

Weighing the Evidence for Expanding Physician Supply

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For 2 decades, health planners have forecasted impending physician surpluses, and policy decisions related to medical schools and residency programs have been based on such expectations. However, these much-heralded surpluses never materialized, and a growing body of data and opinion now point in the other direction. The question at the forefront is whether the United States is instead headed for a physician shortage. What is the evidence? This paper reviews the trends that link economic growth to health care spending and to the demand for physicians. It assesses the current environment by examining trends in the characteristics of clinical practice, signals from the medical market, and recent ex-

periences of physician shortages in other English-speaking countries; it also discusses why past forecasting approaches may have failed. Taken together, this body of information indicates that physician shortages are emerging and that they will probably worsen over the next 2 decades. By 2020 or 2025, the deficit could be as great as 200 000 physicians—20% of the needed workforce. If remedies are to be found, the nature of the problem must be appreciated, and a consensus to solve it must be reached.

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Over the past several years, long-standing concerns about impending physician surpluses (1–8) have been supplanted by growing perceptions of physician shortages (9–12). Skeptics have injected caution (13–16); however, both the American Medical Association (AMA) (17) and the Association of American Medical Colleges (AAMC) (18) have taken the position that the previously feared surpluses are unlikely, and the Council on Graduate Medical Education (COGME) has reversed its policy entirely, declaring that shortages are the issue (12).

The speed with which concern has shifted from potential surpluses to potential shortages has taken many by surprise, leaving key organizations ill prepared. Indeed, many that could foster the development of solutions today called for reductions in the output of physicians during the 1990s and have yet to reconsider the matter (19). Their current inertia can be attributed, at least in part, to a view that since so much credence was given to the notion of too many physicians, what confidence can there be in the notion that there will be too few? However, if the United States is at the cusp of deepening shortages of physicians, the evidence supporting it must be examined and the magnitude of the problem must be defined so that physicians, policy leaders, and the public can make the necessary judgments.

ECONOMIC EVIDENCE OF EVOLVING PHYSICIAN SHORTAGES

The planning model that my colleagues and I have used to assess the adequacy of physician supply is based principally on long-term economic and demographic trends (9, 20). It links the demand for health care services to growth of the economy and ties the necessary size of the physician workforce to the overall dimensions of the health care system. This approach differs from the micro-quantitative “task-and-time” methods that were used by COGME and the Bureau of Health Professions (BHP) (5–8) and by their predecessor, the Graduate Education

National Advisory Committee (GMENAC) (2, 3, 21). These latter models also applied a standard of appropriateness to their measures of demand, thereby forecasting “what ought to be,” whereas ours examines historic trends and projects “what is likely to be.”

The Economic Cascade

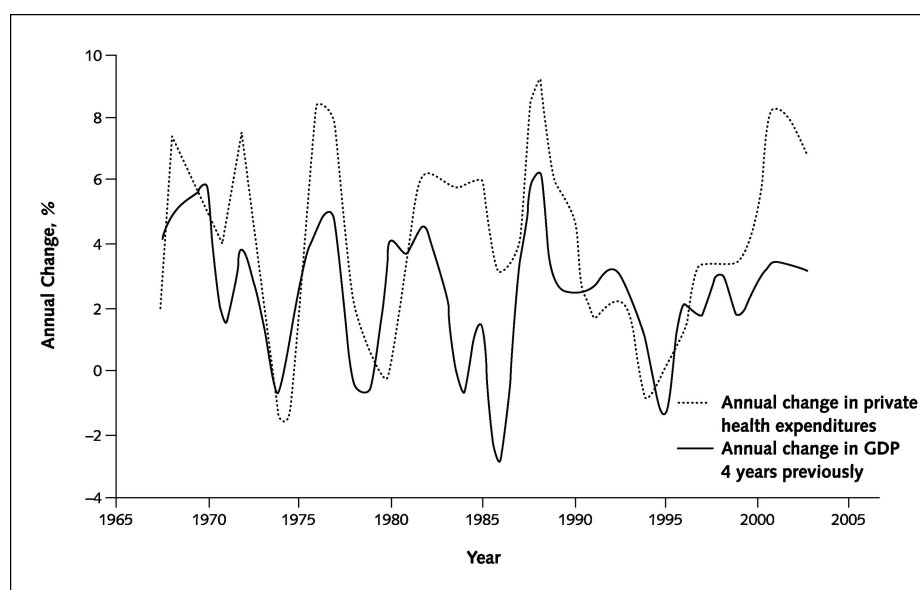
Economic expansion, usually expressed in terms of gross domestic produce (GDP) or per capita income, is central to the nation’s capacity for additional health care services. Over the past 40 years, systematic relationships have been observed between the rate of economic expansion and the growth of health care services in the United States and other developed countries (22–26). However, in each case, health care spending has grown more rapidly than the economy overall. Such disproportionate growth is not unique to health care. It is also seen in areas such as leisure and electronics, while spending on food, clothing, and household equipment has grown more slowly or even declined. On average, for each 1% increase in GDP, health care spending has increased approximately 1.5%. Most of this increase is reflected in health care labor, primarily nurses, technicians, and other support personnel, while the physician component has grown more slowly. In general terms, these interrelations can be represented as follows (20, 22):

GDP ↑ 1.0% → Health care spending ↑ 1.5% →
Health care labor force ↑ 1.2% →
Physician supply ↑ 0.75%

Lags

An important feature of the cascade that links GDP to the demand for physicians is the existence of temporal lags (20, 23, 24), which, if not appreciated, can obscure the underlying relationships (27, 28) (Figure 1). On average, changes in health care spending lag behind changes in the overall economy by 3 to 5 years (20, 22, 28). Health care employment parallels spending, but physician supply lags still further, a manifestation of the delays that are inherent in enlarging medical school capacity, expanding residency

Figure 1. Annual percentage changes in private health expenditures and in gross domestic product (GDP) 4 years previously.



Data on changes in GDP are from the Bureau of Economic Analysis (29). Data on changes in private health expenditures are from Altman and Levitt (27) and Strunk and Ginsberg (30, 31). This analysis was previously described by Cooper and Getzen (28).

programs, or modifying policies related to international medical graduates.

Cross-Sectional Analyses

Correlations between economic growth and health care utilization exist not only longitudinally over time. They can also be observed among large geopolitical units at single points in time. For example, among states, per capita income correlates with both physician supply and health care spending. In fact, economic differences account for more than 80% of the observed differences in physician supply (20). Similarly, in comparisons among developed countries, 90% of the observed differences in health care spending can be explained by differences in GDP (20, 26).

Causality

Because economic expansion precedes the growth in health care expenditures, which, in turn, precedes changes in physician supply (20), the link between economic growth and health care utilization has sometimes been interpreted as “causal” (13, 14). However, rather than being causal, economic expansion is “permissive.” It does not induce health care spending but determines the ceiling above which expenditures cannot comfortably grow. Health care utilization is pushed to this ceiling by a combination of the unmet desires of patients and the growing range of services that patients could receive. As spending approaches the ceiling, social and political forces of constraint engage. The resulting dynamic tension between these opposing forces ensures that health care services will rarely decrease below the level that the economy can sustain, nor will they increase above for very long. This phenomenon is so dominant and so durable that, for planning

purposes, it can be viewed as the organizing principle around which the demand for physicians evolves.

The Pressure To Do More

Many forces contribute to an upward pressure on health care spending. One is technology. Heavy investment by both the National Institutes of Health and the private sector ensures the continued development of technology, and public support welcomes its products. But new technologies are not used just because they exist. A process of sifting and debate ensues in which technology is purchased to the extent that funds are available. This is probably the most visible example of how our society struggles to determine what it can spend.

A similar logic applies to aging. While growth of the elderly population has little effect on total health care expenditures in the United States or in other developed countries (32, 33), the elderly are strong advocates for health care and major recipients of it. Advocacy groups also exist on behalf of patients with breast cancer, diabetes, Alzheimer disease, and other disorders, as well as for children and the uninsured; in each case, society struggles for balance.

Another dynamic that fuels increases in the volume of beneficial services is the relentless effort to reduce health care expenditures by lowering price. While spending can also be controlled by decreasing the volume of service, price is the preferred strategy. Managed care sought to do both, but while providers recoiled at price constraints, it was volume constraints that antagonized the public, so price remains the target. Yet the potential for lower prices to decrease expenditures confronts consumer demand, and,

in a zero-sum game in which price and volume of service are reciprocal and latent demand is substantial, decreasing price simply maximizes the opportunity to increase services, albeit at a lower price per unit of service. Reducing administrative costs could be expected to have a similar result, as unproductive expenditures are recycled into patient care. In both cases, the consequence is continued upward pressure on the demand for physician services.

Prevention, too, causes upward pressure. While some preventive measures reduce the need for services, many simply delay the onset of disease, and most entail added medical care. Even when real prevention occurs, it simply frees up capacity for unmet needs and future opportunities. Today's adults seek not only life-sustaining but life-enhancing treatment. They expect to be more physically active and more productive in the workplace, and their expectations are largely met. Indeed, decreases in adult disability over the past 30 years are among medicine's greatest achievements (34, 35). It is not surprising, therefore, that many of the specialists who are in shortest supply, such as cardiologists, gastroenterologists, interventional radiologists, urologists, dermatologists, and orthopedic surgeons, are those who seek to reduce adult disability by using newer technologies.

FINDING THE LIMITS OF GROWTH

The Notion that Less Care Is Preferable

The foregoing describes a physician workforce whose expansion is fueled by patient demand and biomedical progress but whose magnitude is ultimately governed by the interplay among competing forces within the economy. This formulation suggests that health care utilization and the demand for physicians will grow as the economy grows. The implication is that such growth would be beneficial for society. If both are true, the nation will need to create a future physician workforce in proportion to its future economic capacity. However, the throttle on expansion is frozen because of a contrary perspective that views additional health care spending as yielding diminishing marginal returns (13, 36–39). This perspective sees physicians as having failed in their agency role by developing technology-laden specialties through which they create the demand for their own services (40, 41). The remedy is to curtail physician autonomy through regulation (42, 43) and to set limits on the further growth of physician supply (36, 44), strategies that I have challenged elsewhere (45, 46).

The view that “less is more” rests both on philosophy (47) and on a base of empirical observation that displays the imperfect manner in which health care is provided. Examples include care that is ineffective (48), inappropriate (49), burdened with error (50), or of poor quality (51), features of medicine that are widely acknowledged and are the object of substantial corrective actions. It follows from this line of reasoning that, if health care were better, fewer resources (including physicians) would be necessary. Yet it

seems likely that there always will be some margin of care that represents an imperfect utilization of resources, particularly at the leading edge of medical advances. To plan a system around its perfect state seems unwise. Moreover, workforce planners must confront the reality that large amounts of necessary care are not being provided and that, in fact, the volume of such care exceeds the volume of care that is judged to be marginal or unnecessary (52, 53).

Supplier-Induced Demand

Another impediment to expanding physician supply is the notion that physicians cause health care utilization. This notion emerged in the 1960s when a theory developed that physicians sought a “target income” and that, to achieve it, they delivered inflated volumes of service (1, 4, 36, 40, 41). However, although supported by anecdotal experiences, supplier-induced demand seems to have a small and inconstant effect on overall health care spending (54–56). Not dissuaded, policy experts reasoned instead that even if physicians don't induce demand, they facilitate utilization. Therefore, in systems such as ours and Canada's, in which access is largely ensured through insurance mechanisms, controlling the number of physicians could limit spending (2, 36). Canada followed this policy in the 1990s by cutting its medical school capacity. In the United States, physician supply has been maintained at levels that are lower than in most other developed countries (26), and managed care has been used to further limit access. The question is whether limiting the supply of physicians is a valid approach to constraining health care spending or whether doing so simply decreases quality and creates obstacles for the neediest patients. A corollary question is whether applying such constraints disproportionately to allopathic medical schools does anything more than expand the opportunities for osteopathic schools and international medical graduates who, together, constitute one third of residents, up from 20% in 1985.

Geographic Variation

Another aspect of the “less is more” perspective flows from studies of geographic variation in health care (37–39). Wouldn't fewer physicians be needed if the existing differences could be eliminated? One difficulty is in deciding what level is ideal. A second is in using small areas as the unit of analysis because the lack of socioeconomic homogeneity within them separates community spending decisions from the distribution of care and complicates the process of linking the volume of services to outcomes. As noted earlier, the strongest correlate of health care utilization at the macrogeographic level is economic development (20, 57), a phenomenon that has been chronicled for almost a century in the United States and that can be observed throughout the developed world (20, 26). In planning for the future, therefore, it seems prudent to assume that regional variation in health care will exist as long as differences in economic status persist and that the demand for physicians will vary accordingly.

The Limits of Health Care Spending

Thus, while health care is imperfect and offers countless opportunities for improvement, its long-term growth is governed by the pace of economic expansion. Faced with this reality, the fundamental question becomes, how much additional health care can the economy sustain (58)? In 1987, when health care accounted for 11% of the GDP, Ginzberg (59) postulated that the eventual upper limit might be 15%, a level that was reached in 2004. But these percentages have meaning only in relation to the magnitude of the economy overall. The portion of the economy that health care can consume depends on how large the total economy is and, therefore, what resources are available for other purposes. Had the economy not grown after 1987, it would be crippling to devote 15% of it to health care. However, on an inflation-adjusted basis, GDP grew by one third, which allowed additional resources not only for health care but for other purposes as well.

Over the past several years, health care spending has accelerated steeply, causing some to question the wisdom of training more physicians. Yet this recent acceleration is largely a lagged manifestation of the surging economy that preceded it (28), just as the progressive decrease in the rate of growth of health care spending over the past several years reflects the tapering of GDP growth that began in 1997–1998 (Figure 1). If economic recovery continues, renewed growth in health care spending can be anticipated 4 to 5 years from now. The question is, how long can this upward trend continue?

A recent exercise to examine this question concluded that, if over the next 75 years per capita health care spending grew at a rate that exceeded economic growth by 1% (the differential rate that has existed in the past and that is embedded in our trend model), spending for nonhealth purposes could expand sufficiently to sustain education, commerce, and the other societal needs (60). This would be true even though health care would account for 38% of GDP in 2075. Americans might be expected to slow this rate of growth if the opportunity costs of health care proved to be excessive (61), but workforce planners must consider the more likely possibility that a continued strong desire for health care, coupled with its real and perceived benefits (62, 63), will keep demand at the limits that the economy can sustain (64) and that a proportional demand for physicians will exist.

PROJECTIONS BASED ON TRENDS

Trend Projections

As noted from the outset, our forecasts of the demand for physicians (9, 20) are based principally on the economic trends. We have compared these levels of demand with estimates of physician supply, which consider not only the output and attrition of physicians but also their changing work effort and the potential contributions of nonphysician clinicians. Assuming that the economy con-

tinues to grow at an annual rate of 2%, adjusted for inflation and population (consistent with past trends and with the Federal Reserve's current targets), there will be a shortfall of approximately 200 000 physicians, 20% of the needed workforce, in the period between 2020 and 2025 (Figure 2) (9, 20).

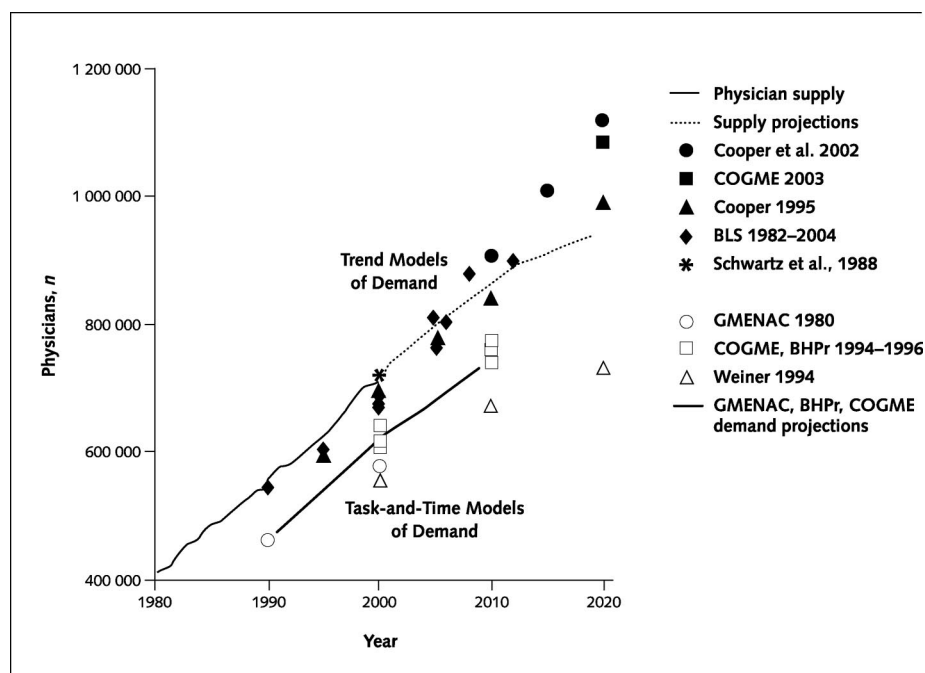
Our projections (9, 20) are concordant with conclusions of others who have integrated economic trends into their planning models. One is the Bureau of Labor Statistics, which, for several decades, has forecasted job opportunities for physicians and other workers 8 to 10 years in the future (68) (Figure 2). Through the year 2000, their forecasts proved to be predictive of subsequent events, and, like ours, their forecast for 2012 exceeds the projected supply (Figure 2). By using similar logic, Schwartz and coworkers (69) correctly concluded in 1988 that GMENAC's projected surplus of physicians in the year 2000 would not materialize. More recently, a study commissioned by COGME to test our trend model projected physician shortages similar to those that we had forecasted (12), and shortages were also projected in a recent study conducted for the BHP (70). Increases in health care expenditures that parallel these forecasts of physician demand have been projected by the Centers for Medicare & Medicaid Services (CMS) (71, 72) and the Congressional Budget Office (73); similar growth in the demand for nurses has been projected by the Health Resources and Services Administration (74). Thus, a widening circle of forecasters whose forecasts depend on economic trends has predicted a growing demand for health care services.

Task-and-Time Projections

Most physicians are familiar with forecasts that are based on micro-quantitative task-and-time analyses. Originally developed in the 1920s to assess time-and-motion in industrial processes (75), this approach was used by the Committee on the Costs of Medical Care in the 1930s to assess the existing adequacy of physician supply (76). Fifty years later, it was adopted by GMENAC (2), and, with modifications, was subsequently used by COGME (5) and the BHP (18, 19) and its contractors (6, 21).

The task-and-time method begins by determining which physician services are "essential" and then measures these services in units of physician visits or, in the case of health maintenance organizations, in terms of full-time equivalent physicians. By assigning times to each and by assuming how many hours physicians work, the total number of physicians who are needed is calculated. These estimates are then extrapolated into the future on the basis of changes in demographic characteristics and reimbursement but little else. While such an approach has been useful for industrial processes in which all of the variables are known, the errors in applying it to a multiplicity of diseases and a diversity of both patients and physicians are enormous. Using it to project future needs when so much about diseases and treatments in the future is unknowable further

Figure 2. Physician supply and demand projections.



Physician supply from 1980 to 2000 is from Pasko and Smart for the American Medical Association (65) and the American Osteopathic Association (66); supply projections are from a previous report (Cooper and colleagues) (9). Trend projections of demand are presented for Cooper and colleagues, 2002 (9); Cooper, 1995 (67); the Council on Graduate Medical Education (COGME), 2003 (corrected for gross domestic product and presumed unnecessary services) (12); the Bureau of Labor Statistics (BLS), 1982–2002 (alternate years) (68); and Schwartz and colleagues, 1988 (69). Task-and-time projections of demand are presented for the Graduate Medical Education National Advisory Committee (GMENAC), 1981 (2); COGME, 1994 (5); the Bureau of Health Professions (BHP), 1995 and 1996 (7, 8); and Weiner, 1994 (6). Projections of demand have been normalized by converting reported values to percentages and applying them to supply levels in the base year.

compounds the error, and applying judgments about which elements of care are “essential” or “appropriate” further biases the conclusions.

Between 1980 and 1996, GMENAC, COGME, and the BHP published a series of reports, each of which projected levels of supply that exceeded demand by approximately 100 000 physicians (Figure 2) (2, 5, 7, 8). Their conclusions were reinforced by others, particularly Tarlov (GMENAC’s chairman) (3), the consulting firms Abt Associates and RAND (cited and critiqued in reference 77), and the BHP’s contractor Weiner (6) (critiqued in reference 67). An abundance of physicians in the 1990s lent further credence to these forecasts, leading prominent economists (78, 79) and major health care organizations (19, 80–84) to adopt the view that surpluses of physicians were imminent and that remedial actions were necessary. However, these much-anticipated surpluses never materialized, and it is now clear that the abundance of the 1990s was simply a manifestation of the “turn-of-the-century bulge” that I had predicted earlier (45, 67). Faced with these realities and with COGME’s recent shift to trend analysis (12), the era of task-and-time planning may finally have ended.

PHYSICIAN WORK EFFORT

An important consideration in the physician supply-demand equation is the changing work effort of physicians.

More physicians are older, as the youthful cohorts of the 1960s and 1970s move through the system, and older physicians tend to work fewer hours. In addition, more physicians are women, who, on average, practice 20% to 25% less than men and who tend to choose specialties in which time commitments are more readily controllable, a particular problem for the surgical disciplines (85). By 2020, 60% of medical students and 45% of practicing physicians will be women. Younger male physicians are also assigning a higher priority to lifestyle, and the recent restrictions on resident duty hours add further to this trend. This is not to suggest that the previous *modus operandi* was better. Rather, the point is that physician workforce planning has been based on the male work patterns of the past, whereas the work preferences of future physicians will be quite different.

ACUITY AND COMPLEXITY

Another consideration in workforce planning is the changing nature of what physicians do. As routine care is delegated to others, the patients who physicians care for tend to be more complicated and time-consuming. Surveys from 1982 through 1999 reveal that the number of encounters per physician decreased at an annual rate of 1.2% (86), principally because visits had become more complex (87) and longer (88, 89). Comparing 2001 with 1992,

17% more of the patients were older than 45 years of age, and twice as many were seen for postacute and follow-up care. The mean number of diagnoses per visit increased by 13%, and the mean number of drug mentions increased by 18% (88). In addition, more diagnostic tests, more counseling services, and more surgical procedures were performed.

These trends in the nature and duration of physician encounters seem likely to continue, and, with stable or declining numbers of physicians per capita, they are certain to add further stress. Most physicians believe that there is too little time available already (87). Moreover, stress and burnout lead some physicians to reduce their patient volumes, seek nonclinical jobs, or simply retire, which places still larger burdens on the remaining practitioners (90). Although some older physicians have delayed retirement because of the recent economic downturn, surveys reveal many who are preparing to retire and an alarming number in their 50s who are contemplating early retirement. Taken together, these dynamics extend the negative consequences of the projected physician shortages.

NONPHYSICIAN CLINICIANS AND THE PHYSICIAN WORKFORCE

Partially offsetting the factors that are creating shortages is the growing participation of nonphysician clinicians (91–93). These clinicians include nurse practitioners, nurse midwives, physician assistants, practitioners of the alternative disciplines (acupuncturists, chiropractors, naturopaths), mental health practitioners (psychologists and clinical social workers), optometrists, podiatrists, and nurse anesthetists. Each has the legal ability to be providers of first contact, to make and communicate a diagnosis, and, often, to prescribe medications. Most extend the capacity of physicians, but many practice independently. However, when considering the future effect of nonphysician clinicians on the demand for physicians, it must be recognized that both modes of participation have evolved over many years and are already embedded in the trends and projections. The question facing planners is whether future growth in the number of nonphysician clinicians and in their scope of practice will add to physician services beyond the existing trends.

Incremental growth of participation seems probable in primary care, where nurse practitioners and physician assistants are playing expanding roles and where a doctoral-level program for family nurse practitioners has recently been established. Growth of participation is also probable in ophthalmology and psychiatry, in which optometrists and psychologists, respectively, can be anticipated to play larger roles (93). However, increments above the existing trends are unlikely in most other specialties. Ultimately, the limits of participation will be determined by quality. While a large body of literature supports the claim that nonphysician clinicians can produce high-quality outcomes

under a range of circumstances (93–95), most of this evidence is derived from care that is at the least complex end of the clinical spectrum, and even there, studies in some fields continue to raise concerns (96). In contrast, fewer studies have evaluated the effectiveness of nonphysician clinicians at the leading edge of their licensed prerogatives and under conditions in which they are free of physician oversight (93, 97). Thus, while a margin clearly exists for greater participation, caution should be exercised in overestimating the degree to which the projected shortages of physicians can be counterbalanced by increasing the number of nonphysician physicians or expanding their scope of practice.

SIGNALS

Signals from the Market

The medical marketplace offers another window into the adequacy of physician supply. Over the past few years, signals from recruiting firms and graduating residents have revealed increasing job opportunities, higher starting salaries, and generous financial incentives in many specialties (98, 99). Most hospitals are either currently recruiting or planning to do so. Strong demand exists in most specialties, particularly anesthesiology, radiology, orthopedic surgery, urology, gastroenterology, oncology, cardiology, dermatology, and pulmonary/critical care (10, 11), which collectively account for almost 20% of practicing physicians.

Physician shortages are also reflected in reduced access for patients. Fewer physicians are accepting new patients, including those covered by Medicare and private insurance (87), and 30% of physicians no longer accept Medicaid patients (100). In some communities, existing Medicare and Medicaid patients are being dropped, and access for those who are uninsured is sharply constrained. It is not surprising, therefore, that waiting times have lengthened, even for insured patients with acute illnesses, or that primary care physicians report difficulty in referring patients to specialists (101). One consequence of the problem of access is that small but growing numbers of primary care physicians are establishing “boutique” or “concierge” practices in which patients pay a premium of \$1000 or more in exchange for easier access, a process that was recently condoned by the AMA. Another is that physicians are relying more heavily on nonphysician clinicians to alleviate the backup, often stretching their scope of practice to the margins of safety.

Organized Medicine

The responses from organized medicine have varied. In 1997, a consortium that included the AAMC, the AMA, and other major organizations declared that “studies of the physician workforce (i.e., those of COGME and the BHPPr) have produced compelling evidence that the United States is on the verge of a serious oversupply of physicians” (19). The consortium recommended limiting the number

of residency positions funded by Medicare, a goal that was partially achieved in the Balanced Budget Act of 1997. After the publication of our trend projections in 2002 (9), the AAMC modified its position from concern about impending surpluses to “agnosticism” (citing neither surpluses nor shortages) (18), and a year later the AMA took similar action (17). Despite this neutrality, three fourths of state medical societies reported physician shortages in various specialties (11), and several have published this fact independently. Similarly, 85% of medical school deans who responded to a recent survey reported physician shortages, and 70% of those reporting shortages noted that a lack of physicians in particular specialties was negatively affecting their schools’ missions (11). As indicated earlier, the most profound change in policy was by COGME, which not only recognized that the problem was one of shortages rather than surpluses but advocated both an expansion of undergraduate medical education and a loosening of the Medicare caps on residency positions that it had fought so hard to create (12). And despite its official “neutrality,” the AAMC recently petitioned the federal government to lift these residency caps entirely (102).

World View

The United States is not alone in coping with inadequacies in physician supply. Similar problems exist in Canada, the United Kingdom, Australia, and New Zealand. However, unlike the United States, these other countries are actively addressing their problems. The government in the United Kingdom has promised 10 000 additional doctors within the next 5 years, a 10% increment, and set a goal of 65 000 more by 2020 (103). It plans to accomplish this partially through increases in training capacity but principally by recruitment from other countries, an effort that promises to offer stiff competition for English-speaking physicians (104). Canada is also increasing its physician supply (105). To that end, both Ontario and British Columbia have announced plans for new medical schools, the first in 35 years, and many existing schools have enlarged their class size. Australia is also expanding medical school capacity (by 30%) (106), and, like the United Kingdom, both Canada and Australia are examining ways to attract more international medical graduates.

DISCUSSION

Taken together, the data, forecasts, and signals discussed earlier indicate that physician shortages are upon us and are likely to worsen over time. The picture that emerges is uncomplicated and unambiguous. In simple numeric terms, the number of physicians is no longer keeping up with population growth. The ability to fully service the population is further compromised by the increasing complexity of the care that physicians provide and the decreasing time commitment that many physicians are willing to make. These limitations collide with economic trends that predict a growing demand for physician services. Recruit-

ers, medical leaders, and patients are already experiencing these shortages, and colleagues in other English-speaking countries see a situation in the United States that is all too familiar to them.

In opposition to this image is a series of task-and-time studies conducted over the past 25 years, which projected physician surpluses that never materialized. Nonetheless, the notion of such surpluses persists, principally because of the belief that physicians are responsible for rising health care expenditures and that additional physicians offer nothing of value (37–39). Curiously, these same considerations have not impeded acceptance of the projected growth of Medicare expenditures (73), total health care expenditures (71), nursing requirements (74), or health care job opportunities (68), all of which parallel the projections of physician demand that emanate from our analyses (9, 20). Yet even these parallels do not overwhelm an underlying belief that physicians drive the system and, therefore, that their numbers must be constrained (1, 4, 36), a view that no countervailing analysis or data are likely to dislodge (107).

While it undoubtedly was correct for allopathic medical schools to cease expanding after the burst of growth in the 1960s and 1970s (108), this moratorium has lasted too long. Its potential negative effects on physician services have been mitigated in part by growth in the number of nonphysician clinicians and in their licensed prerogatives, but there are natural limits to the spectrum of care that these practitioners can and should undertake (91–93). More severe shortages of physicians were also averted by an increment in the number of international medical graduates entering U.S. residencies after 1990 and by a continued expansion of osteopathic medical schools (109). However, a by-product is the decreasing fraction of young physicians who attended a U.S. allopathic medical school.

At present, the most serious shortages are confined to certain specialties, and the severity of these shortages varies across the nation. While viewed as a crisis by some specialty organizations (110, 111), the magnitude of the problem is seen as small enough by the AMA (17) and AAMC (18) that these groups have largely deferred the issue. In contrast, COGME has addressed it head-on and reversed a position that federal bodies have held for more than 25 years (12). While short-term measures to increase practice efficiency or to expand the roles of nonphysician clinicians may offer temporary relief, the counterbalancing effects of regulation and burnout loom ever larger. And while, like other English-speaking countries, the United States can look to recruiting more international medical graduates, this can occur only if the existing caps on residency programs are lifted; even then, complex issues of brain drain and nation building must be confronted. Ultimately, there is no long-term alternative to expanding the output from U.S. medical schools, although doing so is fraught with obstacles (107, 112–114). The medical profession has long accepted the responsibility for assuring adequate numbers

of competent physicians. Fulfilling that responsibility is an obligation that it must now embrace.

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