Robert Wood Johnson Foundation

THE SYNTHESIS PROJECT

NEW INSIGHTS FROM RESEARCH RESULTS

ISSN 2155-3718

RESEARCH SYNTHESIS REPORT NO. 22
JULY 2011

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Primary care health workforce in the United States

See companion Policy Brief available at *www.policysynthesis.org*

TABLE OF CONTENTS

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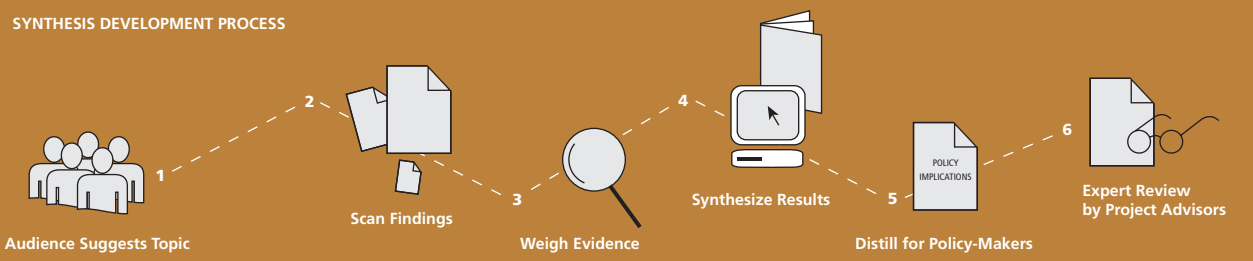


Introduction

Ever since primary care was first distinguished from other specialty care, there has been controversy as to its role, function, provision, payment and efficacy. This controversy leads to a certain level of confusion on the topic of primary care. Consumers may hold a vaunted image of the family doctor, but then quickly abandon the generalist for specialized care. The nation expresses value for all the elements of primary care, but payment policies reflect a different bottom line. At times the nation has expected a great deal from the services of this trusted caregiver–prevention of disease, recovery of health, guide to the complexity and uncertainty of specialized care, and counsel at the end of life. And just as often the public has classed the primary care provider as a "gatekeeper" with little knowledge that is useful, representing an unnecessary barrier to what is really needed and desired.

The controversy is in part reflected in the numerous meanings attributed to primary care. The term is used by everyone in health care, but often quite differently, and it may be fair to say that much of what passes for primary care is in the eye of the beholder. It is multifaceted and far from homogeneous. "Primary care" has been defined comprehensively in the literature (see below), but primary care services are evolving and can range from a single contact with a provider for an acute event to longtime management of chronic conditions. And, while once the purview of physicians alone, primary care for several decades now has been delivered in the United States by nurse practitioners (NPs), physician assistants (PAs), osteopathic physicians (DOs) and medical doctors (MDs). Perhaps too often the discussion about primary care is not about the nature of the care at all, but the training and professional affiliation of the provider.

Primary Care Defined

The Institute of Medicine has defined primary care as "the provision of integrated, accessible health care 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 (59)."

Starfield identifies four main features of primary care: first-contact access for each new need; long-term person-focused care (not disease-focused); comprehensive care for most health needs; and coordinates care when it must be sought elsewhere (147, 148). For some purposes, an orientation toward family and community is included as well.

With the passage of the Patient Protection and Affordable Care Act (Public Law 111-148) and the Health Care and Education Reconciliation Act of 2010 (Public Law 111-152), jointly referred to throughout this document as the PPACA, primary care has received renewed attention. Consensus was largely reached that primary care should be supported and figure prominently in the country's emerging health care system. Interwoven throughout the PPACA are specific provisions–ranging from increased Medicare payment for primary care to expansions in primary care workforce training programs to investments in primary care practice models such as patient-centered medical homes–that tie primary care to the PPACA's ambitious goals of expanding access, improving quality of outcomes and slowing the rate of overall cost growth.

While the implementation of the PPACA is still being debated and its future uncertain, U.S. health care is changing, driven partly by policy but also by market forces, demographic trends, evolving professions, new technology and shifting consumer demands. As health care changes over the next decade and a half, it seems likely that the ecology of the system in which primary care finds itself will progress to meet changing social and economic expectations. Any useful assessment of the primary care workforce must consider these potential changes and as much as possible project a workforce analysis onto the screen of this future landscape.

Introduction

In light of the need for a synthesis of the research and policy work conducted to date on the primary care health workforce in the United States, a compilation of this body of research is presented below. In particular, several key questions are addressed:

a. What is the profile, supply and distribution of the U.S. primary care workforce?

b. What are the nation's primary care workforce needs and demands?

c. What effects do payment policies and market forces have on primary care?

d. What effects do state scope of practice laws have on primary care workforce supply and practice?

e. What pressures are being exerted on the primary care workforce to evolve?

Widespread agreement can be found to support the notion that the United States needs primary care and primary care practitioners. Consensus has also been reached that primary care providers are not evenly available in all geographic regions of the country. A common–though not universal–theme can be found in the professional literature and popular press that we do not–or will not–have sufficient numbers of primary care providers in the United States, particularly with an estimated 30 million individuals newly insured when the PPACA is fully implemented. However, agreement on the need for primary care providers does not extend to the details underlying the need or its repercussions. Supporting data are limited and inconsistent; workforce supply and demand models are imperfect; not all analysts agree when perceived 'shortages' began or will begin; and there is widespread divergence over any implications.

In reviewing published literature and data on the primary care workforce in the United States, one fact is evident: The rediscovery or remaking of primary care is recognized by most analysts as an essential part of a U.S. health care system that lowers costs, improves quality and expands access. Not only is this position supported in the federal reform legislation, it has also informed the discussion of how systems of care respond to the challenges facing the nation with or without the PPACA. Inevitably these considerations lead to a question of the adequacy of supply of providers. But scholars and leaders increasingly are framing questions as to whether the long-term challenge is to staff the existing model for primary care or to use this juncture as an opportunity to evolve new ways in which a primary care function or resources can be provided.

Methodology

This synthesis relies on published data and reports. Data reports and studies were retrieved from many sources, including government agencies, research foundations and professional associations. Peer-reviewed journal articles were located by searching specific journals and through general search engine queries. The reference sections of studies and articles often provided additional leads as well.

The decision to include or exclude material was based upon timeliness, relevance and source credibility. For the most part, studies, articles and legislation are from the last five years. In cases where data or studies are updated periodically, efforts were made to get the most recent version. Some articles and studies are older than five years. These were included when more recent materials were not available or when earlier articles were considered seminal on a particular topic. Determining relevance was more subjective. For the supply and demand reports, any materials not directly related to the supply and/or demand of traditional primary care providers were excluded. A few advocacy pieces and popular press articles were included for background and context. Articles about innovative delivery models were included if they a) focused on primary care; b) presented a new model of care; and c) focused on a patient-centered or team approach to care and not on the individual provider model. Every effort was made to include research that included outcomes data. In the case of the medical home, where numerous articles have been written on the subject, preference was given to more timely articles from established researchers and research organizations. Finally, the credibility of the source was examined; advocacy pieces from online news sources, for example, were often excluded. On the other hand, some pieces in the popular press were included if the data on which the analysis was made were otherwise verified and credible or particularly relevant to the synthesis. Appendix I contains the full bibliography, including the references that are cited in the body of the synthesis.

Supply and demand modeling is limited to the physician workforce. Data collected regarding primary care providers are inconsistent across the professions; within each profession, the data sets have their own strengths and weaknesses. Appendix II identifies the most commonly cited supply and demand models, including their strengths and weaknesses.

Findings

What is the profile, supply and distribution of the U.S. primary care workforce?

Elements of workforce capacity and supply include types of professions, numbers and demographic data of individuals working or in the education pipeline, and geographic distribution. All stakeholders agree that the United States does need an adequate number of practitioners to serve the U.S. population. However, the complexity of variables in discussions about primary care underscores the premise that improvements to primary care need to be more than a numbers or headcount game.

Profile and Supply

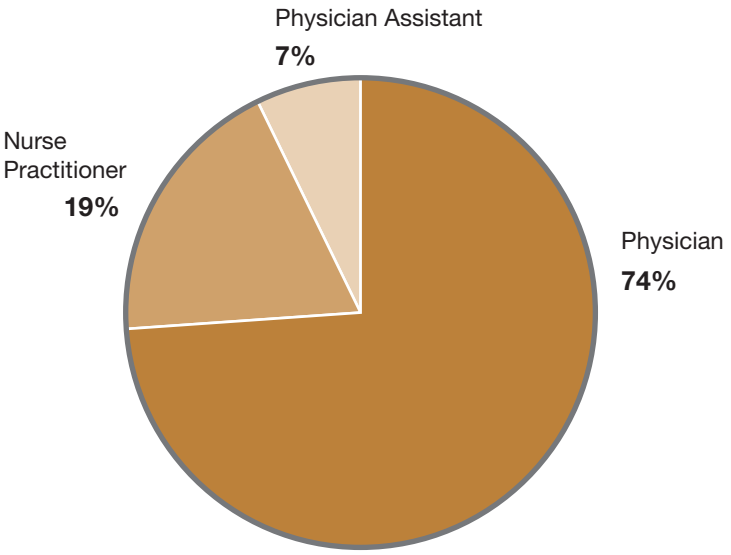
Although a number of different health care professionals may provide primary care services, primary care principally is provided by physicians (MDs and DOs), nurse practitioners (NPs), and physician assistants (PAs). Collectively, an estimated 400,000 primary care providers, composed of these three professions, provide primary care in the United States (31). Primary care is provided by physicians, nurse practitioners and physician assistants individually and jointly in teams. In some cases, members of these professions practice interdependently and collaboratively. In some cases, the collaborations are defined by state laws and may include supervision requirements, particularly for PAs and to a lesser degree for NPs. In still other cases, members of these professions serve as leaders for teams of providers that include multiple other professions in nursing and allied health.

Most of the major studies on U.S. primary care supply and demand focus only on physicians and rely on models developed by the Health Resources and Services Administration's Bureau of Health Professions. In addition to other shortcomings of these models (see Appendix II for further discussion), a significant flaw to this approach is that few workforce needs are calculated to include all relevant professions or adjusted for proportional utilization rates and changing practice patterns. A 2008 GAO (163) report included numbers of physicians, physician assistants and nurse practitioners, but did not attempt to estimate capacity to deliver services, which is influenced by how much someone works (usually estimated by FTE) and relative productivity among various professions to deliver x units of service per y unit of time, or demand for services from a team of providers drawn from different clinical professions. Moreover, as noted in its review of other primary care workforce reports, the GAO highlighted the reports' difficulties in making workforce predictions. Besides the weakness that historical data may not predict future trends, several critical elements are not included in the calculations. One of these is technology innovation, which will surely affect practitioner productivity but in unknown ways.

Data collected regarding primary care providers are inconsistent across the professions; within each profession, the datasets have their own strengths and weaknesses. For example, the datasets often lack depth (rarely including number of hours worked or multiple practice sites); they are not collected in standard formats; they do not include unique identifiers for workers that would permit interstate and longitudinal studies; and barriers inhibit full access by researchers (for more information, see Appendix III). These factors have implications on the strength and credibility of the datasets on which policy decisions must be made. Despite these shortcomings, we present below the information we do know about the three major components of the U.S. primary care workforce.

Findings

Figure 1: The primary care workforce by type of provider



Source: Bodenheimer (31)

Physicians make up approximately three-quarters of the primary care workforce (31) and the number of primary care physicians grew faster than the population during the 1995–2005 decade (163). Over that period, the per capita supply of primary care physicians–internists, pediatricians, general practice physicians and family practitioners–rose slightly more than 1 percent per year. The total increase in primary care physicians per 100,000 population during the decade was 12 percent, compared with 5 percent for other physician specialties (163). In addition, some specialty professions, including obstetricians and gynecologists, provide primary care services, although they are not included in most counts of primary care providers.

Despite this modest positive growth in the supply of primary care physicians, several studies and reports published in professional and popular press during the past decade point to current or projected shortages of primary care physicians. The Association of American Medical Colleges provided a compilation of many of these reports (22, 23). In summary, 29 state-specific reports (sponsored by a range of entities including state government agencies, universities, workforce centers, foundations and state medical associations) concluded that physician shortages are here or loom on the horizon; specialty-specific reports (largely sponsored by professional associations) found that primary care is one of the specialties hardest hit, with numbers of generalist residency graduates declining since 1998 (citing Colwill (46)); and six national reports brought additional attention to perceived physician shortages and offered suggestions for addressing them. A review of the state-level reports reveals that, aside from multiple efforts to point out that a particular state's physician-to-population ratio was lower than other states, most reports focused on maldistribution (especially insufficient numbers of physicians practicing in rural areas), lack of racial and ethnic diversity in medicine, and the anticipated retirement rates of physicians in coming years. Following the passage of the PPACA, which aims in part to insure millions more individuals, AAMC's Center for Workforce Studies estimated there will be 45,000 too few primary care physicians in the next decade (18). Again, it is notable that these studies reviewed only physician data; were based on underlying assumptions that traditional ratios of physicians

to population were appropriate; and did not account for the increasing share of primary care being provided by other providers as substitutes, complements or team members. The impact of these new models on physician–and other provider–productivity are unknown but will likely necessitate new formulas to replace ratios of provider to population as the traditional proxy measure for calculating supply and demand. Even if ratios-to-population continue to be used to calculate supply, the historical estimated numbers of physicians needed may shrink with the integration of other personnel–whether as other primary care providers or as part of a primary care team–into the primary care practice model.

Reports in the early 2000s suggesting workforce shortages in medicine resulted in recommendations from AAMC to grow U.S. medical school graduation rates by 30 percent and from the Council on Graduate Medical Education (COGME), which advises the Secretary of Health and Human Services and Congress on physician workforce and training issues, to expand medical school enrollment overall. Schools responded positively. It is unknown what residency choices graduates will make in the future, but some experts predict that because of a ceiling on Medicare-funded graduate medical education residencies, any increase in U.S. medical school graduates will merely displace international medical school graduates in residency programs (75). As such, there may be minimal impact on the net primary care physician workforce.

Foreign-trained physicians play a noteworthy role in U.S. primary health care. International medical graduates (IMGs, which include both foreign and U.S. nationals who study abroad) finish medical school overseas and complete their residencies in the United States. Notably, one in four physicians in a residency program graduated from a foreign medical school and a large portion of IMGs remain in the United States after completing their training (159). Close to 25 percent of the primary care physician workforce are IMGs. And, while the proportion of IMG physicians practicing primary care has been declining, IMG physicians still practice in primary care at higher rates than U.S.-trained physicians (42 percent vs. 35 percent) (154).

Gender, race and ethnicity of physicians are correlated with different specialty choices. Women and members of some traditionally underrepresented minority groups are more likely than white males to practice in primary care (154, 113). They are also more likely to practice in underserved areas (100).

Though estimates vary and exact numbers are hard to secure, NPs and PAs together make up the remaining one-fourth of the primary care workforce in the United States (31). Both groups have grown in recent years and scopes of practice generally have expanded for these professions, allowing them to provide a more comprehensive set of primary health care services.

The growth in supply of nurse practitioners has outpaced population growth and the majority of NPs practice in primary care. GAO cites figures that place nurse practitioners (one of four groups classified under Advanced Practice Registered Nurses) as the fastest growing primary care practitioner group in recent years. Over the past two decades, the number of practicing NPs has increased overall and relative to the population. Over the six-year period ending in 2005, the NP profession grew an average of more than 9 percent per year relative to the population (163). An estimated 125,000 NPs practiced in the United States in 2008 (3). Primary care NPs make up the majority of the profession, with over 60 percent reporting their main clinical specialty to be family care (3).

Findings

As with other primary care practitioners, physician assistant growth has outpaced population growth in recent years. Between 1995 and 2007, the PA profession experienced an average annual percentage change per capita of nearly 4 percent (163). Relative to nurse practitioners, PAs are a smaller group, numbering close to 75,000 in 2009. Also in contrast to NPs, PAs are more likely to practice in specialty medical care settings, with only about 40 percent—or nearly 30,000—providing primary care in 2009 (6). While legal scopes of practice for PAs vary somewhat among the states, PAs always work under supervision of physicians; they do not practice autonomously.

Supply is not directly correlated with access to or quality of care. As discussed more fully below, geographic variability and maldistribution have been documented and can be used to demonstrate no correlation between workforce supply and access to or quality of care.

Workforce capacity and supply move in cycles. The total number of individuals working in a profession is affected both by capacity (those trained and authorized to provide services in question) and actual supply (qualified individuals who want to work). As high wait times or unfilled employment positions become apparent, educational programs expand to produce more graduates while legal scopes of practice may grant broader practice authority to some professions in underserved areas. At the same time, practice models shift to integrate new workers into care delivery, effectively expanding capacity. Health workforce supply is of a cyclical nature, responding to demographic and market changes in both short- and long-term periods. Efforts to increase capacity may coincide with economic trends producing higher than anticipated numbers of individuals wanting to work. As evidenced by the recent undersupply followed by oversupply of nurses (35), the result may be market gluts and new graduates suddenly facing an unanticipated lack of jobs.

Geographic Distribution

Separate from the issue of overall supply of primary care providers is the issue of geographic distribution of providers. Physician supply tends to be lower in rural and frontier areas than in urban and suburban areas. As discussed below, while supply cannot guarantee access to or quality of care, a threshold number of clinicians to provide health care to a given population is necessary, if elusive to calculate. It has long been known that health care providers, more so than the general population, tend to congregate and practice in urban and suburban areas (134, 73,127). In a recent study of primary care for children, Shipman (146) found "profound maldistribution of physician resources" despite the growth of general pediatrician and family physician workforces by 51 percent and 35 percent, respectively, between 1996 and 2006. The significant growth in the workforce did not occur in the areas where they are most needed, leaving many children in the United States without easy geographic access to medical care.

Physician supply is lower in communities with high proportions of minority and low-income residents with greater health needs, known as the "inverse care law" (75). Some rural and inner-city neighborhoods have had difficulty finding physicians to serve their communities and the gap continues to grow. Overall, between 1979 and 1999, the per capita supply of physicians increased by 51 percent, but regional differences grew. "For every physician who settled in a low-supply region, 4 physicians settled in regions with already high supply" (75).

Findings

To improve access to care, many states have passed practice acts for NPs that, compared with the rest of the state, are deliberately less restrictive in rural and frontier areas or in practice settings, such as community clinics, that see large proportions of otherwise underserved patients. In this way, nurse practitioners who are permitted to practice autonomously can expand access to care in underserved regions and communities. (Because PAs work under supervision of physicians, usually within the same physical practice, their geographic distribution tends to follow that of physicians.)

The longstanding challenge of securing providers in underserved areas has prompted various loan repayment and other incentive programs by states and the federal government. For example, the National Health Service Corps (NHSC) offers loan repayment to primary care practitioners (including physicians, nurse practitioners and physician assistants) ranging from $50,000 for two years of full-time service in an NHSC-approved site in a Health Professional Shortage Area to full payment of total debt for six or more years of service. States have similar loan repayment programs and many also may offer scholarships, direct financial incentives, and resident support programs. Research to date indicates that these programs are successful. For example, a study of 69 state programs found that, compared with non-obligated physicians, physicians who had obligated themselves through these programs practiced in demonstrably needier areas and cared for more at-risk patients, even after the obligation periods. Retention rates were strong, with half staying over eight years (122). A review of 45 studies regarding all types of financial incentives for return of service, including 34 from the United States, found that programs had placed substantial numbers of health workers in underserved areas and that program participants are more likely than non-participants to work in underserved areas (although none of the studies could fully rule out that the observed differences between participants and non-participants were due to selection effects) (26). Participation rates are high in the programs that are available, but there are relatively few programs and not enough slots overall to meet the significant need in underserved areas, and funding for such programs is often in jeopardy.

Analyses of regional supply variations find no relationship between workforce supply and access to or quality of care. For several decades, researchers at The Dartmouth Institute and elsewhere have documented significant variations in how health care is delivered in the United States (169, 168 162, 163, 52) and explored possible links to access and quality. Although at least one study has found that, compared with specialty care, "greater provision… of primary care does appear to offer health benefits to patients" (72), the 2010 Dartmouth Atlas report demonstrated that "neither a greater supply of primary care physicians in an area nor a regular visit to a primary care clinician is, by itself, a guarantee that a patient will get recommended care or experience better outcomes." Individuals and populations who need care may not be accessing or receiving any care, much less receiving high quality care, despite supply numbers. Regarding primary care specifically, data from a 2010 Dartmouth study suggested "no relationship between the supply of physicians and access to primary care [as defined by percent of Medicare beneficiaries who had at least one annual visit with a primary care physician]." On the other hand, supply can be associated with amount of care provided. For example, a 2007 report from the Dartmouth Atlas Project found that "[w]here there is greater capacity, more care [physician visits, hospitalizations, diagnostic testing] is delivered–whether or not it is warranted" (53). Even among geographic regions that share common attributes, ratios of clinicians to population vary (25, 48, 75, 24). One of the key challenges for researchers and policy-makers in coming years will be to make sense of these variations and develop policy solutions to address them.

Findings

What are the nation's primary care workforce needs and demands?

Calculating demand for health care services is challenging and various approaches can be taken. For example, population counts can be used to estimate numbers of individuals who would be likely to need regular primary care visits in the future. Alternatively, retrospective views can be used when, for instance, actual utilization rates can be collected from clinicians or payers. Surveys of patients and would-be patients have been undertaken to explore how long individuals wait between contacting and seeing a provider. In some cases, future demand projections are based on factoring population growth into assumptions that historical supply and demand were in equilibrium and should grow at a parallel pace to future increases in population. As with any effort to predict the future, none of these methods is perfect. Traditional approaches to evaluating the demand for primary care providers have multiple shortcomings: they tend to rely on historical ratios of providers-to-population working in increasingly rare practice models; they look at each profession in a siloed fashion; and they do not consider the impacts of technology or practice model changes on productivity. (See Appendix II for a more detailed discussion.) Demand modeling becomes even more complicated when workforce numbers are overlaid with other developments including new legislation, clinical care innovations and shifting disease patterns. Further, development of a formula that captures how a provider's hours of work are correlated with the provision of care is still a work in progress.

Growth in demand for care services will be driven over the next decade and a half by an overall growth in the size of the U.S. population of almost 20 percent, an aging population, the mandate of near universal insurance and growing use of technology. Demographic changes in the United States may strain the system as currently organized. For example, Colwill et al., assuming that practice patterns would remain essentially unchanged and that NP and PA numbers would remain proportionate to current physician supply, predicted that population growth and aging will increase family physicians' and general internists' workloads by 29 percent between 2005 and 2025 (46).

Perhaps more notably, any demand growth will be accompanied by a shift in the type of demand from acute care services to more chronic care responses as the disease patterns of the whole nation change as the population ages. Again, some aspects of efforts to meet increased demand and demand for different services can be found in recent literature on this topic, for example, calling for the transformation of primary care practices into team-based endeavors to increase patient capacity without sacrificing quality of care or adding more work to physicians (107).

When PPACA is fully implemented, some of the estimated 30+ million newly insured individuals may be trying to schedule appointments for care in the not-too-distant future. Based on one state's experience, this sudden demand increase on a relatively fixed workforce could result in delays in actually seeing a clinician. When Massachusetts passed its own state health care reform that expanded insurance coverage to its residents, experts hypothesized that the expansion would strain the primary care workforce to meet the new demand. Such a strain was indeed documented–wait times were reportedly longer–but appears to have been temporary and to have leveled off by year three (104). Whether Massachusetts' experience, given its low initial rate of uninsured residents relative to the national average, can be extrapolated to the rest of the United States is unclear.

Exact profiles and characteristics of individuals expected to become insured when PPACA is fully implemented are unknown and perspectives differ. On the one hand, for example, the Kaiser Commission on Medicaid and the Uninsured reports that, compared with insured

adults, uninsured adults are significantly less likely to have a usual source of care, more likely to postpone or avoid seeking care due to costs, and less likely to be able to afford prescription drugs. As a result, the uninsured are more likely to be hospitalized for avoidable conditions and less likely to receive preventive care. Uninsured cancer patients are diagnosed later and die earlier compared with those with insurance (97). An estimated 31 percent of uninsured working Americans has at least one of six chronic illnesses (cardiovascular disease, high cholesterol, hypertension, diabetes, asthma or cancer) (171). However, the authors noted that this rate was less than those with insurance (45 percent), though the difference narrows to 38 percent versus 44 percent after adjusting for sex, age, and race or ethnicity (171). In addition, other researchers have reported that uninsured individuals do not differ from the insured population in terms of many common health care needs. Relying on data from the Medical Expenditure Panel Survey, a report from the Urban Institute concluded that "on balance, [under the PPACA] new Medicaid enrollees, particularly after the initial start-up period, are not likely to be markedly different from the non-disabled currently on Medicaid since the new enrollees will be drawn from a population that is healthier than the adults currently covered by Medicaid" (88). Research into the care- and service-seeking behavior and preferences of different market segments in health care, particularly for those who are currently uninsured, is likely to expand in coming years. In addition to perhaps having different needs, members of the various groups may face different challenges finding providers and receiving care.

The geographic maldistribution of primary care providers discussed previously may be exacerbated by demand shifts under the PPACA. A research brief from the Center for Studying Health System Change found that there may not be sufficient capacity to meet increased demand for services by individuals newly covered in Medicaid plans. In particular, "States with the smallest number of PCPs per capita overall–generally in the South and Mountain West–potentially will see the largest percentage increases in Medicaid enrollment…. [while] states with the largest number of PCPs per capita–primarily in the Northeast–will see more modest increases in Medicaid enrollment" (51).

Some of the concerns over workloads, which affect access to care and wait times, are already being addressed and can be mitigated. Several reports and studies in the 1990s and early 2000s led to experiments to reduce unnecessary waiting that ranged from scheduling innovations (advanced access, open access, and same-day scheduling) to new delivery models such as retail clinics. MedPAC's 2010 report to the Congress clarified that most Medicare beneficiaries are now getting timely appointments and that only 6 percent of Medicare beneficiaries reported that they looked for a new primary care physician in 2009. Of those 6 percent who reported seeking a new primary care physician, 78 percent reported their search to be "no problem," 10 percent reported it a "small problem," and 12 percent reported it a "big problem" (110).

In theory, new technologies have the ability to redesign the role and improve the efficiency of primary care, but evidence of this value is limited so far. New technologies have been used mostly to carry out existing workflows and processes. As communications and information technologies improve and become more affordable, they are finding their way into more useful clinical practice demonstrations (17, 36). Their availability, in many different forms, creates the opportunity to see primary care less as a visit to a particular professional who possesses knowledge and skills that are provided to the patient in the exam room and more of a knowledge exchange that occurs continuously, asynchronously, and with a wider engagement of other professionals and consumers themselves in both decision-making and therapeutic follow-through (54, 141). These technologies include the electronic medical record, various forms of telemedicine, and consumer access to their own and other health care information.

These technologies and others to come will continue to disrupt the notion of where the best contact for care is located, how it is consumed, what needs to be paid for and when, and the role of the consumer in health care. While much of the attention today is focused on using these techniques to improve traditional practice, they have the possibility of becoming a powerful driver of change in primary care. Technology is moving care to a wider range of delivery locations and is increasingly making proximity between patient and provider less of an issue (126). These and other shifts in technology are placing tremendous pressure to move primary care out of the offices of the traditional providers as well as redefining who can and should play this role.

While health and labor economists continue to refine demand and forecast modeling, many of the efforts to calculate how many practitioners are needed have given way to explorations of how primary care will be structured and delivered in a new health care environment. At issue is whether we are asking the right question in focusing on physician–or even MD, NP and PA–supply and demand. The numerous authors–generally acknowledged leaders in this field–contributing to the May 2010 primary care issue of *Health Affairs* collectively paid more attention to new practice models, themes of delegation, teams of providers, and collaboration among practitioners than to workforce headcounts. As discussed below, many of these models are still being defined and tested; their implementation is not guaranteed, and the workforce implications are unknown. What remains to be seen is how these new models will be evaluated and how supply and demand modeling will evolve to be a meaningful tool in the changing environment.

What effect do payment policies and market forces have on primary care?

In health care, as in most markets, what is paid for is what gets addressed. In this regard there are several historical problems associated with the payment for primary care services and the expectations of the resulting outcomes.

There is a significant difference in compensation between primary care and specialty care providers. Citing a study by the Medical Group Management Association, researchers at the National Health Policy Forum point to median income (revenues minus practice expenditures) for family practice physicians of $158,000 in 2006 compared with $398,000 for cardiologists and $454,000 for orthopedic surgeons. They further note that "[specialists'] higher compensation… is due in part to the higher valuation of the services they provide and the greater opportunities that specialty practices have to manage the delivery of ancillary services…." (62). This problem has been evident for over four decades and heroic efforts have been made to address it at the national policy level through reforms of the Medicare Fee Schedule and the introduction of managed care policies.[1] Whether these efforts were sufficient or received appropriate updating over the years may be debated. In any event, the compensation gap continues and dramatically informs the career choice of physicians and the time available to primary care providers to address important patient care needs. (28, 29, 31).

Medicare's current resource-based relative value scale (RBRVS) was intended to reduce the disparities, but has not been very successful. Worth noting is that the imbalance in payment between primary and specialty care can be found both in large public programs and in private insurer practices because the private sector often follows Medicare policy (164, 70). Moreover,

1 For more about the impact of the Medicare payment methods on physicians' incomes, see MedPAC reports generally.

while both Medicaid and the private sector often rely on Medicare's "relative values," they may not use constant conversion factors across specialties, thus exaggerating the gap at times. And, while private insurers often follow Medicare, they do not always link their payment rates to Medicare rates. Private insurers' flexibility to innovate in terms of whom and how much they pay plays a significant role in whether this gap expands or closes. One of the ways the PPACA aims to promote primary care is through a direct, though temporary, increase in government-funded payments. For example, from 2011 through 2015, Medicare payments to certain primary care practitioners are 10 percent higher than before and Medicaid payments for primary care may be increased for two years starting in 2013.

Who can be recognized for contributing value to a patient's care and service needs also presents a problem when it comes to payment. Most third party payment today must be tied to some direct contact between the provider–a physician or nurse practitioner–and the patient. This means that all value must be exchanged in an exam room and alternatives such as follow-up calls by a medical assistant, home visits by a community health worker, or well baby visits by a nurse, which are often overseen by an MD or NP, but not attended by them, generally are not reimbursable. Some of these insurer payment limitations affect telemedicine consultations involving an otherwise reimbursable provider. The demonstration and testing of new payment models, including global and bundled payment schemes, and new ways for clinicians to remotely oversee the provision of services, may provide information about how to address some of the payment issues.

Whether and how proposed new financing models will affect the primary care workforce remain to be seen. A relatively new way to organize and finance care can be found in Accountable Care Organizations (ACOs), which have been piloted for only a few years. Under the PPACA, ACOs would be organizations of health care providers that agree to be accountable for the quality, cost and overall care of Medicare beneficiaries who are enrolled in the traditional fee-for-service programs assigned to them. ACOs would be eligible to receive a share of any savings if actual per capita expenditures are below their specified benchmark amount. While the concepts of the ACO and "shared savings" are outlined in the federal legislation, details of their definition and implementation are far from clear and may provide insufficient incentive for system change. As of late 2010, the National Committee for Quality Assurance had released draft accreditation standards and measures for ACOs (119) and as of April 2011, the Centers for Medicare and Medicaid Services (CMS) had just released proposed ACO regulations, which are subject to public comment and agency revision. Despite the fact that ACOs are not fully functioning under federal rules, several ACOs have been formed in anticipation of the CMS implementation. The integration and consolidation of providers, hospitals, and other health system entities will no doubt affect the workforce, but the details of how ACOs will actually operate and their impacts remain to be seen. In particular, while one of the primary goals of ACOs would be shared savings, concerns have been raised that consolidation itself, a key element of ACOs that could lead to savings and increased bargaining power, could result in higher prices.

Findings

What effects do state scope of practice laws have on primary care workforce supply and practice?

Although the country's primary care workforce comprises several professions, these professions are not treated evenly across the states. State laws regarding the practice authority of professionals affect the capacity to deliver primary care. Primary care physicians, like all physicians, have full practice authority under every state's medical practice act to diagnose and treat any health condition. Physician assistants and nurse practitioners, on the other hand, are restricted by scope of practice acts that vary by state. While practice acts for PAs do vary by state (136), the variation for NPs is dramatic (139, 41, 42). (For details on the variation, see Appendix IV.) Some states are more restrictive than others. For example, over a dozen states authorize NPs to practice to the full extent of their competence without physician supervision or collaboration. Some states authorize NPs to practice autonomously in all areas of their competence except prescriptive authority, when a physician must play some supervisory or collaborative role. A handful of states require physician supervision of NPs. Many states have laws that fall somewhere in between, requiring NPs to work in collaboration with physicians when prescribing, diagnosing and treating patients, although 'collaboration' is often vaguely or inconsistently defined (42, 38). And, as noted above, some states have practice acts that vary within the state, granting different levels of authority to NPs depending on where they practice. Analysts have long described the limitations on access to care that these laws have on patients in underserved areas within a given state as well as the inability of practitioners to practice in interstate border communities and to assist in other states experiencing health care emergencies. For the past several decades, the state-based legal scopes of practice for NPs have expanded, providing them with increased authority to practice more independently (i.e., with less physician supervision), prescribe, order diagnostic tests, and refer to other health care professionals (155). However, the changes have been incremental and wide variations still exist among the states (41, 42). The variation across states has been documented and addressed most recently by the Institute of Medicine, with a recommendation that state and federal actors work to adopt standard practice acts that better match the competence of NPs (93).

Studies regarding the impact of expanded scopes of practice for NPs and PAs on access have been limited, but positive (156). Meta-analyses and evidence reviews of numerous pilots, controlled studies and research projects have found the quality of primary care–across the field's range of services–delivered by NPs, including those practicing fully autonomously and without supervision, to be at least as high as that of physicians (120, 45). A large evidence review found that Advance Practice Nurses such as NPs working as members of interdisciplinary health care teams deliver quality health care comparable to physicians in a variety of settings while receiving high patient satisfaction ratings (45). With this progress dovetailing with expansion of scope of practice laws, policy discussions around NPs have focused less on a shortage within the profession and more on how NPs ameliorate perceived shortages of physicians, particularly by meeting primary care needs (120, 89, 49). Compared with care provided by physicians, care provided by NPs currently costs less. Notably, a 2009 RAND cost analysis commissioned by the Massachusetts Division of Health Care Finance and Policy found that more expansive legal scopes of practice for NPs and PAs (consistent with the current laws of other states) and corresponding payment policies could save the state between $4 billion and $8 billion over a 10-year period. The authors note that the lower-bound estimate might be the more realistic savings level should higher reimbursement rates be needed to entice NPs and PAs currently licensed, but not practicing, to enter the market (63).

Findings

What pressures are being exerted on the primary care workforce to evolve?

Various pressures are being applied to the primary care workforce to change. These pressures range from policy and market forces to technology and an aging and growing population. Much has been written about recent policy, especially the PPACA, which, if implemented, could nudge the nation's health care actors toward a system of care that is more inclusive, less costly, and achieves higher levels of clinical quality and consumer satisfaction, or could result in costly market consolidation and a significant number of people experiencing problems finding care. The eventual outcome is uncertain and depends on a number of factors ranging from political agreements to legal decisions to development of clinical, financial and data collection mechanisms. With or without the PPACA, market forces may expose many traditional practices and institutions to more–or less–competition and to consumers who are newly enfranchised with information, choices and exposure to the costs of care. These market and policy forces, together with emerging technology and changing population demographic characteristics, are putting pressure on primary care to be more accountable, more balanced with specialty care, redefined to focus on functions, and more diversified in delivery models.

All aspects of health care are expected to be more accountable than in the past and to demonstrate clinical and economic effectiveness as well as consumer satisfaction. Such a focus on demonstrations of performance outcomes, together with evolving population demographics and disease burdens, could drive delivery institutions to move their attention from being heavily centered on acute care to more effective prevention and management of chronic disease and disability. This shift would require examining the role of the primary care workforce and how diagnosis and treatment resources are deployed.

Policy and market forces are also pushing the health workforce towards a rebalancing of primary and specialty care. The PPACA has significant components to drive the health workforce toward more emphasis on primary care through training and payment modifications. Even without those mechanisms in place yet, compared with 2010, higher numbers of medical school students in 2011 chose residencies in primary care fields including family medicine, pediatrics and internal medicine, reversing trends of earlier years (43).

Further pressures from new information and communication technology, varied consumer preference, financial models that bundle payment for outcomes of care instead of specific processes, and the recognition of the complexity surrounding effective primary care, may move the definition of primary care away from an identification with a particular type of practitioner–family physician, internist, nurse practitioner or physician assistant–toward a definition that is made up of core functions such as prevention, therapy, emergent care, management of active disease state, integration of specialty care and end-of-life palliative care.

As consumer preferences and needs evolve, and as primary care becomes understood as a variety of functions, there will be increasing demand to diversify the models of care to match consumer expectations. One of the burdens of primary care has been the chore of fitting a single model–the solo or small group of clinicians providing care to individual patients in provider offices–to meet a great variety of needs and preferences. Alternatives to the traditional primary care delivery model have been explored in practices and policy conversations across the country. These models, all of which have impacts on the workforce, include patient-centered medical homes, convenient care clinics, community clinics and a new generation of technology-infused self-care at home.

Findings

Facing ongoing physician recruitment challenges, community health centers have long been leaders in recognizing the power of teams that also include NPs, PAs, medical assistants, community health workers, promotores and others. A recent study of Federally Qualified Health Centers in California found that over 20 percent of FQHCs reported PAs or NPs functioning as principal providers (meaning they managed the largest share of primary medical care encounters at those clinics) (27). Community health clinics are far from new; they have been the mainstay of primary care for much of the U.S. population for 40 years. They have been expanding over the past decade and are now receiving considerable attention as a model that may be what is needed in the current environment. In 2009, over 1,200 federally funded clinics served close to 20 million patients at 7,500 sites (117). Controlling for case mix and other factors, researchers have found that, compared with Medicaid patients treated in other settings, community health center Medicaid patients are significantly less likely to be hospitalized or to use the emergency room for acute and chronic conditions (64, 65). A body of research demonstrates that health centers are effective in improving access to care and controlling health care costs (61, 129, 150). Research has found that community health centers have reduced health care disparities based on race and income (145).

Medical Homes, which can trace their roots to efforts in the 1960s to improve pediatric practices for special populations, have evolved and expanded over the years to provide care for other groups, including persons with chronic illness. Definitions of the patient-centered medical home (PCMH) range broadly from, for example, "a clinical setting that serves as a central resource for a patient's ongoing medical care" (47) to lengthy legislative descriptions in the dozens of state bills introduced in 2009–2010 (2). Conceptually, PCMH models focus on strengthening primary care, incorporating health technology, testing modified payment schemes, and improving coordination of care. Two entities have developed guidelines for implementing medical homes: the National Committee for Quality Assurance and the Center for Medical Home Improvement (68). According to the Patient-Centered Primary Care Collaborative (PCPCC), 44 states have passed over 300 laws related to the medical home or have executive-level activity that references the PCMH.

Over 100 medical home demonstrations have been documented (66). Although medical home outcomes are generally positive, specific outcomes vary almost as widely as definitions and types of models. A short but strong list of eight large-scale implementations has been evaluated and the largely positive outcomes publicized (78). Results from the National Demonstration Project (NDP), launched in 2006 to test a particular PCMH model in 36 family practices, found that the model could be implemented in highly motivated or supported practices but that it was difficult to do so and outcomes were inconsistent. For example, adoption of the model was associated with improved access, and better prevention and chronic disease care scores, but patient ratings for health status, satisfaction, coordination of care, and global practice experience were lower (50). Critics also have raised questions about whether this model can meet the challenges it faces, including truly being something new and figuring out the critical design elements (99).

The past decade has seen a significant growth in the number and kind of new retail providers of primary care services. Retail clinics–where a limited list of primary care services is provided in a dedicated space within a larger retail setting–emerged in 2000 and have grown to over 1,000 sites in the United States. Also known as convenient care clinics and usually focused on emergent care needs, these clinics offer a restricted number of services. They are characterized by longer open hours, short wait times and posted prices. The clinical care at the vast majority of retail clinics is provided by NPs, who work under guideline-based protocols.

Findings

Research on quality outcomes at protocol-driven retail sites has been limited, but strong and positive (172,111). To date, few analyses have been completed on the intersection between two or more of the newer primary care models. However, at least one study has explored how retail clinics and medical homes might complement each other and where conflict might need to be addressed (128).

The growing diversity of primary care practice models calls for assessments and evaluations to determine what aspects can and should be fully integrated into the nation's health care system. Several common strengths among the models are relevant to the primary care workforce as it evolves.

All models rely on strong teamwork. This includes concepts of multiple members on each team, appropriate leadership and delegation (including to other providers and to patients themselves), collaboration, integration and hand-off. These teams help vary the array of services provided beyond those traditionally given by the primary care physician. For many clinicians, some of these concepts are new or still being developed. They will need to be incorporated into professional education and training programs, on-the-job training and orientation, continuing education and competence assessments for active clinicians, and continuous quality improvement efforts at primary care delivery sites and practices.

Innovative practice models incorporate meaningful use of technology, including telehealth. As the consuming public seeks more control over their health care, becomes better educated, has greater access to their medical records and is increasingly supported by a growing array of information and communication technologies, they have begun to take greater control of their health care. Information technology allows health care information to be more widely available and used by a wider variety of health care team members. It also allows greater and deeper access of information from and to consumers allowing them to be more actively engaged in their own primary care. These technologies will not be a universal answer for primary care, but as the market for primary care segments, they may fill a need for many. Significant federal investment in this arena will be made under the Health Information Technology for Economic and Clinical Health (HITECH) Act, enacted as part of the American Recovery and Reinvestment Act of 2009, and designed to promote the adoption and meaningful use of health information technology.

Innovative practice models are willing to redefine primary care. A question that is at the edge of some models is whether we should continue to include everything we have traditionally grouped under primary care. An option would be to distinguish, for example, among efforts to manage acute conditions like influenza, chronic conditions like diabetes, and prevention and wellness services. This development also allows greater clarity about the reality that no single model of primary care can be engineered to meet everyone's needs. Recognition of this high level of variability of needs across primary care consumers will allow more diverse delivery models to emerge and be financed. The recognition of a greater range of needs and even consumer desires will also allow new market entrants to organize themselves to speed the rate and variability of innovation.

Conclusions

The demand for primary care services will grow with the population as it expands and ages. The Patient Protection and Affordable Care Act will add to the demand for these services, at least temporarily, as the population approaches universal access to care. Primary care is not a static commodity. It is an evolving service provided by a range of health professionals–including physicians, nurse practitioners and physician assistants–and will be provided by teams composed of an even broader range of practitioners in the future. Several additional conclusions can be drawn from the literature on the primary care workforce including:

Data do not support the suggestion that the United States is currently experiencing or facing an imminent shortage of primary care providers; numbers of physicians, nurse practitioners and physician assistants have grown in recent years relative to the general population. Current workforce supply and demand modeling and analyses have been questioned by researchers and policy analysts because some of the studies are limited or flawed in some respect and conclusions are elusive. The short- and long-term impacts of expanded coverage as envisioned by the PPACA on the primary care workforce are unknown. This is not to say that concerns about workforce supply and capacity are invalid, that the United States has too many primary care providers, or that events are unlikely to unfold putting unanticipated pressures on the workforce to expand.

Many individuals in the United States—particularly those in rural, frontier or underserved communities—experience challenges to obtaining primary health care. Indeed, the maldistribution of primary care providers is a well-documented challenge for some regions and some populations, including children. In addition, some insured populations, such as those on Medicaid, face barriers to access that may grow when the PPACA is fully implemented. Some programs (e.g., National Health Service Corps) and policies (e.g., expanded scopes of practice for nurse practitioners) can help with the problem of geographic maldistribution.

There is no evidence to indicate a correlation between workforce supply and access to or quality of care. Workforce supply is associated with the amount of care provided, whether or not it is warranted. An adequate number of providers is necessary, but not sufficient, to provide access to high quality care. A key challenge to researchers and policymakers is how to better understand regional variations in care and health outcomes in order to develop policy solutions to address them.

Payment and reimbursement policies have shaped the way primary care is organized and delivered. It has long been the case that, for multiple reasons, primary care providers earn less than specialty care providers. This reality is among the reasons–coupled with high medical training debt for physicians in particular–why some practitioners choose specialty care careers.

Some state scope of practice laws may go beyond what is necessary to protect the public's health and safety and may keep practitioners from practicing at the top of their competence and from participating fully in newer primary care models. Research indicates the quality of care provided by NPs is comparable to that of physicians and new models of care provide an opportunity for NPs and MDs to collaborate in teams, but some state scope of practice laws limit the ability of NPs to fully serve in this capacity.

Conclusions

A number of primary care practice models that offer alternatives to traditional small office practices are both a response to the current pressures on primary care to reform and an impetus for additional change. While some of these models have been tested in a limited fashion, they are largely in flux at this point. They show promise because they are addressing the goals and challenges of ensuring access to high quality, safe and affordable care. Common themes of these models include strong integration of teamwork, smart use of technology, and a willingness to redefine primary care. All of these characteristics will put pressure on the current and future primary care workforce to evolve.

Policy Implications

Historically, analyses of workforce data have often led to decisions to expand educational programs, but the current situation may require a more nuanced approach to understanding the situation and crafting an appropriate approach. Rather than staffing the existing practice models of primary care, it seems likely that this juncture provides an opportunity for redesigning parts of how primary care is organized and delivered and for allowing the primary care needs to vary across age, geography, education, health status, and other key variables. Policy-makers have already begun to address the challenge of meeting the increasing and changing needs for primary care through policies adopted by the Patient Protection and Affordable Care Act. To continue to meet this challenge, policy-makers may want to consider the following:

An analysis or understanding of numbers of practitioners needed across professions and how to translate those numbers into educational capacity and production. This could be an important role for the National Workforce Commission established by the 2010 federal legislation. This commission could help determine rational policies regarding public subsidies of professional education and training, including tying interprofessional overlap of primary care to educational programs; addressing current inconsistencies between the professions; and exploring ambivalent policies regarding graduate medical education and international medical graduates.

A focus on the problem of geographic maldistribution of primary care providers. In particular, policy-makers could look more closely at replicating and expanding programs that work, such as the National Health Service Corps, and policies that have been shown to be effective, such as expanded scopes of practice for nurse practitioners.

Considering how services will be paid in reshaping the health delivery system to better meet patient needs. With the emphasis in the federal legislation on exploring new payment models, more attention is being placed on global or bundled payments and shared savings models. Although much work needs to be done to fully study these new models and implement the most promising, they may offer incentives to provide true team-based, patient-centered primary care in a financially sustainable manner.

Re-examining state scope of practice laws to help the delivery system better respond to increased and changing demand for primary care. A report from the Institute of Medicine recommends that states adopt practice acts for NPs that are consistent with the full extent of NP competence and in accord with a consensus model developed by multiple nursing organizations that would move toward standardization across the states (93). A national and interprofessional policy report recommends that legislatures can accommodate this demand by assuming the purpose of regulation–public protection–should have top priority in scope of practice decisions, rather than professional self-interest; changes in scope of practice are inherent in our current health care system; collaboration between health care providers should be the professional norm; overlap among professions is necessary; and practice acts should require licensees to demonstrate that they have the requisite training and competence to provide service (118). Legislatures can also meet the demand for better use of health care professionals by replicating waiver processes–in use by at least one state for several decades–that allow for deeper demonstrations of new care delivery models. Optimally, these waiver programs would insist on data-based reporting that collects information on safety, quality, cost and satisfaction (170).

Funding demonstrations of innovative delivery systems that include the data collection necessary to make meaningful comparisons of outcomes. Evidence-based comparisons of innovative delivery models and modes, such as telehealth, will allow policy-makers to target scarce resources.

Need for Additional Information

As noted throughout this synthesis, several issues and questions related to primary care workforce and practice have not been fully resolved. In particular, attention on the following areas of research could make significant contributions to the information and data on which policy-makers will make decisions:

- Workforce supply data that uses standard measures across professions and across states.
- Robust research on clinical and other outcomes measures associated with patient-centered medical homes, retail clinics and community clinics.
- Clarification and testing of accountable care organizations and other financing models that shift away from fee-for-service and more towards payments that support the key tenets of primary care.
- Studies of differences, if any, in health care demand and access profiles of previously uninsured populations.
- Development of workforce supply and demand models that are interprofessional and interdisciplinary in nature and designed to accommodate predictable aspects of the future in addition to historical trends.
- Research into the costs and benefits, including productivity, of using innovative technology as a mode to deliver primary care.

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Appendix II Supply and Demand Modeling

Model	Uses	Strengths	Weaknesses	Modifications and Alternatives
Physician Supply Model	Developed, maintained and used by Bureau of Health Professions. Also, the Council on Graduate Medical Education has relied on the PSM and the PRM to calculate estimated ratios of physicians (total; primary care physicians; specialty physicians) needed to care for the general population.	Comprehensive model relies on demographic data from American Medical Association and calculates numbers of physicians as well as FTE estimate of physicians by adjusting for estimated productivity.	Weaknesses of AMA Masterfile (see below) are incorporated. Includes only physicians (other primary care providers, such as NPs and PAs, not included).	—
Physician Requirements Model	*Same as above.*	A utilization-based approach relies on physician-to-population ratios, insurance distribution and population projections.	Includes only physicians. Grounded in current and past utilization rates, assuming that utilization patterns and ratios of physicians were appropriate at some point in the past and that delivery models do not change significantly over time.	Colwill (2008) used populations growth and aging to estimate increased workloads by generalist physicians in the future. They also adjusted supply of physicians by age and sex to reduce the overall supply, resulting in an estimated future deficit of adult care generalists. Alternative models include needs-based and benchmarking models, both of which have their own shortcomings. (46)
—	Calculating NP supply and demand	N/A	*Standard workforce supply and demand models have not been developed.*	Trends in NP educational program enrollments, graduation rates and practice patterns described in literature.
—	Calculating PA supply and demand	N/A	*Standard workforce supply and demand models have not been developed.*	Trends in PA educational program enrollments, graduation rates and practice patterns described in literature.
—	Calculating total primary care provider (MD, NP, PA) supply and demand	N/A	*Standard workforce supply and demand models have not been developed.*	U.S. GAO (163) report included numbers of physicians, physician assistants and nurse practitioners but did not attempt to estimate aggregate supply by FTE or demand. The GAO found two resources that offer projections of primary care provider supply and demand but these were limited to physicians. Another future primary care workforce study (47) assumed that NP and PA participation rates would remain proportionate to physician supply over the study's 20-year projections.

Appendix III Workforce Data Sources

Data Sets & Sources	Development and Uses	Strengths	Weaknesses	Modifications and Alternatives
American Medical Association (AMA) Masterfile	National surveys of MDs and DOs	Comprehensive, established (providing trend), strong infrastructure	Self-reported specialty practice; some inaccuracies for older, retiring physicians; some missing data such as race. Profession-specific; cannot be compared easily with data from other professions.	State licensing boards' data available but not standard across country; level of detail, timeliness, accuracy and availability vary by state. Association of American Medical Colleges (AAMC) data on medical students and residents are comprehensive regarding graduation rates and more; self-reporting specialty choices may be inaccurate in long term.
HRSA National Sample Survey of Registered Nurses	National sample survey of RNs. Sponsored by HRSA.	Large, long and objective survey provides detailed information. Well-established and decades worth of data available for trend analyses.	Sampling does not capture everyone (good response rate but sample is only portion of total nurses); delays between surveys (4 years); some loss of detail about APRNs (including NPs) because the survey is about all registered nurses. Profession-specific; cannot be compared easily with data from other professions.	Some state-level data (# of NP licensees) are collected by Linda Pearson from the licensing boards and published in the *American Journal for Nurse Practitioners.* Some raw data from state licensing boards available but not standard across country; level of detail, timeliness, accuracy and availability vary by state. Additional data is collected by professional associations; quality and accuracy vary.
American Academy of Physician Assistants (AAPA), Physician Assistant Masterfile	AAPA identifies new students and graduates from PA programs, acquires lists of people passing NCCPA certification, and acquires lists of PA licensees by states. Sample survey done of all PAs.	Comprehensive national database representing everyone eligible to practice as a PA	Profession-specific; cannot be compared easily with data from other professions. Not as strong for smaller area analyses. Response rate limited.	Some raw data from state licensing boards available but not standard across country; level of detail, timeliness, accuracy and availability vary by state.
—	Data regarding teams of practitioners or data on two or more professions independently (or interdependently) meeting a stated health need.			

Appendix IV Nurse Practitioner Scope of Practice Laws

	Oversight Requirements				Practice Authorities[2]			Prescriptive Authorities			
	No MD Involvement Required	MD Supervision Required	MD Collaboration Required	Written Practice Protocol Required	Explicit Authority to Diagnose	Explicit Authority to Order Tests	Explicit Authority to Refer	Authority to Prescribe w/o MD Involvement	Authority to Prescribe w/ MD Collaboration	Written Protocol Required to Prescribe[3]	Authority to Prescribe Controlled Substances
Alabama			x	x	x	x	x		x	x	
Alaska	x				x			x			x
Arizona	x				x	x	x	x			x
Arkansas			x		x	x			x	x	x
California			x	x					x	x	x
Colorado					x		x		x	x	x
Connecticut			x		x		x		x	x	x
Delaware			x		x	x	x		x		x
District of Columbia	x				x		x	x			x
Florida		x		x	x	x			x	x	
Georgia			x	x	x				x	x	x
Hawaii					x	x	x		x	x	x
Idaho	x				x		x	x			x
Illinois			x	x	x	x			x	x	x
Indiana			x		x	x	x		x	x	x
Iowa	x				x	x	x	x			x
Kansas					x		x		x	x	x
Kentucky					x	x	x		x	x	x
Louisiana			x	x	x		x		x	x	x
Maine	x				x	x	x	x			x
Maryland			x	x	x	x	x		x		x
Massachusetts		x	x	x	x				x	x	x
Michigan									x	x	x
Minnesota			x		x		x		x	x	x
Mississippi			x	x	x		x		x	x	x
Missouri			x	x	x				x	x	
Montana	x				x	x	x	x			x
Nebraska		x	x	x	x	x	x		x	x	x
Nevada			x	x	x		x		x	x	x
New Hampshire	x				x	x	x	x			x
New Jersey					x	x	x		x	x	x
New Mexico	x							x			x

Appendix IV Nurse Practitioner Scope of Practice Laws

	Oversight Requirements				Practice Authorities[2]			Prescriptive Authorities			
	No MD Involvement Required	MD Supervision Required	MD Collaboration Required	Written Practice Protocol Required	Explicit Authority to Diagnose	Explicit Authority to Order Tests	Explicit Authority to Refer	Authority to Prescribe w/o MD Involvement	Authority to Prescribe w/ MD Collaboration	Written Protocol Required to Prescribe[3]	Authority to Prescribe Controlled Substances
New York			x	x	x		x		x	x	x
North Carolina		x	x	x	x	x	x		x	x	x
North Dakota					x		x		x	x	x
Ohio			x	x			x		x		x
Oklahoma		x			x		x		x		x
Oregon	x				x	x	x	x			x
Pennsylvania		x	x		x				x	x	x
Rhode Island									x		x
South Carolina		x	x	x	x				x	x	x
South Dakota			x		x		x		x		x
Tennessee									x	x	x
Texas		x	x	x	x				x	x	x
Utah					x		x		x	x	x
Vermont			x	x	x		x		x	x	x
Virginia		x	x	x					x	x	x
Washington	x				x	x	x	x			x
West Virginia			x	x	x				x	x	x
Wisconsin		x			x	x	x		x	x	x
Wyoming			x	x	x				x	x	x
TOTALS	11	10	27	21	44	20	33	11	40	34	48

Source: Center for the Health Professions at the University of California, San Francisco, 2007 (42)

Notes:

1 References: 1) Linda Pearson, "The Pearson Report," *American Journal for Nurse Practitioners* (February 2007), *http://www.webnp.net/images/ajnp_feb07.pdf*; 2) Carolyn Buppert, *Nurse Practitioner's Business Practice and Legal Guide* (Third Edition; Jones and Bartlett 2008); "Joint Regulation of Advanced Nursing Practice," U.S. Federal Trade Commission (2007), *http://www.ftc.gov/os/comments/healthcarecomments2/carsondoc1.pdf*. Data updated by UCSF Center for the Health Professions in September 2007. For complete statutory references and citations for updates, including detailed variation by state, see full chart at *http://futurehealth.ucsf.edu/Public/Publications-and-Resources/Content.aspx?topic=Overview_of_Nurse_Practitioner_Scopes_of_Practice_in_the_United_States*.

2 **Important:** The Chart is designed to be referenced from left to right. Thus, if the Chart indicates that physician supervision or collaboration is required, then NPs may not diagnose, order tests or refer patients without physician supervision or collaboration.

3 Absent explicit statutory or regulatory language requiring a separate written agreement, the Chart does not indicate that a written prescriptive protocol is required in states that already require NPs to establish written practice protocols with physicians. See, for example, Maryland, Massachusetts and Ohio.

Notes

Notes

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RESEARCH SYNTHESIS REPORT NO. 22
JULY 2011

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