DOCUMENT RESUME

ED 162 902 SE 025 435

TITLE Influence of Preceptorship and Other Factors on the Education and Career Choices of Physicians, Executive Summary.

INSTITUTION Public Health Service (DHEW), Washington, D.C. Bureau of Health Manpower.

REPORT NO DHEW-HRA-78-74

PUB DATE 31 Mar 78

CONTRACT HRA-231-76-0040

NOTE 25p.

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.

DESCRIPTORS *Career Choice; Higher Education; *Medical Education; Medical Schools; *Medicine; *Primary Health Care; *Program Evaluation; Science Education; Surveys

IDENTIFIERS *Preceptorship Programs

ABSTRACT

In order to determine the effectiveness of preceptorship programs in encouraging medical and osteopathic students to choose careers in primary care or rural service, a survey of medical and osteopathic schools, students, residents, and physician preceptors was completed. Questionnaires were completed by 92 schools, 837 students, 462 residents, and 272 preceptors. Some of the conclusions are as follows: preceptorship training appeared to affect both student and resident specialty and location. The personal and educational characteristics most likely to be related to specialty and/or location preferences included sex, race, age at graduation from medical school, degree of financial support from family of savings, reception of a Public Health Service scholarship, place of rearing, and region in which the school was located. Family medicine departments were more likely to encourage primary care practice and rural services, as were federally-supported programs. (BB)

HEALTH MANPOWER REFERENCES

Influence of Preceptorship and Other Factors on The Education and Career Choices of Physicians

Executive Summary

March 31, 1978

U.S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
Public Health Service
Health Resources Administration
Bureau of Health Manpower
DHEW Publication No. (HRA) 78-74

This report is made pursuant to Contract No. HRA 231-76-0040 with Applied Management Sciences, Inc.

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PREFACE

A contract was awarded in June 1976, to Applied Management Sciences to evaluate preceptorship programs in medical and osteopathic schools. This Report is a summary of that study and a presentation of its most significant findings.

The reader should be aware of several factors which influenced the design and scope of the study.

Health manpower legislation (P.L. 92-157), passed in 1971, authorized support for programs to permit medical and osteopathic students to receive part of their education under a preceptor specializing in family medicine, internal medicine, or pediatrics. Preference was also given to physicians practicing in medically underserved areas. Approximately $28 million have been spent on this program since 1972 to support preceptorship training in about 75 medical and osteopathic schools. The thrust of that legislative initiative was to remedy the geographic maldistribution of health providers and to reverse the rising trend among physicians of selecting secondary and tertiary specialties.

A preceptorship experience was thought to be one means of introducing and attracting the predoctoral student to primary health care delivery and small town/rural practice. This study has examined various aspects of these experiences to detect their apparent influences on the selection of specialty choice and geographic location among pre-doctoral students and residents.

The career choice of a student is influenced by a continuum of experiences, some of which occur prior to entering school and some after. To evaluate the effect of one type of experience, namely a preceptorship, on the career choice of physicians, it is necessary to examine the preceptorship in relation to other events which may influence that choice. The study design, therefore, was not limited to a retrospective look at preceptorship programs, but attempted to assess the development and potential impact of these programs within the context of the educational environment, student background and characteristics, and external influences affecting institutional and curricular direction.

Many individuals have contributed to the development of this study. Acknowledgment and sincere appreciation is extended to Itzhak Jacoby, Ph.D., Chief, Research and Analysis Section, Manpower Supply and Utilization Branch, Division of Medicine, Bureau of Health Manpower; Robert Graham, M.D., Deputy Director of the Bureau; and Dona L. Harris, Ph.D., Director, Preceptorship Project, University of Utah Medical Center for their valuable assistance in the early stages of the contract. Special appreciation is extended to Naomi Quenk, Ph.D., former Associate Director, Center for Physician Career Development, who assisted in the development of the survey instruments and Leon Hunt, Consultant in Statistics and Public Health whose guidance was invaluable during the analytic phase. Sincere thanks also to F. Marion Bishop, Ph.D., University of Alabama School of Medicine at Huntsville; James Bobula, Ph.D., Duke University School of Medicine; Lynn Carmichael, M.D., University of Miami School of Medicine; and Marvin R. Dunn, M.D., University of California School of Medicine, San Diego for taking time out of their busy schedules to review the preliminary study results.

Finally, sincere appreciation to the Deans, Associate Deans, faculty, and staff of the participating schools as well as students, residents, and preceptors for their splendid cooperation during the data collection phase and their interest in the results of this study. Without their willingness to participate, this project could not have been accomplished.

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TABLE OF CONTENTS

1.0 INTRODUCTION 1
2.0 STUDY SAMPLES AND RESPONDENTS 2
3.0 ANALYTICAL TECHNIQUE 4
4.0 MAJOR FINDINGS 5
4.1 Physician Specialty Intentions 5
4.2 Physician Location Intentions 8
4.3 Medical and Osteopathic School Preceptorship Programs 11
4.4 Federal Preceptorship Training Program 13
5.0 CONCLUSIONS AND RECOMMENDATIONS 17

LIST OF TABLES

Table 1: Sample Sizes and Response Rates by Type of Respondent 2
Table 2: Intended Specialty of Students by Goals for Which Preceptorship was Taken 7
Table 3: Practice Location Preferences of Students and Residents 8
Table 4: Percentage of Preceptors in Underserved Areas by Departmental Sponsorship of Program 12
Table 5: Residency Experience and Board Certification of Preceptors by Specialty 13

LIST OF CHARTS

Chart 1: Intended Practice Specialty of Students and Residents by Place of Rearing 6
Chart 2: Intended Practice Specialty of Students and Residents by Sex 7
Chart 3: Participation in a Preceptorship Program by Intended Specialty of Students and Residents 7
Chart 4: Actual Selection of Practice Location by Practice Location Preference of Residents 9
Chart 5: Practice Location Preference of Students and Residents by Sex Controlling for Race 9
Chart 6: Practice Location Preference of Students and Residents by Place of Rearing 10
Chart 7: Participation in a Preceptorship by Student and Resident Preference for a Practice Location 10
Chart 8: Practice Location Preference of Student and Resident Preceptees by Location of Preceptor Practice 11
Chart 9: Importance of Selected Program Goals by Departmental Sponsorship of Program 12
Chart 10: Location of Physician Preceptors by Specialty 13
Chart 11: Importance of Preceptorship Program Goals by Funding Status of Program 14
Chart 12: Extent to Which Activities are Emphasized to Preceptors by Programs According to Funding Status 15
Chart 13: Preceptor Pool of Funded and Non-Funded Programs Distributed by Medically Underserved Area Status 16
Chart 14: Use of Orientation Methods by Funding Status of Preceptor Programs 16

1.0 INTRODUCTION

The primary focus of this study was to measure the association between preceptorship experiences and physician career intentions, including specialty, location, and type of practice. From the viewpoint of the individual medical or osteopathic student and resident, these preferences may also be shaped to some extent by personal attributes, by experiences encountered during the education process, and by the nature of the training environment, to name a few. Accordingly, the study considered a variety of experiential variables thought to affect physician career intentions, with special attention paid to the possible impact of the preceptorship experience in relation to other experiences (Sections 4.1 and 4.2).

Another purpose of the study was to describe the preceptorship programs currently offered by medical and osteopathic schools in the U.S. in terms of program goals, structure, and activities. Further, we undertook an examination of the relationship between the characteristics of the sponsoring school and a preceptorship program's goals, structure, and activities (Section 4.3).

A third study purpose was to determine the effect of Federal funding upon the development and character of preceptorship programs. The 1971 Comprehensive Health Manpower Training Act clearly emphasized the need to encourage additional primary care[1] training in medical and osteopathic schools and to stimulate preceptorship training for the purpose of introducing students to practice in underserved areas. This study is the first comprehensive effort to assess the effectiveness of the Federal Program of Special Project Grants for Preceptorship Training and to ascertain whether the legislative goals for the Program have been satisfied (Section 4.4).

Based upon these purposes, the methodology (Sections 2.0 and 3.0) was designed to address four research questions which formed the core of the study, namely:

(1) How do personal, educational, and preceptorship experiences relate to *physician specialty intentions*?

(2) How do personal, educational, and preceptorship experiences relate to physician *practice location preferences*?

(3) How do characteristics of sponsoring institutions relate to preceptorship program goals, structure, and activities?

(4) How has the Program of Special Project Grants for Preceptorship Training affected the development and character of preceptorship programs? Has the Program satisfied the goals mandated by the authorizing legislation?

In order to address the above questions, a research design was implemented that utilized personal, mail, and telephone survey procedures to supplement existing secondary data. These data were subsequently subjected to multivariate statistical techniques to test the existence of significant associations within a hierarchical model of presumed relationships. The nature of the data, however, precluded the possibility of testing models that are causal in nature. In most instances, we were only able to assess the significance of correlations among variables, as opposed to cause and effect relationships.

[1] By primary care we mean the specialties of family medicine, general practice, internal medicine, and pediatrics.

2.0 STUDY SAMPLES AND RESPONDENTS

To examine the relationships embodied in the research questions, data were acquired from four sets of respondents: (1) medical and osteopathic schools; (2) medical and osteopathic school students (class of 1977); (3) residents (class of 1974); and (4) physician preceptors. For each type of respondent, simple random samples were selected so as to achieve confidence levels of 95 percent with a maximum error of 5 percent. In computing the required minimum sample sizes, the design employed a binomial probability function since most of the variables of interest were nominal (i.e., categorical) in nature. For residents (class of 1974), it was necessary to systematically oversample to a greater degree to compensate for the loss of sample respondents who could not be located by their addresses given at the time of graduation. In each case, however, the statistically desired sample size was achieved. The results of the survey effort are summarized in Table 1.

A representative sample of allopathic (medical) and osteopathic schools was selected in order to characterize preceptorship programs in general. To achieve consistency in the survey results, *a preceptorship program was defined as one in which a student spent at least two continuous weeks under the supervision of a specific physician preceptor who practiced primary care medicine outside the academic medical center.* Within the responding sample of 92 schools, all but one school offered a preceptorship program meeting our definition during the Academic Year (AY) 1976-77. A total of 137 preceptorship programs was identified, of which 73 were currently receiving financial support under the Program of Special Project Grants for Preceptorship Training. Characteristics of the preceptorship programs were identified through personal interviews with deans, family medicine and other primary care department heads, and preceptorship program directors.

The second and third respondent groups consisted of random samples of the class of 1977 (called "students") and the class of 1974 (called "residents"). The student and resident samples were selected from rosters provided by the schools. Both students and residents were asked to respond to mail questionnaires which elicited attitudinal data on career preferences, descriptive data on their preceptorship experience, and selected demographic attributes. In addition, residents were asked about their residency training experience and immediate career plans. Thus, these data allowed us to characterize students who were just beginning their residency training, residents who had already made residency training choices, student and resident preferences for specialty, location, and type of practice (or actual choices in some instances), and the medical or osteopathic education environment of students and residents which may have influenced their preferences.

Table 1: Sample Sizes and Response Rates by Type of Respondent

Type of Respondent	Estimated Size of Universe	Sample Size	Number of Completed Questionnaires	Response Rate
Medical and Osteopathic Schools	123	95	92	96.0%
Students (Class of 1977)	14,500	1,147	837	73.0%
Residents (Class of 1974)	12,000	,750	462	62.0%
Physician Preceptors	3,500	334	272	81.3%

*A total of 132 resident questionnaires were returned as undeliverable due to inappropriate mailing addresses. For questionnaires sent to residents with acceptable addresses, a response rate of 74.8 was achieved.

Though the student and resident samples represented classes three years apart, they were not longitudinal data files in any sense. Part of the difference between students (class of 1977) and residents (class of 1974) was due to the different positions in their careers, while another part resulted from intrinsic differences in the two groups themselves and in the changes that occurred in medical and osteopathic education over the three year interval. Therefore, any differences between the classes of 1974 and 1977 cannot be construed as trends.

The fourth type of respondent, physician preceptors, was selected in a random fashion from lists maintained by the preceptorship programs in each school. Of the total sample of 272 physician preceptors, we were able to match 151 to the responses received from student preceptees. A mail questionnaire was used to obtain information on the preceptor's specialty, graduate medical education, type of practice, location, and characteristics pertaining to his/her experience as a preceptor. This data base permitted us to examine the relationships among preceptors, preceptees, and programs.

3.0 ANALYTIC TECHNIQUE

The data obtained from the various respondents were nominal rather than quantitative in nature. That is, most of these data identified individuals or institutions as belonging to one of several categories. For example, a student was either male or female, he came from either a rural or urban background, or the school either did or did not receive Federal funding for a particular preceptorship program. As a consequence, when such data are tabulated, the statistics are typically expressed in the form of percentages (or frequencies) of individual responses across multiple classifications.

Nominal (or categorical) data are poorly suited to standard statistical techniques used in testing relationships among a set of variables. For instance, while regression analysis is designed to test the statistical relationship between a dependent variable and one or more independent variables, the technique is most appropriate when the variables of interest (at least the dependent variable) can actually be measured. Here, however, most data did not result in any *measurement*. If each respondent either belonged to a class or did not, the only measurement—the percentage in a particular category—refers to the class, not to the individual. The methodological problem, then, was to identify a technique whereby categorical data could be related to each other in a general (multivariate) sense, and where the apparent relationships could be assessed in a statistical fashion.

A technique known as Discrete Multivariate Analysis (DMA) is explicitly designed to study data that are classified into several categories. The DMA technique represents a generalization of the ordinary test of association used in contingency tables. One approach to contingency table analysis is to construct a statistical model which expresses the *cell frequencies* of a multidimensional array in terms of the grand (overall) mean, main effects between pairs of variables (dimensions), and interactions among two or more variables at the same time. Such statistical relationships, known as "log-linear models" because they are linear in the logarithm of cell frequencies, are somewhat analogous to analysis of variance equations. Hence, a log-linear model, which statistically fits the observed data (cell frequencies), does provide a precise measure of how the different dimensions are interrelated.

For our complex data set, there were literally hundreds of possible models which could be tested. As a consequence, we applied a hierarchical approach in selecting the various specifications to be estimated. In general terms, the approach was to test various hypothesized bivariate relationships (based upon previous research and a heuristic model involving preceptorship and other experiences) using the DMA technique, and to drop from further consideration all variables which were found to be statistically independent. Subsequently, alternative multivariate specifications were tested in an effort to ascertain the model which "adequately" described the observed data, where adequacy was measured by a goodness-of-fit criterion in relation to the required degrees of freedom. For the statistically adequate multivariate models, we also tested for interaction effects.

The hierarchical approach was particularly useful in ascertaining the multivariate statistical association between students' and residents' specialty and location preferences and other experiential variables (e.g., place of rearing) where the individual (student or resident) was the unit of analysis. However, the technique was less useful in assessing relationships where preceptorship programs or schools were the unit of analysis due to the limited number of observations.

The results of the DMA analysis indicate the current (1977) relationship between, for example, preceptorship experience and specialty choice, and may also suggest strategies for influencing future specialty preferences (or perhaps choices) among medical students. *However, it is important to keep in mind that the relationships determined by these methods are not necessarily causal; rather they are merely associations (albeit statistically significant) among characteristics of the respondents in this set of data.* Students and residents from past or future periods might not display the same associations between their characteristics and specialty/location choices.

4.0 MAJOR FINDINGS

The major study findings are presented in four subsections which parallel the four primary research questions discussed in the Introduction. These findings include: the factors associated with student and resident specialty intentions (Section 4.1) and location intentions (Section 4.2); the relationship between preceptorship program components (goals, structure, and activities) and medical or osteopathic school characteristics (Section 4.3); and the connection between Federal funding and preceptorship program attributes (Section 4.4). The principal finding for each research subissue is briefly given, followed by a more descriptive and expansive discussion. Further, although most of the statistical findings were culled from an examination of complex, multidimensional relationships, more straightforward bivariate charts and tables are presented to facilitate the reader's understanding.

4.1 Physician Specialty Intentions

Research Question: *How do personal, educational, and preceptorship experiences relate to physician specialty intentions?*

The analysis of this research question used data from the *student and resident questionnaires* with augmentation by information contained in the school and preceptorship program questionnaires. Thus, it was possible to assess the statistical importance of any individual attribute (e.g., participated in preceptorship) within the context of other personal and educational factors which might affect specialty preferences.

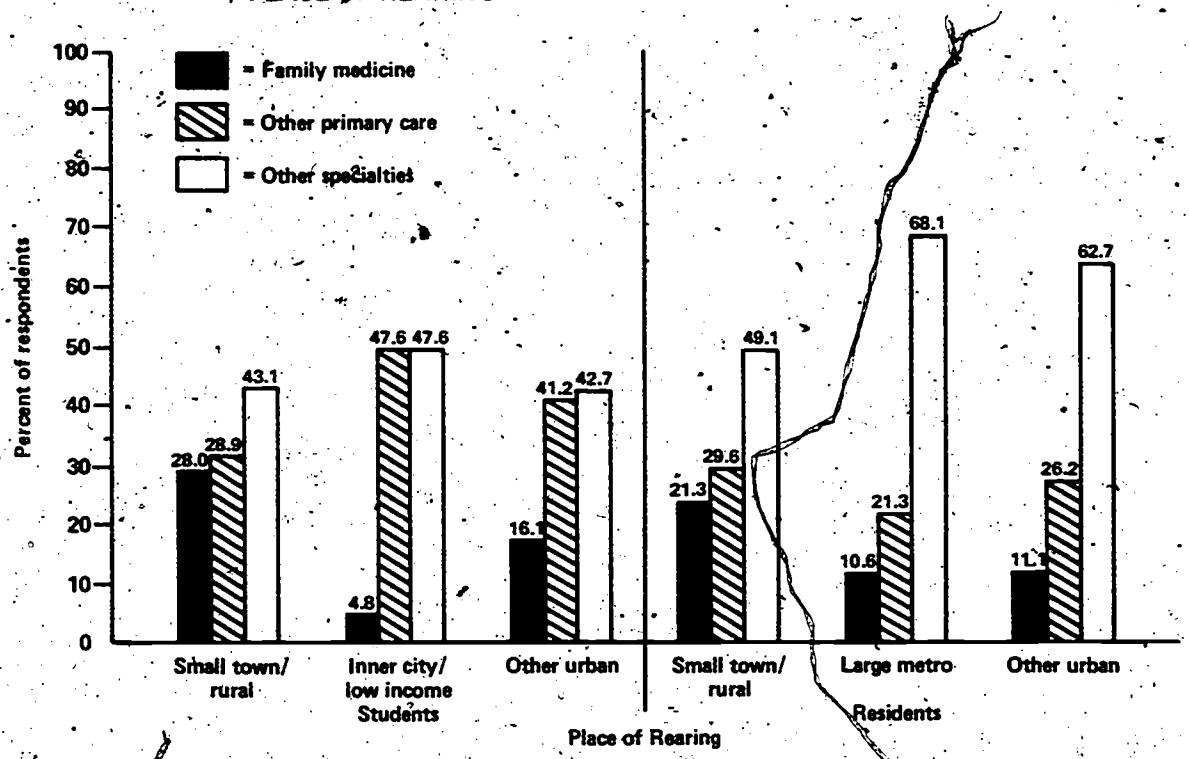
For medical and osteopathic students, the most efficient model for specialty intention included a student physician's place of rearing, sex, source of financial support for medical education, region of medical school, and participation in a preceptorship program.

- The probability of intending to enter *family medicine* (including general practice) was highest for students who attended high school in a rural area or small town, were male, received less than the average amount of financial support from family or savings, went to medical or osteopathic school in the North Central or Western regions, received a Public Health Service Scholarship, and participated in a preceptorship program.
- The probability of intending to enter *other primary care specialties* (i.e., internal medicine and pediatrics, without subspecialization) was highest for students who attended high school in urban areas, were female, received an above average proportion of financial support from family or savings, went to medical or osteopathic school in the Northeast or South, and did not participate in a preceptorship program.
- The probability of intending to enter *other medical or surgical specialties* was highest for students who attended high school in inner-city or urban areas, were male, received the average amount of financial support from family or savings, went to medical or osteopathic school in the Northeast or South, did not receive a Public Service Scholarship, and did not participate in a preceptorship program.

For medical and osteopathic residents, the most efficient model for specialty intention included the resident's place of rearing, sex, age at graduation from medical school, source of financial support for medical education, and participation in a preceptorship program.

- The probability of intending to enter *family medicine* was highest for residents who attended high school in a small town or rural community, were male, received a smaller than average proportion of their financial support from family or savings, were 28 or older at graduation from medical or osteopathic school, and participated in a preceptorship program.
- The probability of intending to enter *other primary care specialties* was highest for residents who went to high school in a rural or small town community, were female, received an average amount of financial support from

CHART 1: INTENDED PRACTICE SPECIALTY OF STUDENTS AND RESIDENTS BY PLACE OF REARING



family or savings, were 27 or younger at graduation from medical or osteopathic school, and did not participate in a preceptorship program.

- The probability of intending to enter *other medical or surgical specialties* was highest for residents who went to high school in large metropolitan areas, were male, received an above-average amount of financial support from family or savings, were 27 or younger at graduation from medical or osteopathic school, and did not participate in a preceptorship program.

Generally, descriptive models of student and resident specialty intentions were remarkably similar in structure and direction of effect in that a large number of characteristics (e.g., place of rearing) were associated with specialty preferences for both groups. However, the total number of characteristics that were statistically associated with specialty intentions was fewer for residents than for students.

The relationship between specialty intention and respondent place of rearing was indicative of other bivariate relationships, which, entered into the multivariate analytic model. As indicated in Chart 1, students from rural/small town areas were more likely than those from other areas to intend to enter family medicine; those from inner-city/low income backgrounds were least likely to intend to enter family medicine.

Another important relationship between respondent personal characteristics and specialty intentions involved the sex of the student or resident. Males were significantly more likely than females to intend to enter family medicine, while females were more likely than males to prefer other primary care specialties (Chart 2).

Preceptorship program participation was also related to specialty intentions, perhaps because it served as a confirmation of specialty inclinations or encouraged students to consider possibilities not considered earlier. Among students and residents intending to specialize in family medicine, more than 70 percent had participated in a preceptorship program (Chart 3).

While the preceptorship experience itself was statistically related to specialty intentions, further investigation suggested that the *process* of the experience might also contribute to the relationship. Multivariate analysis revealed that students who desired hands-on experience during a preceptorship and who actually engaged in such experiences were more likely to prefer family medicine as a specialty. In addition, students who intended to enter family medicine were most likely to have served with a physician preceptor who practiced family medicine in a rural or small town community. In contrast, preceptees who did not cite

CHART 2: INTENDED PRACTICE SPECIALTY OF STUDENTS AND RESIDENTS BY SEX

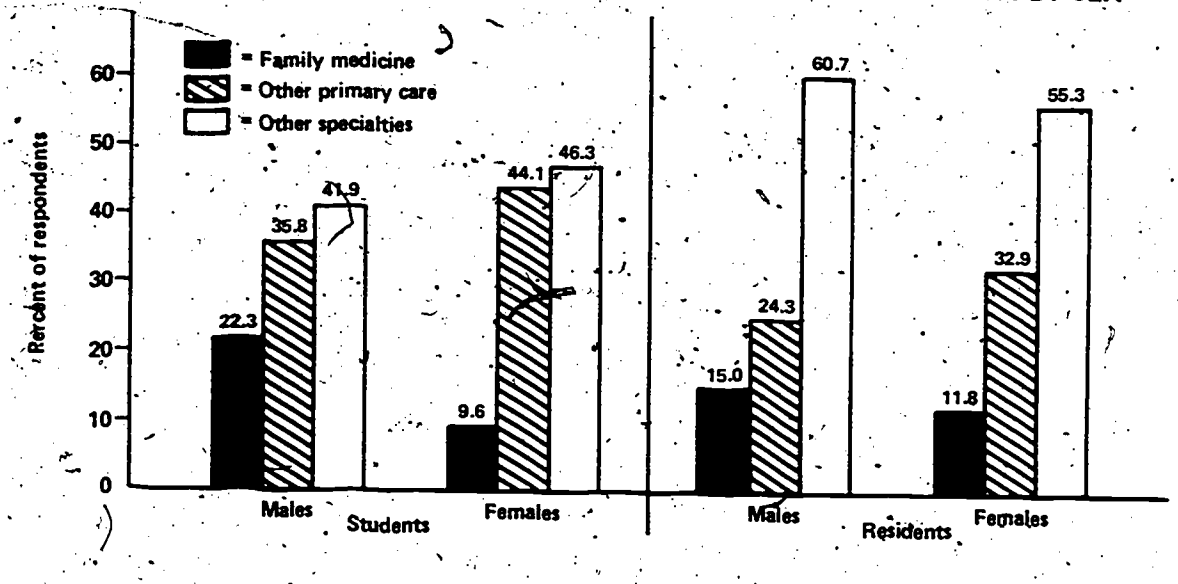


CHART 3: PARTICIPATION IN A PRECEPTORSHIP PROGRAM BY INTENDED SPECIALTY OF STUDENTS AND RESIDENTS

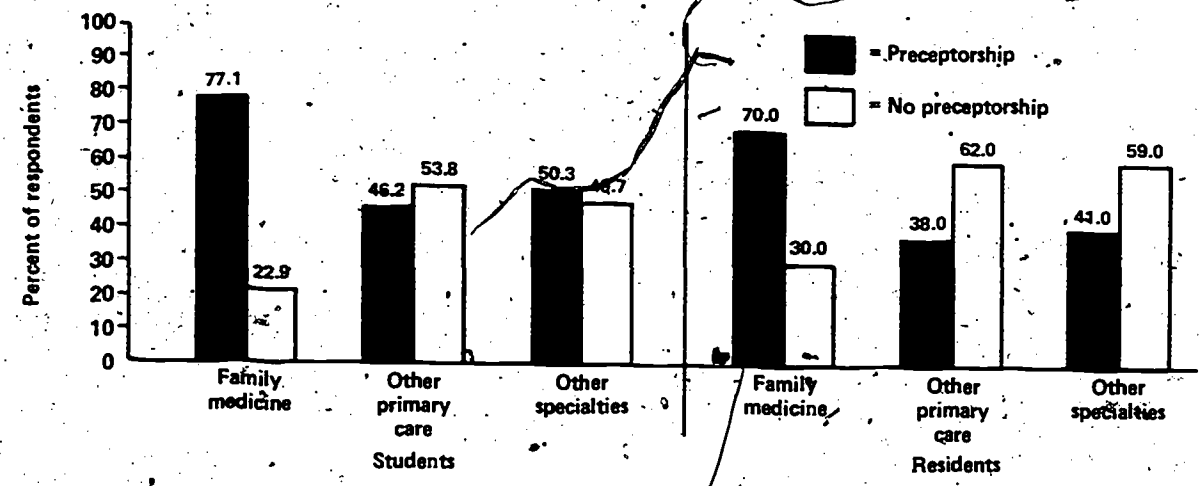


TABLE 2: INTENDED SPECIALTY OF STUDENTS BY GOALS FOR WHICH PRECEPTORSHIP WAS TAKEN

Goals of Preceptorship	Students Rating Goal Important			
	Family medicine	Other primary care	Other specialties	Total
"I wanted to get first-hand experience in a physician's office"	100 of 116 86.2%	106 of 140 75.8%	104 of 158 65.8%	310 of 414 74.9%
"I wanted experience in the kind of setting offered"	112 of 118 94.9%	117 of 140 83.6%	125 of 162 77.2%	354 of 420 84.3%
"I wanted experience in ambulatory care"	99 of 118 83.9%	104 of 140 74.3%	96 of 162 59.3%	299 of 420 71.2%
"I wanted to see if this was the type of setting in which I would like to practice"	96 of 117 82.1%	109 of 140 77.9%	103 of 161 64.0%	308 of 418 73.7%

first-hand experience in a physician's office as an important goal, and/or who did not have an opportunity to participate in such activities as therapeutic procedures on a daily basis, and/or who served with a preceptor in an urban or suburban community, were more likely to intend to enter other primary care or other medical/surgical specialties. The data in Table 2 illustrate the hands-on orientation of students intending to enter family medicine.

4.2 Physician Location Intentions

Research Question: *How do personal, educational, and preceptorship experiences relate to physician location intentions?*

The analysis of this research question paralleled the specialty intention analysis. The same basic data set was used wherein the individual student or resident was the unit of analysis.

For medical or osteopathic students, the most efficient model for location preference included place of rearing, source of financial support for medical education, race, and participation in a preceptorship program.

- The probability of preferring an *inner-city practice location* was highest for students who attended high school in an inner-city location, had average family financial support, were non-white, and did not participate in a preceptorship program.
- The probability of preferring a *rural or small town practice location* was highest for students who attended high school in a rural or small town community, had lower than average family financial support, were white, and participated in a preceptorship program.
- The probability of preferring another *urban or suburban location* was highest for students who attended high school in an urban or suburban community, had above average family financial support, were white, and did not participate in a preceptorship program.

For medical and osteopathic residents, the most efficient model for location preference included place of rearing, source of financial support for medical education, age at graduation from medical or osteopathic school, race, and participation in a preceptorship program.

- The probability of preferring an *inner-city practice location* was highest for residents who attended high school in an inner-city community, had less than average finanical support from family or savings, were 27 or under at graduation from medical or osteopathic school, were non-white, and did not participate in a preceptorship program.
- The probability of preferring a *rural or small town practice location* was highest for residents who attended high school in a rural or small town community, had less than average financial support from family or savings, were over 28 at graduation from medical or osteopathic school, were white, and participated in a preceptorship program.
- The probability of preferring another *urban/suburban location* was highest for residents who attended high school in an urban or suburban community, had above average financial support from family or savings, were 27 or under at graduation from medical or osteopathic school, were white, and did not particpate in a preceptorship program.

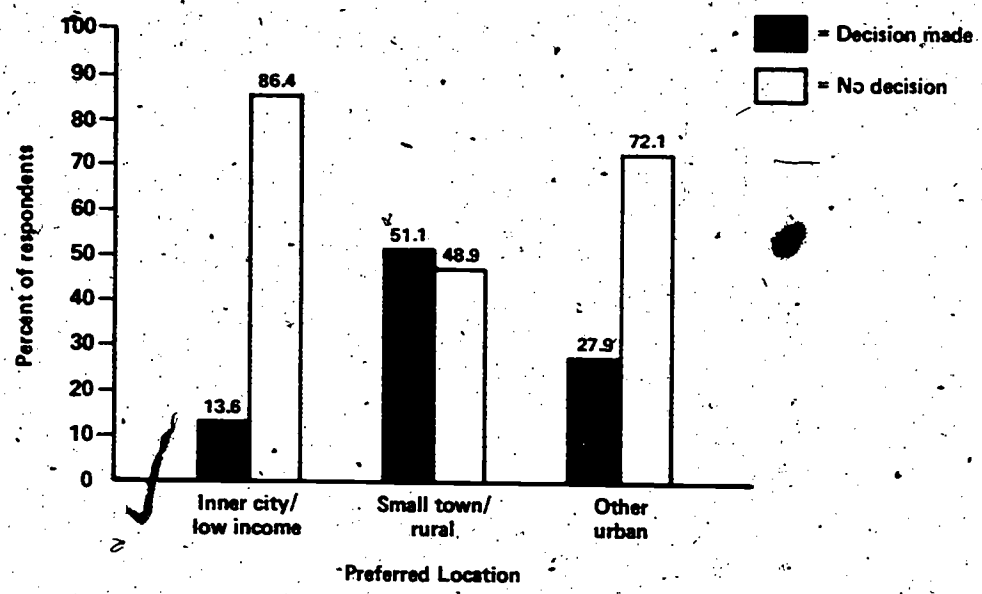
As with specialty intention, descriptive models of location preferences for students and residents were similar in structure and direction of effect. Only with respect to age at graduation did the two models markedly differ, with residents preferring rural locations more likely to be over 28 at graduation from medical or osteopathic school.

Although a majority of both students and residents preferred an urban/suburban practice loca-

TABLE 3: PRACTICE LOCATION PREFERENCES OF STUDENTS AND RESIDENTS

Preferred Practice Location	Students		Residents	
	Number	Percent	Number	Percent
Inner city/low income	74	9.2	25	6.2
Small town/rural	322	40.1	138	33.4
Other urban	408	50.7	250	60.4
Total	804	100.0	413	100.0

CHART 4: ACTUAL SELECTION OF PRACTICE LOCATION BY PRACTICE LOCATION PREFERENCE OF RESIDENTS



tion, over one-third of each respondent sample indicated that they currently preferred to practice in a small town/rural area. In contrast, less than ten percent of either group indicated a preference for inner-city/low income practice location (Table 3).

Only one-third of the residents had made an actual practice location decision at a point three years after graduation. In indicating a choice had been made, the resident was able to provide the name of the town or place in almost all instances. Residents who preferred a rural/small town location were more likely to have made a practice location decision than those with a preference for inner-city or other urban locations (Chart 4).

Both the sex and the race of students and residents were related to location preference. However, as indicated in the descriptive model, the major influence was that of race. Chart 5 displays this relationship, illustrating the higher likelihood

CHART 5: PRACTICE LOCATION PREFERENCE OF STUDENTS AND RESIDENTS BY SEX CONTROLLING FOR RACE

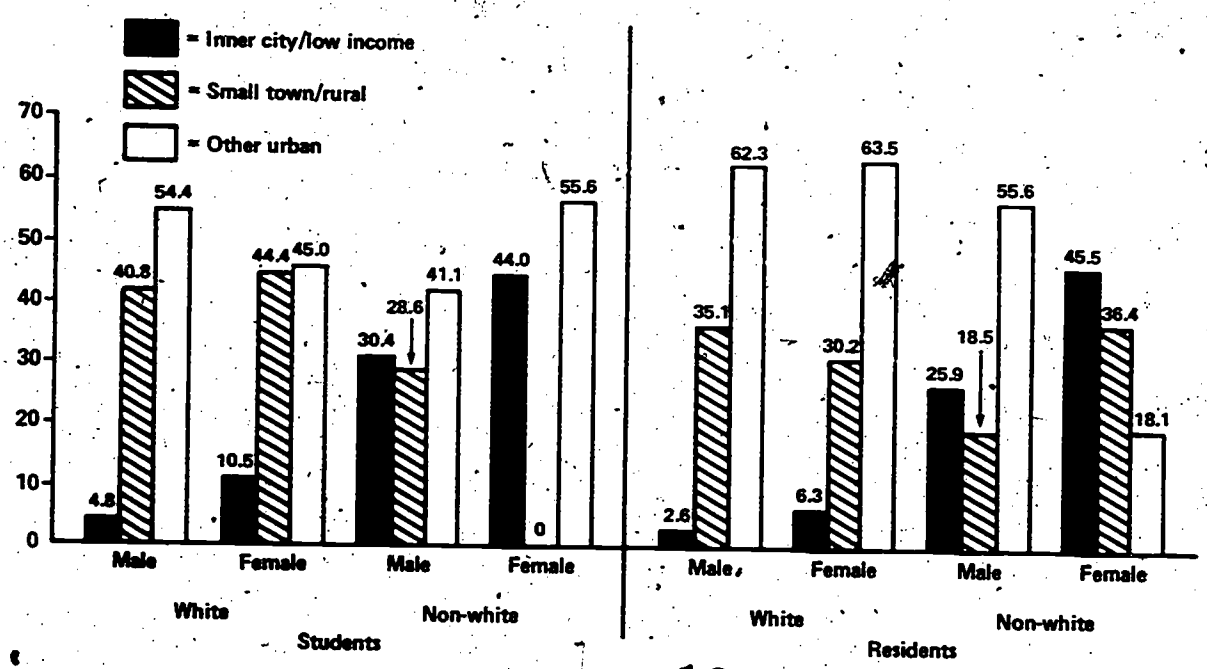
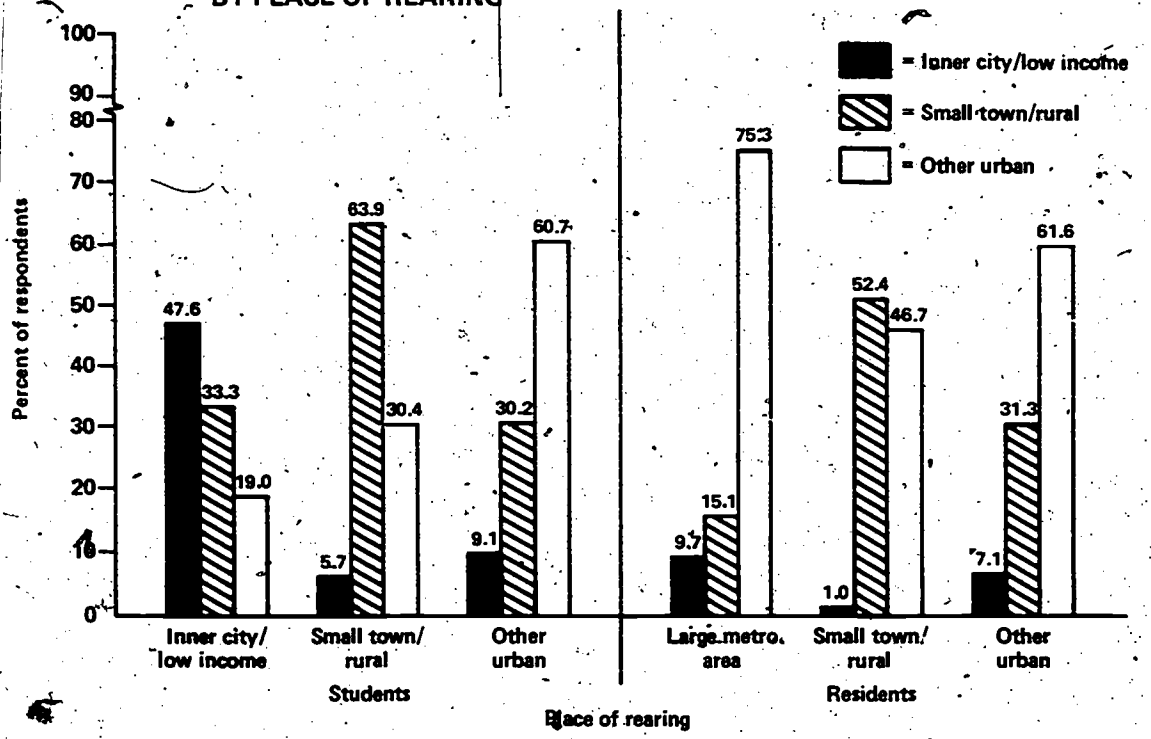


CHART 6: PRACTICE LOCATION PREFERENCE OF STUDENTS AND RESIDENTS BY PLACE OF REARING



of non-whites to prefer service in inner-city/low income areas, while whites tended to prefer rural or other urban/suburban service more than did non-whites (Chart 5).

Among the other bivariate relationships involving student and resident location preferences, one of the strongest relationships involved respondent place of rearing. For both students and residents, the most preferred practice location was the same as the place of rearing (Chart 6).

The experience of a preceptorship program was associated with preference for a rural/small town practice location; students and residents preferring inner-city or other urban/suburban locations were significantly less likely to have taken part in a preceptorship (Chart 7).

Among students and residents who took a preceptorship, the single component of the experience most strongly associated with location preference was the practice location of the physi-

CHART 7: PARTICIPATION IN A PRECEPTORSHIP BY STUDENT AND RESIDENT PREFERENCE FOR A PRACTICE LOCATION

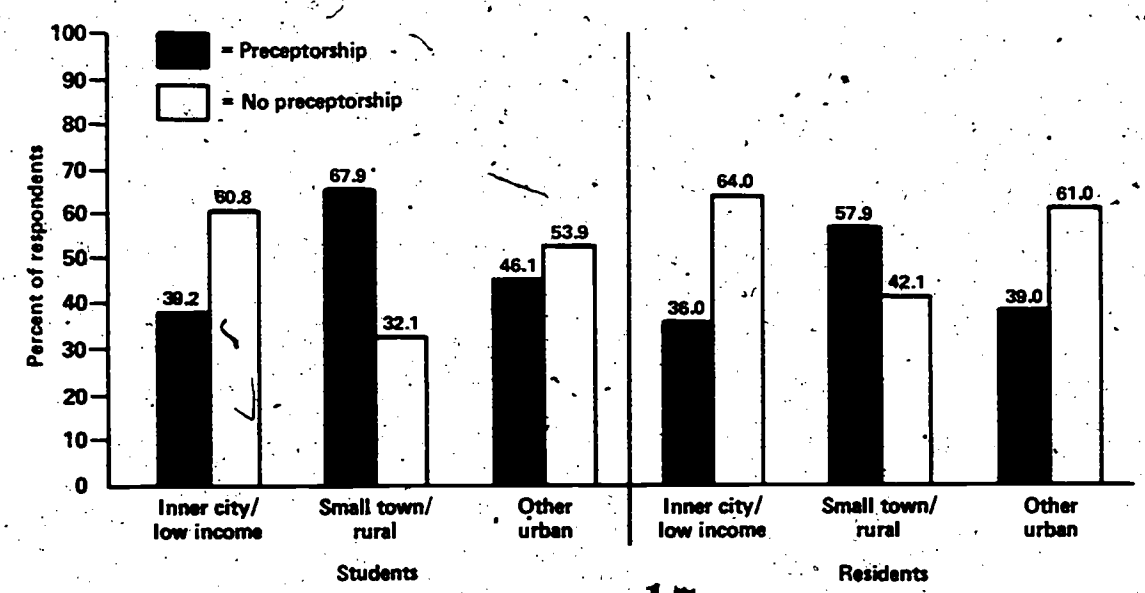
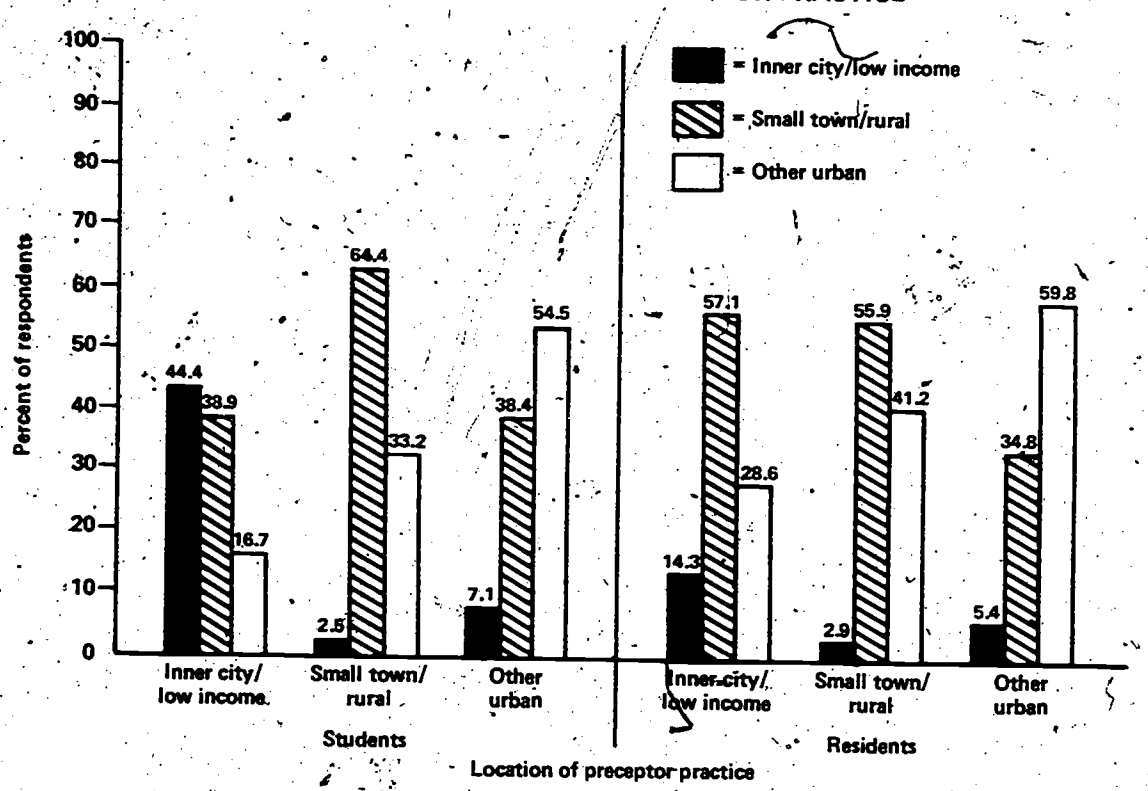


CHART 8: PRACTICE LOCATION PREFERENCE OF STUDENT AND RESIDENT PRECEPTEES BY LOCATION OF PRECEPTOR PRACTICE



cian preceptor (Chart 8). Students and residents who took a preceptorship with a physician preceptor in a rural area were more likely than those who took a preceptorship in any other area to prefer a rural/small town practice location. However, as previously stated, a causal relationship should not be inferred.

4.3 Medical and Osteopathic School Preceptorship Programs

Research Question: *How do characteristics of sponsoring institutions relate to preceptorship program goals, structure, and activities?*

The purposes of the analysis in this area were twofold: first, to identify and describe the universe of preceptorship programs that were offered by medical and osteopathic schools; and, second, to ascertain what, if any, relationships existed between the goals, structure, and activities of such programs and selected attributes of the school in which the preceptorship program was operated. A total of 137 distinct preceptorship programs in 91 schools were available for analysis. Due to the limited number of observations, the analysis of program and school relationships relied upon the Discrete Multivariate Analysis technique to a lesser extent than did analysis of student and resident practice intentions.

The typical program which emerged from an analysis of the universe of programs was as follows:

- *The typical preceptorship program was sponsored by a family medicine department in a public medical or osteopathic school in the North Central or Western United States.*
- *The typical program was elective for students in their third or fourth years and a course in physical diagnosis was required prior to the preceptorship. Students took the preceptorship during the academic year for a period of approximately six weeks.*
- *The primary goals of the modal preceptorship program were to provide students with primary care experiences outside the medical school setting and to get experience in the realities of medical practice. On site, the student was likely to take patient histories, perform physical examinations, discuss diagnosis and treatment plans with patients, and consult with private community physicians or other community health personnel about patients.*
- *The typical preceptorship program had a majority of its preceptors specializing in*

TABLE 4: PERCENTAGE OF PRECEPTORS IN UNDERSERVED AREAS BY DEPARTMENTAL SPONSORSHIP OF PROGRAM

Department	Percent of Preceptors in Definitely Underserved Areas: Medically Underserved Areas	Critical Shortage Areas
All Departments	10.5	4.7
Family Medicine	16.3	6.8
Other	2.7	1.8

family medicine, working in a solo or group (same specialty) setting, and practicing in an area which was not medically underserved.

- *The typical preceptor was recruited through the personal knowledge/contacts of the medical or osteopathic school faculty and accepted because of his/her high professional reputation and desire to be a preceptor. The preceptor was oriented through informal contacts with the program staff and received infrequent informal support throughout the preceptorship. The preceptor also received an academic title because of his/her participation in the program.*

- *The modal preceptorship program had 50 students and a staff of six, two of whom were a program director and a secretary. Students were recruited through an elective book and participated in the selection of their preceptor. After the preceptorship had been completed, the student submitted a final report on the experience to the program staff.*

Programs in public and private institutions did not differ from each other in terms of goals, activities, structure, or size. However, private school sponsored programs reported more problems getting financial support for the programs and locating sufficient preceptors.

Programs sponsored by family medicine departments were more likely than those in other departments to emphasize primary care and/or rural service in their preceptorships. Chart 9 displays the relationship between key program goals and departmental sponsorship.

Programs in family medicine departments were also more likely than those sponsored by any other department to have preceptors located in medically underserved or critical shortage areas. Table 4 displays the percentages of preceptors in each of the shortage designations by the sponsorship of the program.

CHART 9: IMPORTANCE OF SELECTED PROGRAM GOALS BY DEPARTMENTAL SPONSORSHIP OF PROGRAM

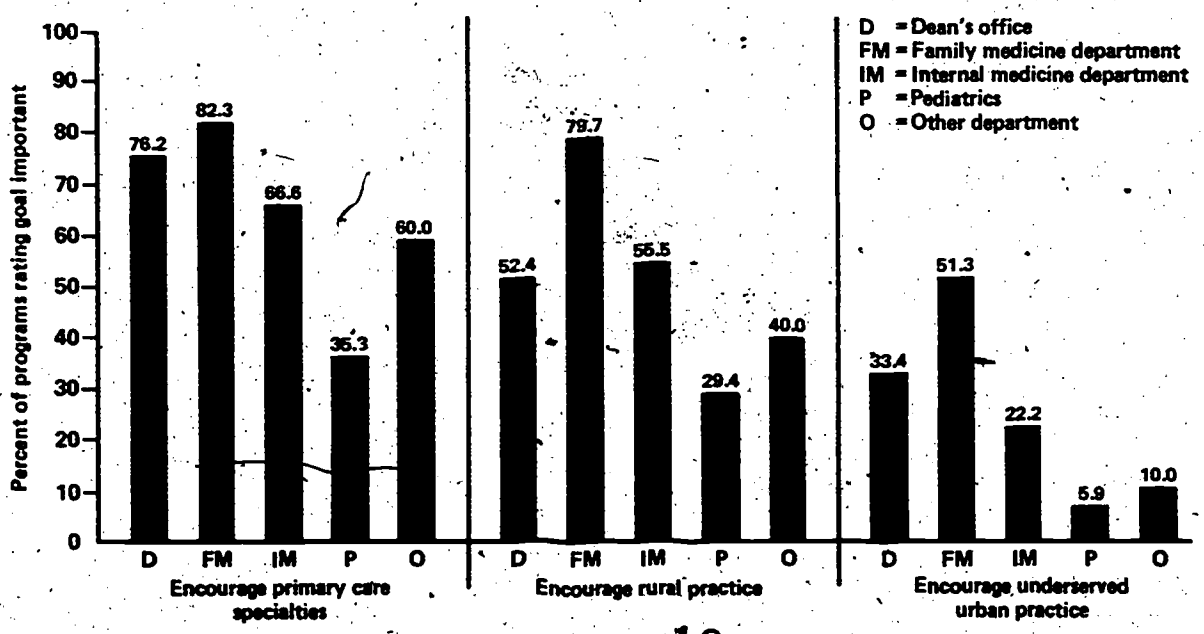


TABLE 5: RESIDENCY EXPERIENCE AND BOARD CERTIFICATION OF PRECEPTORS BY SPECIALTY

Specialty	Residency Number	Residency Percent	Board Certification Number	Board Certification Percent
Family medicine/general practice	74	42.0	114	64.4
Other primary care	59	98.3	53	88.3
Other specialties	25	78.1	27	84.4
Total	158	58.7	194	72.1

A majority of physician preceptors were in family medicine or general practice (65.8%) and in small town/rural or other urban/suburban locations (46.5 and 50.2%, respectively). Only nine preceptors in the study sample (3.3%) reported that their practices were in inner-city/low income areas.

A vast majority of physician preceptors were male (94.0%) and white (93.3%). The mean age of preceptors was 46.1 years and the average length of time in medical practice was 17.5 years.

Virtually all preceptors received internship training, but a smaller proportion of family medicine preceptors than of preceptors in other specialties either experienced residency training or reported that they were board certified (Table 5).

While a majority of preceptors in family medicine were located in rural/small town areas, the majority of other specialists (other primary care and other medical/surgical) were located in other urban/suburban areas. A smaller proportion of family physicians than of other specialists were located in inner-city/low income communities (Chart 10).

Over half of all students and residents who had preceptorship experiences, irrespective of their specialty or location preferences, reported that the experience helped clarify their preferences for specialty, form of of practice (e.g., solo, group), orientation (e.g., administrative, clinical), and size of community of practice.

However, clarification was greatest for respondents who preferred family medicine, rural location, or both and who elected the experience. In addition, clarification is significantly greater for students and residents who selected their own preceptor. Another component of the preceptorship experience highly related to the extent of clarification of the preceptee's career preferences was participation in therapeutic procedures, hospital rounds, and working with families in improving family health care.

4.4 Federal Preceptorship Training Program

Research Question: *How has the Program of Special Project Grants for Preceptorship Training affected the development and character of preceptorship programs? Has the Program satisfied the goals mandated by the authorizing legislation?*

The general objective in this area was to ascertain the effectiveness of the Federal Preceptorship

CHART 10: LOCATION OF PHYSICIAN PRECEPTORS BY SPECIALTY

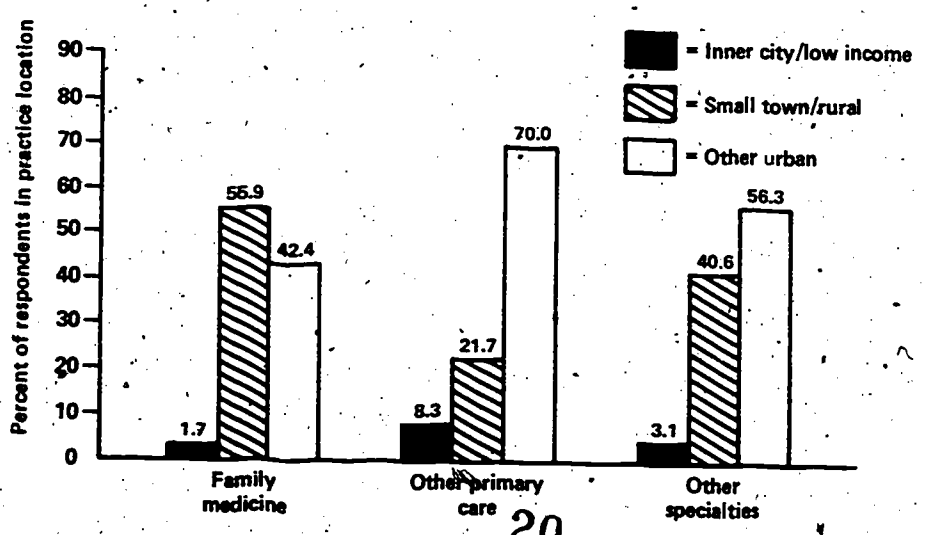
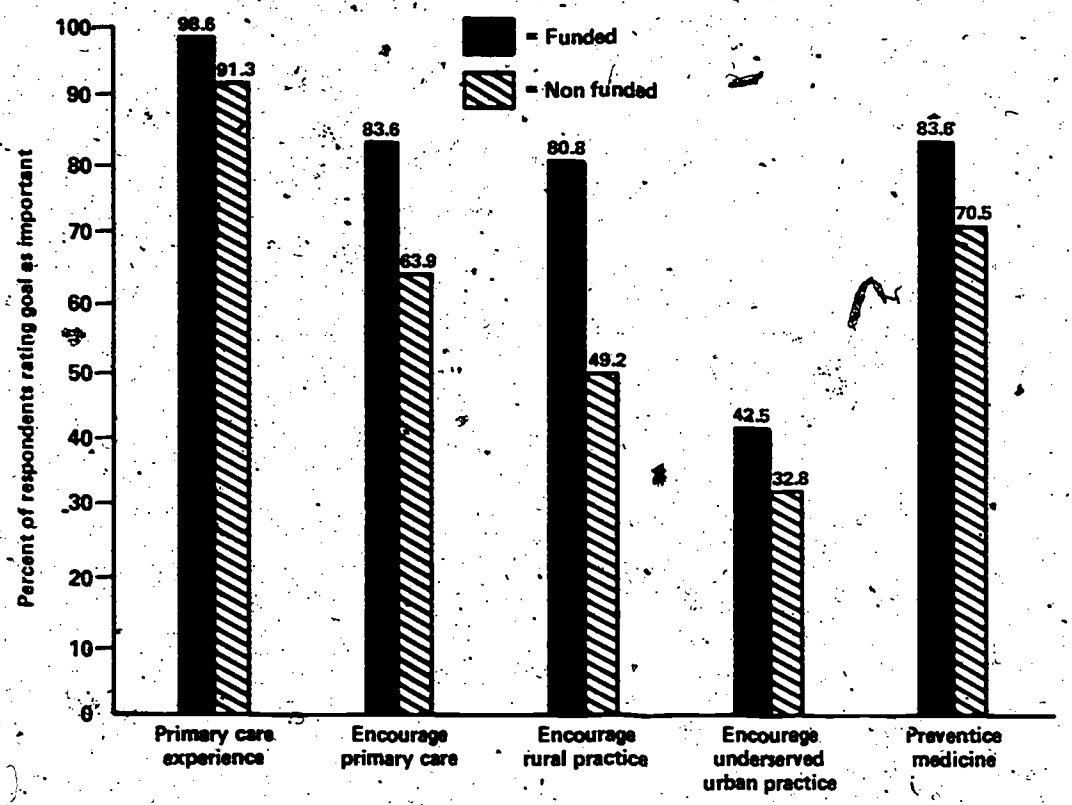


CHART 11: IMPORTANCE OF PRECEPTORSHIP PROGRAM GOALS BY FUNDING STATUS OF PROGRAM



Training Program, and to determine if the preceptorship programs selected for Federal support satisfied the legislative objectives. The analytical approach to these issues relied upon secondary and primary data obtained from the sponsoring schools through interviews with deans, department chairpersons, and preceptorship program directors. The data base consisted of information on 137 preceptorship programs, of which 73 were recipients of Federal Preceptorship Training Program grants in AY 1976-77. In assessing whether or not Federally funded preceptorship training programs were different from non-Federally funded programs, a total of 84 attributes were considered. Of these, more than 30 were found to be statistically associated with Federal funding. The most important discriminators are discussed below.

Preceptorship programs funded under the Program of Special Project Grants for Preceptorship Training statistically differ from non-Federally funded programs in terms of goals, activities, preceptor characteristics, size, and administrative/curricular support of preceptors and preceptees. However, the structure of Federally supported preceptorship programs was not markedly different from that of non-Federally funded programs.

- Funded programs were more likely than non-funded programs to emphasize primary care, preventive medicine, and practice in underserved rural/urban locations as goals.
- Funded programs were more likely than non-funded programs to stress the following activities in orienting preceptors to the curricular objectives of a preceptorship: preceptee performance of therapeutic procedures, participation in preventive health programs, working in an emergency room, involving the family as a whole in the provision of health care, and working with community agencies to solve local health problems.
- Preceptors in funded programs were more likely than those in non-funded programs to be family medicine practitioners and to be located in rural underserved areas.
- Funded programs tended to be larger than non-funded programs in terms of the absolute number of students taking a preceptorship. Also, funded programs were more likely to offer stipends to preceptees, and to provide formal workshops and other activities in orienting and supporting preceptors.

- Funded and non-funded programs were not substantially different in terms of structural attributes such as length of preceptorship, required/elective nature, year/class timing of offering, and credit or grading policy.

In considering the apparent association between Federal funding status and preceptorship program goals, structure, and activities, it is important to note that the Special Project Grants were not distributed uniformly by region. That is, of the 137 preceptorship programs identified in the school sample, a greater proportion of programs in the South (69.4%) and West (63.6%) than in the Northeast (35.7%) and North Central (43.5%) regions were Federal grant recipients. Further, a substantial majority of all Federally funded preceptorship programs were sponsored by family medicine departments (72.9%), followed by the dean's office (12.3%), with the small remainder in departments of internal medicine, pediatrics, and other units. With the preceding profile in mind, the remaining discussion will focus upon some of the more salient bivariate relationships between funding status and characteristics of preceptorship programs.

Funded programs were more likely than nonfunded programs to subscribe to the goals of providing primary care experiences, encouraging students to enter primary care specialties and practice in rural and/or urban underserved areas, and increasing student knowledge of preventive medicine and community health problems (Chart 11). These goals (excluding the "preventive medicine" goal) mirror the emphasis of the legislation which established the Special Project Grants program and the program guidelines.

The activities that funded programs stressed to their preceptors reinforced the findings on goals. Of the 22 possible program activities, six were emphasized to a greater degree by Federally funded than by non-Federally funded preceptorship programs:

- performing therapeutic procedures (e.g., suturing);
- participating in preventive health programs (e.g., immunizations);
- working in an emergency room;
- involving the family of an identified patient in improving family health care;
- attending meetings of local medical organizations; and
- discussing community health needs/goals with the local community.

The distribution of programs stressing these items to a considerable or great extent by funding status is displayed in Chart 12.

Two different definitions of *underserved areas* were used: one based on the Public Health Service's designation of Medically Underserved Areas; and the other from the Critical Medical Manpower Shortage Area designation. While the proportion of preceptors in "critical shortage areas" did not

CHART 12: EXTENT TO WHICH ACTIVITIES ARE EMPHASIZED TO PRECEPTORS BY PROGRAMS ACCORDING TO FUNDING STATUS

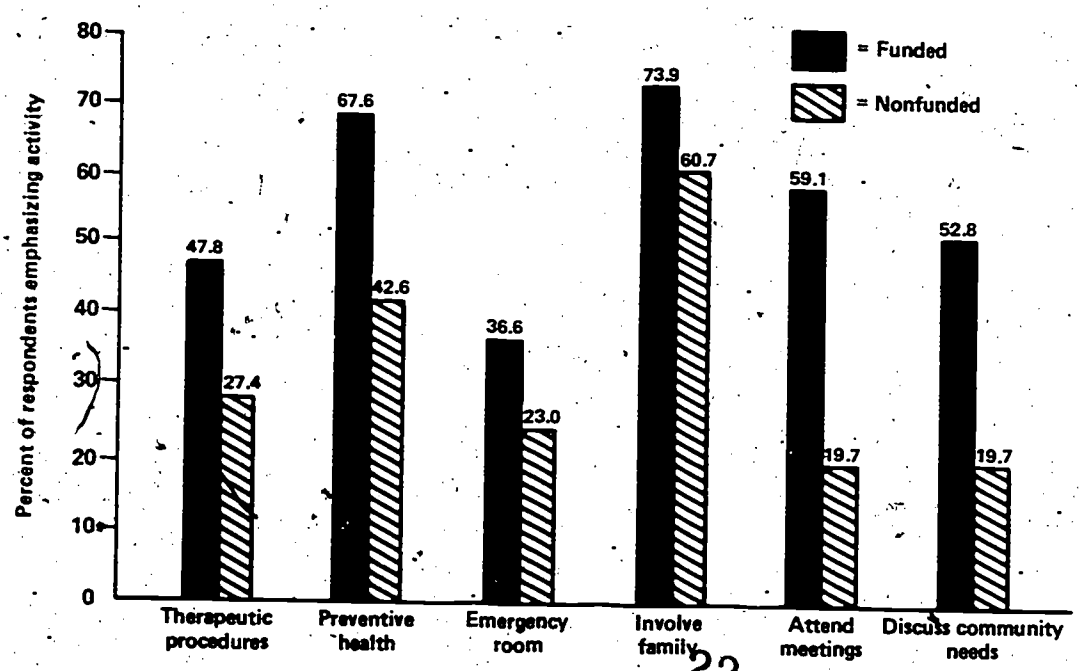
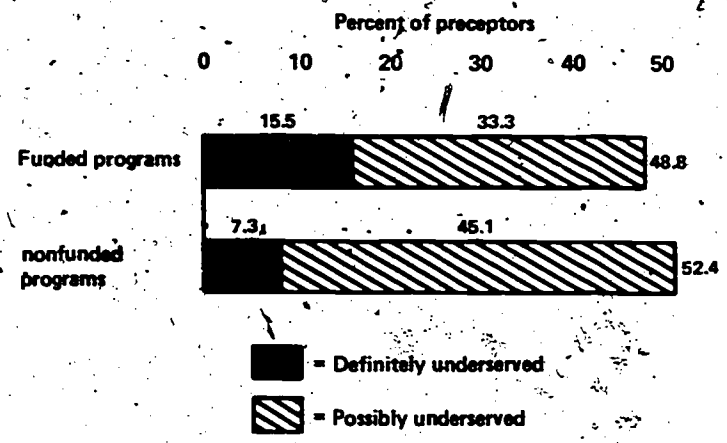


CHART 13: PRECEPTOR POOL OF FUNDED AND NONFUNDED PROGRAMS DISTRIBUTED BY MEDICALLY UNDERSERVED AREA STATUS

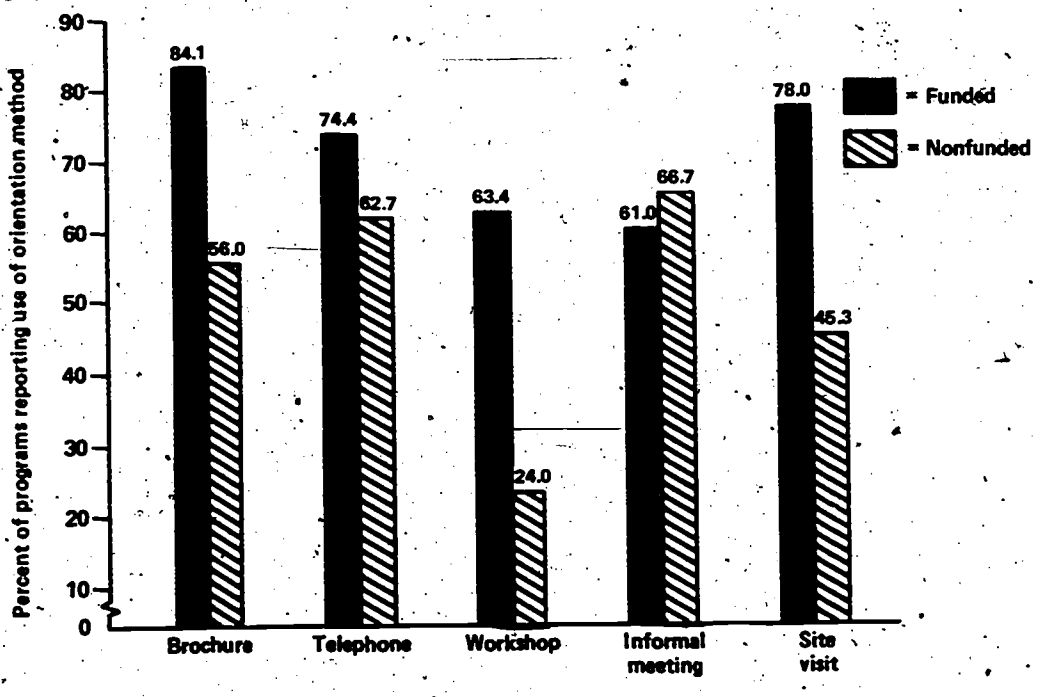


differ signficantly by funding status, the mean proportion of preceptors in "definitely underserved" areas was twofold greater for funded programs than non-funded ones under the MUA designation (Chart 13).

Most directors indicated that they used faculty contacts with community physicians to recruit preceptors and/or recruit preceptors from an existing program. However, funded programs indicated that they used an average of 2.8 sources vs. an average of 1.9 for non-funded programs. Specifically, in recruiting preceptors, directors of programs with Special Project Grant funds tended to report greater use of the medical society, the American Academy of Family Physicians, and the local or State AMA meetings as recruiting sources.

Once preceptors were recruited, the types and number of orientation and support activities they participated in differed according to the funding status of the program. Funded programs were significantly more likely than non-funded programs to use brochures, formal workshops, and site visits (Chart 14). Finally, funded programs reported a more extensive level of preceptor participation in orientation support activities (94.5% of funded vs. 88.5% of non-funded programs reported that over 75% of the preceptors received some form of orientation).

CHART 14: USE OF ORIENTATION METHODS BY FUNDING STATUS OF PROGRAMS



5.0 CONCLUSIONS AND RECOMMENDATIONS

Based upon the above findings, the following conclusions can be reached:

Preceptorship training, within the context of specific personal and educational characteristics, appears to be related to both student and resident specialty and location preferences.

The personal and educational characteristics most likely to be related to specialty and/or location preferences include sex, race, age at graduation from medical school, degree of financial support from family or savings, reception of a Public Health Service scholarship, place of rearing, and region in which the school was located.

Preceptorship program goals, activities, and structure were not related to the control of the sponsoring institution, but were related to the department sponsoring the program. Specifically, family medicine departments were more likely than other departments to emphasize goals and activities related to the encouragement of primary care practice and rural services.

The Program of Special Project Grants for Preceptorship Training appears to have been successful insofar as programs funded under this Federal grant program have adopted goals and sponsored activities which are consonant with the legislative intent. In general, Federally funded programs were more likely than those not receiving Federal funds to emphasize primary care and rural service and to orient their programs to these goals.

The findings of this study indicated that there were strong matching affinities among students, preceptorship programs, and preceptors. Students tended to select the specialty of their preceptor, and in a manner consistent with the goals of their preceptorship program. Preceptorship program goals were apparently related to Federal funding. Students also preferred practice locations similar to the environment in which they were reared. These affinities suggested that the success of some preceptorship programs (and, by implication, Federal initiatives in this area) in producing students who were interested in family medicine practice in underserved rural areas might be the result of student self-selection. However, this affinity was apparently reinforced by the hands-on nature of the preceptorship experience itself. Further, there was evidence to suggest that the preceptorship experience was only somewhat less valuable to students who were not primary care oriented or who were not intending to practice in underserved areas. In short, even though the preceptorship experience may only be reinforcing predispositions that would emerge as future career choices of students, the experience did appear to significantly clarify a broad range of career choices.

To investigate the preceptorship program cause-effect question further and, more generally, to enhance our understanding of physician career choice, particularly specialty and location, several additional areas of investigation are promising:

- *A replication of this study using a randomly selected "experimental" and "control" group.* If specialty and location preference are really influenced by the preceptorship experience (in contrast to their being the product of an individual's background and attitudes), a controlled study can isolate this effect. It may be done by matching a control group (which does not participate in preceptorship programs) with an experimental group (which does have preceptorship program experience) according to their background characteristics. Any differences in specialty and location choices might then be interpreted as the result of the preceptorship program experience.

- *Such a controlled experiment can be partially accomplished by a more detailed analysis of the data gathered by this study.* By linking students, schools, and individual preceptors, it may be possible to obtain matched groups with and without preceptorship experience. If so, the "causal" effect of preceptorship program experience can be further examined within the context of these data.

- *A continuing longitudinal study of the current medical school graduates (class of 1977) in*

this study would show whether the observed specialty and location preferences represent permanent commitments or are subject to future revisions. Such changes are crucial, especially if they should negate the apparent affinities for primary care in underserved areas which this study has shown.

- *A more indepth, process assessment of selected medical preceptorship programs would enhance the understanding of the dynamics of the preceptorship experience, as it is related to student predisposition, program operations, preceptor and preceptee interactions, and the educational environment.* The results of this study can be used to select a representative set of programs which are apparently successful in promoting legislative goals for medical education using various statistical criteria in relation to the multivariate models. The results will serve two purposes: one, the role of a preceptorship experience in formulating career choices, within the context of other experimental influences, can be clarified such that more complex behavioral models can be specified and tested in future periods; and, two, the process evaluation findings can be used to construct alternative best practices which can be utilized by program directors and Federal program managers responsible for extending or initiating preceptorship programs.

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