



Challenges of Forecasting Physician Workforce Needs Amid Delivery System Transformation

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OVERVIEW — As population growth and the aging of the overall population increase demand for health care, policymakers and analysts grapple with whether sufficient health care providers, particularly physicians, will be available to meet that demand. Some argue there are too few physicians already; others say our current supply-demand problems lie with efficiency. But suppose both are correct? Perhaps the real challenge is to understand how the provision of health care services is changing in response to market forces such as payment changes, patients' expectations, provider distributions, and technology innovations. This issue brief revisits what is known about evolving practice organizations, professional mixes, information technology support, and the implications of these and other factors for physician workforce policies.

The 2014 report by the Institute of Medicine (IOM), *Graduate Medical Education That Meets the Nation's Health Needs*, shone the spotlight on a longstanding debate about the adequacy of the current and future health care workforce.¹ Although the IOM recommended no immediate overhaul of the systems that educate physicians, it did underscore the uncertainty about the future numbers and types of physicians that are needed.

The IOM argued that projections based on historical physician-to-population ratios that don't reflect changes (some potential and some already under way) in how care is organized, delivered, and paid for may inflate estimated need. Redesign of care delivery, expanded roles for nurse practitioners (NPs) and physician assistants (PAs), and innovative uses of information technology "may ultimately lessen the demand for physicians despite the added pressure of the aging population and coverage expansions."²

Under the threat of unsustainable spending growth, providers, payers, and policymakers have intensified efforts to conserve resources and organize care more coherently, as integrated delivery organizations seem to do. Payers and providers have increased experimentation with organizational models like the patient-centered medical home and the accountable care organization. The Patient Protection and Affordable Care Act of 2010 (ACA) encouraged use of these models in Medicare, while the American Recovery and Reinvestment Act of 2009 provided generous subsidies for the adoption of health information technology to facilitate increased workforce productivity in the health sector.

But the transformed care delivery of which the IOM writes still faces many obstacles, and the process of change itself is likely to entail far-reaching and multi-dimensional efforts and outcomes that cannot be foreseen with any certainty—including future workforce needs. This issue brief reviews some of the history of physician workforce projections and the difficulties of making such projections in an environment where multiple factors affect how much care is demanded, and how those demands can be met. It also describes some of the factors that could affect future workforce needs, though their ultimate importance and precise effects remain unknown. Given the years of training required to produce a health professional, this uncertainty becomes particularly problematic

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as today's workforce policies will strongly affect the numbers and mix of professionals available to be deployed in the future.

THE UPS AND DOWNS OF WORKFORCE PROJECTIONS

A little over 20 years ago, leaders in the field of medical education predicted a looming surplus of physicians and recommended that federal subsidies for graduate medical education (GME), funded through Medicare, should be trimmed. Their projections were based on the assumption that the tightly managed care model that was gaining traction in the mid-1990s would soon become the norm for how health care was organized and delivered. Managed care took many forms, but it was generally thought that systems would emulate health maintenance organizations like Kaiser Permanente that used a different model of care by employing fewer expensive specialists than had been typical in the overall health system and coordinating services carefully among different practitioners.

Acting on the 1994 recommendation of the Council on Graduate Medical Education (COGME), Congress capped Medicare-subsidized residencies in 1997 as part of the Balanced Budget Act (BBA). No sooner had the cap been established than a backlash against managed care ensued, and spending and service use accelerated. Within a few years, workforce projections by COGME and others swung from an expected surplus to a likely shortage. Shortages have been the dominant story for many years, though the magnitude predicted has fluctuated. For example, the Association of American Medical Colleges (AAMC) in 2012 estimated a need for 45,000 additional primary care physicians and 46,000 surgeons and medical specialists by 2020.³ However, new modeling approaches used by some analysts have tempered the size of the forecasted gaps.

In 2013 the Health Resources and Services Administration (HRSA), the public agency responsible for tracking workforce needs, released a study with new projections of the supply of and demand for primary care practitioners. The baseline scenario for these projections assumes no change in practice patterns from current norms and takes population growth and aging into consideration. It assumes that all states will expand Medicaid as envisioned in the ACA (and therefore overestimates future demand, the authors note). Like earlier projections, HRSA's baseline scenario found that demand will outstrip supply, leading to a smaller projected shortage of about 20,400 full-time equivalent (FTE) primary care physicians in 2020.

Projections of physician shortages have been the dominant story for many years, though the magnitude predicted has fluctuated.

HRSA analysts also modeled alternative scenarios involving more delegation of responsibilities to NPs and PAs and incorporating the rapid growth in the supply of primary care NPs and PAs that has been recently observed. In contrast to an 8 percent increase in primary care physicians from 2010 to 2020, NP supply is expected to grow by 30 percent from 55,400 to 72,100. The number of PAs will grow even faster over the same period, a 58 percent increase from 27,700 to 43,900. Assuming “full deployment” of NPs and PAs, the projected shortage of primary care physicians shrinks to 6,400. Even with this substitution of NPs and PAs, physicians would still provide 72 percent of primary care services in 2020.⁴

A more recent study for the AAMC also considered changes in the delivery system and other factors. It warned of a shortage of 12,500 to 31,100 primary care physicians,⁵ offering a range rather than a single estimate, reflecting some of the uncertainty about future changes. A third estimate coming from the University of North Carolina’s Cecil G. Sheps Center for Health Services Research deemed the projected physician supply adequate, but indicated there would be a geographic misdistribution with both shortages and surpluses in different areas.⁶

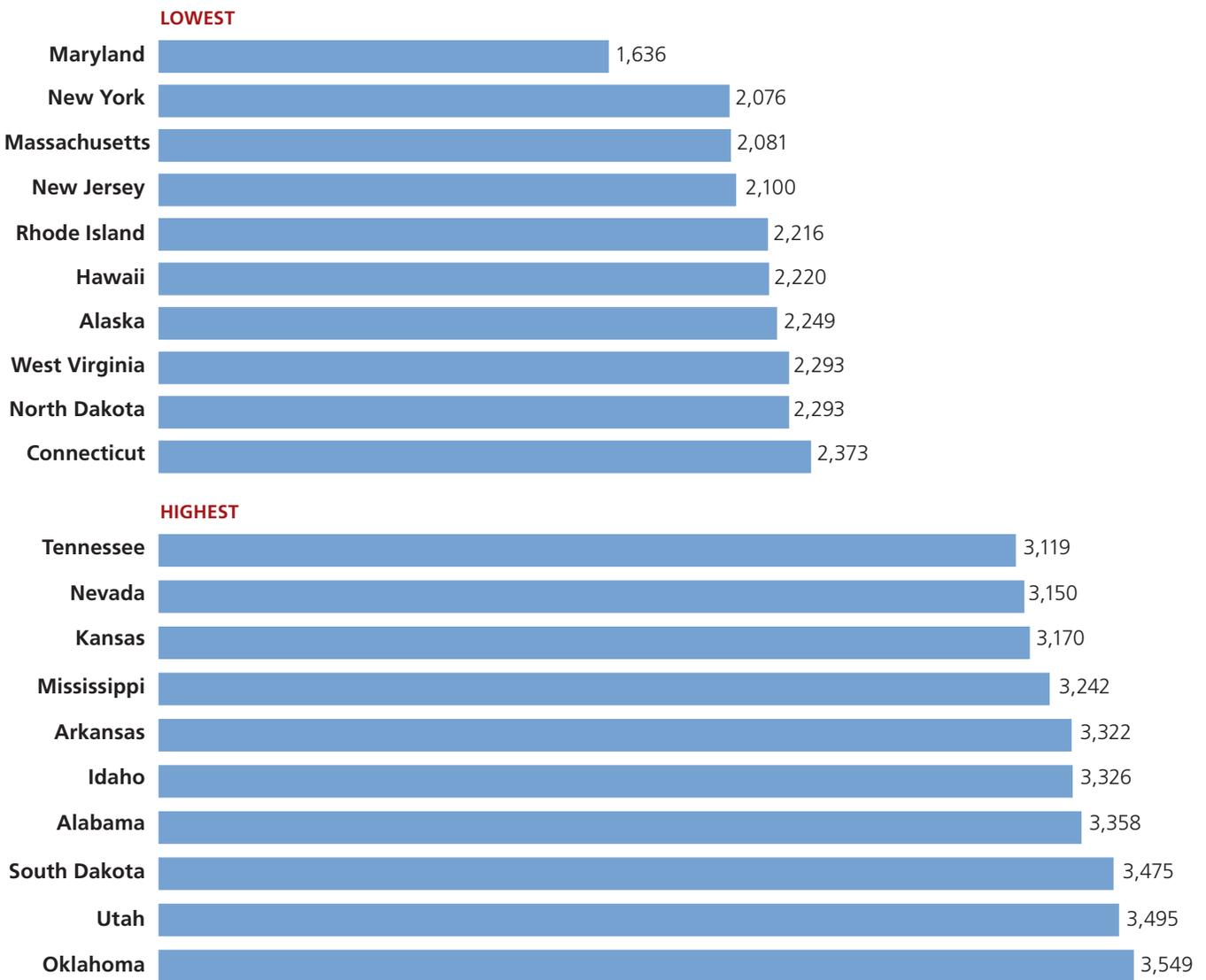
There are both fewer analyses of and more uncertainty about the adequacy of the future supply of non-primary care specialists and subspecialists. In a more limited analysis in 2014, HRSA looked only at the projected supply—not demand or need—for these practitioners. The supply of *non-primary* care physicians is expected to grow by 21 percent from 2010 to 2025, although the rate varies by specialty. Declines are forecast in the per-capita supply of physicians in cardiology, psychiatry, and general surgery; growth is projected in pediatric subspecialties and in obstetrics and gynecology. As with primary care, rapid increases of 140 percent and 108 percent, respectively, are predicted in specialty NPs and PAs from 2010 to 2025.⁷ How much this growth of specialty NPs and PAs adds to the capacity to deliver specialty medical services is unknown. The AAMC-sponsored study reports a shortage of 28,200 to 63,700 specialists by 2025, the larger range showing even more uncertainty than the projections for primary care.

Productivity

While numbers of physicians are critical determinants of the supply of services, those numbers alone may not reliably predict the availability of care. Data from the UNC Sheps Center indicate wide differences in the number of visits per physician being delivered annually across states.

Physicians in Oklahoma provided 3,549 visits on average versus only 1,636 visits per physician in Maryland (FIGURE 1). What these productivity differences imply regarding the provision of services other than visits is not known. In addition, what accounts for these two-fold differences is not clear.

FIGURE 1: States with the Ten Lowest and Ten Highest Number of Visits Per Doctor, 2011



Source: Author's calculations based on Sheps Center data, <https://www2.shepscenter.unc.edu/workforce/index.php>.

While it is accurate to label them as productivity, more or fewer visits per physician do not mean physicians are working more or less hard. Multiple factors may be involved. Some of the differences may relate simply to the variation in physicians per capita across states. When there are fewer physicians, they provide more visits to meet more of the population's needs. Some of the differences may also relate to the demographic composition of states' physician workforces. Age and gender differences in hours worked have been noted frequently. At the same time, variation in visits may imply something about the comprehensiveness of care. It may also reflect differences in how practices are organized. Physicians working in groups are estimated to be able to serve 12 percent more patients than doctors in solo practice.⁸

One question relevant to workforce projections is whether high-performance integrated delivery systems will leverage even greater productivity from a leaner physician workforce with the help of larger NP and PA cohorts. It is also unknown what the prevalence of such systems will be in the future.

Need and Demand

Along with the supply of providers, a full appraisal of workforce adequacy also requires an accounting of future levels of need and demand for services. Ideally, the provision of health care services—and the corresponding workforce needed to supply those services—should correlate closely with a population's health care needs. Unfortunately, a reliable benchmark for those needs is not easily identifiable. In the real world, moreover, the use of health care services reflects demand for care which does not always match with needs. Socioeconomic factors such as income and education affect how aggressively consumers seek health services. The extent of health insurance coverage is another factor. To some degree, these differences reflect relative social advantage and disadvantage, and may correspond to excesses and deprivations. But they may also be attributable to more or less efficiency or wastefulness in local and regional health system organization, as well as variable market, demographic, and public policy environments.

The absence of precise indicators of overuse and underuse of health care services makes determinations of current and future workforce adequacy an elusive target. The notion of overuse in particular may depend on subjective standards.⁹ In any case, a higher priority may be identifying

patterns of underuse and provider shortages that have adverse effects on population health.

OPTIMIZING THE WORKFORCE

Increasingly, policy experts suggest that discussions of the adequacy of the physician or other health professional workforce in isolation are focused on the wrong questions. Rather than asking how many professionals of x, y, z type will be needed, some say the focus should be on how skill mixes could be configured to meet needs in different geographic areas and practice settings. Rather than defining the issue as a surplus or shortage of primary care physicians, discussions should focus on reducing the mismatch between the demand for primary care services and the capacity to supply them. And rather than worrying so much about the pipeline of new clinicians, equal or more attention should be paid to making better use of the 18 million workers already employed in health care.¹⁰

Thomas Bodenheimer and Mark Smith argue, for example, that righting the demand-capacity mismatch could involve looking beyond substitution within clinician roles (physicians, NPs, PAs) to include nonclinician licensed practitioners, nonlicensed personnel, patients, and technology. The authors argue a host of nonclinicians are significantly underused, and a team drawn from social workers, physical and occupational therapists, health educators, medical assistants, front desk staff, health coaches, patient navigators, and lay educators, along with nurses, pharmacists, and psychologists, could competently take on many of the tasks currently performed by physicians. Specific aspects of care where these personnel could augment clinician capacity include clinical preventive services, chronic care, and routine acute care episodes such as diagnosis and treatment of upper respiratory and urinary tract infections. Substitution examples include nurses performing pap smears, pharmacists coaching patients on behavior change and medication adherence, and nurses treating uncomplicated urinary tract infections. Medical assistants are also taking on clinical tasks such as immunizations and blood draws, acting as health coaches, conducting home visits, managing population health, working with electronic health records, managing registries, and acting as scribes.¹¹ In total, Bodenheimer and Smith estimate that primary care teams could save clinicians as much as 24 percent of the time they spend on such tasks.¹²

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Many believe that physicians are trained to do everything, but the reality is that the intensity and duration of their training for individual procedures is finite. Other professionals may be similarly trained in these procedures and fully capable of performing them independently or under supervision, depending on whether a patient's condition requires broader medical knowledge.

Identifying procedures once deemed the sole province of physicians that other appropriately trained professionals can perform safely and competently has multiple precedents in the history of medicine. At one point, procedures like taking a throat swab to test for strep or venipuncture were regarded as physician-only services. That has changed dramatically, and now there is general acceptance of others being capable of being trained and performing these procedures adequately.

The potential for substitution extends beyond what may be regarded as primary care to the realm of specialty services, evidenced both by the realities of what is already occurring and what has been discussed. Certified Registered Nurse Anesthetists, working in collaboration with anesthesiologists, administer approximately 32 million anesthetics per year.¹³ Perioperative nurses numbering over 160,000 can substitute for physicians acting as first assistants at surgery and increase the productivity of surgeons by performing parts of procedures as well as delivering some pre- and post-op care. NPs and PAs also independently deliver and bill for specialty services. NPs and PAs billed Medicare for more than 4 million physician services (excluding evaluation and management services, laboratory, and pathology) in 2012, more than half of which were in the area of dermatology.¹⁴

An increased role for NPs and PAs in colonoscopy and other endoscopic procedures has been discussed to improve perceived access problems for colon cancer screening.¹⁵ Studies of nurse practitioner-administered screening colonoscopies have found no differences in safety, accuracy, or satisfaction compared with physician-administered colonoscopies.¹⁶

DELIVERY SYSTEM CHANGES THAT COULD AFFECT PROJECTIONS

Even if researchers ask the right questions and use the best models available, the future is by definition unpredictable and may not replicate the present. Hence benchmarks based on current experience provide a shaky foundation on which to build future projections.¹⁷ While the

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unsustainability of health care spending seems to suggest that change is inevitable, the nature and magnitude of that change is highly uncertain. The U.S. Department of Health and Human Services has announced its intent to shift 90 percent of traditional Medicare payments to alternative payment models by 2018. Private payers are engaged in many similar efforts. How these payment changes and other factors will ultimately affect care delivery remains to be seen, but there are three areas where some change is already apparent: consolidation of providers into more organized systems of care, use of technology to augment or substitute for professional time, and greater patient involvement in their own care.

Organized Systems of Care

In response to the ACA and private payer initiatives, many providers are experimenting with patient-centered medical homes, accountable care organizations, and other innovations that prioritize team-based care in which some services ordinarily performed by physicians are delegated to others. Although many of these initiatives are still nascent, established integrated delivery systems with a history of using care teams and coordinated patient management can provide some evidence of the potential implications of practice change for the workforce.

In moving from encounter-based to patient-centered population care, Geisinger Health System in Danville, Pennsylvania, has been able to increase the number of patients in a physician's panel from 2,000 to 2,500, and it believes that a panel of 5,000 might be possible in the future. In redesigning its care process, Geisinger focused on eliminating care steps that did not add value, automating any steps in the care process that could be managed electronically and would accelerate other team members' work, delegating work to appropriately trained non-physician staff where possible, eliminating variation through the use of technology, and activating and engaging patients and their families. The old encounter-based approach relied heavily on physicians and medical assistants; the new care model employs a broader array of non-physician providers who in turn allow physicians to see more patients and spend time on those aspects of care that require their level of expertise.

Technology Use

Technology of various types has the potential to affect health care professionals' productivity as well as the demand for their services.

Telemedicine, for example, has long been seen as a means of enhancing access to care for persons living in sparsely populated areas but today is also being deployed in more urban environments. Here the impetus is related to both convenience for patients and potentially increased productivity for clinicians. Traditional health systems and technology companies are offering various options. Kaiser Permanente, for example, has offered virtual physician visits either in centers with assistance from nurses or clinical assistants, or from home via smartphones or other video connections.¹⁸ Kaiser physicians were able to provide 6 virtual visits per hour versus 1.6 traditional face-to-face visits, though some of the difference in productivity was attributed to the lower acuity of need among virtual patients. Stand-alone services such as Teledoc and HealthTap allow patients to consult with physicians from their homes via a telephone or video link.¹⁹ Typical diagnoses reviewed by these virtual doctors include acute respiratory conditions, urinary tract infections, and skin problems. Walk-in kiosks, such as those piloted by the Mayo Clinic in several of its Minnesota facilities and in schools in Austin, Minnesota, provide a quick and relatively inexpensive way for Mayo staff and students to access medical care. The kiosks come with a 32-inch video monitor and devices to take vital signs.

Information technology also has the potential to substitute for some visits. An early study showed that Kaiser Permanente's implementation of a comprehensive electronic health record (EHR) system in Hawaii resulted in a 25 percent reduction in office visits from 2004 to 2007.²⁰ But such reductions don't always occur: an analysis of diabetic patients in Kaiser Permanente's northern California region from 2004 to 2009 found no reduction in office visits following implementation of the EHR.²¹

The evidence on the net effect of virtual visits and the availability of EHRs—whether visits foregone and reductions in clinician time that boost productivity offset or outweigh an expanded total number of visits—is mixed at this point. It stands to reason that, as more patients substitute virtual for in-office visits, they may become more receptive to routine visits with non-physician clinicians such as NPs. The effects of technology use are likely to become clearer as it becomes more prevalent.

Patient Self-Management of Care

Patient self-care could also affect demand for services provided by clinicians. Some diagnostic tests can already be done at home, and many patients manage chronic diseases through the use of monitors that allow

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them to titrate their medications. Peer coaching around specific chronic diseases could also augment primary care capacity.

Mobile phone apps can also help patients manage chronic conditions, especially diabetes and asthma. The universality, convenience, and low cost of smart phones has the potential to extend self-management support, particularly to disadvantaged populations whose access to face-to-face encounters may be limited by exigent circumstances or provider availability issues. Currently, clinical apps are used primarily by health plans and large care organizations “with an interest in improving outcomes and controlling costs,” and thus not dependent on public-sector resources to grow. Technical challenges remain: For providers using these apps, it is not clear how data flows into patients’ records for review. And providers in smaller groups or settings generally are not embracing use of these apps.²²

LOOKING AHEAD

Workforce policy discussions have been dominated in recent years by predictions of a dire physician shortage, especially in primary care, and calls from medical educators to increase federal funding for the training of new physicians. In the face of the history of health care expenditure growth and current budget pressures, however, a strategy of substantially increasing the supply of physicians could be problematic.

The extent to which primary care responsibilities can or will be delegated to non-physicians remains to be seen, as parts of the medical profession continue to resist scope-of-practice expansions. Nineteen states and the District of Columbia allow nurse practitioners to evaluate and diagnose patients, order and interpret diagnostic tests, prescribe medications, and manage treatment under the authority of state boards of nursing. But 29 others limit NPs’ practice to some degree and require supervisory arrangements.²³ Licensing and scope of practice regulation serve a fundamental public purpose—providing assurance that care will meet minimum standards for quality and safety. Yet regulation can be used to protect economic interest by limiting competition. Finding the sweet spot that promotes efficiency while assuring quality and safety will be key to the sustainability of health care spending.

At the intersection of markets and public policy, the new state insurance marketplaces created by the ACA could influence the evolution of workforce deployments. Although consumers show a preference to stick

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with a health plan from year to year once they have enrolled in it, plans' interest in maintaining or growing market shares will likely create some pressure to keep premiums competitive. That would translate to pressure on plans to keep costs down and potentially increase the demand for NPs and PAs and delivery organizations that use them effectively. In addition, network adequacy rules for exchange plans may increase the transparency of workforce distribution and create pressure to deploy more clinical assets to shortage areas.

Rapid change defines the current environment of health care: policy, clinical practice, payment, insurance coverage, delivery system organization, technology deployment, and workforce composition. All of these components affect the balance of supply and demand, and all vary widely across markets and geographic areas. The extended lead time required to train professionals of different types means that today's decisions will greatly affect the available future workforce. Meeting workforce needs requires a capacity to recognize specific circumstances and their implications—and respond to them. The challenge facing policymakers is that postponing decisions because of uncertainty about the future need is not an option.

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