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HEALTH CARE SHORTAGE AREAS

Designations Not a Useful Tool for Directing Resources to the Underserved





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Congressional Committees

This report was prepared at our own initiative in response to the growing number of federal programs using health care shortage areas to determine who can apply for federal assistance. Our report discusses how the Department of Health and Human Services' systems for identifying health care shortage areas are currently used to target resources to the underserved, and Department proposals to combine these systems. We include recommendations to the Congress that could result in a better match of federal program resources to needy communities, and eliminate funding where there is not a demonstrated need for federal assistance.

A handwritten signature in black ink, reading "Mark V. Nadel".

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B-259394

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B-259394

Executive Summary

Purpose

Many Americans live in places where there are barriers to obtaining primary health care. These locations range from isolated rural areas to inner-city neighborhoods. In fiscal year 1994, the federal government spent about \$1 billion on programs for alleviating access problems in such locations. To work effectively, these programs need a sound method of identifying the type of access problems that exist and focusing services on the people who need them.

The Department of Health and Human Services uses two main systems for identifying such locations. One designates Health Professional Shortage Areas (HPSAs), the other Medically Underserved Areas (MUAs). Over half of all U.S. counties are designated as HPSAs or MUAs, and over another fourth have HPSAs or MUAs somewhere within their borders. As part of the broad federal effort to improve access to care, GAO reviewed the two systems to determine (1) how well they identify areas with primary care shortages, (2) how well they help target federal funding to benefit those who are underserved, and (3) whether they are likely to be improved under Department proposals to combine them.

GAO's review included evaluating the systems' criteria for identifying health professional shortages and medical underservice, measuring the accuracy and timeliness of the data in the databases and in a statistical sample of HPSA applications, and discussing the systems with managers who use them to allocate program resources.

Background

The primary care HPSA system focuses on whether an area has a critical shortage of physicians available to serve the people living there. A HPSA can be a distinct geographic area (such as a county), a specific population group within the area (such as the poor), or a specific public or nonprofit facility (such as a prison). The system was first used in 1978 to place National Health Service Corps employees and those providers receiving scholarships or repayment of student loans in exchange for service in shortage areas. Its use has expanded to nearly 30 other programs, each having a different strategy to improve access to care. In fiscal year 1994, combined funding for programs using the HPSA system was about \$473 million.

The MUA system identifies areas or populations with shortages of health care services using several factors in addition to the availability of health care providers. These factors include infant mortality rate, poverty rate, and percentage of population aged 65 or over. Developed at about the

same time as the HPSA system, the MUA system has been used for a more limited range of programs—mainly to identify areas eligible for federally funded community health centers. The Community Health Center program, with fiscal year 1994 expenditures of about \$663 million, is still the system's main user.

Federal programs use the HPSA and MUA systems in varying degrees as a screen to determine eligibility for federal funding.

Results in Brief

The HPSA and MUA systems do not effectively identify areas with primary care shortages or help target federal resources to benefit those who are underserved. For programs relying on the systems for these purposes, there is little assurance that federal funds are used where most needed.

Data and methodology problems are widespread, severely limiting the systems' ability to pinpoint the extent of need in underserved areas. For example, the HPSA methodology may be overstating the need for additional physicians in HPSAs by 50 percent or more, and the designations in both systems are often based on inaccurate or outdated information.

Even when the systems accurately identify needy areas, they often do not provide the information needed to decide which programs are best suited to the area's particular need. As a result, a program without additional screening processes may be applied that does not directly benefit the specific subpopulation with insufficient access to care. An example is the Medicare Incentive Payment program, which provides bonus payments to all physicians treating Medicare patients in geographic HPSAs, even though a different group than Medicare patients—such as migrant farmworkers—may be those actually underserved.

The Department's proposals for combining and streamlining the systems are unlikely to solve the problems we identified. But fixing the systems is not the only option—and probably not the best one. Instead, all but one of the individual programs already have criteria and application processes in place that may be more easily modified to identify where a need exists and whether the program is an appropriate remedy.

Principal Findings

Systems Do Not Effectively Identify Shortage Areas

The HPSA methodology for identifying the extent of primary care shortages is flawed. It tends to overstate the need for additional primary care providers because it omits several important categories of providers already in place. For example, it does not count National Health Service Corps providers, U.S.-trained foreign physicians (unless they are permanent residents), and nonphysicians such as physician assistants, nurse practitioners, and nurse-midwives. These omissions have substantial effects. For example, adding just physician assistants and nurse-midwives known to be practicing in countywide HPSAs would decrease the number of providers said to be needed in such HPSAs by at least 22 percent.

Similarly, the MUA methodology does not accurately identify the geographic areas and populations that have the greatest health service shortages. When the methodology was initially developed in the mid-1970s, independent testing showed that rural areas designated as MUAs did not differ greatly from non-MUAs in terms of access to care. The methodology has remained virtually unchanged; but since 1986, the law authorizes the Department of Health and Human Services to designate underserved populations that do not meet the requirements of the MUA methodology, if so recommended by a state governor on the basis of unusual local conditions.

System Data Are Neither Accurate Nor Timely

GAO estimates that about 20 percent of geographic HPSAs were designated in error or without sufficient supporting documentation in the application file. For example, the number of available physicians listed in some applications was understated by up to 50 percent when compared with information in other sources (such as physician directories) for the area. HPSAs are also not being reviewed on a timely basis to determine if they still qualify or should be dropped from designation. Department policy calls for HPSAs to receive a comprehensive review every 3 years, but 31 percent of current HPSAs have not been reviewed within this time period.

The list of MUAs has gone substantially unchanged since it was established in 1976. Although new MUAs have been added, the overall list has not been reviewed systematically to update scores or to propose areas for dedesignation since 1981. GAO's review of current countywide MUAs

showed that if the designations were to be reviewed using 1990 data, almost half would lose their designation.

Systems Do Not Effectively Target Funding to the Underserved

In many shortage locations, access to care is a problem for only part of the population. For example, most residents in a city may have adequate access to care, but the poor may not. However, most HPSA and MUA designations do not identify the specific subpopulations having difficulty obtaining access to care. Instead, they identify an area only by its geographic boundaries.

This approach presents a problem because, unlike the Community Health Center program, other assistance programs do not go beyond the MUA or HPSA designation to identify who is underserved, and why. As a result, a disconnect can occur between the reason for underservice and the remedy provided. This disconnect is particularly apparent for the Medicare Incentive Payment program. The program, which pays a 10-percent bonus on Medicare billings, was established in 1987 to address concerns that low reimbursement rates could discourage physicians from accepting Medicare beneficiaries as patients. Current evidence indicates that this is no longer a significant problem. However, in 1994, this program provided almost \$100 million in bonuses to physicians in all HPSAs, despite the lack of evidence that Medicare beneficiaries in these areas have difficulty obtaining access to care. GAO believes the use of this program as a remedy for underservice merits close scrutiny.

Systems Do Not Merit Upgrading

The Department has efforts under way to address some of the problems with the two systems, but for several reasons, GAO questions whether these efforts will provide significant benefits to the federal programs using them. First, while the proposed changes may streamline the systems' administrative processes, the more significant problems of identifying underserved populations and the type of federal assistance needed will remain. Addressing these problems could be difficult and costly, in part because the data needed to verify primary care capacity in locally defined service areas are often unavailable at the national level. Second, for all programs except the Medicare Incentive Payment program, the Department already has alternative criteria and application processes in place that would appear to be more easily modified for targeting federal resources. Third, neither of these systems is a suitable match for the Medicare Incentive Payment program because neither specifically identifies or addresses Medicare-related demographics.

Department officials said that maintaining a national shortage designation system for some other purposes (such as general planning and monitoring with regard to health care shortages) would be useful. However, the Department has another effort under way that may address these issues. A cooperative agreement between the Department and the states has provisions for identifying underserved populations and improving their access to existing health care delivery systems by integrating federal assistance with state and local resources.

Recommendations to the Congress

GAO recommends that the Congress remove legislative requirements for HPSA or MUA designations as a condition of participation in federal programs. Instead, GAO recommends that the Secretary of Health and Human Services be directed to develop and use program-specific criteria that will best match the type of program strategy with the type of access barrier existing for specific underserved populations. GAO also recommends that the Congress direct the Secretary to suspend funding for the Medicare Incentive Payment program until the Department can ensure that funding is specifically targeted to situations in which Medicare beneficiaries have a demonstrated difficulty accessing a physician because of low Medicare reimbursement rates for primary care services.

Agency Comments

GAO requested written comments on a draft of the report from the Department of Health and Human Services, but did not receive the comments in time for publication. However, GAO discussed an earlier draft of the report with the Department's management officials responsible for the HPSA and MUA systems. These officials offered observations about GAO's analysis and findings, and their comments were incorporated as appropriate.

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Abbreviations

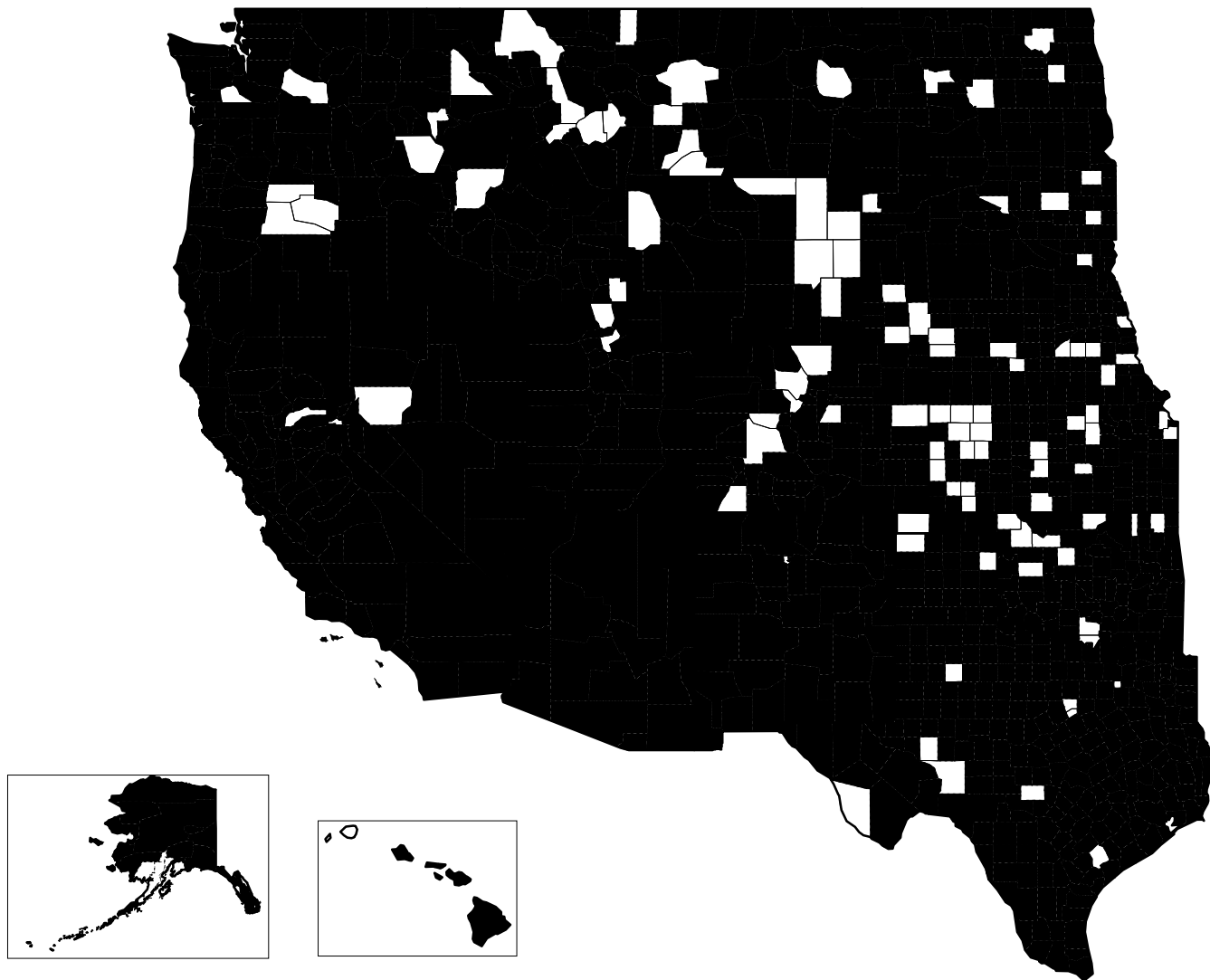
DSD	Division of Shortage Designation
HHS	Department of Health and Human Services
HPSA	Health Professional Shortage Area
IMU	Index of Medical Underservice
MUA	Medically Underserved Area
MUP	medically underserved population
NHSC	National Health Service Corps
OTA	Office of Technology Assessment
USIA	United States Information Agency

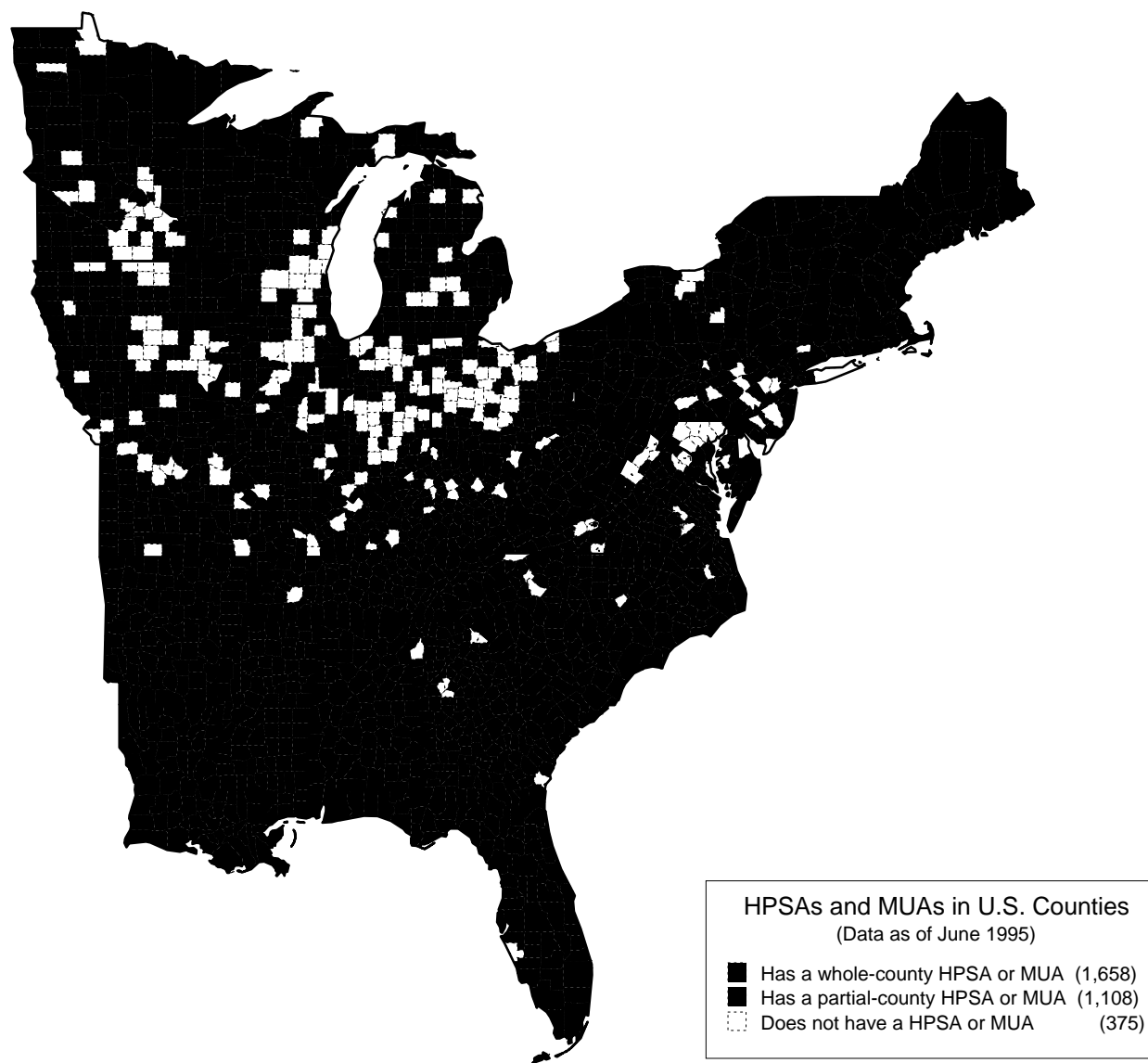
Introduction

The Department of Health and Human Services (HHS) spends about \$1 billion a year on programs for improving access to health care for areas with shortages of primary care physicians and health care services. Many of these programs depend heavily upon systems to identify and designate specific areas and populations that are underserved. HHS has two such systems: The Health Professional Shortage Area (HPSA) system identifies underservice caused by a shortage of health professionals, and the Medically Underserved Area (MUA) system more broadly identifies areas and populations not receiving adequate health services for any reason, including provider shortages. About 88 percent of all U.S. counties contain HPSAs, MUAs, or both (see fig. 1.1).

Chapter 1
Introduction

Figure 1.1: U.S. Counties With HPSAs and MUAs





Source: GAO analysis of data from HHS' HPSA and MUA databases.

Description of the HPSA and MUA Systems

A primary care HPSA is an area designated by HHS as having a critical shortage of primary health care providers.¹ These include areas with no providers or areas with an insufficient number of providers to serve the population living there. Designation as a HPSA is generally based on the following:

- the specified geographic area must be rational for the delivery of health services;²
- the area must have a population-to-provider ratio of at least 3,500 to 1 (or 3,000 to 1 under certain circumstances); and
- adjoining areas must have provider resources that are overused, more than 30 minutes travel time away, or otherwise inaccessible.

In 1994, there were 2,538 primary care HPSAs reporting a need for 5,133.8 full-time-equivalent physicians. About 45 million people reside in these HPSAs.

HHS designates primary care HPSAs in one of three ways:

- a general shortage of providers within a geographic area, such as an entire county or group of census tracts;
- a shortage of providers willing to treat a specific population group (such as poor people or migrant farmworkers) within a defined area; or
- a shortage of providers for a public or nonprofit facility such as a prison or hospital.³

As shown in figure 1.2, most primary care HPSAs are geographically designated. Of the geographic HPSAs, 845 comprised an entire county and 1,107 comprised other types of self-defined geographic service areas.⁴

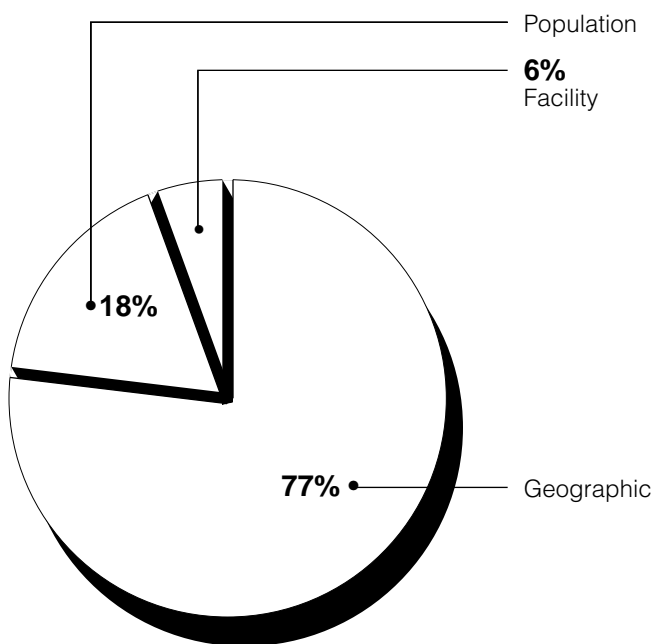
¹Separate HPSA systems are used to identify and track provider shortages for dental and mental health care.

²For example, a rational service area may be defined as a county, or group of contiguous counties, whose population centers are within 30 minutes travel time of each other.

³Hospitals are only eligible for designation when they have insufficient resources to treat underserved populations from an existing area or population HPSA.

⁴A geographic service area can be a portion of a county, portions of multiple counties, or an urban neighborhood.

Figure 1.2: Types of Primary Care HPSA Designations



Note: Percentages do not add to 100 because of rounding.

Source: GAO analysis of data from HHS' HPSA database.

An MUA is an area designated by HHS as having a shortage of health care services. One major difference between an MUA and a HPSA is that underservice in a HPSA is measured primarily as a shortage of health care providers, while underservice in MUAs is measured using other factors as well. Qualification as an MUA is based on four factors of health service need: primary care physician-to-population ratio, infant mortality rate, percentage of the population with incomes below the poverty level, and percentage of the population aged 65 and older.

As of June 1995, 1,455 U.S. counties were designated in their entirety as MUAs, and an additional 1,037 counties had at least 1 MUA designated within them. According to HHS officials operating the system, there were about 3,100 MUAs in all. Like HPSAs, MUAs can be designated for all people within a geographic area or can be limited to a particular group of underserved people within the area. Most MUAs have been designated for geographic

areas rather than population groups (exact figures are not available). Unlike the HPSA system, however, the MUA system does not allow individual facilities to be designated as underserved.

How the HPSA and MUA Systems Are Used

The current HPSA system was developed in 1978 as a means to designate areas for placement of National Health Service Corps (NHSC) providers. NHSC awards students scholarships or loan repayment for medical education and training in exchange for service in areas with critical physician shortages.⁵ The types of primary care health professionals that could participate in the program included physicians, nurse practitioners, physician assistants, and certified nurse-midwives. In 1994, NHSC reported having 1,147 physicians and 482 physician assistants, nurse practitioners, and nurse-midwives working in HPSAs.

Besides NHSC, two other programs now require that a location be designated as a HPSA to be eligible for participation. Like NHSC, the Community Scholarship Program addresses provider shortages by awarding grants to HPSAs for local scholarships in the health professions. The Medicare Incentive Payment program attempts to ensure that physicians treat Medicare patients by paying a 10-percent bonus on all Medicare billings generated from a practice located in a geographic HPSA.

The MUA system was developed about the same time as the HPSA system but independently of it. Authorized by the Health Maintenance Organization Act of 1973, the MUA designation has been applied primarily in identifying areas eligible to participate in the Community Health Center program. This program awards grants for the operation of community health centers and migrant health centers in qualifying areas. In fiscal year 1994, HHS provided support for about 627 grantees providing services at more than 1,600 sites. Centers that serve a designated MUA area or population also are eligible for cost-based reimbursement under the Medicare and Medicaid programs. Another 100 health centers (the so-called “look-alikes”) meet all requirements of the Community Health Center program and receive Medicare and Medicaid cost-based reimbursement, but do not receive Community Health Center grant support.

Nearly 30 other programs use the HPSA or MUA systems to some degree, though none rely on a HPSA or MUA designation alone to decide who can apply for federal assistance. For example, nonphysician providers may

⁵Federal intervention was considered justified only if the number of health care providers was significantly less than adequate, indicating that the needs of these areas were not being met through free market mechanisms or reimbursement programs.

qualify for cost-based reimbursement under the Rural Health Clinic program if they are located in a state-defined underserved area, HPSA, or MUA. The remainder of programs in this category are health professions education and training programs. Programs under titles VII and VIII of the Public Health Service Act give funding preference to schools that place graduates in medically underserved communities. Other programs, using various designations of underservice, award scholarships or grants for obligated service or training.

Together, the various programs that use the HPSA and MUA systems accounted for more than \$1 billion in funding and expenditures in fiscal year 1994. Table 1.1 summarizes the various programs and their funding levels.

Table 1.1: Federal Programs Allocating Funds Using the HPSA and MUA Systems

Basic program	Benefit provided	Number of individual programs	Fiscal year 1994 funding
Programs requiring HPSA designation to apply for federal funds			
National Health Service Corps	Awards scholarships and provides loan repayment for service in a HPSA.	3	\$126,720,000
Medicare Incentive Payments program	Provides 10-percent bonus payment on all Medicare billings in geographic HPSA.	1	98,332,938
Community Scholarship Program	Awards grants to HPSA communities for health professions scholarships.	1	478,000
Programs requiring MUA designation to apply for federal funds			
Community Health Center program	Awards grants for operation of community health centers.	1	663,000,000
Federally qualified health center "look-alike"	Provides cost-based reimbursement for Medicare and Medicaid services provided by a federally qualified health center.	1	^a
Programs requiring HPSA, MUA, or some other designation as a medically underserved community			
Title VII/VIII Health Professions Education and Training Grant Programs	Training programs may provide preference or priority to schools placing graduates in underserved communities.	24	151,834,000
Rural Health Clinic program	Provides direct cost-based reimbursement for Medicare and Medicaid services provided by nurse practitioners, certified nurse-midwives, and physician assistants.	1	77,010,536
Indian Health Professions Scholarship Grant Program	Scholarships for service in HPSA or other locale with large Indian population.	1	7,702,000
(continued)			

Basic program	Benefit provided	Number of individual programs	Fiscal year 1994 funding
Title III Mental Health Clinical Traineeship	Trainees perform obligated service in HPSA or other site with specific need for psychiatric services.	1	5,943,000
Title X Family Planning Services Training Program	Gives priority for grants to institutions that place providers in HPSAs.	2	4,500,000
Total		36	\$1,135,520,474

^aSources at the Health Care Financing Administration told us that funding for federally qualified health center "look-alikes" could not be broken out from funding for all federally qualified health centers.

Designating and Updating HPSAs and MUAs

Any person, agency, or community group may request designation of an area, population group, or facility as a HPSA. Copies of each new request are received and reviewed by the Bureau of Primary Health Care's Division of Shortage Designation (DSD). State representatives from the health department, medical society, and the governor's office are also asked to review and comment within 30 days. DSD staff then check the application data against national and state sources. They also resolve conflicts among applicants, commenters, and data sources to the extent possible.

HHS must by law review annually each designated HPSA to decide if it is still experiencing a shortage of health care providers. DSD does this by giving a list of HPSAs to each state and asking the state to update the information. In addition, Bureau policy requires HPSAs to provide data to DSD every 3 years to support their continued need for the designation. HPSAs not providing these updates are to be proposed for dedesignation in the Federal Register.

MUAs are designated on a much different basis. The Department of Health, Education, and Welfare⁶ designated the original lists in 1975 and 1976 by applying the four criteria (population-to-physician ratio, infant mortality rate, poverty rate, and percentage of population that is elderly) to all U.S. counties, minor civil divisions, and census tracts. All areas that ranked below the county median combined score for the four criteria were designated as MUAs. MUA designations have been added since then on the basis of newer data and the same cutoff score. Since 1986, HHS has also

⁶The Department of Health, Education, and Welfare is the predecessor agency to HHS.

been able to designate new MUAS under an exception process if requested to do so by a state's governor on the basis of unusual local conditions.

MUAS also differ from HPSAS in that there is no requirement to update the designations regularly. HHS officials managing the MUA and HPSA systems told us that DSD no longer reviews the list of MUAS to decide whether any should be dedesignated.

HHS Plans to Combine and Revise the Two Systems

HHS has an effort under way to combine and revise the HPSA and MUA systems. According to HHS officials, this action is being taken to reduce redundancies and differences in the application and administrative processes of the two systems. While HHS officials told us that no changes would be made before 1996, a draft working document says that HHS' goal is to replace the existing systems with one that

- is consistent for all primary care programs,
- has simpler data-gathering requirements,
- uses relevant indicators of need, and
- will not disrupt services in existing areas.

Objectives, Scope, and Methodology

We reviewed the HPSA system as part of the broad federal effort to improve access to care, and as a follow-up to a congressionally mandated review of the role of federal health education and training programs in achieving this purpose.⁷

While separate HPSA systems identify and track provider shortages for primary care, dental care, and mental health care, our review of the HPSA system focused on primary care HPSAS. We chose this focus because the HPSA primary care system is by far the most heavily used for identifying areas eligible for federal funds. We included the MUA system in our review because of current HHS efforts to combine it with the HPSA system.

To review the extent to which the HPSA and MUA systems identify areas with primary care shortages, we

- reviewed past evaluations of the criteria and methodology for designating primary care HPSAS and MUAS and discussed the results with responsible HHS officials,

⁷Health Professions Education: Role of Title VII/VIII Programs in Improving Access to Care Is Unclear (GAO/HEHS-94-164, July 8, 1994).

- identified the number of primary care providers in HPSAs and compared it to the number reported by the HPSA system,
- selected a random sample of primary care HPSA applications and reviewed whether designations were appropriate and accurately reflected in the HPSA database, and
- compared how often the HPSA and MUA data were updated with requirements in the law and HHS policy.

To determine the extent that the HPSA and MUA systems provide information needed to target federal funding appropriate to meet the needs of underserved populations, we analyzed the types of designations requested by communities for their underserved populations and determined the extent to which the designations identify who is underserved in each HPSA and the reasons for underservice.

To determine whether proposed changes to the HPSA and MUA systems would improve them, we discussed the purpose of the proposed changes with HHS representatives operating the HPSA and MUA systems. We also asked federal, state, and program participants how much the proposed changes would help them identify underserved populations and provide assistance appropriate to meet their needs.

Further details of our scope and methodology are presented in appendix I. We did our work from November 1994 through June 1995 in accordance with generally accepted government auditing standards.

We requested written comments on a draft of this report from HHS, but we did not receive them in time for publication. We did discuss an earlier draft of the report with HHS management officials responsible for the HPSA and MUA systems. They made observations about our analysis and findings, and we incorporated their comments in the report where appropriate.

Systems Do Not Reliably Measure the Extent of Primary Care Shortages

Neither the HPSA nor the MUA system reliably measures the extent of shortages in primary health care, providing little assistance to federal programs in directing the \$1 billion spent each year for alleviating underservice. We identified two main reasons for the lack of reliability. First, both systems have methodological problems, such as omitting important categories of primary care providers from the calculations. In the HPSA system, for example, these omissions may be overstating the need for additional physicians in shortage areas by 50 percent or more. Second, both systems rely on data that are often inaccurate or outdated. On the basis of these data problems alone, we estimate that about 20 percent of HPSA designations are in error or lack adequate supporting documentation. Although we did not develop such an estimate for MUAs, many MUA designations are very old and may be invalid. For example, about half of the U.S. counties designated as MUAs would no longer qualify for designation if updated using 1990 data.

Systems Do Not Consider All Primary Care Resources in Making Shortage Determinations

Both systems rely on a population-to-physician ratio in establishing the need for additional primary care providers. The HPSA system bases its shortage determinations on a population-to-primary care physician ratio of 3,500 to 1,⁸ which identified a need for 5,134 physicians in shortage areas in 1994. The MUA system, which uses a population-to-primary care physician ratio as one of four factors in its underservice score, is less dependent on the ratio. However, in making their calculations, both systems exclude two categories of primary care physicians already providing services in the shortage areas:

- NHSC and federal physicians. The systems exclude federally salaried NHSC providers and privately salaried providers who are fulfilling an NHSC service obligation in exchange for health professions scholarships or loan repayment. There were 1,147 such physicians in 1994—the equivalent of about 22 percent of the shortage identified in HPSAs. Other providers employed by federal entities such as the Indian Health Service and the Bureau of Prisons are also excluded. There is no centralized accounting for the total number of federally salaried physicians.
- U.S.-trained foreign physicians with J-1 visa waivers. Such waivers allow noncitizens who complete their residency training in the United States to

⁸This ratio can be dropped to 3,000 to 1 in areas where high need is indicated, such as areas with high poverty or high infant mortality rates.

remain and practice if they are needed in underserved areas.⁹ While the total number of such physicians practicing in underserved areas is unknown, their numbers are substantial. For example, the Appalachian Regional Commission and the Department of Agriculture approved at least 538 J-1 visa waivers for foreign physicians willing to practice in shortage areas in 1993 and 1994 alone.¹⁰ This is equivalent to about 10 percent of the reported shortage of providers in HPSAs.

Both systems also exclude several other categories of providers that deliver primary care services:

- Nonphysician providers. These include nurse practitioners, physician assistants, and nurse-midwives. Comprehensive data on the number of such providers in HPSAs and MUAs are not available. However, NHSC reported having 485 physician assistants, nurse practitioners, and nurse-midwives of its own practicing in HPSAs in 1994. Data provided by health professional associations in 1993 showed at least 369 nonfederal physician assistants and nurse-midwives practicing in HPSAs.¹¹ In total, these two groups may be the equivalent of between 8 and 17 percent of the shortage reported by the HPSA system.¹²
- Specialist physicians who provide primary care. Other research shows that specialists such as general surgeons may provide a substantial amount of primary care in areas where the population base is insufficient to support a full-time specialty practice. Further, a 1991 study illustrated that the availability of a full range of specialists to rural communities almost doubles the number of people needed to support a family physician practice from 2,000 to 3,990.¹³ In urban areas, the oversupply of physicians

⁹Under a J-1 visa, foreign medical graduates can enter the United States for residency training if they return to their own country to practice medicine for at least 2 years after their training is completed. In effect, the waiver cancels the requirement to return to their own country, allowing them to practice in the United States for up to 6 years under a renewable visa until permanent resident status is achieved.

¹⁰The Appalachian Regional Commission and the Department of Agriculture requested the largest number of J-1 visa waivers, according to officials of the United States Information Agency (USIA) administering the waiver process. While the agencies' records showed that 538 waivers had been approved, data from USIA showed an additional 181 physicians that had not yet been entered by the Department of Agriculture in its database. See appendix I for further discussion.

¹¹Data from the American Academy of Physician Assistants and the American College of Nurse-Midwives showed that at least 4,203 physician assistants and certified nurse-midwives were practicing in counties with HPSAs in 1993. However, our analysis includes only those practicing in single-county HPSAs because the number providing care to underserved populations in other types of HPSAs is unknown.

¹²Opinions differ on the physician full-time-equivalency that should be attributed to nonphysician providers. Counting these providers as a 0.5 full-time-equivalent in comparison to a full-time physician would result in a range of 8 to 17 percent.

¹³L.L. Hicks and J.K. Glenn, "Rural Populations and Rural Physicians: Estimates of Critical Mass Ratios, by Specialty," *Journal of Rural Health*, Vol. 7, No. 4, Supplemental (1991).

in various specialties is reportedly causing them to provide an increasing amount of primary care services.¹⁴ Current data on the extent to which specialist physicians are providing primary care in HPSAs and MUAs are not available. However, our review of a sample of 23 single-county HPSAs showed that most had specialist physicians in addition to primary care physicians providing patient care, averaging 1 physician for every 1,968 people.¹⁵

HHS has various reasons for excluding these categories of health care providers. These reasons were published in the Federal Register in 1980 and 1983 to explain or clarify the HPSA criteria and were confirmed by more recent discussions with HHS officials. HHS' rationale for excluding NHSC and federal providers is that they probably would not serve in the HPSA without the service obligation or federal employment, and counting them could cause a community to lose its HPSA status. For similar reasons, HHS regulations exclude foreign physicians unless they are permanent residents. Although HHS originally planned to count nonphysician providers as 0.5 of a physician full-time-equivalent in the HPSA population-to-provider ratio, it excluded them from the final methodology because their scope of practice varies by state, and communities using them for care may be penalized in trying to establish a rural health clinic.¹⁶ HHS does not count specialist physicians because HHS believes the law allows it to count only primary care physicians.

While we understand HHS' rationale for excluding these providers from the designation calculations, we do not agree with it for several reasons. Omitting these providers has such a substantial cumulative effect that the true extent of primary care available in underserved areas cannot be determined if they are excluded. If the 1,147 NHSC physicians, 538 J-1 visa waiver physicians, and 854 physician assistants and nurse-midwives mentioned earlier were included in the HPSA calculations, the reported

¹⁴See conference proceedings for the Health Resources and Services Administration National Conference at the Washington-Dulles Airport Renaissance Hotel, Virginia, on March 27-28, 1995, Estimating Medical Speciality Supply and Requirements in a Changing Health Care Environment: The Technical Challenge (Rockville, MD: Health Resources and Services Administration). See also B. Starfield, Primary Care: Concept, Evaluation, and Policy (Oxford University Press, 1992).

¹⁵Fifteen of the 23 HPSAs in our sample had specialist physicians in addition to primary care physicians with total population-to-physician ratios ranging from 300 to 1 to 3,298 to 1.

¹⁶Rural health clinics may only be established in HPSAs, MUAs, or state-designated underserved areas. If counting nonphysician providers precludes designation, nonphysician providers would not be eligible to establish a rural health clinic and receive direct cost-based reimbursement from Medicare and Medicaid. Dedicating does not affect rural health clinics once they are established.

need for additional providers would be reduced by up to 50 percent.¹⁷ If more complete data were available for all provider categories, this percentage could be substantially higher.

Excluding primary care providers from the system also makes it difficult for federal and state agencies to coordinate their efforts in addressing underservice. For example, in 1994, NHSC had 19 providers in West Virginia in response to the HPSA system's reported shortage of 54 primary care physicians there. However, this need for 54 physicians did not reflect the presence of the NHSC providers or that other federal agencies had also assisted in placing 97 foreign physicians in the state's HPSAs in 1993 and 1994 alone.

Finally, understating the number of primary care providers severely limits the usefulness of the system as a screen to identify which communities should be eligible for additional program benefits. For example, NHSC records show that 15 percent of the 576 providers placed in HPSAs in 1994 were in excess of the number needed for dedesignation, while other HPSA vacancies went unfilled. The excess numbers of NHSC providers placed in these HPSAs ranged from one to six.¹⁸

System Methodologies Are Also Flawed in Other Ways

Both systems have other problems with their methodologies that make it difficult to identify and measure underservice. For the HPSA system, an ongoing concern is that it does not assess the extent that existing primary care resources in the community are being used. For the MUA system, although a number of methodological weaknesses were reported in the past, the methodology has not been revised.

HPSA Methodology Does Not Consider the Extent That Available Resources Are Being Used

The HPSA methodology has no mechanism for measuring the extent that existing primary care resources are insufficient to meet the demand for care. HHS officials said that data for this purpose are unavailable using current sources and would exclude the health needs of people who cannot afford to seek care from a provider. However, past studies of the HPSA criteria and methodology have pointed out that such a mechanism is

¹⁷As discussed in appendix I, this estimate was derived by subtracting the total number of providers practicing in HPSAs from the total number reported as needed by the HPSA system. The range is estimated at about 40 percent to 50 percent if physician assistants, nurse practitioners, and nurse-midwives are counted as 0.5 to 1.0 full-time-physician-equivalent.

¹⁸Many NHSC placements were in areas needing less than 1 full-time physician to dedesignate the HPSA. In these instances, we rounded the needed full-time-equivalent to 1 before comparing the number of physicians needed in a community with the number NHSC placed there.

needed because many factors influence the extent that communities use primary care resources at a rate above or below the 3,500-to-1 ratio.¹⁹ For example, one county in our sample was designated as needing 1 additional physician even though the HPSA application showed that 42 of the 80 physicians surveyed within that HPSA were willing to take new patients.²⁰ Of those willing to accept new patients, over half reported no patient waiting time for appointments—another indication of additional capacity.

Assessing the extent that existing primary care services are insufficient to meet the demand for care would also provide a better indication of whether a provider shortage exists in these areas or whether there are other barriers in accessing existing primary care resources. In the previous example, only 15 of the 42 physicians with additional capacity would accept all new patients; the remainder would only accept patients with certain types of health insurance. In HPSAs such as this that appear to have barriers to accessing underutilized capacity, it may be more appropriate to give incentives for expansion of services rather than adding more providers. For example, states are increasingly placing Medicaid patients in managed care in an effort to make these underserved populations more attractive to the existing physician workforce.

MUA Methodology Is Limited in Ability to Identify Underserved Areas

The MUA methodology has a number of flaws that limit its ability to accurately identify geographic areas and populations that have the greatest shortages of health care services. The methodology—an index of medical underservice—was developed within a short time frame using a process that involved limited empirical testing. Because the developers could not agree on a definition of “medical underservice,” a mathematical model was developed to predict experts’ assessments of service shortages. Subsequent evaluations of the model, however, found little significant difference in the availability of health services between areas that were designated as MUAs and areas that were not. These evaluations, which pointed out other methodological limitations as well, are summarized in appendix II.

The MUA designation methodology has remained virtually unchanged since its development, despite improvements in U.S. health status and resources. The methodology uses the same four criteria to determine the

¹⁹Evaluation of Health Manpower Shortage Area Criteria, Mathematica Policy Research, Inc., HRA contract #232-78-0156 (1980), and M.L. Berk, A.B. Bernstein, and A.K. Taylor, “The Use and Availability of Medical Care in Health Manpower Shortage Areas,” *Inquiry*, Vol. 20, Winter 1983, pp. 369-80.

²⁰The methodology counts the full-time-equivalent each physician currently spends in patient care. This may understate physician resources in areas where physicians are willing to work full time, yet do not have enough patients to do so.

MUA index score, and the cutoff score for MUA status (set at or below the median score for all U.S. counties in 1975) remains the same. The only changes to the methodology were made in 1981, when the weights for the infant mortality rate and the population-to-physician ratio were adjusted slightly. In 1986, the law was amended to allow the Secretary of HHS to designate MUAs that score above the cutoff, if the state's governor recommends designation based on "unusual local conditions which are a barrier to access or availability of personal health services." Since 1986, about 100 new medically underserved areas and populations have been designated on the basis of this exception process.

System Data Are Neither Accurate Nor Timely

Numerous problems exist with the accuracy and timeliness of the data used to obtain and maintain HPSA and MUA designations. Many HPSA applications do not contain the data necessary to support the designation, and data in the HPSA application often differ from those in the HPSA database. The reliability of the HPSA system is also compromised by data that have not been updated as required by law and HHS policy. For the MUA system, because it has no requirements for periodic review and updating, little has been done to keep the system's information current.

Data for HPSA Designation Often Incomplete or Inaccurate

We estimate that about 380 of the 1,952 geographic HPSA designations were made in error or without adequate supporting documentation.²¹ HPSAs qualify for designation on the basis of three main factors: a population-to-primary care physician ratio that equals or exceeds 3,500 to 1, an insufficient number of providers in adjacent areas to provide care, and evidence of being a rational service area. Our review of a random sample of 46 geographic HPSA applications found 17 instances in which data in the file did not support one or more of these three factors. Examples follow:

- Substantial differences existed in the number of physicians reported by some communities and the number obtained by HHS's Division of Shortage Designation (DSD) from other sources. DSD verifies the number of physicians reported by applicants against data available from the professional associations. Any discrepancies and their subsequent resolution are required to be documented in the HPSA file. However, unresolved physician counts in some HPSA applications varied by as much as 50 percent. These differences were enough to preclude HPSA designation

²¹This is the median error using a 95-percent confidence interval. The range of error lies between 131 and 633 of the 1,952 geographic HPSAs.

- in each case. For example, one HPSA needing fewer than 8.7 physicians to qualify for designation reported having 7 physicians, while the American Medical Association directory showed 14 physicians practicing in the area.
- Some HPSA applications did not include data supporting that the number of providers in nearby communities was insufficient to provide care. DSD uses a population-to-physician ratio of 2,000 to 1 in contiguous areas within 30 minutes of travel time from the HPSA population center for this purpose. However, some HPSA files did not show that resources in all contiguous areas were considered. For example, one applicant reported the number of physicians in a town over 30 minutes away, but did not report the number of physicians practicing in a town within 30 minutes travel time.
 - In some HPSA applications, there was no documentation to support the presence of rational service areas for primary care delivery. For example, one single-county HPSA was so large that distances between its population centers exceeded the 30-minute criteria for travel time to care. In another example, two separate service areas asked to be combined and enlarged to maintain the designation for one service area that no longer met the HPSA criteria.

DSD was able to provide additional information to support 8 of the 17 designations GAO questioned. DSD officials said it was unclear why five of the remaining nine HPSAs had been designated, and said that they would follow up to resolve the discrepancies and propose dedesignations as necessary. In the other four cases, they provided additional information that we considered but still found to be insufficient to support the designation. We attempted to project the financial impact of federal funding provided to these areas, but because of program data limitations were unable to do so with an acceptable degree of statistical confidence.

Another problem is that once the HPSA application data are verified, there is still no assurance that they will be entered or accurately reflected in the HPSA database. Of the 46 HPSA applications in our sample, 14 had discrepancies between the verified data and the data existing in the database for population, physicians, poverty rates, or differences in travel distances or times to the nearest source of care. Although these differences did not seem great enough to cause any of the 14 to lose their designation as a HPSA, some may be great enough to affect eligibility for placement of NHSC scholars or loan repayors.²² We were unable to determine the effect these data entry errors or omissions had on the NHSC

²²Each HPSA is scored using four factors: population-to-primary care physician ratio, poverty rate, rates for infant mortality or low birth weight, and distance to care outside the HPSA. HHS establishes cutoff scores each year to determine which HPSAs are eligible for placement of NHSC scholars and loan repayors.

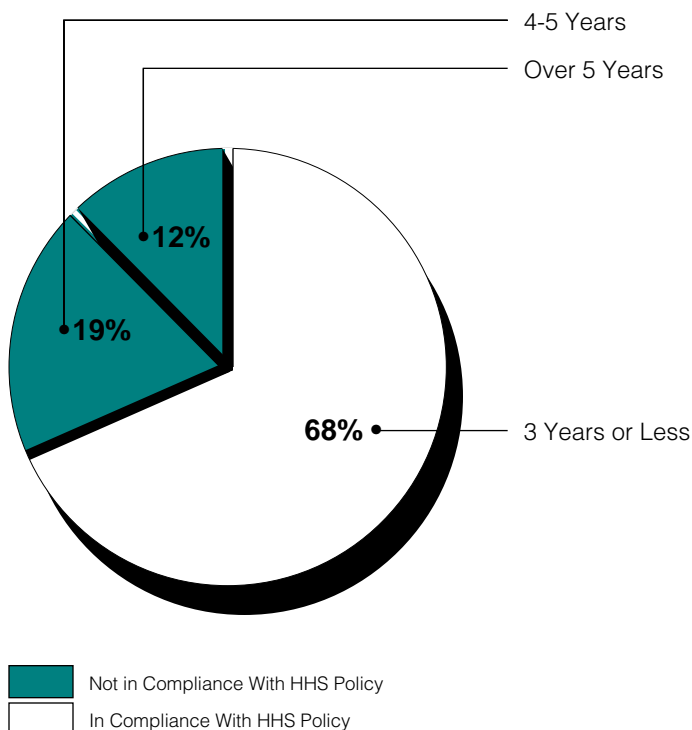
program because, as explained in the next section, HHS sometimes uses data other than those in the HPSA database to prioritize HPSAs for placement of NHSC providers.

HPSA System Data Are Not Updated on a Timely Basis

HPSAs are not being reviewed on a timely basis to determine if they still qualify for federal assistance or should instead be dropped from designation. Federal law requires HPSA designations to be reviewed annually, a task that DSD has delegated to the states. However, DSD annually obtains data from the Bureau of the Census and the National Center for Health Statistics for many of the HPSA fields. DSD uses these current data instead of the older system data to identify which HPSAs have the greatest need for NHSC providers, but it does not use the current data to update its database. DSD officials said they did not use the data to update the database because doing so may cause some HPSAs to become dedesignated. DSD considers it inappropriate to dedesignate a HPSA until it can conduct a complete review of all data submitted by each HPSA during the formal update cycle.

DSD's policy calls for each HPSA to submit an update application to them every 3 years for DSD review and verification that the HPSA designation is still valid. However, DSD is conducting these reviews, at best, every 5 years. Currently, about one-third of the HPSAs have not been updated in more than 3 years and should be updated or deleted, according to DSD policy (see fig. 2.1).

Figure 2.1: Years Since Last Update of Individual HPSAs, as of August 1994



Note: Percentages do not add to 100 because of rounding.

Source: GAO analysis of data from HHS' HPSA database.

DSD officials said they have extended the update period from 3 to 5 years because they have not been able to keep up with the backlog of HPSA applications. However, even the 205 HPSAs that did not reapply for HPSA designation within the past 5 years have not been dropped from the system.²³

Delaying the update process means that HPSA designation is continued for communities no longer requesting it. Communities generally do not request dedesignation when federal assistance is no longer necessary; instead, they simply do not reapply for designation during the update cycle. However, when the designation for these outdated HPSAs is still on

²³As we were concluding our review, DSD officials told us they were in the process of proposing withdrawal of these designations.

the books, federal programs may continue to provide them with resources, perhaps to the detriment of those HPSAS with current designations. The following examples illustrate this problem:

- NHSC policy is to place providers in HPSAS updated in the last 5 years. However, in 1994, 9 percent of the NHSC providers were placed in HPSAS that had not been updated for 5 years or more. Twenty-three percent were placed in HPSAS that had not been updated in the past 3 years.
- Under the Medicare Incentive Payment program, Medicare pays bonuses to physicians in all designated HPSAS regardless of when the HPSA was last updated. Although we were not able to determine how much bonus money was paid in HPSAS that had not been updated in the past 3 years, more than \$98 million was paid to physicians in HPSAS in 1994, and one-third of all HPSAS were more than 3 years old.

MUA Designations Have Not Been Reviewed Since 1981

There is no required schedule for periodically reviewing and updating MUA data and designations, and even less has been done to keep this system current than for the HPSA system. According to DSD officials, no systematic attempt to update the MUA designations has been made since 1981, when existing designations were reviewed against newer data. They told us that at that time, areas that no longer qualified as MUAs with the newer data were not always dedesignated, however, to avoid disrupting existing community health center services. Community health centers are required to serve MUAs or medically underserved populations to receive federal grant support. Essentially, once an area or population has been designated, it remains designated until the state's governor requests dedesignation. Since 1990, this has happened only once, when three counties in North Dakota were proposed for dedesignation in 1994.

To show what might happen if designations were updated, we compared an application of the MUA methodology to 1990 data for all U.S. counties with DSD's 1995 list of MUA-designated counties. We found that about 740 counties would qualify as MUAs on the basis of 1990 data, compared to about 1,380 counties that DSD now has designated.²⁴ Although according to an HHS official there may be other reasons—such as continued eligibility for community health center funding—not to delete some old designations, maintaining the system with such obviously outdated

²⁴The total 1,380 DSD-designated MUA counties cited here differs from the 1,455 MUA counties mentioned earlier because of variations in how counties were defined in the two data sets we compared. To make the comparison, we excluded variations in Alaska and Virginia. See appendix I for details.

information provides further evidence of the system's unreliability in identifying medically underserved areas.

Conclusions

The HPSA system does not accurately measure the existing capacity of communities to provide primary care services to its populations or the additional number of providers needed for this purpose. Shortages in many communities are overstated because the HPSA criteria do not recognize differences in the types of health care providers used to obtain care, or consider the extent that federal resources are already provided. The system's reliability is also questionable because HHS has difficulty verifying and updating the HPSA data in a timely manner. Continued reliance on the inaccurate and outdated MUA system likewise has resulted in designations that are not valid indicators of primary health service shortages, or where federal program funding is most needed.

The next chapter discusses other aspects of the HPSA and MUA systems that hinder effective targeting of federal resources to the underserved.

Designation Systems Do Not Provide Information Necessary to Target Funding to the Underserved

Even when the HPSA and MUA designations identify needy areas, they generally do not provide the type of information needed by federal programs to target assistance best suited to meet a location's particular needs. Because most HPSAs are defined as general geographic areas, the designation does not identify the specific part of the population that has difficulty accessing a primary care provider or the underlying reason for this access problem. Similarly, although the MUA system can be used to designate specific underserved populations, most designations encompass everyone within a broad geographic area. As a result, federal programs relying on the designations to identify the type and scope of assistance needed may not provide assistance to those actually underserved in these areas. A case in point is the Medicare Incentive Payment program, which spent over \$98 million in 1994 without any assurance that funds were used to improve access for Medicare beneficiaries in geographic HPSAs.

Designations Often Do Not Identify Demographics of the Underserved

Most HPSA designations do not provide information about the HPSA community beyond defining that a shortage of providers exists somewhere within the geographic area. Over three-fourths of all HPSAs in 1994 were geographically designated. Such a designation assumes that everyone within the general geographic area is underserved because the population-to-primary physician ratio exceeds a standard of 3,500 to 1.

Only one-fourth of HPSAs were designated for specific types of underserved populations or the facilities that treat them. Unlike geographic designations, these designations provide some indication of the types of access problems that exist in the community. For example, there are seven categories of population-based HPSAs, primarily designated for specific poverty populations such as the homeless or Medicaid-eligible, but which also include designations related to cultural or language barriers experienced by migrant farmworkers or immigrants. Facility HPSAs are primarily used to designate shortages for prison populations but may also include public or nonprofit medical facilities.

While designation as a geographic HPSA implies that federal assistance is needed to address access problems for all residents of the HPSA, HHS and state officials agree that specific subpopulations within the area may be those actually at risk. While HHS and state officials believe that underservice may affect entire populations living in areas with no physicians or in remote rural areas, only 12 percent of the underserved

populations live in such areas.²⁵ The remaining underserved populations live in urban areas or rural areas nearby. Access in these areas may more likely be a problem for specific subpopulations, such as the poor.

The MUA system has similar problems. By combining the weights for four factors into a single MUA score, the system produces scores that are difficult to interpret and tend to obscure an area's specific needs. While communities may request designations for specific populations with shortages of health care services, DSD officials told us this medically underserved population (MUP) designation was not used much until the 1980s. Following program amendments in 1986 that permitted state governors to request designations, about half of those new designations have been for underserved populations.

Existing Disincentives for Identifying Underserved Populations

While the HPSA system allows designation for various types of underserved populations, there are several disincentives to request them instead of the geographic designation. First, communities with geographic designations can participate in all federal programs, while the programs available to population HPSAs are more limited. For example, the 10-percent bonus on Medicare billings is available to all physicians in a geographic HPSA, but not to those providing care in HPSAs designated on the basis of a poverty population. Second, the application process for population designations takes longer and is more difficult. Population designations require the applicant to conduct a physician survey to determine the proportion of services available to the underserved population and to explain why access to care is a problem. These requirements do not exist for geographic designations, which must only provide a population-to-physician ratio.²⁶ Finally, individual program requirements for geographic HPSAs are more flexible. For example, in HPSAs designated for poverty populations, 80 percent of the patients treated by an NHSC provider must live below the poverty level, but in a geographic HPSA, NHSC providers can treat anyone living within the defined geographic area.

To ensure access to the broadest range of federal assistance, HHS officials encourage communities to use the geographic designations if possible, even when a specific underserved population can be identified. As a result,

²⁵This percentage includes HPSAs the system identifies as having no physician full-time-equivalents and rural HPSAs that are not identified as being located near an urbanized area as defined by the Department of Agriculture's urban-rural continuum codes.

²⁶Communities applying for geographic designation are required to conduct a physician survey if the number of physicians exceeds the minimum standard. In such cases, the community must demonstrate that it falls below the standard because some physicians are working only part time.

population HPSAS appear to be designated only as a last resort for communities not meeting the criteria for geographic designation. Our review of HPSA withdrawals and designations made in 1993 also showed that population designations are often used to maintain HPSA designation for areas no longer qualifying on the basis of geography. For example, of the 66 HPSAS that lost their geographic designation in 1993, about a third were redesignated on the same day as population HPSAS.

**Designations Have Not
Changed to Reflect the
Needs of Programs Using
Them**

The general nature of most designations does not reflect the need of many federal programs to target assistance to specific populations or circumstances. Over the years, a variety of federal assistance programs have been created to address underservice identified by the HPSA and MUA systems. Initially, these programs served a broad purpose, requiring only that the HPSA and MUA systems designate the geographic areas that required additional providers or services. The NHSC program, for example, placed providers in all types of urban and rural shortage areas, regardless of who was underserved or whether underservice was caused by an undesirable geographic location, an inability to support a physician practice because of sparse or poor populations, or cultural or language differences of migrant farmworkers or immigrants.

As new programs were added, they became more specific about the types of populations they served and the scope of assistance they provided. An example is the Medicare Incentive Payment program, which was expected to assist Medicare patients having difficulty obtaining access to a physician because of the low reimbursement rates for primary care services. Another example is the Rural Health Clinic program. Recognizing that many isolated rural communities are unable to support a physician practice, this program provides cost-based Medicare and Medicaid reimbursement to nonphysician providers such as nurse practitioners and physician assistants providing care in these areas without direct physician supervision. However, the HPSA designation system has not been changed to serve the narrowed scope of these programs. This has raised concerns that programs using the geographic designations to determine the type and scope of assistance needed in communities, instead of identifying the specific needs of underserved population within them, may result in misdirecting hundreds of millions of dollars in program resources.

This change over time is of less concern with regard to MUA designations, because fewer new programs use them. Moreover, the Community Health Center program, which is the chief user of the MUA system, relies on MUA

designations only as a screen for eligibility to apply for funding, according to the program's Director. Grant funds to support existing and new community health centers are allocated on the basis of reported performance and detailed need criteria within the community. Outdated MUA designations still may be used, however, to certify rural health clinics in areas that no longer have serious health service shortages.

Program Interventions May Be Misdirected

When the access problems of specific underserved populations are not identified, it is difficult to determine what kind of federal intervention would be effective—and conversely, to avoid funding “solutions” that do not address the real need. In regard to the MUA system, for example, a study published shortly after its implementation expressed concerns that the methodology did not adequately capture variations in ability to obtain physician services between rural and urban areas, and among populations of different racial and cultural compositions. Consequently, the study concluded that programs using the MUA system could misallocate resources away from those most in need of federal assistance.²⁷

According to HHS officials operating the HPSA system, they are responsible only for determining whether primary care physician shortages exist. The specific programs using the HPSA system should determine who is underserved in geographic HPSAs and whether their programs are appropriate to address the access problems that exist there. However, to date the programs have relied on the HPSA designations for this purpose and have not developed mechanisms to determine whether their strategies are appropriate for the underserved population in each HPSA. They have not targeted or tailored their programs for individual HPSA needs. Some examples follow.

- The NHSC program requires that providers placed in HPSAs serve 80 percent of the HPSA population. While designations for the Medicaid or migrant populations require that these specific populations be treated, there is no mechanism to ensure that these same populations would be identified and treated by an NHSC provider in a geographic HPSA.²⁸
- The Medicare Incentive Payment program pays all physicians in geographic HPSAs a 10-percent bonus on Medicare billings even if Medicare

²⁷John E. Kushman, “The Index of Medical Underservice as a Predictor of Ability to Obtain Physicians’ Services,” *American Journal of Agricultural Economics* (Feb. 1977), pp. 192-7).

²⁸While NHSC providers in a geographic HPSA must agree to see anyone requesting care, they are not required to seek them out as patients. Therefore, their location or hours of practice may be a barrier to access for some underserved populations, such as migrant farmworkers.

patients are not those actually underserved in the HPSA, and even if low Medicare reimbursement rates are not the cause of underservice.

- The Rural Health Clinic program provides cost-based reimbursement for Medicare and Medicaid services provided in any rural HPSA or MUA, even if the rural health clinic will not accept the entire HPSA population as patients. According to program managers at the Health Care Financing Administration, there is no requirement to distribute rural health clinic services throughout the underserved area or for rural health clinics to accept patients regardless of ability to pay for services.

We did not directly audit these programs to determine the extent that program controls were adequate to prevent misdirection of resources for underserved populations in HPSAs and MUAs. However, we did find evidence that such problems exist—especially in the case of the Medicare Incentive Payment program.

Misapplication of the Medicare Incentive Payment Program

At present, there is no evidence that the Medicare Incentive Payment program is targeted to improve access to care for Medicare beneficiaries, even though over \$98 million was paid to physicians in 1994 for this purpose. Neither the HPSA system nor the program identifies the extent that Medicare beneficiaries are underserved in geographic HPSAs or that low reimbursement rates cause access problems for them.

The Medicare Incentive Payment program was established in 1987 subsequent to concerns expressed by the Physician Payment Review Commission²⁹ that low Medicare reimbursement rates for primary care services may cause access problems for Medicare beneficiaries in rural HPSAs. Under the program, all physicians providing services to Medicare beneficiaries in a rural or urban geographic HPSA are eligible for a 10-percent bonus on Medicare billings.

The premise on which this program was created may no longer be valid in that the basis for Medicare reimbursement has changed since 1987.³⁰ In its 1995 report to the Congress, the Physician Payment Review Commission found no evidence that provider shortages or low Medicare reimbursement rates cause health care access problems for beneficiaries

²⁹The Physician Payment Review Commission was established in 1986 to advise the Congress on reforms in physician payment under the Medicare program.

³⁰The Health Care Financing Administration has been implementing changes to the physician fee schedule since physician payment reform measures were passed in the Omnibus Reconciliation Act of 1989. These changes generally increased reimbursement rates for primary care services and for services in rural areas.

in rural areas.³¹ Close to half of the \$98 million spent under the program in 1994 was paid to about 82,000 rural physicians. While the Commission found some evidence of a link between living in urban HPSAs and access-to-care problems, beneficiaries cited the cost of services not covered by Medicare and a lack of transportation as the primary causes of access difficulties. These problems are unlikely to be solved by providing a bonus on Medicare billings. The remaining half of the \$98 million spent under the program in 1994 was provided to about 96,000 physicians in urban areas.

Further, the HHS Inspector General has questioned the appropriateness of applying the program in HPSAs because it provides bonuses to specialist physicians as well as primary care physicians, while the HPSA system only identifies areas with primary care physician shortages. The Inspector General reported that 45 percent (\$31 million) of the Medicare incentive payments made in fiscal year 1992 went to specialist physicians who provided little or no primary care.³² Among primary care physicians, the Inspector General concluded that Medicare incentive payments rarely have a significant effect on their decisions to practice in underserved areas.

Bureau of Primary Health Care officials agreed that the HPSA system is not structured to effectively identify areas where the Medicare Incentive Payment program should be implemented. However, they do not believe they should modify the HPSA system for this purpose. Rather than add a designation for underserved Medicare populations, they suggested that the Health Care Financing Administration devise another system. While recognizing that the HPSA system is inappropriate, officials at the Health Care Financing Administration said that use of the HPSA system is mandated by law and that they do not have an alternative system that would effectively allocate funding under this program.

Conclusions

While designating HPSAs on a strictly geographic basis may be appropriate for areas with no providers or rural areas remote from other sources of

³¹The Physician Payment Review Commission found that Medicare beneficiaries, as a group, do not appear to have particular problems securing access to care. The Commission analyzed the results of the Health Care Financing Administration's 1993 Medicare Current Beneficiary Survey and reported that 97 percent of Medicare beneficiaries surveyed said they had no trouble with access to care during the previous year. The Commission did not address the continued need for the Medicare Incentive Payment program. However, it did support retaining and expanding the program in its 1994 report to the Congress.

³²Medicare Incentive Payments in Health Professional Shortage Areas: Do They Promote Access to Care? HHS Office of Inspector General, Report No. OEI-01-93-00050 (June 1994).

care, such a designation provides limited benefit in targeting assistance in areas where specific subpopulations are at risk. In addition, although the HPSA and MUA systems have criteria that allow communities to specifically designate the types of populations that are underserved in the area, these criteria do not identify the types of populations or access problems that some federal programs are trying to address. HHS encourages communities to maintain broad geographic designations because the designation process is easier and federal programs will provide more benefits to them. However, these broad designations may result in programs misdirecting federal assistance away from those most likely to benefit from it. A prime example is the Medicare Incentive Payment program, which currently has no method to identify situations in which this federal intervention is likely to improve access to care for underserved Medicare beneficiaries.

These problems, in conjunction with the methodological and administrative problems discussed in chapter 2, raise questions about the benefits of using the HPSA and MUA systems to identify areas where federal program intervention is needed. Accordingly, the next chapter discusses an alternative to replace the systems with individual program requirements structured to match each program's strategy to the various needs of underserved communities.

While our primary focus in this work was reviewing the HPSA and MUA systems rather than the programs that use them, we believe our findings call for a reexamination of the utility of the Medicare Incentive Payment program.

Recommendation to the Congress

To prevent misdirection of federal program funds, we recommend that the Congress direct the Secretary of HHS to suspend funding for the Medicare Incentive Payment program until HHS can ensure that funding is specifically targeted to Medicare beneficiaries having difficulty accessing a physician because of low Medicare reimbursement rates for primary care services.

Major Changes Needed in Approach to Identifying Medical Underservice

As currently implemented, the HPSA and MUA systems provide limited benefit to federal programs in identifying those underserved populations that require federal assistance to improve access to primary care. HHS acknowledges that the HPSA and MUA systems have problems and is proposing changes to address some of them. However, the most significant problems will remain. Fixing the systems is not the only option—and perhaps not the best one. The needed improvements may be difficult and costly, and all but one federal program already have their own screening processes in place that may be more easily modified to better match federal resources with the needs of underserved communities.

Proposed Changes Do Not Address Most Significant Problems

As chapters 2 and 3 have described, the major problems leading to the deficiencies in the HPSA and MUA systems are two-fold. First, the systems contain outdated, inaccurate, and incomplete information. Second, they are based on flawed methodologies that have not been effective at specifically identifying which parts of the population are underserved and why. The Bureau of Primary Health Care is proposing changes to consolidate and streamline the administrative processes of the two systems. But these proposals do little to improve the existing methodologies' ability to accurately identify areas that need additional health care providers or services.

Under the proposed changes, communities would fill out one application form instead of two for both HPSA and MUA designation, and states would take on an increasing role in the designation and update processes. HHS is also considering modifying some of the criteria, which is expected to increase the overall number of designations. For example, HHS may expand the definition of a poverty population from people whose incomes are below 100 percent of the federal poverty level to those whose incomes are below 200 percent, and may add race and ethnicity factors to obtain more designations for disadvantaged populations.

These changes to the existing criteria will not significantly affect the underlying methodologies' tendency to overstate primary care provider shortages or mask underserved populations living within broad geographic designations. For example, the following three aspects of the systems' operations will not change:

- HHS plans to continue measuring available primary care capacity with a population-to-primary care physician ratio, without expanding the

definition of providers counted or considering differences among communities in utilizing primary care resources.

- HHS is also maintaining broad geographic designations that do not indicate who in the area is underserved or why designation was requested.
- The system will continue to overstate primary care physician shortages in areas where federal, state, or regional organizations have been successful in promoting sustainable alternative delivery methods, such as rural health clinics staffed by nurse practitioners and physician assistants.

Improvements Needed May Be Difficult and Costly

DSD officials acknowledge that their proposed changes will not address many of the problems we identified. They said that many of the improvements in data and methodology would require more time and resources than are currently available at the federal, state, and local levels. We agree that cost is an important consideration—and probably a limitation—in making improvements. Solutions to many of the problems we identified may be time consuming or difficult. For example, the geographic area defined in many applications may be different from the geographic area for which data are available at the national level. Census data, health statistics, and provider information may be readily available for a county, but not for specific areas or populations within the county. In such cases, assessment of primary care needs may require surveys of health providers or populations living in the area. These surveys could prove expensive for the communities to perform and the results difficult for HHS to verify.

Existing Alternatives to Revising the Systems

While some way of screening applicants for federal assistance is necessary, most federal programs already have their own screening processes in place. All but one of the federal programs discussed here have their own criteria and conditions of participation that may be more easily modified to target resources to the underserved. Program officials continue to use the HPSA and MUA systems, in part because they are required by law to do so, but in practice they could rely on their own application processes to match community needs with program resources. The Community Health Center program, for example, requires applicants to demonstrate their target populations' need for services by providing data on geographic, demographic, and economic factors; available health resources; and population health status.

Incorporating similar types of controls in each program could preclude the need for a HPSA or MUA system, and result in better matching of program

strategies to individual community needs than currently exists. Here are several examples:

- The NHSC program uses the HPSA system as an initial screen to identify which areas are eligible to apply for the program. However, facilities or practices within HPSA communities wishing to apply for NHSC providers must fill out additional applications to determine whether they meet the program's criteria and conditions of participation. These applications do not currently require the applicants to show that they have unsuccessfully tried to recruit a provider to treat a specific underserved population; however, the program requirements could be modified to include this information.
- The Rural Health Clinic program also relies on the HPSA and MUA systems only as a screen for basic eligibility. The program has its own application process and conditions of participation that must be met after designation is obtained. Program applications currently do not require evidence showing that cost-based reimbursement from Medicare and Medicaid is needed to sustain a clinic, nor do they require the applicant to accept all underserved people as patients. However, these requirements could be modified to do so.
- The health professions education and training programs use the HPSA and MUA systems as only two of several criteria in assessing whether some applicants should receive preference or priority for federal grants or scholarships over others. These program applications could be modified, if necessary, to include evidence on the extent to which the applicants have been successful in addressing underservice.

The Medicare Incentive Payment program is the only program that uses the HPSA designation as the sole criterion for obtaining federal benefits. However, as discussed in chapter 3, we question whether using the HPSA system is appropriate for this program. The HPSA system does not have a designation category for underserved Medicare beneficiaries, nor does it identify them within broad geographic designations.

DSD and program managers acknowledge that the systems provide only limited benefit to federal programs and are not really needed for them. However, they believe that maintaining a national system is needed for developing planning documents and monitoring primary care access. While we agree, HHS already has another effort under way that may serve this purpose. Using statewide primary care cooperative agreements, HHS provides funding to all 50 states, the District of Columbia, and Puerto Rico for the development and coordination of comprehensive primary health

care services in areas lacking adequate numbers of health care professionals or services.³³ Under these agreements, state representatives are responsible for (1) participating in the development of statewide efforts to coordinate and implement primary care delivery systems, (2) identifying special underserved populations and the types of programs appropriate to incorporate these populations into the primary health care system, and (3) integrating federal assistance and health care delivery programs with existing local and state resources. Primary care access plans developed by each state have the potential to provide a more comprehensive and less duplicative way of gathering needed information about the type and scope of programs needed in each community. Aggregating this information at the national level may help in allocating increasingly scarce resources to those programs that are most needed in underserved communities.

Conclusions

HHS is proposing changes in the HPSA and MUA systems, but these changes will not result in improving the methodologies' ability to reliably identify shortages of primary care providers and services. In our view, the costs to make the types of improvements needed in the designation systems are not worth the time and benefit of doing so. For program purposes, it would be easier to incorporate the appropriate screening requirements into the existing conditions of participation for each program. For other purposes, HHS could explore using information collected under the primary care cooperative agreements to prevent duplication of effort in establishing a national primary care monitoring system.

Recommendation to the Congress

To assist underserved populations in accessing federal program resources most appropriate for their needs, and to enable HHS in targeting its resources more specifically to them, we recommend that the Congress remove legislative requirements for HPSA or MUA designation as a condition of participation in federal programs. Instead, the Congress should direct the Secretary of HHS to incorporate the necessary screening requirements into the conditions of participation of each program that will best match the type of program strategy with the type of access barrier existing for specific underserved populations.

³³Primary care cooperative agreements are authorized under section 333(d) of the Public Health Service Act as a technical assistance component of the NHSC program. These cooperative agreements, together with the state/regional primary care associations authorized under sections 329(f)(1) and 330(f)(1) of the Public Health Service Act to provide technical assistance to Community and Migrant Health Centers, are HHS' main mechanism to support state-based planning to improve primary care access to the underserved. HHS provided over \$11 million of NHSC and Community Health Center program funding to the states for the cooperative agreements in fiscal year 1994.

Scope and Methodology

Our scope of work included all MUAs and primary care HPSAs. Although HHS has separate HPSA systems to measure shortages of dental and mental health care professionals, we did not review them.³⁴ We chose to review the primary care HPSA system because most federal funding allocated by HPSA for underserved populations in fiscal year 1994 was based on the primary care HPSA designations. We reviewed MUAs designated through February 1995 and HPSAs designated through August 1994.

Determining the Extent the HPSA and MUA Systems Identify Areas With Primary Care Shortages

To address our first objective, we first reviewed the criteria and methodologies of the systems, and past evaluations of them, and then assessed whether the data in the two systems were accurate and timely.

Criteria and Methodologies

HPSA System

We compared the number of primary care providers that would be counted in HPSAs using the HPSA methodology with the number actually practicing there. Noting that the methodology excluded several categories of primary care providers, we attempted to quantify the impact this exclusion had in overstating the need for additional providers in HPSAs. However, we experienced some limitations in doing so. First, we could not fully identify the total number of health professionals providing primary care in each HPSA because no centralized data exist on primary care providers' practice locations, and because no comprehensive listing of providers is required or included in the HPSA applications. Second, although we could obtain data on certain categories of providers practicing in HPSAs, we were again limited in that the data were available only at the county, state, or national levels. Specifics follow:

- Our review of federal providers in HPSAs was limited to those salaried by NHSC. We obtained these numbers from NHSC's reports on its national field strength prepared at fiscal year-end 1994. This report also provided the number of NHSC providers employed by private entities but serving in a HPSA under a service obligation for educational scholarship or loan repayment.

³⁴HHS also has four other HPSA systems for vision, podiatric, pharmacy, and veterinary services. However, these systems are not currently used by HHS.

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- We determined the extent that physician assistants and certified nurse-midwives provide care in single-county HPSAS by comparing the zip codes of their practice locations with those for HPSA locations. We obtained the practice locations' zip codes from the American Academy of Physician Assistants and the American College of Nurse Midwives. We matched zip codes with HPSA county codes by using a U.S. Department of Agriculture conversion program.
 - Our review of foreign physicians in HPSAS was limited to those practicing under J-1 visa waivers requested by the Appalachian Regional Commission and the Department of Agriculture in 1993 and 1994. We reviewed the number of foreign physicians practicing under J-1 visa waivers because they must practice in underserved areas as a condition of the waiver. We chose the Appalachian Regional Commission and Department of Agriculture because HHS and USIA³⁵ identified them as sponsoring the largest number of requests for J-1 visa waivers in the last 2 years. These agencies provided us with the number of physicians they placed in each state from January 1993 through January 1995.

MUA System

We identified a number of independent evaluations that addressed the methodology, criteria, and validity of the MUA system. These evaluations are discussed in detail in appendix II.

Data Accuracy and Timeliness

HPSA System

We selected a random sample of 56 primary care HPSA applications. The sample consisted of 46 geographic HPSAS, 5 population HPSAS, and 5 facility HPSAS. We chose a greater number of geographic HPSA applications because they make up 75 percent of all HPSA designations.

We decided whether the designations for our sample were valid by comparing the data in each HPSA application with the criteria in legislation and HHS regulations. We also independently verified that the file data were current and correct using methods such as calling providers in the community and measuring distances to care on highway maps. We provided our results to HHS for its review and comment and then projected the error rate to all geographic HPSAS.

³⁵The USIA administers the J-1 Exchange Visitor program and is responsible for processing the J-1 visa waivers.

We also reviewed whether the data in the HPSA file were accurately entered into the HPSA database. When the data in the HPSA application and database were different, we analyzed whether these differences would affect the HPSA's designation status. We also tried to analyze the effect of differences on the HPSAs' eligibility for placement of NHSC scholars. However, we were unable to do so because in some cases, DSD uses data and rules other than those in the HPSA database for this purpose.

We determined whether the HPSA data were current by comparing the date of the last update for each HPSA record with requirements in legislation and HHS policy. We identified the number of HPSAs updated within the last year, the last 3 years, and those that had not been updated in 5 years or more. We then identified the amount of NHSC resources placed in outdated HPSAs in 1994. We did this by matching the HPSA identification number of the outdated HPSAs with those on NHSC's 1994 Health Professional Placement Opportunity Listing. We did not identify the amount of Medicare Incentive Payment bonuses provided to physicians in these HPSAs because this information is not available at the Health Care Financing Administration.³⁶

MUA System

We obtained a data file from DSD listing designated MUA areas and populations that was current as of March 7, 1995. The file contained the names and codes of counties, census tracts, and minor civil divisions that were designated, usually with an MUA score, and sometimes with an indication of specific target populations such as low-income or Medicaid-eligible individuals. We compared DSD's current list of whole-county MUA designations with MUA scores calculated with 1990 data for all U.S. counties from HHS' Area Resource File.³⁷

³⁶Physician bonuses are not paid using HPSA identification numbers. According to Health Care Financing Administration officials, matching bonuses with HPSA locations would require obtaining physician addresses from the 46 Medicare carriers and converting them to a specific HPSA identification code.

³⁷We used a U.S. county data set developed by researchers at the Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill. This data set included MUA scores for all U.S. counties, calculated by the University of North Carolina researchers using DSD's MUA formula and weights and 1990 data from the researchers' data set, which was based on HHS' Area Resource File. We used the District of Columbia and all states except Alaska and Virginia, which we excluded because of differences in how the University of North Carolina file and the DSD file defined counties.

Reviewing the Systems' Usefulness in Targeting Federal Resources

HPSA System

We looked at how well the purpose of the HPSA designations matched the purposes of the various programs that use the HPSA system to allocate resources. We first reviewed the types of designations available in the HPSA system and analyzed whether the designations of geographic, population, or facility HPSAs identified the demographics of the underserved population and the reasons underservice exists. We then interviewed federal and state program managers to learn whether the system provided the information they needed to target resources to the underserved, and the extent to which they relied on the HPSA system for this. We also reviewed the conditions of participation for programs using the HPSA designation to determine whether they provided incentives or disincentives to obtain more general or specific types of HPSA designations.

MUA System

DSD's list of current MUA designations did not include data necessary to determine how many MUAs were geographic areas only (usually whole counties or groups of census tracts) and how many specified target populations within geographic areas. We interviewed the Director of the Community Health Center program to learn the extent that the program relies on the MUA system for funding decisions.

Reviewing Proposed Changes to the HPSA and MUA Systems

To accomplish our third objective, we first read drafts of HHS' proposed changes to the systems in fall 1994 and spring 1995. We obtained these drafts while participating in a 2-day expert advisory panel meeting convened by the Bureau of Primary Health Care to discuss its proposal. We also discussed the types of problems these changes were intended to address. Specifically, we concentrated on whether the changes are likely to address the methodological problems we found and that were previously identified in HHS-contracted studies. We discussed possible changes to the criteria and methodologies with state and federal representatives from HHS' Bureau of Primary Health Care, Agency for Health Care Policy and Research, National Center for Health Statistics, and the Health Care Financing Administration.

Evaluations of the MUA Designation Methodology

As part of our work to determine whether the MUA system accurately identifies areas and populations needing federal assistance, we analyzed published research on the MUA designation methodology. We identified evaluations of the MUA designation system published since the system went into effect in 1975, determined which were most relevant to the scope of our work, and summarized their findings.

In summary, these studies support a common theme—that the MUA designation system is neither accurate nor effective in identifying underserved areas. The methodology (using the Index of Medical Underservice, or IMU) is questionable because it was not based on a clearly defined concept of medical underservice. Moreover, the methodology (including four factors, formula, weights, and cutoff point) was developed by consensus of expert judgment, with limited empirical testing. Scores produced by the index are difficult to interpret, and by combining weights for four factors into a single MUA score, they may obscure an area's specific problems.

Further, the MUA methodology has been tested empirically in at least three studies, which all concluded that the index has limited value in designating underserved areas. These studies found that the index did not discriminate effectively among levels of need for health services and was not an accurate predictor of ability to obtain physician services. Because the MUA methodology does not help determine whether additional resources would produce greater benefits at MUA sites than at non-MUA sites, the studies concluded that the MUA methodology should be used with caution in funding allocations, and should not be used for other health planning purposes.

We have summarized the findings of the relevant evaluations here.

Health Services Research Group, Center for Health Systems Research and Analysis, University of Wisconsin, "Development of the Index of Medical Underservice," *Health Services Research*, Summer 1975, pp. 168-80. The group reported on how it developed the IMU for use by the Bureau of Community Health Services in designating medically underserved areas for the federal Health Maintenance Organization program. There was a short time frame: 3 months to report criteria and 12 months to report the first list of underserved areas to the Congress. Health experts were unable to agree on a definition of "medical underservice." Therefore, a mathematical model was developed to predict experts' relative assessments of scarcity of personal health services. The result was a

“self-explicated multiattribute utility model,” based on empirical work in three states, delphi procedures, and consensus conferences. The group cited the limitations of their approach as follows: (1) sites and experts to validate the model were not randomly selected, (2) expert consensus was less strong in some large metropolitan areas (Detroit), and (3) it was impossible to evaluate whether additional personal health services produced more benefits at MUA sites than at non-MUA sites.

Jere A. Wyson, “Viewpoints: The Index of Medical Underservice: Problems in Meaning, Measurement, and Use,” Health Services Research, Summer 1975, pp. 127-35. This analysis outlined fundamental weaknesses with the IMU, including (1) lack of definition of “medical underservice” and confusion with other concepts such as availability, accessibility, and health status; and (2) difficulty interpreting values obtained by the index, in that any particular index value can be obtained from very different combinations of values of individual variables, and extreme values for one or two variables can determine the index value. The author concluded that the index had limited value in designating medically underserved areas. The author questioned use of a single cutoff score instead of a range, recommended considering scores on individual variables, and cautioned against use of the index for other health planning purposes.

Joel C. Kleinman and Ronald W. Wilson, “Are ‘Medically Underserved Areas’ Medically Underserved?” Health Services Research, Summer 1977, pp. 147-62. These analysts used data from the 1973 and 1974 Health Interview Survey of the National Center for Health Statistics to evaluate MUA designations by comparing respondents living in rural (nonmetropolitan) MUAs with those living in rural non-MUAs, and then by comparing each rural group with respondents in metropolitan counties. The authors looked for differences in health status, access, and utilization of health services. They found no difference between rural MUAs and non-MUAs in number of physician visits per person per year, and a slight difference in proportion of residents with one or more visits per year (not adjusted for need). MUA residents reported poorer health status, used some preventive services less, and used nonsurgical hospitalization more than non-MUA residents. The practical significance of the differences was unclear. The authors concluded, “In terms of reported problems with access to medical care, the differences between MUAs and [non-MUAs] were not large.” Moreover, because the IMU was based on a consensus among experts that had no explicit basis, it was difficult to know what differences between MUAs and non-MUAs would be expected. The authors concluded that for a better methodology to identify underserved populations, the

concept of medical underservice should be closely examined and more carefully defined. Ideally, appropriate standards of care should be agreed upon and deviations from those standards defined as underservice. As an interim measure, they recommended using the Health Interview Survey data to develop and test indirect indexes of underservice.³⁸

John E. Kushman, "The Index of Medical Underservice as a Predictor of Ability to Obtain Physicians' Services," American Journal of Agricultural Economics (Feb. 1977), pp. 192-7. This study evaluated the IMU as a predictor of a population's ability to obtain physician services, using 1976 claims data from the California Medi-Cal (Medicaid) program. The author expressed concerns that the IMU did not adequately capture variations in ability to obtain physician services between rural and urban areas, and among populations of different racial and cultural compositions. He found that the IMU explained only about one-fifth of the variation in the number of claims across counties. When nonwhite and urban population variables were added to the IMU, it explained nearly half of the variation in claims. The author concluded that the IMU "is a statistically significant predictor of ability to obtain physicians' services under California's Medi-Cal program, but it does not predict accurately." The IMU did not adequately reflect barriers to physician services faced by nonwhites and persons who live in rural areas, and thus programs using the IMU may misallocate resources toward whites and urban areas.

Richard C. Lee, "Designation of Health Manpower Shortage Areas for Use by Public Health Service Programs," Public Health Reports, Vol. 94, No. 1 (Jan.-Feb. 1979), pp. 48-59. In addition to citing questions raised by other researchers about the specific factors included in the IMU and the degree to which the IMU actually discriminates between underserved and adequately served areas, this report stated, "A perhaps more significant shortcoming of the MUA designation procedure is the fact that it does not generally involve the definition of rational service areas or take into account conditions in contiguous areas." Problems also stem from the IMU's combination of county data for two factors (population-to-physician ratio and infant mortality rate) with census tract or civil division data for the other two factors (poverty and aged indicators) to designate subcounty MUAS.

Frederick J. Kviz and Jacquelyn H. Flaskerud, "An Evaluation of the Index of Medical Underservice: Results From a Rural Consumer Survey,"

³⁸For details of survey methods and terms, see National Center for Health Statistics, Current Estimates From the Health Interview Survey, U.S. 1974, Vital and Health Statistics Publications, Series 10, No. 100 (Sept. 1975).

Medical Care, Vol. 22, No. 10 (Oct. 1984), pp. 877-89. The authors evaluated the validity of the IMU by examining its ability to discriminate among levels of need for health services reported by rural consumers in response to a random household mail survey done in 1978 in rural counties in six midwestern states (HHS Region V; 2,563 completed questionnaires, cooperation rate was 65.4 percent). IMU was not found to be an effective discriminator among levels of need for health services as reported by survey respondents; MUA vs. non-MUA designation based on IMU values was even less discriminatory. IMU accounted for only a small proportion (less than 10 percent) of the variance in six criterion measures: (1) usual source of care, (2) used services outside county of residence, (3) number of nonemergency outpatient visits, (4) number of serious symptoms, (5) self-evaluation of health status, and (6) satisfaction with available health services. The authors concluded: "The findings of this study do not support the validity of the IMU as an indicator of the relative need for health services; we seriously question the utility of the IMU in appropriately determining funding priorities for health services programs. . . . it is recommended that use and interpretation of the IMU be made with caution and supplemented by additional data as much as possible." (This study was limited to rural areas and predominately white populations.)

Office of Technology Assessment, Health Care in Rural America, OTA-H-434 (Washington, D.C.: U.S. Government Printing Office, Sept. 1990). The Office of Technology Assessment (OTA) analyzed data on HPSAs and MUAs in a study of rural health. Using 1981 data, there were 2,440 designated whole- and partial-county MUAs. Of these, 1,328 whole-county MUAs and 567 partial-county MUAs were in rural areas. OTA reported that these data on MUAs were outdated and probably inaccurate because initial MUA designations did not assess whether subcounty areas met the "rational service area" criterion. Some designated areas may not actually be underserved.

Donald H. Taylor, Jr., and others, The Measurement of Underservice and Provider Shortage in the United States: A Policy Analysis, North Carolina Rural Health Research Program, Cecil G. Sheps Center for Health Services Research (University of North Carolina at Chapel Hill: Dec. 1994). This report, which focused on the HPSA system, included an analysis of the MUA designation system. The authors assessed the change in the number of whole counties having an IMU score of 62 or less (the cutoff for MUA designation) from 1980 to 1990, using HHS' Area Resource File data for all U.S. counties. In 1980, 1,066 whole counties had IMUs at or below 62, and 2,014 counties scored over 62. In 1990, 784 whole counties had IMUs at or

below 62, and 2,296 scored over 62. The authors attributed this change to a decrease in severity of underservice in whole-county measures from 1980 to 1990, due to changes in the variables that make up the IMU and the lack of change in the IMU cutoff of 62. The authors noted that since 1980, in general, in the United States the number of primary care physicians has grown, infant mortality rates have declined, the proportion of the population living in poverty may be about the same, and the proportion of the population over age 65 has increased. The authors concluded that it is unclear what the IMU measures, and there is evidence that the IMU does not adequately identify populations with serious access problems or levels of underservice.

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