TRENDS

Trends In The Physician Workforce, 1980–2000

A review of the evidence indicates that there is no physician surplus in the United States and that numbers of primary care physicians may have reached a plateau.

by Edward S. Salsberg and Gaetano J. Forte

ABSTRACT: Over the past twenty-five years the nation has struggled with a series of physician workforce issues: determining the appropriate number of physicians needed and the appropriate number to produce; the role of international medical school graduates; the mix of primary care and non–primary care physicians; efforts to increase the number of underrepresented minorities in medicine and the supply of physicians in rural areas; and the impact of the growing number of female physicians. This paper documents physician workforce trends over the past twenty years, especially as they relate to these issues.

BETWEEN 1960 AND 1980 the number of allopathic medical schools in the United States grew from 85 to 126, and the number of graduates more than doubled from 7,081 to 15,113. The nation’s physician supply grew rapidly, from 235,303 active allopathic physicians in 1965 to 316,491 in 1975. In 1976, in response to concerns about the rapidly growing supply of physicians, the Graduate Medical Education National Advisory Committee (GMENAC) was established to advise the nation on how many physicians were needed in the United States. In 1980 GMENAC concluded that the nation faced a potentially serious surplus and recommended that it limit the number of medical school positions and severely restrict the number of international medical school graduates (IMGs) entering the United States.

When GMENAC issued its report in 1980, there were 459,555 active physicians in the United States. The surplus GMENAC envisioned was based on an estimate that the number of physicians would grow to 535,750 by 1990 and 642,950 by 2000 unless steps were taken to reduce the growth in physicians.

Concerns about a potential surplus escalated with the publication of several papers in the early 1990s suggesting that the expansion of managed care and its emphasis on primary care would lead to an even greater surplus of physicians than predicted by GMENAC, especially medical and surgical specialists. In fact, Jonathan Weiner estimated that under certain managed care expansion scenarios, the nation required 138–144 patient care physicians per 100,000 population—well below the 191 physicians per 100,000 population suggested by GMENAC. Since the nation already had 238 active physicians per 100,000 in 1990 and was experiencing a period of growth in physician supply, the specter arose of a massive surplus of physicians by the turn of the century. This concern was echoed by the national Council on Graduate Medical Education (COGME). In several reports between 1992 and 1998, COGME reaffirmed its concern about a potential surplus of physicians.
In 2000 there were approximately 780,000 active physicians in the United States, or 276 physicians per 100,000 population (Exhibit 1). U.S. physician supply grew by more than 320,000 physicians between 1980 and 2000. However, despite the sharp growth in supply, there is little indication of a U.S. surplus of physicians. Several recent examinations of the balance of supply of and demand for physicians suggest that the nation may be facing a shortage instead.\(^\text{11}\)

The Center for Health Workforce Studies at the University at Albany, State University of New York, surveys physicians completing training in New York annually to assess the relative demand, by specialty, for physicians entering practice. Initially, it was thought that there would be an indication of “saturation” in some specialties, since New York State has a very high physician-to-population ratio (estimated at 305 physicians per 100,000 population in 2000—well above the numbers recommended by GMENAC and COGME).\(^\text{12}\) Yet despite this high ratio, based on the experience of residency program graduates in the job market, there has been no indication of a general surplus. For example, between 1998 and 2001 only 18 percent of 5,312 respondents had to change their practice plans because of limited job opportunities.\(^\text{13}\) Despite the growing supply, this percentage has remained essentially unchanged each year. The most commonly reported reason for new physicians’ having difficulty finding a satisfactory practice opportunity was limited practice opportunities in desired locations rather than a general lack of practice positions. Similar findings have been reported in California in 2000 and 2001.\(^\text{14}\) Although an earlier report suggested that some new physicians were unemployed, the experience in New York and California over the past several years indicates that only a tiny percentage of physicians do not have confirmed practice plans shortly before graduation because of the lack of practice opportunities.\(^\text{15}\)

In this paper we trace the path of U.S. physician supply analysis and recommendations, based on the published reports by government bodies and academic analysts during the past twenty years, as well as on our own work at the Center for Health Workforce Studies.

### U.S. Medical School Graduations And IMGs Entering Medicine

The growth in physicians between 1980 and 2000 reflects a number of factors. As expected by GMENAC, the increased level of production of U.S. medical schools in the 1980s

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**EXHIBIT 1**  
Trends In U.S. Physician Supply And Projections, Selected Years 1980–2000

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</thead>
<tbody>
<tr>
<td>Active allopathic physicians</td>
<td>379,893</td>
<td>438,659</td>
<td>470,688</td>
<td>551,647</td>
<td>642,877</td>
</tr>
<tr>
<td>Active osteopathic physicians</td>
<td>17,620</td>
<td>24,014</td>
<td>30,924</td>
<td>35,720</td>
<td>41,121</td>
</tr>
<tr>
<td>Residents and fellows</td>
<td>62,042</td>
<td>75,411</td>
<td>92,080</td>
<td>96,352</td>
<td>95,725</td>
</tr>
<tr>
<td>Total active physicians</td>
<td>459,555</td>
<td>538,084</td>
<td>593,692</td>
<td>683,719</td>
<td>779,723</td>
</tr>
<tr>
<td>GMENAC supply projection</td>
<td>–</td>
<td>535,750</td>
<td>–</td>
<td>642,950</td>
<td>–</td>
</tr>
<tr>
<td>U.S. resident population (thousands)</td>
<td>227,016</td>
<td>237,729</td>
<td>249,231</td>
<td>262,571</td>
<td>282,124</td>
</tr>
<tr>
<td>Active physicians per 100,000 population</td>
<td>202</td>
<td>226</td>
<td>238</td>
<td>260</td>
<td>276</td>
</tr>
</tbody>
</table>


**NOTE:** GMENAC is Graduate Medical Education National Advisory Committee.
and 1990s compared with earlier decades added greatly to the total supply, as did continued large numbers of IMGs entering at the graduate level. Also, the number of osteopathic graduates grew sharply.

U.S. allopathic medical schools responded to concerns over a potential surplus by stabilizing enrollment (Exhibit 2); in fact, the number of graduates in 2000 was only slightly higher than it was in 1980. During the same period the number of graduates of osteopathic medical schools more than doubled. Nevertheless, the combined growth in U.S. medical school graduates was only 12 percent between 1980 and 2000, while the U.S. population grew 24 percent.

By the early 1990s it was clear that the supply of physicians in the United States was still growing rapidly, and a sizable number of IMGs were entering the medical education pipeline at the graduate level. These phenomena prompted a vigorous policy discussion and calls by COGME and others to limit the number of IMGs training in the United States.

The rate at which IMGs entered practice in the United States dipped in the 1980s, only to increase sharply in the 1990s. Efforts to track IMGs entering the U.S. health care system have usually focused on the beginning of their pipeline in this country, such as the number of certificates issued by the Educational Commission for Foreign Medical Graduates (ECFMG), the number in the residency match program, or the number in residency training. However, these data have a number of serious shortcomings. An alternative approach is to track the number in practice. The number of active IMG physicians in the United States (excluding residents and fellows) increased by 44,823 between 1970 and 1980 (about 4,500 per annum for the decade), 27,046 between 1980 and 1990 (about 2,700 per annum for the decade), and 45,012 between 1990 and 2000 (about 4,500 per annum for the decade) (Exhibit 3). The growth of IMGs reflects both supply and demand factors, including IMGs' willingness to come to the United States to practice medicine and reimbursement benefits to teaching hospitals for training residents and fellows.

The introduction of new requirements in the late 1990s for IMGs seeking residency training in the United States, including a new clinical assessment examination, led to a surge in new applications for certification by the ECFMG before the new test went into effect and a subsequent drop in 1999 after the exam was in place.

Although the data are difficult to interpret, it appears that the number of non-U.S.-born IMGs entering residency training has moderated over the past few years. At the same time, the number of U.S.-born IMGs is growing. Although efforts in the mid-1980s to discourage U.S. citizens from attending foreign medical schools were effective, the number of U.S. IMGs in residency training in the United States has begun to increase in recent years.

Thus, while U.S. allopathic schools responded to public policy concerns about pro-

### EXHIBIT 2
**Trends In U.S. Medical School Graduations, Selected Years 1980–2000**

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</thead>
<tbody>
<tr>
<td>Allopathic medical school graduates</td>
<td>15,113</td>
<td>16,318</td>
<td>15,398</td>
<td>15,888</td>
<td>15,674</td>
</tr>
<tr>
<td>Osteopathic medical school graduates</td>
<td>1,059</td>
<td>1,476</td>
<td>1,529</td>
<td>1,843</td>
<td>2,279</td>
</tr>
<tr>
<td>Total U.S. medical school graduates</td>
<td>16,172</td>
<td>17,794</td>
<td>16,927</td>
<td>17,731</td>
<td>17,953</td>
</tr>
<tr>
<td>Number</td>
<td>Per 100,000 population</td>
<td>7.1</td>
<td>7.5</td>
<td>6.8</td>
<td>6.8</td>
</tr>
</tbody>
</table>

Producing too many physicians, the growth in osteopathic medical school graduates and IMGs worked to counter efforts aimed at limiting the number of physicians produced in this country.

Primary Care And Non–Primary Care Physicians

As noted above, the growth of managed care raised concerns that the nation needed more primary care physicians to meet the needs of the population. As a result, beginning in the 1980s there was a growing number of calls for additional primary care physicians, including some proposals that half of new graduates of residency training be in primary care specialties.24 These reports and papers led to a series of federal and state policies and programs in the 1990s to encourage the production of more primary care physicians.25 The net result was a sizable increase in the number of new physicians choosing primary care specialties, reflecting both an increase in family medicine residents and a decrease in internal medicine and pediatric residents choosing to subspecialize.26

In the 1980s the number of active primary care physicians grew at a somewhat faster rate (31 percent) than the number of active non–primary care physicians (25 percent). As a result of the promotion of primary care, in the 1990s the rate of growth for primary care physicians (35 percent) continued to exceed the rate of growth for non–primary care physicians (29 percent). Training in family practice and pediatrics grew rapidly, leading to an increase of 160 percent in the number of active family practitioners and 117 percent in the number of active pediatricians between 1980 and 2000. However, because the number of non–primary care physicians greatly exceeded the number of primary care physicians in 1980, the number of non–primary care physicians actually grew by 173,277 between 1980 and 2000, compared with 123,390 for primary care physicians (Exhibit 4).27

Based on the results of resident exit surveys in New York and California, it would appear that the marketplace demand for non–primary care physicians exceeds the demand for primary care physicians. Thus, even in New York, where 68 percent of practicing physicians are non–primary care, and in California, with its high level of managed care penetration, the job market appears stronger for non–primary care physicians than for primary care physicians.28 Accordingly, the number of medical school graduates selecting primary care specialties appears to have peaked, and an increasing number are once again choosing non–primary care specialties.29 In the final analysis, then, there seems to be little support in the marketplace for the goal of half of new graduates being in primary care specialties.

Underrepresented Minority And Female Physicians

■ Minorities. On many fronts, the nation continues to promote diversity in the workforce. Among the physician workforce, the concern about a lack of diversity has been voiced by many.30 Although efforts such as the
American Association of Medical Colleges’ (AAMC’s) Project 3000 by 2000 have yet to reach their goals, the number of underrepresented minorities enrolled in U.S. allopathic medical schools has risen in the past twenty years. Between the 1979–80 and 1999–2000 academic years, the number grew from 5,086 (8 percent of all enrollees) to 7,853 (slightly less than 12 percent). However, this growth ended during the 1996–97 academic year. Since then the number of underrepresented minorities in U.S. medical schools has actually declined slightly. Thus, despite some initial progress, African Americans, Latinos/Hispanics, and Native Americans continue to be underrepresented in the U.S. physician workforce.

Women. The number of female physicians rose steadily, from 37,189 active allopathic physicians in 1980 to 148,768 in 2000, an increase of 300 percent (compared with an increase of 44 percent for men). Over this period the percentage of active allopathic physicians who were female increased from 10 percent to 23 percent. The number of female physicians will continue to grow, since women made up 45 percent of allopathic medical school students in the 2000–01 academic year and 38 percent of medical residents training in the United States in 2000.

Although the impact of having more women in medicine has not been determined completely, a number of studies and reports suggest that female physicians practice differently than their male counterparts do.

Geographic Distribution

One of the more entrenched physician workforce concerns in the United States has been the limited number of physicians in rural communities. In the 1980s and 1990s there was hope that as the number of physicians increased in this country, excess physicians would “trickle down” to rural areas. Data on changes in physician supply in rural areas are not readily available, but data are available for nonmetropolitan areas. The data suggest that the number of active allopathic nonfederal physicians in nonmetropolitan areas increased by 61 percent between 1980 and 2000. This increase was undoubtedly helpful to those communities, but the increase was smaller than the 74 percent increase in metropolitan areas. In absolute terms, the number of active allopathic physicians in metropolitan areas increased by more than 260,000 physicians, while nonmetropolitan areas experienced an increase of 30,000 physicians. Thus, “trickle down” may be the most appropriate term to describe the migration of new physicians into nonmetro-

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**EXHIBIT 4**

**Trends in Active Allopathic Physician Supply, By Primary Care Specialty, Selected Years 1980–2000**

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<tbody>
<tr>
<td>Family practice</td>
<td>27,530</td>
<td>40,021</td>
<td>47,639</td>
<td>59,345</td>
<td>71,635</td>
</tr>
<tr>
<td>General practice</td>
<td>32,519</td>
<td>27,030</td>
<td>22,841</td>
<td>16,867</td>
<td>15,213</td>
</tr>
<tr>
<td>Internal medicine</td>
<td>71,531</td>
<td>88,862</td>
<td>98,349</td>
<td>115,168</td>
<td>134,539</td>
</tr>
<tr>
<td>Pediatrics</td>
<td>28,803</td>
<td>36,026</td>
<td>40,893</td>
<td>50,620</td>
<td>62,386</td>
</tr>
</tbody>
</table>

Active allopathic primary care physicians

<table>
<thead>
<tr>
<th>Number</th>
<th>160,383</th>
<th>191,939</th>
<th>209,722</th>
<th>242,000</th>
<th>283,773</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per 100,000 population</td>
<td>71</td>
<td>81</td>
<td>84</td>
<td>92</td>
<td>101</td>
</tr>
</tbody>
</table>

Active allopathic non–primary care physicians

<table>
<thead>
<tr>
<th>Number</th>
<th>281,552</th>
<th>322,131</th>
<th>353,046</th>
<th>405,999</th>
<th>454,829</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per 100,000 population</td>
<td>124</td>
<td>136</td>
<td>142</td>
<td>155</td>
<td>161</td>
</tr>
</tbody>
</table>

**SOURCES:** For physicians and residents, American Medical Association, Physician Characteristics and Distribution in the U.S., 2002–2003 Edition, Tables 5.1 and 5.2. For population estimates, see Exhibit 1.

**NOTE:** Figures in exhibit include residents and fellows.
In terms of per capita supply of physicians, metropolitan areas experienced slightly slower growth (37 percent, from 205 physicians per 100,000 population in 1980 to 280 in 2000) than nonmetropolitan areas did (43 percent, from 109 physicians per 100,000 population in 1980 to 156 in 2000).37

In terms of specific geographic locations, physician supply grew somewhat unevenly between 1980 and 2000 (Exhibit 5). At first glance, it appears that the Northeast and North Central regions experienced the greatest physician supply growth. However, the number of physicians grew at the fastest rate in the South and West, in excess of 55 percent between 1980 and 2000. At the same time, the South and West experienced the fastest rate of population growth as well, with the population in the South growing 22 percent and in the West, 33 percent. Thus, the per capita physician supply in the South and West did not grow as quickly as it did in the Northeast and North Central regions.

### Discussion

The nation’s record of physician policy making and planning is mixed. While GMENAC correctly forecast the large increase in the number of active physicians in the country, its conclusion, as well as those of COGME and many analysts, that the growth would lead to a surplus appears to have been unfounded.

Although the nation’s allopathic medical schools have heeded the policy calls to constrain their growth, the number of new osteopathic graduates has risen, and the number of IMGs entering the United States continues at high levels despite a dip in the 1980s. The wisdom of limiting U.S. medical school production while demand for residents and practicing physicians remains high and large numbers of IMGs continue to enter U.S. medicine is now being reevaluated.

During the 1990s the nation greatly increased the number and percentage of new primary care physicians being trained. Although the goal of having 50 percent of new graduates in primary care was not reached, it

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**EXHIBIT 5**

**Trends In The Geographic Distribution Of The Nonfederal Allopathic Physician Supply, Selected Years 1980–2000**

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<tbody>
<tr>
<td>Northeast</td>
<td>242</td>
<td>280</td>
<td>303</td>
<td>349</td>
<td>370</td>
</tr>
<tr>
<td>Middle Atlantic</td>
<td>237</td>
<td>276</td>
<td>298</td>
<td>344</td>
<td>362</td>
</tr>
<tr>
<td>New England</td>
<td>254</td>
<td>293</td>
<td>320</td>
<td>364</td>
<td>391</td>
</tr>
<tr>
<td>North Central</td>
<td>169</td>
<td>192</td>
<td>207</td>
<td>237</td>
<td>255</td>
</tr>
<tr>
<td>East North Central</td>
<td>170</td>
<td>195</td>
<td>209</td>
<td>240</td>
<td>259</td>
</tr>
<tr>
<td>West North Central</td>
<td>166</td>
<td>186</td>
<td>203</td>
<td>231</td>
<td>246</td>
</tr>
<tr>
<td>South</td>
<td>170</td>
<td>194</td>
<td>212</td>
<td>237</td>
<td>252</td>
</tr>
<tr>
<td>East South Central</td>
<td>140</td>
<td>162</td>
<td>181</td>
<td>211</td>
<td>229</td>
</tr>
<tr>
<td>South Atlantic</td>
<td>194</td>
<td>222</td>
<td>240</td>
<td>265</td>
<td>279</td>
</tr>
<tr>
<td>West South Central</td>
<td>153</td>
<td>171</td>
<td>184</td>
<td>207</td>
<td>220</td>
</tr>
<tr>
<td>West</td>
<td>219</td>
<td>237</td>
<td>249</td>
<td>257</td>
<td>264</td>
</tr>
<tr>
<td>Mountain</td>
<td>179</td>
<td>193</td>
<td>208</td>
<td>224</td>
<td>229</td>
</tr>
<tr>
<td>Pacific</td>
<td>235</td>
<td>254</td>
<td>264</td>
<td>270</td>
<td>278</td>
</tr>
</tbody>
</table>


**NOTE:** Physician supply figures include residents and fellows.
is now clear that this was an unrealistic goal and one not based on the U.S. marketplace. As noted above, there are growing concerns with potential shortages in a variety of non–primary care specialties. Nevertheless, in the long run, the increase in the number of primary care physicians during the past decade may have a beneficial impact on health care. The lesson for the medical education community and policymakers may be the need to regularly reassess workforce needs by specialty and not to get locked into fixed ratios and fixed goals for the physician workforce. Better information on needs and moderate financial incentives may be sufficient to promote a physician workforce to meet the nation’s future needs.

The number of underrepresented minority physicians in the United States has been increasing, but the increases have been modest, and African Americans, Latinos/Hispanics, and Native Americans remain severely underrepresented in medicine. The continued lack of diversity weakens the health care system. For this reason and in light of the most recent decrease in underrepresented minority enrollment in U.S. medical schools, the nation needs to redouble its efforts to address the lack of diversity in the physician workforce.

The number of women in medicine continues to rise steadily. Over the next thirty years half of all practicing physicians will be women. Research to date suggests that female physicians have different practice styles and patterns. Clearly, the changing demographics of medicine require additional research and attention if we are to be better prepared for the future.

The authors gratefully acknowledge the data collection and manuscript preparation efforts of Mark S. Beaulieu and Karilyn C. Pucio of the Center for Health Workforce Studies, University at Albany, State University of New York.

NOTES


4. Ibid., 21–22.

5. AMA, Physician Characteristics and Distribution in the U.S., 2002–2003 Edition (Chicago: AMA, 2002), Table 51. To calculate this figure, we included all active allopathic and osteopathic physicians, as well as all residents and fellows in training.


8. Calculated from GMENAC requirements of 466,000 physicians (GMENAC, Report of the Graduate Medical Education National Advisory Committee, vol. 2, 269, Table V.I) and a projected U.S. population of 243,513,000 (Ibid., 274, Table V.3): (466,000/243,513,000) × 100,000 = 191 physicians per 100,000 population; and Weiner, “Forecasting the Effects of Health Reform.” The GMENAC requirements should be adjusted for non–patient care activities in order to make the comparison with Weiner. Using the rate of non–patient care physician activity among the supply of physicians in 1990, it was determined that approximately 13 percent of active (nonresident/fellow) physicians were engaged in non–patient care activities. Thus, the more appropriate comparison to Weiner’s range is 166 patient care physicians per 100,000 population [191 × (1–0.13) = 166].

9. There were 214 active physicians per 100,000 population in 1990: 501,612 active physicians, 92,080 physicians in residency/fellowship training, and 249,464,000 in the population.

10. Council on Graduate Medical Education, Im-


16. AAMC, AAMC Data Book, Table BI.


tables/table01.php (8 July 2002).

19. See Note 10.

20. For example, trends in ECFMG certificates issued do not equate to residency entrants and vary based on changes in the entrance requirements. The National Residency Match Program match data for IMGs miss a sizable number of IMGs who do not go through the match. Graduate medical education data from the AMA do not adequately account for new IMGs in training compared with repeaters, and selection of specialties and subspecialties can lead to longer training periods for IMGs compared with USMGs. In addition, some unknown percentage of J-1 visa holders return to their native countries after they complete training.

21. These calculations exclude IMGs in residency or fellowship training. This methodology, which compares the number of IMGs at two points in time, does not take into account that some new IMGs replace others that leave practice; thus, it underestimates the actual number of new entrants. Replacement was probably higher in the 1990s than in the 1970s, as the base of IMGs in practice was much larger and some of the earlier cohorts were likely to be nearing retirement age.


23. From 1986 to 1996 the number of U.S.-born IMGs in allopathic residency programs declined from 4,115 to 1,925. However, since 1996 their number has grown to 2,727; S.I. Etzel et al., “Graduate Medical Education in the United States,” Journal of the American Medical Association 262, no. 8 (1989): 1029–1037; “Graduate Medical Education,” Journal of the American Medical Association 278, no. 9 (1997): 775–784; and “Graduate Medical Education,” Journal of the American Medical Association 286, no. 9 (2001): 1095–1107.

24. In addition to the COGME reports, see, for example, Pew Health Professions Commission,
HEALTH AFFAIRS


The number of new family practitioners is partially offset by the decrease in general practitioners; however, the former receive formal postgraduate medical training, while the latter generally do not.

See Note 13.


AAMC, AAMC Data Book, Table B8, and “Graduate Medical Education,” Journal of the American Medical Association 286, no. 9 (2001): 1095–1107.


Data on metropolitan and nonmetropolitan areas are provided in annual editions of the AMA’s Physician Characteristics and Distribution in the U.S. In these documents nonmetropolitan areas are defined as counties of fewer than 50,000 residents.


Population data are derived from U.S. Bureau of the Census, Statistical Abstract of the United States, 2001 (Washington: Bureau of the Census, 2001). While the per capita ratio is much lower in nonmetropolitan areas, there are many subspecialties that require large population bases to maintain reasonable volume of patients, and thus it should not be expected that the per capita supply of physicians in metropolitan and nonmetropolitan areas will ever be equal.