

## Chapter 11

# Identifying Underserved Populations

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# Identifying Underserved Populations

## INTRODUCTION

That rural areas have a relative lack of health personnel is indisputable. Whether this difference results in inadequate access to health care is more difficult to determine.

The Federal Government uses two composite measures for defining areas in which the population has inadequate access to health services. Areas, population groups, and facilities that lack sufficient health personnel, as measured by population-to-practitioner ratios, are termed "Health Manpower Shortage Areas" (HMSAs). Areas and population groups that have inadequate access to health care, as measured by an index of four weighted indicators of health needs<sup>1</sup>, are known as "Medically Underserved Areas/Populations" (MUA/Ps). Although it is possible for an area to be designated both as an HMSA and as an MUA, the two Federal designations are independently determined and must be applied for separately.

This chapter summarizes the development and uses of the Federal HMSA and MUA designations and presents the results of an OTA survey examining State activity and satisfaction with HMSAs and MUAs. (See app. D for a description of the survey.) In addition, the chapter examines the prevalence and uses of State shortage area designations. It concludes with a discussion of the concepts of 'shortage' and "medical underservice" and a review of the literature on alternative designation criteria.

## DESCRIPTION OF FEDERAL DESIGNATIONS

### *Health Manpower Shortage Areas*

#### History

The first Federal shortage area designations were mandated in 1965 (Public Law 89-290) for the implementation of health professional loan repay-

ment programs. Students in schools of medicine, osteopathy, dentistry, and optometry who served in designated shortage areas could have all or part of their educational loans forgiven. Shortage areas were designated by State health authorities according to population-to-practitioner ratio criteria established by the Secretary of the Department of Health, Education, and Welfare (DHEW).<sup>2</sup> Most of the designations were at the county level (i.e., for whole counties) and were in rural areas.

Legislation enacted in 1971 (Public Law 92-157, Section 332) extended the loan repayment program to cover non-Federal as well as Federal loans and shifted the responsibility for designating HMSAs from the States to the Secretary of DHEW. The 1971 legislation added podiatrists, pharmacists, and veterinarians to the list of eligible practitioners. The value of the shortage ratio for each of the professional groups was established at approximately 150 percent of the national mean population-to-active practitioner ratio for that group (except for physicians, where 200 percent of the national mean was used). Using these cut-off points, about two-thirds of all U.S. counties were designated physician shortage areas and about one-half were designated dentist shortage areas.

A list of "Critical Health Manpower Shortage Areas" (CHMSAs) was compiled following the passage of the Emergency Health Personnel Amendments of 1972 (Public Law 92-585). A population-to-primary care physician ratio of 4,000:1 was used to identify either county or subcounty areas as CHMSAs. The list was used to place National Health Service Corps (NHSC) personnel from 1974 to 1978.<sup>3</sup>

In 1976, Congress directed the DHEW (Public Law 94-484) to establish new criteria for designating HMSAs that would:

- . permit designation of urban as well as rural areas;

<sup>1</sup>The four indicators used to determine MUAs are the infant mortality rate, the percent of the population 65 and older, the percent of the population living in poverty, and the population-to-primary care physician ratio.

<sup>2</sup>The population-to-practitioner ratios chosen as shortage levels for purposes of loan cancellation were 1,500:1 for physicians, 3,000:1 for dentists, and 15,000:1 for optometrists. Special consideration was given to county or subcounty areas with inaccessible medical services, elderly or incapacitated practitioners, and particular local health problems.

<sup>3</sup>See ch. 13 for a description of the NHSC program.

### ***Box 11-A—HMSA Designation Process***

Requests for HMSA designation may be submitted to DHHS's Office of Shortage Designation by any individual, project, or agency. Copies of the requests for designation are then forwarded to local and State health planning agencies, State Governors, State health departments, and appropriate professional associations for review and comment. Following the comment period, the Office of Shortage Designation completes its evaluation of the request to determine if it satisfies the criteria for designation. Applicants are informed of the results of the evaluation by letter.

A record of all the designations made since 1978 is contained in a computerized file, the Shortage Area Data Base. This file is updated regularly to account for new designations, dedesignations, and changes in degree of shortage. By law, the list of HMSAs must be reviewed annually. Each year, DHHS sends the States the data it has on every county in the State and every designated primary care HMSA for the States to review. The States are notified that all primary care HMSAs that are 3 years old or older will be redesignated unless the States supply updated information that warrants their continued designation (341). The most recent comprehensive review was the 1988-89 annual review, which emphasized the assessment of those primary care HMSA designations made or most recently updated during 1985. Because very few resources are currently tied to dental and psychiatric HMSAs, these designations are updated less frequently than primary care HMSAs—usually on a case-by-case basis when a dentist or a psychiatrist is being placed (341).

DHHS periodically publishes lists of primary care HMSAs by State in the Federal Register. The most recent list was published in November 1987 (52 FR 43992).

- . broaden the concept of shortage to include indicators of a need for health services such as infant mortality, health status, and access to health services;
- permit population groups and facilities experiencing health personnel shortages to be designated; and
- . establish priorities for assigning personnel to areas, population groups, and facilities with high needs (682).

The new criteria and designation, which replaced CHMSAs, were published as final regulations in November 1980 (45 FR 75996-76010). They included separate criteria for each of seven types of health manpower: primary care physicians, dentists, psychiatrists, vision care providers, podiatrists, pharmacists, and veterinarians. HMSAs were further categorized according to their degree of provider shortage.

The 1980 HMSA designation criteria are still used, but HMSAs are currently being designated for only three types of health professionals: primary care physicians, dentists, and psychiatrists.<sup>4</sup> Under the current regulations, HMSAs can be defined as: 1) urban or rural geographic areas, 2) population

groups, or 3) public or nonprofit private facilities. The primary criterion for HMSA designation is still the population-to-practitioner ratio. The responsibility for designations rests in the Health Resources and Services Administration's (HRSA's) Office of Shortage Designation, within the Department of Health and Human Services (DHHS).<sup>5</sup> Box 11-A describes the HMSA designation process.

#### **Current Designation Criteria**

**Primary Care HMSAs**—Primary care physicians are defined for designation purposes to 'include family and general practitioners, general pediatricians, obstetricians and gynecologists, and' general internists. A **geographic area** may be designated as having a shortage of primary medical care personnel if it meets the following criteria:

- it is a 'rational' area for the delivery of primary medical care services;
- it has a population-to-primary care physician ratio of at least 3,500:1 (3,000:1 if the area has 'unusually high need' for primary care services or 'insufficient capacity' of existing primary care providers); and
- primary medical care manpower in contiguous areas are overutilized, excessively distant, or

<sup>4</sup>Because of the lack of resources and resulting low designation activity, HMSAs for vision care providers, podiatrists, pharmacists, and veterinarians are no longer routinely designated or updated. Designation of nursing shortage areas is accomplished under a separate legislative authority (Public Health Service Act).

<sup>5</sup>The Department of Health, Education, and Welfare was renamed the Department of Health and Human Services in May 1980.

otherwise inaccessible to the population of the area under consideration (45 FR 76001).

An area qualifying as “rational” for the delivery of primary medical care services need not conform to county boundaries; it may be part or all of a single county, two or more counties, or an urban neighborhood. In some cases a rational service area may extend across State as well as county boundaries. Although service area size may vary due to differences in population densities, HMSA criteria generally require the population centers of counties or contiguous counties seeking designation to be within 30 minutes travel time of each other. Although the specific definition of a rational service area is left up to the local applicant, Federal officials consider such factors as compactness, roads, natural barriers, sociodemographic and language barriers, and other isolating features when reviewing applications for designation (682).

Primary care practitioner counts include all non-Federal doctors of medicine (MDs) and doctors of osteopathy (DOs)<sup>6</sup> providing primary care in a service area and contiguous areas. The number of full-time-equivalent (FTE) primary care providers is computed to take into consideration the amount of time that is spent providing direct patient care (as opposed to administration, research and teaching duties) and to weight the care provided by interns, residents, graduates with foreign medical degrees, and practitioners who are semi-retired (45 FR 76001).

An area with a population-to-primary care physician ratio greater than 3,500:1<sup>7</sup> automatically qualifies for HMSA designation; an area with a ratio less than 3,000:1 is automatically disqualified. Within that range, the area may qualify if unusually high-needs criteria (e.g., infant mortality and poverty rates) or insufficient-capacity criteria (e.g., average waiting times for appointment and average waiting times at site of care) are sufficiently great to warrant the designation. (See table 11-1 for a list of the high-needs and insufficient-capacity criteria.)

Primary care HMSA priority groupings (also called “degree of shortage groupings” were devel-

oped to prioritize HMSAs so that scarce resources could be targeted to areas of highest need. Qualifying HMSAs are separated into four groups according to population-to-primary care physician ratios and indicators of high needs or insufficient capacity (table 11-2). The most critical shortage areas (group 1 HMSAs) are those areas that have no physicians or have a population-to-physician ratio greater than 5,000:1 and an indication of high needs or insufficient capacity.

*Specific population groups* within geographic areas may be designated as primary care HMSAs if they meet the following criteria:

- the area in which the population resides is rational for the delivery of primary medical care services;
- access barriers (e.g., language differences) prevent the population group from using the area’s existing primary medical care providers; and
- the ratio of the number of persons in the population group to the number of primary care physicians serving the group is at least 3,000:1 (45 FR 76002).

Eligible population groups might include those with incomes below the poverty level, those eligible for Medicaid, medically indigent populations (defined as poverty population minus Medicaid eligibles), migrant workers and their families, native Americans, homeless populations, and other populations isolated as a result of language, cultural barriers, or handicaps. Population group designations differ from geographic area designations in that physicians not serving the specific population group are excluded from physician counts (e.g., physicians not serving Medicaid patients are not counted in the designations of Medicaid eligibles). Population group designations are made for partial-county areas, but not for whole counties.

*Public or nonprofit private medical facilities* may be designated as primary care HMSAs if they serve designated areas or population groups and have insufficient capacity to do so. Separate criteria are used for designation of Federal or State correctional

<sup>6</sup>National Health Service Corps (NHSC) commissioned corps and obligated personnel are not included in physician Counts. NHSC providers are counted if they decide to continue practicing in the area following completion of their obligated period of service. This presumably could cause the area to be redesignated.

<sup>7</sup>The current criterion of a 3,500:1 population-to-physician ratio was chosen based on 1974 data because it represented a level approximately 50 percent worse than the median county level and identified those counties that fell into the bottom quartile of population-to-physician ratios (682).

**Table 11-1—High Needs and Insufficient Capacity Criteria for Primary Care, Dental, and Psychiatric Health Manpower Shortage Areas (HMSAs)**

Type of criteria	Primary care HMSAs	Dental HMSAs	Psychiatric HMSAs
Unusually high needs criteria	<p>Must meet at least one of the following</p> <ol style="list-style-type: none"> <li>1. <u>Fertility rates</u> more than 100 births/year per 1,000 women aged 15-44</li> <li>2. <u>Infant mortality rate</u> more than 20 infant deaths per 1,000 live births</li> <li>3. <u>Poverty rate</u> more than 20%</li> </ol>	<p>Must meet at least one of the following</p> <ol style="list-style-type: none"> <li>1. <u>Poverty rate</u> more than 20%</li> <li>2. <u>Majority</u> of the population does not have a fluoridated water supply</li> </ol>	<p>Must meet at least two of the following:</p> <ol style="list-style-type: none"> <li>1. <u>Poverty rate</u> more than 20%</li> <li>2. <u>Youth dependency ratio</u> (ratio of population under 18 to 18-64) greater than 60%</li> <li>3. <u>Aged dependency ratio</u> (ratio of population 65+ to 18-64) greater than 60%</li> <li>4. High prevalence of alcoholism</li> </ol>
Insufficient capacity criteria	<p>Must meet at least two of the following:</p> <ol style="list-style-type: none"> <li>1. More than 8,000 visits/yr per physician</li> <li>2. Unusually long waits for appointments</li> <li>3. Excessive average waiting times at primary care providers</li> <li>4. Excessive use of emergency facilities for routine care</li> <li>5. Two-thirds or more of area's physicians not accepting new patients</li> <li>6. Low annual office visit rate</li> </ol>	<p>Must meet at least two of the following:</p> <ol style="list-style-type: none"> <li>1. More than 5,000 visits/year per FTE dentist serving the area</li> <li>2. Unusually long waits for appointments</li> <li>3. Two-thirds or more of area's dentists do not accept new patients</li> </ol>	

SOURCE: Federal Register, vol. 45, pp. 71996-76010

Table 11-2—Criteria for Primary Care Health Manpower Shortage Area (HMSA) Priority Groups

Group	Criteria if high needs are not indicated	Criteria if high needs are indicated
1	No physicians	No physicians or population greater than 5,000 per physician
2	Population greater than 5,000 per physician	Population between 4,000 and 5,000 per physician
3	Population between 4,000 and 5,000 per physician	Population between 3,500 and 4,000 per physician
4	Population between 3,500 and 4,000 per physician	Population between 3,000 and 3,500 per physician

\*Areas are considered as having "high needs" for primary health care services if they meet at least one of the "unusually high needs" indicators or at least two of the "insufficient capacity" indicators.

SOURCE: *Federal Register*, vol. 45, p. 76002.

facilities. Like population group designations, facility designations are made only for partial counties.

**Dental and Psychiatric HMSAs--Criteria for the** designation of geographic areas, population groups, and facilities as dental and psychiatric HMSAs resemble those for primary care HMSAs, with a few important differences (see table 11-3). The minimum population-to-practitioner ratios, for example, are 5,000:1 and 30,000:1 for dentists<sup>8</sup> and psychiatrists, respectively. Unusually high-needs and insufficient-capacity criteria for these types of HMSAs also differ from the primary care HMSA criteria (see table n-1). Psychiatric facility designations maybe made for State and county mental hospitals as well as for Federal and State correctional facilities.

### **Medically Underserved Areas/Populations**

#### **History**

MUAs were authorized in 1973 by the Health Maintenance Organization (HMO) Act (Public Law 93-222). HMOs drawing 30 percent or more of their membership from MUAs were to receive preference for loans for initial operational costs.<sup>9</sup> The HMO legislation required the Secretary of DHEW to develop explicit criteria for the designation of medical underservice. To do so, DHEW funded a study that developed the Index of Medical Underservice (IMU) as the mechanism for determining MUA status. Of the various indices of underservice considered by the study panel for inclusion in the IMU, measures of poverty, agedness of the popula-

tion, infant mortality, and health personnel were selected because data for these factors were nationally available and reliable (329). DHHS published the IMU criteria for use in designating and prioritizing MUAs in 1975 and 1976 (40 FR 40315 and 41 FR 45718).

Public Law 94-63 authorized grants to be made to projects to plan, develop, or operate community health centers (CHCs) that serve in designated MUAs. In 1978, to eliminate the need to apply for two separate designations pertaining to medical underservice, areas designated as primary care HMSAs were granted MUA designation status for the purpose of meeting CHC funding criteria. In 1980, these policies were repealed because HMSA designations were considered to be unstable and overly dependent on small changes in numbers of physicians or local population characteristics (46 FR 23817). However, the assumed greater "stability" of MUA designations cannot be assessed, since these designations have never been reviewed on a regular basis.

Federal legislation passed in Public Law 99-280 enabled State governors to request designation for Medically Underserved Populations (MUPs) that did not meet MUA criteria. The first two State requests for MUP designations were published in the *Federal Register* in March 1987 (52 FR 7215). The extension of the designation to specific population groups was prompted by situations such as that described by the Governor of Oregon in 1988, in

<sup>8</sup>Unlike the calculation of FTE primary care physicians, the calculation of FTE dentists reflects productivity differences among dental practices based on the age of the dentist, the number of auxiliaries employed, and the number of hours worked per week.

<sup>9</sup>No new loans have been made or guaranteed under this provision since September 1986 (42 U.S.C. 300(e)).

Table 1-3—Basic Designation Criteria for Primary Care, Dental, and Psychiatric Health Manpower Shortage Areas (HMSAs)<sup>a</sup>

Type or designation/criteria	Primary care HMSAs	Dental HMSAs	Psychiatric HMSAs
<b>Geographic area</b>			
Rational area for service delivery	Within 30 minutes travel time and not part of another service area	Within 40 minutes travel time and not part of another service area	Within 40 minutes travel time and not part of another service area
Minimum population-to-practitioner ratio	Minimum 3,000:1 with unusually high needs or insufficient capacity	Minimum 5,000:1 (4,000:1 if unusually high needs or insufficient capacity)	Minimum 30,000:1 (20,000:1 if unusually high needs)
Health personnel in contiguous areas are inaccessible	More than 30 minutes travel time away or ratio greater than 2,000:1	More than 40 minutes travel time away or ratio greater than 3,000:1	More than 50 minutes travel time away or ratio greater than 20,000:1
<b>Population group</b>			
Rational area for service delivery	Within 30 minutes travel time	Within 40 minutes travel time	(not required)
Access barriers prevent group from using area's existing providers	Poverty, language/culture, lack of physicians accepting Medicaid	Poverty, language/culture, lack of dentists accepting Medicaid	Poverty, language/culture, lack of psychiatrists accepting Medicaid
Minimum ratio of population group-to-practitioners serving the population group	Minimum 3,000:1	Minimum 4,000:1	Minimum 30,000:1 (20,000:1 if unusually high needs)
<b>Facility</b>			
Public or nonprofit private facilities	Facility serves designated areas or population groups and has insufficient capacity to do so. Separate criteria are defined for Federal or State correctional facilities.	Same as primary care HMSA	Same as primary care HMSA, but separate criteria for designation also exist for State and county mental hospitals

<sup>a</sup>Information on criteria specific to the type of practitioner designation is presented under the SOURCE: Federal Register, vol. 45, pp. 75996-76010.



which a community's health access problems had been exacerbated by an economic depression following a decline in the timber and wood products industry (53 FR 10435).

In August 1989, the responsibility for MUA/P designations was moved within the Bureau of Health Care Delivery and Assistance from the Division of Primary Care Services, where grants to CHCs are made, to the Office of Shortage Designation, so that HMSA and MUA designations would be handled in the same office. Box 11-B describes the MUA/P designation process.

#### Current Designation Criteria

**MUA Designations--MUAs** are identified based on their IMU score, which considers the following four factors:

1. infant mortality rate,
2. proportion of the population over 65,
3. proportion of the population with incomes below the poverty level, and
4. ratio of population-to-primary care providers.

The IMU score for an area is the sum of weighted values for each indicator (41 FR 45718). (See table 11-4 for two hypothetical examples.) Values of the index range from 0 to 100, with lower scores indicating increasing medical underservice. The 1975 median IMU score of all U.S. counties was 62, and that value was used as the cut-off point for underserved areas. The geographic boundaries of MUAs may be county lines, or they may be subcounty boundaries such as townships and census tracts.

**MUP Designations--MUP** criteria have not yet been published. In general, MUP designations are based on the application of the IMU and an evaluation of the unusual local conditions and access barriers that led to the recommendation for designation in spite of failure to meet the IMU cutoff (728).

#### Current Status of Federal Designations

##### HMSAs

In 1983, HRSA projected that the number of counties that were wholly or partially designated as primary care HMSAs would decline from 1,501 in 1982 to 810 in 1994 (683). It also predicted that the number of primary care physicians needed to bring areas below the level of 3,500 residents per physician would decrease from 5,076 to 3,204 during the

#### Box 11-B—MUA/P Designation Process

*The original* set of MUA designations was made by HRSA in 1976, based on a list of all U.S. counties and subcounty areas (including individual census tracts) that met the designation criteria (see text). States did not have to request designations. The original list did not consider whether designated areas were actually rational service areas (728).

The current MUA designation process requires that State agencies provide the Office of Shortage Designation with data on the four IMU components. Where exact data are unavailable for small geographic areas and population groups, extrapolation methods may be used. MUPs may be requested by State governors or local officials who submit data on the IMU indicators as well as a description of the unusual local conditions that affect the population group. After undergoing an initial staff review, MUA and MUP requests are listed in the Federal Register to provide interested parties with an opportunity to comment. DHHS then makes a final decision of whether to designate or deny the request and informs the applicant of the results by letter.

12-year period. These predictions were based on the assumption that an increased supply of physicians would result in corresponding increases in underserved areas.

Despite the predictions, the total number of designated HMSAs has actually increased since 1982. As of December 31, 1988, there were 1,944 primary care HMSAs (30 percent more than the 1982 figure), 793 dental HMSAs, and 592 psychiatric HMSAs (table 11-5) (665). Of the primary care HMSAs, 67 percent (1,307) were located in rural (nonmetropolitan) areas. Of these rural HMSAs, 63 percent (821) were group 1 or 2 HMSAs and 37 percent (486) were group 3 or 4 HMSAs (665).

Although the number of people living in rural primary care HMSAs is slightly smaller than the number living in urban primary care HMSAs (16.5 million v. 17.4 million), this population is a disproportionately large percentage of all rural residents. In 1988, 29 percent of the U.S. rural population lived in designated primary care HMSAs, compared with 9 percent of the urban population (table 11-5).

Table n-4-Application of the Index of Medical Underservice (IMU): Two Hypothetical Examples

IMU criteria	County 1		County 2	
	percent/ratio	weight <sup>a</sup>	percent/ratio	weight <sup>a</sup>
Infant mortality. . . . .	11.40	24.8	17.30	19.5
Population 65+. . . . .	8.60	19.9	14.10	18.7
Population below poverty. . . . .	7.30	21.9	37.50	3.4
Primary care physicians per 1,000 population. . . . .	.65	20.7	.15	2.8
IMU score. . . . .		87.3		44.4
-----				
Qualifies as an MUA (IMU score < 62). . . . .		No		Yes

<sup>a</sup>Weights that apply to the associated percent as listed in the Federal Register (41 FR 45718).  
SOURCE: Office of Technology Assessment, 1990.

Both the number of dental and psychiatric HMSAs and the population living in those areas were higher for rural than for urban HMSAs. The disparity is especially apparent for psychiatric HMSAs; in December 1988, 61 percent of the rural population lived in designated psychiatric HMSAs (table 11-5).

Both the total number of primary care HMSAs and the percentage of primary care HMSAs that are in rural areas have been quite stable during the past decade (table 11-5). However, there has been some instability among individually designated areas (i.e., some areas have been newly designated and others redesignated). Figure n-1 illustrates the whole and partial counties that qualified as rural primary care HMSAs in 1987.

Table 11-6 shows the number of urban and rural primary care HMSAs, the total population in primary care HMSAs, and the number of physicians needed to remove designations, by region and State, as of September 1988. The South led the four regions with both the largest total number of primary care HMSA designations (849) and the largest number of nonmetropolitan primary care HMSA designations (623) (666). One-half of the U.S. population in rural HMSAs were living in the South.

Population group designations accounted for 12 percent of primary care HMSAs as of December 31, 1988 (665); 22 percent of the urban primary care HMSAs and 8 percent of the rural primary care HMSAs were for population groups (667). In the future, the Office of Shortage Designations expects to see an increasing number of population group

designation requests, especially for Medicaid eligibles and the medically indigent (340).

To the extent that factors such as the lack of incentives and the lack of funds discourage areas from applying for Federal designations that would otherwise qualify, the number of designated HMSAs and MUAs underestimates the actual level of shortage. In 1986, for example, there were 95 nonmetro counties with a physician shortage (population-to-physician ratio greater than 3500:1)<sup>10</sup> that were not designated as HMSAs, even though they would presumably qualify (511). These counties were concentrated in the South and North Central regions. Also, since this analysis used county-based data, it did not capture partial-county areas that may have qualified for designation.<sup>11</sup>

#### MUA/Ps

In 1981, the most recent year for which comprehensive data are available, there were 2,440 designated MUAs (both whole- and partial-county) (511). Of these, 1,328 whole-county MUAs and 567 partial-county MUAs were in rural areas (511) (see figure 11-2). The highest proportion of whole-county MUAs were located in the South, and the highest proportion of partial-county MUAs were located in the North Central region (511).

These data on MUAs are not only outdated but are probably inaccurate, due to the fact that the initial MUA designations did not assess whether identified subcounty areas met the "rational service area" criterion (see box 11-B). Thus, some designated areas may not actually be underserved. Updated

<sup>10</sup>These computations are based on the presence of doctors of medicine only and do not consider the Presence of doctors of osteopathy.

<sup>11</sup>In 1988, 49 percent of all rural HMSAs were partial-county designations (667).

**Table 11-5--Primary Care, Dental, and Psychiatric Health Manpower Shortage Areas (HMSAs): Number, Population, and Number of Providers Needed To Remove Designations, 1979, 1985, and 1988**

HMSA type	December 31, 1979			June 30, 1985			December 31, 1988			
	Number of designated areas	Population in designated areas	Number of providers needed to remove designations <sup>a</sup>	Number of designated areas	Population in designated areas	Number of providers needed to remove designations <sup>a</sup>	Number of designated areas	Population in designated areas	Percentage of U.S. population <sup>c</sup>	Number of providers needed to remove designations <sup>b</sup>
Primary care (total) . . . . .	1,921	41,884,430	5,835	1,843	33,690,635	4,331	1,944	33,658,814	13.9	4,104
Nonmetro. . . . .	1,350	19,010,058	2,587	1,314	17,661,218	2,044	1,307	16,477,146	29.0	<b>1,794</b>
Metro . . . . .	571	22,874,372	3,248	529	16,029,417	2,207	837	17,381,668	<b>9.2</b>	2,310
Dental (total) . . . . .	916	20,952,631	2,442	777	16,814,930	1,715	793	18,832,332	6.5	<b>1,729</b>
Nonmetro. . . . .	735	11,711,460	1,459	561	8,975,971	835	574	8,696,800	<b>15.7</b>	690
Metro . . . . .	181	9,241,151	983	196	7,638,959	880	219	7,142,532	3.6	839
Psychiatry (total) . . . . .	218	19,224,017	-- <sup>d</sup>	473	42,473,600	2,314	592	49,131,309	20.1	1,810
Nonmetro. . . . .	160	-- <sup>d</sup>	-- <sup>d</sup>	317	-- <sup>c</sup>	-- <sup>c</sup>	396	34,006,866	61.0	1,137
Metro . . . . .	<b>58</b>	-- <sup>d</sup>	-- <sup>d</sup>	156	-- <sup>c</sup>	-- <sup>c</sup>	196	15,124,443	8.0	673

<sup>a</sup>These figures include all HMSAs (priority groups 1-4), including HMSAs in the U.S. possessions.

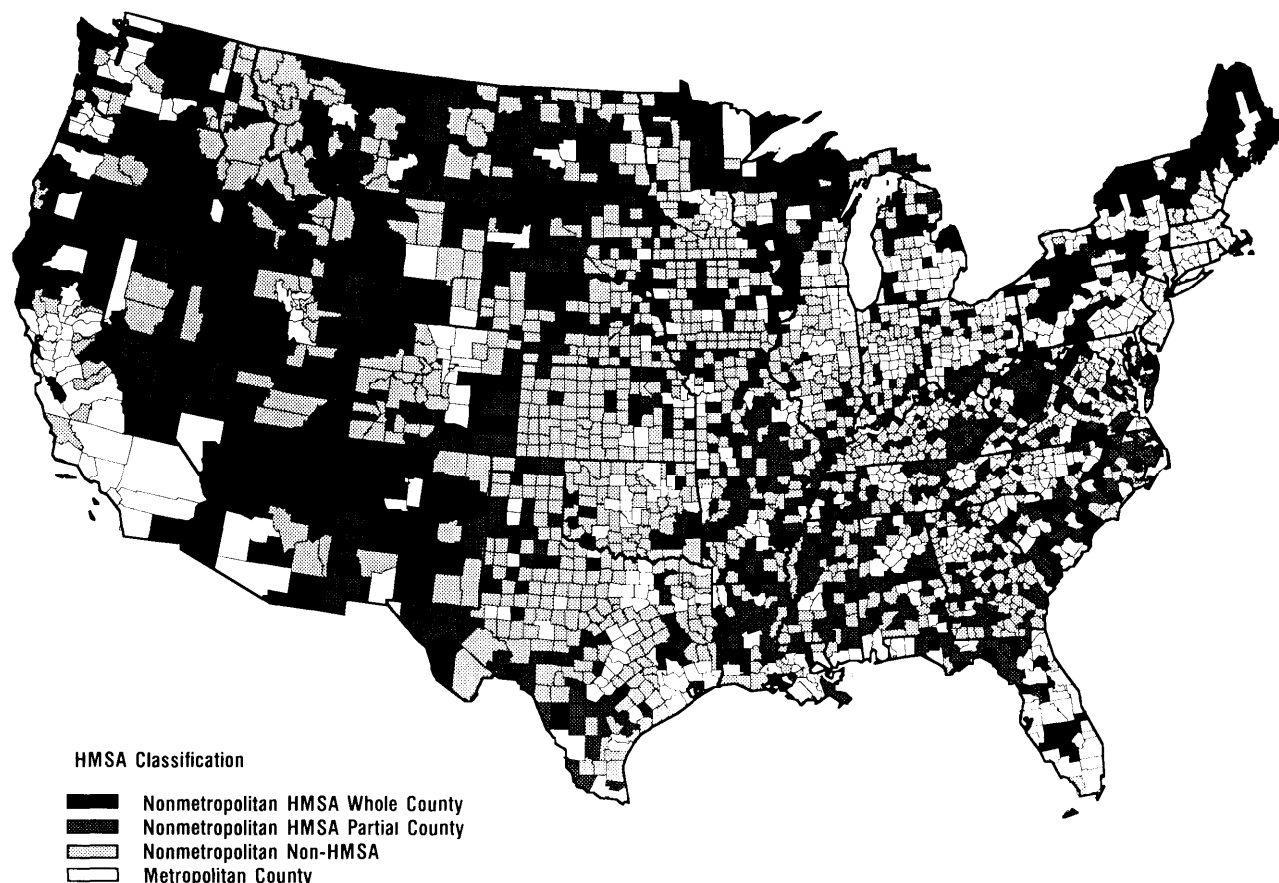
<sup>b</sup>The number of additional providers needed to redesignate all HMSAs, as follows: For primary care HMSAs, the number of additional primary care physicians (general/family practice, general internal medicine, general pediatrics, obstetrics/gynecology) required to achieve a population-to-primary care physician ratio of 3,500:1 (3,000:1 where high needs are indicated); for dental HMSAs, the number of additional dentists required to achieve a population-to-dentist ratio of 5,000:1 (4,000:1 where high needs are indicated); for psychiatry HMSAs, the number of additional psychiatrists required to achieve a population-to-psychiatrist ratio of 30,000:1 (20,000:1 where high needs are indicated).

<sup>c</sup>Based on 1987 population estimates.

<sup>d</sup>Data not available.

SOURCES: U.S. Department of Health, Education and Welfare, Health Resources Administration, Bureau of Health Professions, Division of Health Professions Analysis, "Selected Statistics on Health Manpower Shortage Areas as of December 31, 1980," Report No. 81-11, Rockville, MD, Feb. 26, 1981; U.S. Department of Health and Human Services, Health Resources and Services Administration, Bureau of Health Professions, Office of Data Analysis and Management, "Selected Statistics on Health Manpower Shortage Areas as of June 30, 1985," Rockville, MD; U.S. Department of Health and Human Services, Health Resources and Services Administration, Bureau of Health Care Delivery and Assistance, "Selected Statistics on Health Manpower Shortage Areas as of December 31, 1988," Rockville, MD; U.S. Department of Health and Human Services, Health Resources and Services Administration, Bureau of Health Professions, Office of Data Analysis and Management, Rockville, MD, unpublished data from the Area Resource File provided in 1989 and 1990.

Figure 11-1--Health Manpower Shortage Areas (HMSAs), 1987 (by nonmetropolitan county, 1986)



SOURCE: T.C. Ricketts, Rural Health Research Center, University of North Carolina, Chapel Hill, NC, under contract to the Office of Technology Assessment, 1989. Data from the Area Resource File, Bureau of Health Care Delivery and Assistance, Health Resources and Services Administration, U.S. Department of Health and Human Services.

figures cannot be determined in any case, because the existing MUA database is configured in such a way that subcounty MUAs may be double-counted. As of June 1990, a total of 13 MUP designations had been made (728).

## USES OF DESIGNATIONS

### *Federal Uses*

#### National Health Service Corps

The principal Federal program using HMSA designations is the National Health Service Corps (NHSC), which places both volunteer and obligated health care practitioners (mostly physicians) in

HMSAs (see ch. 13). As there are many more HMSAs than NHSC scholarship obligated providers, loan repayment participants, and nonobligated providers (i.e., volunteers), a national vacancy list is prepared by the Federal Division of NHSC<sup>12</sup> that includes the most needy of the designated shortage areas.

To be included on this vacancy list, a site must be part of a system of care, be located in a currently designated HMSA, and need at least one FTE practitioner before it would be redesignated (664).<sup>13</sup> The degree of shortage (priority grouping) of the HMSA is one of seven criteria that are used to

<sup>12</sup>The Federal Division of NHSC is located in HRSA's Bureau of Health Care Delivery and Assistance (see app. D).

<sup>13</sup>Rural primary care HMSAs needing less than one FTE practitioner before dedesignation would occur may be considered for the assignment of nurse practitioners, other midlevel practitioners, and in some cases for the placement of a physician (664).

Table 11-6—Characteristics of Metropolitan and Nonmetropolitan Primary Care Health Manpower Shortage Areas (HMSAs), by Region and State, Sept. 30, 1988

Geographic area	Number of primary care HMSAs <sup>a</sup>		Total population in HMSAs		Number of physicians needed to remove designation	
	Metro	Nonmetro	Metro	Nonmetro	Metro	Nonmetro
United States <sup>b</sup> . . . . .	635	1,280	17,173,563	14,183,882	2305	1570
Northeast . . . . .	147	84	4,509,819	741,387	412	77
New England . . . . .	52	24	951,162	100,789	120	14
Connecticut . . . . .	10	0	130,424	0	22	0
Maine . . . . .	6	17	40,178	62,446	5	9
Massachusetts . . . . .	24	1	583,847	5,306	73	0
New Hampshire . . . . .	2	1	33,618	2,616	5	1
Rhode Island . . . . .	8	0	146,095	0	14	0
Vermont . . . . .	2	5	17,000	30,421	1	4
Middle Atlantic . . . . .	95	60	3,558,657	640,598	292	63
New Jersey . . . . .	12	0	736,677	0	36	0
New York . . . . .	46	31	1,766,304	325,671	163	31
Pennsylvania . . . . .	37	29	1,055,676	314,927	93	32
Midwest . . . . .	122	319	3,907,546	3,730,108	577	454
East North Central . . . . .	91	139	3,387,761	2,118,938	527	297
Illinois . . . . .	27	24	1,634,575	342,253	268	25
Indiana . . . . .	10	27	249,650	392,380	40	42
Michigan . . . . .	14	34	657,229	471,648	101	44
Ohio . . . . .	29	27	592,254	610,626	80	44
Wisconsin . . . . .	11	27	254,053	302,031	38	31
West North Central . . . . .	31	180	519,785	1,611,170	50	157
Iowa . . . . .	6	17	76,783	218,021	7	16
Kansas . . . . .	2	14	11,499	132,193	0	7
Minnesota . . . . .	8	17	113,329	129,870	9	7
Missouri . . . . .	10	49	258,750	628,049	30	66
Nebraska . . . . .	2	21	23,449	149,437	2	13
North Dakota . . . . .	2	26	31,006	171,254	2	24
South Dakota . . . . .	1	36	4,969	182,346	0	24
South . . . . .	226	623	6,228,126	7,836,845	864	771
South Atlantic . . . . .	107	219	2,995,959	3,335,279	449	344
Delaware . . . . .	2	1	49,626	31,700	5	1
Florida . . . . .	35	32	1,027,893	392,995	180	55
Georgia . . . . .	21	53	731,901	628,434	109	66
Maryland . . . . .	8	5	274,757	72,169	37	5
North Carolina . . . . .	8	37	426,406	775,498	37	93
South Carolina . . . . .	15	29	264,723	465,648	43	34
Virginia . . . . .	10	27	112,372	469,809	14	38
West Virginia . . . . .	8	35	108,281	499,026	24	52
East South Central . . . . .	49	162	1,318,070	2,492,083	168	237
Alabama . . . . .	20	28	550,529	528,478	61	46
Kentucky . . . . .	5	43	131,501	517,723	23	70
Mississippi . . . . .	7	48	260,413	808,425	35	60
Tennessee . . . . .	17	43	375,627	637,457	49	61
West South Central . . . . .	70	242	1,914,097	2,009,483	247	190
Arkansas . . . . .	10	37	96,601	306,452	23	25
Louisiana . . . . .	19	31	405,468	713,318	55	61
Oklahoma . . . . .	8	16	170,813	92,673	25	11
Texas . . . . .	33	88	1,241,215	897,040	144	93

(continued on next page)

**Table 11-6-Characteristics of Metropolitan and Nonmetropolitan Primary Care Health Manpower Shortage Areas (HMSAs), by Region and State, Sept. 30, 1988-Continued**

Geographic area	Number of primary care HMSAs <sup>a</sup>		Total population in HMSAs		Number of physicians needed to remove designation	
	Metro	Nonmetro	Metro	Nonmetro	Metro	Nonmetro
West.....	140	254	2,528,072	1,875,542	452	268
Mountain.....	40	167	350,255	1,283,060	87	190
Arizona.....	10	23	109,532	193,923	26	28
Colorado.....	8	19	67,787	83,410	9	12
Idaho.....	1	32	1,450	239,144	1	42
Montana.....	0	29	0	141,366	0	20
Nevada.....	12	8	59,069	39,159	19	6
New Mexico.....	6	27	96,352	351,362	29	57
Utah.....	2	15	14,680	130,705	3	13
Wyoming.....	1	14	1,385	103,991	0	12
Pacific.....	100	87	2,177,817	592,482	365	78
Alaska.....	3	11	42,855	61,914	9	15
California.....	65	27	1,806,804	230,455	284	16
Hawaii.....	2	0	18,760	0	6	0
Oregon.....	20	31	161,303	113,379	31	23
Washington.....	10	18	148,095	186,734	35	24

<sup>a</sup>Includes geographic, population, and facility designations.

<sup>b</sup>This is the number of additional primary care physicians needed to bring the population-to-primary care physician ratio below 3,500:1 (3,000:1 where high needs are indicated).

<sup>c</sup>These figures do not include HMSAs in the District of Columbia or in the U.S. Possessions.

SOURCE: U.S. Department of Health and Human Services, Health Resources and Services Administration, Bureau of Health Care Delivery and Assistance, Office of Shortage Designation, Rockville, MD, unpublished statistics on Health Manpower Shortages as of September 1988, provided to OTA in 1989.

determine a site's ranking on the vacancy list. The seven criteria are:

1. infant mortality rate,
2. percent of population with incomes below 200 percent of poverty level,
3. HMSA degree-of-shortage grouping,
4. percent minority population served by the site or residing in the county where the site is located,
5. percent special population (including homeless, migrant and seasonal farmworkers, perinatal, persons with human immunodeficiency virus and acquired immunodeficiency syndrome (AIDS), substance abusers, and elderly persons) served by the site,
6. vacancies as a percent of total budgeted staff, and
7. degree of rurality (664).

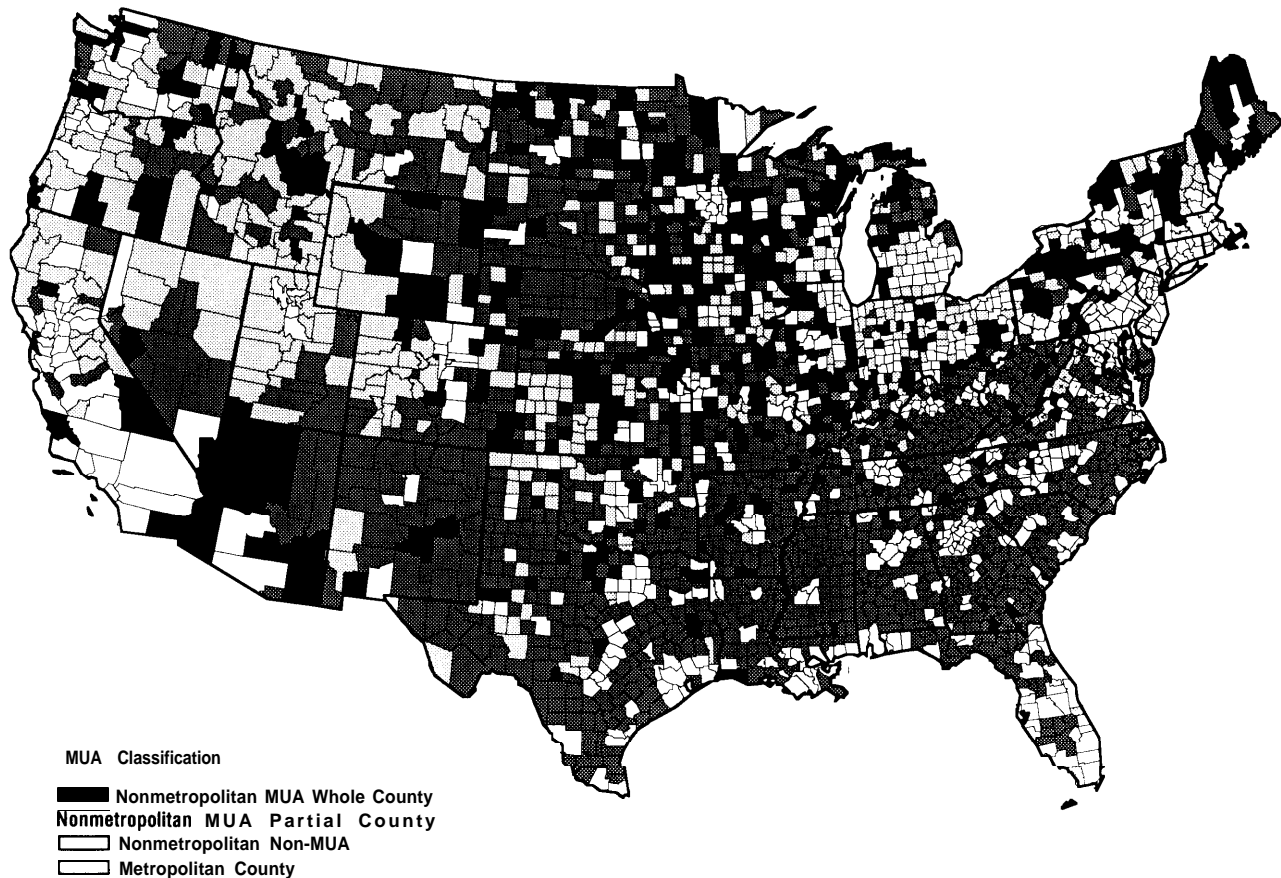
A point system (O-4, with 4 indicating greatest need) is applied to each of the seven criteria, with the total points indicating a site's relative need and determining its ranking on the vacancy list (664).

There is a separate vacancy list for each primary care specialty and for emergency medicine (270). The opportunities vary by specialty. Family practitioners, for example, may get lists of relatively isolated rural sites, while other primary care specialists may get lists of placements in more populated areas (716). Placements of obstetricians are made only in areas where an "established and well-functioning system of care with appropriate cross-coverage" exists (716).

The highest priority sites on each of the vacancy lists become the "HMSA Placement Opportunity List" (HPOL)<sup>14</sup> for that specialty. The number of sites on each specialty HPOL corresponds exactly to the number of graduating scholarship recipients available for placement in a given year. In 1991, there will be 74 obligated professionals available for placement (716). The obligated NHSC participants select placements from the list and arrange interviews. Negotiation for a placement occurs between the NHSC participant and the community or organization that has the vacancy.

<sup>14</sup>The HPOL was first used in 1983 following congressional hearings suggesting that DHHS target NHSC resources to areas of greatest need (270).

Figure n-2-Medically Underserved Areas (MUAs), 1981 (by nonmetropolitan county, 1986)



SOURCE: T.C. Ricketts, Rural Health Research Center, University of North Carolina, Chapel Hill, NC, under contract to the Office of Technology Assessment, 1989. Data from the Area Resource File, Bureau of Health Care Delivery and Assistance, Health Resources and Services Administration, U.S. Department of Health and Human Services.

Following the determination of the HPOL, a loan repayment list is created from the sites remaining on the vacancy list. The number of sites on the loan repayment list is based on estimates of the number of providers the Division of NHSC hopes to recruit under the loan repayment program (the goal for 1991 is 900 providers) (716). Finally, a volunteer vacancy list is determined that includes all the sites on the vacancy lists that are not included on the HPOL or loan repayment lists. (Volunteers may, of course, practice at a higher-priority site if they choose.)

#### Other Programs

MUA/P designations have primarily been used to target Federal resources to CHCs and related programs (e.g., Migrant Health Centers (MHCs)) (Public Law 94-63). However, existing data<sup>15</sup> suggest

that only one-fourth of nonmetro whole-county MUAs have a federally supported CHC or MHC, and the great majority of these are in the South (table 11-7) (511). Only 17 percent of nonmetro partial-county MUAs have a CHC or MHC.

Although HMSA and MUA designations were designed to meet the needs of the NHSC and CHC programs, they have since been used to implement a number of other Federal programs as well. Those linked to HMSA designations include the provision of funds for health professions training, the Area Health Education Center (AHEC) program, and the Medicare physician bonus payment program (see ch. 13 for program descriptions). Both HMSAs and MUAs are used to target resources under the Rural Health Clinics Act (Public Law 95-210). Providers

<sup>15</sup>Based on 1981 MUA data and 1989 CHC/MHC data.

Table 11-7--Medically Underserved Areas (MUAs) With Federally Supported Health Centers, by Region, 1989<sup>a</sup>

Type of health center in MUA	Region	Metropolitan			Nonmetropolitan			Region totals	Facility totals
		Non-MUA	Whole-county MUA	Partial-county MUA	Non-MUA	Whole-county MUA	Partial-county MUA		
Community Health Center (CHC) only	Northeast	4	1	39	0	9	19	72	
	South	6	16	40	4	166	9	241	
	Midwest	3	1	27	4	37	23	95	
	West	0	0	16	8	28	8	60	468
Migrant Health Center (MHC) only	Northeast	5	0	3	1	0	1	10	
	South	1	6	5	1	28	6	47	
	Midwest	2	0	7	9	1	7	26	
	West	2	0	4	9	6	4	25	108
Both CHC and MHC	Northeast	2	0	10	0	1	0	13	
	South	1	7	15	1	47	2	73	
	Midwest	2	0	10	4	3	6	25	
	West	2	0	27	6	5	9	49	160
None	Northeast	26	1	26	22	5	42	122	
	South	34	82	116	68	654	76	1,030	
	Midwest	68	5	70	193	257	316	909	
	West	13	0	11	139	81	39	283	2,344
Totals		171	119	426	469	1,328	567		

<sup>a</sup>Centers data as of 1989; population as of 1986; MUAs as of 1981.

SOURCE: T.C. Ricketts, Rural Health Research Center, University of North Carolina, Chapel Hill, NC. Analysis of unpublished data (provided by the Health Resources and Services Administration) conducted under contract to the Office of Technology Assessment, 1989 and 1990.



Table 11-8—State Service and Shortage Areas Criteria, 1986

Criteria	Programs	States <sup>a</sup>
Health Manpower Shortage Area (HMSA) . . . . .	16	14
HMSA and/or Medically Underserved Area (MUA). . . . .	2	2
Modified HMSA. . . . .	5	4
Population-to-physician ratios <sup>c</sup> . . . . .	3	3
Community size <sup>d</sup> . . . . .	8	8
Anywhere in State <sup>e</sup> . . . . .	10	8
State criteria . . . . .	8	4
Other . . . . .	9	8
Total . . . . .	61	51

<sup>a</sup>States do not total 50 because multiple programs in the State use the same criteria. Eight States with programs have no criteria.

<sup>b</sup>Maryland, Maine, New Mexico, and North Carolina add their State and local health, mental health, and corrections institutions to a list of acceptable practice sites.

<sup>c</sup>County-wide population-to-physician ratios are used by three States: Kansas (3,000:1), Kentucky (4,500:1), and South Carolina (2,000:1).

<sup>d</sup>States with programs with placements according to community size are Alabama (5,000 Population maximum), Arkansas (8,000), Georgia (15,000), Illinois (35,000), Missouri (6,500), Mississippi (10,000), Oklahoma (7,500), and Texas (30,000).

<sup>e</sup>Alaska, Arizona, Kansas (primary care specialists), Massachusetts, Maryland (except Montgomery County), Washington, West Virginia, and Wisconsin.

<sup>f</sup>California, Illinois, New York, and Oregon.

SOURCE: U.S. Department of Health and Human Services, Health Resources and Services Administration, Bureau of Health Professions, Office of Data Analysis and Management, Compendium of State Health Professions Distribution Programs: 1986, DHHS Pub. No. HRP-0906964 (Washington, DC: U.S. Government Printing Office, 1986).

must be located in clinics in rural HMSAs or MUAs to qualify to receive cost-based reimbursement for Medicare and Medicaid services (see ch. 3). Most HMSA-linked resources are tied to the primary care HMSA designation.

### State Uses

Many States have adopted programs to promote the placement of health professionals in underserved areas (see ch. 12). Although some States have developed their own shortage area designation criteria, many States rely on Federal designations to identify areas and populations in need.

Of 113 State health professions distribution programs identified by the Federal Bureau of Health Professions in 1986, 61 used some type of shortage area criteria. About one-third of programs and States used the Federal HMSA criteria or slight modifications of them (table 11-8).

Three-fourths of the 45 respondents to a 1989 OTA survey of State HMSA/MUA activity (34 States) indicated that their State had health personnel distribution programs that used some type of

shortage area designation (either an HMSA, MUA, or State designation) (table 11-9).<sup>16</sup> HMSA designations were most frequently used to implement AHEC programs, service-contingent loans and scholarships, health professions school loan repayment programs, and preceptorship. State designations were most frequently used for service-contingent loans and scholarships, placement programs, and targeted primary care training opportunities.

## FEDERAL DESIGNATIONS: STATE ACTIVITY AND SATISFACTION

### HMSAs

#### Activity

Interest in obtaining HMSA designations has not declined substantially despite a decline in the number of available NHSC personnel. In fact, in OTA's survey the percentages of States indicating that the demand for Federal primary care HMSA designations had *increased* or *remained the same since 1985* were 71 and 82 percent for urban and rural areas, respectively (table n-10). States indicat-

<sup>16</sup>Ten respondents indicated that their States did not have any health personnel distribution programs using shortage area designations and one respondent answered "don't know."

Table 11-9—Presence of State Health Personnel Distribution Programs That Use Shortage Area Designations, 1989<sup>a</sup>

State distribution programs	Program present in State? <sup>b</sup>			Shortage designation used <sup>c</sup>		
	Y	N	NR	HMSA	MUA	State designation
Educational programs						
Area Health Education Centers . . . . .	21	15	9	11	2	3
Targeted primary care training opportunities (e.g., residencies) . . . . .	20	15	10	6	0	7
Seat purchases . . . . .	5	20	20	1	0	0
Preceptorship . . . . .	20	15	10	9	2	3
Other educational program . . . . .	2	15	28	1	0	0
Financial incentives during training						
Service-contingent loans and scholarships . . . . .	27	11	7	10	3	16
Other loans . . . . .	4	20	21	1	0	2
Other scholarships . . . . .	1	20	24	0	0	1
Other financial incentive . . . . .	1	15	29	1	0	0
Aid in practice						
Placement . . . . .	16	15	14	6	2	9
Guaranteed income . . . . .	2	21	22	0	0	0
Loans . . . . .	6	17	22	1	0	4
Health professions school loan repayment . . . . .	13	19	13	10	4	4
Malpractice subsidy . . . . .	5	20	20	1	1	2
Other aid in practice . . . . .	3	14	28	1	1	2
Other programs . . . . .	4	13	28	2	2	2

ABBREVIATIONS: Y = yes; N =no; NR= no response.

<sup>a</sup>Based on 45 States responding to OTA's survey of shortage and underserved areas (see app. D).

<sup>b</sup>Ten States reporting no State health personnel distribution programs, and one responding "don't know," were included as "no" for each specific program. Where States answered "yes" to some programs but left others blank, the blank responses were included in the "no response" column.

<sup>c</sup>HMSA, MUA, and State designations used for a particular program do not always add up to the number of States indicating that the program was present in their State. Some States use more than one designation criteria to implement programs, while other States did not indicate that any of the three criteria were used.

SOURCE: Office of Technology Assessment, 1990.

Table 11-10--Changes in Designation Activity for Metropolitan and Nonmetropolitan Primary Care HMSAs Since 1985 (as of 1989)<sup>a</sup>

	Number (percent) of States that had:			
	Increased activity	No change	Decreased activity	Don't know/does not apply
<b>Total of States:</b>				
Metro HMSAs . . . . .	12 (27%)	20 (44%)	11 (25%)	2 ( 4%)
Nonmetro HMSAs . . . . .	26 (58%)	11 (24%)	7 (16%)	1 ( 2%)
<b>Within regions:</b>				
<b>Northeast (7 States)</b>				
Metro HMSAs . . . . .	0 ( 0%)	4 (57%)	2 (29%)	1 (14%)
Nonmetro HMSAs . . . . .	2 (29%)	2 (29%)	3 (43%)	0 ( 0%)
<b>South (16 States)</b>				
Metro HMSAs . . . . .	6 (38%)	5 (31%)	4 (25%)	1 ( 6%)
Nonmetro HMSAs . . . . .	11 (69%)	1 ( 6%)	3 (19%)	1 ( 6%)
<b>Midwest (11 States)</b>				
Metro HMSAs . . . . .	1 ( 9%)	8 (73%)	2 (18%)	0 ( 0%)
Nonmetro HMSAs . . . . .	5 (46%)	5 (46%)	1 ( 9%)	0 ( 0%)
<b>West (11 States)</b>				
Metro HMSAs . . . . .	5 (46%)	3 (27%)	3 (27%)	0 ( 0%)
Nonmetro HMSAs . . . . .	8 (73%)	3 (27%)	0 ( 0%)	0 ( 0%)

<sup>a</sup>Based on 45 States responding to OTA's survey of shortage and underserved areas (see app. D).

SOURCE: Office of Technology Assessment, 1990.

Table 11-1 I—Factors Affecting the Demand for Federal Primary Care HMSA Designations Since 1985 (as of 1989)<sup>a</sup>

Factor	Number (Percent) of States that had:				
	Increased demand	Decreased demand	Had no effect	Don't know	No response
Need for NHSC personnel. . . . .	31 (69%)	5 (11%)	6 (13%)	3 (7%)	0 (0%)
Availability of NHSC personnel. . . . .	15 (33%)	23 (51%)	5 (11%)	2 (4%)	0 (0%)
Rural Health Clinics Program . . . . .	19 (42%)	1 (2%)	11 (24%)	13 (29%)	1 (2%)
Medicare physician bonus payment. . . . .	26 (58%)	0 (0%)	7 (16%)	12 (27%)	0 (0%)
State programs linked to HMSAs. . . . .	18 (40%)	0 (0%)	19 (42%)	5 (11%)	3 (7%)
Other . . . . .	10 (22%)	0 (0%)	1 (2%)	2 (4%)	32 (71%)

ABBREVIATIONS: HMSA = Health Manpower Shortage Area; NHSC = National Health Service Corps.

<sup>a</sup>Based on 45 States responding to OTA's survey of shortage and underserved areas (see app.D).

SOURCE: Office of Technology Assessment, 1990.

Table 11-12—State Satisfaction With the Federal Primary Care Health Manpower Shortage Area (HMSA) Designation Process, 1989a

	Number (Percent) of States that were:			
	Satisfied	Dissatisfied	Don't know/no opinion	No response
Criteria . . . . .	28 (62%)	16 (36%)	1 (2%)	0 (0%)
Application process <sup>b</sup> . . . . .	32 (74%)	11 (26%)	0 (0%)	0 (0%)
Review process. . . . .	30 (67%)	13 (29%)	0 (0%)	2 (4%)

<sup>a</sup>Based on 45 States responding to OTA's survey of shortage and underserved areas (see app.D).

<sup>b</sup>The two States that have not filed an HMSA application since 1985 were not asked to evaluate the application process. Thus the total number of States answering this question was 43.

SOURCE: Office of Technology Assessment, 1990.

ing an increase in designation activity were most likely to be located in the South or the West. Forty-three of 45 responding States had filed at least 1 HMSA application since 1985, but trends in designation activity varied considerably among States.

Factors cited most often as contributing to increased demand for HMSAs since 1985 were:

- need for NHSC personnel (31 States);
- Medicare physician bonus payment (26 States);
- Rural Health Clinics program (19 States); and
- State programs linked to HMSA designations (18 States) (table 11-11).

Ironically, the factor cited most often as decreasing HMSA demand activity was the *availability* of NHSC personnel (23 States).

#### Satisfaction With HMSA Designations

**Criteria-In** OTA's survey, most States (62 percent) were satisfied with the criteria used to designate Federal primary care HMSAs (table 11-12). Overall, respondents indicated that HMSA criteria were generally relevant, well-defined, and

workable. Aspects of HMSA criteria that respondents thought were good and should be retained included:

- high needs criteria (9 States),
- population-to-physician ratio (7 States),
- consideration of distance and travel conditions (6 States),
- the "rational service area" concept (6 States),
- consideration of contiguous area resources in assessment of the availability of physicians (3 States), and
- focus on special population groups (6 States).

For the substantial minority of States (36 percent) that were dissatisfied with the criteria, the most common criticism was that the present cut-off point of 3,500:1 for the population-to-primary care physician ratio is too high (13 States). Suggested cut-off points ranged from 2,000:1 to 3,000:1. Related suggestions to improve the identification of primary care personnel shortage areas concerned the productivity and actual availability of physicians counted. Three respondents suggested discounting elderly physicians before they retire. Several respondents suggested excluding physicians whose services are

not available to the general public (e.g., physicians located in mental hospitals or on military bases). Other areas of dissatisfaction with Federal HMSA designations that were listed by respondents included:

- lack of specialty shortage area designations, especially for obstetricians (12 States),
- lack of discrimination in the calculation of physician counts between physicians who serve Medicaid patients and physicians who do not (6 States),
- ambiguity of the rational service area criteria (4 States), and
- problems designating special population groups (e.g., the indigent, the homeless, AIDS patients, and minority groups) (4 States).

While nine respondents specifically mentioned the high-needs indicators as a very positive aspect of the HMSA criteria, some suggested improvements such as eliminating the fertility criterion, substituting unemployment rates or per capita income for poverty level, and changing the weighting of the infant mortality criterion.

Difficulty designating frontier areas was the most commonly listed problem associated with health personnel shortages in rural areas of the States. Other problems characteristic of rural areas included the application of the "rational service area" criterion, inadequacies of distance and travel time criteria, and severity of specialty shortages in rural areas.

**HMSA Priority Groups—***There* was considerable disagreement among survey respondents regarding the usefulness of the primary care HMSA priority groupings. Over one-half of the respondents agreed that they are a good measure of HMSAs' relative degrees of shortage, while one-third disagreed. Over 40 percent of States did *not* believe that Federal resource allocation was correlated with the priority groups.<sup>17</sup> Several respondents felt strongly that the priority groupings did not reflect the States' primary care personnel needs and should be eliminated. Others commented that groupings would be more meaningful if other changes were made in

HMSA criteria (e.g., if criteria were more sensitive to specialty shortage areas, or if changes were made in the high needs categories). Four respondents noted that HMSAs with CHCs usually were assigned higher priority than HMSAs without Federal centers.<sup>18</sup>

**Application and Review Processes—***Most* respondents indicated that they were satisfied with the HMSA application and review process (table 11-12). Federal staff were generally reported to be helpful, but one-third of respondents found long processing times to be a problem, especially for rural areas.

## MUAs

### Activity

Although 43 of 45 States responding to the OTA survey had filed an HMSA designation application since 1985, only 18 States indicated that they had filed an MUA application since 1985.<sup>19</sup> Most States reported that MUA application activity in both rural and urban areas has remained the same or decreased since 1985 (table 11-13). The *need* for CHCs was listed most frequently as having increased demand for MUA designation, while the *availability* of CHC funds was listed most frequently as having decreased demand for MUA designations (table 11-14).

### Satisfaction With MUA Designations

**Criteria—**Many States in OTA's survey reported that they were unfamiliar with MUA designation criteria. Of respondents expressing an opinion about their satisfaction with the criteria used to designate Federal MUAs, slightly more were dissatisfied (16 States) than were satisfied (12 States) (table 11-15). Over one-third of respondents answered "don't know," "no opinion," or left this question blank. Several States suggested that Federal staff clarify the current relevance and utility of MUA designations.

Most respondents commented favorably on at least a few of the indicators of need. Changes suggested to improve the MUA designation criteria included:

<sup>17</sup>Twenty-nine percent of the respondents thought resource allocation was correlated with HMSA priority groups and 29 percent responded "don't know," "no opinion," or left the question blank.

<sup>18</sup>This is probably a reflection of an NHSC policy that gives priority to federally funded CHCs for the placement of obligated personnel (see ch. 13).

<sup>19</sup>Twenty-four States indicated that they had not filed an application for MUA designation since 1985, one State responded "don't know," and two States left this question blank.

**Table 11-13--Changes in Designation Activity for Federal Medically Underserved Areas (MUAs) Since 1985 (as of 1989)<sup>a</sup>**

	Number ( percent ) of States that had:				
	Increased activity	No change	Decreased activity	Don't know/does not apply	No response
Metro MUAs. . . . .	4 (9%)	12 (27%)	12 (27%)	10 (22%)	7 (16%)
Nonmetro MUAs. . . . .	3 (7%)	14 (31%)	11 (24%)	10 (22%)	7 (16%)

<sup>a</sup>Based on 4s States responding to OTA's survey of shortage and underserved areas (see app. D).

SOURCE: Office of Technology Assessment, 1990.

**Table 11-14—Factors Affecting the Demand for Federal MUA Designations Since 1985 (as of 1989)<sup>a</sup>**

Factor	Number ( percent ) of States that had:				
	Increased demand	Decreased demand	Had no effect	Don't know	No response
Need for CHCs. . . . .	14 (31%)	0 ( 0%)	15 (33%)	5 (11%)	11 (24%)
Availability of CHC funds . . . . .	7 (16%)	11 (24%)	12 (27%)	5 (11%)	10 (22%)
Rural Health Clinics Program. . . . .	9 (20%)	0 ( 0%)	16 (36%)	9 (20%)	11 (24%)
State programs linked to MUA designation. . . . .	3 ( 7%)	0 ( 0%)	22 (49%)	5 (11%)	15 (33%)
Other . . . . .	0 ( 0%)	1 ( 2%)	0 ( 0%)	0 ( 0%)	44 (98%)

ABBREVIATIONS: CHCs = Community Health Centers; MUA = Medically Underserved Area.

<sup>a</sup>Based on 45 States responding to OTA's survey of shortage and underserved areas (see app. D).

SOURCE: Office of Technology Assessment, 1990.

**Table 11-15--State Satisfaction With the Federal Medically Underserved Area (MUA) Designation Process, 1989<sup>a</sup>**

	Number ( percent ) of States that were:			
	Satisfied	Dissatisfied	Don't know/no opinion	No response
Criteria. . . . .	12 (27%)	16 (36%)	15 (33%)	2 ( 4%)
Application process . . . . .	2 (11%)	9 (50%)	6 (33%)	1 ( 6%)
Review process . . . . .	2 ( 4%)	20 (44%)	16 (36%)	7 (16%)

<sup>a</sup>Based on 45 States responding to OTA's survey of shortage and underserved areas (see app. D).

<sup>b</sup>The 27 States that had not filed an MUA application since 1985 were not asked to evaluate the application process. The total number of States responding to this question was 18.

SOURCE: Office of Technology Assessment, 1990.

- updating the weighting factors attached to the four indicators of need (8 States),
- considering combining HMSA and MUA designations into one measure (7 States),
- incorporating factors that might be affecting access to care (e.g., the percentage of the population that is uninsured, on Medicaid, or a member of a minority) (6 States),
- replacing some criteria with other measures (e.g., low birthweight percentage instead of infant mortality, unemployment rates or personal income instead of poverty rates, and rates of chronic disease instead of percentage of elderly) (estates), and

- reexamining the current applicability of the IMU cut-off score used to distinguish an MUA from a non-MUA (2 States).

Two States mentioned that the weighting factors associated with the proportion of the population that is elderly and the infant mortality rate tend to cancel each other out. Designating frontier areas was reportedly five States to be a problem.

**Application and Review Processes--Of the 18** States that had filed an MUA application since 1985, 9 reported dissatisfaction with the application process (table 11-15). Four respondents noted that they had received no response to designation requests and

cited poor communication with Federal staff as a problem.

Most respondents who expressed an opinion were dissatisfied with the frequency of review (table 11-15), with suggested frequencies ranging from annually to every 3 to 5 years. Three States believed the optimal frequency would depend on the specifics of new modified MUA designation criteria and how resources were tied to MUA status.

Thirteen States suggested that criteria used for reviewing MUAs that have CHCs or other federally funded services should differ from criteria used for other MUAs. Several States raised the concern that when CHCs have a favorable impact (e.g., reduce infant mortality), this jeopardizes their MUA designation status. One respondent suggested that different MUA criteria be developed for initial designations and for those areas seeking redesignation.

### *State Designation Capability*

OTA's survey also examined the opinions of the respondents regarding how well-equipped they were to conduct shortage designation activity in their States. Nearly three-fourths of respondents (33 of 45) reported that the withdrawal of Federal planning resources had a negative effect on the States' ability to prepare requests for HMSA/MUA designation. Respondents overwhelmingly linked the lack of staff available to prepare requests for designations to the withdrawal of Federal funds. The majority of respondents (35 States) reported that State and Federal resources were *not* adequate for maintaining an accurate and up-to-date list of health personnel shortage areas and medically underserved areas.

## **STATE SHORTAGE DESIGNATIONS: PREVALENCE AND USES**

Federal HMSA and MUA designations provide a centralized and relatively uniform designation system, but they do so at the cost of being inflexible to State-specific priorities and needs. To fill in the gaps, some States have expanded on Federal designation criteria or created their own criteria to address particular problems. States that have developed their own criteria generally apply more lenient or more specific criteria in defining shortage areas.

In the OTA survey, State designation criteria were being used in almost one-half of the responding

States (22 of 45), either alone or in conjunction with HMSA or MUA criteria, to implement State health personnel distribution programs. In describing criteria, two States reported that they used modified HMSA designation criteria, four States used specialty-specific population-to-provider ratios, and two States used a population-to-primary care physician ratio that was lower than the HMSA cut-off of 3,500:1. Another criterion used by two States was community size (e.g., an area could qualify if it had fewer than 15,000 or 10,000 residents).

A few States have developed more elaborate indicators of medical underservice. Michigan, for example, has expanded on the IMU to develop a new model designed to be more responsive to State economic conditions (386). The Michigan Primary Care Association (MPCA) model added two new variables (percentage of persons eligible for Medicaid and the aggregate unemployment rate) to the IMU and has a revised system of weights (table 11-16). The MPCA model puts the greatest emphasis on poverty and Medicaid eligibles, while the IMU emphasizes population-to-primary care physician ratios and infant mortality. The MPCA intends to use its model as one of the criteria in a State program to place physicians, nurse practitioners, and nurse-midwives in areas of need (323).

Over 40 percent (19) of States responding to the survey were defining shortage areas for physician specialties or for nonphysician health personnel. Eight respondents indicated that they were identifying shortage areas for all physician specialties, most using population-to-provider ratios specific to each specialty. Shortage designations for obstetricians were the most common designation described (eight States). Several States were either currently defining or were planning to define shortage areas for nurses. Other specialties for which States were designating shortage areas include psychiatrists, pediatricians, family practitioners, internists, and general practitioners.

When asked why States used their own criteria instead of Federal HMSA or MUA designations, respondents said they viewed their State criteria as a more accurate measure of need. Some respondents stated that their State designation criteria were addressing areas of specialty shortage, were more sensitive to needs of frontier and other rural areas, were more lenient than HMSA criteria, or were more timely.

**Table 11-16--Comparison of the Federal Index of Medical Underservice (IMU) and the Michigan Primary Care Association (MPCA) Model<sup>a</sup>**

Federal variable	IMU weight (percent )	MPCA weight (percent )
Percentage of persons below 100% of Federal poverty level . . . . .	25.1	20.7
Five year infant mortality rate. . . . .	26.0	17.2
Percentage of persons age 65 and over. . . . .	20.2	17.2
Primary care physician to population ratio. . . . .	28.7	13.8
Percentage of persons Medicaid eligible . . . . .	NA	20.7
Unemployment rate. . . . .	NA	10.4
	100.0	100.0

NOTE: NA = not applicable.

<sup>a</sup>The weights that appear in this table are those associated with least-needy extreme for each criterion (e.g., the IMU weight of 25.1 for percentage of population below the Federal poverty level is associated with 0% below poverty). (See 41 FR 45718-45723 for the complete weighting tables used for IMU computation.) Lower weights are associated with more critical need.

SOURCE: Michigan Primary Care Association, A Blueprint for Primary Health Care: Communities Building a Healthy Foundation, executive summary (Lansing, MI, November 1987).

**Table 11-17--State Opinions on How Accurately Federal HMSAs and MUAs Reflect State Health Personnel Shortages, 1989<sup>a</sup>**

	Yes	No	Don't know/ no opinion	No Response
State has areas/populations that have health personnel shortages or are medically underserved but are not designated as HMSAs or MUAs	38 (84%)	3 ( 7%)	3 ( 7x)	1 ( 2%)
State has areas/populations <u>inappropriately</u> designated Federal HMSAs/MUAs	8 (18%)	29 (64%)	8 (18%)	0 ( 0%)

<sup>a</sup>Based on 45 States responding to OTA's survey of shortage and underserved areas (see app. D).

SOURCE: Office of Technology Assessment, 1990.

Testifying to the limitations of the Federal designation criteria, over four-fifths of respondents (38 of 45) believed that there were areas or populations in their State that had health personnel shortages or were medically underserved but were not designated as Federal HMSAs or MUAs (table 11-17). Fourteen States had designated such areas as State health personnel shortage or medically underserved areas. These areas tended to be rural parts of the State, areas with specialty shortages (i.e., shortages of obstetricians) and nonphysician shortages, and areas where the population-to-physician ratios were below the Federal HMSA cut-off. State designated populations included Medicaid and indigent populations. When asked why these areas or populations were not federally designated, respondents replied either that the areas lacked incentives to apply (e.g. limited NHSC personnel availability) or that the State

lacked financial resources and staff to nominate them for designation.

Seven States indicated that there were areas or populations in their States that *were inappropriately* designated as Federal HMSAs or MUAs (table 11-17). Several respondents speculated that inappropriate designations existed due to the lack of review of MUA designations.

States engaged in several other activities related to designating underserved areas (table 11-18). Forty percent of States (18 of 45) were delineating primary care service areas. The majority of States (32 of 45) were conducting special surveys of primary care providers to monitor shortage areas or underserved areas; one-third of these were doing so as a part of HMSA designation and redesignation

Table 1 1-18—Shortage Area Designation Activity, by State, 1989

State <sup>a</sup>	Has filed at least one primary care HMSA application since 1985	Has filed at least one MUA applications since 1985	Defines its own shortage areas for certain health practitioners	Delineates primary care service areas	Conducts special surveys of primary care providers
Alabama	X	X	X		?
Alaska	X	?			
Arizona	X		X		
Arkansas	X				X
Colorado	X	X			X
Delaware	X				X
Florida	X			X	X
Georgia	X		X	X	X
Hawaii	X	X			
Idaho	X				X
Illinois	X	X		X	X
Indiana	X		X	X	X
Iowa	X		X		X
Kansas	X	?	X	X	
Kentucky	X		X	X	X
Louisiana	x				x
Maine	X	x	x	X	x
Maryland	x		x		X
Michigan	x	x	x	x	X
Minnesota	x	?			
Mississippi	X		X	X	X
Missouri	X		x		X
Montana	X				
Nebraska	X	X	X	X	X
Nevada	X				
New Hampshire					
New Jersey	X				X
New Mexico	X	x		X	X
New York	X	X	;	X	X
North Carolina	X		;		X
Ohio	X	X			X
Oklahoma	X	X			
Oregon	X	X		X	X
Pennsylvania	X	X		X	X
Rhode Island	X				X
South Carolina	x	X	x	?	
South Dakota	X			X	
Tennessee	X		X	X	X
Texas	X	X			X
Utah	X		X	X	X
Vermont		X			X
Virginia	X	X			X
Washington	X	X	X		
West Virginia	X			X	X
Wisconsin	X				X

NOTE: X = yes; ? = don't know or no response; blank = no.

<sup>a</sup>Only the 45 States that responded to OTA's survey of shortage and underserved areas are included.

SOURCE: Office of Technology Assessment, 1990.

activities. Some States reported surveying each physician as a part of their relicensing procedure, and some States conducted annual surveys of CHCs, hospitals, or health departments. Other reasons for doing surveys included monitoring obstetrician and nursing shortages and determining the number of private physicians accepting Medicaid patients. One respondent reported that their organization was no

longer able to conduct surveys because of the lack of staff time.

## HMSAs AND MUAs: PROBLEMS AND ALTERNATIVES

There are two problems inherent in the identification and prioritization of health service shortage



areas. First, the terms “shortage” and “underservice” are hard to define; second, the measurement of various indicators of shortage and underservice is constrained by the limited availability of accurate and current local data. Despite these problems, the Federal Government has pursued its efforts to designate needy areas since the late 1960s and has relied on HMSA and MUA designations to target Federal resources.

The distinction between HMSAs and MUA/Ps has not always been clear. The concept of medical underservice is broader than that of health manpower shortage, since the former relies on a number of indicators of need, while the latter is primarily concerned with underservice attributable to lack of health personnel (339). Much of the confusion associated with the purpose and validity of the Federal designations stems from the ambiguous meanings of the terms “shortage” and “medical underservice.”

### *Shortage Area Designations*

Federal policies to redistribute physicians through the NHSC program were based on the premise that relative physician shortages were associated with impaired access to care. The NHSC program was initially tied to CHMSA designations in the early 1970s to increase the number of providers in areas with a relative undersupply.

The concept of shortage was broadened by changes in the HMSA designation criteria established in 1978. Shortage was not only measured by the relative supply of providers to an area, but also by taking into consideration socioeconomic barriers to access and other indicators of need. The designation of population groups as HMSAs was an additional means of addressing the specific access problems that face certain populations.<sup>20</sup> Identifying what the indicators of shortage should be and deciding how they ought to be prioritized were major concerns in the development of HMSA criteria.

One point of criticism of HMSAs has been their reliance, despite these changes, on population-to-provider ratios. Critics have suggested that these ratios do not reflect differences between specialties

in the total hours worked, allocation of time to different practice activities, and productivity (718).

In 1983, Berk and colleagues questioned whether HMSA criteria result in a valid distinction between areas with adequate access to medical care and those with inadequate access (85). They evaluated four measures of access to health care for populations residing in and out of HMSAs:

1. the likelihood of having any physician visits (in 1977),
2. the number of physician visits,
3. travel time to usual source of medical care, and
4. waiting time in the medical provider's office or place of practice.

The authors found that differences in access to health care were better explained by differences in income, racial composition, and insurance coverage than by differences in physician supply. Based on these findings, they suggested that criteria be developed that would more closely link factors limiting access and utilization with low levels of physician supply, and they concluded that the physician redistribution effort was “a relatively inefficient mechanism for reducing inequities in access to care.”

In 1983, the criteria used to designate HMSAs were evaluated as was required by law (Public Law 97-35), and four alternative designation criteria were evaluated:

1. the IMU,
2. the Utilization Deficit Index (developed by researchers at the National Center for Health Statistics),
3. the Deaths Averted Index (developed by researchers at the Urban Institute), and
4. the Use/Need Index (also developed by researchers at the Urban Institute) (682).

While the HMSA criteria stress provider availability, the IMU considers both availability and health status measures, and the other three indices all emphasize health status and health care utilization. The shortage area designations that would be produced by the HMSA and alternative methods were compared and contrasted. The alternatives were assessed according to how well they ranked counties in terms of need, access, health status,

<sup>20</sup>“Access” has been defined broadly as the absence of geographic, financial, and capacity barriers that reduce a population's ability to reach (travel to), afford (pay for), and obtain in a timely manner health services that are wanted or desired (682).

utilization, insufficient capacity, and health personnel availability.

Although different groups of counties were identified by the different alternatives, all methods identified a core group of the same counties. These counties were predominantly poor, rural counties in the South (682). The HMSA criteria appeared to be the most effective in ranking counties by relative availability of health personnel—not surprising, since the other methods did not necessarily emphasize personnel availability.

In this 1983 evaluation, HRSA also evaluated the criteria used to determine “degree-of-shortage” groupings among HMSAs. The agency found that the priority groupings: 1) gave undue importance to differences in population-to-practitioner ratios and certain measures of unmet need; 2) did not consider the size of affected populations; and 3) did not take into account unmet demand or area attractiveness (682). Despite some efforts to develop better degree-of-shortage criteria, the original priority groupings continue to play a role in the allocation of NHSC personnel.

### *Undeserved Area Designations*

*The* lack of a generally accepted definition of medical underservice has generated considerable criticism. Wysong, for example, criticized the IMU for its failure to define medical underservice directly, noting that the IMU simply attempted to predict the assessments experts would make if they actually visited sites (742). Critics contend that the lack of any empirically verifiable concept makes the IMU difficult to interpret and also difficult to defend as a basis for policy formation (682).

Several studies examined how well the IMU identifies residents with poor access to health care. Kleinman and Wilson used data from the 1973 and 1974 Health Interview Surveys to determine whether residents of rural areas satisfying MUA requirements had poorer access to medical care than others (321). No difference was found between MUAs and “adequately served” areas in volume of physician visits per resident, and only a small difference was found in the proportion of residents with one or more visits per year. MUA residents used some preventive services less and nonsurgical hospitalization more. The authors concluded that there was a need for specific objective standards of appropriate care and

that underservice should be defined as deviations from those standards.

Kushman evaluated the IMU as a predictor of the ability to obtain physician services using California Medicaid claims (329). He found that the IMU explained only one-fifth of the variation in the number of claims across counties. When nonwhite and urban populations were considered as independent variables in addition to the IMU, the regression equation explained nearly one-half of the variation in claims. Kushman concluded that the IMU did not adequately reflect barriers to physician services faced by nonwhite and rural persons and that programs using the IMU run the risk of misallocating resources toward whites and urban dwellers.

Other noted limitations of the IMU include the IMU’s insensitivity to consumers’ perceptions of health care needs and the way individuals select and utilize health services (330), the absence of a clear definition of ‘rational service area,’ and the lack of consideration of needs and available services in contiguous areas (339).

Criticisms that current measures of underservice may not be adequately identifying areas in greatest need prompted a 1987 study of the usefulness of health status, as measured by sentinel health events, to identify underserved areas (55). Sentinel health events are medical conditions that, by virtue of their presence or prevalence in a population, indicate a lack of access to acceptable-quality preventive and other primary health care. Examples of sentinel health events include dehydration in infants; measles, mumps, or polio in children; and advanced breast cancer or invasive cervical cancer in adult women. Identifying areas and populations that are potentially underserved involves calculating the relative rate of sentinel events among different areas or populations. The study found that sentinel health events were effective in identifying underserved urban areas, but results were inconclusive in rural areas. At present, the most promising use of sentinel health events is as a supplement to existing methods, to identify certain populations groups and subgroups that may have impaired access (55).

## **SUMMARY OF FINDINGS**

While there are no definitive criteria that define what constitutes the “adequate” supply of health care in given area, the Federal Government has developed measures of “shortage” and “medical

underservice" that attempt to identify areas and populations with a relative lack of health care.

As measured by personnel shortage, rural health needs remain high. Contrary to predictions, and despite overall increases in physician supply, *the number of designated primary care HMSAs actually increased 30 percent between 1982 and 1988. In 1988, 29 percent of the U.S. rural population (16.5 million people) lived in designated primary care HMSAs.* States continue to request new shortage designations. Where demand for designations has declined, States report that it has been due in part to the decreased availability of incentives linked to these designations (e.g., NHSC personnel and new CHC funds) and the lack of funds to engage in designation activity.

In general, States regard HMSA criteria as relevant and workable. Points of dissatisfaction include the cut-off point of 3,500:1 for the population-to-primary care physician ratio (which is often regarded as being too high), the lack of adequate consideration of the productivity and the actual availability of physicians, and the often long processing time associated with designation. The use of HMSA priority groupings as a means of allocating resources has also been challenged. The prioritization process is not as public as it could be. The criteria used to determine the HPOL list, on which NHSC personnel placements are based, have never been published.

Unlike HMSAs, MUA/P designations attempt to measure health underservice by considering primarily measures of health service demand rather than supply. *Although the MUA criteria may well be a better measure of impaired access than the HMSA criteria, the Federal identification and administration of MUA/Ps has some major problems.* Because MUAs have not undergone a regular review since 1981, they cannot be viewed as an accurate indication of the current level of medical underservice, either on an individual area or national basis. Other potential problems associated with MUA designa-

tions concern the use of IMU weights and cut-off point that have not been reexamined since 1976, the ambiguous status of MUA designations during the past decade, and decreases in the incentives for States to apply for MUA designation.

*There appear to be a substantial number of areas and populations that have health personnel shortages or are medically underserved but are not designated as Federal HMSAs or MUAs. In 1986,* there were 95 nonmetro counties that qualified as HMSAs based on whole-county population-to-physician ratios<sup>21</sup> but were not designated as HMSAs (511). It is also possible that a number of subcounty areas may have also qualified but not applied for HMSA designation. Four-fifths of respondents to OTA's survey (38 States) believed that there were areas or populations in their State that had health personnel shortages or were medically underserved but were not designated as Federal HMSAs or MUAs.

Some States have engaged in activities to help fill in the gaps where Federal designations do not adequately address special State problems. *At least 22 States use their own designation criteria either alone or in conjunction with HMSA or MUA criteria, to implement State health personnel distribution programs.* Examples of other State designation-related activities include defining shortage areas for physician specialties or for nonphysician health care providers, defining primary care service areas, and using State surveys of primary care providers to monitor health personnel shortages and medically underserved areas.

State criteria are generally more specific or more lenient than Federal criteria, and they are believed by the States to be more sensitive to the needs of rural and frontier areas, to specialty shortage areas (e.g., obstetricians), and to needs that must be met quickly. State shortages of resources and staff, however, have limited designation activities.

<sup>21</sup>Includes doctors of medicine only.