

Geographic Distribution of Family Practice Residency Graduates: The Experience of Three Statewide Networks

John P. Geyman, MD, Edward W. Ciriacy, MD, Fitzhugh Mayo, MD, Maurice Wood, MD, and Daniel C. Cherkin, PhD

Seattle, Washington, Minneapolis, Minnesota, and Richmond, Virginia

It is widely recognized that geographic maldistribution among physicians constitutes a serious national problem even though the aggregate number of practicing physicians has increased greatly in recent years. Geographic maldistribution exists in terms of both total numbers of physicians and their distribution by specialty. Over 45 million Americans live in areas where the delivery of health services is inadequate or nonexistent, at least 120 rural counties are without a physician, and many people in the cities find that private physicians are unavailable.¹ There has been a strong tendency in many specialties to establish practice in populous, high income areas of the country. For example, the state of New York has the highest density of physicians-to-population in the United States,² and, in 1970, 22 percent of all the nation's psychiatrists practiced in that state.³

It has been assumed by many that the specialty of family practice will have a direct and positive impact upon the complex problem of geographic maldistribution of physicians. This is a reasonable assumption in view of the commitment of the field to primary care of families in varied settings and the generalist training and orientation of family physicians. To date, however, the actual experience of family practice residency graduates in this respect has not been systematically examined.

With this specialty now ten years old, it is both timely and possible to test the assumption that family physicians will locate where they are needed, and this is the purpose of this paper.

As noted previously, similar questions and reporting methods were used in the three follow-up studies for family practice residents graduating from the statewide networks of the University of Minnesota, the Medical College of Virginia, and the University of Washington. The results of these studies have been reported in companion papers for field of practice, nature of practice, hospital privileges, personal and professional satisfaction, and preparation for practice.⁴⁻⁶ The practice locations of graduates from these three networks, however, were summarized only briefly. This paper will analyze the patterns of geographic distribution of these graduates and relate these patterns to available national data.

Methods

The current location of graduates from the three residency networks was obtained from updated mailing lists maintained by each network. The population of the community in which the graduates were practicing was estimated using data from the 1979 Statistical Abstract of the United States, published by the US Census Bureau. In addition, the 1979 Area Resource File (US Department of Commerce) was used to determine whether or not graduates were practicing in Standard Metropolitan Statistical Areas (SMSAs). The proportion of graduates located in SMSAs and non-SMSAs was compared to (1) the distribution of the general population in these areas as derived from esti-

Dr. Geyman is Professor and Chairman, Department of Family Medicine, University of Washington, Seattle, Washington. Dr. Ciriacy is Professor and Head, Department of Family Practice and Community Health, University of Minnesota, Minneapolis, Minnesota. Dr. Mayo is Professor and Chairman, and Dr. Wood is Professor and Director of Research, Department of Family Practice, Medical College of Virginia, Richmond, Virginia. Dr. Cherkin is Research Associate, Department of Family Medicine, University of Washington, Seattle, Washington.

Table 1. Distribution of Graduates (1970-1979) by Population of Community of Practice

	<2,500		2,501-25,000		25,001-50,000		50,001-100,000		>100,000		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
University of Minnesota	26	13.1	90	45.2	39	19.6	7	3.5	37	18.6	199*	100.0
Medical College of Virginia	44	25.3	66	37.9	9	5.2	9	5.2	46	26.4	174*	100.0
University of Washington	23	14.4	55	34.4	20	12.5	6	3.7	56	35.0	160*	100.0
Total	93	17.4	211	39.6	68	12.8	22	4.1	139	26.1	533*	100.0

*N is total of all graduates

Table 2. Community and Type of Practice for Affiliated Program Graduates—University of Minnesota

Type of Practice	Population of Community of Practice					Suburb	Total Number	Percent
	0-2,500	2,501-25,000	25,001-50,000	50,001-100,000	Over 100,000			
Fee-for-Service								
Solo	1	2	1	0	2	4	10	6.2
Partnership	2	4	1	1	0	6	14	8.7
Single Specialty	7	25	2	4	12	15	65	40.4
Multispecialty	2	26	4	1	1	10	44	27.3
Health Maintenance Organization	0	0	1	1	3	7	12	7.5
Other*	2	2	1	1	8	2	16	9.9
Total Number	14	59	10	8	26	44	161**	100.0
Percent	8.7	36.6	6.2	5.0	16.2	27.3	100.0	100.0

*Teaching (5), Military (5), Emergency Room (2), Indian Health Service (2), Community Clinic (1), Consumer-Run (1)
 **N is graduates completing the questionnaire

mates made by the US Census Bureau for 1978; and (2) the distribution of medical school graduates in these areas as reported by the Center for Health Services Research and Development of the American Medical Association. Uniformly collected data from the follow-up studies of residency graduates (described elsewhere)⁴⁻⁶ were used to examine the relationship between population of community of practice and type of practice.

Comparisons were made between the geographic distribution patterns of graduates from the three statewide family practice residency networks and the distribution of family practice residency graduates nationally as reflected by the recently completed graduate follow-up studies by

the American Academy of Family Physicians.⁷ Additional comparisons were drawn between the retention of network graduates in their respective states, and corresponding retention figures for all medical school graduates of these three schools as of December 1973.

Results

Distribution by Population of Community of Practice

The distribution of the graduates of the three statewide residency networks from 1970 to 1979 is shown in Table 1 in terms of population of com-

Table 3. Community and Type of Practice for Graduates of Medical College of Virginia Residency Training System

Type of Practice	Population of Community of Practice					Suburb	Total Number	Percent
	0-2,500	2,501-25,000	25,001-50,000	50,001-100,000	Over 100,000			
Fee-for-Service								
Solo	7	13	1	0	3	2	26	21.5
Partnership	7	20	1	3	4	5	40	33.1
Single Specialty	5	15	2	3	8	4	37	30.6
Multispecialty	0	1	1	0	0	0	2	1.6
Health Maintenance Organization	0	0	0	0	0	0	0	0
Other*	0	2	1	8	4	1	16	13.2
Total Number	19	51	6	14	19	12	121**	100.0
Percent	15.7	42.1	5.0	11.6	15.7	9.9	100.0	100.0

*US Public Health Service—Alaska Native Health Service (1), Emergency Room (8), Teaching (6), County Health Department (1)
 **N is graduates completing the questionnaire

munities of practice. A wide distribution by community size is evident for all three groups. It is of interest that an average of 17 percent of graduates located in small towns of less than 2,500 people, with an average of 57 percent locating in communities of less than 25,000 in population. On the other side of the scale, over one quarter of the graduates are practicing in cities with more than 100,000 people.

Correlation of Size of Community with Type of Practice

Tables 2 to 4 display correlations for community size and type of practice for graduates of the Minnesota, Virginia, and Washington networks, respectively. In each instance, single specialty group practice is the most common practice mode. Of interest is the comparatively high proportion of Minnesota graduates in multispecialty group practice, especially in communities with populations between 2,500 and 25,000 and suburbs. Solo practice is uncommon, particularly in towns with less than 2,500 people. Health maintenance organizations, as could be expected, include graduates primarily in the larger communities.

Relation of Practice Locations to Standard Metropolitan Statistical Areas (SMSAs)

Tables 5 to 7 present interesting information comparing the practice locations of the network graduates in terms of SMSAs* and non-SMSAs, with further comparisons with the distribution of all graduates of each medical school as of December 1973 (Table 6) and the general population (Table 7). Taken together, these tables show that (1) approximately two thirds of network graduates have established practice in metropolitan areas, with about one third locating in rural areas, (2) family practice residency graduates from these networks have opted more often for rural practice than had all graduates from their respective medical schools in 1973, and (3) the distribution of family practice residency graduates closely parallels

*Current criteria adopted in 1976 provide that each SMSA must include: (1) at least one city with 50,000 inhabitants, or (2) a city with at least 25,000 inhabitants which together with contiguous places (incorporated or unincorporated) having population densities of at least 1,000 persons per square mile, has a combined population of 50,000 and constitutes for general economic and social purposes a single community provided that the county or counties in which the city and contiguous places are located has a total population of at least 75,000 (in New England the cities and towns qualifying for SMSA must have a total population of at least 75,000)

Type of Practice	Population of Community of Practice					Suburb	Total Number	Percent
	0- 2,500	2,501- 25,000	25,001- 50,000	50,001- 100,000	Over 100,000			
Fee-for-Service								
Solo	1	9	2	2	6	1	21	17.6
Partnership	2	7	2	0	1	0	12	10.1
Single Specialty	2	18	6	0	6	7	39	32.8
Multispecialty	1	2	1	1	0	1	6	5.0
Health Maintenance Organization	0	0	0	0	10	2	12	10.1
Other*	3	8	2	5	10	1	29	24.4
Total Number	9	44	13	8	33	12	119**	100.0
Percent	7.6	37.0	10.9	6.7	27.7	10.1	100.0	100.0

*National Health Service Corps (8), Emergency Room (8), Teaching (5), Military (2), Indian Health Service (2), Industry (1), Mental Health Center (1), County Health Department (1), Veterans Administration (1)
**N is graduates completing the questionnaire

Network	Non-SMSA		SMSA		Total	
	No.	%	No.	%	No.	%
University of Minnesota	79	39.7	120	60.3	199*	100.0
Medical College of Virginia	52	29.9	122	70.1	174*	100.0
University of Washington	63	39.4	97	60.6	160*	100.0
Total	194	36.4	339	63.6	533*	100.0

*N is total of all graduates

	All Graduates of Medical School (%)	Family Practice Network Graduates (%)
University of Minnesota	79.2	60.3
Medical College of Virginia	72.1	70.1
University of Washington	83.1	60.6

State	Percent of Population in SMSA	Percent of Counties in SMSA
Minnesota	64	18
Virginia	66	66
Washington	71	21

*Based on estimates made by US Census Bureau for 1978

School	Network Graduates in State		Network Graduates in Region		All Medical School Graduates in State††
	No.	%	No.	%	%
University of Minnesota	131	64.5	156	76.8*	48.1
Medical College of Virginia	114	65.5	135	77.6**	41.9
University of Washington	113	74.8	131	80.9†	42.1

*Includes Wisconsin (19), Iowa (4), North Dakota (2), and South Dakota (0)
 **Includes North Carolina (12), Tennessee (3), District of Columbia (3), Maryland (1), West Virginia (1), and Kentucky (1)
 †Includes Montana (6), Idaho (10), and Alaska (3)
 ††Based on 1973 studies by American Medical Association for proportion of all active medical school graduates in state of predoctoral education⁸
 Note: Two University of Washington and four University of Minnesota network graduates were abroad, and were excluded from these figures

the distribution of the general population in their respective states.

The findings in Virginia bear further comment. Although 57.8 percent of the graduates from the Medical College of Virginia's network are now practicing in towns of less than 25,000 people (Table 3), 70 percent of them are located in SMSAs (Table 6). This apparent discrepancy is explained by geographic considerations particular to Virginia whereby there are fewer rural counties (in non-SMSA terms) in Virginia than in Minnesota and Washington (Table 7). Thus, while Medical College of Virginia network graduates tend to practice in smaller communities than network

graduates from the University of Washington, they seem to be closer to metropolitan areas.

Retention in State and Region

Table 8 demonstrates high levels of retention within the state of graduate training and the contiguous states adjacent to the three family practice residency networks. It is readily apparent that about two thirds of network graduates (three quarters in the case of Washington) remained in their respective states for practice, with substantially larger numbers remaining within the region. No corresponding figures are available for state re-

tention of residency graduates in all fields, but the retention of medical school graduates in these states was substantially lower in 1973.

Comment

The patterns of geographic distribution of the graduates of the three statewide family practice residency networks in Minnesota, Virginia, and Washington represent direct and effective responses to the problems of geographic maldistribution of physicians in these states. That these findings are more typical than atypical of the distribution patterns of family practice residency graduates nationally is demonstrated by the results of the recently completed national survey of residency graduates conducted by the American Academy of Family Physicians.⁷ This survey found that 58 percent of the 3,021 respondents are practicing within SMSAs with 38.1 percent in non-SMSAs, reflecting substantial representation of graduates in rural areas. This finding closely parallels the experience of the three statewide residency networks in Minnesota, Virginia, and Washington where an average of 36.4 percent of graduates established practice in non-SMSAs. In contrast, in 1973 approximately 85 percent of all physicians were located in SMSAs, with only 14 percent in non-SMSAs.⁸

Although many graduates of family practice residency programs have gravitated to rural areas, a large number of graduates have located their practices in metropolitan areas of all sizes. For example, about one quarter of the network graduates in Minnesota, Virginia, and Washington now practice in communities with populations over 100,000 people. Nationally, about one quarter of 3,021 responding family practice residency graduates practice in counties of metropolitan areas of 250,000 to 1,000,000 in population, and an additional 15 percent practice in core counties of greater SMSAs with populations over 1,000,000 people.⁷

In summary the following conclusions can be drawn from these studies:

1. Family practice residency graduates in the statewide networks in Minnesota, Virginia, and Washington are well represented in all types of communities, and gravitate to smaller and non-

metropolitan areas more than other physicians.

2. Differences in geographic distribution of the graduates from these three statewide networks, as well as from all US family practice residencies, are relatively minor.

3. Retention rates are high in the states and contiguous states where graduates completed their residency training; these retention rates are consistently higher than were those for all medical school graduates in these states in 1973.

4. A larger majority of the graduates are in partnership or group practice; only rarely is a graduate in solo practice in a community smaller than 2,500 in population, where a solo family physician would be at highest risk to develop an uncontrolled practice without a satisfactory coverage system involving other physicians.

5. Ten years of experience in graduate education for family practice in Minnesota, Virginia, and Washington have demonstrated definite and sustained impact on the problems of geographic maldistribution of physicians in their states and contiguous areas. These findings confirm the original assumptions and hopes that family practice residency programs would effectively address this problem.

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