

MINNESOTA. LEGISLATURE. SENATE SUBCOMMITTEE
ON MEDICAL EDUCATION.

[Report]

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INTRODUCTION

The Senate subcommittee on medical education was appointed to study "the need for and location of another medical school in Minnesota." Since we began our work in August, 1967, we have examined the status of medical care in Minnesota, the trends in the production and distribution of physicians, and the changing patterns in the organization and delivery of medical care. We have read detailed discussions of these and other topics in books, articles, and commission reports. In some instances we have also invited experts to appear before the committee to answer our questions about more complex issues.

It is clear to us that our task involves more than the simple determination of whether a second medical school is required, and where it should be located. We believe that Minnesota needs more physicians, but we also believe a certain kind of doctor is needed, and needed with special urgency in some parts of our state. The committee is convinced that its fundamental problem involves physicians' services, not merely physician manpower, and that its task is to assure an adequate and sufficient supply of physicians' services for all Minnesotans.

Defining the task in these terms has considerably broadened the scope of the committee's concerns. Moreover, the fact that the solutions we propose must satisfy the unknown needs and conditions of medical care a decade or two in the future has further complicated our task!

On the basis of our understanding of the problem, we have defined Minnesota's physician manpower needs in terms of a number of specific requirements that any new program of medical education in Minnesota should be planned to meet. We do not believe that the considerable expenditure of state dollars that will be required to establish such a program should be made indiscriminately.

This paper outlines the direction of our future study and deliberation. The committee wants to know what means are available to satisfy Minnesota's unmet need for physicians; to what extent these needs can be met by expanding the productive capacity of the University of Minnesota School of Medicine; and how the advantages and disadvantages of that approach compare with the benefits that might be expected by establishment of a second medical school. We would also like to know how both of these approaches compare with one that is based on expanding and strengthening appropriate residency programs.

This paper, therefore, is also the committee's request for specific proposals outlining programs that will forward the goals defined by this committee. Two types of program proposals are invited:

- 1.) Programs of undergraduate medical education through establishment of a second medical school, or (in the case of the University) expansion of the existing School of Medicine.

2.) Programs of graduate medical education from hospitals, complexes of hospitals, or medical groups, who presently conduct, or would like to develop residency programs along the lines of the goals stated below.

This paper contains the necessary guidelines to be followed in preparing and submitting proposals for the committee's consideration. It also delineates the criteria by which these proposals will be evaluated.

During the remainder of the interim study period the committee will devote its attention to a close examination of the alternative solutions that are available. Its final report to the Senate will summarize the nature and extent of Minnesota's need for medical manpower, and will also name organizations that are prepared to sponsor educational programs to meet these needs. The report will summarize each of the programs proposed, along with the committee's evaluation of it. The solution-choices available to the Senate will be regrettably narrowed by the absence of proposals from organizations which it expects to respond to this invitation.

SECTION I: THE PROBLEM IN PERSPECTIVE

The problem of assuring adequate health care for Minnesotans is a complex one in which physician manpower is one of many components. Ideally the problem should be approached within the framework of a comprehensive evaluation of the entire pattern of health care in Minnesota, and proposed solutions should be designed as a coordinated part of an efficient health care "system". The committee has neither the authority nor the expertise to conduct a study of such scope, nor does it believe that the readiness and means yet exist for such an extensive examination of medical care in Minnesota. Our attention, therefore, has focused on what can and should be done now to assure the production of additional physicians, whose training, skills, and outlook will prepare them to provide quality health care for Minnesotans in terms of the needs and conditions that may exist in the 1970s and beyond.

On the basis of its study of the status of medical care in Minnesota, the committee has concluded that ...

MINNESOTA NEEDS MORE PHYSICIANS, AND NEEDS A MORE APPROPRIATE BALANCE IN THE VARIOUS BRANCHES OF MEDICAL PRACTICE, SO AS TO ASSURE AN ADEQUATE SUPPLY OF PRIMARY PHYSICIANS' SERVICES FOR ALL ITS CITIZENS.

The very existence of the Senate committee acknowledges the widely-held belief that the present supply of physicians is not adequate, and that in the future the shortage is likely to be even more critical due to a growing demand for physicians' services.

On THE SUPPLY side it is clear that the number of Minnesota physicians in private practice in relation to the population is declining. Table 1 shows that, while the gross ratio of physicians to population in Minnesota is about equal to the national average, its ratio of physicians in private practice is well below average.

The supply of primary or family physicians * is particularly deficient, as many of our citizens can attest. Trends in the percentage of Minnesota physicians in each of the major fields of specialization over the past half century are shown in Table 2 and Figure 1. They reveal that the percentage of general practitioners (95% of all MDs in 1910!) has steadily declined, and today about one doctor in three is a GP. (Of. also figures 3 & 4). If we broaden the definition of family physicians to include internists and pediatricians as well as GPs, the picture does not improve substantially, as Figure 2 and Table 3 reveal.

Certain geographic gaps in the distribution of physicians in Minnesota provide another kind of evidence of the shortage of doctors. Trends indicate a disproportionate decline in physician-population ratios in the rural areas. (Of. Table 5). Equally significant is the critical lack of doctors in the depressed areas of our inner cities.

The Senate committee recognizes that Minnesota's physician shortage is similar to problems which exist throughout the nation. The problem is due in part to the recent rapid expansion of knowledge that has necessitated medical specialization. A comprehensive group of medicine for general practice is no longer even remotely possible in the old sense, and less than 10% of today's medical graduates enter that branch of practice. ** as more and more graduates choose careers in academic medicine, or delay practice in a lengthy period of residency, fewer doctors are available to provide medical care, and fewer still to provide primary health care.

While this trend toward greater expertise is unquestionably necessary and likely to continue, various factors are at work that will sharply increase THE DEMAND for medical services. The population growth, rising levels of income and education, improvements in health insurance, and such government programs as Medicare, are commonly cited as contributing to this heightened demand. One authority has carefully worked out a quantified

* Internists and pediatricians are commonly regarded as providing primary or family care. The terms "primary physician", "family physician", "personal physician", and "first-contact physician" are used interchangeably in this paper.

** According to the Bing Report (Report of the National Advisory Commission on Health Manpower, November, 1967), "less than 2% of today's medical graduates go into general practice." Page 14.

projection of the various demographic and socio-economic trends that are likely to result in an increased demand for physicians' services. He concludes that, in the decade between 1965 and 1975, there will be a 22% to 26% increase in physician visits. *

The evidence, then, indicates that certain demographic and socio-economic trends are at work that will undoubtedly increase the demand for physicians' services in the future. On the basis of our understanding of the present status of physician manpower in Minnesota, the shortage of doctors is to be seen in terms of both a present deficit, and the need to provide additional doctors to meet the increased consumer demands in the future.

The committee has considered the changes that are occurring in medical science and technology, and in the organization of medical care, and concludes that ...

MINNESOTA NEEDS TO TRAIN NEW PHYSICIANS WHOSE EDUCATION IS BASED ON THE CHANGING PATTERNS IN THE ORGANIZATION AND CONTENT OF MEDICAL PRACTICE, AND WHO THEREBY ACQUIRE THE SKILLS AND OUTLOOK TO PREPARE THEM TO MEET THE CHALLENGES OF THE FUTURE.

Medical research has achieved such astonishing gains in the past two decades that both medical science and medical practice have been virtually revolutionized. It has amassed a body of information and technical skill so vast that specialization is a virtual necessity, and whole new paramedical occupations have had to be created. The introduction of automation and increasingly costly machine technology is an even more recent development.

While these advances have greatly increased the physician's productivity, they also call for economies of grade and critical mass, which has given rise to a variety of group practice arrangements, and a trend for the physician to center more and more of his activities in hospitals and large clinics.

Each research "break-through" has resulted in increased consumer demand for medical care. Not so obvious, perhaps, is the fact that the pattern of illness in this country has^{be} changed so much that medical practice today bears little resemblance to what it was a generation ago. The list of factors that contribute to the rapid changes that are occurring in the content of medical practice and in the system of which health care is delivered is too long to be enumerated here. Each of them contribute to the decline of the familiar patterns of medical practice, and add their influence to newly emerging patterns.

* Cf. Rashi Fein, The Doctor Shortage: An Economic Diagnosis. Washington: The Brookings Institution, 1967. Pages 22-61. (See also page A2 of the Appendix to this paper).

These changes in the delivery system, and the need for further change in the productivity and relevance of medical care, would seem to call for similar experiments and modernization of medical education. The Senate Committee wishes to review proposals that represent experiments with new approaches in medical education based on knowledgeable forecasts of future medical practice. While we are not qualified to know what form medical education should take, we are convinced that bold new approaches are in order, and we will favor those proposals which give evidence of relevant innovation.

SECTION II: THE CRITERIA

While the Senate committee believes that the physician supply problem in Minnesota is critical, it does not believe that the situation requires that compromises be made with quality medical education. Program proposals will be expected to conform to the appropriate standards of accreditation. The standards used in the certification of both undergraduate and graduate programs of medical education can be found in published documents which are readily available. *

The criteria which the committee will use in evaluating the proposals it receives are based on Minnesota's physician manpower needs as we understand them. These specific criteria are outlined below. (The supporting data and other information may be found in the appendix.) The first three deal with specific medical care needs -- how many physicians are needed, what kind of doctors they should be, and how they should be distributed. The last two criteria are somewhat different but still relate to Minnesota's specific situation. One deals with the suitability of the community in which the proposed program will be located. The other asks for a cost-effectiveness analysis of the proposed program in terms of state dollars required, on one hand, and the number of physicians produced annually for practice in Minnesota, on the other hand.

CRITERION I: THE NECESSITY OF PRODUCING 100 ADDITIONAL PHYSICIANS ANNUALLY FOR MEDICAL PRACTICE IN MINNESOTA.

The committee is aware of the difficulties that surround the estimation of future physician needs, and of the wide divergence in such estimates. We do not believe, however, that such difficulties should excuse either inaction or vagueness in planning. This goal represents our estimate of the minimum number of physicians required to reduce present deficits and meet increased consumer demands in the near future.

* Cf. Functions and Structure of a Modern Medical School and Essentials of Approved Residencies, published by the Council on Medical Education, A.M.A.

CRITERION II: THE NECESSITY OF ASSURING THAT 65% OF THE NEW PHYSICIANS PRODUCED WILL SPECIALIZE IN THE PRACTICE OF PRIMARY HEALTH CARE OR A RELATED SPECIALTY.

Determining the optimal distribution of new physicians by specialty is even more precarious than estimating future physician needs, and were it not for the alarming decline in the number of first-contact physicians in Minnesota, the committee would not attempt to do so. We believe, however, that the character of the state's medical care needs should substantially determine the character of any new program of medical education in Minnesota. We have based our estimate on restoring the 1950 balance, when 50% of the state's physicians were either in general practice, or in the specialty fields of internal medicine or pediatrics. To do so, and to overcome the present deficit, requires that considerably more than 50% of new physician production be primary physicians.

CRITERION III: THE NECESSITY OF ASSURING THE AVAILABILITY OF PHYSICIANS' SERVICES IN ALL PARTS OF MINNESOTA, ESPECIALLY IN RURAL AREAS AND URBAN GHETTOS.

We believe that it is both possible and highly desirable for proposed programs to deal specifically with the problem of providing adequate medical care to these two segments of Minnesota's population. Proposals that indicate serious concern, and show promise of developing unique and innovative approaches toward solving this problem will receive more favorable consideration.

CRITERION IV: THE NECESSITY OF A LOCATION THAT WILL PROVIDE AN APPROPRIATE ENVIRONMENT AND THE NECESSARY RESOURCES TO PERMIT AND SUPPORT THE PROPOSED PROGRAM.

Specific resources available and the overall suitability of the community as the setting for the proposed program will be considered, although the committee will regard the objective merit of each proposal, and the extent to which it promotes the goals we have stated, with greater importance.

CRITERION V: THE NECESSITY OF PRODUCING AND RETAINING PHYSICIANS, SUITABLY TRAINED TO ASSURE ADEQUATE HEALTH CARE, AT THE LOWEST ANNUAL COST PER RETAINED GRADUATE.

The committee will use the cost-effectiveness information as the basis for comparing the relative efficiency of the proposals it receives.

SECTION III: GUIDELINES FOR PROPOSALS

The following information should guide the preparation of proposals submitted to the Senate Committee. There is no printed form to be used.

GENERAL INSTRUCTIONS

A. Proposal Submission. The first page of the proposal must show the following information in the order indicated:

- Proposal Title: (Be concise, descriptive and specific. Avoid obscure technical terms. Example: "Establishment of a Medical School in the City of _____." The title should not be longer than one line.)
- Submitted by: (Name of organization, institution, etc. formulating the proposal, hereinafter referred to as "organization.")
- Address: (Of organization.)
- Telephone Number: (Of organization, including area code.)
- Initiated by: (Full name and position of individual who is regarded as the principal author or project coordinator).
- Transmitted by: (Full name and position of official approving the submission of the proposal. This must be someone with authority to commit the organization to the proposed program. The proposal should be signed by both the initiator and the transmitter on the original or master copy.)
- Date: (Date transmitted to the Senate Committee.)

B. Mailing address for Proposals: Send all proposals to:

Senator Harold R. Popp, Chairman
Senate Interim Subcommittee on Medical
Education
State of Minnesota
Room 238, State Capitol
St. Paul, Minnesota 55101

C. Scope and Substance of the Proposal. The proposal should be long enough to communicate all of the information necessary for sound evaluation, but excessive length should be avoided. It should encompass:

1.) Purpose and expected outcomes.

a.) The proposal should describe an educational program that promotes the goals and meets the criteria stated by the Senate committee, including:

- Evidence that the proposed program will conform to the established requirements of accreditation appropriate to the given program.
- A full description of specific methods by which the program expects to meet, or substantially contribute to, the goals stated by the Senate committee.

b.) The proposal should give primary attention to changes in the patterns of medical care, and to innovations in medical education that will prepare students to meet and adapt to these changes.

c.) The expected outcome of the proposed program should be estimated in terms of the number and kind of physicians the program will produce and retain for practice in Minnesota.

2.) Supporting evidence.

a.) The purpose and objectives of the proposal should be described in terms of Minnesota's physician manpower needs, and should reveal a knowledge of the status and trends in the production and distribution of physicians in this state.

b.) The proposal should cite relevant research findings or experimental programs in support of methods it advocates or outcomes expected to be achieved.

3.) Sponsoring organization, staff, and facilities.

a.) The sponsoring organization should have a demonstrated competence in medical education appropriate to the kind of program proposed. Demonstration of competence will be primarily in terms of the academic qualifications and professional experience of staff personnel.

b.) Sponsoring organizations must show that they have a reasonable expectation of obtaining the required facilities and staff to appropriately implement the program outlined.

○ c.) Proposals should indicate the agreed interest and intended cooperation of local institutions and groups whose support is necessary for successful conduct of the program.

4.) Estimated costs.*

a.) Preparation of this section should follow the principles and categories developed by the AAMC, and used by its member-schools to report annual program costs.**

b.) Estimates should be presented with reference to the estimated time-table (see below) for development of the program, and should also indicate total cost estimates for legislative biennial periods.

c.) Cost estimates should include:

- Planning and development costs (e.g. personnel, site acquisition and development, engineer's and architect's fees, etc.)
- Construction costs (e.g., new construction, remodeling and renovating existing structures, fixed equipment, etc.)
- Operational costs.

d.) The amount of financial support requested from the state of Minnesota should be stated in terms of biennial periods.

e.) The amount of financial or other support available to the program from other sources should be indicated.

D. Preparation, Submission, and Review of Proposals.

1. Preparation: Proposals should include the prescribed information and follow the format outlined.

a.) Fifteen copies are required. The proposal should be typed or otherwise reproduced on white paper of standard size, using only one side.

b.) One copy should be an original, or master copy, and should be signed by the organization's designated authority and its principal author.

* A part of the cost-effectiveness analysis (see below).

** Cf. Carroll, A. J., A Program Cost Finding System for Medical Colleges -- Manual of Procedures. (Workbook for the 3rd Institute on Adminis.) Evanston: Association of American Medical Colleges, 1965, and Carroll, A. J. and Darley, Ward, "Medical College Costs", Journal of Medical Education, 42:1-16, January, 1967.

2.) Submission: Proposals must be submitted by July 15, 1968, to be reviewed by the committee. ((However, the sections dealing with the estimated costs (see above) and the cost-effectiveness analysis (see below) of the proposed program need not be submitted until August 15, 1968. The intention to delay submission should be stated clearly at the time of submitting the initial proposal.)) The Senate committee will acknowledge receipt of all proposals within fifteen days.

3.) Review: The committee will review all proposals as follows:

a.) Organizations submitting proposals will be scheduled to make oral presentations of their programs to an open meeting of the Senate committee. Organizations will be given up to two hours to make their presentation. Spokesmen for the organization may use the opportunity to elaborate details not included in the written proposal, provide additional support for claims made in the proposal, etc. Members of the committee may ask for additional information, clarification, etc. Oral presentations will be scheduled in the order in which the written proposals are received.

b.) The committee will base its evaluation of proposals on the written documents, oral presentations, and on the opinions of such outside experts as it may deem necessary to adequately weigh and compare the relative merits of the programs outlined.

c.) The findings of the committee and its evaluation of individual proposals will be contained in the committee's report to the Senate. Copies of this report will be available to organizations submitting proposals.

OUTLINE OF PROPOSAL CONTENT

Follow the outline below in describing the proposed program. Identify each section by number and title as indicated.

A. Abstract. On a single, separate page submit a summary of the proposed program under two main headings: 1) objectives, and 2) procedures or methods.

B. Problem. Give a brief statement of the problem (or aspect of the problem) to which the program is addressed, indicating its relevance and significance to the stated goals of the Senate committee study.

C. Objectives. State the specific objectives the program will accomplish.

D. Relationship to Trends in Medical Education and Medical Care. Discuss the proposed program in relation to Minnesota's physician manpower needs and recent trends in the production and distribution of physicians in Minnesota. Relate the program to developments in

the pattern of health care delivery and forecasts of the future health care system. Indicate the implications for medical education and point out examples of successful innovations in medical education designed to prepare physicians for this future challenge. Emphasize the distinctive aspects of the proposed program in comparison to classic patterns of physician education, and cite research or experimental programs that are regarded as supportive of the probable success of the proposed program.

E. Description of the Proposed Program. Describe the proposed program in detail including the sequence of steps to be taken in its establishment. Where applicable, include specific information on such topics as the following:

- 1.) Organizational structure, lines of authority, and relationships with existing institutions and facilities.
- 2.) The underlying philosophy and basic concepts of education and medical care upon which the program is based.
- 3.) The content of the curriculum should be outlined. Give emphasis to unique didactic, clinical, or research features designed to specifically assure achievement of the program objectives.
- 4.) The plan for recruiting faculty.
- 5.) Policies regarding student selection and admission should be outlined and discussed in relation to the program objectives and to the goals stated by the committee. Give specific attention to any methods devised to retain students for Minnesota practice and to assure equitable distribution of physicians geographically.

F. Estimated Time-Table for Implementing the Proposed Program. Describe the sequence of steps leading to the inauguration of the program, estimating the time required for each step and the total time estimated from initiation of planning to the production of the first graduates.

G. Methods for Evaluating the Proposed Program. Methods designed for evaluating the end-product of the program should be fully described.

COST-EFFECTIVENESS ANALYSIS

This section of the proposal should begin on a new page, but should be identified in sequence with previous sections (e.g., "H. Cost-Effectiveness Analysis"). In addition to the general instructions regarding "estimated costs" (see page 13), the following guidelines should be observed:

A. This section should consist of three main divisions as follows:

- 1.) Estimated costs for planning, establishing, and operating the program.
- 2.) Amount of financial support requested from the state of Minnesota, and the amount of financial support available from other sources.
- 3.) The cost-effectiveness analysis.

B. The cost-effectiveness analysis provides an equitable basis for comparing the economic efficiency of the various proposed programs and approaches. Cost-effectiveness is calculated on the operational costs of the program. We have defined it as the estimated cost (in terms of state dollars required annually)/ per graduate retained in Minnesota (as estimated by each proposal for its own program)/ per year. In calculating the cost-effectiveness of programs proposed, organizations should give careful attention to the following guidelines:

- 1.) Calculations should be based on the assumption that the program has attained its full enrollment.
- 2.) The cost of operating the program is defined as the sum of the direct costs of the program, plus the operational deficit in the cost of operating supporting programs and services (essential to the conduct of the primary program).*
- 3.) Calculations should not include other income received from the state of Minnesota (e.g., research grants, patient fees paid by state welfare, etc.). Only the amount of financial support contributed by the state annually toward the operation of the program should be used in the calculations.
- 4.) The annual number of graduates which the proposal estimates will be retained in Minnesota should be divided into the amount of state dollars contributed annually toward the operational costs of the program, including both direct costs and operational deficits in essential supporting programs.

* Fuller explanation of these terms and procedures, along with a detailed example of the manner in which medical school program costs are determined, may be found in Carroll, A.J., and Ward Darley, "Medical College Costs", Journal of Medical Education, 42:1-16, January, 1967.

APPENDIX I: MINNESOTA'S PHYSICIAN NEEDS

THE SUPPLY

THE RATIO OF PHYSICIANS IN PRIVATE PRACTICE TO POPULATION IS DECLINING, AND MINNESOTA RANKS BELOW THE U.S. RATIO OF 99 PER 100,000 POPULATION (TABLE 1).

1. Both the total number of physicians in Minnesota, and the ratio of total physicians to population have increased (Figure 3, Table 4), and Minnesota ratio ranks above the U.S. ratio of 145 per 100,000 (Table 1).
2. However, the number of active* physicians in Minnesota has not increased as rapidly as the population, with the result that the ratio of active physicians to population has remained relatively stable (Figure 3, Table 4).
3. The percentage of Minnesota physicians in active* practice has declined (Figure 4, Table 4), reflecting the growth in the number of physicians in specialized training.

THE RATIO OF FAMILY PHYSICIANS ** TO POPULATION IN MINNESOTA HAS DECLINED.

1. The percentage of active physicians in family practice has declined from 95% in 1910 (Table 2, Figure 1), and today only about 1 doctor in 3 is engaged in family practice (see also Table 4, Figures 3 & 4).
2. The ratio of family physicians to population in Minnesota has rapidly declined (Figure 2, Table 3) to the present ratio of about 50 per 100,000.

THE NUMBER OF RURAL PHYSICIANS IN MINNESOTA AND THE RATIO OF RURAL PHYSICIANS TO POPULATION HAVE DECLINED AT A FASTER RATE THAN THE STATEWIDE DECLINE (TABLE 5).

1. In each year shown (Table 5), all regions except Region VIII (centered in the Twin Cities as shown in Figure 5) and Region XI (Rochester) have contained a smaller proportion of the state's physicians than of the state's population.

* "Active", but not necessarily engaged in "private", practice. See definition of active practice in the footnote to Figure 1.

** "Family physicians" include general practitioners, internists, and pediatricians.

2. Over the period 1940-1965 (Table 5), every region except Region VI (St. Cloud), Region VIII, and Region XI, declined in the percentage of the state's physicians practicing in those regions.
3. While Minnesota's population has shifted from rural to urban, its physicians have shifted even more rapidly (Table 6). Counties with less than 20% of their population residing in urban centers have lost doctors since 1940. Counties with less than 50% of their population living in urban centers have lost doctors since 1950.

WHILE THE TWIN CITIES METROPOLITAN AREA HAS ALWAYS HAD A LARGE PROPORTION OF THE STATE'S PHYSICIANS, ITS RATIO OF PHYSICIANS PER 100,000 POPULATION HAS DROPPED BETWEEN 1940 AND 1960 (TABLE 5).

THE DEMAND

THERE IS A DIFFERENCE OF OPINION REGARDING THE AMOUNT, BUT NEARLY ALL AUTHORITIES AGREE THAT THE DEMAND FOR PHYSICIANS' SERVICES IS INCREASING.

1. While acknowledging the effect of other factors on the future demand for medical services, the Upper Midwest Health Manpower Study Commission confined its quantitative estimate to the effect of anticipated population growth. The Commission estimated that between 1965 and 1975 Minnesota's population would increase by 389 thousand persons. To "compensate for this population growth" their report stated that "there must be a net addition of 335 new physicians ... if the 1960 ratio of 93 physicians per 100,000 population is to be maintained."*
2. One of the more elaborate attempts to quantify the effect of certain known demographic and socio-economic data and trends on future demand for physicians' services is found in Rashi Fein's book, The Doctor Shortage: An Economic Diagnosis.** Dr. Fein begins with known statistical baselines such as population growth rates, physician utilization rates by age, sex, color, education, level of income, etc. From this information, he calculates a quantified projection of the expansion in demand that would result from demographic and socio-economic changes as summarized in the following table:

* Health Manpower for the Upper Midwest, p. 62.

** Fein, Rashi, The Doctor Shortage: An Economic Diagnosis. Washington: The Brookings Institution, 1967. Chapter II, "Future Demand for Physicians' Services", pages 22-61.

Characteristic	Percentage Increase In Physician Visits
Population growth	12.2-14.6
Age-sex distribution	1.0- 1.0
Region and residence	0.2- 0.2
Color	0.5- 0.5
Education and income	7.0- 7.5
Medicare	1.0- 2.0
Total	21.9-25.8

TABLE 1. LOCATION OF NON-FEDERAL PHYSICIANS IN RELATION TO POPULATION: DECEMBER 31, 1965

Location	Civilian population in thousands, July 1	All non-Federal physicians			Physicians in private practice*		
		Number		Rate per 100,000 civilians	Number		Rate per 100,000 civilians
		M.D. and D.O.	M.D. only		M.D. and D.O.	M.D. only	
All locations	194,778	281,045	268,040	144	100,748	180,752	98
United States	191,890	279,050	266,045	145	189,637	179,641	99
Alabama	3,438	2,735	2,733	80	2,119	2,118	62
Alaska	221	157	155	71	134	132	61
Arizona	1,587	2,201	1,941	139	1,641	1,428	103
Arkansas	1,950	1,712	1,691	88	1,315	1,300	67
California	18,299	32,899	32,441	180	23,391	23,220	128
Colorado	1,933	3,524	3,274	182	2,357	2,145	122
Connecticut	2,821	5,121	5,063	182	3,287	3,244	117
Delaware	497	692	651	139	479	442	96
District of Columbia	787	2,937	2,920	373	1,451	1,438	184
Florida	5,713	8,618	8,027	151	5,522	5,098	97
Georgia	4,264	4,362	4,285	102	3,026	2,962	71
Hawaii	648	917	901	142	681	670	105
Idaho	686	651	615	95	571	548	83
Illinois	10,599	14,659	14,306	138	10,029	9,793	95
Indiana	4,877	5,126	4,932	105	3,978	3,819	82
Iowa	2,759	3,303	2,883	120	2,437	2,095	88
Kansas	2,195	2,632	2,427	120	1,861	1,695	85
Kentucky	3,140	3,094	3,054	99	2,231	2,202	71
Louisiana	3,501	3,986	3,973	114	2,753	2,742	79
Maine	975	1,211	999	124	941	784	97
Maryland	3,464	5,780	5,760	167	3,021	3,008	87
Massachusetts	5,309	10,835	10,544	204	6,358	6,172	120
Michigan	8,198	12,038	10,050	147	7,874	6,350	96
MINNESOTA	3,549	5,356	5,289	(13) 151	3,303	3,249	(21) 93
Mississippi	2,301	1,714	1,713	74	1,333	1,332	58
Missouri	4,470	6,677	5,522	149	4,354	3,502	97
Montana	696	714	671	103	634	608	91
Nebraska	1,459	1,694	1,643	116	1,269	1,232	87
Nevada	432	439	412	102	372	350	86
New Hampshire	663	894	867	135	651	632	98
New Jersey	6,735	9,689	9,081	144	7,220	6,728	107
New Mexico	1,008	1,011	894	100	773	671	77
New York	18,032	39,169	38,601	217	24,122	23,665	134
North Carolina	4,821	4,976	4,946	103	3,320	3,298	69
North Dakota	640	576	565	90	496	486	78
Ohio	10,227	14,329	13,293	140	9,727	8,894	95
Oklahoma	2,448	2,814	2,399	115	2,188	1,834	89
Oregon	1,894	2,839	2,673	150	2,049	1,915	108
Pennsylvania	11,505	18,108	16,602	157	12,176	10,973	106
Rhode Island	867	1,384	1,299	160	1,018	949	117
South Carolina	2,489	2,009	2,002	81	1,539	1,534	62
South Dakota	696	572	534	82	492	458	71
Tennessee	3,817	4,333	4,267	114	2,894	2,843	76
Texas	10,387	12,029	11,218	116	9,061	8,391	87
Utah	986	1,323	1,303	134	927	910	94
Vermont	397	718	670	181	431	402	109
Virginia	4,294	4,888	4,850	114	3,302	3,273	77
Washington	2,929	4,471	4,266	153	3,221	3,058	110
West Virginia	1,811	1,861	1,745	103	1,380	1,279	76
Wisconsin	4,140	4,958	4,789	120	3,643	3,496	88
Wyoming	335	315	300	94	285	274	85
Puerto Rico	2,621	1,807	1,807	69	1,077	1,077	41
U.S. outlying areas	267	188	188	70	34	34	13

* Excludes physicians in training (interns & residents), in federal service, in other non-federal practice (full-time hospital staff, full-time medical school faculty, and physicians primarily engaged in administration, laboratory medicine, preventive medicine, or research), retired physicians, and those whose status is unknown or unreported.

** Bracketed numbers indicate Minnesota's rank in comparison to the other 49 states and the District of Columbia.

(SOURCE: Pennel, M.Y. and Baker, K.I., Health Manpower Source Book, 1966.)

FIGURE 1

PERCENTAGE DISTRIBUTION OF ACTIVE PHYSICIANS* IN MINNESOTA BY TYPE OF PRACTICE, 1910-1965

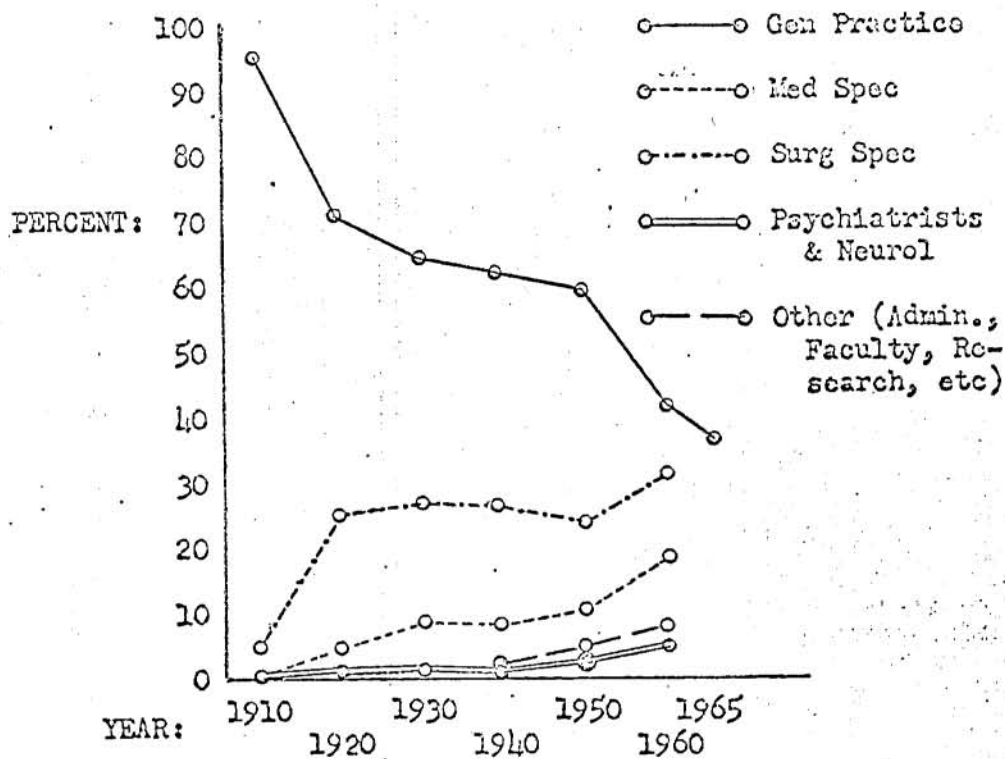


TABLE 2

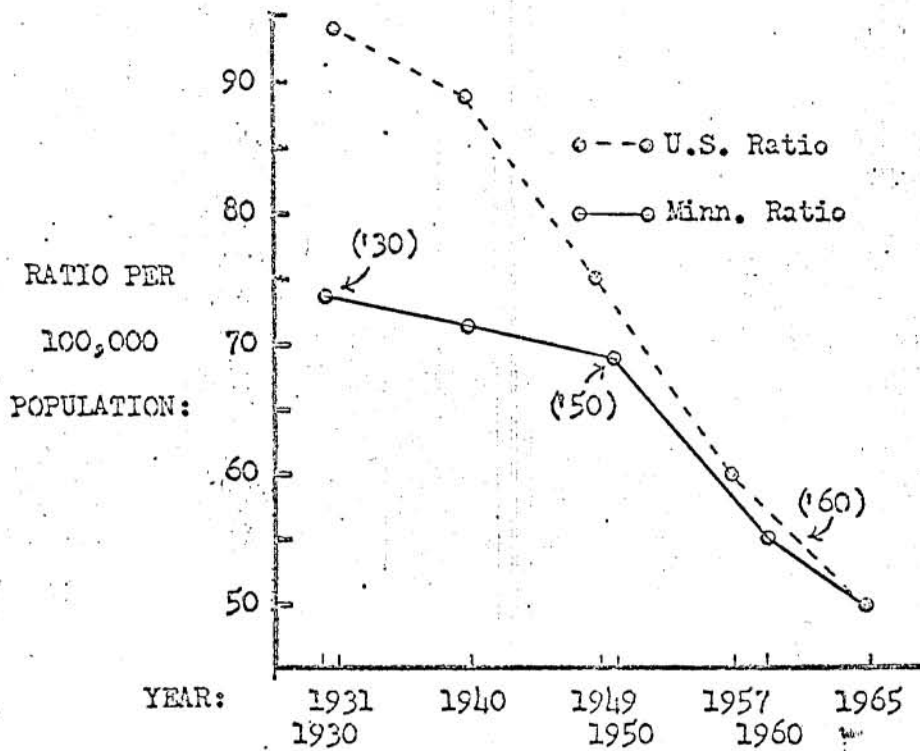
FIELD OF PRACTICE	1910	1920	1930	1940	1950	1960	1965
General Practica	95.0	70.3	63.8	61.6	59.3	41.0	36.7
Med Specialists	0.5	3.8	8.0	7.9	10.7	18.3	n.a.
Surg Specialists	4.3	24.6	26.8	26.5	23.8	31.0	n.a.
Psychiatrists & Neurologists	0.2	1.3	1.4	1.1	2.2	3.6	n.a.
Others	-	-	-	2.9	4.0	6.1	n.a.
	100.0	100.0	100.0	100.0	100.0	100.0	-
Base of calculat'n	2084	2465	2791	2861	2935	3163	n.a.

SOURCE: Health Manpower for the Upper Midwest, Table 9, page 32.

* Defined by the Upper Midwest Health Manpower Commission as all physicians except "doctors who describe themselves as retired, not in practice, or still in training." Most of the published data on physician manpower comes from the AMA Directory Report Service, which defines "active physicians" as all physicians except those who are "retired, not in practice, or status not reported". There is a considerable difference!

FIGURE 2

FAMILY PHYSICIAN POTENTIAL - SELECTED YEARS:
NO. & RATIO PER POPULATION - U.S. & MINN.



TYPE OF PRACTICE		1931	1940	1949	1957	1965
Pediatrics	- U.S.	1,396	2,222	3,787	5,876	9,726
	Minn.	(106)	** (226)	(311)	(578)	
Int. Med.	- U.S.	3,567	5,829	10,923	14,654	22,432
	Minn.	(106)	(226)	(311)	(578)	
Gen. Prac.	- U.S.	112,116	109,272	95,526	81,443	65,951
	Minn.	1,781	1,761	1,741	1,297	1,386
Total	- U.S.	117,079	117,386	110,236	101,973	98,109
	Minn.	1,887	1,987	2,055	1,875	1,806
RATIO per 100,000	- U.S.	94	89	75	60	50
	Minn.	73 ('30)	71	69 ('50)	55 ('60)	50

TABLE 3

* The U.S. and Minnesota data is not exactly comparable since the years for which data is cited and plotted do not coincide in each instance. Where the Minnesota data varies from the years indicated in the column headings in Table 3, the actual year from which local data has been used is indicated in brackets in Figure 2.

** Since separate data for pediatricians & internists was not available, all medical specialists were counted as either pediatricians or internists.

FIGURE 3

Ratio per 100,000 Population of Total MDs,
Active MDs, and Family MDs, 1940-65
(Minnesota)

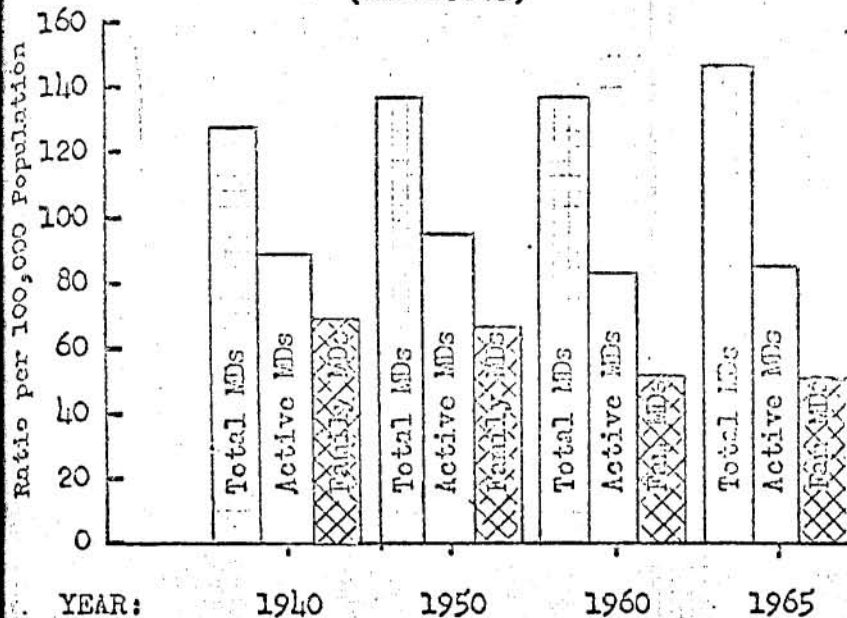


FIGURE 4

Percentage of Total MDs in
Active or Family Practice
(Minnesota)

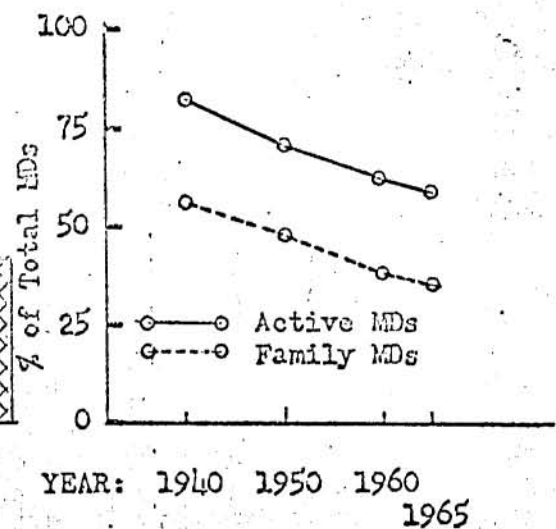


TABLE 4

Number and Ratio per 100,000 Population of Total Physicians,
Active Physicians, and Personal Physicians, 1940-1965 (Minnesota)

TYPE OF MD	1940			1950			1960			1965		
	No. MDs	MDs/100M	% of MDs	No. MDs	MDs/100M	% of MDs	No. MDs	MDs/100M	% of MDs	No. MDs	MDs/100M	% of MDs
Total M.D.s	3,517	126	--	4,085	137	--	4,677	137	--	5,291	146	--
Active M.D.s	2,868	89	81	2,936	94	71	3,163	84	63	3,106	86	59
Personal Physicians (G.P.s, Internists and Pediatricians)	1,926	69	55	1,997	67	49	1,809	53	39	1,905	50	36
Population base for calculation	2,792,300			2,982,483			3,413,864			3,611,868		

(SOURCES: Health Manpower Source Book, U.S.P.H.S., 1966, and Health Manpower in the Upper Midwest.)

TABLE 5 Percentage Distribution of Population, Active Physicians, & Active Physicians Per 100,000 Population by Hospital Planning Region, 1940 to 1965

	1940			1950			1960			1965		
	% of State Pop.	% of MD's	MD/100,000	% of State Pop.	% of MD's	MD/100,000	% of State Pop.	% of MD's	MD/100,000	% of State Pop.	% of MD's	MD/100,000
Region I	4.19	2.4	60	3.65	1.9	51	2.94	1.7	55			1.4
Region II	5.21	3.0	60	4.69	3.1	64	3.83	2.6	64			2.2
Region III	0.61	0.4	65	0.57	0.3	53	0.53	0.3	50			0.3
Region IV	5.08	3.2	65	4.75	2.8	59	4.26	2.7	59			2.3
Region V	10.46	9.1	89	9.69	9.3	94	9.57	9.4	90			7.7
Region VI	5.07	3.2	64	4.84	3.1	63	4.26	2.8	55			3.2
Region VII	6.21	4.1	68	5.76	4.5	77	4.90	3.8	71			2.9
Region VIII	43.32	45.8	108	46.71	55.5	117	51.00	54.2	98			51.4
Region IX	4.52	3.6	81	4.26	3.1	71	3.74	2.4	60			2.0
Region X	6.79	6.4	97	6.64	5.6	83	6.28	5.5	82			4.5
Region XI	8.56	18.6	223	8.45	10.5	123	8.31	14.5	162*			19.3
TOTAL	100.00	100.00	101	100.00	100.00	98	100.00	100.00	93			105
Base For Calculation	2,792,300	2,868		2,982,483	2,936		3,413,864	3,163		3,611,868	3,787	

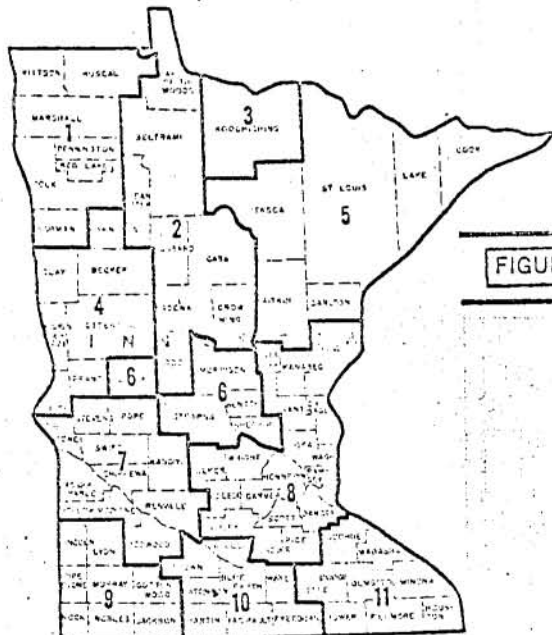


FIGURE 5 Boundaries of Hospital Planning Regions.

Percent Urban Population	1940		1950		1960	
	Number of Counties	MD/100,000	Number of Counties	MD/100,000	Number of Counties	MD/100,000
0-9	32	64	27	56	24	53
10-19	11	65	7	68	6	49
20-29	16	63	15	71	13	68
30-39	12	67	17	75	20	58
40-49	5	115	8	161	8	62
50-59	7	86	6	73	4	90
60-69	1	90	4	138	8	134
70-79	1	97	1	104	1	101
80-89	0	0	0	0	1	16
90-100	2	124	2	117	2	138
TOTALS	87	101	87	98	87	93

(SOURCE: Health Manpower for the Upper Midwest)

APPENDIX II: THE CRITERIA

CRITERION I: THE NECESSITY OF PRODUCING 100 ADDITIONAL PHYSICIANS ANNUALLY FOR MEDICAL PRACTICE IN MINNESOTA.

One approach to the problem of quantifying existing physician needs is to base gross estimates of the deficit on the "average staffing ratios ... of prepayment group practice plans", as the Bureau of Health Manpower has done.* They conclude that "the group practice ratio is the best available approximation of personal health care needs today." Table 7 summarizes the average staffing pattern and ratio of physicians to population for six medical groups:

TABLE 7 MDs per 100,000 Population Served, Average in 6 Medical Groups Providing Prepaid Medical Services, by Specialty

Specialty	Average MDs per 100,000 Population Served	
	Mean	Median
Total	109.4	
Internal Medicine	45.2	44.9
Allergy & Dermatology	4.4	3.9
Pediatrics	18.0	15.8
Obstetrics	9.1	8.0
Orthopedics	3.2	3.0
Ophthalmology	3.7	3.3
Otolaryngology	4.6	3.5
Surgery	6.5	6.7
Urology	1.9	1.5
Radiology	4.4	4.0
Physical Medicine	1.3	1.0
Anesthesiology	1.5	1.5
Pathology	1.8	1.6
Psychiatry & Neurology	3.8	2.5

* Health Manpower: Perspective 1967. Bureau of Health Manpower, U.S.P.H.S. (PHS Publication No. 1667), Washington: U.S. Government Printing Office, 1967. See pages 9, 10, & 75.

From this starting point, the Bureau of Health Manpower has concluded:

"Using this ratio, and considering all physicians in private practice to be the universe of physicians giving personal health care ... we can estimate an unmet need at the present time for between 20,000 and 30,000 physicians to provide personal health care; hospitals need more than 10,000 additional interns and residents ... In short, we should now have over 50,000 more physicians than we have, even without considering the projected population growth over the next decade ..."

If we assume that this need is evenly distributed in direct ratio to the general population, it is possible to translate this estimate of "unmet need" to the situation in Minnesota. In recent years, Minnesota's percentage of the U.S. population has ranged from 1.82% in 1963 to 1.9% in 1960. Using the lowest percentage figure, one can say that at the present time, Minnesota has an estimated "unmet need" for between 728 and 1001 more physicians than we have, as follows:

364 to 546	physicians for personal health care
182	interns and residents*
<u>182</u> to <u>273</u>	other physicians
728 1001	TOTAL additional NDs needed now.

It is possible to show that this simple interpolation is an inappropriate means of defining Minnesota's unmet health needs. The committee feels, however, that the use of the minimum figure of 700 physicians needed now provides at least an approximate estimate of Minnesota's present physician deficit. Furthermore, in view of the fact that Minnesota's ratio of physicians in private practice to population falls below the national ratio, it is likely that the straight-line interpolation of the national estimate is, if anything, a conservative one.

Another way of applying the Bureau of Health Manpower guidelines would be by the simple application of the "group practice ratio" of 109 physicians per 100,000 population to Minnesota's estimated population. We then get the following estimate of additional physicians needed now:

Physicians needed for personal health care	4,108
(Less Physicians in private practice now)	3,249
Additional physicians needed for personal health care	859
Additional interns and residents for available vacancies	<u>268</u>
TOTAL ADDITIONAL PHYSICIANS NEEDED IN MINNESOTA	<u><u>1,127</u></u>

* According to the annual Education Number of J.A.M.A. (November 20, 1967), Minnesota actually needed 75 additional interns and 193 additional residents to fill available vacancies, or a total of 268 additional interns and residents.

The Upper Midwest Health Manpower Study Commission was convinced that Minnesota has a "substantial unsatisfied demand" for physicians, and that the shortage of physicians was becoming more critical. The Commission recommended:

- 1.) "That the University of Minnesota expand its entering class to 200 students at any early date and lay plans for a further expansion to 250 at some time in the future."
- 2.) "That students from these two-year schools (University of North Dakota and University of South Dakota) be encouraged to complete their education at the University of Minnesota."
- 3.) "That the Northern Association for Medical Education consider establishing a Medical Federation for Graduate Education and Research."
- 4.) "In view of the future need for physicians in Minnesota and other states in the Upper Midwest, the Commission foresees the need for and recommends a second medical school, probably in the Twin Cities."

These recommendations grew out of the Commission's judgment that both short-term and long-range solutions were necessary in order to alleviate present shortages and meet future demands. That a shortage already existed and that it would probably become more critical in the future was a conclusion based on:

- 1.) "...requests for doctors made by many communities to official and other agencies."
- 2.) Its calculations that estimated that "there would be between 200-300 fewer physicians (in 1975) than would be needed to maintain the present (1965) ratio of active physicians to population".
- 3.) "...trends in the supply of physicians ... (that reveal) the long-term decline in the doctor-population ratio of active and personal physicians ..."
- 4.) "A greatly increased demand for medical care (that) must be anticipated because of Medicare, rapid growth of personal income, improvements in health insurance and population growth."

The Upper Midwest report, published in 1966, calls for the early expansion of the University of Minnesota School of Medicine by 100 additional students -- 50 to be added "at an early date", and 50 more to be in the planning stage. The Commission also recommended a rather extensive post-graduate medical education network, under the direction of NAME, that would establish internship and residency programs as "an effective way of recruiting physicians." In addition the Commission foresaw "the future need for a second medical school ..."

While a strict comparison between these figures and the committee's conclusion that "100 additional physicians" are needed "annually for medical practice in Minnesota" is not possible, the two estimates are fairly close. The Upper Midwest report called for an

expansion of the productive capacity of the present School of Medicine by 100, but recognized that about half, or 50 of these graduates would annually "migrate out" of Minnesota. The report also recommended an ambitious post-graduate program partly because of the proven ability of such programs to "hold" physicians for practice in the area. While the report does not place a numerical goal or estimate on the productive capacity of its recommended program, we would be safe in assuming that the Commission envisioned programs which would provide a total of 25 to 50 additional residency places. In other words, the Commission was, in effect, recommending an expansion of medical education that would provide an additional 75 to 100 physicians retained for practice in Minnesota annually. The Commission based these recommendations on maintaining the 1960 ratio of 93 "active physicians" per 100,000 population (inclusive of Olmstead County).

The Senate committee believes that the use of the 1960 ratio has the effect of understating Minnesota's physician shortage. "Active physicians" includes MDs in federal service, in medical education and medical research, and in administrative positions. Moreover, the 1960 ratio represents the lowest point this ratio has reached in the years show in Figure 3. In any case, both of the estimates must be regarded as conservative.

CRITERION II: THE NECESSITY OF ASSURING THAT 65% OF THE NEW PHYSICIANS PRODUCED WILL SPECIALIZE IN THE PRACTICE OF PRIMARY HEALTH CARE OR A RELATED SPECIALTY.

The serious shortage of family physicians (i.e., physicians who provide first-contact, or primary health care, such as general practitioners, internists, and pediatricians) has already been shown.

There are virtually no guidelines available for determining an optimal distribution of doctors by specialty. According to the Bureau of Health Manpower estimate already quoted, Minnesota's present "unmet need" is for 364 to 546 additional personal or family physicians. About one-fourth, or 45, of the additional interns and residents needed would probably also be in the fields of internal medicine, pediatrics, and general practice. Based on this interpolation, about 56% to 59% of the additional physicians needed in Minnesota are family physicians.

Figures 1 and 2 in the appendix indicate that the year 1950 marks the beginning of a sharp decline in both the percentage of doctors in general practice, and the ratio of family physicians to population. In 1950 the ratio of family physicians was 67 per 100,000 people in Minnesota, or approximately one-half of the active physicians at that time. We believe that it would be a reasonable goal

to restore and maintain that balance between primary physicians and other specialists. To do this and to overcome the present deficit requires that considerably more than 50% of the new physician production be primary physicians.

The committee believes that it is possible to design programs of medical education that will accomplish this goal. Studies of the abilities, interests, personalities, and biographies of medical students indicate that certain characteristics distinguish those who choose general practice from students selecting specialty practice or careers in academic or research medicine.* These findings suggest that admissions requirements and policies of student selection can affect the kind of doctor produced. Moreover, it is commonly believed that the career choices of medical students are influenced by their clinical education. Faculty values and attitudes, as well as the content and organization of the clinical setting, have an effect on shaping career choices. We believe that the legislature should give preference to proposals that forward this emphasis on primary health care by providing for its specific implementation in ways such as these.

CRITERION III: THE NECESSITY OF ASSURING THE AVAILABILITY OF PHYSICIANS' SERVICES IN ALL PARTS OF MINNESOTA, ESPECIALLY IN RURAL AREAS AND URBAN GHETTOS.

We have already pointed out that the shortage of rural physicians is partly due to a shift away from the general practice of medicine toward specialty practice, and that the place of the vanishing GP is not being taken by other personal care specialists. To date improvements in transportation have tended to offset the decline in the number of rural physicians. The committee feels, however, that the problem of providing adequate physicians' services for rural Minnesota warrants more explicit attention.

Medical specialists have tended to locate almost exclusively in urban areas because they deal with a narrow range of medical problems and because they depend on the highly specialized facilities and personnel that are available in larger hospitals and clinics*. Contrary to the impression given by relatively high physician-population ratios in these urban areas, however, a surplus of physicians does not exist in Minnesota's cities. Urban ratios are distorted due to the large number of specialists and doctors involved in training programs. The ratio of family physicians is probably quite different (this data has not been available to the committee), and would almost certainly fall below desirable levels.

* Cf. Schunacher, Charles F., "The 1960 Medical School Graduate: His Biographical History," Journal of Medical Education, V. 36, No. 5, May 1961; & Schunacher, Chas F., "Personal Characteristics of Students Choosing Different Types of Medical Careers," J of Med Ed, V. 39, No. 3, March 1964.

** There is some indication that urban competition may be generating a trend to decentralize specialists as seen in the growing number of medical groups in Minnesota's medium-sized cities.

The inadequate health care presently provided to the urban disadvantaged* is also a serious concern to the Senate committee. The committee recognizes that the reasons for this inadequacy are far too complex to be solved by simply increasing the number of family physicians in urban areas. More doctors will not provide transportation or the services of a baby-sitter to care for a mother's children while she seeks medical help. Yet such seemingly simple problems are the everyday barriers that prevent many from receiving the help that is available. Or the barriers may be such not-so-simple things as ignorance, fear, or a simple inability to "negotiate in a complicated system".

While the problems of the disadvantaged have been the object of greater concern recently, and various experimental approaches have been, or are being tried, the committee knows of no clear-cut method that has proved to be especially successful. The one thing that is apparent is that most of the concern and active effort that has been expressed for this segment of our citizens has come from government agencies on various levels. We share the judgment expressed by the National Advisory Commission on Health Manpower in its recent report:

"Health is only one of the problems which beset the disadvantaged, but the severity of health problems and their unique characteristics are not generally appreciated. As a consequence, many current efforts to correct them have been ineffective ... Many health problems of the disadvantaged are not susceptible of solution by dollars alone or by traditional health programs ... We believe that successful programs will have to be unique, intensive, and designed with recognition of the special problems of this particular segment of society... We urge that such experimentation be markedly expanded and, further, that successful innovations introduced for the care of the disadvantaged be examined for their applicability to the care of the general population ... To conduct such programs with the scale and quality required to attain our goals, the larger base of private medicine must supplement the limited capabilities available through public sources ... As with other problems of the disadvantaged to which the nation as a whole is turning its attention, health problems must come under concerted attack from all segments of society."**

The Senate committee believes that the plight of the urban disadvantaged constitutes both a responsibility and an unparalleled opportunity for medical education. The greatest health need of this

* Disadvantaged for many reasons including poverty, race, age, and other reasons.

** Report of the National Advisory Commission on Health Manpower. U.S. Government Printing Office, Washington, D.C., November, 1967. Volume I, pages 36-38.

group is for preventive and primary medical care, and the disadvantaged as a group would comprise a better clinical model of family practice than now exists in our teaching hospitals. Moreover, the situation would be ideal as a setting for research and demonstration projects for the development of new patterns of health care delivery. Faculty and students could take the leadership in determining the shape of future practice patterns in an environment virtually free of hindering traditions. The medical student's strong service motive would also find ample reward in providing health care to persons who have not had its benefits. In such a setting it is very probable that the student's choice of primary or family medicine would be greatly strengthened. At the same time, the medical needs of the disadvantaged would be substantially alleviated.

CRITERION IV: THE NECESSITY OF A LOCATION THAT WILL PROVIDE AN APPROPRIATE ENVIRONMENT AND THE NECESSARY RESOURCES TO PERMIT AND SUPPORT THE PROPOSED PROGRAM.

The concerns of the Senate committee in stipulating this requirement are those that are in the minds of the accrediting agency as it conducts its evaluation of the qualifications of candidate programs. Salient community factors that receive consideration in the accreditation process are contained in the published standards of the various undergraduate and postgraduate accrediting agencies, to which reference has already been made. These requirements are readily available and need not be elaborated here.

It is the Senate committee's intention to conduct its evaluation on the basis of the relative and objective merit of each proposal, and the extent to which the proposal forward the goals established by the committee. While the committee cannot disregard certain community requirements that relate to accreditation, these will be considered as of less importance than the overall quality of the program proposed.

