The Effect of the Organization and Status of Family Practice Undergraduate Programs on Residency Selection

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Family practice, as a medical specialty, is designed to help fill the void in primary care availability. In order to expose medical students to family practice and provide a basis for choosing a residency in the field, many medical schools have developed undergraduate programs in family practice. This paper reports the results of a survey conducted in March 1975 on the status of undergraduate programs with particular focus on the relationships between administrative status, size of program, faculty size, and type of undergraduate curricula to the number of graduates choosing family practice as a specialty. The data indicate that there is a relationship between the commitment of the school to family practice, the size of the program, and the presence of required courses in the curriculum to the success of the program, as measured by the proportion of students in each school who choose family practice residencies.

One of the most serious problems besetting the health-care system is the chronic shortage and maldistribution of physicians delivering primary care and the fragmentation of care as a byproduct of increased specialization. A serious shortage of these physicians exists and has been growing steadily worse. The shortage of physicians delivering primary care reached crisis proportions in the 1950s. In 1900 there was one general practitioner for every 600 people. Today there is only one for every 3,000 people. The ratio of general practitioners/family physicians to other specialists has been completely reversed in the last 40 years, from approximately 80 percent general practitioners to 20 percent specialists in 1930 to about 17 percent to 83 percent today. The shortage of general practitioners becomes even more serious when we consider that almost half of all of the physicians in general practice/family practice are over 55 years of age.[1] The ratio of all primary care physicians (general practitioners, pediatricians, internists, obstetricians, and gynecologists) declined from 65 per 100,000 population in 1966 to 59 per 100,000 in 1970.[2]

Increased specialization has resulted in the lack of physicians to act as physicians of the family and to coordinate the care received from the various specialties in a manner that is relevant to the needs of the family. This lack of coordination has been criticized by lay persons and professionals alike as a partial cause of public discontent and of rising costs of medical care. Family practice, as a medical specialty, is designed to fill the void in primary care availability.

Congress has recognized the problems of the availability and distribution of primary care physicians. Under the authority of Section 767 of the Comprehensive Health Manpower Training Act of 1971, an attempt has been made to encourage the development, expansion, and upgrading of residency programs in family practice. Over $33.5 million has been expended through this program in an effort to increase the pool of available family physicians. Legislation has resulted in increased federal pressure on medical schools to develop departments or administrative units of family practice. All these pressures are forcing family practice to come to maturity at a much faster rate than has been the case with any other medical specialty.

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Table 1. Relationships Between Type of Administrative Unit and Other Organizational Aspects of Family Practice Units

Year Unit Created

Administrative Unit	1969 and before %	1970-1972 %	1973-1975 %	N
Department	14.3	53.6	32.1	56
Division	23.1	23.1	53.8	13
Other	16.7	33.3	50.0	6
N	12	35	28	75*

Medical Specialty of Chairman

Administrative Unit	Family Practice %	Other %	N
Department	79.6	20.4	54
Division	58.3	41.7	12
Other	16.7	83.3	6
N	51	21	72

Rank of Chairman

Administrative Unit	Professor %	Associate Professor %	Assistant Professor %	Instructor %	N
Department	78.2	20.0	1.8	0.0	55
Division	33.3	25.0	33.3	8.3	12
Other	66.7	33.3	0.0	0.0	6
N	51	16	5	1	73

*Throughout this paper the total number of responses varies in terms of the number of schools answering certain sections of the questionnaire.

Table 2. Academic Rank of Chairman and Total Full-Time Equivalents

Academic Rank of Chairman	Total Full-Time Equivalents 0-2 %	3-5 %	6-9 %	10-15 %	16+ %	N
Professor	7.8	19.6	17.6	21.6	33.3	51
Associate Professor	12.5	31.3	18.8	25.0	12.5	16
Assistant Professor	0.0	20.0	20.0	20.0	40.0	5
Instructor	0.0	100.0	0.0	0.0	0.0	1
N	6	17	13	16	21	73

The growth of family practice residencies has been truly phenomenal. At the end of 1969, there were only 30 approved residency training programs. By July 1, 1976, there was a total of 290 approved residency training programs.[3]

In order to expose medical students to family practice and provide a sound basis for choosing a residency in the field, many medical schools have developed undergraduate programs in family practice. An analysis of applicants to family practice residency programs indicates that public and private schools with departments of family practice have a higher percentage of graduates applying for family practice residencies.[4]

In order to determine the status of undergraduate family practice programs in the United States and Canada, a survey was conducted under the auspices of the American Academy of Family Physicians and the Society of Teachers of Family Medicine.

This paper is a product of that survey and will report on the status of undergraduate programs with particular focus on the relationships between administrative status, size of program, faculty size, and type of undergraduate curricula time and their effect on the number of graduates choosing family practice as a specialty.

Method

In March 1975, a predominately open-ended questionnaire was developed and mailed to 85 medical schools in the United States and 12 medical schools in Canada which had undergraduate programs in family medicine.

There was an 88 percent return from the United States schools with 75 of the 85 questionnaires being completed. All 12 of the Canadian schools returned the questionnaires resulting in an overall return rate of 89.7 percent.

The material available from the questionnaire has been categorized into variables related to organizational aspects of the program, size of the program, and curriculum. The specific variables that make up the categories are as follows:

1. Organizational – (a) age of program, (b) administrative title of unit, (c) medical specialty of chairman, and (d) academic rank of chairman.
2. Size – made up of several variables enumerating the size of the full-time and part-time faculty and staff in terms of full-time equivalents (FTEs).
3. Curriculum – (a) required preclinical courses, (b) required clerkships, (c) required preceptorships, (d) number of students taking elective clerkships, and (e) elective preceptorships.

Results

For purposes of this paper the results from the Canadian schools are not reported. It was found that for most of the analyses performed, the number of Canadian schools was too small for meaningful interpretation of the data.

The findings are first presented by describing the relationships found among the variables making up the organizational category. Then, logical relationships among the organizational aspects, the size of programs, and the curricula in medical schools are presented. Finally, the associations between the organizational, size, and curricular characteristics of the family practice programs and the proportion of students selecting family practice residencies are explored.

Organizational Aspects of Family Practice Programs

The variables that the authors have designated as "organizational" indicate

Table 3. Type of Administrative Unit and Total Full-Time Equivalents

Administrative Unit	Number of Full-Time Equivalents 0-2 %	3-5 %	6-9 %	10-15 %	16+ %	N
Department	7.1	21.4	12.5	26.8	32.1	56
Division	15.4	30.8	30.8	0.0	23.1	13
Other	16.7	16.7	33.3	16.7	16.7	6
N	7	17	13	16	22	75

Table 4. Relationships Between Type of Administrative Unit and Curriculum

	% Yes	% No	N
Required Preclinical Courses			
Department	82.0	18.0	50
Division	44.4	55.6	9
Other	20.0	80.0	5
N	46	18	64
Required Clerkships			
Department	35.8	64.2	53
Division	23.1	76.9	13
Other	0.0	100.0	6
N	22	50	72
Required Preceptorships			
Department	22.2	77.8	54
Division	15.4	84.6	13
Other	16.7	83.5	6
N	15	58	73

the general emphasis that the medical school puts on its family practice program. Table 1 presents the interrelationships among some of the organizational variables. Most of the US programs are organized as departments and most were created between 1970 and 1972. About one half of the divisions or other types of units were created between 1973 and 1975. This may support the idea that when units are created they may be designated as "divisions" or "programs" within another academic unit and then gain departmental status as they mature.

The type of administrative unit does seem to be related to the medical specialty of the chairman and the academic rank of the chairman. In departments almost 80 percent of the chairmen have a specialty in family practice, while the proportion drops to about 60 percent in divisions, and less than 17 percent in other types of administrative units. The academic rank of the chairman presents a mixed picture. Chairmen of departments are much more likely to be full professors with very few at the assistant professor level. However, the heads or chairmen of divisions are fairly equally divided among the three professorial ranks with about eight percent at the instructor level. The "other" category, in which the units are primarily classified as "programs," has two thirds of its chairmen at the full professor level with the remainder as associate professors.

Table 5. Academic Rank of Chairman and Aspects of Curriculum

Academic Rank	% Yes	% No	N
Required Preclinical Courses			
Professor	84.1	15.9	44
Associate Professor	42.9	57.1	14
Assistant Professor	75.0	25.0	4
Instructor	0.0	100.0	1
N	46	17	63
Required Clerkships			
Professor	39.6	60.4	48
Associate Professor	6.3	93.8	16
Assistant Professor	20.0	80.0	5
Instructor	100.0	0.0	1
N	22	48	70
Required Preceptorships			
Professor	20.4	79.6	49
Associate Professor	18.8	81.3	16
Assistant Professor	40.0	60.0	5
Instructor	0.0	100.0	1
N	15	56	71

Relationships between Organizational Aspects and Size of Programs

As a measure of size of a unit, it is useful to look at the total number of FTEs who are employed. As might be expected, units in which the chairman is a full professor tend to be larger (Table 2). The only exception to this trend is in the assistant professor category where 40 percent are in the largest category. However, the small number of programs in this category should be noted. Although not presented in this paper, this general relationship holds when the number of FTEs is broken down into faculty and staff categories.

In general, the relationship between the type of administrative unit and number of FTEs is the same as described above (Table 3). Departments tend to be larger than divisions or other types of units. This relationship is expected from the data already presented and the consistency of the interrelationships is reassuring.

Table 6. Type of Administrative Unit and Proportion of Students Choosing Family Practice Residencies

Administrative Unit	Proportion Choosing Family Practice 0-10%	11-20%	21-30%	34-40%	N
Department	10.6	51.1	27.7	10.6	47
Division	66.7	22.2	11.1	0.0	9
Other	50.0	50.0	0.0	0.0	6
N	14	29	14	5	62

Relationships between Organizational Aspects of Units and Curriculum

Curriculum time in medical schools is traditionally a scarce commodity, and the amount and type of curricular time obtained by a new discipline within a medical school is often a key indicator of the commitment of the school to the specialty.

Family practice units were asked to indicate whether they taught required preclinical courses in the curriculum and, if they had clerkships and preceptorships, were they required, elective, or both? Table 4 presents the responses to these questions in relationship to the type of administrative unit. The schools that responded to these questions indicate that units with the title of "department" are much more likely to have obtained required preclinical curricular time. While it seems that a distinct minority of units have obtained required clerkships and preceptorships, it is obvious from Table 4 that departments are more likely to have required preceptorships and even more likely to have required clerkships than divisions or other units. Although the data are not presented here in order to conserve space, departments are more likely to have a greater number of students electing to take the elective clerkships and preceptorships.

Table 5 presents the responses to the curriculum questions by the academic rank of the chairman. Here we find that the higher the academic rank of the chairman, the more likely the unit has obtained required preclinical time and the more likely it is to have required clerkships and preceptorships. The relationships between type of administrative unit and academic rank of chairman presented in Table 1 lend consistency to the data. The number of responses to these questions does not allow a further analysis of which variable – academic rank or type of administrative unit – is more powerful, but the cells in which there are enough numbers indicate that there is a compounding effect, ie, departments with full professor chairmen are more likely to have required curriculum time than departments with chairmen of a lower rank.

Table 7. Academic Rank of Chairman and Proportion of Students Choosing Family Practice Residencies

Academic Rank	Proportion Choosing Family Practice 0-10%	11-20%	21-30%	31-40%	N
Professor	16.3	41.2	20.9	11.6	43
Associate Professor	14.3	50.0	35.7	0.0	14
Assistant Professor	100.0	0.0	0.0	0.0	3
Instructor	100.0	0.0	0.0	0.0	1
N	13	29	14	5	61

Associations between the Organizational, Size, and Curricular Characteristics and the Proportion of Students Selecting Family Practice Residencies

If one of the purposes of undergraduate programs is to encourage the selection of residencies in the specialty, then a measure of success is the number of graduates who select that

Table 8. Number of Full-Time Salaried Family Physicians and Proportion of Students Choosing Family Practice Residencies

Number of Full-Time Family Physicians	Proportion Choosing Family Practice 0-10%	11-20%	21-30%	31-40%	N
0-2	35.0	40.0	25.0	0.0	20
3-5	20.8	58.3	20.8	0.0	24
6-9	0.0	53.8	15.4	30.8	13
10+	40.0	0.0	40.0	20.0	5
N	14	29	14	5	62

Table 9. Total Number of FTEs in Family Practice Unit and Proportion of Students Choosing Family Practice Residencies

Total FTEs	Proportion Choosing Family Practice 0-10%	11-20%	21-30%	31-40%	N
0-2	60.0	0.0	40.0	0.0	5
3-5	18.8	43.8	37.5	0.0	16
6-9	18.2	72.7	9.1	0.0	11
10-15	0.0	53.8	23.1	23.1	13
16+	35.3	41.2	11.8	11.8	17
N	14	29	14	5	62

specialty. The schools were asked to indicate the number of their graduates each year who select family practice residencies. The size of the school was controlled for by computing the proportion of all graduates of the school who selected family practice residencies. These proportions were then grouped by deciles and run as the dependent variable with the various characteristics of the family practice units. It was found that none of the schools responding succeeded in encouraging more than 40 percent* of their graduates to select family practice residencies.

Table 6 indicates that departments are more likely to have students choosing family practice residencies, with other types of units seemingly less successful.

Table 7 indicates that the academic rank of the chairman does have a relationship to the proportion of students choosing family practice, but the threshold seems to be between the associate professor and assistant professor levels, with full professor chairmen having slightly more success than chairmen at the associate professor level.

There also seems to be a threshold level between the number of full-time salaried family physicians in a unit and the proportion of students selecting family practice residencies (Table 8). It seems that units with five or less full-time salaried family physicians have proportionately fewer students choosing family practice residencies. When all other faculty and staff are added into the relationship to come up with the total FTEs (Table 9), a similar pattern emerges with the threshold moving up to nine or less FTEs having less success in motivating students to choose family practice residencies.

Required clerkships and preceptorships in the curriculum, although existing in a minority of the schools, are related to the proportion of students choosing family practice residencies (Table 10). Schools in which clerkships are required are much more likely to report a higher proportion of students selecting family practice residencies. The relationship does not appear to be as strong for required preceptorships.

Because of the complexity of the interrelationships presented in this paper along with the confounding effects of the size of the schools involved, it was decided to submit the data to a stepwise multiple regression technique in order to isolate the effects of size. It is unfortunate that much of the available data is categorical in nature and does not meet the assumptions of the multiple regression technique. The variables that meet the assumptions are displayed in Table 11. As expected, the variable explaining the most variance in the number of students selecting family practice residencies is the total number of graduates of the school (R^2 = .50931 or about 51

*Caution should be used in interpreting data from this section in that many students may have chosen family practice but, due to a shortage of residency positions were not matched. Thus, some schools may have been more successful in stimulating interest in family practice than the data indicate.

percent of the variance explained). The number of full-time salaried family physicians appeared in the equation next, with an additional change in R^2 of about 13 percent which raises the multiple R to .80170. The last variable to enter the equation that produces a significant change in the R^2 is the academic staff size of the family practice unit. The three variables produce a multiple R of .82322 and explain approximately 68 percent (R^2) of the variance. The next two variables to enter the equation did not reach significance, but did increase the multiple R to .82918.

Thus, it seems that the size of the family practice faculty is related to the number of students choosing family practice residencies. We cannot say anything definite about the type of administrative unit, the academic rank of the chairman, or the curriculum, but the interrelationships demonstrated in the preceding tables would indicate that they too may be related to choice of specialty and might even have additive effects when explaining student choice of residency.

Table 10. Aspects of Curriculum and Proportion of Students Choosing Family Practice Residencies

		Proportion Choosing Family Practice				
		0-10%	11-20%	21-30%	31-40%	N
Clerkship Required	% Yes	20.0	40.0	13.3	26.7	15
	% No	22.7	47.7	27.3	2.3	44
	N	13	27	14	5	49
Preceptorship Required	% Yes	11.1	44.4	33.3	11.1	9
	% No	23.5	47.1	21.6	7.8	51
	N	13	28	14	5	60

Table 11. Stepwise Multiple Regression on Number of Students Choosing Family Practice Residencies

Variables	Multiple R	R^2	Change in R^2	Significance
1. Total graduates of school	.71366	.50931	.50931	$p<.001$
2. Full-time salaried family physicians	.80170	.64272	.13341	$p<.001$
3. Academic staff size	.82322	.67769	.03497	$p<.05$
4. Part-time FTE (other faculty)	.82694	.68383	.00614	NS
5. Part-time FTE (family physicians)	.82918	.68754	.00371	NS

Conclusions

If the encouragement of students to enter family practice residencies is an important goal of undergraduate family practice programs, the data from this survey indicates that the relative success of the individual program is related to the characteristics of that family practice unit. Fortunately, the data indicate that the commitment of the school as measured by the type of administrative unit, the rank of the chairman, the curriculum, and the size of the unit in terms of full-time salaried family physicians, produces relationships that are what would have logically been expected. The greater the autonomy granted to the unit, the higher the academic rank of the chairman, the commitment to family practice as measured by required courses, clerkships and preceptorships, and the size of the family physician faculty seem to result in higher percentages of students choosing family practice as a specialty.

It should be pointed out that some of the data collected and the size of the sample did not allow the authors to look at some of the interrelationships between the variables that would provide additional information on the particular characteristics of family practice units that seem to have the strongest influence on students' selection of family practice residencies. The authors would recommend that future studies in the area attempt to collect information in a form that would be amenable to more intensive analysis.

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