COUNCIL ON GRADUATE MEDICAL EDUCATION

Tenth Report

Physician Distribution and Health Care Challenges in Rural and Inner-City Areas

FEBRUARY 1998

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U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Health Resources and Services Administration

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The Council on Graduate Medical Education

The Council on Graduate Medical Education (COGME) was authorized by Congress in 1986 to provide an ongoing assessment of physician workforce trends and to recommend appropriate federal and private sector efforts to address identified needs. The legislation calls for COGME to serve in an advisory capacity to the Secretary of the Department of Health and Human Services (DHHS), the Senate Committee on Labor and Human Resources, and the House of Representatives Committee on Commerce. By statute, the Council was to terminate on September 30, 1995. It has been extended through the end of FY 1998 by appropriations legislation.

The legislation specifies 17 members for the Council. Appointed individuals are to include representatives of practicing primary care physicians, national and specialty physician organizations, international medical graduates, medical student and house staff associations, schools of medicine and osteopathy, public and private teaching hospitals, health insurers, business, and labor. Federal representation includes the Assistant Secretary for Health, DHHS; the Administrator of the Health Care Financing Administration, DHHS; and the Chief Medical Director of the Veterans Administration.

Charge to the Council

The charge to COGME is broader than the name would imply. Title VII of the Public Health Service Act, as amended by Public Law 99-272 as amended by Title III of the Health Professions Extension Amendments of 1992, required COGME to provide advice and make recommendations to the Secretary and Congress on a wide variety of issues:

1. The supply and distribution of physicians in the United States.
2. Current and future shortages or excesses of physicians in medical and surgical specialties and subspecialties.
3. Issues relating to international medical school graduates.
4. Appropriate federal policies with respect to the matters specified in items 1-3, including policies concerning changes in the financing of undergraduate and graduate medical education (GME) programs and changes in the types of medical education training in GME programs.
5. Appropriate efforts to be carried out by hospitals, schools of medicine, schools of osteopathy, and accrediting bodies with respect to the matters specified in items 1-3, including efforts for changes in undergraduate and GME programs.
6. Deficiencies and needs for improvements in existing data bases concerning the supply and distribution of, and postgraduate training programs for, physicians in the United States and steps that should be taken to eliminate those deficiencies.

In addition, the Council is to encourage entities providing graduate medical education to conduct activities to voluntarily achieve the recommendations of this Council specified in item 5.

COGME Reports

Since its establishment, COGME has submitted the following reports to the DHHS Secretary and Congress:

- First Report of the Council, Volume I and Volume II (1988)
- Second Report: The Financial Status of Teaching Hospitals and the Underrepresentation of Minorities in Medicine (1990)
- Scholar in Residence Report: Reform in Medical Education and Medical Education in the Ambulatory Setting (1991)
- Third Report: Improving Access to Health Care Through Physician Workforce Reform: Directions for the 21st Century (1992)
- Fourth Report: Recommendations to Improve Access to Health Care Through Physician Workforce Reform (1994)
- Fifth Report: Women and Medicine (1995)
- Sixth Report: Managed Health Care: Implications for the Physician Workforce and Medical Education (1995)
- Seventh Report: Physician Workforce Funding Recommendations for Department of Health and Human Services' Programs (1995)
- Eighth Report: Patient Care Physician Supply and Requirements: Testing COGME Recommendations (1996)
- Ninth Report: Graduate Medical Education Consortia: Changing the Governance of Graduate Medical Education to Achieve Workforce Objectives (1997)

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Executive Summary

PURPOSE OF THIS REPORT

Access to health care in the United States is affected by where physicians locate. The tendency for physicians to practice in affluent urban and suburban areas—a phenomenon known as geographic maldistribution of physicians—creates barriers to care for people living in rural and inner-city areas. This report summarizes the extent of this problem, discusses the effect of an impending physician oversupply on the locational patterns of physicians, and proposes concrete recommendations to improve the geographic distribution of physicians in the United States.

THE PERSISTENCE OF GEOGRAPHIC MALDISTRIBUTION IN RURAL AND INNER-CITY AMERICA

Geographic maldistribution of health care providers and service is one of the most persistent characteristics of the American health care system. Even as an oversupply of some physician specialties is apparent in many urban health care service areas across the country, many inner-city and rural communities still struggle to attract an adequate number of health professionals to provide high-quality care to local people. This is the central paradox of the American health care system: shortages amid surplus.

Geographic maldistribution is related to a large extent to the career choices of U.S. medical school graduates. Physicians who enter into the primary care disciplines—and particularly those who choose to be become family physicians—are much more likely to practice in underserved areas than their peers who enter narrowly defined specialties. Private and governmental interventions in the medical education system to increase the production of family physicians and other primary care physicians have been successful, particularly when coupled with federal programs that deliver care to the underserved and offer incentives to those physicians who provide that care. Programs such as the National Health Service Corps (NHSC), the Community Health Center (CHC) Program, and targeted incentives provided through Medicare and Medicaid, provide vehicles to bring physicians to areas where they would not otherwise practice.

Geographic maldistribution did not develop overnight. In fact it is one of the most enduring features on the American health care landscape. Yet it should not be assumed that it is an unalterable rift that cannot be bridged. It is the opinion of COGME that geographic maldistribution can—and will—yield to combined efforts of public and private institutions. The challenge is to ensure that a variety of public and private interventions are tightly integrated and mutually supportive.

RECOMMENDATIONS

COGME's recommendations are of three types:

1. **To address physician geographic maldistribution generally**
2. **To address the problem of rural physician shortages**
3. **To address problems specific to inner-city urban areas**

GENERAL RECOMMENDATIONS

Although access to care is affected by the geographic maldistribution of physicians, it is impossible to disentangle the issue of geographic maldistribution from that of health insurance. The most direct and efficient way to improve access to underserved populations is to assure they have health insurance coverage, and then address the residual problem of provider maldistribution with focused programs that deploy health professionals to places with insufficient providers. A second general approach is to change the specialty and practice location choices of American medical graduates. Educational interventions designed to increase the proportion of medical students choosing primary care disciplines in general medicine, and in particular family medicine, are a critical component of any strategy to address the geographic maldistribution of physicians.

Until universal health insurance is enacted, the federal government will need to continue to support a medical care safety net, a network of integrated programs able to provide care for the tens of millions of people without financial access to health care. Given the long history of existing safety-net programs, it would be prudent to expand the safety net using these well-established programs while improving their integration. To the extent that resources for these programs are limited, it is critical to ensure that the measures used to identify places in need be further refined.

Recommendation 1: **Continue to develop policies that increase the proportion of the population with health insurance coverage.**

Recommendation 2: **Significantly increase the NHSC to enable it to serve the growing number of underserved people in rural and urban areas.**

Recommendation 3: **Significantly increase funding for community health centers and other safety-net programs to enable them to serve the growing number of underserved people in rural and urban areas.**

Recommendation 4: **Create a joint federal-state-local strategy for coordinating, and expanding where needed, the spectrum of safety-net activities to ensure that underserved populations receive adequate access to the full range of appropriate health services.**

Recommendation 5: **Continue to support federal and state programs that have been proven to increase the number of physicians who choose generalist careers, and who practice in rural and inner-city areas and serve underserved populations.**

Recommendation 6: **The current methods used by the government to designate medical underservice should be replaced by a uniform, rational, objective, feasible, and periodically updated measurement. Current efforts of the Health Resources and Services Administration (HRSA) to revise the designations—termed the Health Professional Shortage Area (HPSA) and the Medically Underserved Area (MUA)—should be bolstered and expedited. They should include to the extent feasible measures of health status, poverty, cultural disadvantage, the availability of health insurance coverage, and the effective supply of all health personnel, not just physicians. Designations should be precise enough to promote the most effective targeting of limited federal resources.**

Improving the Supply of Rural Physicians

Although the supply of rural physicians has increased modestly in the last few decades, most of the increase has occurred in the larger rural communities adjacent to metropolitan areas. Rural supply lags far behind the current urban supply of physicians. Family physicians distribute themselves in proportion to the population in both rural and urban locations and are the largest single source of physicians in rural areas. Osteopathic physicians are proportionately more likely than allopathic physicians to be located in rural areas. All other specialties are much more likely to settle in urban areas. The more highly specialized the physician, the less likely it is the physician will settle in a rural area. As a consequence, any strategy to improve rural physician supply must begin at the medical student and resident level. Merely expanding the total physician supply is an very inefficient way of improving the geographic distribution of physicians.

In addition to the training of family physicians, other strategies can enhance the provision of health care to underserved rural areas. Programs that increase the likelihood that women physicians will locate in rural areas need to be explored. Nonphysician health providers make important contributions to the workforce in rural areas and complement the physicians practicing there. And new technological bridges between rural and urban areas such as telemedicine links offer promise in supporting rural practitioners and broadening the scope and enhancing the quality of services they can provide locally.

The number of international medical graduates (IMGs) practicing in the United States has expanded rapidly in recent years and is a major reason for the projected oversupply of physicians. Although some IMGs provide valuable services to underserved rural and urban populations, most end up practicing in well-supplied urban areas, and their addition to the U.S. workforce deprives their home countries of needed physicians while contributing to U.S. oversupply. In order to ensure that the training of IMGs benefits the United States and the countries from which these physicians originate, it is important to make major modifications in this part of the system.

Recommendation 7: **The nation should continue to encourage and support medical education and health care delivery programs that increase the location of physicians in rural areas, with an emphasis on the smaller and more remote communities.**

Recommendation 8: **Federal support for undergraduate and residency training of family physicians should be sustained. Programs authorized under Title VII of the Public Health Service (PHS) Act support family medicine programs with a successful record of training physicians who choose to practice in rural and underserved areas. These efforts should be continued and increased.**

Recommendation 9: **Encourage the development of primary care residencies in general internal medicine and general pediatrics and residencies in general surgery and obstetrics and gynecology that prepare, deploy, and support graduates who will have the skills and the desire to practice in rural areas.**

Recommendation 10: **Support research into the impact of gender on rural practice location, and consider the establishment of demonstration programs that lead to an increase in the number of women practicing in rural areas.**

Recommendation 11: **Eliminate Medicare direct and indirect educational subsidies for new exchange visitor (J-1 visa) residents as part of the process of reducing the number of first-year residency positions to 110 percent of 1993 U.S. medical graduates.**

Recommendation 12: **Use a portion of the Medicare savings realized to increase funding for medical student and residency programs that prepare U.S. medical school graduates (USMGs) for service in rural and urban underserved areas. These funds should also be used to support targeted expansion of community and migrant health centers and the NHSC.**

Recommendation 13: **Continue enhanced Medicare payments to rural providers in underserved areas, coupled with more research to determine the best way to construct the incentives so as to optimize their influence.**

Recommendation 14: **Support continued experimentation in rural telemedicine efforts, while forging consensus on how these services should be provided, licensed, and paid for.**

Improving the Supply of Physicians in Inner-City America

Inner-city residents often have major problems gaining access to health care, but the availability of local physicians is but one component of a much more complex problem. In the inner city, use of health services is much more likely to be constrained by culture, language, class, income level, race, ethnicity, health insurance, and transportation — all of which matter more than whether the nearest clinic is around the corner or across town. In cities, barriers to care are much more a function of the structure of the social and health care system than they are the result of where physicians locate. Merely locating doctors in designated underserved areas of our cities will have little impact on the delivery of health care without other more profound changes in the system. To improve the health care for the urban underserved, urban health care must be treated as a multifaceted entity.

Reliance on independent private practice in office-based settings is unlikely to be effective in addressing the health care needs of most underserved urban communities. Patterns of residential segregation based on race, ethnicity, and class will likely perpetuate the shortages of physicians in these areas. Federally supported community health clinics and innovative collaborations between local health departments, community hospitals, neighborhood associations, and academic medical centers will be the foundation of future efforts to improve services to inner-city populations and to bring more physicians to these communities. These programs will also need to learn to manage creatively the new challenges and opportunities represented by managed care in its public and private forums.

Recommendation 15:

- **Federal policy should reflect the effectiveness of publicly funded community health centers in addressing the problems of underserved urban populations and should expand these models of care, where needed.**
- **Partnerships should be forged between government at federal, state, and local levels and private and academic groups to develop innovative community-based primary care group practices in underserved urban areas. Federal policy should encourage these partnerships, and any disincentives to their creation should be removed.**

Recommendation 16:

- **The federal government should provide technical assistance to clinics in underserved areas to enable them to participate more successfully in managed care programs, especially under Medicaid managed care contracts. The current efforts of the Bureau of Primary Health Care (BPHC) in this area are a promising start and should be expanded to include clinics in shortage areas that are not directly funded under the consolidated Community Health Centers program.**
- **Managed care plans in which Medicaid beneficiaries are enrolled should be required**

to enter into contracts with established community clinics and associated health providers located in shortage areas.

- **The federal government should monitor managed care programs to evaluate their effectiveness in providing access to health care for individuals enrolled in these programs, and their impact on providers in shortage areas, including community clinics.**

Recommendation 17: **The Public Health Service should more closely coordinate 330 clinic and National Health Service Corps funding, in order to improve support for staffing at these sites.**

Recommendation 18:

- **Critical efforts to promote the representation of minorities in medicine such as the "3000 by 2000" initiative of the Association of American Medical Colleges (AAMC), and related initiatives of private foundations and schools, should be continued and enhanced.**
- **Continue Federal and state programs that encourage minority participation in medical education, and where possible, increase their support.**

Recommendation 19: **Federal, state, and local initiatives should be coordinated to mutually support efforts to solve the problem of poor health status among the urban poor.**

Recommendation 20: **The federal government, in collaboration with states and foundations, should provide resources to support research related to the health care workforce for urban underserved areas.**

Geographic Maldistribution in the United States — Genesis and Response

Large numbers of Americans have limited access to health care. The problem stems from two defining and interrelated characteristics of our health care system: the large number of Americans without health care insurance and the tendency of health care professionals to locate and practice in relatively affluent urban and suburban areas. This latter issue—known as physician geographic maldistribution—is the subject of this report.

Geographic maldistribution is a theme that has run through COGME's discussions and reports since its inception a decade ago. During the time that COGME has studied the supply of health professionals in the United States—a decade marked by rapid expansion in the absolute and relative number of practicing physicians—geographic maldistribution has persisted. Even as an oversupply in some physician specialties is beginning to have an impact in selected health care service areas across the country, many inner-city and rural communities still struggle to attract an adequate number of health professionals to provide high-quality care to local people. This is the central paradox of the American health care system: shortages amid surplus. Large and needy segments of the population in our country continue to experience a lack of basic health services, while the larger society at times receives health services that may not improve individuals' quality of life, or their health outcomes.

These are not new findings, but it is time to develop a renewed sense of urgency because of the profound changes in financing and delivery of health care taking place in the United States. Vertically integrated health care systems providing managed care to defined populations are rapidly becoming the norm for the majority of Americans; however, it is not clear whether currently underserved populations will eventually be folded into these new systems of care. To the extent that these systems of care penetrate into inner cities and isolated rural areas, it is possible that they will make health care more available to historically underserved areas. On the other hand, if managed care systems restrict themselves to populations with ample health insurance coverage, it is entirely possible that the disadvantaged segments of American society will be left further behind.

The situation is further complicated by the wide variety of federal, state, and private programs that have been developed to address—either directly or indirectly—problems associated with geographic maldistribution. Starting with the establishment of community and migrant health centers and the NHSC over 25 years ago, the federal government has invested billions of dollars to remedy some of the effects of geographic maldistribution. These programs have been supplemented by major changes in the education of physicians, with an overdue attention to the training of more primary care providers.

As will be seen, many of these programs have been absolutely critical to enhancing access for underserved populations in the United States. Still, it is fair to ask whether these programs have achieved their goals and whether they will remain the most effective vehicles for providing a "safety net" for those people who do not receive care in other ways.

Geographic maldistribution did not develop overnight. In fact it is one of the most enduring features on the American health care landscape. Yet it should not be assumed that it is an unalterable chasm that cannot be filled. It is the opinion of the Council that geographic maldistribution *can* yield to combined efforts of public and private institutions. This report will detail some of the steps we feel should be taken to accomplish this end.

HEALTH PROFESSIONAL SHORTAGE IN THE AMERICAN CONTEXT

The first systematic discussions of geographic maldistribution began in the 1930's in this country (Lee & Jones, 1933), but the problem did not move onto the public agenda until the late 1960s. The report of the National Advisory Commission on Health Manpower in 1967 declared a national shortage of physicians and was one of several influential reports that catalyzed an enormous expansion in the nation's capacity to train physicians. The effort was a rapid success: new medical schools were established and existing schools expanded their class size. Within 10 years it was evident that we had closed the gap, and were about to overshoot the mark. In 1980, the Graduate Medical Education National Advisory Council (GMENAC) stated in its landmark report the finding that there would soon be a surfeit of physicians. Although there have been some who have at times demurred, COGME has found repeatedly that physician oversupply in certain areas and specialties has begun to be

apparent and will increase. The evidence is now stronger than ever that the future supply of most specialty physicians is and will be substantially above requirements under a variety of alternative scenarios (COGME, 1996).

Despite any oversupply of physicians, geographic maldistribution persists, though the exact extent of the problem is difficult to measure with precision. The governmental response to geographic maldistribution has been multifaceted and vigorous. Beginning with the community and migrant health centers in 1970 and with the NHSC Program in 1970, federal programs—often with state and local partnerships—have attempted to identify specific areas of shortage and intervene by directly providing both health care providers and grant funds designed to foster the provision of medical services to underserved populations.

Before discussing the specific problems of health professional supply in rural and inner-city areas, it is important to understand how these federal programs work. In the 25 years that these programs have grown, they have come to comprise the medical safety net, that web of health services that catches those who fall through the cracks created by a porous patchwork of public and private health insurance programs that most people rely on to help them purchase health services. The following discussion reviews the origins, development, and current status of these programs, as a prologue to a more focused discussion of geographic maldistribution in specific segments of American society.

FORMAL METHODS TO IDENTIFY AND DESIGNATE SHORTAGE AREAS — HPSAs AND MUA/Ps

Federal health personnel programs such as the NHSC are critical tools among relevant federal programs designed to address the geographic maldistribution of health personnel and other health-related resources. But not every community or organizational entity that would like to use these programs has a significant shortage of health personnel. Eligibility for federal health personnel programs such as the NHSC is triggered by designating an area as a HPSA; other federal interventions require designation as a MUA. As seen in Figure 1-1, these formal designations theoretically allow the government to allocate resources made available by relevant federal programs.

But how well do these shortage area designations do the job they were intended to do? Do they adequately differentiate areas or entities with sufficient health care providers from those that "need" or "deserve" federal resources? Evidence has accumulated that the designation tools currently in use do an inadequate job of allowing government to target its resources to places with the most need. It is worth briefly reviewing the genesis of the two major designation tools—both of which are currently undergoing review for possible changes as of this writing—and discussing their shortcomings.

HEALTH PROFESSIONAL SHORTAGE AREAS (HPSAs)

The predecessor to the HPSA, the Critical Health Manpower Shortage Area (CHMSA), was created as part of the initial legislation that created the NHSC (Pub Law No. 91-623). The designation was originally based on the physician-to-population ratio; areas with fewer than one physician for every 4,000 people were designated as shortage areas and became eligible for the assignment of NHSC personnel.

The primary care HPSA (initially designated as the Health Manpower Shortage Area, or HMSA, in Public Law No. 94-484) has evolved over the years to reflect the increasing supply of physicians and changes in the nature of the federal programs that use the designation as a way to target resources. Since 1978, designation as a HPSA has required a ratio of 3,500 people to one full-time equivalent primary care physician, excluding current NHSC assignees, other federal physician employees, IMGs with U.S. residency training possessing J-1 visa waivers, as well as other primary care practitioners such as physician assistants and nurse practitioners. In addition, areas with mitigating factors such as unusually high service needs can be designated with ratios of 3,000:1. Although the initial designations were limited to geopolitical areas, current law allows the designation of any area, population group, or facility if the requesting entity can demonstrate unusually high needs or access barriers such as poverty, language, or cultural differences.

The evolution of the HPSA designation has allowed enormous flexibility for entities wishing to obtain this designation, and many have availed themselves of this opportunity: 1,970 of 3,141 of the nation's rural counties—62.7 percent—were designated in whole or part as primary care physician HPSAs in 1995. In total, there were 2,597 designations across the nation in June of 1997 (68% geographic areas, 26% population groups, and 6% facilities). Unfortunately, as this measure gained flexibility, it lost specificity. As the Government Accounting Office and other researchers have pointed out, many designated HPSAs are located

FIGURE 1 - 1

Programs Using HPSA and MUA Methodologies to Designate Eligible Areas

Program	*HPSA*	*MUA*
National Health Service Corps Scholarship Program	Yes	No
National Health Service Corps Loan Repayment Program	Yes	No
Medicare 10% bonus for physicians	Yes	No
Higher customary charges for new physicians vis-á-vis Medicare reimbursement	Yes	No
Community health center (Section 330 of PHS Act	No	Yes
Federally qualified health center look-alike (Section 330 of PHS Act)	No	Yes
Rural Health Clinic certification	Yes	Yes
J-1 Visa Waiver Program (International Medical Graduates)	Yes	Yes
Medicare reimbursement for Telehealth Services	Yes	No

Source: Adapted from Taylor DH, Ricketts TC, Kolimaga JT, Howard HA. The measurement of underservice and provider shortage in the United States: a policy analysis. The North Carolina Rural Health Research Program under grant number CSR000002-02-0 from the Office of Rural Health Policy, Health Resources and Services Administration, Public Health Service, U.S. Department of Health and Human Services, 1994.

in areas with adequate numbers of physicians (Berk et al., 1983; General Accounting Office (GAO), 1995; Ricketts & Taylor, 1996; Taylor et al., 1995). Although the populations so designated may or may not have ready access to those physicians, the original HPSA designation process has become less useful to the government as a tool for prioritizing the use of scarce federal resources. Furthermore, as the process of designation becomes more malleable, places may be designated more on the methodological or political sophistication of those applying for such designation, than on their relative need for scarce federal resources. Nevertheless, HPSA designations are periodically reviewed and designations can be removed based on changes in the area's data.

MEDICALLY UNDERSERVED AREAS AND POPULATIONS (MUA/PS)

The MUA arose in the Health Maintenance Organization (HMO) Act of 1973 (Public Law No. 93-222), originally to promote the creation of HMOs in rural areas. Currently, MUA/P designations are used to trigger programs such as CHCs, certification of entities as Federally Qualified Health Centers (FQHCs) eligible for cost-based reimbursement through Medicare and other third-party payers, and a variety of other programs (see Figure 1-1). However, under the new Balanced Budget Act of 1997 (BBA, P.L. 105-33), Medicaid will phase down cost-based reimbursement for FQHCs and rural health clinics (RHCs) between FYs 2000 and 2003. States are to make up the difference between what the managed care organization or HMO pays and the phased-down percent of cost-based reimbursement, and transitional payments are to be made for services provided to FQHCs and RHCs by managed care organizations until October, 2003.

The MUA is based on four variables: the primary care physician-to-population ratio, the infant mortality rate, the percentage of the population 65 years of age and older, and the percentage of the population with an income below the poverty level. Rankings on each of these parameters are scored and summed, and regions with scores below an arbitrary figure are designated as MUAs. In addition, state governments may override this process by requesting designation because of unusual local health conditions. Population groups can be designated as well as areas. Unlike HPSAs, there is no requirement for periodic review of the MUA designations or for loss of designation of areas based on changes in their demographic composition, health resources, or health status.

While the process of designation of an area or population as a MUA/P resembles that of a HPSA, the designations often do not overlap. Although both measures are potentially important as statistical tools used to describe health shortages in the United States—and critical in the process of deploying federal resources—both have lost the somewhat slender methodological moorings upon which they were based. Because of the evolution of the definitions and how they are applied, these designation criteria have become less useful as a way to summarize the extent of geographic maldistribution of health resources in the United States.

For these reasons, a major effort is under way in DHHS to revise, link, and update the MUA and HPSA designation process. This would incorporate additional measures of underservice in MUA designations; make HPSAs a subset of MUAs; include nurse practitioners (NPs), physician assistants (PAs), and nurse midwives in counts of primary care practitioners; and include regular updates of the MUA designations on the same schedule as HPSA designations.

The BBA requires that the area in which an RHC is located must be in a shortage area (HPSA

or MUA) that has been reviewed by HRSA within the last three years. The Secretary must find that there are insufficient numbers of needed health care practitioners in the clinic's area, not just primary care physicians. Clinics that no longer meet the shortage area requirements may retain their designation only if the DHHS Secretary determines they are essential to primary care services in the area.

FEDERAL PROGRAMS TO MITIGATE PROVIDER SHORTAGES

The federal government has been very active in its attempts to remedy the geographic maldistribution of physicians. Over almost 30 years, an array of programs have been created that seek to bring health care providers to communities in need. Although it is impossible in this document to discuss all the federal programs that touch in some way on the issue of health professional distribution, the programs tend to cluster around five major strategies: deployment of health professionals to areas of need, establishment of clinics for the direct provision of care, educational interventions designed to increase the flow of health professionals to underserved areas, economic incentives to induce health professionals to practice in underserved areas, and research and consultation aimed at specific problems associated with maldistribution. The following is a partial list of some of the most prominent programs that have been established to affect distribution of health professionals, organized according to these five strategies.

Deployment of Health Professionals to Shortage Areas

The program specifically designed to address geographic maldistribution is the NHSC. Created in 1970 to meet the needs of communities with health professional shortages, the NHSC directly deploys health professionals to nonprofit and governmental organizations located in HPSAs. The program began as a sort of domestic medical Peace Corps, with recent graduates volunteering to serve in mostly rural places as federal employees sponsored by local community boards.

During the last 25 years, the NHSC has changed its character and its emphasis. Most NHSC professionals currently receive scholarships or loan forgiveness that pay for all or part of their medical education, and thus incur service commitments that they discharge through the NHSC. The place where many of the NHSC personnel practice has also changed. In 1996, roughly half of the 2,331 physicians, nurse practitioners, physician assistants, nurse midwives, dentists, and mental health professionals fulfilling their service commitments in the NHSC worked in CHCs, although they constitute only 8.8 percent of the centers' physician staff.

The NHSC has been criticized over the years because a relatively small percentage of those assigned remain for long periods after the fulfillment of their obligations (GAO, 1995; Pathman et al., 1992). But it is also clear that a significant number of physicians remain in or fairly close to their original assignment site and provide a substantial amount of obligated and nonobligated community service (Cullen et al., 1997; Rosenblatt et al., 1996).

The NHSC is an very flexible instrument of federal policy. Because the government has the ability to directly deploy health professionals to areas of need, the NHSC has the theoretical capacity to eradicate all shortages. The conceptual problem that is not easily addressed is that access barriers caused by a lack of health insurance or cultural or linguistic barriers deprive people of access even though they live in places with an ample supply of physicians. One of the reasons that the HPSA designation process has been stretched beyond its original purpose has been to allow programs to be established in places where the aggregate supply of health professionals is clearly adequate and yet a significant number of people are still underserved.

Community Health Centers — Establishment of Clinics for Direct Provision of Care

A major example of federal intervention to provide access to needy populations—and one of the largest organized networks of care in this country—is the community and migrant health centers program. Growing out of the neighborhood health centers established in the 1960s, community and migrant health centers are now a major employer of health professionals serving underserved rural areas, communities with large numbers of migrant and seasonal farm workers, and disadvantaged inner-city neighborhoods. Today the term CHC encompasses four primary care programs—CHCs, migrant health centers, health care for the homeless, and health care for residents of public housing—all consolidated into a single "health center" authority under P.L. 104-299, the Health Centers Consolidation Act of 1996. Figure 1-2 shows various statistics on federally funded CHCs, stratified by rural and urban location.

CHCs are involved in a wide variety of creative collaborations with state, county, and local government; academic health centers; public health de-

FIGURE 1 - 2
Community Health Center Statistics
Fiscal Year 1996*

	Urban	Rural	Total
People served (in millions)	3.9 (50%)	3.9 (50%)	7.8
Service delivery sites	1,536 (39%)	2,367 (61%)	3,903
Grantees	263	363	625
Funding (in millions of $):			
BPHC grants	355 (53%)	314 (47%)	669
Other grants & contracts	308 (72%)	119 (47%)	427
Patient collections & third-party payments	757 (58%)	550 (42%)	1,307
Other revenues	53 (69%)	24 (31%)	77
Total funds	1,473 (59%)	1,007 (41%)	2,480
Clinicians:			
Primary care physicians	1,999 (53%)	1,739 (47%)	3,738
NPs, PAs, CNMs	966 (52%)	900 (48%)	1,866
Dentists	513 (59%)	357 (41%)	870
Psychiatrists	38 (76%)	12 (24%)	50
Other physician specialists	61 (67%)	30 (33%)	91

*Community and migrant health centers funded under Sections 330 of the U.S. Public Health Service Act

Source: Bureau of Primary Health Care, Health Resources and Services Administration, 1997.

partments; foundations; and other federal agencies. They have a very direct influence on the spatial distribution of health professionals because they hire or sponsor health care workers whose major job is providing care to the underserved. Although it is impossible to be precise, CHCs care for approximately 10 percent of the uninsured people in the United States, more than four million people annually. However, CHCs are not distributed evenly across the nation, with some states having none or few rural CHCs (e.g., Wyoming and North Dakota) while others have many (e.g., South Carolina).

A significant problem is that not all of the health care professionals practicing under the auspices of these programs are captured in current estimates of the supply of health professionals. The major source of information about the location, specialty, and practice type of physicians in the United States comes from the American Medical Association's (AMA) Masterfile, a periodic survey of practicing physicians that contains limited information about federally sponsored clinics. The CHC and NHSC programs together employ directly more than 7,500 health care providers, predominantly MDs and DOs, but also NPs, PAs, and certified nurse midwives (CNMs). The AMA Masterfile does not have a specific designation for community or public clinics, and because of its periodic survey methods may undercount newly graduated resident physicians who remain for short periods in their first practice—a status more likely to pertain to physicians working in CHCs. In addition, federal employees and obligated NHSC clinicians are specifically excluded from the enumerations of physician supply used to create the HPSA designations. Thus, current estimates of the extent of shortage are made as if the CHCs did not exist, although they have become a widespread, sophisticated, and stable part of the health care system.

The NHSC and CHC programs are often linked in the discussions of this report. While they unquestionably overlap in their objectives and are often synergistic in providing better access to care at the local level as NHSC providers help staff community health clinics, the two programs are not inextricably linked. Each program has independent as well as shared roles within the federal strategy to combat geographic and financial access problems.

EDUCATIONAL INTERVENTIONS

The vast expansion in the number and size of medical schools in the 1960s and 1970s was to a large extent a direct response to the perception of widespread physician shortages. During the 1970s, it became apparent that the shortages were a function of specialty and geographic maldistribution. Expansion of medical student class sizes contributed directly to the growing oversupply of physicians but did not in and of itself do very much to remedy geographic shortages.

The most far-reaching federal intervention was support for the creation of generalist specialties: family medicine, general internal medicine, and general pediatrics. Through grants to medical schools and teaching hospitals, the government catalyzed the creation of a growing cadre of generalist physicians. Although initial progress was halting, the emergence of managed care—and the resulting demand for generalists to work in these systems—has translated into a significant change in the preference of medical students for primary care careers. This shift would not have been possible without the sustained commitment and creative leadership of those who crafted the federal programs and very creative partnerships among federal, state, and private entities.

ECONOMIC INCENTIVES

A significant economic incentive was the establishment in 1989 of Medicare bonus payments to physicians providing care in urban and rural HPSAs (Physician Payment Review Commission,

1994). Beginning in 1989 as a 5 percent bonus payment—also known as Medical Incentive Payments (MIPs)—the amount was raised to 10 percent in 1991, the level at which it remains. It is clear that the bonus payments are an important inducement for at least some physicians who locate in HPSAs and have become an increasingly popular tool to help establish and sustain practices in underserved areas.

The creation of the bonus payments increases even more the importance of ensuring that designation of shortage areas is valid and objective. Because the HPSA designation has an immediate and substantial effect on the flow of funds to areas designated, it becomes an even more attractive status sought after by organizations or governmental entities delivering health services. One possible reason that the number of HPSAs has not declined is that as the penalty for designation loss has increased, organizations have become more adept at making the case for retaining or attaining this coveted status.

Another important incentive is designation as a RHC. Such designation allows entities to receive cost-based reimbursement through Medicare and Medicaid, which can amount to a substantial increase in revenues for clinics so designated.

The BBA contains provisions that will affect those who train and employ health care providers, the organizations that insure patients, and the people who receive medical care. The provisions are so complex and interrelated, and the regulations are in such an early stage of development, that it is impossible to predict exactly how they will influence the location patterns of practitioners or the access barriers experienced by the rural and urban underserved (Mueller, 1997). However, while the reimbursement and graduate medical education (GME) payment modifications are likely to affect how the Medicare and Medicaid programs interact with the educational and provider institutions that train and deploy the health professionals discussed in this report, it remains to be seen whether such changes as the payment of direct GME to FQHCs, RHCs, and others will materially change current reimbursement and training patterns.

Research and Policy Development

Recognizing the need for better coordination of federal health policy for rural areas, Congress created the Office of Rural Health Policy (ORHP) in 1988 through Section 711 of the Public Health Service Act. ORHP sponsors a national network of rural health research centers that do basic and applied research that relates to problems of rural geographic maldistribution. ORHP also addresses other issues such as the development and dissemination of telemedicine, one potential tool to decrease the impact of maldistribution.

One of the greatest barriers to better focused health workforce policy has been a lack of research into the causes and consequences of shortages, as well as evaluations of programmatic experiments and interventions. ORHP has begun to remedy that shortfall in rural areas and, in consort with agencies such as the Agency for Health Care Policy and Research (AHCPR), has begun to produce the data needed to inform public policy.

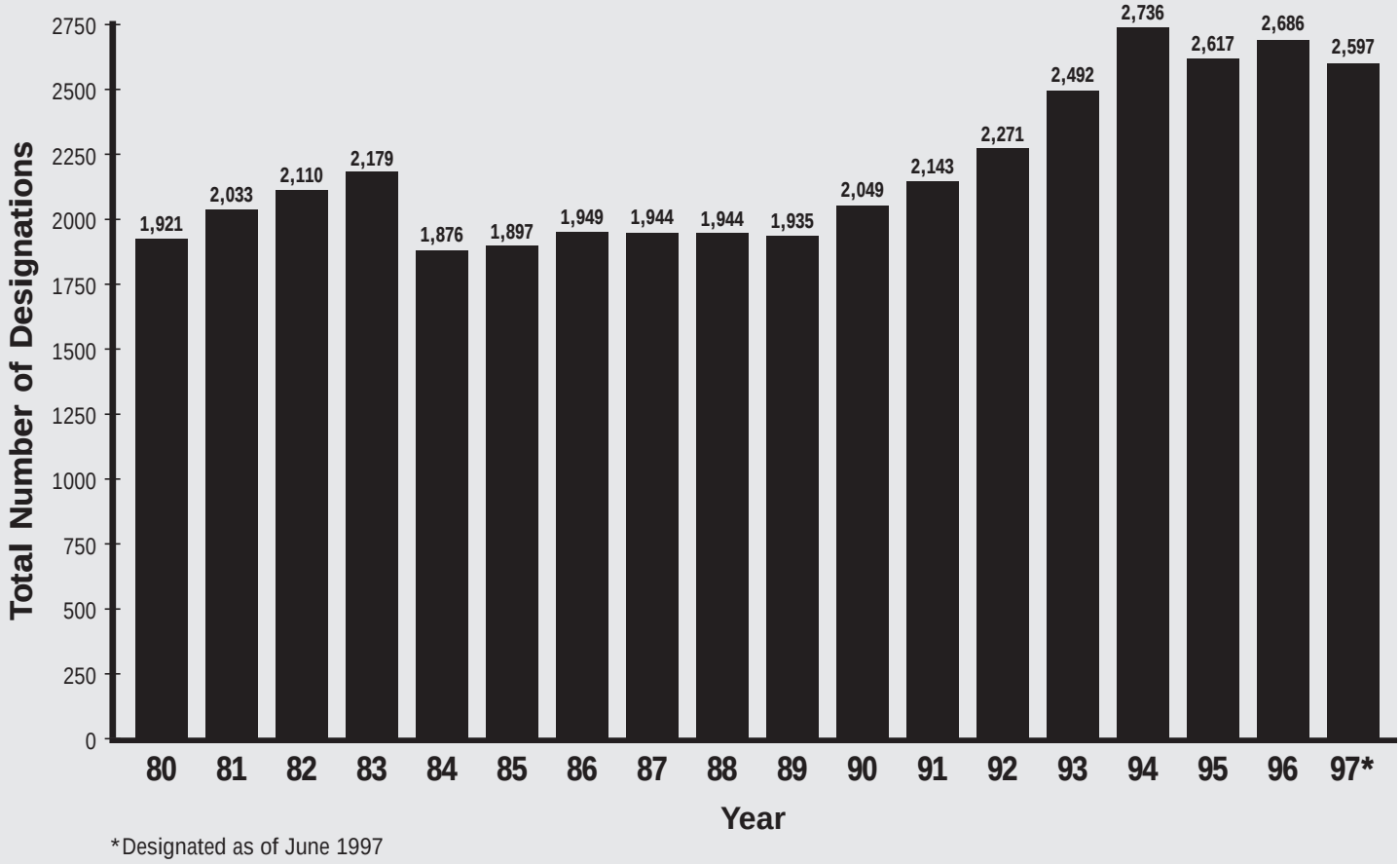
THE PERSISTENCE OF SHORTAGE AREAS DESPITE INTERVENTIONS

The nation is faced with a paradox: the number of people living in designated health professional shortage areas—and the number of designated HPSAs—has increased at the same time that the ratio of physicians to population has doubled. In general, the number of HPSAs has increased even though the total number of physicians needed to de-designate these areas has changed little (e.g., 5,835 in 1980 and 5,359 in 1996). Currently almost 47 million Americans (one in six) live in designated HPSAs. During this same period, the number of physicians and the physician-to-population ratio have increased rapidly, as seen in Figure 1-4, and, as discussed above, a spectrum of governmental programs have been designed to make health care professionals available to people living in these shortages areas. How could the number of underserved people continue to expand?

One reason for the paradox is that population group HPSA designations have increased dramatically during the period. As discussed earlier, HPSA designation is not a pure measure of provider shortage. Rather, as the designation process has evolved over the years, HPSA designation is more a reflection of the fact that—because of the increasing number of uninsured in this country—there are substantial numbers of underserved people in most geographic locations in the United States, regardless of how many physicians practice there. HPSA designation seems to occur more because some governmental or private entity decides to provide care to the poor and the underinsured in a particular area than because there is a shortage of health professionals.

A second reason for the paradox is that the rapid expansion of the physician supply has been concentrated among specialty physicians, as demonstrated

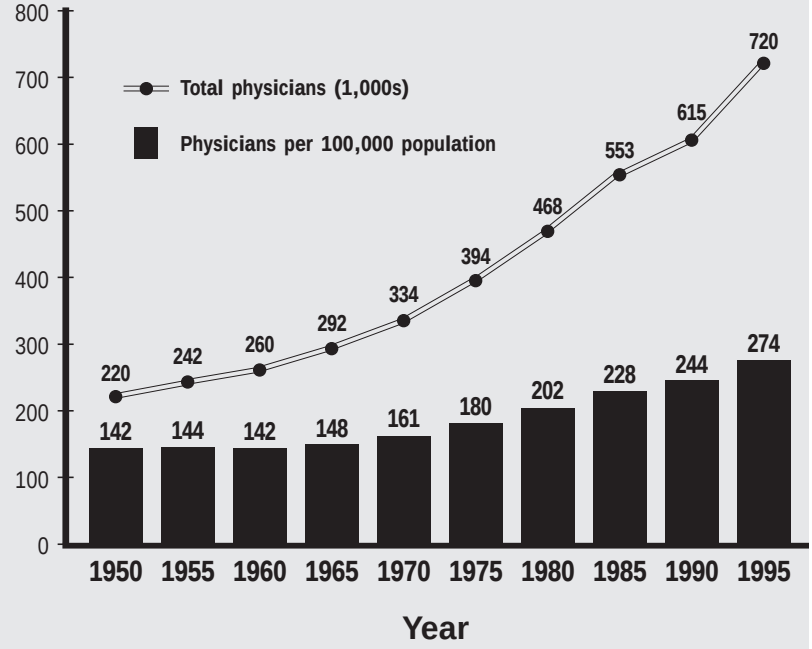
FIGURE 1 - 3
Number of Primary Care Shortage Designations by Year



*Designated as of June 1997

Source: BPHC data, 1997.

FIGURE 1 - 4
Total Active Physicians by Year



Source: AMA from BHPr's ARF data, 1997.

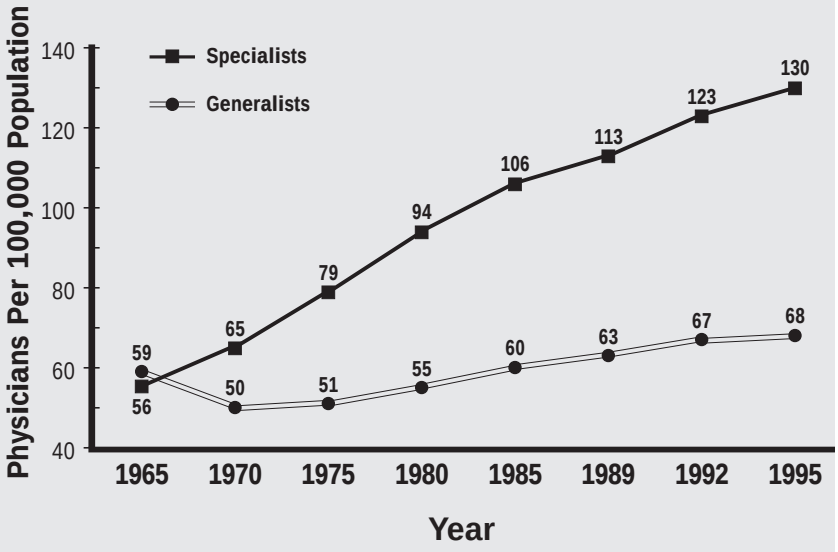
in Figure 1-5. There has been relatively little change in the ratio of generalist physicians to population, and little more is expected in the future. The supply of generalists is at the lower edge of what COGME estimates will be required by the population (COGME, 1996). By contrast, there is an oversupply of specialty physicians. This oversupply is often unavailable or irrelevant to the needs of underserved populations, a further explanation for the apparent paradox.

A third reason is that the trickle-down effect of a physician oversupply is very muted. As experience in other countries has shown, some physicians will drive cabs in urban areas before they will migrate to isolated and underserved rural areas or set up practice in problematic inner-city areas (Frenk et al., 1991). This issue is discussed further in the sections dealing with rural and urban geographic maldistribution, but the general principle is the same. Many persistently underserved areas in this country will require practitioners who possess a unique commitment to improving the well-being of underserved populations and can work within organizational structures that support them in their

commitment. Mere expansion of the physician workforce in and of itself—particularly if physicians are trained in traditional tertiary medical centers to become specialists—will have virtually no impact on the amelioration of geographic maldistribution.

FIGURE 1 - 5

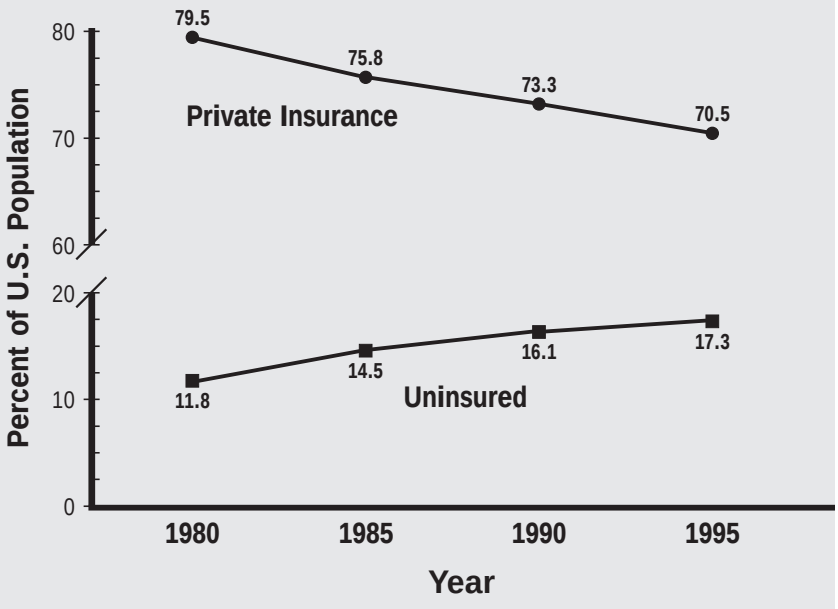
Patient Care Generalist and Specialist Physician Supply Ratios per 100,000 Population



Source: COGME, 1996, P. 8 & updated with BHPr data.

FIGURE 1 - 6

Percentage of U.S. Population Uninsured
(<65 years of age)



Source: GAO, 1997.

AN OVERRIDING ISSUE — THE LACK OF UNIVERSAL HEALTH INSURANCE COVERAGE

The issue of geographic maldistribution of health providers is intertwined with the issue of health insurance coverage. If people do not have coverage, they have only a limited capacity to purchase health services, no matter how many health providers practice in their communities. Conversely, well-insured people living in places without sufficient health providers also experience barriers to care, often forcing them to travel long distances or forgo care. As we will show later in this report, the geographic maldistribution of providers—while not trivial—could be solved in large part through a modest expansion of some of the more effective governmental programs. The challenge of providing financial access to care is less tractable.

Approximately 41.7 million people in the United States were without health insurance in 1996 (U.S. Bureau of the Census, 1996). As shown in Figure 1-6, the percentage of people under 65 with employer-sponsored insurance has declined steadily, from 79.5 percent in 1980 to 70.5 percent in 1995. The percentage of uninsured in the United States has risen from 11.8 percent in 1980 to 17.3 percent in 1995 (GAO, 1997a). Although changes in federal and state legislation have begun to address the problems of uninsured children, it is unlikely that the large number of uninsured Americans will decrease without implementation of some national health insurance program. In 1997, such a program is not even a glimmer on the political horizon.

The primary alternative to the establishment of universal health insurance is the creation of a safety net, a web of federal, state, local, and private programs that provide care to uninsured or underinsured people (Baxter & Mechanic, 1997). Many of the federal programs described earlier serve this function by providing care to patients at no or reduced cost. At the same time, these programs also ameliorate geographic maldistribution by providing care to populations that are underserved because fewer health professionals generally practice in places in places where there are more uninsured.

The most direct way to solve problems of geographic maldistribution would be to institute universal health insurance and then target specific programs to those areas where shortages persist. There will be rural and inner-city areas where physicians will not practice even if everyone has health insurance, a phenomenon that has been observed repeat-

edly in industrialized countries with national health insurance plans. But in the absence of universal health insurance coverage in the United States, bolstering the safety net programs could ensure that as many people as possible have access to basic health services.

FINDINGS AND RECOMMENDATIONS

The following findings and recommendations deal with issues that are applicable to geographic maldistribution generally and are not specific to either rural or urban areas.

FINDING 1: Although geographic maldistribution of physicians persists in both rural and urban areas despite rapid increases in the physician-to-population ratio, the lack of health insurance presents the greatest barrier to medical care.

It is impossible to disentangle the issue of geographic maldistribution from that of health insurance. The most direct and efficient way to ensure health care access to underserved populations is to provide them with health insurance coverage and then address the residual problem of maldistribution with focused programs that deploy health professionals to places with insufficient providers. Even though progress in this area has been erratic, incremental improvements continue to be made.

Recommendation 1: **Continue to develop policies that increase the proportion of the population with health insurance coverage.**

FINDING 2: In the absence of universal health insurance, safety net programs such as the CHCs and the NHSC are essential mechanisms for insuring access to health care for underserved populations.

Because the process of expanding health insurance is likely to be incremental, large segments of the population will continue to be underserved for the foreseeable future. The nation will continue to need a flexible set of programs that allow the establishment of federal, state, and local partnerships that sponsor health clinics that provide medical care at reduced cost to needy populations. The community and migrant health centers and the NHSC afford such vehicles, allowing local communities to recruit clinicians and establish delivery systems that at least partially address the problems of geographic maldistribution, poverty, cultural isolation, and lack of health insurance.

Neither program is perfect. Physicians who accept federal scholarships and loan forgiveness in return for future service in the NHSC are not always happy with the locations where they are subsequently expected to serve, and long-term retention in underserved areas is a desirable but often unattainable goal. Yet despite these problems, there are few viable alternatives that could be implemented on a national basis. As the safety net frays under the weight of increasing numbers of uninsured, these vital delivery systems should be preserved and strengthened. Marginal increases or approaches are unlikely to be adequate to address the enormous need.

Recommendation 2: **Significantly increase the NHSC to enable it to serve the growing number of underserved people in rural and urban areas.**

Recommendation 3: **Significantly increase funding for CHCs and other safety-net programs to enable them to serve the growing number of underserved people in rural and urban areas.**

Recommendation 4: **Create a joint federal-state-local strategy for expanding the spectrum of safety-net activities to ensure that underserved populations receive adequate access to the full range of appropriate health services.**

FINDING 3: The substantial growth in the number of physicians in the United States has not eliminated the problem of geographic maldistribution; most of this growth is comprised of specialists who practice in affluent metropolitan areas, while most of the underserved population live in rural and inner-city areas and need enhanced primary care services.

An oversupply of physicians in the United States appears to be emerging. Although medical school class size has been trimmed slightly, and a greater proportion of graduating students has chosen primary care fields in the past few years, many metropolitan areas have a substantial oversupply of specialty physicians. Unfortunately, this has not translated into migration of practicing physicians into underserved areas or primary care specialties. Geographic maldistribution will persist even as the physician supply grows.

The recent renaissance of primary care disciplines has been stimulated by a broad array of federal and private foundation programs for medical students and primary care residents, and by changes

in the delivery system that have increased the market's demand for generalists. Given the powerful historical forces that encourage physicians to specialize—both within the academic community and in the practice environment—this renaissance is fragile. Continued support is essential for programs that identify students likely to serve underserved communities, encourage them to enter primary care disciplines, and assist them in establishing viable practices in underserved communities.

Recommendation 5: **Continue to support federal and state programs such as Title VII of the PHS Act that have been proven to increase the number of physicians who choose generalist careers, practice in rural and inner-city areas, and serve underserved populations.**

FINDING 4: The existing MUA/P and HPSA criteria no longer do an adequate job of identifying areas with absolute or relative health personnel shortages.

Current processes for designation of shortage areas are flawed. Both measures have become so malleable that some segment of virtually any geographic area could obtain designation as a shortage area under one or both criteria. This partially reflects the fact that in our current health care system a substantial proportion of the population is underserved, either because they are uninsured, experience cultural, linguistic, and economic barriers that deny them access to health services that surround them, or—more rarely—live in places with very few health care workers.

The principal problem with the current designation tools is that they have lost credibility (GAO, 1995). This undermines the programs that use them. Although they have allowed enormous flexibility in the way in which communities and organizations use federal programs, some areas officially designated under these programs may no longer be underserved. The current revisions of the designation process being undertaken by BPHC should maintain some flexibility while ensuring the accuracy of the designations themselves. Designations should differentiate provider shortage from economic disadvantage while being selective enough to effectively target federal intervention to those most in need.

Recommendation 6: **The current MUA/P and HPSA designations should be replaced by a uniform, rational, objective, feasible, and periodically updated measurement of medical underservice. The current effort of the HRSA to revise the designation process should be bolstered and expedited, and should be based on state-of-the-art research that incorporates measures of health status, poverty, cultural disadvantage, the availability of health insurance coverage, and the effective supply of health personnel. Designations should be exclusive enough to promote the most effective targeting of limited federal resources.**

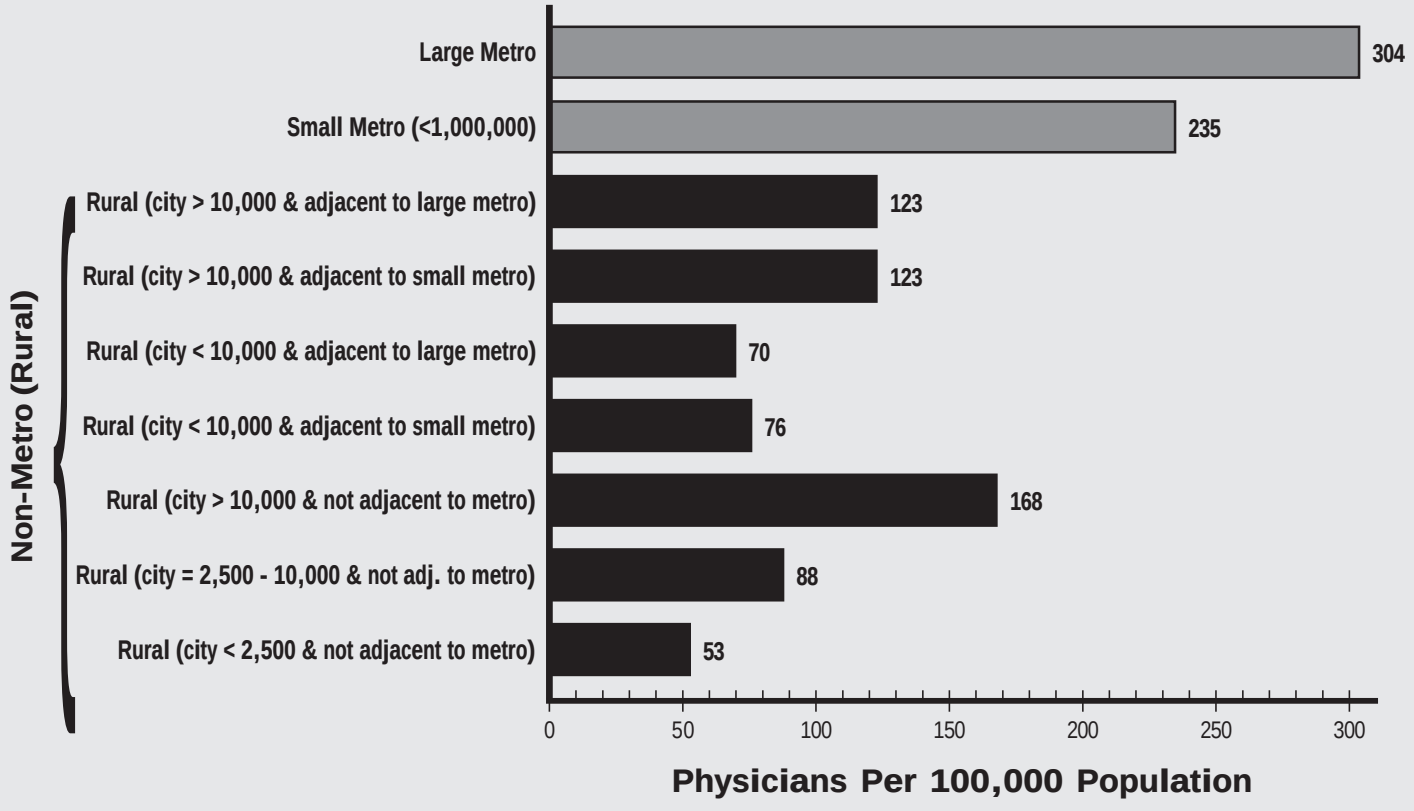
Health Professional Shortages in Rural Areas

The relative shortage of health professionals in rural areas of the United States is one of the few constants in any description of the United States medical care system. About 20 percent of the United States population—over 50 million people—live in rural areas, but only 9 percent of the nation's physicians practice in rural communities. Severe rural physician shortages were the primary stimulus behind the development of many of the federal health care workforce programs, and the persistence of the rural-urban disparity continues to fuel federal and state educational and service efforts.

Historically, perceptions of physician shortages date back to the late 18th century (COGME, 1992, p. 11). The first national effort to remedy these shortages was the rapid increase in the production of physicians in the United States starting in the late 1960s. This greatly increased the supply of physicians while having only a modest impact on the relative differences between rural and urban areas. However, it is important to note the absolute number of physicians in rural areas has increased with the physician supply, as has the physician-to-population ratio.

It is critical to make a distinction between the adequacy of health professional supply in rural areas and the disparity between the supply in rural and urban areas. Crude comparisons of the physician-to-population ratio in rural versus urban areas can be very misleading and provide almost no information about whether shortages or oversupplies exist in either location (see Center for the Evaluative Clinical Sciences, 1996). Figure 2-1 shows the gap that exists between the supply of allopathic physicians in counties of different size in 1995, the latest year for which data are available. As can be seen in this figure, major differences persist between the aggregate supply in urban and rural areas, with the larger counties having many more physicians per 100,000 population.

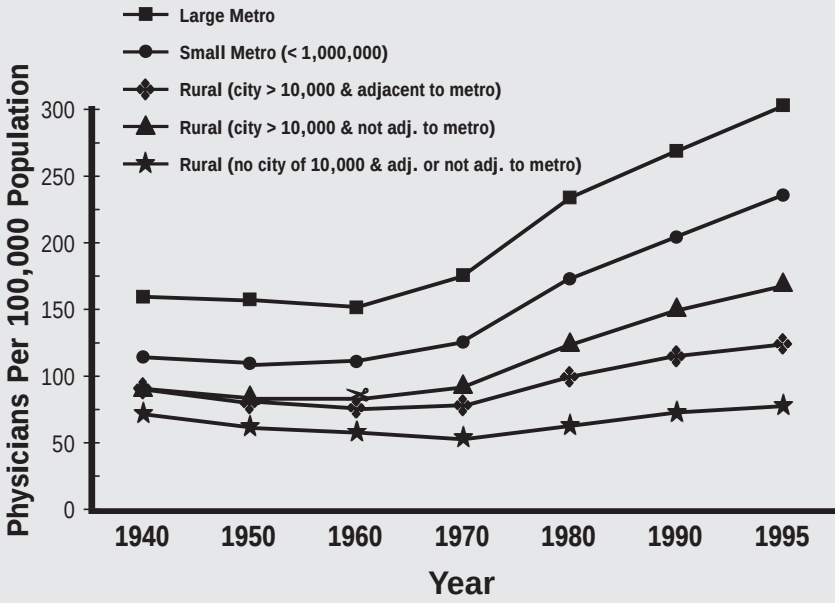
FIGURE 2 - 1
1995 Active Physicians Per 100,000 Population by Location



Source: AMA from BHPr's ARF data, 1997.

FIGURE 2 - 2

Active Physicians Per 100,000 Population by Year and Location



Source: AMA from BHPr's ARF data, 1997.

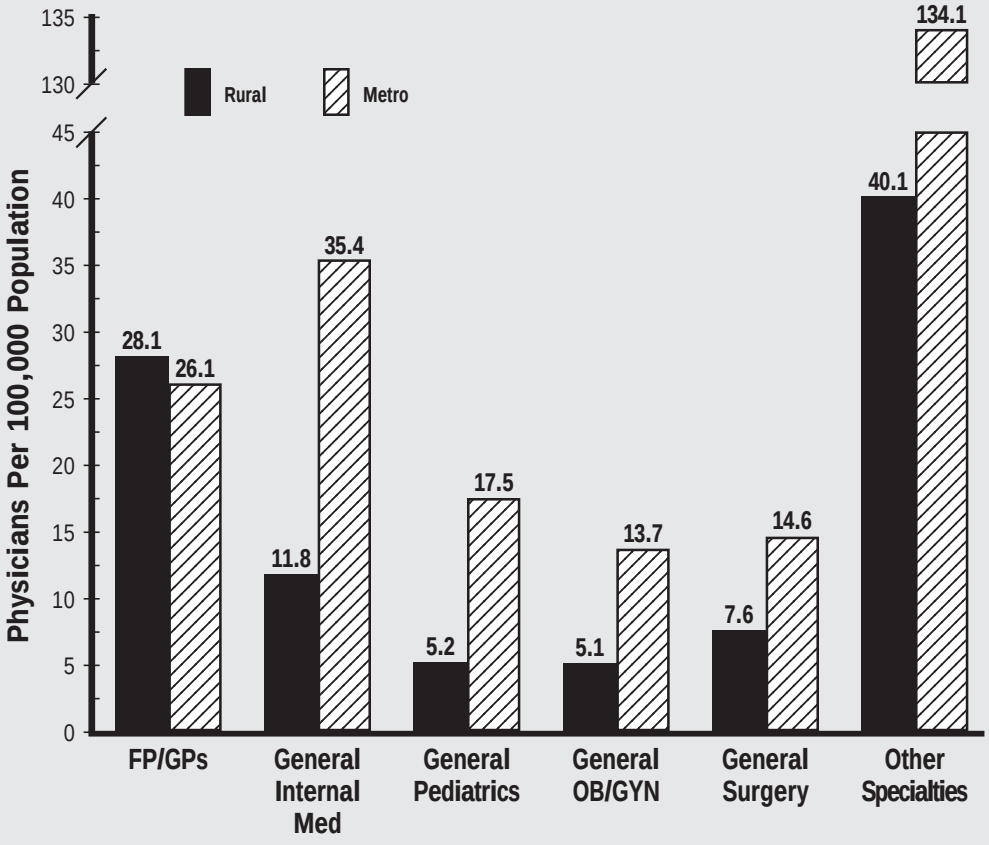
But this information obscures the fact that the physician supply has grown rapidly in rural areas over the last 20 years. As seen in Figure 2-2, the supply of rural physicians has increased modestly in the last few decades, with most of the increase in the larger rural communities adjacent to metropolitan areas. Rural supply lags far behind the current urban supply of physicians, but the urban supply of physicians is in significant excess. It is likely that some of the larger rural areas are now approaching more optimal physician-to-population ratios, both as a result of the expansion of the overall physician supply and because of the educational interventions that have increased the number of physicians with the willingness and ability to practice in rural areas.

Figure 2-3 shows the influence of specialty on physician location choice for each of the major specialty groups. Family physicians distribute themselves in proportion to the population in both rural and urban locations and are the largest single source of physicians in rural areas. All other specialties are much more likely to settle in urban areas, even the other generalist disciplines.

FIGURE 2 - 3

Patient Care Physicians Per 100,000 Population by Location and Specialty

(1995)

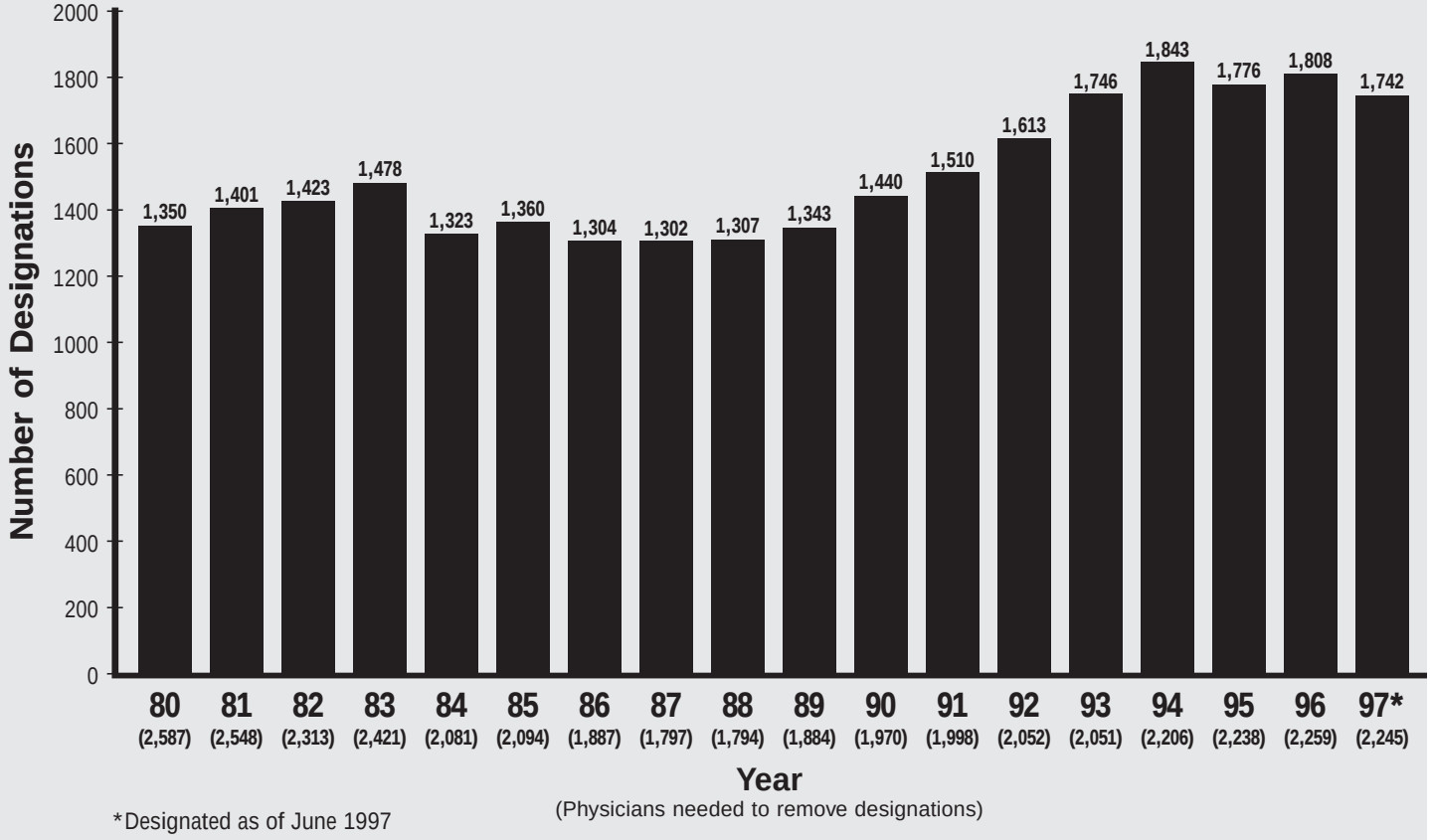


Source: AMA from BHPr's ARF data, 1997.

Given the expansion of the rural physician supply, it is important to distinguish between rural areas that have definite shortages of critical health professionals and those that have fewer health professionals relative to oversupplied urban areas. Here is where a reliable shortage designation process would be invaluable and where the deficiencies in the current HPSA designations are most troublesome. Figure 2-4 shows the number of rural health professional shortage areas from 1980 to the most recent figures and the number of physicians that would need to be deployed to remove the designation.

As the figure shows, the number of rural HPSAs and the number of primary care physicians needed to remedy the designated shortages have increased in recent years. But it is likely that the increase in the number of rural HPSAs is more a function of an increase in the rate at which designations have been requested—possibly because of declining rates of health insurance—than because of a deterioration in physician supply in those areas. In particular, the revitalization of the NHSC and Medicare bonus payment program give rural organizations and communities an incentive

FIGURE 2 - 4
Number of Non Metro Primary Care Shortage Designations



Source: BPHC data, 1997.

to apply for designation, irrespective of recent changes in their relative supply of health professionals.

CRITICAL ISSUES IN PHYSICIAN SUPPLY IN RURAL AREAS

THE EFFECT OF SPECIALTY CHOICE AND DISTRIBUTION

Nothing affects the location decision of physicians more than specialty. Unfortunately for rural areas, the more highly specialized the physician, the less likely it is the physician will settle in a rural area. As a consequence, the growth of specialization is a major contributor to the geographic maldistribution of physicians. Many of the shortages in communities with fewer than 10,000 residents could have been reduced or eliminated if even a small fraction of subspecialists produced over the past 15 years had chosen to become primary care practitioners in rural or underserved areas (Konrad, 1996).

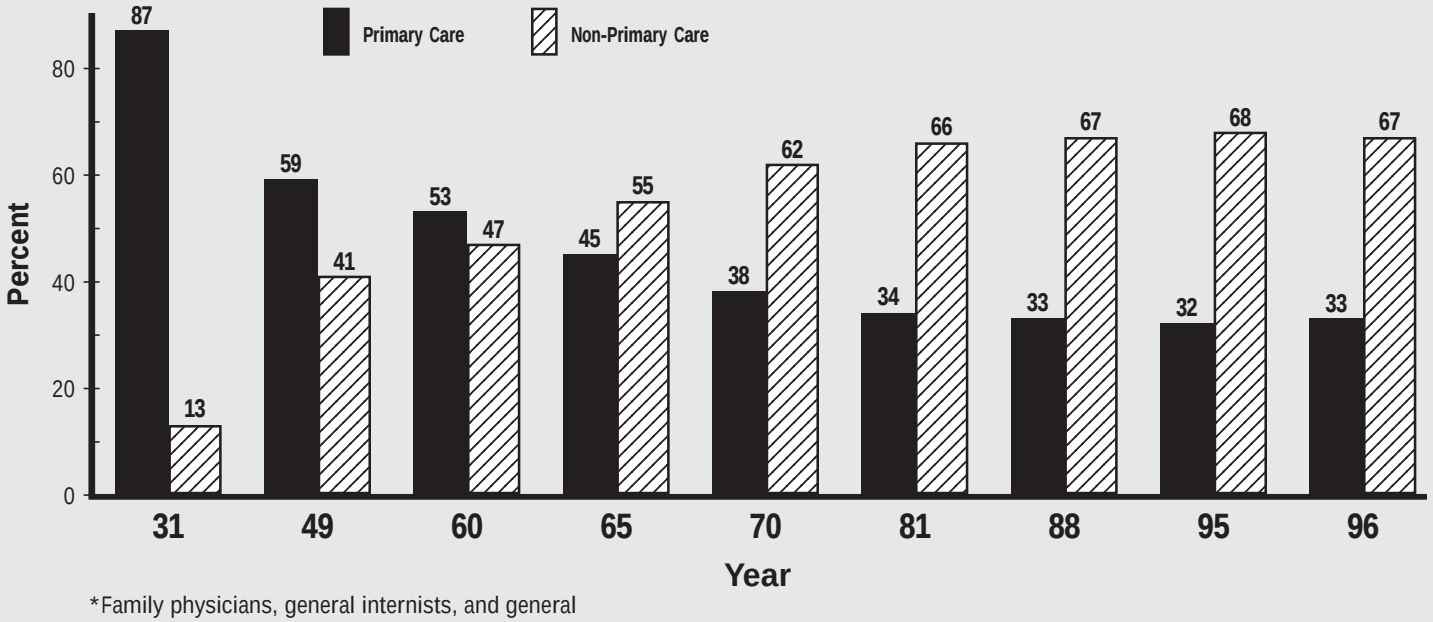
The decision of specialists to settle in cities is not random: specialists require a large population base, sophisticated hospitals and laboratories, and specialty colleagues to be able to pursue their expertise. While the average family physician may serve 2,000 people, the typical neurosurgeon requires a population base of 100,000 people to achieve professional and economic equilibrium. When specialists are in oversupply, they can reduce the amount of time they work, practice outside the traditional domain of their specialty, or generate demand by increasing the rate at which they perform investigations or procedures. Only at the margin will they migrate to smaller places, and there is a population threshold below which it is not feasible for them to continue to pursue the specialty in which they trained.

In addition to the technical requirements of the specialty, there are also important behavioral and philosophical differences that cause specialty imbalances to be translated into geographic maldistribution. Family physicians—the quintessential generalist discipline—are the only specialty group who are as likely to locate in a small rural as a large urban area (Bureau of Health Professions (BHPr), 1992). Part of the reason is that their practice breadth endows flexibility. But part of the

FIGURE 2 - 5

Percentage of Primary Care* and Non-Primary Care Physicians

(Selected Years 1931-1996)



*Family physicians, general internists, and general pediatricians

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

Source: AMA from BHPr's ARF data, 1997.

reason is that family medicine has always had strong roots in rural practice and that many of the educational programs in this new discipline reinforce those roots. Other specialties have migrated to rural areas, but rural medicine remains highly dependent upon the supply of family practitioners.

Thus the recent revived interest in family medicine and the other generalist disciplines is a major factor in addressing rural geographic maldistribution. As seen in Figure 2-5, the decreasing proportion of generalist physicians leveled off in the 1980s. (Despite recent increased interest in primary care, the percentage in generalist disciplines has not yet shown a substantial increase.) An improvement in the balance of generalists and specialists is a necessary precondition for eliminating rural physician shortages.

OSTEOPATHIC PHYSICIANS

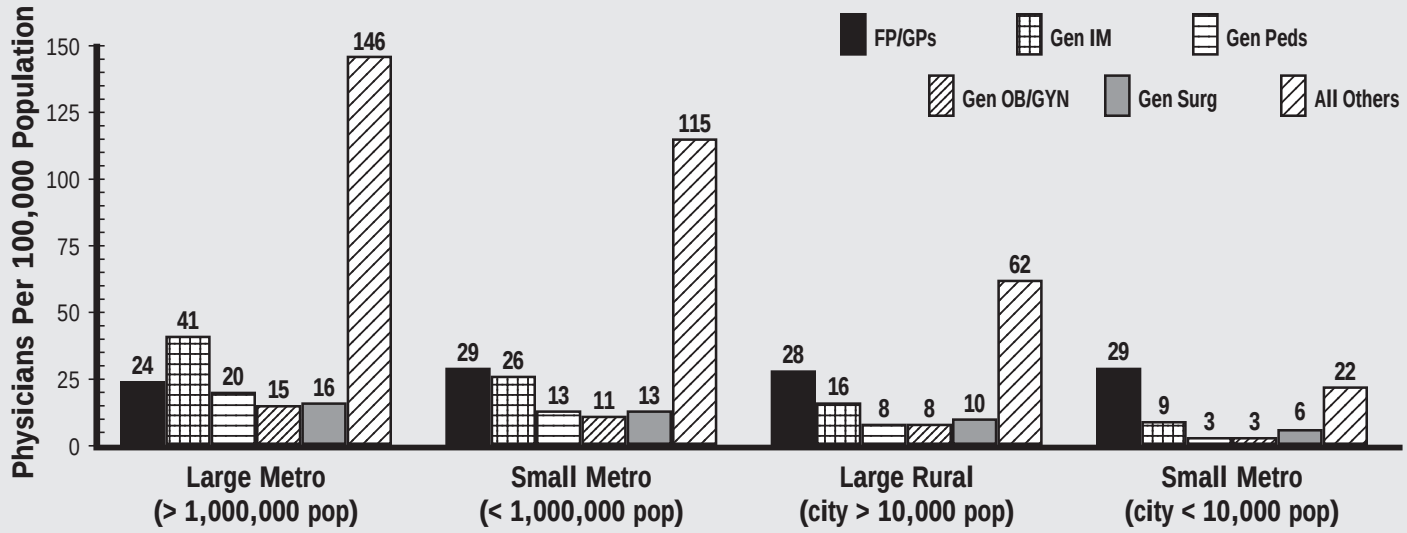
Osteopathic physicians (DOs) represent a special case, illustrating the critical importance of specialty choice in location decision. Osteopaths are significantly more likely than allopathic physicians to settle in and remain in rural areas (18.1% of osteopaths versus 11.5% of allopaths). While osteopathic and allopathic family practitioners are equally likely to select rural practice, 46 percent of osteopaths become family physicians as opposed to 11 percent of allopathic physicians. If a higher proportion of allopathic physicians chose family medicine, it is likely that the proportion of allopathic physicians settling in rural areas would mirror that of osteopaths. Osteopaths make up approximately 5 percent of the total national physician (allopathic and osteopathic) workforce but are unevenly distributed across the states.

SPECIALTY-SPECIFIC ISSUES — INTERNAL MEDICINE, PEDIATRICS, OBSTETRICS AND GYNECOLOGY, AND GENERAL SURGERY

The previous discussion has focused on generalists, particularly family physicians, because the supply of rural doctors is so closely tied to the supply of both allopathic and osteopathic family doctors. The supply of the other two generalist disciplines—general internists and pediatricians—is directly proportional to the size of the communities in which they are located, as seen in Figure 2-6.

Because of the necessity to provide 24-hour on-call coverage in rural communities—and because of the difficulties that internists and pediatricians have in covering each others' practices or the practices of family physicians—internists and

FIGURE 2 - 6
Patient Care Physicians Per 100,000 Population by Location and Specialty
(1995)



Source: AMA from BHPr's ARF data, 1997.

pediatricians are unlikely to settle in communities where they will be the only member of their discipline. In practice groups with fewer than five physicians, it becomes very difficult to incorporate internists and pediatricians into the call schedule. Once the catchment area is large enough to support five or more physicians—populations above 10,000—it becomes more feasible to add internists and pediatricians to the practice mix. This phenomenon is reflected in the patterns seen in Figure 2-6.

Obstetrician-gynecologists (OB/GYNs) work at the cusp between specialty and primary care, and the discipline is increasing its emphasis on primary care. The provision of high-quality local obstetrical care is a critical component of the scope of service of rural communities; loss of local services imposes significant economic and travel burdens on rural residents and may impact perinatal outcomes (Nesbitt et al., 1990). Although family physicians can provide excellent quality obstetrical care in rural areas, they require the ready availability of obstetric consultation and the ability to refer their patients expeditiously to consulting physicians.

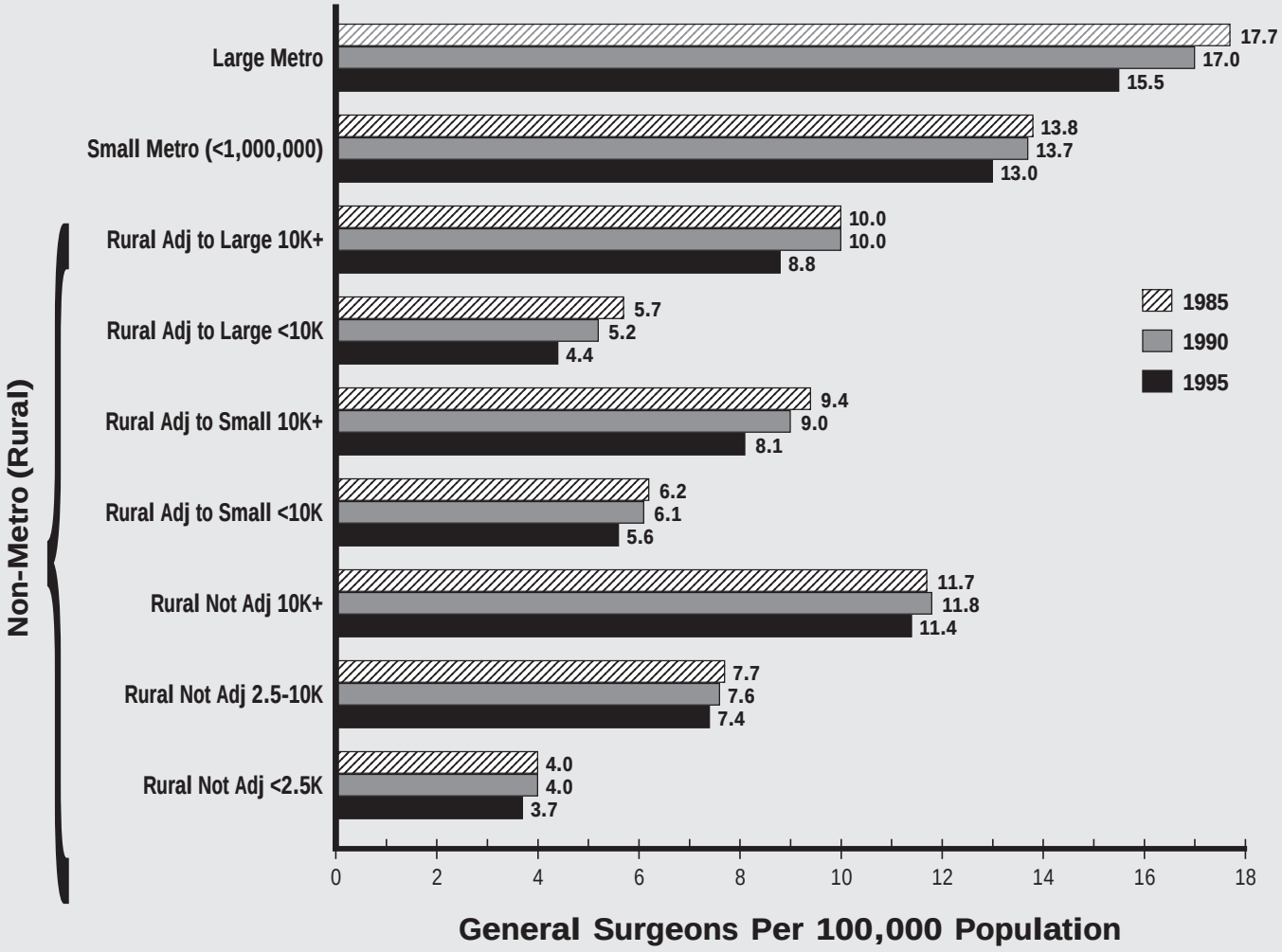
Figure 2-6 demonstrates that obstetricians are heavily concentrated in urban areas and almost nonexistent in the smaller rural communities. In rural counties with largest city populations of fewer than 10,000, there are fewer than three OB/GYNs per 100,000 residents. Given these patterns, it is likely that smaller rural communities will need to continue to depend on family physicians for basic obstetric and gynecologic care, with defined links with obstetrical specialists providing referral and consultation.

General surgeons represent a special case, because at one time they were a very important source of care for rural areas. As Figure 2-7 shows, there has been a modest but steady decline in the number and proportion of general surgeons in smaller rural communities. Part of this is due to the evolution of surgery as a discipline. As surgery has become more and more specialized, the domain of the general surgeon has shrunk. Concomitantly, the number of general surgeons trained has decreased. The result is that there are fewer general surgeons produced, and those who do finish the arduous residency have a more narrow breadth of practice and feel less comfortable practicing alone in smaller rural areas.

Because of the rapid changes in technology, it is difficult to set a standard or target for the supply of general surgeons in rural communities. Although frowned on by the American College of Surgeons, circuit-riding and itinerant surgery by surgeons based in larger rural or nearby metropolitan areas is common and may be increasing. Improving telecommunications and the advent of telemedicine make it possible for these itinerant surgeons to better manage surgical patients at a distance, with the help of local rural family physicians. And the evolution of service networks increases the contact and interdependence of physicians living in different locations, with networks employing physicians who back up family physicians practicing in more remote rural areas.

Despite organizational and telecommunication innovations, there are still important benefits to having broadly trained general surgeons available

FIGURE 2 - 7
Patient Care General Surgeons Per 100,000 Population by Location and Year



Source: AMA from BHPr's ARF data, 1997.

to rural communities. It is certainly worth exploring whether residency programs can be designed that will train competent rural general surgeons who are willing to settle in smaller areas and work collaboratively with local generalists. This may be an area where educational experimentation is possible. Rural fellowships have been very successful within the context of family medicine; they might be replicated in surgical programs as well (Norris & Acosta, 1997).

THE IMPACT OF GENDER ON CHOICE OF PRACTICE LOCATION

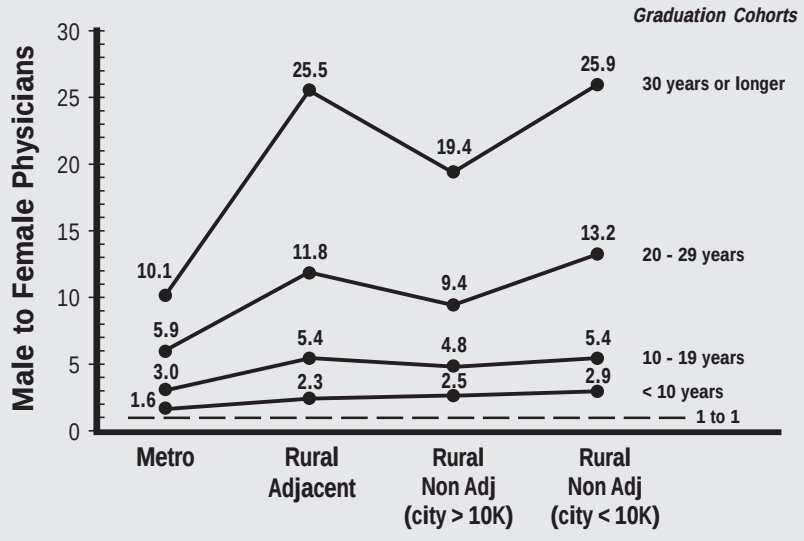
Until very recently, medicine was a largely male profession. Starting a decade ago, the proportion of women attending medical school increased rapidly. The number of allopathic women physicians in the United States more than quadrupled between 1970 and 1991 and has continued to rise (COGME, 1995, page 31).

Historically, rural medical care was almost exclusively provided by male physicians. This was a product of the paucity of women in medicine and the tendency of the few female graduates to locate in urban areas. Figure 2-8 shows that male generalist allopathic physicians far outnumber their female counterparts in rural areas across the United States. A similar analysis of DOs from the Area Resource File (ARF, 1997) reveals similar findings, wherein the active DO male-to-female ratio for rural counties in 1995 was nearly eight to one. As the proportion of women in medical schools has increased, there have been concerns that rural physician supplies might dwindle if women continued to settle almost exclusively in urban areas.

FIGURE 2 - 8
Ratio of Rural Male to Female Patient Care Generalist Physicians: 1997

Source: Doescher et al., in-press.

FIGURE 2 - 9
Male to Female FP/GP Physicians by Graduation Cohort (1997)



Source: Doescher, et al., in-press.

Recent work suggests that the problem may be growing less acute with time but that women still are much less likely than men to settle in rural areas. As seen in Figure 2-9, the disparity between male and female allopathic family physicians has narrowed dramatically for more recent graduates. However, even women in the most recent graduate cohort are much less likely than their male counterparts to locate in rural areas, and the disparity is greatest for the smaller and more remote communities.

Although COGME's Fifth Report concluded that "physician gender has little impact on workforce forecasting" (COGME, 1995, p. 52), the same cannot be said of geographic maldistribution. The continuing preference of women for urban practice—even though less pronounced that in earlier years—may still pose a problem for the future recruitment of rural physicians. Further research must be done in this area, and programs that support women who have the potential for practicing in underserved rural areas should be encouraged and supported.

THE ROLE OF IMGS IN RURAL AREAS

The role of international medical graduates (IMGs) in the American workforce is highly controversial. At one time, most IMGs who came to the United States were primarily immigrant permanent residents and a relatively small number of exchange visitors who came to garner specialized training and then return to their home countries to practice. The original intent of the Physician Exchange Visitor Program was to strengthen international relations and further mutual understanding through educational and cultural exchange; the program was specifically not intended to add physicians to the U.S. physician workforce.

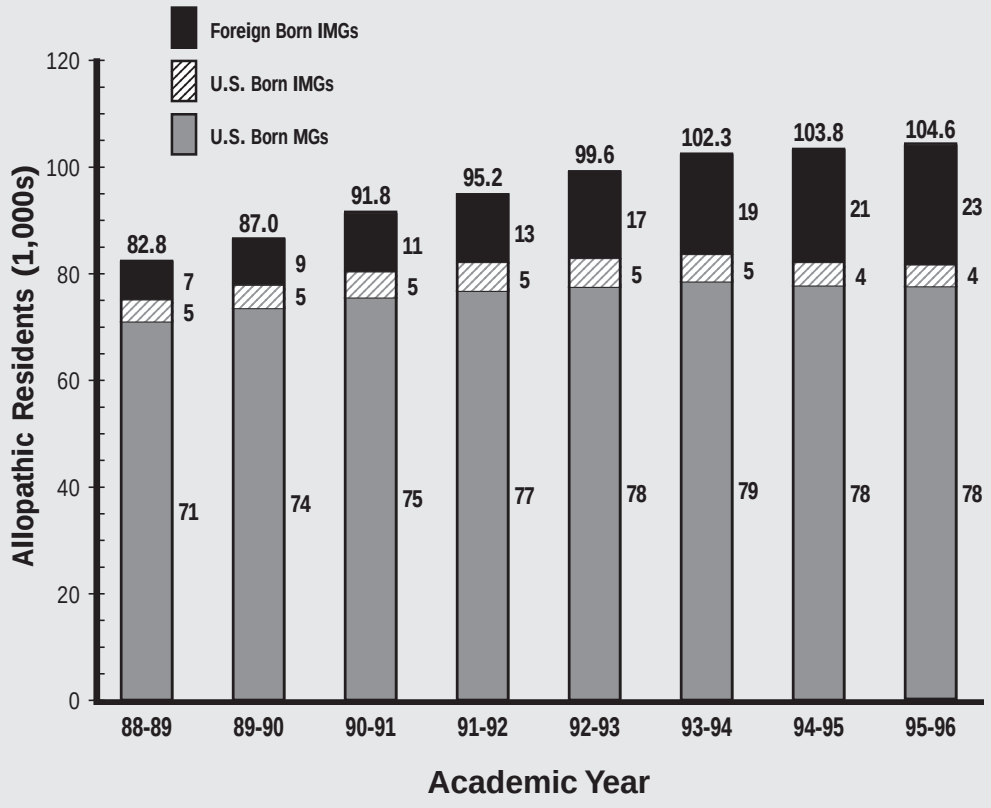
This is no longer the case. Today a large proportion of exchange visitor IMGs eventually settle permanently in the United States. IMGs are drawn to the United States by the numerous training opportunities, the relatively high salaries, and the opportunity to establish themselves in practice here. Training opportunities for IMGs have expanded rapidly since 1988; as Figure 2-10 shows, the number of foreign-born IMGs currently working as allopathic residents in the United States has increased from 7,227 in 1988-89 to 22,565 in 1995-96, an increase of 321 percent in seven years. Foreign-born IMGs now constitute 21.6 percent of all residents in training in the United States (COGME, 1997). In particular, exchange visitors and other temporary visaholders have risen to an all-time high in both number and proportion of IMG residents in training.

One of the major reasons for this significant expansion in the number of exchange visitor physicians has been physician maldistribution. IMGs go where the jobs are, and more jobs are available in areas where U.S. graduates do not locate. In selected urban areas, large metropolitan hospitals have become very dependent both on the services rendered by IMGs and by the substantial subsidies received from Medicare for both direct (DME) and indirect medical education (IME). In addition, interested government agencies have had wide latitude in requesting visa waivers (the J-1 Visa Waiver Program) that allow them to employ IMGs in rural areas. Nationally the number of J-1 visas processed by the United States Information Agency (USIA), including a relatively small number granted for research purposes, has increased from 70 in 1990 to an estimated 1,746 in 1996. Nearly all processed waivers are granted (USIA, 1997). Although it has been proposed to limit the J-1 waivers to officially designated areas, the process of designation is so malleable that most rural areas with programs that serve the underserved can secure designation. This creates another powerful lobby to continue permissive programs for attracting IMGs.

There is no question that individual IMGs have established themselves as key providers in selected underserved rural areas and in so doing have provided critical services to needy populations (Verghese, 1994; White, 1993). However, IMGs have been less likely than USMGs to end up in nonmetropolitan areas—they have tended to settle in large cities, where, nonetheless, they tend to practice in urban underserved areas. For certain areas of the United States, including rural counties with high infant mortality and low physician-to-population ratios, they do represent a disproportionate percentage of the rural physicians (Mick & Lee, 1997; Mick & Sutnick, 1996).

IMGs have made important contributions to the provision of medical

FIGURE 2 - 10
Total U.S. Allopathic Residents by Birth Place and Medical School Location



Source: BHPr data, 1997.

care in rural areas. The problem with using IMGs to address geographic maldistribution is that it significantly exacerbates the impending physician oversupply in the United States and deprives other countries of talented clinicians (GAO, 1997a). COGME has recommended that the size of the physician residency pool be reduced from 140 percent of the number of the U.S. medical graduates in 1993 to 110 percent. As an outgrowth of its further consideration of these issues, COGME has also recommended the elimination of Medicare DME and IME payments for new exchange visitor residents (COGME, 1997b).

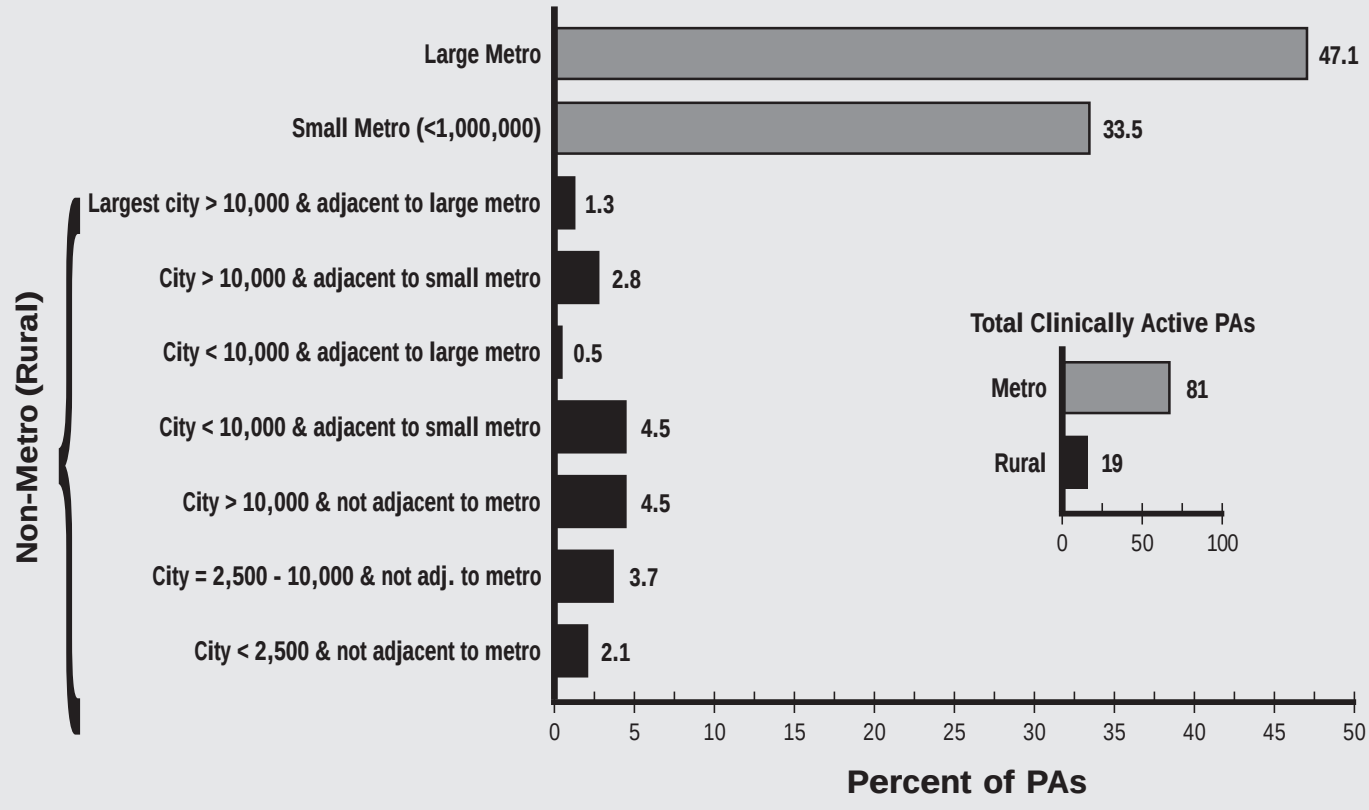
If there were no other changes, a decrease in the entry number of foreign IMGs would impact rural areas, but the impact would be very slow and modest. In addition, other mechanisms exist to increase the flow of USMGs to underserved rural areas. COGME has recommended that a portion of the savings realized from the elimination of Medicare GME support be diverted to incentives to make residency programs more effective at training physicians likely to practice in underserved areas and also be used to bolster the NHSC and CHC programs.

The Contribution of Physician Assistants, Nurse Practitioners, and Other Nonphysician Health Providers to Rural Medical Care

Physicians are not the only practitioners in rural areas. The physician assistant (PA) movement—like so many of the programmatic innovations of the 1970s—was largely stimulated by rural physician maldistribution. Many of the early PA programs were designed to create physician extenders, nonphysicians who could assist beleaguered rural doctors in providing care to isolated populations. By the same token, other nonphysician provider programs have grown under the same stimulus.

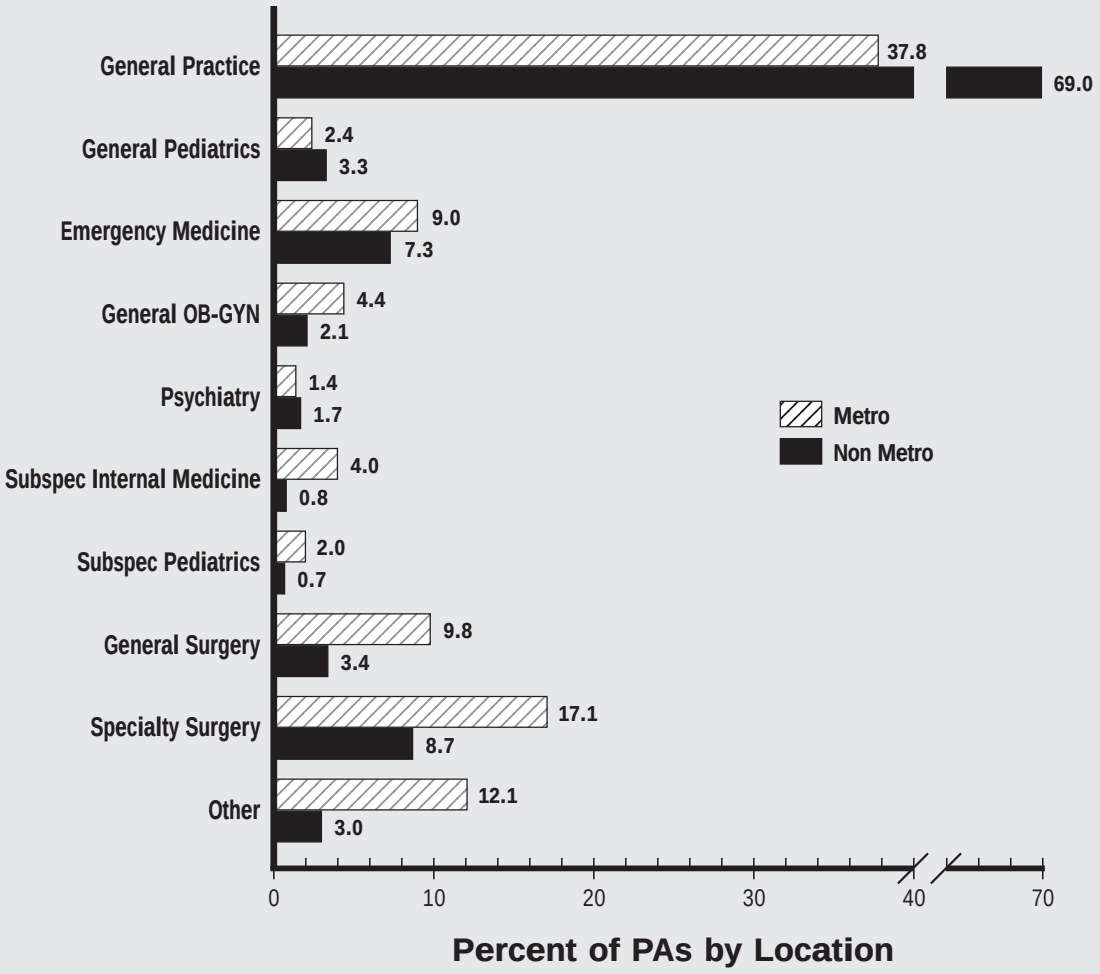
Nonphysician provider supply is a topic unto itself and is beyond the scope of this report. However, COGME readily acknowledges the enormous contribution made by PAs and nurse practitioners (NPs). Figure 2-11 shows that PAs make a very substantial contribution to the active workforce in rural areas. Figure 2-12 demonstrates that the majority of PAs practice in generalist fields; the proportion of generalists are even higher in rural areas.

FIGURE 2 - 11
Clinically Active PAs by Location
(1994 National PA Study)



Source: Hart, et al., in-press.

FIGURE 2 - 12
Specialty Type for Clinically Active PAs by Location
(1994 National PA Study)

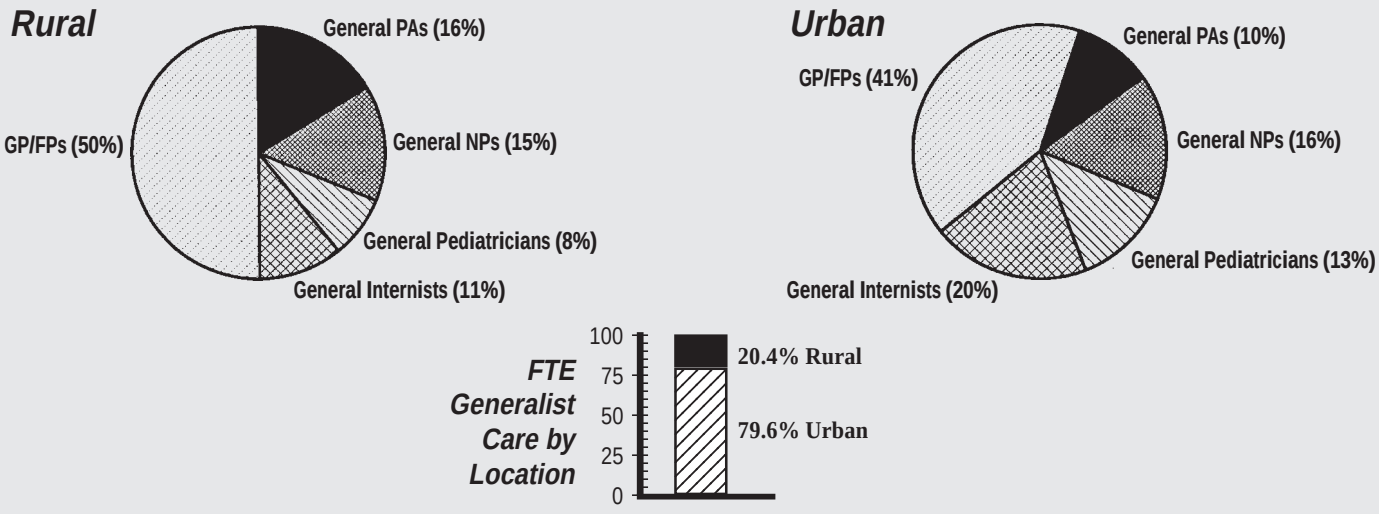


Source: Hart et al., in-press.

We know much less about the national distribution of NPs and the extent to which they are represented in rural underserved areas or rural areas generally. Data collected in Washington State show that NPs also play an important role in rural areas, as seen in Figure 2-13. Future research should create the ability to track the deployment of these professionals and estimate their contribution to overall workforce resources on a national basis.

The BBA has now removed the restriction on settings for services furnished by NPs and clinical nurse specialists (CNSs), by allowing payments for services in all settings if no facility or other provider is paid in connection with the service. Payment can be made directly to NPs and CNSs.

FIGURE 2 - 13
Generalist FTE Contribution of PAs and NPs to Care
(Washington State, 1997)



Source: Pirani and Hart, in-press.

THE INFLUENCE OF MANAGED CARE

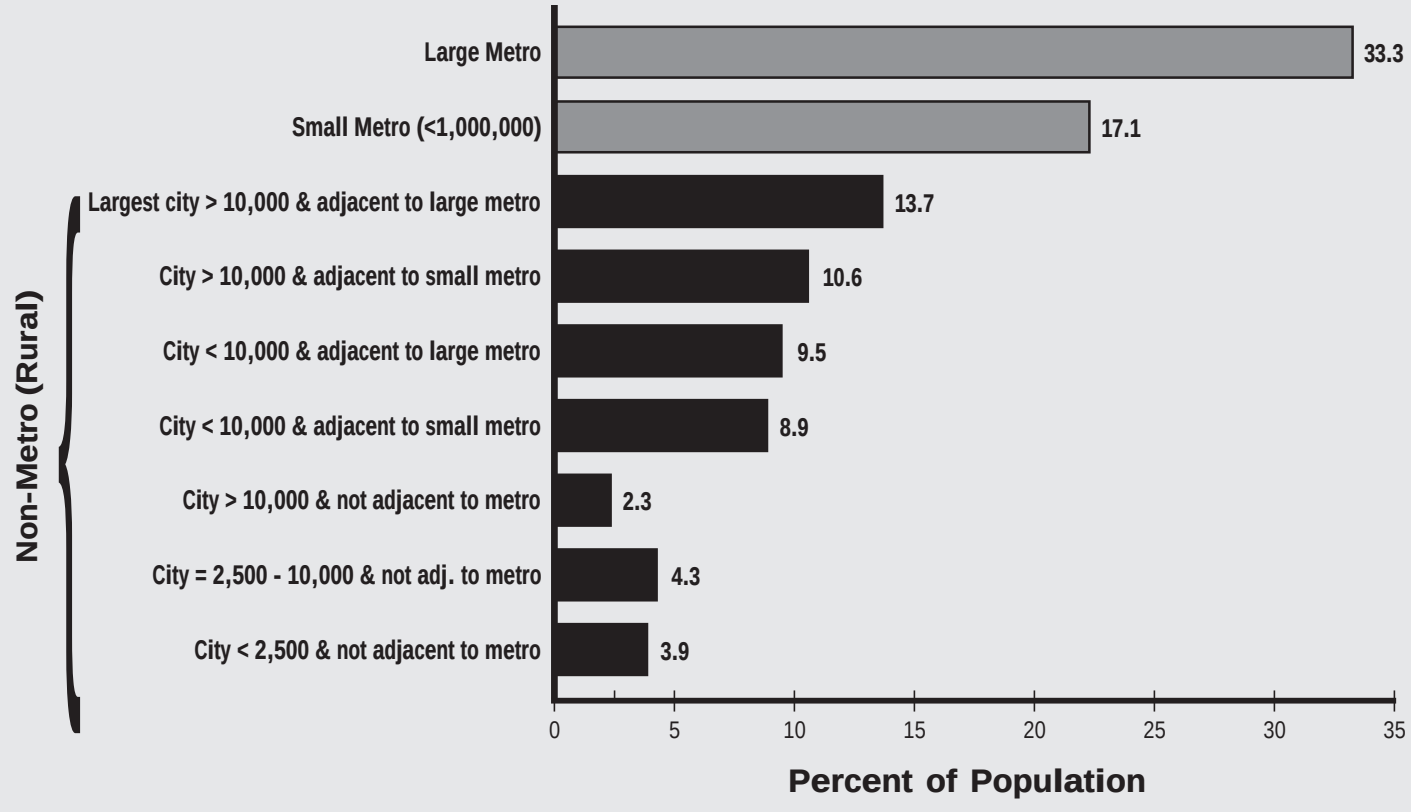
Managed care is a major emerging influence on the delivery of rural health care. Although managed care has become dominant in many urban areas of the United States, its impact in rural areas is just beginning to be felt. As seen in Figure 2-14, the more rural the area, the less the penetration of managed care. But this is changing rapidly, and over 90 percent of all rural counties were in the service area of at least one HMO by the end of 1995. Managed care is not only a creature of the private sector; nationally, about one-tenth of rural Medicaid recipients are enrolled in Medicaid HMOs and prepaid plans, and the number is increasing rapidly.

Managed care is a two-edged sword, both with regard to geographic maldistribution and with regard to rural medical underservice. Managed care networks have the potential to provide organizational vehicles for hiring and deploying physicians in areas that could not support independent physicians on their own. By emphasizing primary care services and raising the status and the salary of primary care providers, managed care systems favor the type of generalists who are more likely to practice in rural areas. And by creating economies of scale—and providing on-call coverage, continuing medical education, and locum tenens service—they can markedly improve the conditions of employment for isolated physicians and the economic viability of marginal groups.

The potentially negative impacts of managed care systems on rural health derive from two factors: the loss of local control of health care systems and the reluctance of private managed care systems to provide care to the uninsured. Most managed care systems are sponsored by large metropolitan organizations, and these places may have little understanding of or empathy for isolated rural areas. In the past, many rural health care systems have been sponsored by nonprofit community groups. As physicians are absorbed into health care systems managed from a distance, their loyalties may be displaced to those who pay their salaries.

Managed health care systems also exist in a brutally competitive marketplace and are unlikely to provide much uncompensated care for those who cannot afford to pay. The presence of physicians hired through vertically integrated systems may

FIGURE 2 - 14
1995 Commercial HMO Enrollment in Eight States by Location Type



Source: Moscovice et al., 1997.

mean that the community has health professional presence, but it may be of little use to the working poor who have neither Medicaid nor conventional health insurance. Again, the remoteness—physical and cultural—of the managed system from the distant rural scene may make it much more difficult for the rural provider to offer subsidized or sliding-scale services to the needy in the community.

The BBA has provisions for Medicare managed care payments that will increase per capita payments in rural areas. Beginning in 1998, Medicare capitation rates paid to plans will be the higher of one of various alternative amounts, including a local-national blended rate.

The managed care industry is in rapid flux, and it is difficult to predict the extent to which managed care will ultimately dominate rural areas as it has dominated some urban ones. The extent to which Medicare and Medicaid make managed care more or less attractive in rural areas will have an immense impact on its extension into these areas. Whatever decision is made, it is critical that there be some sensitivity to the impact on rural areas. Most rural places are too small to have more than one or two clinics offering care. The plurality and choices that exist in urban areas are often simply unavailable in rural areas, and individual rural areas are at risk for losing what little autonomy and local control they currently enjoy.

Persistent Shortage Areas — The Fragility of Small and Impoverished Rural Communities

One of the reasons that shortage areas persist in rural America is that some parts of the country present problems more severe and recalcitrant than the norm. There are three major factors that make counties difficult to staff with physicians: extreme and persistent poverty, a lack of conventional physical and cultural amenities, and populations that consist primarily of groups that are ethnic or racial minorities within the United States.

Often these factors exist in tandem. African Americans in the rural South, Hispanics in the Southwest, and American Indians generally often live in communities that are poor, suffer extreme weather, and have few sources of employment. Life in these places is hard, and it is difficult to attract and retain professionals of any kind, including physicians and other health professionals.

The sources of persistent rural poverty are numerous and are bound up in the history of this country, racial and ethnic polarities, and the economic disadvantages of remote isolated places. Health care is just one of the basic human services that are needed to allow these places to advance, along with improved education and economic development. Until these places join the economic mainstream, it is highly unlikely that they will ever attract an adequate retinue of health professionals without the direct intervention of programs such as the NHSC, the CHC, or the Indian Health Service that support the direct provision of services. And it should be recognized that long-term practice in these areas by physicians, no matter how altruistic, is a rare event.

As the Physician Payment Review Commission (PPRC) pointed out in its 1994 *Annual Report to Congress*, rural poverty may be a better marker of effective physician shortage than the HPSA designation (PPRC, 1994). Even universal health coverage, in and of itself, might not translate into the settlement of sufficient physicians in some areas perceived as unattractive. In these cases, government will continue to be the provider of the last resort under almost every possible scenario, an entirely proper role given the importance of health care as a basic human need.

Potential Solutions to the Persistent Problem of Rural Geographic Maldistribution

Educational Initiatives, Including Selection, Training, Deployment, and Support of Health Professionals

One of the most powerful ways to remedy problems of rural geographic maldistribution is to change the medical education system so that it selects, trains, and deploys more health care workers who choose to practice in rural areas. Crandall has discussed four basic conceptual models underlie many of the physician recruitment and retention programs designed as a way to address rural physician shortages (Crandall et al., 1990). The power of educational interventions derives basically from one of these, the "affinity" model, the notion that physicians choose rural practice because it is their preferred choice. To the extent that we train health professionals who prefer rural practice over other alternatives, it may be possible to improve physician distribution without the need to create special delivery systems or invoke some element of coercion in location choice.

Much of the federal support incorporated within the Title VII programs is based on the premise that

this is an achievable goal. Talley has discussed what he calls the four basic "truths" about rural health (Talley, 1990): (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. To the extent that these relationships are accurate—and considerable evidence supports associations between these characteristics and the decision to practice in rural areas—modifications of the training milieu to incorporate these factors make sense.

The advantage of this approach is that it takes optimum advantage of free-market solutions to the problem of geographic physician maldistribution. Rather than requiring the establishment of federal or state delivery systems that may be controversial, intricate and expensive, graduating residents gravitate to underserved areas to fulfill their personal desires. In taking advantage of the affinity model, recruitment is streamlined, and long-term retention enhanced (Pathman et al., 1994b). Even in situations where such graduates do not elect to serve in places of shortage, programs that encourage generalist careers near training sites address other problems within the health care system and provide opportunities for the advanced professional training of rural and minority students who might not otherwise pursue the health professions.

Although this type of intervention does not lend itself to controlled experiments, there is ample evidence that the affinity model works. The enormous difference in the extent to which medical schools send physicians into rural practice is powerful indirect proof of Talley's postulates (Rosenblatt et al., 1992). Publicly-owned medical schools in rural states—particularly those that see their mission as training future family physicians—have very high proportions of their graduating classes ultimately practicing 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).

The range of educational interventions is limited only by the creativity of those designing the courses, but a few themes have been repeated with success in a variety of settings. The key seems to be the creation of a pipeline that reaches out to rural communities to encourage the selection and success of rural students, gives them opportunities throughout medical school and residency to work in rural settings, and supports them in practice after they do settle in rural areas. This 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 investments in these areas have been very effective, a fact reflected in the popularity and ubiquity of these programs.

Changes in Reimbursement Strategies of Medicare and Medicaid

Although educational interventions have the proven ability to improve the flow of health professionals to underserved rural areas, they cannot overcome all the barriers that exist that prevent physicians from settling in these places. A powerful additional mechanism is the use of targeted incentives, an adaption of the economic incentive model in Crandall's taxonomy. Central to this approach is the belief that physicians and others act as rational economic beings. If some form of economic inducement enhances the reimbursement for rural services, then physicians are more likely to locate in these areas. This approach has been used with some success in Britain, Canada, and Australia, where a variety of bonuses increase reimbursement for selected rural practitioners.

The major example of this approach in the American setting is the locational effects of the Medicare reimbursement system. Effective January 1997, Medicare greatly reduced the number of payment localities by consolidation of areas including rural and urban areas in a number of states. The net effect is to reduce urban/rural payment differentials that led to relatively lower payments for rural providers, thus serving as a disincentive for rural practice.

An even more direct example of the introduction of economic incentives are the Medicare Incentive Payments (MIPs), described earlier. The presence of this 10 percent supplement to the usual fee scale seems to have had a stabilizing influence in certain rural areas, though it is difficult to tease out the independent effect. Part of the problem may be the difficulty in targeting the MIPs to those areas and individuals with the greatest need. It is also possible a larger monetary incentive will be needed to counter the centripetal pull of our larger cities.

Changes in Existing Direct Federal and State Programs

When educational interventions and economic incentives fail to remedy geographic maldistribution, the major recourse is the creation of programs that provide direct services to underserved

areas. There are numerous examples of such programs, the largest of which are the CHCs and the NHSC. There is no question that these two remain the preeminent safety net programs for rural America. Studies by the Rural Health Research Centers in North Carolina and Seattle demonstrate that about one in four of every new primary care physician entering an HPSA in the late 1980s was placed there under NHSC auspices (Konrad, 1994) and that one in five physicians practicing independently in many of the smallest rural communities was initially brought to those areas through their service in the NHSC (Cullen et al., 1997). CHCs provided care to 3.9 million rural people in 1996.

The optimal size of the CHC and NHSC programs in rural areas is difficult to determine. Even the most precise methodological tool will never produce an estimate that will satisfy everyone's need. Shortages are, by definition, relative, and what constitutes adequate service is highly dependent on subjective criteria. From a pragmatic standpoint, the NHSC, CHCs, and related direct-service programs exist to plug the largest cracks in a system that is highly porous. Providing health insurance for an individual will always be a much more precise intervention than establishing a clinic for an underserved population or sending a physician to practice in a place of need. But in the absence of universal health insurance, there is really no other recourse.

Given the realities of the present system, future efforts should concentrate on improving the fit between need and services, enhanced coordination—and reduced duplication—of services provided, better identification of students to ultimately serve in the NHSC, and improved effectiveness and efficiency of governmentally sponsored health care services, including those of rural health clinics (GAO, 1996b). The wide variety of programs available—and the natural variability in the way they are organized and administered—leads to enormous complexity in the provision of services. It is certainly worth the unending effort to simplify programs and their administration and to ensure that governmental resources follow human need.

New Technologies — The Potential Impact of Telemedicine

Telemedicine is an emerging technology with enormous potential for mitigating the impact of the geographic maldistribution of health professionals. Telemedicine—by transcending spatial and temporal barriers—eliminates some of the isolation felt by patients and providers in remote and/or underserved rural areas. By bringing together patients, primary care physicians, and specialists through telecommunications, it is possible to solve complex clinical problems, increase professional collaboration and training, support continuing medical education, and foster network development—all with reasonable cost. The development of new information management technologies is closely tied to telemedicine and will improve sharing of paperless records, clinical research, and medical education. There is no question that telemedicine has a legitimate, important, and growing role in rural medicine (Balas et al., 1997).

The Office of Rural Health Policy (ORHP) of the Health Resources and Services Administration has funded a number of telemedicine demonstration and evaluation projects, to help address questions that need to be answered before telemedicine can be fully accepted by medical, insurer, and patient communities.

ORHP has also supported the development of telemedicine networks consisting of entities to provide specialty consultations, small rural hospitals, rural primary care practitioner offices or clinics, and other rural facilities. A research center is being supported to facilitate evaluation of data on costs, utilization, and patient and practitioner satisfaction. A nationwide survey of rural hospitals is being carried out to assess the use of telemedicine, equipment, costs, and organizational factors influencing the development of the networks.

But the path to the future is neither clear nor simple. As pointed out in the Second Invitational Consensus Conference on Telemedicine and the National Information Infrastructure (Bashshur et al., 1995), multiple significant obstacles exist that make the current efforts uncoordinated, expensive, inaccessible, and at times even illegal. Although a full discussion of the issues surrounding telemedicine is well beyond the scope of this report, there are certain issues that should be addressed in order to ensure that this promising innovation can be effectively and appropriately used.

The current state of telemedicine could be characterized as creative but relatively unstructured, with a wide variety of public and private sector experiments proceeding simultaneously. Some applications—such as reading electrocardiograms or fetal monitoring strips at a distance—have become commonplace. Others—such as dermatology consults or teleradiology—are being performed in many different places but without standard protocols for transmission, interaction, evaluation, or charging. And others—such as doing an appendectomy at a distance—remain in the realm of science fiction, if just barely. If roving spacecraft can

perform atomic spectroscopy on rocks on Mars, there are no conceptual barriers to devising complex interventions at a medical facility 100 miles removed from the base station.

The next stage in the process of telemedicine is to codify, standardize, and evaluate those experimental and practical applications that exist. The major issues have been raised in the report cited and by the GAO (1997b). From the standpoint of geographic maldistribution, several topics rise to the fore. First, there must be some resolution of the professional licensure regulations so that physicians in metropolitan areas can make their expertise available to remote rural areas, when state lines are crossed. Second, there needs to be clear protocols for a unified technological infrastructure, both to reduce costs and to allow rural providers to have the option of communicating with multiple providers of these distant services without being captives of any single information provider. And third, third-party payers need to agree upon reasonable standards for reimbursing those who provide medical services at a distance.

The BBA provides for Part B Medicare reimbursement for telehealth services provided by physicians located in rural areas designated as HPSAs. It also provides for a four-year Informatics, Telemedicine, and Education Demonstration for beneficiaries with diabetes who reside in medically underserved rural or inner-city areas. The goals of the demonstration are to increase access and compliance for chronic disease care and to develop a model of cost-effective delivery for both managed and fee-for-service care.

FINDINGS AND RECOMMENDATIONS

FINDING 5: The number of physicians in many rural areas remains inadequate, despite the rapid expansion in the nation's physician supply.

FINDING 6: Expansion of the total physician supply is an very inefficient way of addressing the problem of geographic maldistribution

Geographic maldistribution persists, despite the rapid expansion of the nation's physician supply during the past decade. The problem is most marked for the smallest and most remote communities, but rural towns in every demographic classification have fewer physicians of all types, including generalists, than metropolitan areas.

Increases in the aggregate supply of physicians have begun to translate into an increased number of physicians in rural areas, but the response is directly related to the size of the community and its proximity to urban areas. The greatest residual problems are in rural communities of less than 10,000 people that are not adjacent to metropolitan areas: the physician supply in these areas is only slightly higher than it was in 1940. While the physician-to-population ratio in urban areas has more than doubled since 1960, it has risen by less than 15 percent in the smallest rural communities.

Recommendation 7: **The nation should continue to encourage and support medical education and health care delivery programs that increase the flow of physicians to rural areas, with an emphasis on the smaller and more remote communities.**

FINDING 7: Specialty choice is the most powerful predictor of rural practice location; family physicians are much more likely than any other specialty to settle in rural areas and comprise almost half of the entire physician population in rural areas. The relatively small number of family physicians educated has contributed to the shortage of rural physicians.

The supply of rural physicians is largely dependent on the production of family physicians, both allopathic and osteopathic physicians. Although many factors contribute to the choice to practice in rural areas—rural upbringing, medical school attended, and special educational service experiences—the final common pathway for the largest number of rural physicians is a family medicine residency. Family physicians have the clinical flexibility to provide care in virtually any rural setting, and the discipline of family medicine has long and enduring rural roots.

It is important to recognize that there is a distinction between enhancing generalist careers because of society's need for more primary care physicians and the importance of training family physicians specifically because of their predilection for rural practice. The emphasis on training more general internists and pediatricians—and the efforts of the specialty of OB/GYN to define itself as a generalist discipline—provide an important source of primary care physicians for the nation as a whole but have had a relatively minor influence on ameliorating the problem of rural physician shortages, especially in the more sparsely populated rural areas. General surgeons have a potentially important role to play in rural areas, but changes in training of general surgeons—and

further specialization within the field of surgery generally—have led to a decline in the supply of rural general surgeons.

Recommendation 8: Federal support for undergraduate and residency training of family physicians should be sustained. Title VII support for family medicine programs with a successful record of placing physicians in rural and underserved areas should be increased.

Recommendation 9: Encourage the development of primary care residencies in general internal medicine and general pediatrics and residencies in general surgery and OB/GYN that prepare, deploy, and support graduates who will have the skills and the desire to practice in rural areas.

FINDING 8: Women are much less likely than men to practice in rural areas; the recent increase in the proportion of women physicians may affect the future supply of rural physicians.

The rapid expansion of the number of women in medicine has potential implications for the future supply of rural physicians. Women are much less likely than men to locate in rural areas, and this phenomenon has the potential to further complicate the recruitment of rural physicians. This is an area where additional information and monitoring of trends are important.

Recommendation 10: **Support future research into the impact of gender on rural practice location, and consider the establishment of demonstration programs that lead to an increase in the number of women practicing in rural areas.**

FINDING 9: Although IMGs have made an important contribution to the provision of medical care in some rural areas, training IMGs is an inefficient way to expand physician supply in rural areas. Although many inner-city hospitals are dependent on IMGs for providing care for underserved urban populations, more direct avenues exist for meeting the needs of these hospitals. The funds would be better targeted to programs that increase the flow of USMGs to underserved rural areas (Mullan, 1997).

General consensus exists that an oversupply of physicians is emerging. The engine behind this development has been the number of entry level residency positions in the country's GME system, which has expanded rapidly in recent years. Most of this expansion is due to the increase in the number of IMGs coming to this country for training.

Although some of these foreign-born IMGs ultimately practice in underserved rural areas, most become permanent residents in metropolitan areas. Just as expansion of the total physician supply is a very inefficient way to address problems of geographic maldistribution, depending on IMGs to practice in rural areas is a suboptimal solution for persistent rural shortages. Because these first-year residency positions are supported by DME and IME payments by Medicare, we are in the paradoxical situation where an emerging oversupply of physicians is being stimulated by governmental subsidies.

Proven methods exist that can increase the number and proportion of USMGs that practice in rural areas and involve both educational and service interventions. Redirecting federal money to these programs has a potential dual benefit: improving geographic maldistribution while addressing the emerging problem of a physician oversupply.

Recommendation 11: **Eliminate Medicare DME and IME payments for new exchange visitor (J-1 visa) residents as part of the process of reducing the number of first-year residency positions to 110 percent of 1993 U.S. medical graduates.**

Recommendation 12: **Use a portion of the savings realized to increase funding for medical student and residency programs which prepare USMGs for service in rural and urban underserved areas and to support targeted expansion of community and migrant health centers and the NHSC.**

FINDING 10: Generalist-trained PAs and NPs play an important role in providing medical care in rural underserved areas; the exact dimension of this contribution and the optimal interrelationship among the various disciplines is not well understood.

Many PA programs have long been focused on producing graduates who are likely to serve in underserved rural areas, and evidence has shown that a substantial number of PAs have settled in rural areas. Information is less available about NPs, but it is clear that they also make an important contribution. Relatively little work has been done that shows how these clinicians and providers work together, the extent to which they substitute for one another, and what constitutes optimal collaboration

in different types of rural areas. It is important that research be done in this area.

FINDING 11: Reimbursement strategies that provide incentives for providers settling and practicing in rural areas, such as the Medicare Incentive Payment program, show promise in attracting rural providers.

Financial incentives have a powerful effect on physician behavior, although the independent effect of incentives is difficult to isolate from other simultaneous interventions designed to increase the rural physician supply. When coupled with educational programs that augment the number of providers interested in—and trained for—rural practice, incentives increase the flow of providers to rural areas.

The optimal structure of the incentive is as yet undetermined, though the current 10 percent supplement to the usual Medicare fee scale in certain rural areas appears to have an impact. Better research is needed to determine the best use of the incentive pools as inducements for the recruitment and retention of rural providers.

Recommendation 13: **Continue enhanced Medicare payments to rural providers in underserved areas; this process should be coupled with more research to determine the best way to construct the incentives so as to optimize their influence.**

FINDING 12: Telemedicine offers promise as a way to extend new services into underserved areas, but the lack of standardization threatens the widespread applicability of these new technologies.

Telemedicine has great promise in rural medicine and may magnify the effectiveness of local providers by making sophisticated services and consultation available from a distance. During this early phase in the development of these new technologies, there is little consensus on how these innovations should evolve. Problems with the hardware and software compatibility, licensing and reimbursement of providers who offer services across state lines, malpractice issues, and the difficulty of forging collaborative professional interrelationships hinder the further development of this area.

Recommendation 14: **Support continued experimentation in rural telemedicine efforts, while forging consensus on how these services should be provided, licensed, and paid for.**

Problems of Maldistribution of Physicians in Urban Areas

Urban America is a juxtaposition of want and plenty, a place where sophisticated tertiary medical centers are near neighborhoods where people cannot get rudimentary health care. The morbidity and mortality rates of some urban neighborhoods exceed those of the third world countries whose elite come to the nearby urban American hospitals for their medical care. Among the incongruities is a remarkable maldistribution of health professionals. Even as the physician supply in the United states has increased rapidly, many inner-city neighborhoods have few physicians or other health institutions capable of providing local care. In 1997, parts of 855 urban areas were officially designated as primary medical care HPSAs; even given the problems with the urban designation process (discussed below), the fact that this many inner-city areas were considered underserved is a reflection of the perceived problems in the areas applying.

The unequal distribution of physicians within urban areas is a much more difficult problem to document and quantify than rural maldistribution. First, rural America is supplied with far fewer physicians per capita than urban regions. As shown in Chapter 2 above, the physician supply increases with size of the community, largely because physicians cluster in cities for all the reasons discussed earlier.

But inner-city access to physicians is only weakly related to the supply of physicians in the surrounding metropolitan core. In rural communities, lack of physicians is often the dominant barrier to care, affecting residents regardless of insurance status, social class, income, or ethnicity. Yet, urban neighborhoods with a low number of available physicians are almost always “next door” to neighborhoods with high levels of physician supply. These urban shortage neighborhoods are pockets of undersupply in cities often bursting at the seams with physicians and other health professionals.

Although urban residents may live relatively close to concentrations of physicians—especially in contrast to the substantial distances that some rural residents must drive to obtain care—travel time may still be significant in the urban context. Many urban households are without automobiles, particularly households in poor, inner-city neighborhoods (Fossett & Peterson, 1989). Fifty miles of travel in a decent car on a county highway may present less of a geographic barrier to receiving care than three miles and two transfers on a crowded bus in a convoluted urban mass transit system. The underlying dynamic introduced by race- and class-based residential segregation that is common in urban areas further accentuates the geographic discrepancies in our urban environments.

THE UNIQUE METHODOLOGICAL DIFFICULTIES OF DEALING WITH WORKFORCE ISSUES IN URBAN AREAS

The science of health workforce planning in urban areas is in its infancy. Where we have developed relatively sophisticated tools for understanding the supply and requirements for health care professionals in rural areas, we lack even an agreed-upon way of categorizing, measuring, and comparing inner-city urban areas.

The methodological challenge is the lack of objective boundaries in urban areas, complicated by rapid changes in population demographics and the distribution of human services. Although we may impose order on American metropolitan areas with statistical tools such as census districts or postal codes, these boundaries do not reflect where people live, work, shop, or seek medical care. Even though many rural areas in this country are changing rapidly, they appear placid when compared to the urban caldrons where most people live.

Spatial distance between patient and doctor is one of several factors in trying to determine whether urban maldistribution of health professionals exists and whether it is a problem. In the city, use of health services is much more likely to be constrained by cultural background, language, class, income level, race, health insurance, and transportation—all of which matter much more than whether the nearest clinic is around the corner or across town. In some sense, the idea of urban geographic maldistribution is a conceptual misnomer. The barriers to care are much more a function of the structure of the social and health care system than they are the result of where physicians locate.

Since this report deals primarily with geographic maldistribution of physicians, the discussion that follows explores the issue of urban shortage areas within the context of the current supply and distribution of health professionals, the causes of maldistributions and shortages, and the programs

that have been launched to attempt to correct these problems. But it should be emphasized that merely correcting geographic maldistribution within our cities will have little impact on the delivery of health care without other more profound changes in the system. To improve the health care for the urban underserved, urban health care must be treated as a multifaceted entity.

URBAN SHORTAGE AREAS AND THE DISTRIBUTION OF URBAN HEALTH PROFESSIONALS

The shortage of urban health professionals must be viewed in the context of the dramatic growth in physician-to-population ratio, particularly among specialists (see Figures 1-4 and 1-5). This growth has been particularly notable in the cities; between 1970 and 1990, the number of total patient care physicians virtually doubled in metropolitan areas (Roback et al., 1992). Even among office-based general and family physicians, the number increased by 20 percent in metropolitan areas.

In one of the few studies to examine trends in the distribution of physicians within cities, investigators studied changes in the supply of patient care physicians—excluding physicians in residency training—between 1963 and 1980 in 10 large cities in the United States (Kindig et al., 1987). They found that while the overall supply of urban physicians per capita grew 29 percent, the increase in supply was nearly twofold higher in nonpoverty than in poverty areas. However, for office-based primary care physicians, the per capita supply declined by 38 percent in these cities and the reduction was much more pronounced in poverty areas.

By 1980, nonpoverty areas in these 10 cities had 11 percent more total physicians—and 48 percent more office-based primary care physicians per capita—than did the poverty areas. The authors concluded that "the overall increase in the physician supply may not adequately correct geographic and specialty maldistribution in urban areas," an observation made by others (Miller et al., 1978). Even though the supply of urban physicians has continued to grow since Kindig's work, there is no reason to think that patterns have changed.

Designated Shortage Areas in Urban Communities

The problem of shortage designation—difficult as it is in rural areas—is even more challenging in the urban milieu. Measuring the physician-to-population ratio of a metropolitan statistical area says almost nothing about physician access within that city's boundaries, and for this reason urban HPSAs are almost always subcounty neighborhoods that are demographically or socioeconomically somewhat distinct. These designated areas are almost always in the vicinity of areas with practicing but "inaccessible" providers, that is, physicians who do not freely accept patients from the designated area.

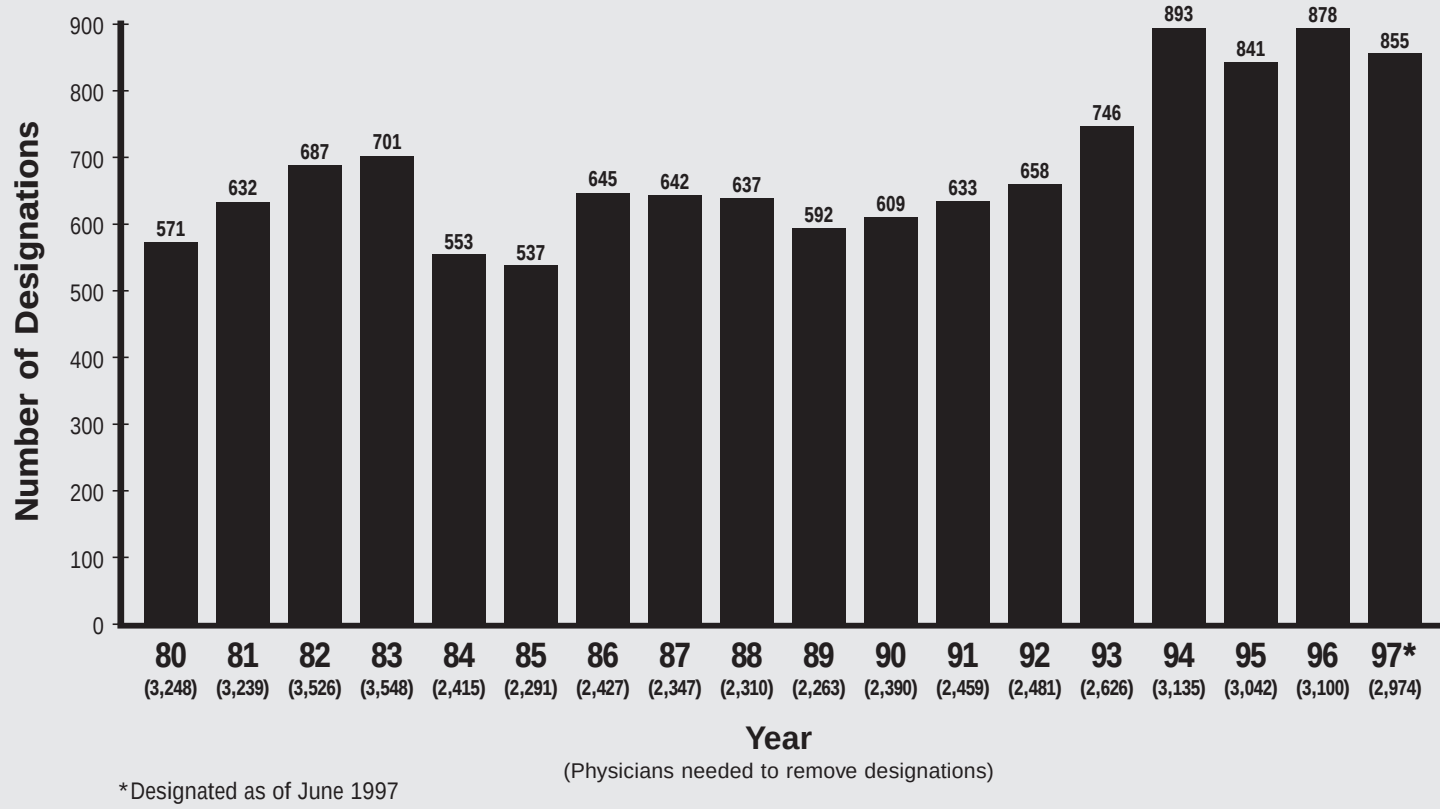
As seen in Figure 3-1, the number of urban primary care HPSAs increased rapidly from 592 at the end of 1989 to 893 at the end of 1994 and has not changed significantly since then. According to the Division of Shortage Designations within the Bureau of Primary Health Care, 24 million people lived within these urban areas, and it would have required an additional 3,000 primary care physicians in June 1997 to remove the areas from designation. Bringing these underserved urban areas to parity would have taken roughly 6,700 new physicians practicing in these areas.

It should be recognized that the number of primary care physicians serving a defined urban population is merely one element in the complicated process of ensuring that people have adequate health care. Other practitioners provide primary health care in these settings, but there are no published reports that systematically evaluate the urban distribution of NPs, PAs, or CNMs. To a large extent, such research is hampered by the lack of a universal database that captures practice information on nonphysician providers, similar to the Physician Masterfile compiled by the American Medical Association. The results of a survey conducted by the Division of Nursing in the Bureau of Health Professions suggest that nurse practitioners serve a disproportionate number of patients who are uninsured, covered by Medicaid, or are from minority groups (BHPr, 1995). To the extent that these nurse practitioners are practicing in the designated urban HPSAs, they would compensate for the relative lack of primary care physicians.

Characteristics of Populations Residing in Urban Shortage Areas

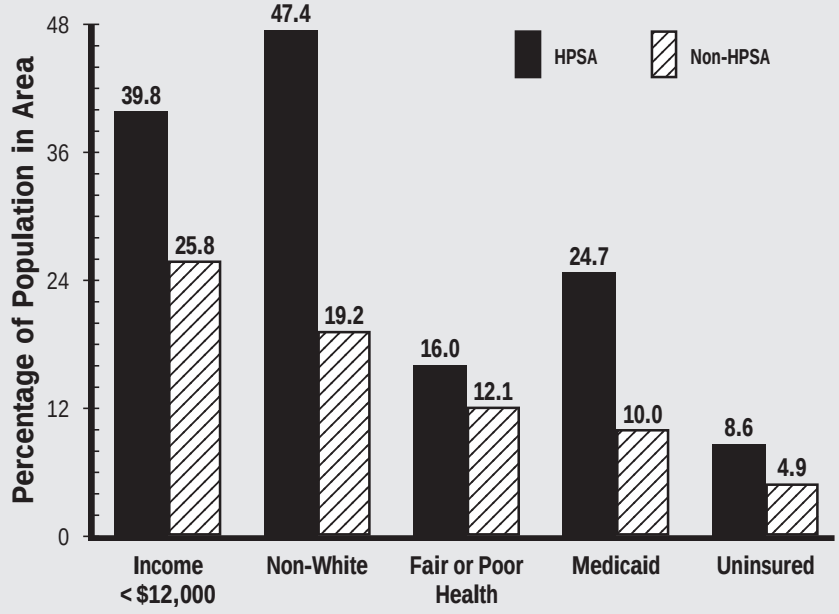
Several studies have been performed to analyze the demographic and related characteristics of neighborhoods that predict physician practice location within urban regions, but they are dated and limited in scope (Berk et al., 1983; Elesh & Schollaert, 1972; Gober & Gordon, 1980; Guzick & Jahiel, 1976; Kaplan & Leinhardt, 1973; Knaap & Blohowiak, 1989). In general, these studies confirm the observation that poor neighborhoods are prone to physician shortages (Kindig et al., 1987). Several of these studies also detected an independent effect of race on physician supply after

FIGURE 3 - 1
Number of Metro Primary Care Shortage Designations



Source: BPHC data, 1997.

FIGURE 3 - 2
Comparisons of Metro Populations by HPSA Designation
(1977)



Source: Berk et al., 1983.

controlling for income, with lower numbers of physicians in neighborhoods with proportionately higher numbers of African American residents. In many cases, the contrasting level of physician supply is stark within a city, differing by a factor of 10 between well-endowed and shortage communities (Ginzberg, 1994; Grumbach et al., 1995).

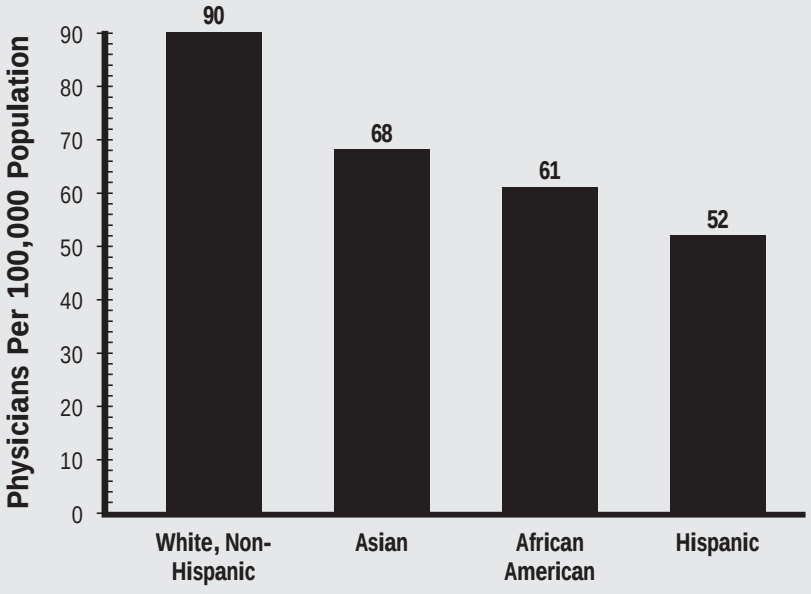
In one of the most thorough descriptions of populations residing in urban HPSAs (Berk et al., 1983), analysis of data from the 1977 National Medical Expenditure Survey found that 47 percent of residents in urban HPSAs were nonwhite compared with 19 percent in non-HPSAs. Residents in HPSAs were also poorer than non-HPSA residents and were twice as likely to be uninsured or covered by Medicaid (Figure 3-2). Although this study provides one of the few national descriptions of urban HPSA populations, it did not use multivariate methods to analyze the independent association of these demographic variables with physician supply and it is seriously out of date.

Although limited to a single state, a recent comprehensive analysis of physician supply in California in 1990 provides insight into urban physician location patterns. The distribution of office-based

physicians across urban communities was examined using as the unit of analysis subcounty zip code groupings derived from the state's zoning of primary care planning areas (Grumbach et al., 1995). The results show the primary care physician-to-population ratio is strongly and negatively associated with the proportion of both African American and Hispanic residents in a community. After accounting for the effect of race and ethnicity, income was *not* independently predictive of physician supply in multivariate linear regression models. The distribution of all office-based physicians mirrored the pattern found for primary care office-based physicians in California. The same pattern emerged in logistic regression models used to predict whether an area met the physician-to-population criterion for HPSA designation.

As expected on the basis of this demographic profile, populations residing in HPSAs tend to have worse-than-average health status. Residents in urban HPSAs are one-third more likely to report their health as being fair or poor than are residents of non-HPSAs (Berk et al., 1983). A detailed inquiry into shortage areas in New York City reported high rates of low-birthweight babies and morbidity from chronic disease such as hypertension (Brellochs & Carter, 1990). Many of the most devastating health scourges of modern American society—acquired immunodeficiency syndrome, chronic mental illness, drug-resistant tuberculosis, interpersonal violence, substance abuse—are rampant in the nation's inner cities.

FIGURE 3 - 3
Generalist Physician Supply by Race-Ethnicity of Urban Areas
(California, 1990)



Source: Komaromy et al., 1995.

The aforementioned studies do not always paint a uniform picture of the demographic composition of urban shortage areas—not surprisingly when the studies differ substantially in chronology and geographic settings. However, urban shortage areas generally tend to be low-income neighborhoods populated disproportionately with nonwhite residents, and while poverty, coupled with an absence or inadequacy of insurance coverage, serves as an obvious deterrent to establishment of private medical practice in these areas, a community's racial and ethnic character also exerts a powerful influence on physician location independent of income status.

CHARACTERISTICS OF OFFICE-BASED PHYSICIANS PRACTICING IN URBAN SHORTAGE AREAS — THE IMPORTANCE OF MINORITY PHYSICIANS

Physicians practicing in urban shortage areas tend to be of the same racial and ethnic background as the residents of these areas. In one of the first major studies to examine the relationship between physician and patient race, data from the AAMC were used to track medical school graduates of the class of 1975 (Keith et al., 1985). The results indicated that nonwhite physicians were more likely than white physicians to have practices serving nonwhite patients. Minority graduates were twice as likely as nonminority graduates to practice in physician shortage areas (12% versus 6%). More recent studies further confirm these associations (e.g., Xu et al., 1997). Physician race is not reported on the most commonly used database on physician supply, the AMA Physician Masterfile, hampering research on this topic.

A recent survey of office-based primary care physicians in California showed that African American and Hispanic physicians located in urban areas that had a relatively low supply of primary care physicians (Komaromy et al., 1996). The mean number of generalist physicians per 100,000 population in the area of practice was 68, 61, and 52 Asian, African American, and Hispanic physicians, compared with a mean of 90 per 100,000 for non-Hispanic white physicians (Figure 3-3). Nonwhite physicians in California had a much larger proportion of nonwhite patients enrolled in their practices than did white physicians (Figure 3-4).

Concerns have been raised about the quality of the physicians practicing in urban shortage areas. A detailed survey of nine of New York City's poorest neighborhoods conducted in 1988 by the Community Service Society of New York revealed that

FIGURE 3 - 4

Physician Supply and Community Demographics, California, 1990

Urban Community	*Mean Number of Primary Care Physicians Per 100,000 Population**	*Mean Number of Physicians Per 100,000 Population**	*Percentage Physician Shortage Areas*
Poverty:			
High African American and high Hispanic	23.9	53.8	57.1
High African American, not high Hispanic	42.8	104.8	43.5
High Hispanic, not high African American	44.2	100.5	46.2
Neither high African American nor high Hispanic	69.1	171.0	12.5
Nonpoverty:			
High African American	54.4	126.0	41.7
High Hispanic, not high African American	40.5	82.0	28.6
Neither high African American nor high Hispanic	80.4	206.5	10.3

* Active patient-care physicians in office-based practices with or without correspondingly high Hispanic populations

Source: Grumbach K, Seifer S, et al. Primary Care Resources and Preventable Hospitalizations in California. Berkeley, CA: California Policy Seminar, 1995.

only 24 percent of physicians practicing in these areas were board certified, compared with a citywide average of 64 percent. More than 70 percent of the physicians were graduates of foreign medical schools. Only one-third had hospital admitting privileges, including only 40 percent of the OB/GYNs caring for pregnant women in these communities (Brellochs & Carter, 1990). Many studies of both local and national scope have documented that private physicians in urban areas who accept Medicaid patients are less likely to graduate from United States medical schools or to be board certified than physicians who do not accept Medicaid payment (Fossett et al., 1990; Mitchell, 1991; Mitchell & Cromwell, 1980; Perloff et al., 1986).

Summarizing his study of health care for the poor in the late 1980s in four of the nation's largest cities, Ginzberg (1994) observed, "A long-term trend of abandonment and avoidance by physicians had drained the low-income neighborhoods in all four metropolitan areas of private practitioners; physician-population ratios were as low as 1:10,000 to 1:15,000, in contrast to affluent neighborhoods with ratios of 1:300 or even higher. Moreover, the majority of practitioners serving the poor consisted of foreign medical graduates, many with indifferent professional competence and language problems that impeded effective patient-physician communication. Deterred by the low reimbursement rates paid by state Medicaid programs . . . the majority of United States-trained physicians refused to accept Medicaid patients or limited the numbers they were willing to treat, leaving the field to group practices with questionable standards (Medicaid mills) that thrived on volume throughput."

While there is concern that graduates of foreign medical schools may have suboptimal training or may not be fluent in the English language, some of these physicians share the same native language and culture as many of the residents of the communities they serve. The few studies performed to measure the quality of care provided have reported equivocal findings (Mitchell & Cromwell, 1980; Wyszewianski & Donabedian, 1981). Another study suggested that pregnancy outcomes for poor women in Chicago under the care of private physicians were inferior to those for women who received prenatal care at public health clinics (Handler & Rosenberg, 1992).

Just as the presence of a physician in an underserved community is no guarantee that the physician provides an acceptable quality of care, physician location also does not necessarily assure access to care. In one study, physician "availability" and "accessibility" are distinguished (Zuvekas et al., 1994): "Availability consists of the presence of necessary health providers and services, while accessibility ensures that these services are usable by the target population." The study by the Community Service Society of New York illustrates how availability in terms of apparent physician supply may not always paint an accurate portrait of true accessibility. The survey detected 701 different primary care physicians with practices located in the study neighborhoods. However, only 94 of the 701 physicians were considered truly accessible to the community on the basis of meeting all of the following criteria: accepting Medicaid payment, practicing at the location at least 20 hours per week, and having 24-hour telephone coverage (Brellochs & Carter, 1990). Lack of 24-hour coverage was the

single most frequently missing ingredient. In addition, 35 percent of the physicians practiced in the communities less than 15 hours per week. Although most physicians in underserved areas do accept Medicaid payment, less is known about whether these physicians are willing to care for patients who are entirely uninsured.

The "Safety Net" — Providers Other than Office-Based Physicians

Community and Neighborhood Health Centers

As discussed in Chapter 1, CHCs were developed as an alternative organizational model for bringing medical providers—and services—into underserved communities. Following the inception of the first two Office of Economic Opportunity (OEO) funded centers in 1965 in Boston and Mississippi, CHCs developed throughout the country during 1965-80, with the number stabilizing in the past decade. In 1996, 625 CHCs provided services at over 3,900 different sites (BPHC, 1997). As seen in Figure 1-2, nearly eight million patients each year use these centers, which have operating costs of over two billion dollars annually. Direct federal funding (under Sections 329 and 330 of the PHS Act) subsidizes approximately one-fourth of these costs. Third-party insurance payments (mostly from Medicaid and Medicare) and out-of-pocket payments from patients comprise most of the balance of clinic revenues. Although there are more centers in rural areas, the population served and the resources used are split fairly evenly between rural and urban locations.

Of those patients using CHCs, 90 percent have incomes below 200 percent of the poverty level, 43 percent are uninsured, and another 43 percent are covered by Medicaid or Medicare. Two-thirds of patients are nonwhite (Rosenbaum & Dievler, 1992). In some communities with severe shortages of office-based physicians, federally funded CHCs have become the dominant source of care. In other regions, cities and counties have attempted to emulate the CHC model by administering and funding their own freestanding primary care clinics in needy urban communities. For example, several years ago the San Francisco Health Department embarked on a new model of primary care clinics by converting five former public health stations into full-spectrum primary care centers and by assuming administration of three other clinics that had previously been federally funded clinics under the auspices of a nonprofit community board. Similar efforts have occurred in Dallas and New York City, as well as in other cities.

A systematic enumeration of primary care clinics in California, including both federally funded "330" CHCs and primary care clinics administered under other arrangements (e.g., local health departments) but targeted to underserved populations, was undertaken to evaluate the correlation between location, income levels, and racial and ethnic characteristics. Consistent with their mission, these clinics were much more likely to be located in lower-income communities. In contrast with the patterns found for physician distribution, clinic location was not associated with community racial and ethnic characteristics after controlling for income status (Grumbach et al., 1995).

One problem faced by CHCs is attracting and retaining physician staff. In 1990 it was estimated that approximately 400 community health center physician positions were vacant (Boufford, 1990). While approximately 50 percent of physician positions in CHCs were filled through the NHSC (Boufford, 1990), the decline in the number of NHSC scholarships awarded in the late 1980s, as well as ongoing debate about the relative priorities of rural and urban sites for NHSC participants, has contributed to the problem of physician staffing at these clinics. As indicated in Figure 1-2, CHCs have approximately one mid-level provider for every two physicians on staff. This ratio is considerably higher than the overall ratio of mid-level practitioners to physicians in the United States, suggesting that NPs, PAs, and CNMs are relatively more likely to practice in underserved communities than are physicians.

Without a doubt, CHCs have partially helped fill the void related to the paucity of office-based clinicians in many urban neighborhoods. Unfortunately, the current supply of these facilities is insufficient to meet the demand for services in many of these communities. Although the centers were established with the goal of serving all patients irrespective of their ability to pay, policies limiting federal subsidies to these clinics have compelled many facilities to reduce the amount of uncompensated care provided and to attempt to become more fiscally self-sufficient through generation of patient revenue.

Federal funding of CHCs has lagged far behind medical inflation over the past decade at a time when insurance coverage has deteriorated and the health needs of the urban poor have become more acute. Between 1981 and 1991, federal funding for CHCs increased at one-half the rate of increase in the urban consumer price index for medical care (Rosenbaum & Dievler, 1992). A recent study found that only 61 percent of CHCs in 10 U.S. metropolitan areas were able to schedule an appointment for

a new Medicaid patient (Medicaid Access Study Group, 1994). The most common reason cited by the clinics for refusing a request for an appointment was that the center was "not accepting new patients," regardless of their insurance status. Only 44 percent of the clinics could accommodate Medicaid patients with relatively acute symptoms with appointments within two days.

URBAN HOSPITALS

Urban hospitals, particularly public hospitals, have long served as "providers of last resort." In many cities, crowded hospital emergency and outpatient departments are considered symptomatic of the problems of physician maldistribution and insufficient numbers of accessible primary care providers in the community. The volume of care provided in the emergency and outpatient departments of public hospitals in 100 of the nation's largest cities increased by nearly 40 percent from 1980 to 1990 (Ginzberg, 1994). In some cases, the volume of care is astonishing: 865,000 visits per year to Grady Memorial Hospital in Atlanta, 670,000 visits to Cook County Hospital in Chicago, 645,000 visits to Los Angeles County-University Southern California Hospital. Veterans Affairs hospitals and ambulatory are services are also a significant source of safety-net services (Wilson & Kizer, 1997).

Although public hospitals account for a disproportionate share of outpatient and emergency department use in urban areas, especially use by uninsured patients, private hospitals are the setting for the majority of outpatient and emergency department visits overall in these cities (Ginzberg, 1994). Several studies have documented that many patients seek care from emergency departments in urban areas because they lack access to a regular source of primary care in their community (Grumbach et al., 1993; Pane et al., 1991; Rask et al., 1994). Yet, many urban hospitals and their affiliated outpatient departments have closed in recent years because of the financial predicament of serving populations with high medical needs and low—or absent—reimbursement systems. Between 1985 and 1992, over 10 hospitals in the inner city of Chicago closed (Getzenberg & Lenihan, 1992).

Although urban hospitals play an important role in the safety net, many analysts have criticized the reliance on these facilities for outpatient care. Concerns have been raised about the inability of hospital outpatient and emergency departments to provide a coordinated approach to primary care that is economical and conveniently accessible (Freeman et al., 1982; Ginzberg, 1994). In many shortage areas, however, hospital outpatient facilities represent the only available source of ambulatory care.

Appreciating the problems associated with the traditional mode of care in outpatient departments, many hospitals have attempted to redesign their ambulatory care approach along the principles of a primary care model that emphasizes continuity, coordination, and comprehensiveness of care. Some hospitals have emphasized enhancement of primary care clinics located at the central hospital campus (Fein, 1991). Other hospitals have entered into partnerships with community-based clinics. For example, in the late 1980s, Parkland Memorial Hospital assisted in the development and administration of six primary care clinics located in underserved communities in Dallas (Smith et al., 1991). In Chicago, the University of Illinois Medical Center and the Chicago Department of Health collaborated in resurrecting a community health center in the city's impoverished west side after the clinic lost its federal funding as a result of management problems (Getzenberg & Lenihan, 1992). The Johns Hopkins Academic Health Center has linked with community organizations in East Baltimore in an attempt to enhance delivery of primary care services in this low-income, minority community (Foreman, 1994; Levine et al., 1994). Many of these collaborative efforts are discussed by Zuvekas et al. (1994) in their report, "Models of Care for Inner City Populations," prepared for the PPRC.

CAUSES OF HEALTH PROFESSIONAL SHORTAGES

The divergent nature of rural and urban physician shortages recurs in discussions of the causes of physician maldistribution. A substantial body of research analyzing key factors associated with the recruitment and retention of physicians to serve in rural areas is available (Pathman et al., 1992; Pathman et al., 1994a). These studies have indicated that in addition to issues related to economic opportunities, the supply of providers for rural areas is constrained by factors related to professional and personal lifestyle considerations in locating in regions remote from cities that are the hub for most academic training. Considerably less research has been directed to systematically analyzing factors associated with physicians choosing to practice in underserved urban communities.

A number of important factors appear to be related to recruiting and retaining primary care clinicians in urban underserved areas. These factors can be grouped into four main categories: (1) clinician attitudes and exposure to the urban underserved, (2) working conditions and quality of life issues, (3) reimbursement and economic issues, and (4) clinical issues.

Clinician Attitudes and Exposure to the Underserved

Clinician attitudes toward and perceptions about the urban underserved play a prominent role in practice decisions. A recent study uncovered a host of attitudes and, in some cases, misperceptions about the poor (Komaromy et al., 1995). Some physicians expressed concerns over being sued by poor patients, whereas studies of medical malpractice have found the opposite to be true: poor patients are less likely to sue than their wealthier counterparts (Burstin et al., 1992). Physicians were also found to be averse to patient populations with "self-induced" disease caused by drug and alcohol use and other high-risk behaviors. A study of the willingness of family physicians to provide obstetric care for Medicaid patients suggested that the fear of being sued and the perception that Medicaid patients are noncompliant were important factors in the decision to discontinue obstetric care for these patients (Nesbitt et al., 1991).

Perceptions of underserved practice can be traced to the training conditions and lack of exposure to the urban underserved during medical school and residency. Physicians in training can develop a kind of "psychological callousness" about vulnerable populations, making it unlikely they will care for these populations when they enter practice (Lurie & Yergan, 1990). Class, cultural, and racial gulfs between clinicians and patients also play a role in physician practice decisions. As discussed previously, a match between the ethnicity of the physician and the community served is considered a significant factor in physician recruitment and retention.

A recent study identified several personal characteristics that described physicians with a predisposition to work with the underserved (Scammon et al., 1995). These characteristics included a desire to "return to their roots," a value orientation toward service developed over a lifetime of experiences, the desire to make a difference by taking on challenges that others are unwilling to tackle, and the desire for a challenging mix of patients, both in terms of clinical spectrum and cultural diversity. It should be noted that there are a very different set of characteristics that motivate those choosing rural practice.

Working Conditions and Quality of Life

Suboptimal physical facilities; inadequate staffing, resources, and hospital linkages; lack of professional support; and unrealistic productivity demands can hinder practice in urban underserved areas and lead to physician burnout (Scammon et al., 1995). Physicians report difficulty in providing care for Medicaid and uninsured patients because of burdensome paperwork and difficulty obtaining specialty consultations (Komaromy et al., 1995). Safety concerns and violence in inner-city areas are deterrents to practicing with the urban underserved and can lead even the most altruistic physicians to consider relocating their practices (Calman, 1993).

Reimbursement and Economic Issues

Inadequate reimbursement is a common reason cited by physicians for choosing not to care for Medicaid and uninsured patients. Physicians with a "social orientation" appear less likely to be concerned with financial incentives (Calman, 1993). No study has determined the role of economic opportunity in physicians' decisions to work in a nonprivate practice setting in urban shortage areas (e.g., as a salaried physician at a CHC).

Clinical Issues

Physicians cite psychosocial problems and patient noncompliance as important reasons for avoiding Medicaid and uninsured patients. Patients with complicated illnesses related to substance abuse, mental illness, and exposure to life-threatening contagious illnesses (e.g., tuberculosis, human immunodeficiency virus/acquired immunodeficiency syndrome) also pose barriers to physicians practicing in urban underserved settings (Komaromy et al., 1995). Conversely, physicians committed to working with the urban underserved cite the wide range of clinical practice and their abilities to intervene in the psychosocial needs of their patients as prominent factors in their decisions to practice there (Scammon et al., 1995).

POLICIES TO IMPROVE HEALTH PROFESSIONAL DISTRIBUTION IN URBAN AREAS

The federal government, as well as government at the state and local level and private agencies, have established numerous programs in the past decades to attempt to correct the maldistribution of physicians and other health professionals. Most of these policies have sought to address simultaneously the maldistribution of these professionals in both the rural and urban context. These programs differ in their emphasis, in recognition of the multifaceted nature of the barriers to practice in underserved areas as described in the preceding section of this report. Following is a brief review of some of the most noteworthy programs addressing the problem of urban shortage areas.

The National Health Service Corps

As noted in Chapter 1, the NHSC—after a brief period in which most assignees were volunteers—initially concentrated on providing scholarships to medical students in exchange for a service obligation in shortage areas on a year-for-year exchange basis. In later years, a loan repayment program was added for practitioners who had already completed their residency training. After an apex of 2,380 scholarships awarded in 1979, federal support for the NHSC waned in the 1980s, reaching a nadir of 40 scholarships in 1988. In 1990, Congress enacted the NHSC Revitalization Amendments, which nearly doubled the NHSC's budget from $51 million to $91 million. The NHSC offered approximately 400 scholarships and 600 loan repayments in 1994 (Office of Inspector General (OIG), 1994).

Most practitioners in the NHSC are located at CHCs or similar types of primary care clinics situated in HPSAs. Although individuals are given the option to practice in a private office setting in a shortage area to fulfill their service obligation, very few NHSC practitioners select the office practice model, underscoring the difficulty in sustaining such a model in underserved communities.

The OIG recently issued an extensive review of the NHSC, including a survey of NHSC clinicians and the directors of sites to which they were assigned. The report indicated that clinic directors felt the NHSC was essential for attracting quality health professionals to their sites. The report identified several problems limiting the success of the NHSC in attracting and placing providers and enhancing their experience in underserved community practice, e.g., fewer than one-half of the providers who sought loan repayment placement in 1993 could be matched with a site acceptable to the applicant. Recommendations were made regarding the need for greater technical assistance and outreach by administrative staff to NHSC providers and placement sites, more accurate and on-line information regarding vacancies and greater flexibility in the types of sites offered (OIG, 1994) .

Obstacles to retention of providers after completion of NHSC service obligations are similar to those encountered in attracting and retaining physicians in underserved areas in general: noncompetitive incomes, lack of clinical and administrative support, "burnout" in small practices, and conflicts over health center management and working conditions. It is clear that, particularly in urban areas, the expectation that physicians may move from NHSC service at a health center to independent private practice in the same community is generally unrealistic. To the extent that these providers remain in shortage areas, they require the infrastructure of an organized clinic to support their continued practice in underserved urban communities.

Community Health Centers

CHCs, by definition, bring new providers into underserved areas. To qualify for federal funding, sites must meet certain criteria that include a low physician-to-population ratio. Interestingly, no study has been undertaken to formally investigate how clinics may affect the "ecology" of providers within an area. For example, it is not known whether clinics have a ripple effect on private office-based physicians in a community. An effect in either direction is plausible; clinics might displace some private practitioners (e.g., studies indicate that substantial numbers of clinic patients formerly sought care from private physicians), or clinics might provide a clinical locus that serves to stabilize or attract other providers (e.g., physicians might remain in a community in private practice after completing a service obligation at a clinic).

One methodological problem in sorting out the relative contribution of clinic staff to the overall physician supply in an area is that current databases do not always clearly distinguish those physicians working in clinic settings. For example, the AMA Physician Masterfile does not have a specific designation for a practice setting of community or public clinic. It is unclear how many clinic physicians select "office-based" versus some other category when reporting their practice setting on the AMA survey. In addition, federally employed physicians are typically not included in enumerations of physician supply used to make HPSA determinations; physicians in the NHSC may appear as federal employees and thus not be counted, depending on whether the clinic or the federal government issues salary payments. Because of these limitations, it is difficult to gauge accurately the overall magnitude of the contribution of clinic staff to the health care workforce and the exact extent to which these providers compensate for the lack of office-based private practitioners in shortage areas.

Educational Strategies

One strategy to encourage health professionals to locate in underserved communities has been to develop training programs focused on the needs of underserved communities. Proponents of this approach have suggested that greater exposure to underserved populations during training will result in professionals gaining greater familiarity and comfort with these populations and will stimulate

interest in continuing practice in shortage areas after the completion of training (Lurie & Yergan, 1990). Federal grants have supported the creation of Area Health Education Centers to promote linkages between underserved communities and academic programs. In addition, several training programs have developed mission statements to train professionals to serve urban underserved populations. A recent study of training programs for PAs, NPs, and CNMs found that programs that had clear mission statements to produce health professionals to serve underserved communities and that conducted training in underserved settings were likely to have substantial proportions of their graduates practicing in shortage areas (Fowkes et al., 1994).

Perhaps the most widely known residency training program for physicians that specifically focuses on the urban underserved is the residency program in social medicine at Montefiore Medical Center in the Bronx. This program, founded in 1970 to help develop staffing for the affiliated Martin Luther King, Jr., Health Center, one of the first neighborhood health centers funded by the OEO (Strelnick et al., 1988), involves residents in family medicine, general pediatrics, and general internal medicine. It has subsequently established linkages with several other community-based primary care clinics. By 1994, over 300 physicians had trained in the social medicine program. Seventy percent of its graduates went on to practice in medically underserved areas, compared with 46 percent of physicians who had applied to the program but ultimately trained elsewhere (Strelnick et al., 1994).

The family practice residency program at San Francisco General Hospital, initiated in 1972, has also had an explicit objective to train physicians to meet the needs of underserved urban communities. Follow-up in 1994 of the 163 graduates of the San Francisco General program found that 49 percent were working in medically underserved areas or in a public clinic caring for low-income patients (personal communication, Jonathan Rodnick, M.D.).

The most encouraging evidence that training programs may be able to actually stimulate greater willingness of professionals to serve in shortage areas is the comparative study of graduates of the Montefiore social medicine program. Graduates were more likely to practice in underserved areas than other physicians who expressed a strong interest in the program but were either not selected or opted for an alternative training site. This finding suggests that the training environment itself may make a difference. Even in the absence of more conclusive evidence, the existence of training programs dedicated to urban underserved communities provides, at a minimum, a raining experience that supports individuals in their desire to practice in underserved areas and better equips professionals for practice in such a context.

Other Policies

Several additional types of policies may affect physician distribution in urban areas but have not been subjected to careful scrutiny by researchers. For example, it is plausible that increasing fees under the Medicaid program might make practice in lower income areas more financially attractive (or less financially unattractive) to physicians. Several studies have been performed to evaluate the association between temporal changes or cross-sectional variation in Medicaid fees, on the one hand, and rates of physician participation and Medicaid visits, on the other hand. These studies have tended to find that higher fees are associated with more physicians participating in the Medicaid program but are not associated with greater use of services by Medicaid patients (Adams, 1994; Fanning & de Alteriis, 1993; PPRC, 1991). Fee increases do, however, appear to shift the locus of care from clinics and hospitals to private physician offices. The results of a recent study of a dramatic increase in Medicaid fees for obstetric services in Maryland showed that the fee increase arrested a precipitous decrease in the number of physicians providing these Medicaid services but did not go so far as to reverse the trend (Fox et al., 1992). No study has been done to evaluate whether changes in Medicaid fees actually produce changes in the location of physician practices, as opposed to affecting the number of physicians participating in Medicaid. Indeed, there is evidence that fee increases may influence participation mainly among physicians practicing in areas with relatively low concentrations of Medicaid patients.

It is reasonable to speculate that other types of policies may well improve physician distribution in urban areas. For example, the strong association between physician race and ethnicity and the likelihood of practicing in underserved areas suggests that policies such as affirmative action that have augmented the enrollment of minorities in health professional training programs have probably also helped to ameliorate a more severe shortage of physicians in these communities. In the case of widely implemented policies such as affirmative action, it is difficult to design research to measure specifically the contribution of affirmative action policies per se to physician distribution. Rather, the observation that physician race and ethnicity are highly

correlated with practice location stands as compelling circumstantial evidence that increasing the number of minority graduates from health professional training programs reduces the degree of maldistribution that would otherwise occur in the absence of these programs.

RELATIONSHIP BETWEEN PHYSICIAN SUPPLY, ACCESS TO CARE, AND HEALTH OUTCOMES

Does Location Matter in the Urban Context?

The maldistribution of health professionals is a problem only insofar as it causes inequities in access to care or, more importantly, in health itself. After controlling for the effects of other factors such as poverty, insurance status, and race, does a higher supply of health professionals in a community significantly contribute to improved access to care and health outcomes? The rural versus urban distinction is important in considering this question. In rural areas, the geographic remoteness of providers may intuitively seem to be a major obstacle to access to care. In urban areas, local physician shortages in the context of general overall physician supply may appear to be a less self-evident problem, although the evidence suggests that local physician supply is an important factor in influencing access to care (Fossett & Peterson, 1989; Ginzberg, 1994).

There is little empirical evidence supporting the contention that physician proximity in urban areas enhances access to care. Research addressing this question is sparse and dated (Acton, 1973; Dutton, 1986). In a study of inner-city residents commissioned by the OEO, Acton found that longer travel times to a regular source of care were significantly associated with fewer visits to this source and greater likelihood of visits to alternative sources of care. Dutton's study of 1971 survey data had similar findings, with a stronger association for two predominantly African American neighborhoods in Washington, DC.

Studies of Medicaid Physician Participation

Many studies have detected what has often been considered a paradoxical relationship between the physician-to-population ratio in urban counties and the likelihood of physicians in these counties participating in Medicaid (Fossett & Peterson, 1989; Perloff et al., 1986): higher ratios are associated with lower participation rates. Economic models predicted that increasing competition for privately insured patients, related to a growing physician supply, would make physicians more likely to accept Medicaid patients (Sloan et al., 1978). Findings contrary to this economic prediction have been explained on the basis that urban counties with higher levels of physician supply also tend to be large cities with greater degrees of residential segregation (Fossett & Peterson, 1989). The concentration of Medicaid recipients in racially and economically segregated neighborhoods may isolate these individuals from physician practices in more affluent areas, and the physicians are less likely to include Medicaid patients in their practice. Indeed, a variable measuring the degree of residential segregation in a county explained much of the variance in Medicaid participation rates, and studies of Medicaid participation by OB/GYNs in Chicago (Fossett et al., 1990) and other investigators have reported findings consistent with this hypothesis (Mitchell, 1991).

Studies of residential segregation and Medicaid participation not only lead to discouraging conclusions about the effect of growth in the overall physician supply on access to care for poor patients, but also suggest that physician maldistribution within urban areas may well be a limiting factor for policies seeking to improve access to care in underserved communities. For example, Fossett has suggested that increasing Medicaid fees is unlikely to lead to improved access to care for many urban Medicaid patients; the few physicians practicing in these segregated areas are already nearly at maximal capacity for caring for Medicaid patients, and modest fee increase are unlikely to induce other physicians to relocate their practice to these communities. Instead, fee increases may increase participation rates among physicians practicing in low-Medicaid neighborhoods and only marginally improve access for the Medicaid population as a whole. Studies of the Medicaid fee policies cited previously have usually found that increased fees are not associated with a higher overall use of primary care services by Medicaid recipients.

Although these studies suggest that proximity of providers makes a difference, other research has failed to detect as significant a role for local physician supply in influencing access to care. For example, investigators performing evaluations of new CHCs were often surprised to find that relatively large proportions of residents in underserved urban communities had a private physician as their regular source of care prior to the establishment of clinics (Ginzberg & Ostow, 1985). A baseline survey of residents of low-income neighborhoods in five cities in 1978-80, prior to the establishment of

community clinics funded under a Robert Wood Johnson Foundation initiative, found that almost two-thirds of these residents had a private physician as their regular source of care (Fleming & Andersen, 1986). Similar studies in other inner-city neighborhoods have found somewhat lower but still substantial baseline levels of private physician use (Aday et al., 1984; Okada & Wan, 1980).

Comparisons of Access to Care and Health Outcomes in Shortage and Nonshortage Areas — The Role of Physician Supply

Access to Care

Few studies have been undertaken to systematically compare access to care in shortage and nonshortage communities, and they have serious flaws. The most rigorous and thorough of these studies, by Berk et al. (1983) using the 1977 National Medical Expenditure Survey, found that both Health Manpower Shortage Area (HMSA) and non-HMSA residents had the same average number of physician visits per year. Living in an urban HMSA was also associated with an increase of about four minutes in both travel times and waiting times. On all the access measures studied, the effect of living in a shortage area was dwarfed by the much more powerful effects of income, race, insurance coverage, and underlying need for care. Findings were similar for rural areas, although a much greater association between HMSA residence and longer travel times was detected for rural respondents.

Health Outcomes

Research on health outcomes has been hampered by lack of methods to measure health indices at the population level, with the exception of relatively crude measures such as infant mortality rates, disease-specific death rates, or life expectancy. One approach that has come into prominence in recent years has been consideration of nonelective hospitalization for certain types of medical diagnoses (e.g., asthma, diabetes, congestive heart failure) as an adverse health outcome, and not simply as a measure of use of care. These types of hospitalizations may be indicative of problems in access to primary care, because timely access to outpatient care early in the course of an episode of illness may in many cases avert further deterioration that results in the need for hospitalization.

Several studies have demonstrated that rates of these types of "preventable hospitalizations" in urban neighborhoods are highly correlated with the demographic characteristics of the area, with higher rates found in areas with a greater proportion of poor residents (Billings et al., 1993; Caper, 1993). Community surveys have been used to show that variation in access to medical care does in fact explain much of the variation in rates of preventable hospitalizations (Bindman et al., 1995). In an analysis of variations in preventable hospitalization rates across counties in Pennsylvania, researchers found that hospitalization rates declined as the primary care physician-to-population ratio increased (Parchman & Culler, 1994). In a multivariate regression model, the association between these variables was relatively modest but statistically significant. In a specialty-specific subanalysis, these authors found that an increased supply of family physicians, but not of general internists, was related to lower rates of preventable hospitalizations. Because physician supply was analyzed as a continuous variable, this study does not shed light on whether there is a critical threshold of physician supply that may be associated with reductions in preventable hospitalization rates (e.g., a supply above the 1 physician per 3,500 population threshold for defining HPSAs).

Physician supply and preventable hospitalization rates in California have been analyzed in an attempt to overcome some of the possible limitations of earlier studies (Grumbach et al., 1995). A cross-sectional analysis of the per capita supply of primary care physicians and rates of preventable hospitalizations was performed using multiple regression models to control for underlying population characteristics. The results in many ways mirror those of Berk et al. with regard to physician supply and access indicators. Although a statistically significant association was found between physician supply and preventable hospitalization rates in urban neighborhoods, with higher supply associated with lower rates, the effect of physician supply was of marginal importance compared with the much stronger association between race, income, and hospitalization rates. While a statistically significant relationship exists between physician supply and preventable hospitalization rates in urban areas in California, this association may not be highly significant in terms of its policy implications; a 50 percent increase in total physician supply was associated with only a 1.8 per 10,000 decrease in preventable hospitalizations. The analysis was repeated using a dichotomous variable for whether the area qualified as an HPSA on the basis of a physician-to-population ratio below the 1-to-3,500 threshold, instead of treating physician supply as a continuous variable. In this repeat analysis, the shortage area variable was not a significant predictor of preventable hospitalization rates in models controlling for income and race-ethnicity.

In addition, physician supply had no association with preventable hospitalization rates in rural areas.

Longitudinal Studies of Changes in Physician Supply

One feature shared by all of the aforementioned studies of physician distance, physician supply, access to care, and health outcomes is that they are cross-sectional in design. That is, they examine the association between variables at a single point in time. The cross-sectional design is not a robust method for establishing causal inferences about relationships between variables such as physician supply and access to care. Physicians may have a preference to locate in more desirable neighborhoods where residents are in better health; the lower rates of preventable hospitalizations in areas with greater physician supply may therefore represent underlying population and environmental characteristics that both attract physicians and result in a lower burden of disease.

Observational or quasi-experimental approaches provide a stronger basis for causal inferences than cross-sectional studies (Hurley et al., 1993). One such approach is the longitudinal study that measures the effects of a "naturally" occurring change in the health care system, ideally using a control sample where no similar change has occurred. For example, Bindman et al. (1990) investigated the effect on indigent care of the closure of a public hospital in one county in California, using another county in California with similar demographics and the continuing operation of a county hospital as the control. The results of this study disclosed more adverse outcomes over time for residents in the study county relative to those for residents of the control county.

A comprehensive computer-assisted literature search of information on physician supply and distribution detected only two articles that used a longitudinal design to study the impact of changing the supply of physicians in underserved areas in the United States. One of these studies (Nguyen et al., 1991) examined an urban area, Dade county in Florida, and purported to show that an influx of NHSC physicians resulted in improved pregnancy outcomes in poor neighborhoods compared with poor neighborhoods not served by these physicians. These findings were subsequently retracted (Nguyen et al., 1991) based on a reanalysis of their data. In a study of a rural community in Minnesota, an area was examined where the supply of primary care physicians abruptly doubled (Krishan et al., 1985). The authors found that although there was no significant increase in the overall rate of physician visits in the area, the visit rate for residents of the specific town in which the new physicians were located increased by nearly 50 percent.

Comparisons of Access to Care and Health Outcomes in Shortage and Nonshortage Areas — The Role of Community Health Centers

Access to Care

In contrast with the relatively sparse research on physician supply and access to care and health outcomes in urban areas, a much richer body of literature exists on the effects of CHCs. These studies consistently show that substantial numbers of residents in urban neighborhoods adopt CHCs as their regular source of care when these clinics are established. Clinics draw most heavily from populations that previously relied on hospital outpatient facilities and emergency departments or private physicians for their primary care. Often, these centers appear less successful at attracting individuals who have no established regular source of care. For example, one study of five urban neighborhoods found that 10.6 percent of residents had no regular source of care before the establishment of CHCs; 8.7 percent of residents remained without a regular source after the clinics became operational (Freeman et al., 1982). In contrast, reliance on hospital outpatient services and emergency departments dropped from 42.4 percent to 30.0 percent. Results were similar in another study of urban health centers (Fleming & Andersen, 1986).

Okada and Wan (1980) attempted to provide more of a community-level analysis of visit rates in their pre- and post-survey design study of five urban communities. They showed that the annual average physician visits per person increased from 3.6 to 4.1 in these areas after the establishment of CHCs. A quasi-experimental study by Hochheiser et al. (1971) evaluated community-level rates of use of hospital emergency department facilities in Rochester, New York. The study area was a neighborhood in the area of a new CHC; control areas consisted of other urban and suburban neighborhoods without CHCs. The authors found a 38 percent reduction in emergency room visits by children in the clinic neighborhood, compared with no change in visit rates among other urban neighborhoods and an increase in visits among suburban children. These results provide some of the strongest evidence that establishment of a CHC can improve access to primary care in a manner that reduces reliance on emergency department care.

HEALTH OUTCOMES

Preventable hospitalizations can be useful as a potential indicator of both poor health outcomes and inadequacy of primary care. Both Okada and Wan (1980) and Freeman et al. (1982), analyzing the same survey data, found that individuals with a CHC as a regular source of care had lower rates of hospitalization than patients with other sources of care.

An analysis of preventable hospitalization rates in California was undertaken to measure whether the presence of community clinics was associated with lower hospitalization rates (Bindman et al., 1995). Primary care clinics administered by state or county government and nonfederally funded clinics, as well as the more traditional CHCs funded under the federal 330 statute were included. This study failed to detect any significant association between clinic availability and rates of preventable hospitalizations in urban neighborhoods after controlling for community demographics. A weak but statistically significant negative relationship was detected between the supply of office-based primary care physicians and preventable hospitalization rates in urban areas.

Several studies have examined the association between CHCs and more direct measures of health outcomes. A few of these studies have used pre- and post-designs with reasonable control groups to produce some of the most impressive evidence on the benefits of clinics. In an analysis of trends in the incidence of rheumatic fever in Baltimore neighborhoods between 1960 and 1968, the incidence declined 60 percent in neighborhoods served by health centers, whereas the incidence remained constant in other low-income Baltimore districts (Gordis, 1973). A similar approach was used to examine trends in infant mortality rates in Denver neighborhoods between 1964 and 1968 (Chabot, 1971). The author found a 60 percent greater reduction in the infant mortality rate in the community served by a clinic compared with the trend in similar areas lacking a health center. In a very different analysis of infant mortality, a sophisticated time-series model was applied to national data on county-level infant mortality rates and the distribution of CHCs (Goldman & Grossman, 1988). In this study the presence of CHCs accounted for a small but significant portion of the variation in the decline in infant mortality rates from 1970 to 1978 in counties in the United States; CHCs had a much greater effect on infant mortality rates for African Americans than for whites.

In summary, a critical mass of reasonably well-conducted research documents that CHCS have had a measurable, positive impact on access to care and health outcomes for the populations they serve. It is important to appreciate that direct government subsidies have been an essential ingredient in the establishment and maintenance of most neighborhood clinics, making it financially possible for these centers to provide services to low-income uninsured and Medicaid patients. The salutary influence of these clinics is likely attributable both to augmentation of the supply of practitioners in shortage areas and reductions in financial and related barriers to use of services provided by clinics.

EMERGING TRENDS — THE COMPETITIVE MEDICAL MARKETPLACE AND MEDICAID MANAGED CARE

COGME (1994) has stated that ". . . universal financial access to health care will significantly reduce access problems for inner-city populations. These reforms must also be accompanied by increased numbers of generalist physicians who are prepared to serve these populations." Subsequent political currents indicated that financial problems impeding access to care are likely to persist and become more acute in the coming few years, not only for inner-city populations but also for a wide spectrum of Americans.

IMPACT ON MEDICAID

The health care system in the United States is in the midst of major transformation related to the ascendancy of managed care and a more competitive medical care marketplace. The increase in enrollment of the privately insured population in managed care plans is being mirrored by rapid conversion of the traditional fee-for-service Medicaid program into a managed care model. The paramount objective of these market-based reforms is cost containment rather than expansion of access to care. This emerging trend toward a medical marketplace of competing managed care plans has profound implications for health care workforce policies, particularly as they relate to Medicaid recipients, in the coming years.

The Omnibus Budget Reconciliation Act of 1981 allowed states to apply for waivers to pilot managed care programs for Medicaid recipients. Between 1981 and 1992, Medicaid enrollment in managed care programs grew from 200,000 to 13.3 million (Health Care Financing Administration, 1996; Hurley et al., 1993). In the past few years, many states have moved toward mandatory

enrollment of Medicaid recipients in managed care programs. A variety of models for managed care under Medicaid have been developed in different states.

A comprehensive critical assessment of studies of the first decade of Medicaid managed care programs was undertaken by Hurley et al.(1993) and Freund and Lewit (1993). This work was supplemented by a review that included two more recent studies focusing specifically on care for children and pregnant women (Freund & Lewit, 1993). Based on these reviews, the authors noted that the most consistent finding was a reduction in visits to emergency departments (echoing some of the findings for studies of the effects of CHCs). Results were more equivocal with regard to physician visits and hospital use. Based on all studies reviewed, there was a trend toward increased physician visits, but results from the most rigorously performed studies suggested that visit rates may have actually declined in more programs than they increased. Similarly, a trend toward lower hospitalization rates based on all studies was less apparent when only the highest quality studies were examined (Hurley et al., 1993). The two most recent studies failed to detect higher visit rates or lower inpatient use among the managed care patients (Freund & Lewit, 1993).

Managed care programs do not appear to consistently improve quality of care and outcomes for Medicaid patients, compared with care received by Medicaid patients in traditional fee-for-service programs. Vaccination rates for children and use of prenatal care by pregnant women are comparable in the managed care and nonmanaged care groups, and in both cases typically fall considerably short of recommended standards. The incidence of low-birthweight babies was similar in both types of programs (Freund & Lewit, 1993). A recent study in Washington State reported similar findings in a comparison of the patterns of care and outcomes among Medicaid patients in a traditional fee-for-service program and in an HMO (Krieger et al., 1992).

In summarizing their findings of Medicaid managed care, the authors of the review noted on several scores both the potential for improvement in primary care and the lack of evidence to confirm objective improvements in measured patterns of care. However, a Medicaid beneficiary in a managed care program "has, by design, a contractually obligated regular source of care who must be available 24 hours a day, seven days a week. This . . . constitutes a critical difference between these Medicaid recipients and many of their fellow beneficiaries remaining in the conventional . . . Medicaid program" (Hurley et al., 1993). At the same time, "based on the research cited, the care rendered to managed care patients is no better that in fee-for-service plans, and sometimes is worse" (Freund & Lewit, 1993).

Emerging New Models

CHCs and public hospitals and clinics are developing new organizational structures to attempt to compete in the Medicaid managed care market. For example, in New York, where state policies call for mandatory enrollment of at least 50 percent of the Medicaid population in managed care plans by 1996, community clinics have formed their own HMOs (the Bronx Health Plan and Centercare, the latter consisting of Manhattan clinics) (Kotelchuck, 1992). The Health and Hospitals Corporation in New York has also developed its own HMO, the Metropolitan Health Plan. A recent study was commissioned by BPHC in HRSA to investigate seven CHCs (all but one urban) that were involved in managed care programs. The results of the study indicated that the centers' traditional orientation toward providing coordinated and accessible primary care services placed them in a good position for adapting to managed care, although most centers lacked some of the administrative elements (e.g., utilization review, financial risk management) considered necessary for competing successfully in a managed care environment. The investigation concluded, "In general, the HMOs reported that the community health clinics studied are important components of the HMO's network and offer strong primary care services accompanied by cultural sensitivity. In addition, the locations of the CHCs typically make them particularly accessible to the Medicaid population" (Lewin & MDS Associates, 1994).

One obstacle to achieving the goal of continuity of primary care under Medicaid is the lack of sustained coverage over time as individuals gain and lose eligibility. Forty percent of Medicaid recipients maintain their coverage for less than 12 months (Freund & Lewit, 1993). This market dynamic interferes with continuous enrollment with a primary care provider under a capitated arrangement, creating administrative havoc as patients continually cycle through periods of coverage. In addition, when a highly competitive market attracts new intermediaries into Medicaid managed care, aggressive enrollment of patients may sever long-standing relationships between patients and primary care providers (Freund & Lewit, 1993). Despite the relatively optimistic outlook for the attractiveness of CHCs to managed care networks, it is not clear that managed care plans, even those in which Medicaid beneficiaries are enrolled, are offering

contracts to many primary care clinics and other traditional safety net providers. The City and County of San Francisco, for example, recently sought legal action because of concerns that door-to-door marketing by a large for-profit HMO was inducing Medicaid recipients to enroll in the HMO without making them aware that this meant severing existing ties with primary care clinic providers. A subsequent state regulation banned this type of marketing. Similar marketing scandals have plagued Medicaid managed care plans in Florida, causing the state to halt temporarily further enrollment of beneficiaries in these plans.

Impact on Physician Distribution

No study of Medicaid managed care has yet addressed a central question related to workforce planning: does the managed care alternative affect the geographic distribution of physicians and other health professionals? The ostensible objective of a primary care model under Medicaid managed care could create an opportunity for a natural experiment to explore the significance of provider location for access to primary care. Managed care programs might, for example, decide that access to primary care depends on the presence of providers located within low-income communities; this decision might result in the development of new practice sites, or the augmentation and integration of existing sites, within shortage areas. Alternatively, programs might decide that patients are willing to travel outside of their neighborhoods for care when they are provided with a clearly identified and financially accessible primary care provider who is accountable for their care. The notion of "mainstreaming" under Medicaid managed care might even imply that patients might prefer to travel to providers that do not serve predominantly low-income communities. The results of a study of one area indicate that, in that area, Medicaid managed care may have improved accessibility to private practice physicians by enhancing physician participation in Medicaid without necessarily changing the location of these physicians practice sites (Temkin-Greener & Winchell, 1991).

In addition to the direct impact of managed care within the Medicaid program on underserved populations, a more competitive market may also have a number of indirect effects on physician distribution in urban areas. One concern is that the high priority placed on recruiting new primary care physicians by managed care plans serving privately insured patients may drain the pool of primary care physicians interested in practicing in shortage areas (OIG, 1994; Zuvekas et al., 1994). Managed care plans appear to be increasing their payments to family physicians, particularly for those in salaried positions. Although there has been concern about a widening gap between these salaries and those offered by community clinics and other facilities in underserved communities, no study has been done to document the extent to which this gap may be widening and aggravating the difficulty recruiting providers to shortage areas.

FINDINGS AND RECOMMENDATIONS

The following findings and corresponding recommendations focus on implementing policies that can address the health care needs of underserved individuals in urban settings. They are directed toward various levels of community, state, and federal government in an effort to promote a coordinated approach to overcoming obstacles to care in an increasingly competitive managed care environment.

FINDING 13: CHCs and related group practice arrangements appear to be the most viable model for bringing health care services to underserved urban communities.

Reliance on independent, private practice in office-based settings is unlikely to be effective in addressing the health care needs of most underserved urban communities. In poor, inner-city communities, such practice settings have marginal, if any, economic viability for health professionals. The increase in Medicaid physician fees has not led to an influx of physicians into these neighborhoods. Patterns of residential segregation based on race, ethnicity, and class will likely perpetuate the shortages of physicians in these areas. Available research has not disclosed a strong association between access to office-based physicians and measures of health care access and health outcomes. Finally, the system of health care in the United States is moving away from independent, solo, and small-group practice toward more organized systems of care and larger group practices.

Numerous clinic models have been developed since the inception of the federal neighborhood center program, in which clinics function as autonomous sites administered by a nonprofit board with federal funding. Although many clinics continue to function in this fashion, other models have emerged as collaborations between local health departments, community hospitals, neighborhood associations, academic medical centers, and other involved parties. Some clinics are involved in managed care programs, either directly or through affiliations with other provider groups. These clinic

arrangements have had a positive impact on some measures of health access and health outcomes.

Recommendation 15:

- **Federal policy should recognize the effectiveness of community health centers in addressing the problems of underserved urban populations and should emphasize these models in health care funding decisions.**
- **Partnerships should be forged between government at federal, state, and local levels and private and academic groups to develop innovative community-based primary care group practices in underserved urban areas. Federal policy should encourage these partnerships, and any disincentives to their creation should be removed.**

FINDING 14: Because of the rapid, dramatic, and not entirely predictable changes occurring in the United States health care system, there is a need for careful monitoring of the dramatic growth of managed care and the more competitive medical care market, especially as it relates to Medicaid enrollees and the uninsured.

The health care system in the United States is in the midst of major transformation related to the ascendancy of managed care and a more competitive medical care marketplace. This transformation has the potential to have both adverse and beneficial effects on underserved communities. Key factors in this evolving system will be policies concerning managed care for Medicaid enrollees and the uninsured, in particular policies that may affect whether traditional providers in shortage areas are integrated into provider networks serving these patients.

Many elements of managed care emphasize objectives consistent with those of traditional programs in underserved communities. The increasing appreciation of the clinical importance of comprehensive, continuous, coordinated primary care may enhance awareness of the value of primary care providers in underserved areas. Reorganizing care under a primary care model and reallocating Medicaid dollars from hospital-based care to primary care under a capitated payment method hold the promise of offering better delivery of care than traditional Medicaid arrangements. Research has not consistently shown, however, that a managed care model necessarily results in improved process or outcomes of care for Medicaid patients. Efforts to improve delivery of care to inner-city populations under a managed care model may be undermined by a number of factors, including lack of a so-called "safety net" of providers in their provider network. Loss of Medicaid patients could result in closure of many sources of care that form a part of the safety net in communities where residents lack health insurance coverage. Further reductions in government expenditures for Medicaid may threaten the beneficial features of primary care and create excessive pressures on primary care "gatekeepers" to limit access to appropriate services.

Recommendation 16:

- **The federal government should provide technical assistance to clinics in underserved areas to enable them to participate more successfully in managed care programs, especially under Medicaid managed care contracts. The current efforts of the Bureau of Primary Health Care in this area are a promising start and should be expanded to include clinics in shortage areas that are not directly funded under the 330 program.**
- **Managed care plans in which Medicaid beneficiaries are enrolled should be required to enter into contracts with established community clinics in shortage areas and related providers that form the safety net in these communities.**
- **The federal government should carefully monitor managed care programs to evaluate their direct effects on individuals enrolled in these programs, their indirect effects on uninsured individuals in shortage areas, and their effects on providers in shortage areas such as community clinics.**

FINDING 15: Many urban community health clinic sites depend on NHSC funding and placement programs for an essential portion of their clinical staff. Retention of NHSC clinicians after conclusion of their service obligation depends on developing and maintaining a mutually supportive relationship between these professionals and their clinics.

The recent expansion of the NHSC, in particular its loan repayment program, has enhanced staffing at community clinics. CHCs and related primary care clinics are a significant source of placement of NHSC scholarship and loan recipients in urban shortage communities. In urban

underserved areas, the NHSC personnel placements augment federal and other clinic funding.

Recommendation 17: **The Public Health Service should more closely coordinate section 330 clinic and National Health Service Corps funding, in order to support staffing at these sites.**

FINDING 16: Minority health professionals play a unique and important role in serving populations in urban shortage areas. Underrepresented minority physicians are much more likely than majority physicians to locate their practices in underserved, predominantly minority communities. Little is known about other characteristics that may predict which health professionals are more likely to practice in underserved communities.

Racial segregation is a powerful underlying factor associated with the maldistribution of physicians in urban areas. Some evidence suggests that the racial and ethnic characteristics of urban neighborhoods are stronger predictors of physician supply than community income level. Because of the tendency of minority physicians to practice in underserved areas, increasing the number of minority physicians who complete training is likely to have a direct impact on reducing the inequitable geographic distribution of clinicians in urban areas. The conclusions in COGME's Third Report, *Improving Access to Health Care Through Physician Workforce Reform: Direction for the 21st Century*, are supported by current evidence (COGME, 1992):

"Increasing the percentage of underrepresented minorities in the medical profession is vital as a means of improving access to care and health status of these vulnerable and underserved populations. . . . Strategies to increase minority enrollment must emphasize increasing and strengthening the applicant pool, the acceptance rate from within this pool, and the student retention rate."

Factors in addition to race or ethnicity of health professionals may also dispose individuals to practice in urban underserved communities. However, little research has been done to analyze carefully these putative predictive characteristics.

Recommendation 18:

- **Current activities such as the COGME report on minorities in medicine (COGME, in press), the "3000 by 2000" initiative by the Association of American Medical Colleges, and the initiatives of private foundations and schools to promote representation of minorities should continue unabated (COGME, 1992).**
- **Federal and state programs that encourage minority participation in medical education should be continued and, where possible, enhanced.**

FINDING 17: The shortage of health care professionals is but one factor in determining the health status of urban underserved communities. Other factors include a poor standard of living, poor educational opportunities, overt and covert racism, and a widespread lack of health insurance. Improvement in overall health status requires coordination among health professionals, public health, and social and environmental entities.

A paucity of health professionals is but one of many barriers to access to care confronting many inner-city communities. Poverty, racism, lack of educational opportunity, and substandard living conditions exact a direct toll on health, independent of the effect of these social forces on access to medical care. Residential segregation based on race or ethnicity remains a fact of urban life. Thus the need for professional health care workers in these communities is only a piece of a very complex puzzle. A coordinated approach is essential to be even modestly optimistic about the development of lasting solutions to the problems of urban health.

Recommendation 19: **Federal, state, and local initiatives should coordinate programs and mutually support efforts to solve the vexing problem of poor health status among urban poor.**

FINDING 18: There is a paucity of well-documented, statistically valid research on the many variables that affect the availability and utilization of health care in urban, underserved communities.

Although several high-quality research studies address one or more of the problems of medical care and health status among urban poor, the field is so complex and the questions so demanding that current research efforts barely begin to shed light on the issues. There is no research available, past or present, to help answer critical questions about the impact of managed care, Medicaid managed care, care for the uninsured poor, and the effect of these changes on so-called "safety net" facilities.

One of the major obstacles to the study of the health care workforce is the lack of data on the location and practice patterns of the current workforce. Such data are the cornerstones of studies of the workforce and decisions regarding strategies that might affect community shortages.

Recommendation 20: **The federal government, perhaps in collaboration with states and foundations, should provide adequate resources to support research regarding the makeup of the health care workforce.**

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