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# Patterns of Health Maintenance Organization Service Areas in Rural Counties

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*This study analyzes the 1993 National Directory of HMOs to determine the extent to which rural counties are included in health maintenance organization (HMO) service areas. Two specific questions are addressed: (1) How do the patterns of service areas differ across HMO model types? (2) What are the characteristics that distinguish rural counties served by HMOs from those that are not? Although a majority of rural counties are in HMO service areas, substantially fewer are served by non-individual practice association (non-IPA) models. Access to HMO services is found to decrease with county population density, and adjacency to metropolitan areas is an important predictor of inclusion in service areas.*

## INTRODUCTION

Since the popularization of the concept of HMOs during the 1970s, there has been concern that this approach to financing and organizing health services would not fit in the rural environment (Appel and Schlenker, 1976). Although from the beginning there have been proponents who have suggested that HMOs provide increased access to care in rural communities (Hillis and Miller, 1974; Less, 1975; Ross, 1975), an early analysis of the potential for rural HMOs concluded that the prepaid man-

aged-care concept was not feasible in rural locations from a competitive standpoint (Cattani et al., 1975). Despite the longstanding and continuing existence of HMOs completely in rural areas (Nycz et al., 1976; Korczyk and Witte, 1992), concern remains among rural health planners as it has become evident that the prevailing trend in medical economics is toward a complete dominance of the market by managed-care systems.

Unlike traditional indemnity plans, some types of HMOs (such as staff models) require a threshold number of subscribers to support the capital needs of the staffed delivery system or to provide some actuarial basis for distributing risk. A recent study of 23 HMOs by Mathematica Policy Research, Inc. observed that HMOs tend to expand into new areas based on both the potential for growth in enrollment and also the potential for access to services for the new enrollees (Felt, Frazer, and Gold, 1994). Because of the need for both a threshold population to meet actuarial requirements and the demand for adequate provider resources to serve the people brought into the plan, there has been concern that HMOs may not represent viable health care delivery systems in many rural areas of the United States, a conclusion that was echoed when the promise of managed competition for rural areas was assessed (Kronick et al., 1993).

This article examines the expansion of HMO service areas into rural areas geographically and by type of HMO. The study attempts to answer two questions: (1) How do the patterns of rural county inclusion in

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This work was supported by the U.S. Office of Rural Health Policy, Health Resources and Services Administration (HRSA), Public Health Service, Department of Health and Human Services (DHHS), under Grant Number CSR000002. The authors are with the Rural Health Research Program, Cecil G. Sheps Center for Health Services Research, University of North Carolina. The opinions expressed in this article are those of the authors and do not necessarily reflect those of HRSA, the University of North Carolina, or the Health Care Financing Administration (HCFA).

HMO service areas differ across HMO models (i.e., staff, IPA, etc.)? (2) What are the characteristics that distinguish rural counties that are served by HMOs from those that are not? The analysis is intended to guide policymakers who are assessing the potential for managed care to improve access and affordability for all Americans no matter where they live.

## BACKGROUND

Rural prepaid systems were in place as early as 1842 (Ross, 1975) and one of the earliest examples of the modern concept of prepayment was established in a rural area by Michael Shadid and the Farmers Union in Elk City, Oklahoma (Starr, 1982). Rural health cooperatives were set up in the 1930s with the support of the Farm Security Administration, enrolling as many as 600,000 low-income people. These attempts to meet the health care needs of rural populations were abandoned for reasons that kept prepaid systems from emerging throughout the period prior to 1970, primarily opposition from organized medicine. In an outline of the development of HMOs in rural areas, Christianson (1989) and Christianson and Grogan (1990) emphasized both the exceptional nature of these HMOs and the very small number of persons actually enrolled in the few operating rural HMOs.

There is no single authoritative source that tracks the penetration of managed-care programs into rural places. States individually license and monitor companies providing health insurance (including managed care), and may or may not require detailed geographic information on markets to be reported. Christianson et al. (1986) used a 1984 census of HMOs conducted by InterStudy, Inc. to assess the degree of HMO penetration in rural counties and to briefly discuss the change in

penetration between 1981 and 1984. The authors identified 118 HMOs serving rural areas in 34 States, a 50-percent increase from an earlier survey. This analysis indicated the number of HMOs and counties being served but did not differentiate the penetration of staff versus other types of managed-care organizations.

The Group Health Association of America (GHAA) (1993a) produces an annual *National Directory of HMOs* which contains basic descriptive information provided by each HMO, including organizational type and service area. This data source was used in the article by Serrato, Brown, and Bergeron (1995) in this issue in their analysis of HMO coverage for rural Medicare beneficiaries. Out of the 592 HMOs listed in 1990, the authors identified 301 HMOs that had at least one rural (non-metropolitan) county in their service area and 11 which served only non-metropolitan counties. However, the study was focused on Medicare plans and did not fully examine all rural HMOs. Serrato, Brown, and Bergeron did find that overall penetration of Medicare coverage into rural areas was low and that this penetration was selective; Medicare enrollees were more likely to be offered coverage by HMOs serving rural areas with higher payment rates under the adjusted average per capita cost (AAPCC) system, greater potential demand, and more medical resources.

Descriptive statistics using data from the GHAA *National Directory of HMOs* (Group Health Association of America, 1993a) were presented in a Congressional Research Service (CRS) paper discussing managed competition in rural areas (Fuchs, 1994). The CRS study identified a total of 541 HMOs which were in operation in 1992. Of these, 56 (10.3 percent) were staff models, 67 (12.4 percent) were groups, 87 (16.1 percent) were networks, and 331 (61.2 percent) were IPAs (Group

Health Association of America, 1993b). This listing is by primary type; overall, 6 percent of all HMOs are a mixture of types, with 49 percent staff, 28 percent network, 13 percent group, and 8 percent of IPA HMOs mixed with some other type. Fuchs did not, however, examine the geographic distribution of HMOs. The Fuchs review also cited an unpublished 1992 study conducted by Wholey which assessed adjacency as a predictor of inclusion of a rural county in an HMO service area. His results indicated that HMOs served 845 rural (non-metropolitan) counties and that non-metropolitan counties adjacent to metropolitan areas were almost 2.5 times more likely to be included in an HMO market area than were counties not adjacent to metropolitan areas.

Even though the potential for rural HMOs remains an open question (Serrato, Brown, and Bergeron, 1995), the Congress has encouraged policies to support the development of rural managed-care systems. This is evidenced by the funding for managed-care demonstrations in rural America which is included in appropriations for the Agency for Health Care Policy and Research (AHCPR) (U.S. Senate, 1994). That program has funded five projects intended to demonstrate the advantages of managed care for rural communities which, in the words of AHCPR Administrator Clifton Gaus, "...are of proven value and available in metropolitan areas, but are frequently unavailable to rural populations" (Agency for Health Care Policy and Research, 1994).

## Data and Methods

This study uses the methods employed by Serrato, Brown, and Bergeron (1995) of abstracting information from the GHAA *National Directory of HMOs* (1993a). The name, type, age, Medicare coverage status,

and county-defined service area for each HMO were entered into a data base. Where the service areas were not listed as counties, the HMO was contacted and counties were identified and entered. Where cities were identified, the county or counties including the city were listed as the service area. Observations for Alaska and Hawaii were dropped from the analysis file—the former because it is treated as one county; the latter because of its unique health care environment.

Variables representing county characteristics were drawn primarily from the Area Resource File and special files provided by the Office of Shortage Designation, Bureau of Primary Health Care, HRSA, DHHS. The Area Resource File is maintained by the U.S. Bureau of Health Professions to track health professions' supply and trends and includes numerous county-level descriptors drawn from other data bases including the U.S. Census, the American Medical Association Physician Masterfile, the American Hospital Association Annual Survey, Medicare and Medicaid files, and other sources that compile county-level data. These files were linked to the HMO inventory file through common Federal Information Processing Standard (FIPS) codes.

For the purpose of identifying non-metropolitan counties and assigning degree of "rurality" to them, this study made use of a county-level classification system developed by the U.S. Department of Agriculture—the "Urbanicity Code" or Parker-Ghelfi system (Ghelfi et al., 1993). This system is particularly appropriate here because, in addition to considering the population of the county itself, it also differentiates non-metropolitan counties according to their relationship to larger metropolitan areas, which allows the analysis to consider both size and adjacency as factors affecting market choices. Counties

are categorized into six levels: large metropolitan, small metropolitan, non-metropolitan adjacent to large metropolitan, non-metropolitan adjacent to small metropolitan, non-metropolitan non-adjacent with city >10,000 population, and non-metropolitan non-adjacent with no city >10,000. The classification system depends upon 1990 U.S. Census data and 1990 Office of Management and Budget classification of counties. The classification of counties by the Office of Management and Budget as metropolitan and non-metropolitan is not done according to any set schedule and changes may be made at any time during the year. Because of this, the total number of counties listed as non-metropolitan may not agree with extant listings unless the dates of the classifications coincide.

Descriptive statistics across county types, HMO model types, and States were generated using the SAS<sup>®</sup> data management and statistical system (version 6.1). Maps of the locations of the HMO service areas and the change in those service areas were created using the MapInfo<sup>®</sup> mapping software (version 3.0). The maps differentiate only between metropolitan and non-metropolitan counties; for technical reasons, service areas were not mapped across all dimensions of rurality. In the large counties of the Western States, the classifications "metropolitan" and "non-metropolitan" become problematic. Rural communities and remote populations are often included in counties which also have very large, densely settled urban areas and are classified as metropolitan.

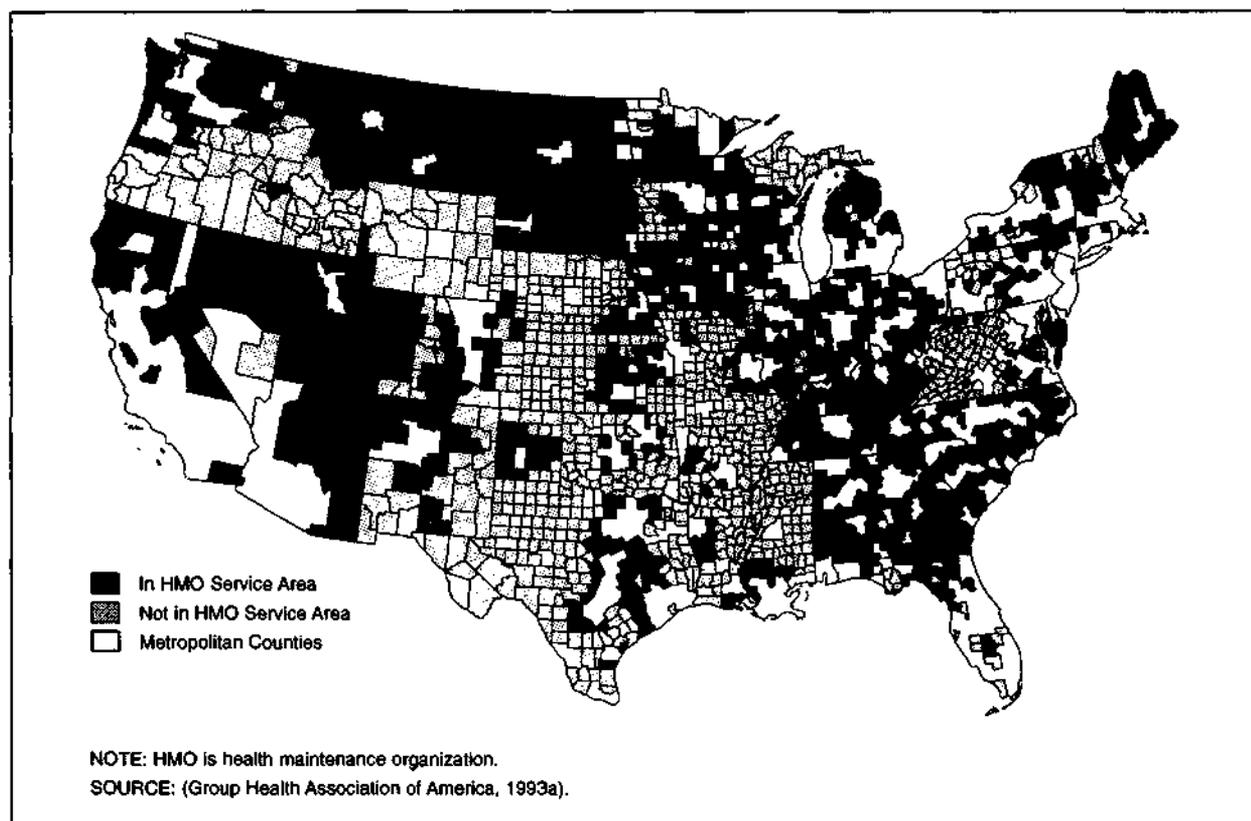
The geographic and cartographic examination of the distribution of the HMOs was supplemented by a multivariate regression analysis in order to identify those county characteristics which predict inclusion in an HMO service area. Two versions of a logistic regression with the county as the unit of analysis were estimated using the

STATA<sup>®</sup> statistical software (version 3.1). The first model estimated the probability of inclusion in any HMO service area, and the second model estimated the probability of inclusion in staff, group, or network HMOs, with IPA models excluded.

To assess the association between rurality and the probability of being in an HMO service area, dummy variables for each urbanicity code were included in the model, with "large metropolitan" as the reference category. It was also hypothesized that counties which were more populous, wealthier, had more medical resources, and were adjacent to more urban counties were more likely to be included in an HMO service area. Therefore, additional independent variables included: designation as a part- or whole-county Health Professional Shortage Area (HPSA) at any time between 1978 and 1990 or designation as a chronic HPSA (with no HPSA at any point as the comparison category); the county's Medically Underserved Area (MUA) index in 1992; the population as reported by the U.S. Bureau of the Census in 1990 (natural log); the population density in 1990 (natural log); the mean per capita income for the county in 1990 (natural log); the percentage of workforce unemployed in 1990 (natural log); the percentage of the population minority (natural log); and the population in 1990 of the largest adjacent county (natural log). The inclusion of the population of the largest adjacent county was considered to account for multi-county market influences, with the population standing in for potential complexity of the market and of HMO activity.

Although it would have been desirable to also include measures of provider and hospital bed availability, these variables were found to be endogenous to the model. Therefore, a reduced-form model was estimated. A final estimation problem was the inability to control for differences in State-level policies. Differing degrees of regula-

**Figure 1**  
**Non-Metropolitan HMO Service Areas: 1992**



tion, oversight, or support for HMOs might have caused a variable level of service area inclusion across individual States. This could potentially be controlled by using individual State dichotomous variables. However, the HMO service areas in some States include all counties, and those States would be eliminated from the analysis due to perfect prediction. In an attempt to control for the differing degrees of receptivity towards HMOs across States, a final dummy variable was included which indicated whether the county was in a State with three or more operating HMOs in 1980. Serrato, Brown, and Bergeron (1995) found that the AAPCC rate was a strong indicator of a county having a Medicare HMO option. However, because the AAPCC rates are "highly volatile" and potentially not a stable factor in market decisions (Physician Payment Review

Commission, 1995), the AAPCC rate was not included in the model.

## RESULTS

The inventory of HMOs indicated that, of the 544 total HMOs included in the analysis file, 218 (40.1 percent) were located strictly in metropolitan counties and did not claim non-metropolitan counties in their service areas; only 5 (<1 percent) were serving solely non-metropolitan counties while 321 (59 percent) included both metropolitan and non-metropolitan counties in their service areas. The non-metropolitan distribution of HMOs in 1992 is depicted in Figure 1. The lighter shaded areas identify non-metropolitan counties that are not included in the service areas identified by HMOs in 1992. The pattern of markets indicates differences based on

**Table 1**  
**Rural Counties<sup>1</sup> Included in HMO Service Areas, by State and Model Type**

State	Total Rural Counties (n)	Rural Counties Included in Service Area of							
		Staff		Group/Network		IPA		Mixed Model	
		n	Percent	n	Percent	n	Percent	n	Percent
<b>Total</b>	<b>2,258</b>	<b>22</b>	<b>1</b>	<b>447</b>	<b>20</b>	<b>1,179</b>	<b>52</b>	<b>302</b>	<b>13</b>
Alabama	46	2	4	11	24	46	100	5	11
Arizona	9	0	0	2	22	9	100	4	44
Arkansas	64	0	0	0	0	7	11	0	0
California	24	0	0	24	100	12	50	9	38
Colorado	53	0	0	7	13	29	55	5	9
Connecticut	2	1	50	0	0	2	100	0	0
Delaware	1	0	0	0	0	1	100	1	100
Florida	33	0	0	1	3	18	55	3	9
Georgia	117	0	0	1	1	117	100	0	0
Idaho	42	0	0	0	0	5	12	3	7
Illinois	74	6	8	16	22	37	50	24	32
Indiana	55	1	2	14	26	55	100	55	100
Iowa	89	0	0	32	36	65	73	0	0
Kansas	96	0	0	10	10	23	24	3	3
Kentucky	98	0	0	10	10	98	100	6	6
Louisiana	40	0	0	5	13	15	38	5	13
Maine	13	0	0	0	0	13	100	1	8
Maryland	9	0	0	9	100	9	100	0	0
Massachusetts	3	0	0	1	33	2	67	1	33
Michigan	58	0	0	35	60	20	35	6	10
Minnesota	69	0	0	8	12	0	0	43	62
Mississippi	75	0	0	0	0	4	5	0	0
Missouri	93	3	3	4	4	9	10	0	0
Montana	54	0	0	0	0	54	100	0	0
Nebraska	87	0	0	1	1	21	24	5	6
Nevada	14	0	0	0	0	12	86	0	0
New Hampshire	7	0	0	0	0	5	71	5	71
New Mexico	26	0	0	2	8	9	35	0	0
New York	24	2	8	7	29	19	79	7	29
North Carolina	65	0	0	7	11	65	100	0	0
North Dakota	49	0	0	7	14	49	100	5	10
Ohio	49	0	0	49	100	40	82	16	33
Oklahoma	63	0	0	7	11	7	11	0	0
Oregon	27	0	0	4	15	7	26	0	0
Pennsylvania	34	0	0	15	44	9	27	2	6
Rhode Island	1	0	0	0	0	1	100	1	100
South Carolina	30	0	0	2	7	30	100	0	0
South Dakota	63	0	0	0	0	63	100	0	0
Tennessee	69	0	0	69	100	32	46	3	4
Texas	196	0	0	18	9	60	31	18	9
Utah	25	6	24	0	0	25	100	25	100
Vermont	11	0	0	0	0	0	0	8	73
Virginia	59	0	0	7	12	17	29	0	0
Washington	27	0	0	27	100	18	67	4	15
West Virginia	43	0	0	0	0	5	12	6	14
Wisconsin	51	1	2	35	69	33	65	23	45
Wyoming	21	0	0	0	0	2	10	0	0

<sup>1</sup> Rural counties are defined as non-metropolitan counties under the 1990 Parker-Ghelfi "Urbanicity Code."

NOTES: HMO is health maintenance association. IPA is individual practice association. Only 47 States are represented because 3 have no rural counties.

SOURCE: (Group Health Association of America, 1993a).

**Table 2**  
**Counties in Service Areas of HMOs, by Model Types**

	Staff Model			Group/Network		IPA		Mixed Model	
	<i>n</i>	<i>n</i>	Percent	<i>n</i>	Percent	<i>n</i>	Percent	<i>n</i>	Percent
0 = Large Metropolitan	302	65	22	222	74	284	94	180	60
1 = Small Metropolitan	511	13	3	214	42	416	81	183	36
2 = Non-Metropolitan, Adjacent to Large Metropolitan	184	14	8	59	32	137	75	59	32
3 = Non-Metropolitan, Adjacent to Small Metropolitan	803	4	.5	243	30	515	64	148	18
4 = Non-Metropolitan, Non-Adjacent, City > 10,000 Population	224	3	1	34	15	98	44	32	14
5 = Non-Metropolitan, Non-Adjacent, No City	1,047	1	.1	111	11	429	41	63	6

NOTES: HMO is health maintenance organization. IPA is individual practice association.

SOURCE: (Group Health Association of America, 1993a).

State regulation, population density, and regional HMO market activity.

Table 1 lists the numbers of non-metropolitan counties included in HMO service areas by State and type of HMO. The table illustrates the widespread penetration of the IPA model and the very local and concentrated penetration of the staff model. Group/network and mixed models are present in intermediate numbers of counties. Figures 2 and 3 break the distribution down by type of HMO and the number of competing HMOs in each non-metropolitan county. Again, there are marked State by State differences in distribution of HMOs and the degree of potential competition among HMOs serving non-metropolitan areas. Figure 3 reiterates the point made by Table 1 that staff and group/network HMOs are present in a limited number of non-metropolitan counties and concentrated in a few States, including Ohio, Tennessee, Wisconsin, California, and Oregon.

Although HMOs have been extant for more than 20 years and were originally targeted for rural areas in the enabling Federal legislation, the spread into rural areas is considered to be a recent phenomenon (Knight, 1994; Lawrence, 1994; Christianson et al., 1986). Figures 4 and 5

indicate that the older HMOs are more likely to include non-metropolitan counties in their service and market areas than the newer organizations. These findings suggest that a substantial period of time elapses between the establishment of a plan in metropolitan areas and the subsequent spread of service areas into the adjacent rural counties.

Table 2 uses the Parker-Ghelfi Urbanicity Codes (Ghelfi et al., 1993) classification system to examine patterns of HMO service areas by non-metropolitan county location and city size. It is apparent that staff models, which are the more complex and resource-dependent type of HMOs, are an urban phenomenon. That pattern does not hold as well for group and network model HMOs, where 11 to 32 percent of the rural classification counties are included in service areas. The IPA HMOs include the greatest number of non-metropolitan counties in their service areas. Over 40 percent of the smallest and most isolated counties are included in a service area, which, though relatively fewer than the more adjacent and larger counties, indicates that the very small and remote counties are being considered and included in HMO markets. The nearly uniform decline

**Table 3**  
**Counties in Service Areas of HMOs Offering Coverage to Medicare Enrollees**

Urbanicity Code	n	Any HMO Service Area		HMO Covers Medicare	
		n	Percent	n	Percent
0 = Large Metropolitan	302	294	97	268	89
1 = Small Metropolitan	511	446	87	307	60
2 = Non-Metropolitan, Adjacent to Large Metropolitan	184	155	84	107	58
3 = Non-Metropolitan, Adjacent to Small Metropolitan	803	591	74	305	38
4 = Non-Metropolitan, Non-Adjacent, City > 10,000 Population	224	122	55	55	25
5 = Non-Metropolitan, Non-Adjacent, No City	1,047	520	50	154	15

NOTE: HMO is health maintenance organization.

SOURCE: (Group Health Association of America, 1993a).

in service area penetration by urbanicity code indicates that this classification system clearly captures market complexity.

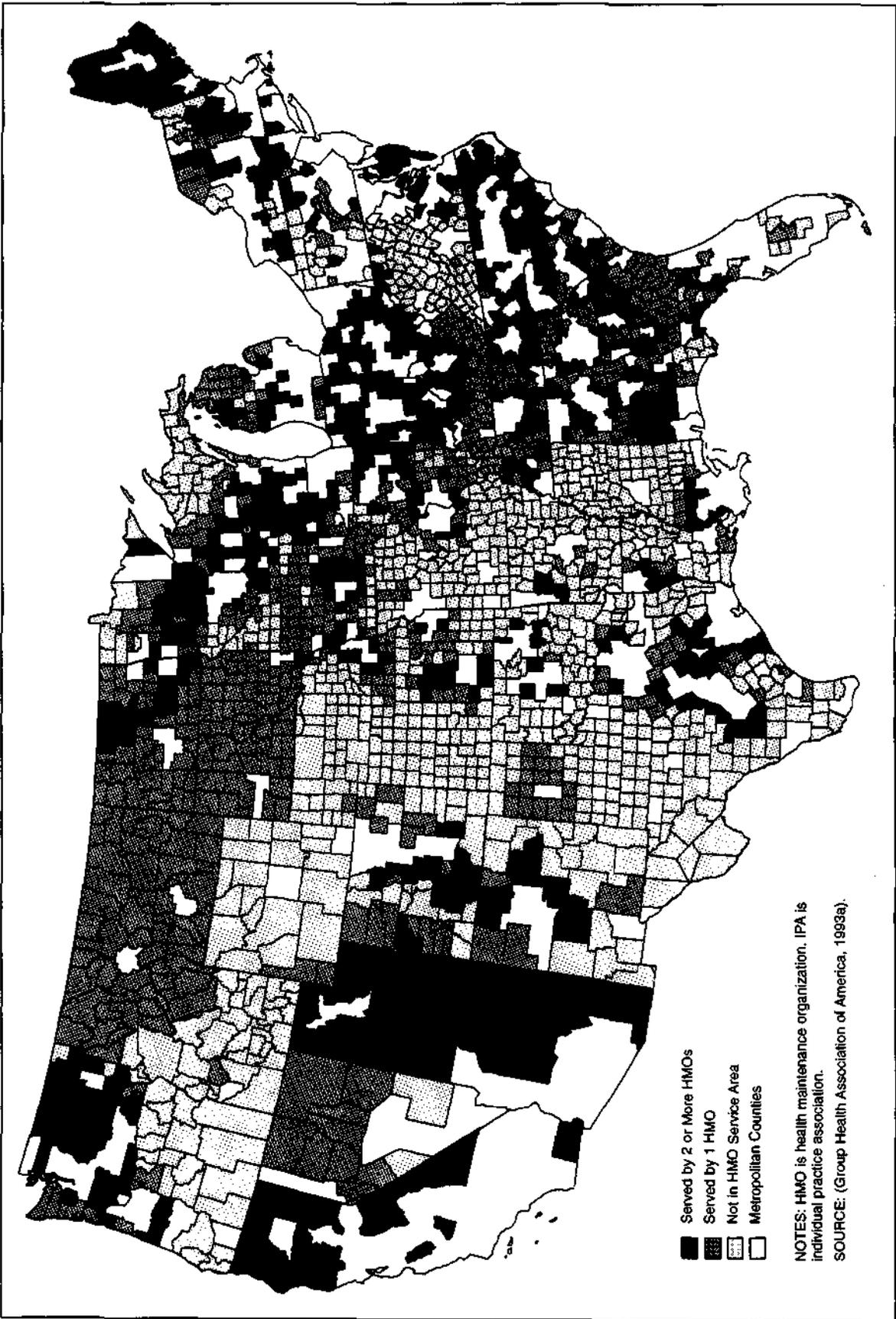
Recently, the Federal Government has turned to managed care in an attempt to stem the rise of costs in the Medicare program. The geographic distribution of HMOs which offer coverage for Medicare enrollees is mapped in Figure 6. HMOs which offer coverage to Medicare enrollees showed a strong State-specific distribution. Table 3 shows the pattern of geographic inclusion of Medicare beneficiaries by county type. Non-metropolitan counties which are adjacent to large metropolitan counties are more likely than other rural counties to be included in the service area of HMOs offering Medicare coverage.

The results of the reduced-form logistic regressions are summarized in Table 4. The two models, one estimating the probability of being in any HMO service area and one estimating the probability of service by a non-IPA HMO, are displayed side by side to allow for contrast between the two estimations. In general, the individual model results agreed with the informal hypotheses presented earlier, with some important exceptions. In both models, all classes of county urbanicity had a lower

probability of being in an HMO service area than the largest metropolitan counties, the reference or omitted category. Population was not significant but population density was a positive and significant predictor of service area inclusion. County economic characteristics were not significant, with the exception of unemployment, which was significantly associated with the risk of being in a non-IPA HMO service area. However, the proportion of minority county population was negatively correlated with the county being in an HMO service area. As expected, the greater the population in the largest adjacent county, the greater the odds that a county would be included in a service area.

The association between the dependent variable and the dummy variable that identified States that had early, relatively extensive, experience with HMOs was particularly interesting. Having this experience was significantly associated with decreased odds of being part of the service area of any HMO, but the odds of being in a service area of a staff, group, or network HMO were increased. Also unexpected was the result that counties that are or were a HPSA were more likely to be in an HMO service area (significant for all types of HMOs, only

**Figure 2**  
**Non-Metropolitan HMO Service Areas, Including IPAs: 1992**



**Table 4**  
**County Level Predictors of Inclusion in an HMO Service Area**

Variable	Included in Any HMO Service Area		Included in Non-IPA HMO Service Area	
	Odds Ratio	CL	Odds Ratio	CL
Small Metropolitan	**0.31	(0.14,0.65)	**0.48	(0.33,0.72)
Adjacent to Large Metropolitan	0.45	(0.19,1.05)	*0.58	(0.35,0.97)
Adjacent to Small Metropolitan	**0.23	(0.11,0.50)	*0.59	(0.39,0.91)
Non-Adjacent With City > 10,000	**0.11	(0.05,0.25)	**0.35	(0.20,0.61)
Population Non-Adjacent, No City	**0.14	(0.06,0.32)	**0.32	(0.19,0.53)
State Had HMOs Prior to 1980	**0.50	(0.41,0.61)	**1.74	(1.42,2.12)
Chronic HPSA, Part County	**1.50	(1.14,1.98)	1.03	(0.78,1.34)
Chronic HPSA, Whole County	**1.69	(1.22,2.34)	*1.61	(1.12,2.31)
HPSA Sometime Between 1978-90	*1.26	(1.01,1.59)	1.17	(0.92,1.49)
Medically Underserved Area, 1990	**1.02	(1.01,1.03)	**1.04	(1.03,1.05)
Log, Population 1990	0.94	(0.78,1.13)	0.96	(0.79,1.16)
Log, Population Density 1990	**1.42	(1.22,1.61)	**1.40	(1.12,1.62)
Log, Mean per Capita Income	1.34	(0.75,2.40)	1.65	(0.84,3.24)
Log, Percent Unemployed	0.92	(0.73,1.15)	**1.63	(1.24,2.16)
Log, Percent Minority	**0.88	(0.82,0.93)	**0.79	(0.74,0.85)
Log, Population in Largest Adjacent County, 1990	**1.38	(1.23,1.55)	**1.59	(1.42,1.79)
Percent Correctly Classified		73		78

\* p < 0.05

\*\* p < 0.01

NOTES: HMO is health maintenance organization. IPA is individual practice association. HPSA is health professional shortage area. CL is confidence level.

SOURCES: (Group Health Association of America, 1993a); Health Resources and Services Administration: Area Resource File.

significant for non-IPA in the counties which had persistent or chronic designation as HPSAs).

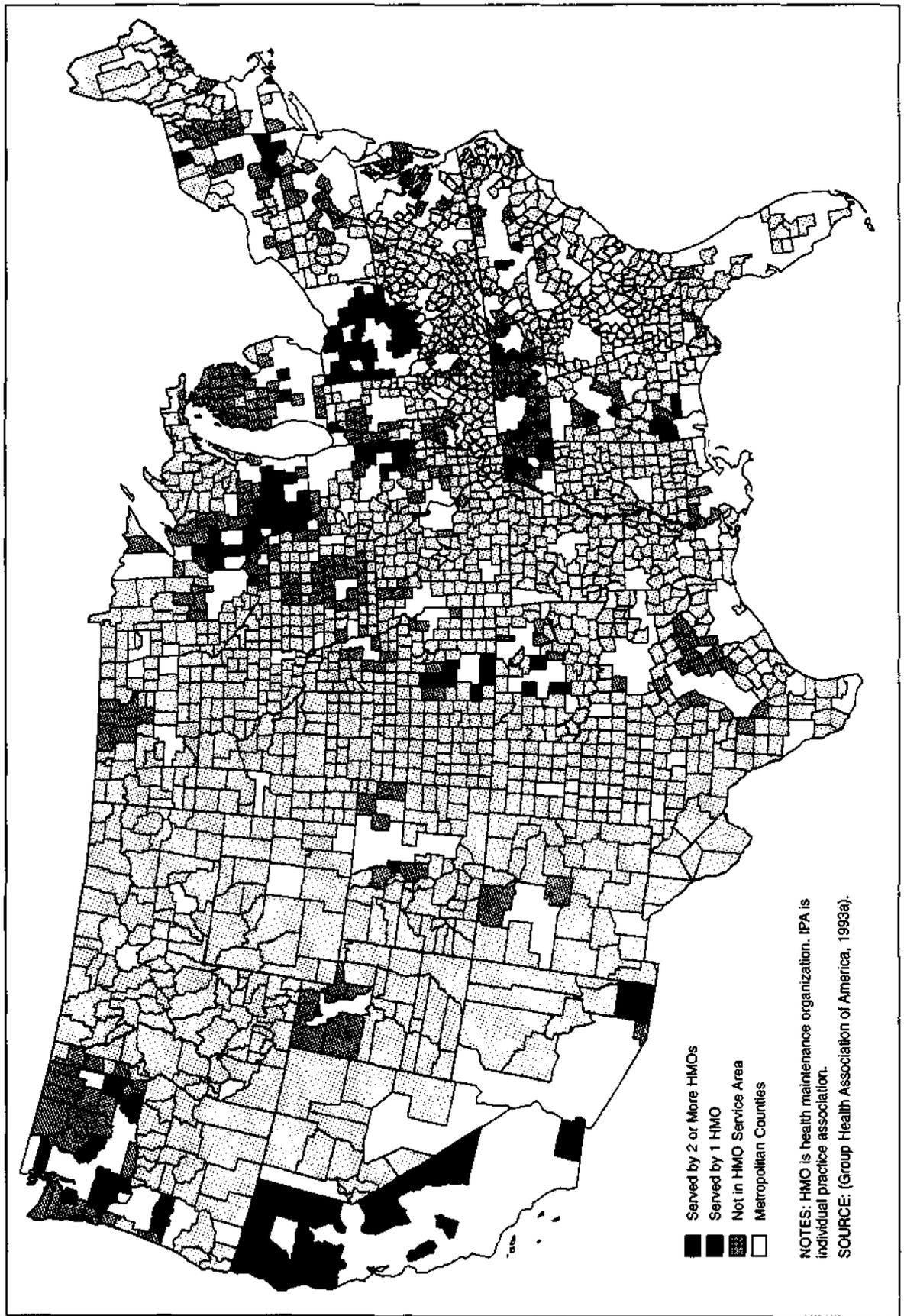
## CONCLUSIONS

The variable penetration of HMO service areas into non-metropolitan counties reflects differences in State regulatory environments and the importance of State boundaries in HMO market decisions. Companies which must meet the requirements of each State insurance regulator see differences in market opportunities from State to State. In addition to this insurance regulatory process, the policy environment for managed care reflects the extent to which individual States or State professional societies have encouraged or restricted group or corporate forms of health care delivery. There are also regional variations within and across States which influence decisions that are potentially more related to market potential than regulatory issues in some non-metropoli-

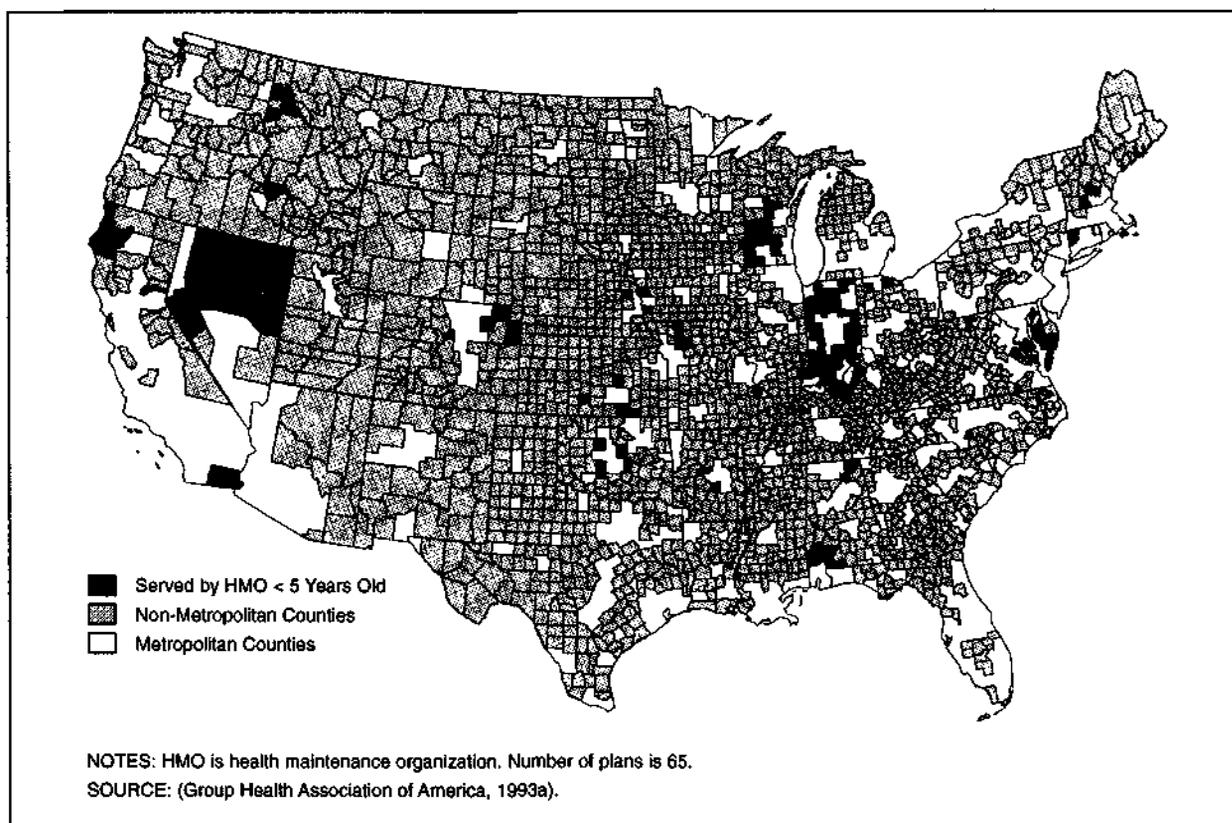
tan areas. Because the early and mid-term development of HMOs was restricted to specific regions—initially California and the West Coast, the upper Mid-West, Arizona, and selected cities—the pattern of expansion of HMO markets is uneven and highly dependent on the regulatory environment and the history of earlier HMO establishment.

Overall, it is clear that the managed-care industry sees a benefit to including many non-metropolitan communities in their service area; the inclusion of a substantial number of non-metropolitan counties in more than one HMO service area indicates that the direst prediction that all non-metropolitan areas will not benefit from competition-based financing systems (Kronick et al., 1994) may not be the case. However, the degree to which inclusion in a service area represents actual access to HMO services is not known; it is possible that a county which is included in a service area does not have an HMO provider, or has ready access only to primary-care providers.

**Figure 3**  
**Non-Metropolitan HMO Service Areas, Excluding IPAs: 1992**



**Figure 4**  
**Non-Metropolitan HMO Service Areas of Plans Less Than 5 Years Old: 1992**



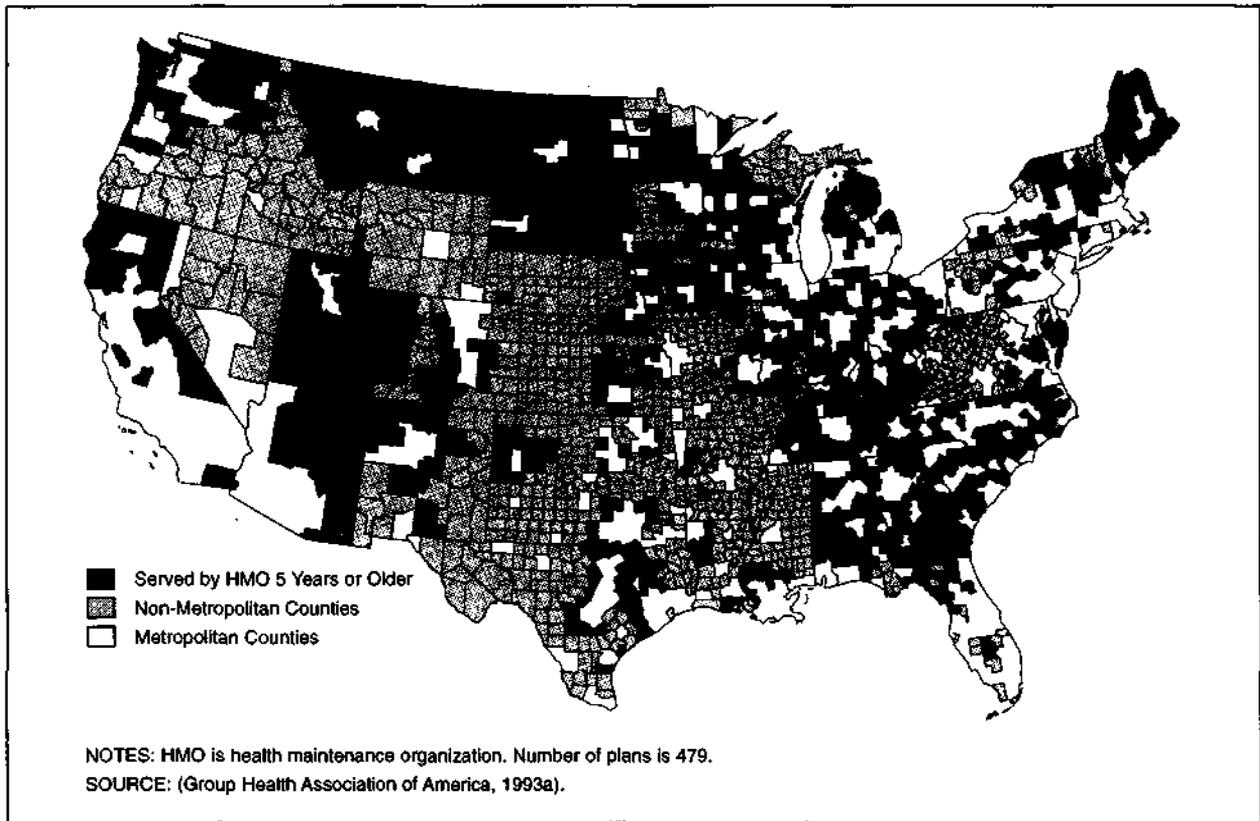
Even if a substantial number of rural counties in HMO service areas actually have reasonable access to service, there are still problems for these rural communities when it comes to being included in the managed-care market. The difference in penetration when IPAs are excluded from the analysis is stark. Given that the structure and operation of HMOs differ widely according to their model type (Luft, 1981), with staff-model HMOs requiring substantial capital and personnel investment, group or network HMOs requiring a range of infrastructure, and IPA or preferred provider organization (PPO) models requiring minimal capital or organizational structure, the lack of penetration of non-IPA HMO service areas into rural counties is not surprising. The finding implies that, while many rural areas may participate in managed-care systems, the choice of

model type available to either employers or individuals may be limited.

The least populous and most remote counties are not at all likely to be included in HMO markets. The two most rural classes of counties include 22.3 million people; 55 percent of those (12.3 million) are in counties that are not served by HMOs. An additional 5.5 million people in the other two non-metropolitan county classifications were not included in any HMO service area in 1992. If managed care is the guarantor of reasonable cost savings, then 17.8 million rural Americans may not be able to benefit from this market-driven advantage.

It is important to note that these population estimates may either understate or overstate the current population that actually has access to HMO services. To the extent that the inclusion of a county in a

**Figure 5**  
**Non-Metropolitan HMO Service Areas of Plans 5 Years or Older: 1992**



service area does not necessarily represent easy access to an HMO provider, the population estimates understate the number of people who could reasonably choose HMO coverage. However, this tendency of service areas to understate actual coverage could be somewhat offset by the rapid expansion occurring in the HMO market. As HMOs expand their markets over time, many of the counties that were designated as service areas but did not have reasonable access to providers in 1992 may now have such access.

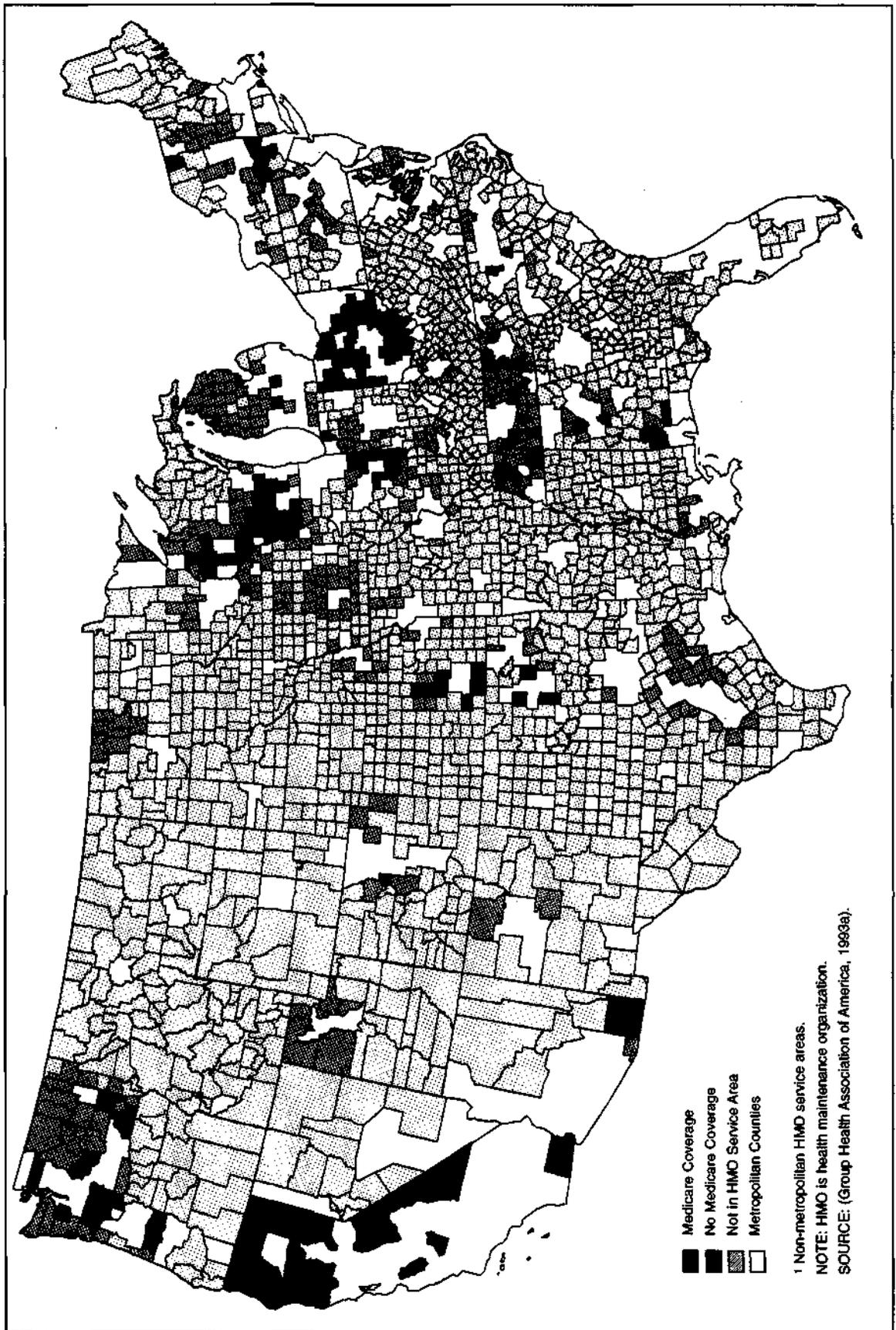
The process of selection of rural counties for inclusion in HMO markets is not necessarily clarified by the multivariate analysis previously described. It makes sense that more populous and wealthier areas are more likely to be targeted as markets for an insurance product. But the general propensity for counties in an HMO service area to be more

often identified as areas with shortages of professionals does not fit the notion of a desirable market. When that factor is combined with the negative relationship between HMO market inclusion and the proportion of the population minority, it might seem that the inclusion of underserved areas may be selective. When HMOs make their market plans they may avoid areas with fundamental problems in their social and economic makeup, but may serve areas that have effective demand for services that might be met by providers in adjacent counties.

#### ACKNOWLEDGMENTS

The authors would like to thank Hilda A. Howard for substantial help with data file construction. We also thank three anonymous reviewers who provided very useful suggestions to improve the article.

**Figure 6**  
**HMO Coverage for Medicare Enrollees:<sup>1</sup> 1992**



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