Chapter 2
Rural Health Workforce: Context, Trends, and Issues

L. GARY HART, PH.D. • DENISE M. LISHNER, M.S.W. • ROGER A. ROSENBLATT, M.D., M.P.H.

ACKNOWLEDGMENT: *Portions of this chapter draw upon Hart et al., 2002.*

INTRODUCTION

This chapter provides an overview of the current national health care workforce context, trends, and issues that shape the local rural health workforce. We focus much of our discussion on generalist physicians, recognizing their large numbers, widespread practices, and pivotal role in the rural health care delivery system. This emphasis is not intended to diminish the importance of other types of rural health care providers (Table 2-1). Some of the most acute workforce shortages facing rural areas are actually in the nonphysician workforce—dentists, technicians, nurses, and others. The provision of health care in rural places relies on a wide variety of health care professionals, and the effective delivery of health care is dependent on their ability to work as a team (Rosenthal, 2001).

Shortage amid surplus constitutes the great American health care system paradox (COGME, 1998). The rural health care setting has long been compromised by the uneven distribution and relative shortage of medical care providers. More than 50 million of the U.S. population live in areas that are considered rural or nonmetropolitan by various definitions (Ricketts, Johnson-Webb, & Randolph, 1999). While selected communities across the nation experience surpluses of some physician specialties, rural communities often struggle to recruit and retain an adequate supply of health professionals. During the 1980s, many towns witnessed a loss of rural providers that accompanied rural hospital closures (Hart, Pirani, & Rosenblatt, 1994). Once local health care delivery systems are dismantled, few rural towns are able to resurrect them. Despite major attempts by federal and state policy makers and educational institutions to address rural provider shortages over three decades, both the shortages and misdistribution persist.

The challenge of providing medical care to rural populations of the United States is complicated by the higher level of needs among rural groups. Rural populations tend to be older, poorer, and less well insured than their urban counterparts (NRHA, 1999; Ricketts, Johnson-Webb, & Randolph, 1999). In addition, rural areas must confront issues that are part of the fabric of rurality: long travel distances to obtain health care, low population densities, diseconomies of scale, and high rates of fixed overhead costs (Hassinger & Hobbs, 1992).

Federal laws and programs cannot adequately address health care issues in both rural and urban venues in the United States. Nor can "one size fits all" solutions address the health care needs of the nation's diverse rural environment—across all of its economic, social, environmental, demographic, and epidemiological dimensions. For the most part, national policy is designed to solve urban health care delivery problems, with rural interests recognized only in times of crisis (Hart & Taylor, 2001). The prevailing national view sees the rural population as tied to urban areas for the vast majority of its medical care. In this time of dynamic health care delivery change, with its emphases on cost containment and, more recently, quality improvement, federal and state policy decisions may profoundly influence the viability of the rural health care delivery system (Hart & Taylor, 2001). Rural health workforce policies must be based specifically on rural data and research that reflect the particular needs and circumstances of this population.

Table 2-1: Number of Rural Providers[1] by Type

	Number[2] (1,000s)	Percent
Registered nurses (RNs)	281.2	48.3
Licensed practical nurses (LPNs)	109.9	18.9
M.D. physicians (2000)	79.2	13.6
Pharmacists	31.4	5.4
Dentists	18.9	3.2
Nurse practitioners (2001)	10.7	1.8
Physical therapists	12.0	2.1
Dental hygienists	9.5	1.6
Physician assistants (2001)	9.2	1.6
Cert. reg. nurse anesthetists	5.7	1.0
Optometrists	5.1	0.9
D.O. physicians (2001)	7.3	1.3
Certified nurse midwives (1996)	1.3	0.2
Podiatrists	0.7	0.1
Total[1]	**582.1**	**100.0**

[1] Only selected provider types are included. Many provider types are not included (e.g., chiropractors, dental assistants, psychologists, occupational therapists, home health aides, nurse aides, technicians, and social workers).
[2] Data are for 1990 unless otherwise noted.

RURAL PROVIDERS: KEY RURAL HEALTH WORKFORCE ISSUES

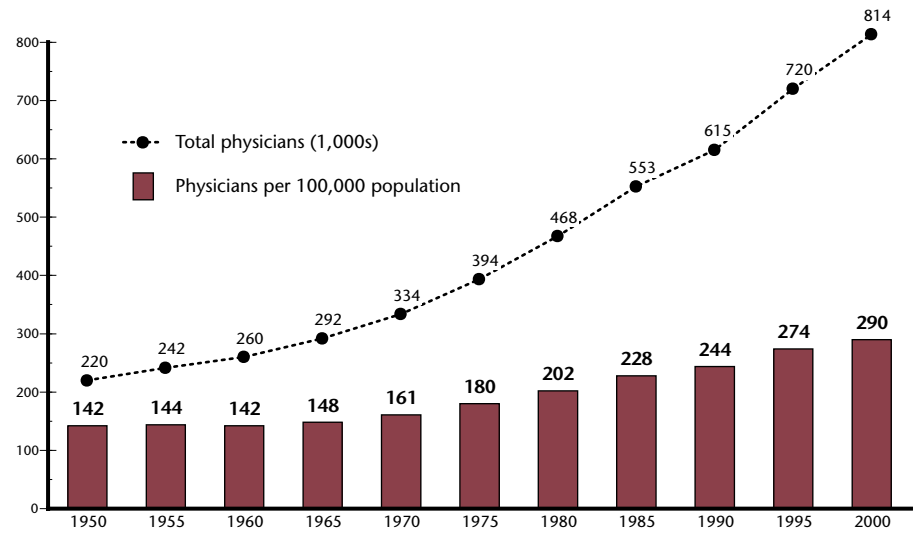
PHYSICIANS

PHYSICIAN SUPPLY

Health care is the largest single economic sector in the United States. It has grown dramatically over time, and the size of the workforce has increased in tandem. Figure 2-1 shows the growth in the physician supply over the past 50 years. More than 800,000 active physicians work in the United States—roughly 1 physician for every 350 people.

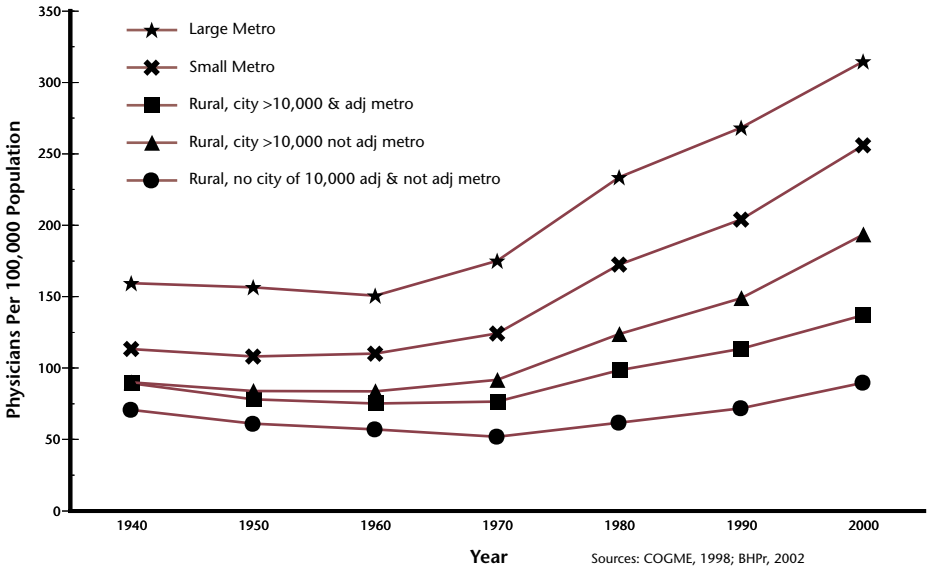
The crux of the rural workforce problem is that physicians are not distributed uniformly across the country. As seen in Figure 2-2, the density of physicians—the supply of doctors per capita—parallels the density of the population. In 2000, nearly five times as many physicians per capita practiced in America's large cities as in its most rural counties. Importantly, the relative rural shortage has doubled in the 60 years we have been tracking the situation. The data suggest that health workforce policies implemented in the early 1970s—the height of the rural health care crisis—reversed the decline in the rural physician workforce. But it is only in more recent years that the per capita supply in our smallest towns has again reached the levels that were prevalent in the 1940s.

Figure 2-1
Total Physicians by Year



Sources: AMA 2001; AMA 2002
Note: Numbers represent all federal and non-federal physicians (including residents and inactive physicians) in all U.S. states & posessions)

Figure 2-2
Active MD Physicians Per 100,000 Population, by Year & Location*



Sources: COGME, 1998; BHPr, 2002
Note: Numbers represent all federal and non-federal M.D.s (including residents) in all U.S. states

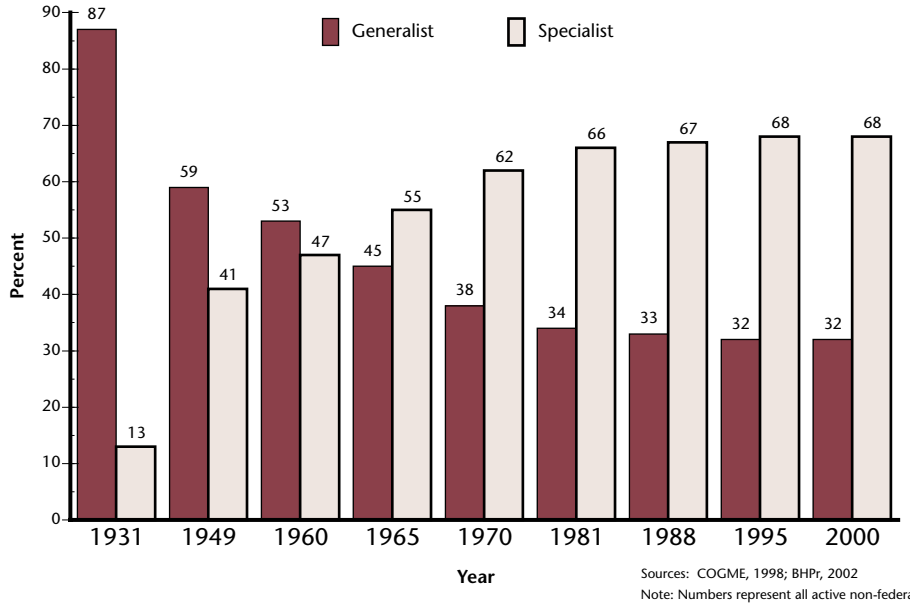
* Groups of Urban Influence Codes (Dept Agriculture).

The issue of geographic maldistribution is intertwined with the process of specialization. In 1965, there were roughly the same number of generalist physicians (family physicians, general internists, and general pediatricians) per capita as there were specialists (Figure 2-3). By 2000, the per capita supply of generalist physicians had grown by a third, but the specialty supply had more than doubled. Figure 2-4 shows why this is an important cause of the relative paucity of rural physicians. Only general and family physicians are equally as likely to practice in rural as in urban locations. All other disciplines tend to settle in cities, and the more specialized the physician, the greater this trend. The smaller and more remote the rural place, the more likely that only family physicians will be practicing there. Despite federal and state programs to encourage physicians to practice as generalists, the share who do has not meaningfully changed since 1980.

Osteopathic physicians make up 5 percent of the rural physician workforce and are more likely than their allopathic counterparts to practice as generalists (COGME, 1998). Osteopaths are significantly more likely than allopathic physicians to settle and remain in rural areas (18.1% of

osteopaths versus 11.5% of allopaths). While osteopathic and allopathic family practitioners (FPs) are equally likely to select rural practice, 46 percent of osteopaths become family physicians compared to only 11 percent of allopathic physicians.

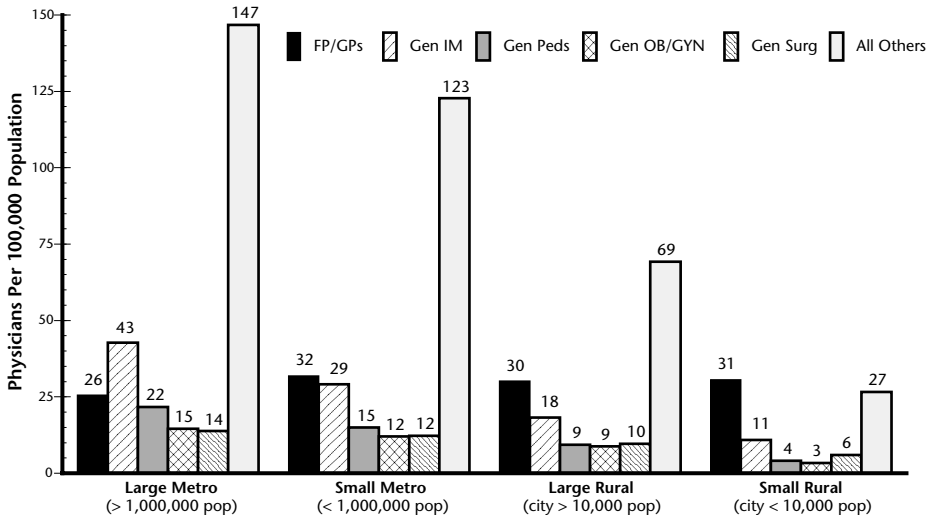
Figure 2-3
Percentage of Generalist and Specialist Physicians



The AMA reclassified MDs in 1968 causing a 3.5% change in primary and non-primary care.

Sources: COGME, 1998; BHPr, 2002
Note: Numbers represent all active non-federal M.D.s (including residents) in all U.S. states

Figure 2-4
Patient Care MD Physicians Per 100,000 Population by Location and Specialty
(2000)



Source: BHPr, 2002
Note: Numbers represent all active non-federal patient care M.D.s (including residents) in all U.S. states

THE INCREASING PROPORTION OF FEMALE PHYSICIANS—IMPLICATIONS FOR THE RURAL PHYSICIAN SUPPLY

The proportion of female physicians has dramatically increased during the past two decades. The number of female allopathic physicians more than quadrupled between 1979 and 1991 and has continued to rise (COGME, 1995). In 1997, women made up 43 percent of the first year enrollment of U.S. medical schools (Schmittdiel & Grumbach, 1999). Due to the increasing percentage of women graduating from medical schools and residency programs, it is estimated that women will represent 30 percent of the physician workforce by 2010 (Schmittdiel & Grumbach, 1999). Colwill & Cultice (2003) predict that the family physician workforce (excluding residents) will increase to 40 percent women by 2020. This transformation has far-reaching implications for rural areas. The fact that women are more likely to choose to train as generalists than men means good news for the rural communities that need generalist providers. Unfortunately for those communities, female generalists appear less likely than men to choose rural practices (Doescher, Ellsbury, & Hart, 2000). Consequently, the recent increase in the number of female physicians may ultimately exacerbate physician shortages in rural areas. Successful recruitment and retention of female providers thus poses a major challenge for rural communities.

QUALITY OF CARE

Equally important to the supply of the health workforce is the quality of care that a workforce provides. Research literature is scant and mixed concerning the quality of rural health care providers compared to urban ones. A few studies have demonstrated substantial differences in clinical prenatal and intrapartum practice styles between rural and urban physicians for similar low-risk

patients, without apparent differences in outcome (Hart et al., 1996). Women who received prenatal care from rural physicians were at no greater risk of bad outcomes than were those who visited urban physicians (Larson, Hart, & Rosenblatt, 1997). It is important to distinguish between scope of service and quality of care (i.e., the types of services a physician provides versus how well those services are provided). In many small and remote rural towns, the scope of local services is limited by factors such as low patient volumes, high personnel costs, and lack of health insurance. While positive outcomes appear associated with procedural volume, those procedures commonly performed by rural physicians have been shown to have little or no such relationship once a minimal number of the procedures are performed.

Although difficult to implement, quality of care research, performance-based evaluations, and quality assurance and improvement programs are critical to improving the health care of rural individuals (Coombs, 2001; Moscovice & Rosenblatt, 2000). Rosenblatt (2000) suggests that, just as for urban populations and providers, it is crucial to examine issues related to quality of care and the selection of appropriate scope of medical services to maximize local health outcomes. Such analyses are complicated within rural areas by the small numbers of cases, severe environmental constraints, and the scarcity of adequate data.

RECRUITMENT AND RETENTION

To correct the persistent difficulties in recruiting physicians to rural and underserved areas, rural health advocates have for several decades emphasized rural-focused recruitment and retention research, programs, and training. Studies have identified a combination of physician factors that increase success in recruiting physicians to practice in a rural areas. These include rural background, family physician specialty, rural training, proximity of family and professional opportunities that match aspirations, and such community factors as good local K-12 schools. Crandall, Dwyer, and Duncan (1990) classify factors important to rural recruitment and retention in terms of *affinity* (e.g., rural background of physician), *economic incentive* (e.g., Medicare shortage area bonus payments), *practice characteristics* (e.g., telehealth continuing medical education programs), and *indenture* (e.g., National Health Service Corps [NHSC] obligations) models. Other factors shown to encourage recruitment and retention of physicians to rural locales include creation of a stable and financially sound rural health care delivery system; and provision of opportunities for physicians to live rewarding professional and personal lives. It should be emphasized that recruitment and retention are not synonymous and that factors that affect one do not necessarily relate to the other (Conte, Imershein, & Magill, 1992; Pathman, Konrad, & Agnew, 1994; Pathman, Williams, & Konrad, 1996; Rabinowitz et al., 1999a).

RURAL TRAINING

The production of rural physicians by U.S. medical schools varies widely, from 2 percent to 41 percent of graduates (Rosenblatt et al., 1992). High proportions of the graduating classes of publicly owned medical schools in rural states—particularly those that see their mission as training future family physicians—ultimately practice in rural areas. By contrast, research-intensive private schools in metropolitan areas with no commitment to family medicine have virtually no rural graduates (Rosenblatt et al., 1992).

Encouraging students from rural communities to become physicians (or other types of health providers) begins as early as middle school with experience such as "Career Days" and continues with mentoring and opportunities for work experience in high school. Once in medical training, it is important to provide opportunities throughout medical school and residency to work in rural settings, and supports physicians in practice after they settle in rural areas. Talley (1990) asserts that (1) students with rural origins are more likely to train in primary care and return to rural areas, (2) residents trained in rural areas are more likely to choose to practice in rural areas, (3) family medicine is the key discipline of rural health care, and (4) residents practice close to where they train. Thus, rural training increases interest in rural practice at all stages of medical education. This interest, coupled with a medical school and residency training environment that values generalism, community-responsive practice, and rural life, is a recipe for improving the flow of medical practitioners to underserved rural areas.

Federal and state governments and medical education programs have implemented a variety of educational strategies to ameliorate rural physician maldistribution problems and to promote the choice of rural practice by physician graduates. Federal and state investments in these areas have been very effective, a fact reflected in their popularity and numbers. In many states, medical schools, Area Health Education Centers (AHECs), and state offices of rural health create a synergy as they work together.

Studies have demonstrated that the medical school programs that are most likely to produce rural physicians admit medical students with rural backgrounds and interest; work with a rural-focused mission; have a family medicine department; offer visible, credible faculty role models with rural experience; require sequential educational experiences in rural settings; provide advising programs to create a bridge to residency training, and require a family medicine curriculum of some length (Blackman, 2001; Geyman et al., 2000; Rabinowitz et al., 1999b).

Characteristics of graduate medical education (GME) training programs that successfully prepare physicians for rural practice include: creation of rural training tracks, fellowships, rural mission, rural location, procedural orientation, and a director with rural experience. Effective programs emphasize training in advanced obstetric care,

emergency care, general trauma care, pre- and postoperative care, surgical assisting, geriatrics, medical specialties, counseling, practice management and informatics, and community assessment (Geyman, 2001; Geyman, Norris, & Hart, 2001).

Three overriding barriers to rural residency training are inadequate reimbursement, stringent accreditation requirements, and an unhealthy rural health care delivery environment (Saver et al., 1998). Although the United States has thousands of rural hospitals, many of which have hundreds of beds and are located in communities of more than 20,000, only 70 of them received Medicare GME reimbursement in 1994, and their combined reimbursement amounted to less than 1 percent of all such reimbursement (Slifkin, Popkin, & Dalton, 1998). During 2000, only 7 percent of the nation's rural training took place in rural communities (Rosenblatt et al., 2002).

PRODUCTIVITY AND INCOME

Nonmetropolitan FPs and general practitioners (GPs), on average, earned $130,000 per year in 1996 (net income after expenses but before taxes), as compared to $131,000 for their metropolitan counterparts (AMA, 1998). This rural-urban parity of salaries is shown across all physician specialties. But in 1996, nonmetropolitan FP/GPs worked on average six hours more per week than large metropolitan FP/GPs, and they reported nearly 20 percent more patient visits (AMA, 1997). Thus, rural providers worked substantially more hours and performed more visits for about the same net income, even before taking into account the heavier on-call burden of rural practice. Rural physician incomes vary considerably, with the income of some physicians limited by small population bases, low reimbursement levels, low levels of insurance coverage, and high insurance discount levels (Wright, 2001). A critical issue is the extent to which the Balanced Budget Act of 1997 (BBA97) and managed care will curtail the real income of rural generalist and specialist physicians. This issue goes beyond the direct payments to physicians, to the fiscal health of local facilities with whom the local physicians often are strongly tied both financially and by their clinical scope of services. Furthermore, the business of rural physician practice is a difficult one that requires significant expertise and business acumen (Larimore & Rehm, 2001).

REIMBURSEMENT AND MANAGED CARE

Medicare and Medicaid reimbursement policies may represent half or more of the incomes of rural physicians (FORHP, 1997). The BBA97, the Balanced Budget Refinement Act of 1999 (BBRA99) and the Health Insurance Portability and Accountability Act of 1996 (HIPAA) are dramatically altering the fiscal realities of rural clinical practice and the rural health care delivery system environment, including the training of physicians. These changes are playing out in an environment in which managed care and network development have also come into place, as described extensively elsewhere (see managed care: Casey, 1999; see network development: Wellever, 1999; see Medicare: Mueller, Schoenman, & Dorosh, 1999; see Medicaid: Slifkin & Casey, 1999; see BBA97 and BBRA99: RUPRI, 1999a, 1999b, 1999c; see HIPAA: Hart et al., 2003; and see GME funding: Slifkin, Popkin, & Dalton, 1998; Henderson, 1999). Rural physicians and other providers now practice in a hostile fiscal environment where their reimbursement and that of other rural facilities is complicated, uncertain, and often lower than that of their urban counterparts.

Managed care has diffused into rural areas much more slowly than into urban areas, and its share of the rural market varies greatly from state to state (McBride et al., 2003; Rural Health Research Center, 1997). In 2001, Medicare+Choice enrollment in rural counties was estimated to be 9 percent (compared to 50% nationally). To survive in the business side of rural practice, physicians must deal with payment discounts, staff, changing federal reimbursement schemes, negotiating and participating in networks, risk evaluation, and managed care guidelines, often without the specialized staff that handle these issues in urban settings. Physicians must choose between the advantages of networks and managed care (e.g., economies of scale and better on-call coverage) versus loss of local independence and control (e.g., cutbacks in local charity care and scope of service) (Larson & Hart, 2001).

FEDERAL AND STATE RURAL POLICY AND AMELIORATIVE PROGRAMS

Federal and state governments have sponsored numerous programs designed to improve health workforce supply in rural areas. Indirect programs such as Medicare and Medicaid provide insurance financing that reimburses rural practitioners for services that otherwise would go unpaid or would neither be sought nor provided. Federal programs also provide supplementary Medical Incentive Payments to providers in designated rural health shortage areas and cost-based reimbursement for authorized Rural Health Clinics. Direct service programs include AHECs, Community Health Clinics (CHCs), NHSC scholarship and loan programs, Title VII and VIII health professional training funding, the Rural Outreach Grant Program, the Indian Health Service, and rural Network Development grant programs (Geyman, Norris, & Hart, 2001; Ricketts, 1999b). These programs significantly affect the distribution and other aspects of rural physician supply. For instance, the current federal initiative to increase the number and coverage of the nation's CHCs has significant physician workforce consequences. The NHSC places health care providers in rural shortage areas in an effort to provide care where it otherwise might not be available. In addition to providing scholarships and loans to students and medical care in shortage areas, the NHSC encourages retention of physicians in underserved rural areas, with varying degrees of success (Pathman, Konrad, & Ricketts, 1992; Rosenblatt

et al., 1996). Any general tightening of federal funding for rural programs and facilities will undermine efforts to promote recruitment, retention, and effective practice within rural areas.

Numerous and varied state programs are designed to facilitate the production, recruitment, and retention of generalist physicians within rural towns (Slifkin, 1999). Among the largest are state-funded scholarship and loan repayment programs that require recipients to make repayment by practicing in a rural town designated by the state. In their national study, Pathman and colleagues (2000) found that in 1996, 41 states operated such programs with a field strength of 1,676 physicians, nurse practitioners, and physician assistants.

INTERNATIONAL MEDICAL GRADUATES

The supply and distribution of rural physicians is also influenced by federal policies regarding international medical graduates (IMGs). Foreign-born IMGs are physicians who enter the United States via the Physician Exchange Visitor Program to receive residency and other medical training. The number of foreign-born IMGs increased during the 1990s. Many settle permanently in the United States, with all IMGs now representing 24 percent of the patient care physician workforce (AMA, 2001). IMG physicians come from all over the world, but in 2000, nearly half had received their medical school training in just seven countries: India (which sends a full 20% of IMGs), the Philippines, Mexico, Pakistan, China, the Dominican Republic and Egypt.

Graduates of foreign medical schools who complete residency training in the United States can participate in federal and state "incentive" programs designed to bring physicians to underserved rural areas, in some cases in exchange for permanent residence status at the conclusion of several years of service. At least in part because of these programs, almost 12,000 IMGs (excluding residents) worked in rural areas of the United States in 2000. While IMGs play a significant role in providing care in small rural communities (Hagopian et al., in press), many do not stay in the underserved areas that originally recruited them. The future direction of IMG policies and programs is clouded, given the cap on U.S. residency slots, the Council on Graduate Medical Education's recommendations to limit federal funding of IMGs through Medicare, and concerns about national security.

DESIGNATION OF SHORTAGE AREAS

A key issue related to improved configuration of the rural health workforce is the designation of areas for the targeting of program interventions (e.g., shortage areas in which NHSC obligator physicians can be placed). Health Professional Shortage Areas (HPSAs) and Medically Underserved Areas/Populations (MUA/Ps) are used for this purpose. Many federal programs in rural areas are tied to

Table 2-2: Number of Nonmetropolitan Primary Care Shortage Designations

Year	Number of Shortage Designations	Approximate Number of Providers Needed to Remove Designations
1980	1,350	2,587
1981	1,401	2,548
1982	1,423	2,313
1983	1,478	2,421
1984	1,323	2,081
1985	1,360	2,094
1986	1,304	1,887
1987	1,302	1,797
1988	1,307	1,794
1989	1,343	1,884
1990	1,440	1,970
1991	1,510	1,998
1992	1,613	2,052
1993	1,746	2,051
1994	1,843	2,206
1995	1,776	2,238
1996	1,808	2,259
1997	1,832	2,303
1998	1,885	2,343
1999	1,916	2,489
2000	1,847	2,382
2001	2,229	3,293
2002	2,278	3,432
2003	2,294	3,467

Sources: BPHC, 1997, 2000; Richard Lee, BPHC, personal communication, July 5, 2003.

HPSA and MUA/P designations, often in combination with Office of Management and Budget metropolitan/nonmetropolitan status (Rosenblatt & Hart, 1999). The number of nonmetropolitan shortage designations increased during the 1990s from 1,440 in 1990 to 1,916 in 1999 (BPHC, 1997, 2000, 2003) (Table 2-2). It is estimated that in 2003, the designated areas had a rural population of more than 28 million and that nearly 3,500 physicians would be needed to reach a ratio of 1 physician per 3,000 population. The Bureau of Primary Health Care proposed a major methodological change for shortage/need designation in 1998, and other federal programs are considering alternative designation criteria. Accurate revisions of the current short-age/need designation system are critical to ensure the appropriate targeting of government resources. It is important that researchers, policy analysts and policy makers address issues such as the varied purposes of shortage designations, their methodological premises, and how expansive or restrictive they are. Subtle methodological

distinctions may cause enormous differences in federal resource allocation, with significant consequences for rural physicians and populations.

SAFETY NET PROVIDERS

The formal and informal rural safety net—which tries to ensure a minimal level of health care to people who need it, even if they cannot afford it—is under stress from the growing numbers of rural residents who are uninsured and underinsured, rising health care costs, difficult economic times, and the fiscal realities that BBA97 and BBRA99 are causing providers. In many rural agricultural towns, local farmers and ranchers have either dropped their health insurance or have converted to policies with high deductibles. For local generalist providers, these policies are tantamount to no insurance. CHCs and Medicaid play essential roles in providing care for rural indigents, as do many other formal government, private, and foundation endeavors. Some 3.9 million rural residents received CHC services in 1996 (COGME, 1998). In small and remote rural towns, much of the safety net workload is informal, dependent on care delivered by a few local physicians and other providers with little or no reimbursement. Despite the fact that rural residents are increasingly in need of safety net medical services, researchers and policy makers have inadequate information on the magnitude of unmet need or the amount of care that is already provided at no or low cost.

TELEHEALTH

Telehealth is a technology with enormous potential for changing rural physician practice and increasing access to sophisticated medical care for rural residents. During the 1990s, technology developed rapidly to produce more economical, reliable, and higher quality telehealth services, and the federal government has funded numerous demonstration projects (Norris, 2001). But few private and government medical care payers provide reimbursement for telehealth services, and physician-related uncertainties include problems associated with interstate licensure and standardization/quality criteria. It will likely take years before we learn whether the technology can help overworked primary care physicians better serve their local community, or whether it will be used primarily as an access point for specialty care.

OTHER ISSUES

Many other national and rural health care issues dramatically influence the rural physician workforce. The implementation of HIPAA both directly and indirectly influences the rural workforce through its control over how care is provided and the cost of care. Reimbursement levels, scope of clinical coverage, and breadth of subpopulation coverage from the Centers for Medicare and Medicaid Services and its state partners influence the ability of providers to keep practicing in rural communities. An especially critical current issue is the dramatic increase in provider malpractice premiums, which can price providers out of rural practice and cripple training programs. Health policy makers should examine all proposed policies and programs carefully for their intended and unintended workforce influences.

NURSE PRACTITIONERS (NPs)

Of more than 63,000 trained NPs nationwide in 1996, about 56,000 were employed in nursing. Of these, 33,000 used the title NP, and 24,000 of this group were state licensed as advance practice nurses (Baer & Smith, 1999). The number of NPs has grown rapidly and is expected to double by 2015 (Cooper, Laud, & Dietrich, 1998). It is not known what number of licensed NPs apply their added NP authorities substantially in their practices. Licensing authority for independent practice and prescriptive authority varies widely from state to state (Sekscenski et al., 1994). Nor is it known what percent of NPs practice as generalists, despite the fact that the majority of NPs provide primary care.

About 20 percent of NPs practice in nonmetropolitan areas, and many of the training characteristics described for successful rural physician production are characteristic of NP programs (Baer & Smith, 1999). Factors negatively influencing the supply of NPs in rural practice include many of those mentioned for physicians (e.g., longer hours, more isolation, and fewer colleagues) as well as those more specific to NPs (e.g., prescription-writing restrictions, low Medicaid reimbursements, and private insurance policies) (Anderson & Hampton, 1999). NPs have been shown to be present during 37 percent of rural hospital outpatient visits, compared to 5 percent of urban visits (Anderson & Hampton, 1999). In Washington State, NPs provided 10.3 percent of all the outpatient rural generalist care (Larson et al., 2003).

PHYSICIAN ASSISTANTS (PAs)

Slightly more than 39,000 clinically active PAs practiced in the United States in 2000 (AAPA, 2001). About 18 percent of PAs practice within nonmetropolitan areas. Of the full-time rural PAs, 69 percent identified with generalist clinical care (Larson et al., 1999a). The most recent graduating PA cohorts are less likely to practice in rural areas than those PAs who graduated earlier (Larson et al., 1999b). Only 10 percent of PAs who graduated during the past four to seven years were practicing as generalists in a rural area, compared to 37 percent of those who graduated 12 or more years ago. There is also evidence that generalist PAs are attracted to states with favorable PA practice laws. In terms of ambulatory visits, full-time rural generalist PAs are nearly as productive as family physicians (Larson & Hart, 2001).

A significant issue for both NPs and PAs is how their clinical scopes of practice overlap with generalist physicians and other providers such as registered nurses. Clinical scope

of practice turf battles are a longstanding issue, as are questions related to the degree to which various provider types act as substitutes and complements. Some recent research indicates that the quality of NP and PA care may be comparable to generalist physician care where there is an overlap in scope of practice (Mundinger et al., 2000; Rosenblatt et al., 1997), but these findings are controversial and need further investigation. The overall cost, access, and quality implications of different personnel type configurations of NPs, PAs, and generalist physicians are not well understood. Issues such as physician acceptance of NPs and PAs, the role of state practice laws, and the characteristics of those providers and provider types who render care for the rural poor and elderly should be investigated further. In Washington State, PAs provide 14.4 percent of outpatient generalist rural care.

NURSES

The largest single group of rural health care providers is registered nurses, accounting for nearly two-thirds of all providers. In 1996, more than 420,000 nurses practiced in rural areas. Employment of registered nurses is expected to grow faster than the average for all occupations through 2006, a trend that will create many jobs. The 1996 National Sample Survey of Registered Nurses found that 80 percent of all registered nurses were working in metropolitan areas, and 20 percent were in nonmetropolitan counties. The northeastern states had the highest number of nurses per population and the southern states the lowest. Ratios of registered nurses to population varies substantially by region and county size and follows physicians distribution (Movassaghi et al., 1992; HRSA, 1996).

One study demonstrated that those nurses most likely to be working in rural locations were rural high school graduates with rural clinical experience during nursing school (Gordon & Denton, 1992). Further studies are needed to understand more about the reasons for the variations in availability of nurses and to develop standards of adequacy of nursing support for counties with different characteristics. Defining nursing workforce need and requirements is a necessary step in developing a long-term nursing national strategic plan (Movassaghi et al., 1992). Planning for nursing recruitment must be linked to examination of retention factors. Improving the job environment (Pan et al., 1995), minimizing paperwork requirements (Congdon & Magilvy, 1995), addressing inequality of salaries (Pan & Straub, 1997), and offering continued professional education development (Farmer & Richardson, 1997) are workforce policy areas to be addressed. In many cases, restraints on the scope of local rural clinical care are limited as much by the availability of experienced local clinic and hospital nursing staff configurations as by the physician mix. It is clear that the United States is experiencing a national nursing shortage that puts exceptional stress on the rural health care delivery system and limits local access to care.

OTHER HEALTH CARE PROFESSIONALS

Many other types of rural health professionals play an important role in the delivery of health care to rural populations. These include, but are certainly not limited to, certified nurse anesthetists, certified nurse midwives, chiropractors, public health professionals, pharmacists, mental health professionals, naturopaths, dentists, and physical therapists. We know surprisingly little about these provider groups, including, for example, the workforce configuration and needs of rural local health districts and mental health services (Hartley, Bird, & Dempsey, 1999; Richardson, Casey, & Rosenblatt, 2001; Woolf, Dewar, & Ruditer, 2001). Further research is necessary to determine the need for, supply, and distribution of these professionals in rural America.

CONCLUSIONS

Providing accessible, high quality health care to rural Americans requires a sufficient number of health care providers, with training appropriate to the population they serve. Rural areas have historically struggled to recruit and retain well-trained health professionals. The smaller and more remote the area, the more difficult the challenge. The data presented in this chapter demonstrate that the problem is exacerbated as the health care enterprise becomes larger and more specialized, because rural areas have trouble sustaining capital-intensive health care structures and attracting and retaining specialized providers.

The inadequate health workforce supply in rural areas is of broad public policy importance because a significant proportion of Americans live in rural areas, and they are on average older, poorer, and less well-insured than their urban counterparts. Efforts to constrain health care costs, declining physician interest in generalist disciplines, the tendency for female physicians to practice in urban settings, and chronic shortages of many categories of health professionals make the problems seem at times to be intractable. But federal and state policies have had a powerful influence in the past, and with governmental support, training institutions have demonstrated their ability to respond to rural health workforce shortages.

In the chapters that follow, we will explore these issues in more depth and provide detailed state-by-state data on various aspects of the rural health workforce. Timely, accurate, and comprehensible data are a prerequisite to both the diagnosis and treatment of the chronic health workforce problems confronting rural communities. The problems are large, but they are not insoluble.