and their implications for use of primary care services. Although a number of disease risk factors influence the demand for primary care services, available data and modeling techniques limited the number of risk factors that could be incorporated into this study. Obesity was selected for use because of its correlation with multiple diseases, including heart disease, stroke, and type 2 diabetes, as well as its increasing prevalence over the past few decades.³⁵ The study relies on survey findings from the Behavioral Risk Factor Surveillance System (BRFSS), which is fielded by CDC, and captures information on obesity and other health characteristics of a representative sample of adults throughout the United States. In order to increase the sample size, two years (2007 and 2008) of data were combined.³⁶ Because of small sample size in some demographic groups, to estimate obesity rates, logistic regression was used, with each individual in BRFSS as the unit of observation. The dependent variable is whether the person is obese (yes=1, no=0). The explanatory variables include dichotomous variables (yes=1, no=0) for age group, sex, race/ethnicity group, and state of residence.³⁷

[df](#)). This increase in the percent remaining uninsured might result in less demand, however slight, than projected in this report. See also *National Federation of Independent Business v. Sebelius*, 132 S. Ct. 2566 (2012).

³⁵ For more information on obesity and health, including Healthy People 2020 goals for improvement, see www.healthypeople.gov/2020/LHI/nutrition.aspx?tab=overview.

³⁶Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System Annual Survey Data. Atlanta, GA: Author. Available online at: www.cdc.gov/brfss/annual_data/annual_data.htm.

³⁷State was included in the regression analysis since the model used to project future demand calculated estimates at the state level and then aggregated the estimates to produce national totals.

Obesity rates vary significantly by age, sex, and race/ethnicity. As reported by CDC and reflected in this analysis, compared with White adults, obesity rates for African Americans/Blacks are 36 percent higher, and rates for Hispanics are nearly 20 percent higher.³⁸ Trends in obesity rates suggest that the rate of growth has slowed substantially.³⁹ For modeling demand, it is assumed that obesity rates within each demographic group will remain constant over time. Hence, changes in demand over time associated with obesity in the modeling of demand are driven by the overall obesity rate produced by changes in the population demographic composition.

D. Results: Drivers of Projected Future Demand for Primary Care Services

Changing demographics of the population, including the aging and growth of the population, account for the majority (81 percent) of the projected increase in demand for PCPs between 2010 and 2020. In contrast, only 19 percent of the increased demand for PCPs from 2010 through 2020 is associated with the estimated expansion of the population covered by health insurance with the full implementation of the Affordable Care Act. If all states do not expand Medicaid, the percent of demand due to coverage expansion will be even less. This finding is consistent with several recent studies that have estimated the increased demand for primary care resulting from coverage expansions under the Affordable Care Act at 2 to 3 percent.⁴⁰

³⁸See age-adjusted rates in Flegal, K. M., Carroll, M. D., Ogden, C. L., & Curtin, L. R. (2010). Prevalence and trends in obesity among U.S. adults, 1999-2008. *Journal of the American Medical Association*, 303(3), 235-241; Centers for Disease Control and Prevention. *Adult obesity facts*. Available online at: www.cdc.gov/obesity/data/adult.html.

³⁹Flegal, K. M., Carroll, M. D., Ogden, C. L., & Curtin, L. R. (2010). Prevalence and trends in obesity among U.S. adults, 1999-2008. *Journal of the American Medical Association*, 303(3), 235-241; Ogden, C. L., Carroll, M. D., McDowell, M. A., & Flegal, K. M. (2007). *Obesity among adults in the United States—No statistically significant change since 2003–2004*. NCHS data brief no 1. Hyattsville, MD: National Center for Health Statistics. Available online at: www.cdc.gov/nchs/data/databriefs/db01.pdf.

⁴⁰See, for example, Hofer, A. N., Abraham, J. N., & Moscovice, I. (2011). Expansion of coverage under the Patient Protection and Affordable Care Act and primary care utilization. *Milbank Quarterly*, 89(1), 69-89; Huang, E. S., & Finegold, K. (2013). Seven million Americans live in areas where demand for primary care may exceed supply by more than 10 percent. *Health Affairs*, 32(3), 614-621.

VII. PROJECTED ADEQUACY OF FUTURE SUPPLY OF PCPS

The study applies the national practitioner-to-population ratios for each demographic and insurance category to the projected future population. Then, the study translates projected demand for primary care services to projected demand for primary care practitioners, assuming continuation of current utilization patterns of physicians, NPs, and PAs.

A. Physicians

Between 2010 and 2020, the estimated total supply of primary care physicians grows more slowly than the levels needed to meet projected demand for health care services from physicians. The number of primary care physicians is projected to increase from 205,000 FTEs in 2010 to 220,800 in 2020, an 8-percent increase. However, the total demand for primary care physicians is projected to grow by 28,700, from 212,500 FTEs in 2010 to 241,200 FTEs in 2020, a 14-percent increase (see Exhibit 7). Without changes such as how primary care is delivered, the growth in primary care physician supply will not be adequate to meet demand in 2020, with a projected shortage of 20,400 physicians.

Exhibit 7. Projected Demand for Primary Care Physicians

	2010	2020
Total primary care physician demand (FTE)	212,500 ^a	241,200 ^c
General ^b	164,400	187,300
Pediatrics	44,800	49,600
Geriatrics	3,300	4,300
Primary care physician supply	205,000	220,800
Supply and demand	(7,500)	(20,400)

^a National demand projections presented in this report assume that in 2010 the national supply of primary care physicians was adequate except for the approximately 7,500 FTEs needed to de-designate the primary care HPSAs.

^b This category includes general and family practice, and general internal medicine.

^c Assumes all states expand Medicaid.

B. NPs and PAs

The supply of primary care NPs and PAs is estimated to grow faster than the levels required to meet demand if the current physician-to-NP/PA ratios in care delivery are maintained (see Exhibit 8). From 2010 through 2020, the supply of primary care NPs is projected to increase by 30 percent and the supply of primary care PAs is projected to increase by 58 percent. Assuming that NPs and PAs provide the same proportion of services in 2020 that they did in 2010, the combined demand for NPs and PAs would increase by only 17 percent. However, if

NPs and PAs provide a greater share of primary care services, their effective demand would be higher.

Exhibit 8. Projected Supply and Demand for Primary Care NPs and PAs

Provider Type/Specialty	2010	2020
<i>Supply</i>		
Nurse Practitioners	55,400	72,100
Physician Assistants	27,700	43,900
<i>Demand</i>		
Nurse Practitioners	55,400	64,700
Physician Assistants	27,700	32,700
<i>Supply and Demand</i>		
Nurse Practitioners	*	7,400
Physician Assistants	*	11,200

*There were no data available for estimating if there were base year shortages of NPs and PAs.

Note: Counts of NPs and PAs are not adjusted for productivity.

VIII. DISCUSSION

At the national level, both the supply of and demand for PCPs will grow over the next decade. The growth in primary care physician supply alone will not be adequate to meet demand in 2020 under current configurations of care provisions. Given the projected growth in the NP and PA workforce, as well as ongoing efforts to effectively integrate these providers into the primary care delivery system, the projected physician shortage could be somewhat alleviated. Efficient use of NPs and PAs will require patient and health system acceptance and the continued dissemination of more effective models of workforce deployment. There are indications of the acceptance of these practitioners by patients.

NPs and PAs are not substitutes for physicians, but they have an important role in the health care system and are trained to provide some of the same services as physicians. Additionally, since NPs and PAs do not provide the same volume of services as physicians, projections of the extent to which NPs and PAs could help alleviate the physician shortage are dependent upon productivity assumptions.

Applying a 0.75 weighting to NPs and PAs relative to primary care physicians could help estimate the potential impact NPs and PAs could have on alleviating the primary care physician shortage. This weighting reflects the consensus of the Negotiated Rulemaking Committee on the Designation of Medically Underserved Populations and Health Professional Shortage Areas.⁴¹

Under a scenario in which the rapidly growing NP and PA supply can be effectively integrated, and using a 0.75 FTE weight, the shortage of 20,400 physicians in 2020 could be reduced to 6,400 PCPs. Physicians would still remain the dominant providers of primary care, decreasing from 77 percent of the primary care services in 2010 to 72 percent in 2020, but the percent of primary care services provided by NPs and PAs would grow from 23 percent in 2010 to 28 percent in 2020.

Such offset assumes a reorganization of primary care in which NPs and PAs deliver a greater proportion of the services than they do within the present system. It also anticipates, to some extent, a redesign of service delivery in physician practices whereby NPs and PAs provide a

⁴¹“Negotiated Rulemaking Committee on the Designation of Medically Underserved Populations and Health Professional Shortage Areas: Final Report to the Secretary,” October 31, 2011. It is important to note that the Committee did not intend for this weighting to represent the general relative cost or value of NP and PA services compared with physician services. The Committee also acknowledged that these providers often deliver a different set of services than a physician, and that weighting them at 1.0 would overstate the assessment of primary care capacity.

greater share of primary care services than they do now, to complement the services provided by physicians.

Improving the efficiency of health care service delivery through team-based models of care will help increase access to services. In 2009, the AAMC conducted a survey of primary care physicians and asked the physicians what steps they would take if their practice experienced a significant increase in demand, such as from the Affordable Care Act. Preliminary findings suggest that many practices would likely respond to increases in demand for services by hiring additional support staff (52.7 percent), physicians (46.5 percent), NPs (43.7 percent), and PAs (33.6 percent).⁴² When asked what they thought society should do to expand primary care capacity, these same physicians responded that various health care system redesign initiatives would have an impact. The most common response was to increase the efficiency of care delivery by reducing paperwork (90-percent response), improving productivity (69 percent), and providing technology (66 percent).

Increasing the efficiency of care delivery through greater reliance on technology and reducing non-direct care activities (such as paperwork) may also have the potential to improve adequacy of primary care supply. Blanchfield et al. reported that as much as four hours per week of physician time that is spent on paperwork could be directed to other activities if the health care system streamlined clinical service billing processes.⁴³ These four hours per week, if redirected to patient care activities, would be equivalent to increasing primary care supply by approximately 11 percent. These efficiency gains would help close the gap between supply and demand.

Some medical and technological advances have the potential to increase practitioner productivity. For example, the Health Information Technology for Economic and Clinical Health Act, which defines and encourages “meaningful use” of Electronic Health Records (EHRs). EHRs allow practitioners to more efficiently manage patient care, thus reducing demand. In large part because of increased funding for health information technology (HIT), the proportion of primary care physicians using EHRs doubled (from 20 to 39 percent) between 2009 and 2011.⁴⁴ HIT also exists in the form of decision support systems that facilitate diagnosis and allow practitioners to print customized information to help patients understand and manage their conditions, thereby saving the practitioner time. Finally, alternative communication methods (e.g., email and telephone) can allow practitioners greater flexibility in communicating with patients and reduce the need for face-to-face visits.

⁴²Association of American Medical Colleges, Center for Workforce Studies. (n.d.). 2009 AAMC Physician Survey on Primary Care.

⁴³Blanchfield, B. B., Heffernan, J. L., Osgood, B., Sheehan, R. R., & Meyer, G. S. (2011). Saving billions of dollars – and physicians’ time – by streamlining billing practices. *Health Affairs*, 29(6), 1248–1254.

⁴⁴Blumenthal, D. Implementation of the Federal Health Information Technology Initiative. (2011). *New England Journal of Medicine*, 365(25), 2426–2431.

The experience over the past decade is encouraging in terms of the ability of the delivery system to make use of a growing supply of PAs and NPs. For example, the number of new PA graduates grew from 4,400 in 2000 to about 6,000 in 2010.⁴⁵ Despite this 36-percent increase, new PAs do not appear to be having any difficulty finding jobs. A recent study also found strong acceptance of care by PAs and NPs, especially by those who had previous direct experience with these practitioners.⁴⁶

A. Geographic Disparities Will Likely Continue

Even with the potential for greater reliance on NPs and PAs to provide primary care services to patients, disparities will continue. National projections mask problems that exist in specific geographic areas. Some areas enjoy the benefit of a supply of PCPs well above the national average. Other areas have a supply that is inadequate to meet the need for primary care services. More detailed analysis of the adequacy of supply within local geographic areas—whether counties, cities, townships, or neighborhoods—is needed to better understand the adequacy of the primary care workforce and how the primary care workforce would need to be distributed across the nation to ensure access.

Ensuring access to primary care for all Americans will continue to require programs and policies to address the maldistribution of the primary care workforce. Given the importance of access to primary care for an effective health care system, HRSA will continue to monitor the supply and distribution of PCPs. HRSA also will periodically update these projections as new data and information become available.

B. Limitations of These Projections

Numerous factors will influence future supply and demand for PCPs. The projections in this report do not account for new programs and policies that may help grow the supply of PCPs or reform the health care delivery system. While the projections do consider the estimated impact of expanded health insurance coverage associated with full implementation of the Affordable Care Act, if all states do not expand Medicaid, the numbers in this report are likely an overestimate.

A number of new programs and policies included in the Affordable Care Act are designed to increase the supply of PCPs and increase the effectiveness of their use through models emphasizing team-based care, such as patient-centered medical homes. Such changes could

⁴⁵Physician Assistant Education Association. *17th annual report on physician assistant educational programs in the United States, 2000-2001*. Alexandria, VA: Author. Available online at: www.paeaonline.org/index.php?ht=a/GetDocumentAction/i/61838; Physician Assistant Education Association. (2010, October). *26th annual report on physician assistant educational programs*. Presentation on preliminary data, 2009-2010. Baltimore, MD: Author. Available online at: www.paeaonline.org/index.php?ht=a/GetDocumentAction/i/114396.

⁴⁶Dill, M., Pankow, S., Erikson, C., & Shipman, S. (2013). Survey shows consumers open to a greater role for physician assistants and nurse practitioners. *Health Affairs*, 32(6), 1135–1142.

allow for an increased role of NPs and PAs in the provision of primary care services and have the potential to help address the projected shortage of primary care physicians.

This study assumes that the supply and demand for PCPs was balanced in 2010 except for the number of physicians that would be needed to de-designate HPSAs. The HPSA shortfall is used as a proxy for the base-year national shortfall since it is the only federal measure of shortage currently available. Shortages may exist in areas that are not designated as HPSAs or in professions not currently covered by HPSAs (such as NPs and PAs).

Finally, while it is reasonable to use historical patterns to project future supply and demand, it is important to be aware that small changes in the parameters in the projections (such as changes in hours worked or retirement patterns) could have a notable effect on future supply and/or demand.