Physician Workforce Projections in an Era of Health Care Reform

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Abstract

In 2020, the United States may face shortages of 45,400 primary care physicians and 46,100 medical specialists—a total of 91,500 too few doctors. Unfortunately, health workforce shortages like these are being advanced as cause for repealing or "defunding" the Affordable Care Act (ACA). The extension of health insurance coverage to millions of Americans is a critical first step toward a healthier America. It would be a national failure to leave millions of Americans without health insurance coverage because they will generate additional demand. Rather, the solution is to find ways to meet that demand. Workforce projections utilizing real data and carefully formulated assumptions to assess how and why supply and demand change over time can greatly assist policy makers in finding those solutions. With implementation of the ACA under way, it is time to understand what lessons such projections can teach, and to begin to heed those lessons.

INTRODUCTION

ACA: Affordable Care Act

AAMC: Association of American Medical Colleges

The Affordable Care Act (ACA) was signed into law in March 2010. Along with many other initiatives, the ACA seeks to increase access to health services by expanding health insurance coverage to more than 30 million Americans by 2014 (1). But will there be enough physicians to meet the anticipated rise in demand, especially when shortages are already a concern (2)?

The Massachusetts experience is instructive. Shortages in Massachusetts were projected across specialties and primary care, even before state health care reform legislation took effect, just as national shortages are anticipated following the ACA. Since implementing state-based health care reform (through the Act Providing Access to Affordable, Quality, Accountable Health Care in 2006), 364,000 more Massachusetts residents have health insurance, with the result that 97% of nonelderly residents are insured. Now in the fifth year of implementation, Massachusetts is facing its fifth year of primary care physician shortages. Not only are more than half of all primary care practices closed to new patients, but 10 out of 18 physician specialties, for which data are available, are experiencing shortages as well (3). Owing to these shortages, nearly one-third (32.8%) of fully insured Massachusetts residents reported some type of problem getting health care in the past 12 months, and more than one-fifth (22.5%) reported trouble accessing providers, according to a report released in 2010 by the Massachusetts Division of Health Care Finance and Policy (4).

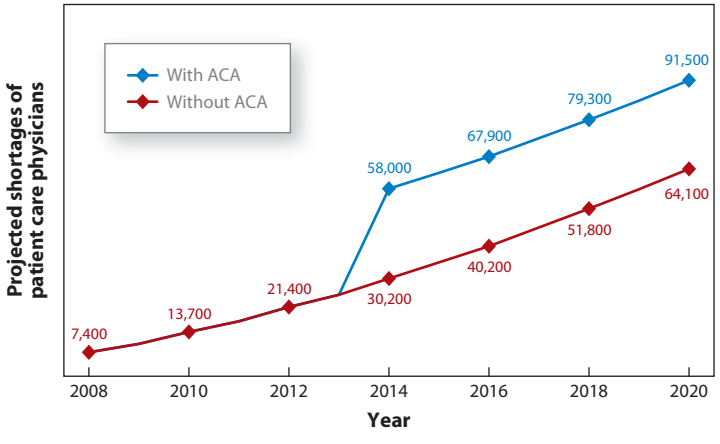

Figure 1

Projected shortages of patient care physicians with and without the Affordable Care Act (ACA), 2008–2020 (5).

Massachusetts provides important insight into the potential barriers that may be faced across the country as coverage is expanded. However, one state's experiences may not be completely replicated in other parts of the country, where differences in demographics, health status, and utilization can create a very different health care landscape. Each state has the opportunity to improve both its health systems and access under the ACA. However, national decisions also must be made. Taking the provisions of the ACA into account, it is possible to project potential physician shortages that may result in the next 10 years.

The Association of American Medical Colleges (AAMC) Center for Workforce Studies recently worked with the Lewin Group to produce updated projections incorporating current physician supply and utilization data, more recent population projections, and the specific provisions of the ACA. Whereas previous physician supply and demand projections produced by the Center showed a shortage of 39,600 doctors in 2015 (2), the new ACA-adjusted estimates bring that number close to 62,900, with a progressive worsening of the shortage through at least 2020, as illustrated in **Figure 1**. The total projected shortage for 2020, after full ACA implementation, is 91,500 physicians. Without ACA implementation, the projected shortage for 2020 would still be a disconcerting 64,100 physicians (5). Although physicians are only one part of the health workforce, they are a critical component, and the trends described here apply to many, if not all, of the other health professions.

The projected impact of the ACA on physician workforce shortages adds fuel to the heated national debate over health care reform, as these projections are being used by some to justify calls to repeal the legislation. It must be acknowledged that, although the legislation seeks to increase access, this may not be

possible without the necessary human resources and more efficient care models. Leaders in health profession education and health care delivery must respond to this challenge. The ACA sets the stage for a transformation in health care that, if implemented well, will yield an improved system that allows physicians and other health professionals to treat patients more efficiently and effectively. Improving the health of American citizens is the goal of the ACA. Rather than retreat from this goal, there must be a sense of urgency around the simultaneous tasks of health workforce expansion, the creation of new delivery models, and the redesign of education to support those models.

SOCIETAL IMPLICATIONS OF HEALTH WORKFORCE SHORTAGES

Health workforce shortages have significant implications regarding the ethical commitment of physicians to social justice, insofar as these shortages invariably hit the most vulnerable populations hardest (6). Those with the most tenuous connections to our health care system are the first to be affected when extant access barriers are heightened by an increasingly inadequate supply of health care providers. One out of every five Americans already lives in a federally designated Health Professional Shortage Area (7, 8). If shortages worsen, not only will access become more problematic for the vulnerable populations in these rural and inner-city communities, but their numbers are likely to grow. The ACA seeks to improve health care access, but without the necessary workforce in place this goal remains unattainable.

Even without the ACA, access to all types of health services would be a growing concern, as access to both specialist and primary care physicians is projected to decline over the next decade (2, 5). An aging population that wants to remain active as long as possible, and is increasingly able to do so, will continue to drive up the need for oncologists, urologists, and other specialist physicians. If those specialists are inaccessible, then an aging population may become an ailing population. For the entire population, diminished access to primary care limits the use of preventive health care, resulting in an array of adverse effects. Workforce shortages lead to longer waits before even being able to see a health care professional, and increases in travel distances once the wait is over. Time spent with the physician or other provider grows shorter, even after the longer wait and travel, pushing an already burdened system closer to its limits (9). As evidence of a demand that exceeds supply continues to accrue, prices are unlikely to remain static. At a time when it is important to "bend the cost curve" of health care spending downward, shortages will drive costs higher.

THE METHODOLOGICAL COMPLEXITY OF WORKFORCE PROJECTIONS

Addressing physician workforce shortages and the related unwanted consequences requires a thorough understanding of the complex factors that create physician supply and demand. Even though health care is experienced (supplied and demanded, as it were) on an individual level, societal dynamics are the driving forces behind health workforce supply and demand. Thus, although the health workforce supply and demand equations are complex, the demographics of the population, which represent the ultimate source of both supply and demand, are largely predictable (10).

The most important demographic trend in the United States in this regard is population growth, with the total population expected to exceed 350 million by 2025—an addition of 40 million people in the next 15 years (8). Furthermore, older Americans comprise a historically disproportionate share of this rapidly growing population. The baby boomers have already begun to turn 65, and this vast cohort will require significantly more health care per capita than younger Americans. Older individuals are more likely to have multiple chronic conditions, requiring more intensive, coordinated care. Over 50% of cancer cases occur in the elderly population, and after the age of

GME: graduate medical education

65, the likelihood of developing dementia roughly doubles every five years (11, 12). Additionally, outpatient visit rates for older adults have been rising steadily (2).

In the United States, health care use is driven not only by health status but also by health insurance. Having health insurance affects not only how much care is utilized, but what kind of care is received. In the coming years, 15 million more Americans will become eligible for Medicare and another 32 million are projected to become newly insured under the ACA (13). When added to the projected overall population growth, that constitutes 87 million Americans either using health insurance for the first time or being able to use health care in ways they had not previously. The implications for health workforce demand are profound and worrisome.

Turning to the supply side of the equation, the nation's physicians are aging along with the rest of the nation. As many as one-third of all physicians in the United States may retire within the next two decades (5). What is also troublesome is that analyses of AAMC data suggest physicians may retire earlier than they have in the past, exacerbating this problem (2). Given that a physician shortage already exists, as departures from the workforce increase, it will be even more important to expand educational and training programs for physicians. Indeed, because it takes up to 14 years to educate and train a physician, this expansion is needed immediately. Only 27,000 new physicians are trained in the United States each year and, although medical school enrollment has expanded to address anticipated shortages, there has been no substantial increase in the number of graduate medical education (GME) residency training positions supported by the federal government since the 1997 Balanced Budget Act (14). Without additional GME capacity, the nation cannot hope to meet its physician workforce needs.

Furthermore, additional factors are altering the way, and how much, practicing physicians work. Not only are older physicians retiring, but changing demographics and work–life expectations mean that younger physicians are working fewer hours than their predecessors (15). Work–life balance is becoming increasingly important among younger physicians, many of whom utilize part-time work schedules to accommodate commitments at home. As a result, medical school graduates are increasingly drawn to specialties with "controllable lifestyles," such as anesthesiology, emergency medicine, diagnostic radiology, and pathology (16). Increased productivity might partially offset these changes in work patterns, but physician productivity levels historically have been relatively stable (2).

In this general context of health workforce shortages, societal trends that seem likely to worsen these shortages, and disproportionate burdens on the most vulnerable, the need for methodological rigor in workforce projections is greater than ever. It is important to acknowledge that projections are not forecasts. Projections are a tool for better understanding the dynamics of workforce supply and demand, rather than a predictor thereof. A projection takes current conditions, develops scenarios involving a set of educated guesses about possible future changes in the system, and looks at the implications of those changes. In contrast, a forecast explicitly tries to predict what the future will hold. For example, a population projection might begin with how many people we have, then look at what would happen if changes occurred in birth, death, and/or net immigration rates. In contrast, a weather forecast might predict rain tomorrow.

Current workforce conditions are understood in terms of two equations: one for supply and one for demand. The equations presented in **Figure 2** demonstrate how we can conceive of physician supply and demand. These equations are fairly detailed but conceptually straightforward and could be adapted to any other health profession or to the health workforce as a whole. Too often, conceptualizations of the future physician workforce focus on a single variable. In fact, it was an overemphasis on a single assumption regarding the adoption of managed care in the United States that led the AAMC and other organizations to project

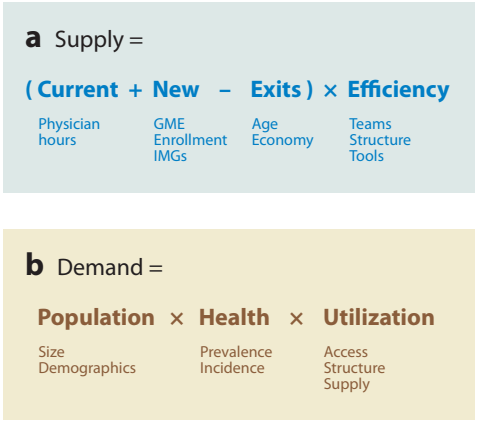

Figure 2

A conceptual model for building physician workforce projections.

a physician surplus in the mid-1990s (17). In hindsight, it appears that this failure to include a broader range of variables in the supply and demand equations may have contributed to the physician workforce shortages that currently exist.

Formulated as a multivariate equation, physician supply is a function of current supply (how many physicians there are), new supply (entry from the education pipeline), and exiting supply (departures from practice, e.g., for retirement or economic reasons). These are then modified by measures of efficiency, i.e., how much any one physician can get done (based on the system in which physicians are operating, the tools available to them, and with whom they work). Physician demand stems from the population (demographics, such as age or gender), its health status (what conditions they have and the incidence and prevalence of those conditions), and how the population uses physician services (based on ease of access to the system, its structure, and available supply).

These are equations for physician services, rather than physicians, per se, as they do include concepts such as efficiency and utilization rates. Nonetheless, they lay out a general conceptual framework for measuring, modeling, and projecting physician supply and demand in the United States. Indeed, this is the methodology the AAMC has used for its physician supply and demand projections. Carefully developed workforce equations, and the projections that can be constructed with those equations, allow us to assess real-world policy options in a context in which our assumptions are all made explicit.

With the aid of the Lewin Group's Physician Supply and Demand Model (2, 18, 19), we began with a baseline scenario, which assumes that current conditions affecting supply and demand (GME slots, utilization rates, etc.) will remain steady. Then we asked a series of "What if?" questions based on what we saw as potential future changes from the baseline scenario. These are described in detail in our report (2) and summarized in **Figure 3**.

The results of modeling these scenarios teach us some important lessons about the future physician workforce. GME growth appears crucial to increasing supply, especially insofar as available policy levers are concerned (assuming that retirement age is much harder to change). Forces influencing physician retirement age need to be better understood. The trend toward younger physicians working fewer hours is likely to exacerbate any shortage. Economic growth spurs an increase in demand for medical services. The anticipated growth in demand, especially among older Americans, should be a grave concern for all—even more so than expanded insurance coverage. The greatest potential for lowering demand, as measured in terms of physicians needed to provide a given quantity of service, lies in expanding the role of physician assistants (PAs) and nurse practitioners (NPs) and increasing physician productivity.

POLICY INSIGHTS

Health workforce shortages present challenges to the government, academic medical centers (AMCs), and the nation as a whole. Although projections do not constitute a policy-making crystal ball, they offer insights that can inform decisions at the national and state levels, in addition to decisions made by the programs in

AMC: academic medical center

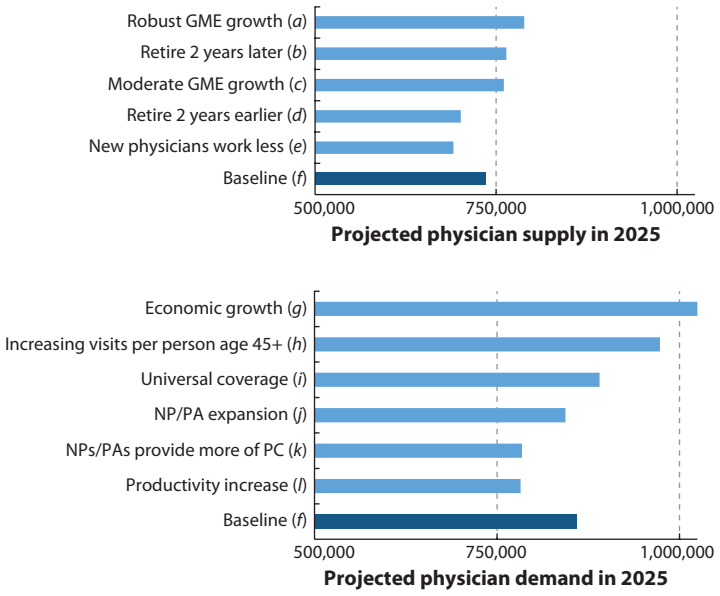

Figure 3

Projected physician supply and demand in 2025, twelve scenarios. (*a*) Robust GME growth: Graduate medical education (GME) capacity grows to 32,000 first-year residents. (*b*) Retire two years later: Physicians retire two years later, on average, than they currently do. (*c*) Moderate GME growth: GME capacity grows to 27,600 first-year residents. (*d*) Retire two years earlier: Physicians retire two years earlier, on average, than they currently do. (*e*) New physicians work less: Younger generations of physicians work fewer hours than physician cohorts in the past. (*f*) Baseline: No change in current conditions. (*g*) Economic growth: Expected growth in demand that might accompany economic growth (modeled pre-recession). (*h*) Increasing visits per person age 45+: Increased health care utilization among Americans aged 45 years or older (a trend we had observed in data from the National Center for Health Statistics). (*i*) Universal coverage: Health insurance coverage is expanded to the entire population. This was modeled before we knew what health care reform might look like. (*j*) NP/PA expansion: Physician assistant (PA) and nurse practitioner (NP) supply grows beyond that needed to maintain the status quo in terms of health care delivery patterns. Increasing numbers of PAs and NPs are assumed to reduce demand on and for physicians. (*k*) NPs/PAs provide more of PC: Expanded role for NPs and PAs in primary care, with these professions taking on 25% of the primary care currently provided by physicians. (*l*) Productivity increase: A 10% increase in physician productivity between 2007 and 2025.

which physicians train and work. Because key stakeholders are many and varied, we must explore potential ways forward that encompass an array of actors as complex as the factors that drive health workforce supply and demand. By understanding the scenarios outlined in **Figure 3**, a diverse and courageous group of health care leaders can meet the problem of physician shortages head on.

Expand Graduate Medical Education

The robust expansion of GME has the most potential in addressing physician workforce shortages on the supply side of the projections equation. Yet a crisis surrounding the availability of funded residency slots looms. Medical and osteopathic school enrollment has increased 36% in the past eight years, but this is only a first step in increasing educational pipeline output (20). Since 2002, the number of residents entering GME programs has increased by only 5%, and the number of funded and available slots for first-year residents increased by only 1.4% last year (21). We are now approaching a critical point at which the number of medical and osteopathic school graduates will likely surpass the number of available residency positions.

Congress plays a key role in mitigating this crisis. Unless legislation passes that supports at least a 15% increase in residency training slots (adding another 4,000 physicians a year to the residency pipeline), access to health care will likely continue to be out of reach for many Americans (13). Because residents care for a large portion of Medicare patients, Medicare pays for its share of training costs. Caps were placed on the Medicare reimbursement for GME positions in the 1997 Balanced Budget Act, and the ACA has provided only modest increases in these caps. Lifting these caps on the number of residency positions funded by Medicare would lead to a substantial expansion of GME capacity. The cost to train new physicians through GME is <1% of the current Medicare expenditures (14). If people are to have timely access to physicians, it is essential to invest in GME in order to increase the number of available training positions.

The federal government is not the only important stakeholder in the robust expansion of GME. In addition to financial resources, human resources to meet the needs of residents are crucial at teaching hospitals and AMCs. Programs will require additional faculty staffing and leadership development among current faculty to achieve the quality of education

necessary for today's complex health care system. Increasing physician supply requires increased capacity in GME programs, increased medical school enrollment as recommended by AAMC in 2006, and time. Because it often takes more than a decade to educate and train a physician, AMCs must embrace the innovation imperative and address the projected workforce shortages now, by drawing attention to leadership development and propelling our nation's faculty forward. Without effective mentors and teachers in academic medicine, the doctors of tomorrow will be unable to take on the increasingly complex work of health care.

Expand Utilization of Nurse Practitioners and Physician Assistants

Obviously, the supply and demand of health workers are driven by many social factors that are difficult to control and address. As seen in **Figure 3** and discussed in the section above, economic growth, retirement, and work patterns of younger physicians play a significant role in workforce shortages, and these factors cannot be altered by any stakeholder. Yet, these determinants are important to keep in mind when making policy decisions related to physician shortages.

Not all factors are as difficult to address as the economy, retirement decisions, and generational preferences. The increased use of NPs and PAs has great potential to significantly address health workforce shortages. Across the nation, nurses provide health care services valued by patients and the overall health system. The continued expansion of PA and NP training programs will help lessen the impact of the projected physician shortage. Concomitantly, increasing the use of NPs, PAs, and other health professionals at the top of their respective skill sets will also make these jobs both more attractive and more effective. Even now, prompted by the projected increase in demand resulting from the implementation of the ACA, some health insurers are beginning to extend independent primary care provider status to NPs even if they do not practice in medically underserved areas (22).

Increase Physician Productivity

Combining increased capacity for all health care professionals with models of interprofessional deployment will help ensure an increase in productivity throughout the physician workforce. The utilization of team-based care prompts physicians and nonphysician clinicians to work with care coordinators, social workers, nutritionists, and other health workers, thus creating opportunities for better-coordinated care and efficient care delivery. Team-based care also improves chronic care management while improving efficiencies through electronic health records, online appointments and communications, and practice-management innovations (23). Collaborative care organizations and medical homes, both of which promote highly integrated team-based and patient-centered care, are cited as ideal models for improving outcomes and efficiency (24). According to an analysis done by the Lewin Group for physicians who provided a medical home model, a 26% rise in physician earnings was seen as patients' overall health care expenditures declined and satisfaction increased simultaneously (23). Implementing these models will help address physician shortages while bringing costs down and satisfying both providers and patients.

CONCLUSION

Physician shortages in the United States are already being felt today, and they will continue to worsen without significant interventions, as discussed above. Shortages span across specialties and are not limited to any single region of the country. For example, the number of U.S. medical school graduates selecting family medicine fell 27% between 2002 and 2007, a trend that has shown only a modest reversal more recently, and the number of general surgeons has decreased 26% since 1981 (25). The hardest-hit patient populations will be those already vulnerable and underserved. Physician shortages will affect health care access, quality, and cost. Patients will face longer waits and greater travel

distances when they seek treatment. Increased use of emergency rooms and delayed treatment may also result. The problem will only worsen as population growth and aging result in rising utilization rates, and the retirement of a third of currently practicing physicians will further exacerbate shortages (13). The implications for the nation are of great concern, but there are concrete actions that insightful and steadfast leaders in health care can take.

As the implementation of the ACA continues forward, the health care community must have the courage to lead and innovate. Particularly well-positioned to produce and diffuse innovation, and thereby to lead reform, are our nation's AMCs. These institutions not only educate and train the doctors of tomorrow, but they also function as a major supplier of health services in their communities while facilitating research-based transformation. The tripartite mission of AMCs creates an environment in which new models of care can be created as groups of providers work collectively to design and implement highly integrated delivery systems. These improved systems can serve as examples for future reform across the country. The Center for Medicare and Medicaid Innovation, created under the ACA, was also given the authority to create Healthcare Innovation Zones, in which willing groups of health systems and partners, including AMCs, other hospitals, community practitioners, and insurers, can come together to design and test highly integrated systems specifically tailored to their region (26). The courage to lead is an essential component of health reform and the pursuit of innovation. It has the potential not only to address workforce shortages but also to improve the overall system of health care in the United States.

From retirement patterns to generational differences in work–life balance, understanding our nation's health workforce needs is an endeavor fraught with complexity. Comprehending these needs is difficult enough, never mind predicting how they will look in 10 or 20 years. Yet a sense of what the future may hold is critical to making decisions now. Despite its intricacies, our health care workforce is amenable to careful analysis, allowing us to make rational conjectures about how the needs we have today may look through the lens of tomorrow's more predictable circumstances. With this information and a keen understanding of how supply and demand interact, we are able to glimpse possible health workforce futures, to gain insights into how services may be provided and who will receive these services. Health care workforce projections are a key health care policy tool. Health care leaders can use this tool to create a healthier future for our most vulnerable populations, and indeed for us all.

SUMMARY POINTS

1. In 2020, the nation may face shortages of as many as 45,400 primary care doctors and 46,100 surgeons and medical specialists—a total of 91,500 too few doctors.
2. Potential consequences of physician shortages include diminished access to primary and specialist care, longer wait times, increased travel distances, decreased time spent with the physician or other provider, and increasing prices.
3. Physician supply concerns include aging physicians, static growth in the number of graduate medical education (GME) residency training positions supported by the federal government, and younger physicians working fewer hours.
4. Physician demand concerns include increased utilization by a growing and aging population, economic growth, and expanded health care coverage.

5. Health care workforce projections suggest the following lessons concerning physician supply. GME growth appears crucial. Forces influencing physician retirement age need to be better understood; the trend toward younger physicians working fewer hours is likely to exacerbate any shortage.
6. Health care workforce projections suggest the following lessons concerning physician demand. The anticipated growth in patient population, especially among older Americans, is an even greater concern than expanded insurance coverage. The greatest potential for lowering demand lies in expanding the role of physician assistants and nurse practitioners and in increasing physician productivity.
7. The utilization of team-based care prompts physicians and nonphysician clinicians to work with care coordinators, social workers, nutritionists, and other health workers to meet the rising demand of the population.
8. Particularly well-positioned to produce and diffuse innovation, and thereby to lead reform, are our nation's academic medical centers, through the implementation of Healthcare Innovation Zones.

FUTURE ISSUES

1. Additional health care workforce projections are needed that take into account variations related to geography, as well as specialty and nonphysician supply factors, in order to understand better where shortages are likely to occur and to what extent.
2. Workforce projections should employ improved methods for assessing demand and its drivers and go beyond the current approach, which assumes equilibrium at the starting point.
3. How can the nation go beyond Medicare funding for increasing GME programs? A study of the public policy options to create a more stable funding stream linked to workforce projections is needed. For example, what might be the effects of an all-payer trust fund that eliminates the current dependence on Medicare funding?

DISCLOSURE STATEMENT

The authors are not aware of any affiliations, memberships, funding, or financial holdings that might be perceived as affecting the objectivity of this review.

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Indexes

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