SYSTEMS ANALYSIS APPROACH TO MEDICAL SCHOOL CURRICULUM: AN ATTITUDINAL SURVEY OF SELECTED MEDICAL FACULTY MEMBERS

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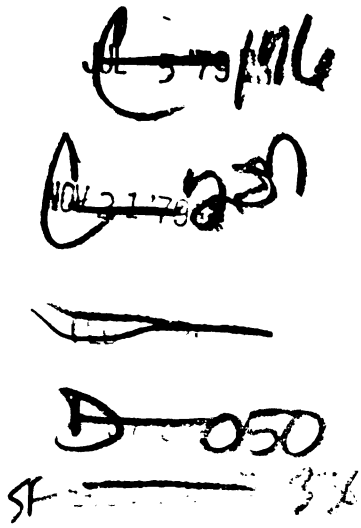

ABSTRACT

SYSTEMS ANALYSIS APPROACH TO MEDICAL SCHOOL CURRICULUM: AN ATTITUDINAL SURVEY OF SELECTED MEDICAL FACULTY MEMBERS

By

Loren L. Hatch

Medical education is coming under searching scrutiny today. Increased concern over curriculum change has arrived with new tools for effecting change--in particular systems analysis. The present study attempted to assess receptivity to, and actual use of, systems analysis in a sample of midwestern medical schools.

A number of reasons appear to justify the use of systems analysis in medical education. Systems analysis may help shape a curriculum better suited to social and humanistic ideals; it might also help fill the need for more physicians. A third reason is that present and future physicians may be dissatisfied with the training they have been receiving. A fourth reason is that the medical school, like the university as a whole, is heir to a host of problems inherent in irrational and haphazard design.

Self-evaluation may be carried out at a large

number of medical schools. This study attempted to assess the extent to which this kind of scholastic self-evaluation is being carried out through systems analysis in one region of the United States. A questionnaire employing open-ended and closed-choice questions was used, with a descriptive presentation of findings. Faculty at nineteen medical schools in the midwest were contacted, with a final sample size of seventy-three respondents.

All faculty ranks were represented in the final sample, from department chairman through instructor. There was an equal number of respondents from public and private medical schools. The proportion of respondents from clinical science and basic science departments corresponded roughly to the proportion of such departments in the schools studied. A wide variety of departments was represented. Most respondents were relative newcomers to their present positions, with half having served five years or less and about 70 per cent ten years or less.

The investigation produced a number of findings, including the following:

1. Respondents tended to see objectives in medical education as not changing very much over the past several years. The principal reason for stability in terminal objectives was stability of the physician's role.

2. Clinical training, research, and emphasis on

the whole person were the leading objectives of medical education--for both entire schools and individual departments. Some departments, however, ranked research highest.

3. Respondents were more critical of overall attainment of school objectives than they were of their own departments' records.

4. Most change in educational objectives can be attributed to external constraints, such as changes in public philosophy or public funding.

5. Widespread use of some components of systems analysis was reported in this group of schools along with major but less widespread use of systems analysis as a total approach.

6. There was cautious acceptance of systems analysis, with virtually total absence of rejection. The tendency was to accept it where it is being used.

7. Neither personal background nor the type of school affected attitudes toward systems analysis or the conception of terminal objectives.

A number of recommendations were offered, including the following main ones:

1. That similar studies be conducted for other regions of the country and for the country as a whole.

2. That all schools in a region be assessed.

3. That department-by-department comparisons be

undertaken and that comparison between basic science and clinical science be made.

4. That systems analysis itself be used as a conceptual source for such comparisons.

5. That a permanent unit be established for undertaking or supporting research in systems analysis in medical schools, for exchanging that information, and for exporting systems-developed curricula to departments with comparable objectives.

6. That the limits on the use of systems analysis be explored through the experiences of medical educators themselves.

SYSTEMS ANALYSIS APPROACH TO MEDICAL SCHOOL CURRICULUM: AN ATTITUDINAL SURVEY OF SELECTED MEDICAL FACULTY MEMBERS

By

Loren L. Hatch

A DISSERTATION

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Michigan State University
in partial fulfillment of the requirements
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DOCTOR OF PHILOSOPHY

Department of Higher Education
College of Education

1975

DEDICATION

To those who will follow--

so they may know obstacles can be overcome.

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ACKNOWLEDGMENTS

So many persons are responsible for any success we may have in our second doctoral program we regret only a few can be mentioned.

Certainly Dr. Richard Featherstone, Chairman of our guidance committee, deserves to head the list of those who gave their time, knowledge, and energies on our behalf. Other important influences include the members of our committee: Dr. Ann Olmsted, Office of Medical Education Research and Development, our cognate leader who provided initial encouragement; Dr. William Sweetland, for his patience and fine humour; Dr. George R. Myers who always has a kind and generous word.

To our committee--thank you!

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It was necessary to be employed throughout our ambitious endeavors; and without the real help and understanding of James S. Feurig, M.D., Director of University Health Services, where we worked as a physician, nothing would have been accomplished. For this and personal courtesies, we shall always be grateful.

To my wife Elizabeth and our children April, Mark, and Loren, who did without much these past few years, goes my love for their part in helping us.

And a special thank you is extended to Miss Eulalie Beffel, our teacher of so long ago whose farsighted wisdom let a young man see beyond the horizon.

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CHAPTER I

INTRODUCTION

Medical education, like all education, is coming under searching scrutiny today. An innovative mood has been amply documented.

> Medical educators are concerned--perhaps more now than in the past--with the kind of training they give their students: they are worried about the kinds of physicians being turned out; they have begun to experiment with new methods of selection; they are interested in trying new teaching methods; and they wish to redesign their curricula.[1]

In the 1970s the spirit of experimentation has become even more widespread. A significant new approach for implementing innovations has made its appearance: systems analysis. Computer technology, a valid source of instructional media hardware, has been recognized also as a major source of techniques for executing systems analysis. It is important to note the distinction between the execution and the instructional functions.[2] Having made

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[1]Howard S. Becker and Blanche Geer, "Medical Education," in Handbook of Medical Sociology, ed. Howard E. Freeman, Sol Levine, and Leo G. Reeder (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1963), pp. 169-170.

[2]Eric D. Zemper, "Computer Assisted Instruction in Medical Education: Perspectives and Potential at Michigan State University," Office of Medical Education, Research and Development, Paper No. 1973-1 (East Lansing: Michigan State University, 1973), p. 39.

this distinction, it is pertinent to ask to what extent these tools are being used in the execution function, and what their effectiveness is.

Definition and Statement of Problem

Medical education today is experiencing a crisis of many dimensions. Health care consumers as well as medical school alumni have become acutely aware of a range of problems: an insufficient number of physicians; dehumanization of health care delivery; and inappropriate exclusion or allocation of curriculum materials. Curricular change is seen as a significant approach to solution of these problems, and systems analysis is seen as a potentially powerful tool for effecting curricular change.

In the field of medical education, objectives have always occupied a prominent position. There has been growing dissatisfaction with the degree to which objectives have been attained, or even sought. The emergence of systems analysis promises to provide an effective means of evaluating objectives and the means of attaining them. Systems analysis has several virtues: it is operational; it is comprehensive; it is adaptable and revisable; and it can be applied at any level--from one individual to a national system. Yet it is problematic whether medical educators recognize the potential of systems analysis for resolving problems in curriculum design.

The challenge of curriculum evaluation has assumed

ever larger dimensions in modern educational thinking. Statements of problems of evaluation in terms of objectives help to bring those problems into focus. At the same time, new questions are raised, such as the following: (1) How does one go about formulating objectives? (2) How does one decide on the materials to be included in the curriculum? (3) How does one evaluate whether such materials have in fact satisfied the formulated objectives? (4) How does one decide whether those objectives are appropriate for the overall purposes of medical education?

Objectives have occupied a varied role in education. While they have been a basic element in curriculum design for some time,[3] the principal emphasis has been on evaluation of student performance or learning,[4] rather than on evaluation of the curriculum itself. Even in that limited perspective, it has become apparent that an objective could be formulated in a number of alternative ways, reflecting different philosophical or psychological positions: the formulation could be instructor-oriented, activity-oriented, learning-oriented, or behavior-oriented. The last approach has a number of virtues: it describes

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[3]An early analysis of objectives is found in Ralph W. Tyler, Basic Principles of Curriculum and Instruction (Chicago: The University of Chicago, 1950).

[4]Benjamin S. Bloom, ed., Taxonomy of Educational Objectives, Handbook I: Cognitive Domain (New York: David McKay, 1956); David R. Krathwohl, Benjamin Bloom, and Bertram Masia, Taxonomy of Educational Objectives, Handbook II: Affective Domain (New York: David McKay, 1964).

"what the learner will be able to do as a result of the learning experience;" it states explicitly "the essential characteristics of the desired behavior;" it "clearly specifies the conditions under which the learner will perform the behavior;" it requires that "the behavior is observable," and specifies that "the behavior can be evaluated."[5]

The behavioral approach to objectives, while oriented to the individual learner, has its organizational counterpart in the operational goal--a goal so specified that its attainment, or degree of attainment, is easily observed and evaluated. With the growing size and complexity of educational problems, the virtues of operational goals for educational institutions have been noted.[6] In addition to operational characteristics of objectives, the educational planner must also consider the following criteria in designing objectives: significance of the problem, feasibility, relevance, definitiveness with regard to contingencies, parsimony, adaptability, time factors, and monitoring.[7] These criteria are readily translated

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[5]Sidney J. Drumheller, Handbook of Curriculum Design for Individualized Instruction: A Systems Approach (Englewood Cliffs, N.J.: Educational Technology Publications, 1971), p. 13.

[6]William E. Moran, "The Instrumentation of Universities," The Journal of Higher Education, XXXVIII (April, 1967), 190.

[7]Frank W. Banghart and Albert Trull, Jr., Educational Planning (New York: The Macmillan Co., 1973), pp. 10-11.

for application to the problems of medical education.

The systems approach, which uses objectives as a fundamental building block, has been employed by some medical schools in designing curricula. However, studies which describe such efforts are few in number. The impression gained from these studies is that only particular departments, rather than entire schools, are the foci of systems design and evaluation. Yet it is clear that the systems approach can be used at any level up to and including the national system of medical education.[8]

It is therefore the purpose of this study to assess the presence of systems analyses in particular medical curricula. The state of this developmental and evaluative methodology goes well beyond a mere recitation of its virtues. However, it may be that it is being used in only a few exemplary instances. What is lacking is definitive information on the nature and extent of the use of such technology. An important part of this knowledge pertains to the receptivity to a systems approach within particular faculties. A continuum may be conceived, ranging from nonacceptance of systems through acceptance without implementation and on to various stages of implementation. The present study was undertaken to assess the degree of acceptance and implementation of a systems approach in a group of medical schools.

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[8]Hans R. Grunauer, "Systems Theory Applied to Medical Education," Medical Progress Through Technology, I (1973), 164-168.

Need for the Study

The need for self-renewal in medical education has been well noted by Sigerist.

> It is important to know that the medical ideal has changed a great deal in [the] course of time and is evolving constantly. As a result, medical education can never reach definite forms but is obliged to adapt itself to changing conditions. Every society required of its physician that he have knowledge, skill, devotion to his patients and similar qualities. But the position of the physician in society, the tasks assigned to him and the rules of conduct imposed upon him by society changed in every period . . . .
>
> We must keep in mind that the picture a society has of its ideal doctor--the goal of medical education --is determined primarily by two factors: the social and economic structure of that society and the technical means available to medical science at that time.[9]

Stating his case over three decades ago, Sigerist asserts the need for "a scientific physician, well-trained in laboratory and clinic;" at the same time he posits the need for "a social physician who, conscious of developments, conscious of the social functions of medicine, considers himself in the service of society."[10]

Such a social ideal would apply to the physician collectively as well as individually. Yet it is clear that the ideal has not been attained. For one thing, various factors such as expanding health care needs have inhibited the effective delivery of health services. Another factor inhibiting proper health delivery is, simply, a dearth of physicians: "Just to meet current demand, it is said that

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[9]Henry E. Sigerist, "Trends in Medical Education," The University at the Crossroads: Addresses and Essays (New York: Henry Schuman, 1946), p. 107.

[10]Ibid., p. 113.

the U.S. could use another 50,000 doctors (we now have 300,000) and another 150,000 registered nurses (we now have 660,000)."[11]

The implication is that the patient is suffering and dissatisfied with this relative scarcity of health services. That scarcity--whether in quantity or in quality--must be at least partly a function of the medical education system. But few have bothered to investigate the degree of dissatisfaction among the graduates of that system. One study found doctors about evenly divided between "satisfied" and "dissatisfied" with their medical education over the first half of the 1950s--where the subjects were trained in public medical schools; dissatisfaction among private school graduates was less pronounced.[12] Dissatisfaction was more frequent among general practitioners than among specialists, with the general practitioners graduating from public medical schools showing the highest incidence of dissatisfaction.[13] Such a high incidence of dissatisfaction cannot be taken lightly.

One might infer that greater dissatisfaction among

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[11]David Hapgood, Diplomaism (New York: David W. Brown, Inc., 1971), p. 62.

[12]Fremont J. Lyden, H. Jack Geiger, and Osler L. Peterson, The Training of Good Physicians (Cambridge, Mass.: Harvard University Press for the Commonwealth Fund, 1968), p. 186.

[13]Ibid., p. 187.

general practitioners is related either to the growth of a stronger personal ideal or to the fact that specialists receive much of the training in their specialty after they have finished medical school--or to both. It is clear that the general practitioner is not satisfied with the training he received, as assessed through the needs of his actual practice. In trying to explain this dissatisfaction, it is necessary to understand the nature of the medical school experience. The one problem common to student and educator alike in medical school is that there is too much to learn. The result is constraint on attempts at curricular change:

> As the medical system is now devised, the student has to go through a whole series of hurdles. First there is the highly standardized MCAT test, which heavily influences whether or not he is accepted into medical school. Then in medical school he has to go through a curriculum which is determined to a large extent without reference either to his interests or to the requirements of patient care. The curriculum reflects the power structure of the school; the faculty members who have the most power get the most hours in the curriculum.[14]

The medical school, it should be noted, is predominantly a part of a university. As such it is heir to all the problems of the university in general and of the medical school in particular. With regard to the former, "The present university structure, taken as a whole, tends

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[14]National Institute of Child Health and Human Development, U.S. Department of Health, Education, and Welfare, Behavioral Sciences and Medical Education: A Report of Four Conferences (Washington: Government Printing Office, 1972), pp. 97-98.

to be poorly integrated and not always rational in design."[15] With regard to the latter:

> The medical school has always occupied a unique and sometimes difficult position amongst the graduate schools of the university. Other faculty members have looked upon medicine as a more vocational pursuit than their own scholarly interests. Another source of friction has been the salaries of medical faculty which have diverged widely and far exceeded those in other graduate schools. Deans of medical schools have become increasingly powerful in the university as their budgets have grown, swollen mainly with federal funds, an imbalance which has been a source of stress to the university's administration.[16]

Given these shortcomings, what attempts at resolutions or cures have been undertaken? On the one hand, there have been technological innovations, such as the use of television and computers in assisting instruction.[17] On the other hand, a number of schools, according to the Association of American Medical Colleges, are instituting curricular changes:

> Virtually every medical school in the country has instituted more or less intensive study of its own teaching approaches, and many have followed such studies with a series of reforms. The traditional curriculum provided emphasis on content of material

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[15]Stanley O. Ikenberry and Renee C. Friedman, Beyond Academic Departments (San Francisco: Jossey-Bass, Inc., 1972), p. 6.

[16]John H. Knowles, "Medical School, Teaching Hospital, and Social Responsibility: Medicine's Clarion Call," in The Teaching Hospital: Evolution and Contemporary Issues, ed. John H. Knowles (Cambridge, Mass.: Harvard University Press, 1966), pp. 96-97.

[17]James W. Ramey, Television in Medical Teaching and Research (Washington: Government Printing Office, 1965); Zemper, "Computer Assisted Instruction," passim.

> and the material, for the most part, was presented as consisting of separate entities. Features of the new curricula include greater correlation between the clinical and basic sciences, emphasis on function rather than structure, introduction of multiple track systems, and more elective time.[18]

One could gain the impression from such statements that all is well with medical education. But it is noteworthy that of the approximately 120 medical campuses in the United States, only about 50 have offices that are concerned with evaluating the process of medical education.[19] The proportion is significant and is subject to contrapuntal interpretations: either that few medical schools, or that many medical schools--depending on the point of view--are concerned with the quality of the education they are giving.

It is clear that a more definitive statement is needed regarding the nature and extent of self-evaluation being conducted by American medical schools. Self-evaluation of some form is apparently occurring at a large number of schools. While systems analysis necessarily includes self-evaluation as part of its approach, it does not follow that all schools engaged in self-evaluation are using a systems approach. It is not at all clear, either,

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[18]Association of American Medical Colleges, Medical School Admission Requirements, 1974-75, U.S.A. and Canada, 24th ed. (Washington: Association of American Medical Colleges, 1973), p. 43.

[19]Association of American Medical Colleges, 1973-1974 AAMC Curriculum Directory (Washington: Association of American Medical Colleges, 1973), p. 285.

just what is the extent to which systems analysis is being applied at any schools. Because of the need for evaluation and because of the capacity of the systems approach for evaluation and change, the present study was undertaken.

Limitations of the Study

There were several limitations to the present study. One important limitation was that the study was descriptive in design: no specific hypotheses were formulated prior to executing the research. Instead, it was expected that hypotheses might emerge in the course of the investigation. The decision not to formulate hypotheses was based on the perception that there was little descriptive knowledge or information bearing on this area and that such descriptive knowledge was a prerequisite to any valid postulations.

A second limitation lay in the kind of data collected. The instrument used was a questionnaire (see Appendix A, p. 98), one employing open-ended and fixed-choice responses; hence the responses elicited were not of an exact and quantifiable variety. However, since the study was descriptive and exploratory, it was believed that even an entirely open-ended questionnaire could produce valuable and pertinent information that might not be obtainable from an alternative format.

A third limitation was, specifically, the population sampled. It was decided to collect data from a

sample consisting of the following twenty medical schools:

Case Western Reserve University School of Medicine
Indiana University School of Medicine
Loyola University of Chicago, Stritch School of Medicine
Mayo Medical School
Medical College of Ohio at Toledo
The Medical College of Wisconsin
Michigan State University College of Human Medicine
Northwestern University Medical School
The Ohio State University College of Medicine
The Pritzker School of Medicine of the University of Chicago
Southern Illinois University School of Medicine
University of Cincinnati College of Medicine
University of Health Sciences, The Chicago Medical School
University of Illinois College of Medicine, Chicago
The University of Iowa College of Medicine
The University of Michigan Medical School
University of Minnesota-Minneapolis Medical School
The University of Nebraska College of Medicine
University of Wisconsin Medical School
Wayne State University School of Medicine

A geographical limitation, thus, was that the sample was located entirely in the Midwest, and only in part of the Midwest. It was decided that this restriction would allow more intensive examination of the schools chosen while permitting examination of other regions at some future time.

While the sample does not include all the schools in the region, it was believed to be representative of the region. Another possible limitation referred to the need to generalize the results to the nation as a whole: on the basis of the distinction between a national system of medical education and the individual systems of medical

schools,[20] there was no expectation that the present investigation could be directly generalized to the national system as a whole even though indirect inferences might be permitted. Given the tendency toward homogeneity of medical education among American schools, one could argue for the validity of the results of the present study in terms of the national population of schools. It was thought that future regional comparisons might help to prove such validity.

Definition of Terms

The following terms are considered important for the purposes of this study:

Computer-assisted instruction (CAI): "a general term for a number of teaching techniques designed to enhance learning through utilization of a computer which interacts directly with a student."[21] CAI is thus one application of systems in curriculum design but is distinct from the general application of systems for that purpose.

Constraint: a constant input, one that has a limiting or delimiting value that cannot be removed. A constraint stands in contrast to an objective, which has a variable value. "Constraints are mainly financial, such

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[20] Grunauer, "Systems Theory Applied to Medical Education," pp. 164-168.

[21] Zemper, "Computer Assisted Instruction," p. 1.

as the availability of funds, or physical, such as the availability of buildings or equipment."[22]

Isolated objectives: objectives that are incidental to the main purpose. Stated in terms of learning, these objectives refer to items that are "nice to know."[23]

Objectives: "statements that are capable of both measurement and planning;" stated specifically in terms of a systems approach, "objectives are not fully specified at the start of the educational planning exercise."[24]

Prerequisite objectives: In terms of learning, these "relate to specific behaviors such as skills, attitudes or knowledge . . . . When certain behaviors are prerequisite to a unit, they are usually the terminal objectives of a preceding unit."[25]

System: "an organized or complex whole, an assemblage or combination of things or parts forming a complex or unitary whole," in the definition offered by Johnson and associates, who also note: "It will be helpful to define systems more precisely as an array of components designed

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[22]Khateeb M. Hussain, Development of Information Systems for Education (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1973), p. 63.

[23]Drumheller, Handbook of Curriculum Design, p. 13.

[24]Banghart and Trull, Educational Planning, pp. 265-266.

[25]Drumheller, Handbook of Curriculum Design, p. 13.

to accomplish a particular objective according to plan."[26]

Terminal objectives or end objectives: the final objectives for particular processes or activities.

Transitional objectives or means objectives: an objective that is constructed solely for the purpose of attaining a terminal objective and is thus discarded when the latter is attained.[27] Being able to walk with crutches may be viewed as a transitional objective relative to the terminal objective of being able to walk without them. A transitional objective is not synonymous with a prerequisite objective since the latter may stand as a terminal objective in its own right and be basic and essential. Both terminal and transitional objectives may be classified into prerequisite and isolated objectives as well as into subobjectives.[28]

Summary

The medical profession in the United States is today faced with a host of problems, among them production of insufficient numbers of doctors. A number of steps have been taken to deal with such problems at the medical school level; among the solutions attempted have been evaluation and innovation. Yet it has become clear that only

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[26]R. A. Johnson, F. E. Kast, and J. E. Rosenzweig, The Theory and Management of Systems, 2nd ed. (New York: McGraw-Hill Book Co., 1967), p. 113.

[27]Drumheller, Handbook of Curriculum Design, p. 11.

[28]Ibid., p. 12.

a systems approach implementing these measures in an integrated manner, minimizing waste and inefficiency in the attainment of overall objectives, can answer the needs. At the core of the issue is the nature of educational objectives as such and how these are approached at the institutional level.

The present investigation attempted to assess the nature of medical education objectives and the extent to which a systems approach was being used to implement the objectives at several midwestern medical schools. Regarding the systems approach, a continuum was conceived, ranging from non-acceptance to full acceptance. Limited in geographic scope, the study was also limited to being descriptive and exploratory, using an open-ended questionnaire as the data-gathering instrument. It was expected that hypotheses would be suggested in this manner and that future comparisons with other regions would be possible.

CHAPTER II

SURVEY OF THE LITERATURE

The literature on the education of future doctors has followed certain trends over time. One such trend has been the increasing accumulation of sheer knowledge of the effects of medical education. Another trend has been the response of those concerned with medical education in terms of emerging problems in medical education and in the general health delivery system. The present chapter is concerned primarily with one facet of medical education, the school of medicine. As one writer has observed: "Medicine is one, perhaps the only profession, where a person receives his degree halfway through his training."[1] It must be recognized that the school of medicine is interdependent with other phases of medical education even though it is of necessity considered in relative isolation in the present context.

For the purposes of the present study, the literature may be divided into the following categories: (1) descriptive studies of the nature and effects of medical education; (2) criticisms of medical education and

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[1]Joan Arehart-Treichel, "Training Doctors: Shortcuts, Change, and a Fund-Cut 'Disaster,'" Science News, CIII (March 24, 1973), 190.

confrontation of problems old and new; (3) recent innovations or attempts to meet these problems; and (4) one innovation in particular--the systems approach to planning, executing, and evaluating programs in medical education.

Descriptive Studies

It is generally acknowledged in the literature that medical education is a complex process, with many variables exerting an influence of greater or less magnitude. As stated above, the medical school phase is only one aspect of the total process, which begins at recruitment or earlier, depending on how one considers factors affecting recruitment. There has been a disproportionate tendency for individuals from higher socioeconomic backgrounds to be recruited for medical careers. While there has been an increasing democratization of recruitment in America since the turn of the century,[2] it has been noted that in "most western societies and some socialist countries, the selection of medicine as a career is largely determined by a candidate's social background."[3]

Explanations for this trend are not hard to find. For one thing, people of more affluent background are better able to afford the expenses of a prolonged

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[2]Stuart Adams, "Trends in Occupational Origins of Physicians," American Sociological Review, XVIII (August, 1953), 404-409.

[3]Robin F. Badgley, "Studies in Planning Health Manpower: The Varna Meeting," Journal of Health and Social Behavior, XII (March, 1971), 7.

education, as well as to endure the relative privations of low income during post-graduate training. The norm of scholastic achievement during the pre-medical years is undeniable: "The medical norm stressing scholastic achievement in determining who is admitted or who is excluded appears to be a cornerstone of medical education regardless of differences in the organization of a health service system, the health needs of a nation, or the characteristics of applicants."[4] Social background also contributes to the proportion who are able even to go to college in the first place, as well as the motivation to take on the professional role of doctor.[5] Hence scholastic achievement is partially dependent on social background while it also exerts a strong influence of its own.

Other studies have concentrated on the particular effects of medical education on students. One study found that in the long run, class rank in medical school was not an accurate predictor of professional performance.[6] A number of studies have concentrated on immediate effects. Of particular importance has been the effect of medical school on the student's attitudes and values. Fox found

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[4] Ibid., p. 8.

[5] Mariam K. Slater, "My Son the Doctor: Aspects of Mobility Among American Jews," American Sociological Review, XXXIV (June, 1969), 359-373.

[6] Osler L. Peterson and others, "An Analytical Study of North Carolina General Practice, 1953-54," Journal of Medical Education, XXXI (December, 1956, Part 2).

that the student acquired a value for detached concern and for dealing with uncertainty.[7] Becker and his associates found that the values of clinical experience and medical responsibility were transmitted.[8]

Somewhat alarming, however, is the allegation that medical students become cynical. One study found that students scored higher on a "Cynicism" scale and lower on a "Humanitarian" scale as they progressed through medical school.[9] Another study found that medical school seniors scored higher on a "Machiavellianism" scale than college students, business executives, or Washington lobbyists.[10] Others have tried to suggest, however, that such cynicism is really a veneer covering up a core of idealism.[11]

A central concern is how well a medical school is

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[7]Renee C. Fox, "Training for Uncertainty," in The Student-Physician, ed. Robert K. Merton, George G. Reader, and Patricia L. Kendall (Cambridge, Mass.: Harvard University Press, 1957), pp. 207-241.

[8]Howard S. Becker et al., Boys in White: Student Culture in Medical School (Chicago: University of Chicago Press, 1961).

[9]Leonard D. Eron, "Effect of Medical Education on Medical Students," Journal of Medical Education, X (October, 1955), 559-566.

[10]Richard Christie and Robert K. Merton, "Procedures for the Sociological Study of the Values Climate of Medical Schools," Journal of Medical Education, Part II, XXXIII (October, 1958), 125-153.

[11]Lathrop V. Beale and Louis Kriesberg, "Career-Relevant Values of Medical Students--A Research Note," Journal of the American Medical Association, CLXXI (November 14, 1959), 1447-1448.

attaining its goals. Goals of educational institutions may be conceptualized in a variety of ways, including output goals and positional goals. Of particular relevance are output goals, which may be defined as "those goals . . . which are reflected, immediately or in the future, in some product, service, skill or orientation which will affect (and is intended to affect) society."[12] Issues of concern are the tendency to specialize and the tendency to be overly scientific. The tendency to specialize is found to increase with each year in medical school. While there is a hard core of those who wish to specialize and a hard core of those who do not wish to, a group of initially uncommitted students is the source of newer recruits to specialties.[13] The tendency to specialize is partly explained by the student's realization that there is too much knowledge to master,[14] a problem that confronts the student from his first day in medical school.

Pre-clinical courses, in the first two years, tend to have a number of scientist-teachers whose interests lie in particular fields that are not necessarily clinical.

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[12]Edward Gross, "Universities as Organizations: A Research Approach," American Sociological Review, XXXIII (August, 1968), 524.

[13]William A. Glaser, "Internship Appointments of Medical Students," Administrative Science Quarterly, IV (December, 1959), 337-356.

[14]Patricia L. Kendall and Hanan C. Selvin, "Tendencies Toward Specialization in Medical Training," in The Student-Physician, ed. Robert Merton et al., pp. 153-174.

Clinical courses, on the other hand, are all taught by practicing clinicians with differing styles of teaching. Particular schools, however, are found to vary in their overall goals--whether they wish to produce practitioners or researchers and teachers, humanitarians or scientists. In general, these schools are able to realize these objectives, as measured by the type of internships that their graduates receive.[15]

A study of one medical school is instructive in how conflicting pressures operate on the school's implementation of goals and the impact of such pressures on the student. During the clinical years, the medical student "is a student in the School of Medicine but a 'doctor' in the hospital."[16] But there is no question as to which role is uppermost in the school's view: "They are here to learn about disease in the living body; their prime responsibility is to the faculty and only secondarily to the patients."[17] This particular teaching hospital had two divisions--a University division and a Community division. There is strain between them, and the student feels it because he must work in both:

> The underlying issues of town versus gown--salaried physicians versus fee-for-service physicians,

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[15] Harry Perlstadt, "Goal Implementation and Outcome in Medical Schools," American Sociological Review, XXXVII (February, 1972), 73-82.

[16] Raymond S. Duff and August B. Hollingshead, Sickness and Society (New York: Harper & Row, 1968), p. 47.

[17] Ibid., p. 48.

> scientific medicine versus the art of medicine, service patient versus paying patient, and so on--create strains in the relationships of the administrators with physicians in the two divisions. The university-oriented physicians complain that the private practitioners are not interested in science and have little interest in patient care but a strong interest in money. The private practitioners respond that the university physicians are interested essentially in research and advancing their academic careers. They assert that interest in patient care is lacking in the superscientific world of the academician. Although these polar orientations exist, there is a substantial minority of the individuals on both sides who recognize the importance of each orientation for the promotion of the more basic issue of better health for people in the community.[18]

Problems and Criticisms

The issues of science versus humanitarianism, of greed versus professionalism, have been amply pontificated. Moreover, they have been used by critics of the medical profession, both within it and outside it. The care and attention given the patient are perceived as becoming more and more attenuated. One doctor, addressing a graduating house staff of a general hospital, stated: "I have seen the image of the doctor decline steadily to . . . [that of] a scientific technician, no different from any other skilled practitioner or trade."[19] Complementing or contributing to this alleged decline is an apparent nonresponsiveness on the part of the medical school: "Only in our professional field do the schools that gave the

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[18] Ibid., p. 65.

[19] Martin L. Gross, The Doctors (New York: Random House, 1966), p. 317.

profession birth come under fire from their offspring; only in medicine does alma mater appear to lose common touch with her sons."[20]

One of the problems is that so much is expected of each student. Not only must he assimilate a formidable mass of information, he must also show evidence of being able to function in different areas. This problem extends into the undergraduate years: in the hypothetical case of Ann, questions arise as to what she should major in, what she would like to take as opposed to what she "must" take, how much time she must allocate--or has left to allocate--to extra-curricular activities.

> Given these conditions, which ones of Ann's commitments are going to weigh most heavily? Can she afford to retain her academic interest and predetermined plan to study in the social sciences with the concomitant scheduling pressure? Or will Ann become a chemistry major and take a smattering of social science courses to satisfy her intellectual curiosity? Translated, will she retain her identity and her well-thought-out career goals, or will she elect to look like most of the other premedical students who take the shorter, safer way to potential admission to medical school?[21]

Because of the multiplicity of expectations, the ordering of those expectations in a hierarchy becomes problematic. Consequently, no two schools may order that hierarchy identically. There is no consensus, for example,

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[20]W. Clarke Wescoe, "The Town-Gown Syndrome: Pathology," Journal of the American Medical Association, CLXXV (November 23, 1963), 785-786.

[21]Paul R. Elliott, "The Evolutionary Curriculum: Revolutionary Accountability Vise," Journal of Medical Education, XLVIII (September, 1973), 826.

that all medical schools should inculcate a particular ideal; some most explicitly do not. But if an ideal is embraced by some schools, there is the question of how to implement it. Some observers advocate a new emphasis on the humanities, particularly philosophy.[22] Others see a need for a formal admixture of social and behavioral sciences in medical curricula and research. Some of the ramifications of this move would include attending to the following: the human individual in relationship with the internal organic environment; the human individual in relation to significant others, including the family; the human individual in relation to institutionally organized significant others; the human individual in relationship with categorically identified populations such as socio-economic strata and cultural origins; the human individual as a member of plural institutions organized as a community, such as neighborhoods and ghettos.[23]

The fact is that the patient as consumer is demanding attention as never before: "Patients have basic rights as consumers . . . and the first right is that of having a full explanation of one's disease, including the

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[22]Edmund D. Pellegrino, "Medicine, History, and the Idea of Man," Annals of the American Academy of Political and Social Science, CCCLXIV (March, 1963), 9-20.

[23]National Institute of Child Health and Human Development, U.S. Department of Health, Education, and Welfare, Behavioral Sciences and Medical Education: A Report of Four Conferences, HEW Publication No. (NIH) 72-41 (Washington: Government Printing Office, 1972), pp. 86-87.

possible effects of various treatments," exclaimed Gloria Steinem, women's rights figure.[24] In a curriculum characterized by fierce competition for scarce time even in the "established" disciplines, innovation becomes a challenge: "A basic science department might wish to institute a radically new method of teaching but be inhibited by the knowledge that the examination will be written by people who hold different views on this point."[25] Accordingly, anxiety about introducing a behavioral science course would probably be even greater because of the confusion surrounding the whole question of objectives.

While the output goals of medical schools are debated, other problems have arisen in recent years. For one thing, the costs of education have risen sharply. The Health Manpower Act of 1971 was to provide capitation for student tuitions as well as funds for construction of new medical schools and buildings. The funds were not forthcoming. In 1971, of 108 medical schools in existence, 60 were in financial distress, with 30 close to closing their doors.[26] In the meantime, the number of schools has

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[24]"Feminists on the Firing Line: Medicine is Male Chauvinist," Science News, CV (March 9, 1974), 157.

[25]Howard S. Becker and Blanche Geer, "Medical Education," in Handbook of Medical Sociology, ed. Howard E. Freeman, Sol Levine, and Leo G. Reeder (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1963), p. 182.

[26]"Health Manpower: Buying Off the Care Crisis," Science News, C (December 25, 1971), 422.

climbed from 84 in 1963 to 114 in 1974.[27] The number of doctors being turned out is still far short of a desirable number. But along with attempts at quantitative improvement there have been attempts at qualitative improvement.

Innovations in Medical Education

Medical schools have increasingly responded to the need for innovations in teaching and curriculum. One study describes the revamping of clinical training to insure more complete contact of students with patients, sensitizing them to the psychological and social aspects of illness.[28] Another study evaluated the results of a similar project, finding that a course in comprehensive care raised students' estimates of the amount of time required for each patient; such a course appears to retard a deterioration in attitude that otherwise occurs over four years.[29]

Innovation may take place in either of two ways: introducing changes into an existing school or starting a new school from scratch, with innovative features built in. A description has been given of such a new school, one

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[27] "Medical Education Takes Off," Science News, CV (March 2, 1974), 139.

[28] Kenneth R. Hammond and Fred Kern, Jr., Teaching Comprehensive Medical Care (Cambridge, Mass.: Commonwealth Fund, 1959).

[29] Patricia L. Kendall, "Evaluating an Experimental Program in Medical Education," in Innovation in Education, ed. Matthew B. Miles (New York: Bureau of Publications, Teachers College, Columbia University, 1964), pp. 350-355.

established by a state university in the East:

> The psychology, of course, was obvious. There would be no traditions to buck, no political quagmires to wade through inside or outside of departmental affairs. For energetic and ambitious educators, it was a once-in-a-lifetime chance to build their Camelot.[30]

The focus of this new school was unabashedly innovative:

> One of the Dean's strongest personal campaigns has been an emphasis on community medicine. This is a more sophisticated reworking of the old "GP" role. Instead of honing in on a specialty like obstetrics or pathology (specialization being particularly prevalent at the top private Boston medical schools), UMass is concerned with the level, balance and availability of health services in a community. Says one assistant professor in community medicine, "We need to give more attention to problems on the state, local, and family levels, like transportation, lack of family practitioners in urban core and rural areas, and interpersonal factors in illness."[31]

One attitude at this school is that a certain number of facts are not necessary for successful completion of training: "One must understand the slippery nature of facts: they tend to change, and taken out of context, they can be dangerous."[32] Instead of lectures and rote memory, selective reading, "nongraded" tests, frequent conferences, and a give-and-take lecture format are the ways the faculty provides guidance and assesses development. In the laboratories, the faculty feedback is particularly intensive."[33]

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[30] Tom Hayes, "Building a Camelot, Gross Anatomy and All," The Alumnus, University of Massachusetts, Amherst, IV (December/January, 1974), 7.

[31] Ibid.

[32] Ibid., pp. 8-9.

[33] Ibid., p. 9.

What are the results of such innovations? For one thing, the first two cohorts of second year students have done well on a National Board of Examiners test, ranking in the upper third on a national scale. Not to be dismissed is the fact that the individual who designed the clinical programs had previously worked with the National Board of Medical Examiners in Philadelphia. The content of the curriculum is traditional even while the style of pedagogy remains innovative. Says the associate dean: "You've got to have a solid base established before you can move into significant innovation."[34] There is no question of initial success in this program. However, since the first class has not graduated yet, it is too soon to arrive at a more definitive verdict.

The Systems Approach

One innovation that has touched the field of education in general is the systems analysis approach. Essentially a systems approach is concerned with the relation between inputs and outputs. Given a set of goals or objectives, one's attention is directed to how closely actual outputs approximate those goals, and the effects that particular inputs have on the process. This means that, in the implementation of some goal, processes of feedback or evaluation are instituted. This self-monitoring serves to evaluate the degree of success for particular

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[34] Ibid.

goals and for the means employed. Thus one is forced to be explicit about one's goals.

In the field of education, the specification of objectives for students is not a new innovation. Over two decades ago, for example, Tyler distinguished two principal aspects of such objectives: the content aspect and the behavioral aspect. For the latter he discerned seven elements: (1) understanding of important facts and principles; (2) familiarity with dependable sources of information; (3) ability to interpret data; (4) ability to apply principles; (5) ability to study and report results of study; (6) broad and mature interests; and (7) social attitudes.[35] These elements cover both technical and value-judgmental aspects of education and hence are applicable to the particular field of medical education--as is indicated by the research and criticisms already cited.

The specification of educational objectives for individual students can be translated into objectives for a particular program as a whole: that is, when individual students perform sufficiently well, the program is said to be operating successfully. The systems approach has been introduced into medical education as well; it has also given rise to programmed instruction (PI):

> A systems approach means to set up a course of instruction by following a comprehensive, orderly set of

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[35] Ralph W. Tyler, Basic Principles of Curriculum and Instruction (Chicago: The University of Chicago, 1950), p. 32.

> steps. Of course, people who design curricula have always thought of themselves as being logical and orderly in their work. Some have used the topical outline to lay out the essential areas or points of a course, in its entirety, before beginning. But this was before the advent of PI. What PI illuminated for curriculum designers was, among other things, the critical importance of defining and stating objectives as an initial step in designing teaching programs. . . . PI also made abundantly clear to the educational world that there was really very little in the way of basic scientific knowledge which could be easily and usefully applied to the actual process of writing a course . . . . it took the development of PI to initiate a wave of research directed toward the practical problems and questions encountered in course design.[36]

A number of attempts have been made to apply systems analysis to medical curriculum construction. Educational objectives have been broken down behaviorally as skills, knowledge, and attitudes. When applied specifically to medical education, this classification has been specified as follows: under skills fall data handling skills, motor skills or procedures, and problem solving; under knowledge falls awareness of the causes of and treatments for illness; under attitudes fall any attitudes that are seen as necessary in the role of physician.[37] The investigators go on to say:

> A system of education based on clear, specific outcome objectives would usher in an age of individualized medical education. Such individualization would

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[36]Eric D. Zemper, "Computer Assisted Instruction in Medical Education: Perspectives and Potential at Michigan State University," Office of Medical Education, Research and Development, Paper No. 1973-1 (East Lansing: Michigan State University, 1973), pp. 6-7.

[37]Robert Kane, F. Ross Woolley, and Rosalie Kane, "Toward Defining the End Product of Medical Education," Journal of Medical Education, XLVIII (July, 1973), 617.

> be used to facilitate learning through feedback, to eliminate redundant learning when objectives were already met, or to permit self-pacing, thus allowing students to accelerate themselves. Some medical schools have made beginnings in this direction.[38]

Systems analysis has been recommended for analyzing medical education at both the medical school level and the level of the national system of medical education. The general outlines of a systems analysis have been proposed for this task, covering the following steps: analysis of the system's environment; analysis of the system's goals and purposes; analysis of the system's elements; analysis of the system's internal relations and processes, and synthesis.[39]

Systems analysis has the competence to evaluate any phase of education. One study discerned several major categories or attributes of an ideal health educator for undergraduates: administrative functions; the training of fellow professionals (health or education) in the need for and uses of health education; fulfilling the tasks expected of a health education professional; coordination of health education activities with other health professions; use of education and the correct educational tools where the health problem is appropriate; identification of the need for and the involvement of the community and its leaders

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[38] Ibid., p. 623.

[39] Hans R. Grunauer, "Systems Theory Applied to Medical Education," Medical Progress Through Technology, I (1973), 165.

in health education programs; and, finally, assembling material that health education will teach. Each of these major categories consisted of a set of subcategories sufficiently specific to be respecified as behavioral objectives.[40]

One example of the use of systems analysis on an ongoing system is the planning of the surgery department of the University of Florida. A set of questions was posed: (1) What is the organization doing now? (2) What should the organization be doing five or ten years hence? (3) What alternative paths might the organization follow in shifting from today's to tomorrow's role?[41] Using a matrix of inputs from resources and environment and of department outputs, the investigators evaluated the relative importance of teaching, service and research for the department. The whole process culminates in a synthesis:

> In management terms the self-study provides a vehicle for codifying the aspirations of all the department faculty and administrators. The task force in the Department of Surgery used the process that has been described to articulate the composite views of the faculty.[42]

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[40]Richard M. Grimes, H. Denny Donnell, Paul C. Ritchie, and Helen L. Tinnin, "A Systems Approach to the Design of a Model Under-Graduate Curriculum for Health Educators," Journal of School Health, October, 1971, p. 405.

[41]Ronald E. Beller and Lowell E. White, Jr., "Long-Range Planning for a Department of Surgery: A Systems Analysis Approach," Journal of Medical Education, XLVII (November, 1972), 855.

[42]Ibid., p. 861.

The planning of a musculoskeletal organ system curriculum was even more elaborate in detail. In this study, student performance was evaluated on a daily basis, as a criterion of success for the curriculum. General educational objectives were developed; these specified the areas of competence, the kinds of behaviors, and the level of accuracy that determined success. The structure and content of the course were then set up along logical lines, beginning with normal structure and development and proceeding to pathology. A system of student evaluation by multiple choice tests was set up. A careful accounting of man-hours for preparation and conduct of the course was kept. The course was evaluated by a comparison of pretest and incourse test scores, with the curve for the latter notably higher. Students were asked to evaluate the course in terms of content, organization, clarity, and quality of presentation. Almost all of the students approved of the course's organization and presentation, a majority ranking it as the best or equal to the best course they had taken.[43]

Summary

The literature on medical education began as a set of discrete studies on the effects of education on students. These were a source of evaluation for medical

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[43]Frank C. Wilson, "Development of a Musculoskeletal Organ System Curriculum," Journal of Medical Education, XLVIII (October, 1973), 928-933.

education in general. Spurred on by intramural and public criticism, self-evaluation became a serious enterprise. With the development of systems analysis, self-evaluation could be employed to close the gap between planning a program and reaping its results. The prospect of more efficient use of time means that new courses can be incorporated into curricula with fewer qualms. A systems approach, finally, means tailoring the curriculum more to the individual student's needs.

CHAPTER III

RESEARCH DESIGN

The present study included a survey of the attitudes of a sample of faculty members randomly selected from a number of medical schools in the Midwest. The survey instrument was a questionnaire, or Basic Instrument (see Appendix A), consisting of both open-ended and fixed choice questions. Responses were coded and tabulated as percentages for qualitative categories. Statistical tests were not employed to test specific hypotheses, but rather to assess distributions. This study is thus exploratory in purpose and method.

Population and Sample

The population studied was every level of faculty at the following midwestern medical schools:

Case Western Reserve School of Medicine
Indiana University School of Medicine
Loyola University of Chicago, Stritch School of Medicine
Mayo Medical School
Medical College of Ohio at Toledo
The Medical College of Wisconsin
Michigan State University, College of Human Medicine
Northwestern University Medical School
The Ohio State University College of Medicine
The Pritzker School of Medicine of the University of Chicago
Southern Illinois University School of Medicine
University of Cincinnati College of Medicine

University of Health Sciences, the Chicago Medical School
University of Illinois College of Medicine
The University of Iowa College of Medicine
The University of Michigan Medical School
University of Minnesota-Minneapolis Medical School
The University of Nebraska College of Medicine
University of Wisconsin Medical School
Wayne State University

These twenty medical schools are located in eight midwestern states. The entire region designated as Midwest is not included--Missouri and Kansas are excluded, for example. The sample is thus not necessarily representative of the entire Midwest, however that term is defined. Nor is any claim made that the schools are representative of the particular states in which they are situated. However, it is believed that the selected schools are generally representative of the Midwest, as opposed to other regions. Somewhat more cautiously, it can be stated that the schools tend to be representative of schools throughout the country.

The latter statement is not based on statistical considerations, but on the assumption of homogeneity in medical education in America, with constraints such as national board examinations taken into account. It is possible that this regional selection would make possible future regional comparisons, with the above qualifications included.

The target sample size was one hundred respondents. A total of seventy returned completed questionnaires. Included in the sample were all levels of faculty rank--

department head, professor, associate professor, assistant professor, instructor. Respondents were drawn by a process of simple random sampling from the faculty of each school; thus, for sampling purposes, the population consisted of the respondent's own faculty, not all faculties in the twenty schools. The ideal number was a sample of five from each school, hardly sufficient to make comparisons of opinions among the twenty schools but sufficient to make comparisons on factual questions. The only other constraint was that differentiation was made between schools that had a department of family medicine or equivalent and schools that did not have such a department.

Data and Instrumentation

The survey was administered by a mailed questionnaire (see Appendix B, p. 99). The questionnaire is primarily an open-ended instrument. This structural mode was indicated because so little information is presently available in this field. Accordingly, it was believed that a maximum of useful information could be obtained through free responses that could subsequently be coded. This kind of data consisted of raw responses capable of conveying the richness of available authoritative opinion, yet classifiable in coded categories deemed suitable for purposes of comparison.

Specific questions were also included, eliciting fixed responses on issues of both opinion and fact.

Regarding factual questions, respondents were regarded as informants for their own schools. Thus, factual comparisons could be made among the selected schools, as well as generalizations about the schools as a group.

Administration

The names of faculty members were selected at random, in the manner described above. Through the latter part of 1974 and early 1975, copies of the covering letter (Appendix A) and of the questionnaire (Appendix B) were mailed to all of the selected individuals. Also enclosed was a stamped, addressed envelope to facilitate returns. Prompt responses were encouraged in the covering letter. Request was also made, at the end of the questionnaire, for any descriptive information on ongoing programs in systems analysis at the respondent's medical school. Overall, the investigator has projected his relationship with the respondent as rather a collegial one. This is factually true and is in keeping with the exploratory nature of the investigation.

Analysis of Results

The data were presented predominantly in the form of qualitative categories. Consequently, the principal method of data analysis consisted of the analysis of percentages and of the raw figures on which percentages are based. Data were presented for all the schools in the aggregate, allowing for statistical tests such as the

chi-square test. Univariate distributions were employed for descriptive purposes while cross-tabulations were used to assess possible association between two variables; in the latter case, the chi-square test is particularly pertinent. In addition to statistical analysis, qualitative interpretation was used liberally. In this way, possible hypotheses could be adduced for additional statistical analysis of the data or for future investigation. However, this is primarily a descriptive study.

CHAPTER IV

PRESENTATION OF RESULTS

The results of the survey are presented below. The order of presentation for the categories of results is as follows: (1) description of the characteristics of the sample; (2) educational objectives; and (3) attitudes toward systems analysis.

Characteristics of the Sample

Of the medical educators sampled, a total of seventy-three returned usable questionnaires. Thirty-two forms were returned uncompleted or unusable because of unanswered items. Table 1 shows the distribution of respondents by school.

Of the twenty schools from which the population was selected, only one school was unrepresented by respondents. Of the remaining schools, the number of responses ranged from one to ten--the mean number of responses per school being 3.84, the median and mode being 3. Of the nineteen schools, eleven are state institutions; eight are private institutions. Of the seventy-three respondents, thirty-seven are from public institutions and thirty-six from private institutions. Four of the medical schools--Mayo, Medical College of Ohio, Michigan State,

and Southern Illinois--were founded in 1964 or later.

TABLE 1

FREQUENCY OF RESPONDENTS, BY SCHOOL

School	Frequency
Case Western Reserve School of Medicine	7
Indiana University School of Medicine	5
Loyola University of Chicago, Stritch School of Medicine	3
Mayo Medical School	4
Medical College of Ohio at Toledo	3
Medical College of Wisconsin	2
Michigan State University, College of Human Medicine	1
Northwestern University Medical School	10
The Ohio State University College of Medicine	5
The Pritzker School of Medicine of the University of Chicago	2
Southern Illinois University School of Medicine	1
University of Cincinnati College of Medicine	3
University of Health Sciences, The Chicago Medical School	5
University of Illinois College of Medicine	-
The University of Iowa College of Medicine	3
The University of Michigan Medical School	4
University of Minnesota-Minneapolis Medical School	2
The University of Nebraska College of Medicine	7
University of Wisconsin-Madison Medical School	3
Wayne State University School of Medicine	3
Total	73

A broad variety of departments is represented in the sample, as shown in Table 2. The number of respondents in clinical sciences--sixty-five--clearly outnumbers the total for basic sciences--eight. This reflects the general tendency among clinical departments to outnumber basic science departments. Table 3 shows the distribution

TABLE 2

FREQUENCY OF RESPONDENTS, BY DEPARTMENT

Department	Frequency
Basic Sciences	
Anatomy	1
Biochemistry	2
Biometry	1
Educational Services and Research	1
Environmental Health	1
Physiology	2
Total Basic Sciences	8
Clinical Sciences	
Anesthesiology	3
Clinical Pathology	1
Community Health, Family Practice, Environmental Medicine, Primary Care	6
Dermatology	1
Medicine	12
Neurology, Neurosciences	2
Obstetrics, Gynecology	5
Orthopedics, Orthopedic Surgery	2
Otorhinolaryngology	2
Pediatrics	2
Physical Medicine, Rehabilitation	5
Preventive Medicine	1
Psychiatry	6
Radiation Therapy, Radiology, Nuclear Medicine	5
Reproductive Biology	1
Surgery	7
Urology	2
Other, unspecified	2
Total Clinical Sciences	65
Total	73

TABLE 3

NUMBER OF BASIC AND CLINICAL DEPARTMENTS[a]

School	Undifferentiated			Differentiated			
	Basic (1)	Clin. (2)	Total (3)	Basic (4)	Clin. (5)	Total (6)	Rank (7)
Case Western	9	8	17	9	23	32	9.5
Indiana	9	19	28	9	21	30	12
Loyola	6	13	19	6	15	21	17
Mayo	11	20	31	11	46	57	1
Med. Coll. Ohio	5	10	15	5	10	15	19
Med. Coll. Wis.	6	13	19	6	13	19	15.5
Michigan State	13	6	19	13	6	19	15.5
Northwestern	6	16	22	6	26	32	9.5
Ohio State	6	11	17	6	11	17	18
Pritzker - U. Chi	10	9	19	10	27	37	6.5
Southern Illinois	0	9	9	0	30	30	13
Univ. Cincinnati	8	14	22	15	36	51	2
Univ. Health Sci.	7	10	17	8	29	37	6.5
Univ. Iowa	7	16	23	8	32	40	5
Univ. Michigan	7	13	20	7	37	44	4
Univ. Minnesota	7	18	25	8	23	31	11
Univ. Nebraska	7	16	23	8	28	36	8
Univ. Wisconsin	9	13	22	10	35	45	3
Wayne State	6	21	27	6	21	27	14
Total	139	255	394	151	469	620	
Mean	7.32	13.42	20.74	7.95	24.68	32.63	

[a]Derived from: Association of American Medical Colleges, 1973-1974 AAMC Curriculum Directory (Washington: Association of American Medical Colleges, 1973).

for the two kinds of departments for the nineteen schools.

It should be noted that medical school curricula are broken down first by department, second by divisions within some departments. Those departments most frequently differentiated by divisions are medicine and surgery, followed by radiology and psychiatry at some distance. Columns 1-3 of Table 3 show differentiation by department only; columns 4-7 by department and division as well. With the exception of three schools--Case Western Reserve, Michigan State, and Pritzker-University of Chicago--clinical departments predominate. The main differentiation by departmental division is in the clinical departments, as shown in columns 2 and 5.

Another factor should be pointed out. Differentiation as a whole increases sharply when divisions are taken into account, as is shown in columns 3 and 6. If column 6 is taken as a criterion of differentiation, or of complexity of faculty, it is useful to rank the schools accordingly, as was done in column 7: differentiation may have some explanatory significance for findings presented later in this chapter (see Appendix C, p. 104, for a fuller breakdown of the variation in departments and divisions that occur among the nineteen schools). Of the seventy-three respondents, sixty-five--or 89 per cent--are from clinical departments. According to Table 3 again, of the 620 departments or divisions, 469--or 76 per cent--are in clinical areas (totals in columns 5 and 6). One may

conclude that the proportion of basic and clinical science respondents corresponds roughly to the actual faculty differentiation in the nineteen schools.

Tables 4 and 5 show that the M.D. degree is the dominant degree among medical faculties. Table 4 shows that among departmental or divisional chairmen pertinent to this sample, 87.7 per cent of respondents' chairmen have either an M.D. alone or an M.D. in combination with another higher degree. A doctorate other than the M.D. is held, alone or in combination, by 22 per cent of the departmental or divisional chairmen. Table 5 shows the distribution for respondents themselves. The M.D. is almost as dominant among respondents as among chairmen, with 79.4 per cent holding at least an M.D. Other doctorates are held by 22 per cent of respondents. Since thirty of the respondents are also chairmen, Table 5 shows degrees for both chairmen and non-chairmen. At least 93.4 per cent of the chairmen have an M.D. while 23.5 per cent have another doctoral degree. Of the remaining non-administrative faculty in the sample of respondents, only 69.8 per cent have at least an M.D.--compared to over 90 per cent for chairmen; 20.9 per cent of the non-chairmen have at least another kind of doctoral degree, comparable to the figure for chairmen.

Table 6 shows the distribution for title or rank of respondent, while Table 7 shows the number of years that respondent has occupied his or her present position on the

TABLE 4

DEGREES HELD BY CHAIRMEN

Degree	Frequency	Percentage
M.D. only	46	63
Ph.D. only	4	5.5
M.D. and Ph.D.	10	13.7
M.D. and M.A., M.S., or M.P.H.	7	9.6
M.D. and other degree	1	1.4
Ph.D. and Master's	1	1.4
Other Doctorate (D.P.H.)	1	1.4
Not ascertainable	3	4.1
Total	73	100

TABLE 5

DEGREES HELD BY RESPONDENTS, BY ADMINISTRATIVE STATUS

Degree	Chairman	Others	Total
M.D. only	17 (56.7)	22 (51.2)	39 (53.4)
Ph.D. only	1 (3.3)	6 (14)	7 (9.6)
M.D., Ph.D.	5 (16.7)	1 (2.3)	6 (8.2)
M.A., M.S., M.P.H.	- -	1 (2.3)	1 (1.4)
M.D. and Master's	5 (16.7)	7 (16.3)	12 (16.4)
M.D. and other	1 (3.3)	- -	1 (1.4)
Ph.D. and Master's	1 (3.3)	1 (2.3)	2 (2.7)
Ph.D. and other Doctorate	- -	1 (2.3)	1 (1.4)
Not ascertainable	- -	4 (9.3)	4 (5.5)
Total	30 (100)	43 (100)	73 (100)

Note: Figures in parentheses are percentages based on column totals.

TABLE 6

RESPONDENT'S TITLE OR RANK

Title	Frequency	Percentage
Professor	48	65.8
Associate Professor	13	17.8
Assistant Professor	4	5.5
Instructor	-	-
Lecturer	-	-
Other	2	2.7
Not ascertainable	6	8.2
Total	73	100

TABLE 7

YEARS OCCUPYING PRESENT POSITION

Years	Frequency	Percentage
1-5	37	50.7
6-10	15	20.5
11-15	8	11
16-20	5	6.8
21-25	6	8.2
Not ascertainable	2	2.7
Total	73	100

faculty. Table 8 shows the distribution of basic science and clinical faculty for public and private medical schools; Table 9, the distribution of chairman-respondents for the two kinds of schools; and Table 10, the number of years in their present positions for respondents in the two kinds of schools. The sample is dominated by full professors, as is shown in Table 6. Of the forty-eight full

TABLE 8

TYPE OF FACULTY, BY TYPE OF SCHOOL

Type of School	Type of Faculty		
	Basic Science	Clinical Science	Total
Public	3 (8.1)	34 (91.9)	37 (100%)
Private	5 (13.9)	31 (86.1)	36 (100%)
Total	8 (11)	65 (89)	73 (100%)

Note: Not statistically significant; χ^2 = .1729 (df = 1).

TABLE 9

DISTRIBUTION OF CHAIRMEN, BY TYPE OF SCHOOL

Type of School	Chairmen	Non-chairmen	Total
Public	13 (35.1)	24 (64.9)	37 (100%)
Private	17 (47.2)	19 (52.8)	36 (100%)
Total	30 (41.1)	43 (58.9)	73 (100%)

Note: Not statistically significant; χ^2 = .6585.

TABLE 10

YEARS IN PRESENT POSITION, BY TYPE OF SCHOOL

Type of School	Years in Present Position				
	1-5	6-10	11 or more	NA	Total
Public	12 (32.4)	12 (32.4)	13 (35.1)	-	37
Private	25 (73.5)	3 (3.8)	6 (17.6)	2	36
Total	37 (52.1)	15 (21.1)	19 (26.8)	2	73

Note: Significant $<$ .01; χ^2 = 9.21 (df = 2); based on total of 71; percentages based on exclusion of NA (not ascertainable) category.

professors, thirty are chairmen of their respective departments or divisions; thus eighteen of the full professors are in non-administrative positions--a figure more comparable to that of the next lower rank. Table 7 shows that roughly half of the respondents have been in their present positions for five years or less, and about 71 per cent have been there for ten years or less. This suggests either high mobility or an influx of younger faculty. However, it is impossible to answer this question definitively.

Tables 8-10 deal with the public/private dichotomy and how it may be related to some characteristics, at least in this sample. Table 8, for example, shows that the public and private medical schools in the sample have roughly the same proportions of basic science and clinical science faculty among respondents. Similarly, in Table 9, the proportion of chairmen does not vary significantly between public and private medical school respondents. In Table 10, the private medical schools tend, to a significant degree, to have faculty who have been situated for a shorter duration than the public medical schools. As in the case of Table 7, there is no information in this survey--such as age of respondent--to help resolve the question of whether mobility or new cohorts are contributing to the differential in duration of occupancy between public and private medical schools. Still, this difference may have some significance.

In Table 3, a variable of differentiation was specified operationally. By ranking the schools, as in column 7, it is possible to group the schools as follows:

High differentiation

Mayo
Northwestern
Pritzker - University of Chicago
University of Cincinnati
University of Health Sciences
University of Iowa
University of Michigan
University of Nebraska
University of Wisconsin

Low differentiation

Case Western Reserve
Indiana
Loyola of Chicago
Medical College of Ohio
Medical College of Wisconsin
Michigan State
Ohio State
Southern Illinois
University of Minnesota
Wayne State

Such grouping resulted in placement of forty-one respondents in the high group and thirty-two in the low group. Northwestern and Case Western Reserve were tied in rank and at the median; but Northwestern was placed in the high group by virtue of its greater number of clinical departments (column 2), total departments (column 3), and clinical departments and divisions (column 5).

Using this categorization divides the schools almost evenly--as evenly as is possible with an odd-number total. Table 11 shows that there is no essential difference between public and private medical schools in this sample with regard to differentiation or specialization of

faculty--at least in terms of departments or divisions, if not of individual faculty members. On the other hand, differentiation is strongly predictive of duration of occupation of present position, as is indicated in Table 12.

TABLE 11

DIFFERENTIATION OF PUBLIC AND PRIVATE SCHOOLS

Type of School	Differentiation		
	Low	High	Total
Public	7	4	11
Private	3	5	8
Total	10	9	19

Note: Not significant; $\chi^2 = .4372$ (df = 1).

TABLE 12

YEARS IN PRESENT POSITION, BY DIFFERENTIATION

Differentiation	Years in Present Position				
	1-5	6-10	11 or more	NA	Total
Low	14 (45.2)	6 (19.4)	11 (35.5)	1	32
High	23 (57.5)	9 (22.5)	8 (20)	1	41
Total	37	15	19	2	73

Note: Significant $< .001$; $\chi^2 = 16.55$ (df = 2). Per cents based on row totals excluding NA's; chi square computed on basis of total of 71.

The Objectives of Medical Education

Respondents have been compared on a number of criteria dealing with their experiences with, and evaluation of, medical education at their school. One pertinent issue is the possible conflict between objectives in basic sciences and those in clinical disciplines. The presence of a Ph.D. program in which medical faculty were involved would seem to underline this basic conflict: basic science faculty, while outnumbered by their clinical colleagues, presumably would feel more justified in pursuing their own ends if they had a Ph.D. program in which to participate. Of the seventy-three respondents, sixty-seven--or 91.9 per cent--stated that their medical school was involved in some way with offering a Ph.D. degree; only five--or 6.8 per cent--stated that their school was not so involved. One person did not answer. Every school in the sample apparently was so involved, since only a single respondent giving a negative answer represented a given school. All five respondents are from clinical departments and hence were further removed from possible contact with Ph.D. education, and even from knowledge of its existence.

Respondents were asked a series of questions about educational objectives (1) for medicine in general, (2) for their particular medical school, and (3) for their particular department. Table 13 shows the distribution of responses to Question 2: "Do you believe the terminal objectives of medical education have changed in any way since

you first held your present position?" Table 14 enumerates reasons given by respondents for why they thought there was or was not any change in that time.

TABLE 13

CHANGE OF MEDICAL EDUCATION OBJECTIVES

Response	Frequency	Percentage
Yes	33	45.2
No	40	54.8
Total	73	100

TABLE 14

REASONS GIVEN FOR CHANGE OR STABILITY IN OBJECTIVES

Reasons for Change	Frequency	Reasons for Stability	Frequency
Increasing number of physicians	2	No change in M.D. role	11
Emphasis on primary health care	22	No changes at this school	3
Emphasis on research	3	Objectives still valid	4
Basic conflict in objectives	2	Too short a time to know	9
Less emphasis on quality, humanity	3	External constraints, e.g., state licensing laws	1
		Inertia, complacency	2
		Other	1

As Table 13 shows, opinion tends to hold stable, although a sizable minority believes there has been change. The principal reason for change appears as an increased emphasis on primary care, while the principal reason for

stability is that the physician's role has been basically the same over the years. Some comments by respondents follow:

> The objectives of this school and the University of _____ where I taught for 20 years have been to prepare men to: 1. Provide competent medical care. 2. Teach how to provide competent medical care. 3. Search for ways to improve medical care. These objectives still stand!

> 1950-1965, increasing emphasis on basic science (molecular biology); since 1965, increasing emphasis on training primary physicians.

> Role oriented.

> At first toward greater specialization; now tending away.

> There is less emphasis upon purely quantitative and basic material and more emphasis upon the total patient and the importance of a humanistic approach. Some of this stems from changed social ideas, some from selection of different type of student who is more activistic and some from the realization that there is a finite amount of material that can be absorbed in a given time.

> Medical students have begun to rotate through an elective in several clinical specialties.

> Intention of creating more graduates in shorter time.

> No essential change in physicians' jobs.

> We are working on attitudes necessary for a physician, not on specific items of information.

> The role of the physician is the same. The medical school's function is to prepare students for post-graduate/specialty education. The emphasis in p. g. education has shifted to primary care, but the ingredients of the basic training have not really required modification. Since ours is the dept. that deals with comprehensive care, psychosocial aspects of medicine, community concerns, etc., we feel the world has finally caught up to us.

> We have always tried for balance. Majority of M.D.'s are for practice but some are destined for academic

medicine. It has been this way at _____for many years (>15). We train M.D.'s, Ph.D.'s and M.D.-Ph.D. types.

The goals of medical education have remained essentially the same.

The details have been altered but our overall goal is unchanged.

Bigger schism between academic medicine vs. practical medicine.

More emphasis on family practice.

Desire more medical students will go into family practice and stay in state.

The objectives are more technical and objective. There is a loss of humanism in medicine. We seem to be becoming so technically oriented, both in our techniques of therapy but also in our approaches to the patient, i.e. systems analysis. That we forget about the art. We do not teach artists by giving them number paint. There has to be a balance between these forces because I believe the current trend of medical education is egalitarian to the point that it leads to mediocrity and not excellence.

More trade school oriented; more emphasis on numbers than quality.

I think this question could be answered at a variety of levels. For one thing medical education does not produce one product, but many. Here, and on basis of national policy, more emphasis is being placed on preparation of students for "primary practice." That is a change in objectives? There are specific changes in skills required in various fields of medicine so that a list of behavioral objectives for a given program would change. On the other hand one could make a case for a general statement concerning a type of end product that would not have substantially changed over the past 100 years and probably won't in the next, unless disease is essentially eliminated by advancing technology.

Many of these comments are both pertinent and thoughtful. They include not only description but evaluation and prescription as well. Some responses are specific to a particular school while others are broad in conception. As the last comment suggests, it is possible to gather

simultaneous impressions of stability and change, depending on the "level" one addresses. Perception of stability or change is not found to be associated with type of school--public or private--years in present position, or differentiation, as shown in Tables 15, 16, and 17, respectively.

TABLE 15

PERCEIVED CHANGE IN PUBLIC AND PRIVATE MEDICAL SCHOOLS

Belief in Change	Type of School		
	Public	Private	Total
Yes	20 (54)	13 (36)	33
No	17 (46)	23 (64)	40
Total	37 (100%)	36 (100%)	73

Note: Not significant; $\chi^2 = 1.7$.

TABLE 16

PERCEIVED CHANGE, BY YEARS IN PRESENT POSITION

Belief in Change	Years in Present Position			
	1-5	6-10	11 or more	Total
Yes	15 (40.5)	8 (53.3)	8 (42.1)	31
No	22 (59.5)	7 (46.7)	11 (57.9)	40
Total	37 (100%)	15 (100%)	19 (100%)	71

Note: Two NA excluded from total.

TABLE 17

PERCEIVED CHANGE, BY DIFFERENTIATION

Belief in Change	Differentiation		
	Low	High	Total
Yes	15 (46.9)	18 (43.9)	33
No	17 (53.1)	23 (56.1)	40
Total	32 (100%)	41 (100%)	73

Respondents were queried on objectives for medical education as a whole and answered by ranking them in the order they saw as appropriate. Table 18 shows the distributions for the first three choices among nine objectives presented.

Of the eight listed objectives, sixty-six respondents chose clinical training as their first or second choice. The next most popular objective was whole-person orientation, with fifty-two persons selecting it in their first three choices; research was the third most popular choice, with thirty-four persons specifying it. Of the total sample, forty-eight--or 65.8 per cent--stated that their own school would rank these objectives in similar fashion; six persons' responses could not be ascertained. For the remaining nineteen who stated that their school would give a different ranking, Table 19 gives the distribution.

TABLE 18

OBJECTIVES FOR MEDICAL EDUCATION AS A WHOLE

Objectives	First Choice	Second Choice	Third Choice
Clinical training (diagnosis, treating prevention)	56 (76.7)	10 (13.7)	-
Research (theories) of disease	2 (2.7)	20 (27.4)	12 (16.4)
Whole (total) person (social, biological, spiritual, economic)	11 (15)	26 (35.6)	15 (20.5)
Environmental medicine	-	-	2 (2.7)
Public health (including bio-statistics)	-	-	1 (1.4)
Continuing medical education	-	7 (9.6)	18 (24.7)
Mental health	-	1 (1.4)	6 (8.2)
Humanistic approach (patient interactions)	-	5 (6.8)	14 (19.2)
Other	2 (2.7)	-	-
Not ascertained	2 (2.7)	4 (5.5)	5 (6.8)
Total	73 (99.8%)	73 (100%)	73 (99.9%)

TABLE 19

MEDICAL SCHOOL OBJECTIVES THAT DIFFER FROM MAJORITY

Objectives	Total Frequency for First Three Choices
Clinical training	16
Research	11
Whole person	7
Environmental medicine	-
Public health	1
Continuing medical education	4
Mental health	2
Humanistic approach	4
Other	1
Total	46

Note: Responses total more than 19 because of multiple responses.

In response to the same question on objectives for medical education as a whole (Question 3), respondents were asked if their own--or any other--departments differ from these overall objectives for the profession (Question 6). Thirty-two (43.8 per cent) thought some departments differed in their objectives; twenty-eight (38.4 per cent) did not think so; thirteen gave no response. When asked how these departments differed, respondents answered in terms of specific objectives as they did above for their schools. Table 20 shows the distribution of responses on this question. Table 19 shows that a group of respondents who saw their schools as differing from the broad mainstream of medical education as a whole still tended to see

clinical training as the foremost objective; research and the whole person were still the second and third ranking objectives, but in opposite order. By contrast, for those respondents who felt that some departments differed from medical education as a whole as regards objectives, Table 20 shows research as foremost in rank.

TABLE 20

DEPARTMENT OBJECTIVES THAT DIFFER FROM MAJORITY

Objectives	Frequency
Basic Science	3
Whole person	5
Research	9
Clinical, care	4
Each department different	1
Other	2
Not ascertained	8

Respondents were also asked to list the objectives for their own departments specifically as well as for their school. In contrast to Tables 19 and 20, Table 21 shows the distribution for all respondents who could list as many as five objectives each for department and school, without ranking them.

For both departments and schools, the same five objectives ranked highest in Table 21: clinical, research, whole person treatment, continuing medical education, and humanistic approach. Clinical easily ranked first for both categories, with research and whole person treatment ranked second and third. Research was more important for schools

as a whole and whole person treatment more important for some of the respondents' departments. Table 21 agrees strongly with the findings for medical education as a whole in Table 18, with findings for some medical schools in Table 19, but not entirely with findings for some departments--in Table 20: the main difference is that in Table 20, some departments are described as emphasizing research. On the whole, there appears to be agreement among medicine as a whole, specific schools in the sample, and departments in those schools.

TABLE 21

DEPARTMENT'S AND SCHOOL'S OBJECTIVES

Objective	Department Frequency	School Frequency
Clinical	38	34
Research	26	24
Whole person treatment	29	22
Environmental medicine	9	3
Public health	5	6
Continuing medical education	21	15
Mental health	8	6
Humanistic approach	14	10
Basic science	5	2
General preparation	8	9
Problem-solving ability	5	5
Needs of the state	2	2
Specific to department	1	1
Other	5	6
Not ascertained	17	30
Total	176	145

Note: Totals exceed 73 because they are based on multiple responses.

Agreement within the respondents' departments is explored in Question 5: "Do you believe there is a predominant opinion on medical education terminal objectives at your school?" Extent of agreement was explored (1) regarding department faculty, (2) between department faculty and chairmen, and (3) between department faculty and the Dean.

Table 22 shows a predominance of opinion among department faculty with decreasing agreement between faculty and chairmen and still less agreement between faculty and the Dean--but still sizable agreement in the last case. A further check on the extent of agreement between faculty and chairmen is found in Table 23 which shows the distribution for chairmen on their first three ranking objectives for medical education as a whole. Table 23 shows general agreement between chairmen and non-administrative faculty, and in particular on the first three objectives. In fourth

TABLE 22

PERCEIVED AGREEMENT ON OBJECTIVES

Sphere of Agreement	Yes	No	NA	Total
Among department faculty	57 (78)	12 (4)	4 (5.5)	73
Between department chairman and faculty	53 (72.6)	13 (17.8)	7 (9.6)	73
Between Dean and department faculty	35 (47.9)	24 (32.9)	14 (19.2)	73

Note: Figures in parentheses are percentages.

and fifth place for both groups are continuing education and the humanistic approach, but in opposite order. Thus Table 23 corroborates the agreement between chairmen and faculty described in Table 22.

TABLE 23

RANKING OF OBJECTIVES BY CHAIRMEN AND NON-CHAIRMEN

Objectives	Chairmen	Non-Chairmen
Clinical training	27	39
Research	11	23
Whole person	23	29
Environmental medicine	1	1
Public health	1	-
Continuing medical education	9	16
Mental health	2	5
Humanistic approach	11	8
Other	1	1
Total	86	122

Note: Totals and grand total of 208 are based on multiple responses.

Table 24 shows the opinions of respondents regarding how well their school and their own department are meeting their terminal objectives. Respondents' departments fared better than their schools, with the mean response for departments being almost up to the "well" category--2.07, where "very well" has a value of 1 on a five-point scale--and the mean response for schools is somewhat lower--2.31. Not one respondent rated either his department or his school "very poorly" on this criterion. The two distributions differ significantly, indicating that

TABLE 24

PERCEIVED ACCOMPLISHMENT OF OBJECTIVES

Evaluation	Department	School
Very well (1)	17 (23.3)	5 (6.8)
Well (2)	32 (43.8)	41 (56.2)
Average (3)	16 (21.9)	16 (21.9)
Poorly (4)	3 (4.1)	5 (6.8)
Very poorly (5)	-	-
Not ascertained	5 (6.8)	6 (8.2)
Total	73 (100%)	73 (100%)

Note: Numbers in parentheses after evaluation categories are scale values. Per cents are based on column totals. Chi-square test based on exclusion of NA category (df = 3); significant $< .05$; $\chi^2 = 8.1$.

respondents are more inclined to give their own departments a good "grade" on performance than they are to rate their school highly--although schools do not fare poorly. Tables 25, 26, and 27 examine possible association between opinion on departmental performance and chairman status, differentiation, and public-private status, respectively. In each case no association was found. Similarly, Tables 28, 29, and 30 find no such associations for opinions on how well schools are performing in reaching their terminal objectives.

Table 31 shows that, for both departments and schools, respondents tended to feel that objectives had changed only slightly since the previous decade. The distributions as a whole do not differ significantly, and the mean responses for each are very close. Also notable is

TABLE 25

ATTAINMENT OF DEPARTMENTAL OBJECTIVES, BY CHAIRMAN STATUS

Evaluation	Chairmen	All Others	Total
Very well	6 (20.7)	11 (27.5)	17
Well	16 (55.2)	16 (40)	32
Average	6 (20.7)	10 (25)	16
Poorly	1 (3.4)	2 (5)	3
Total	29 (100%)	39 (100%)	68

Note: Mean score for chairmen is 2.07, for all others, 2.03. Not significant; χ^2 = .39 (df = 3).

TABLE 26

ATTAINMENT OF DEPARTMENTAL OBJECTIVES, BY DIFFERENTIATION

Evaluation	Differentiation		
	Low	High	Total
Very well	6 (20)	11 (28.9)	17
Well	10 (33.3)	22 (57.9)	32
Average	11 (36.7)	5 (13.2)	16
Poorly	2 (6.7)	1 (2.6)	3
Total	29 (100%)	39 (100%)	68

Note: Mean score for low differentiation is 2.23, for high differentiation, 1.95. Not significant; χ^2 = 5.65 (df = 3).

TABLE 27

ATTAINMENT OF DEPARTMENTAL OBJECTIVES, BY PUBLIC-PRIVATE STATUS

Evaluation	Public	Private	Total
Very well	7 (20.6)	10 (29.4)	17
Well	14 (41.2)	18 (52.9)	32
Average	9 (26.5)	7 (20.6)	16
Poorly	2 (5.9)	1 (2.9)	3
Total	32 (100%)	36 (100%)	68

Note: Mean score for public medical schools is 2.06, for private schools, 2.09. Not significant; χ^2 = 1.62 (df = 3).

TABLE 28

ATTAINMENT OF SCHOOL OBJECTIVES, BY CHAIRMAN STATUS

Evaluation	Chairmen	All Others	Total
Very well	2 (6.9)	3 (7.5)	5
Well	19 (65.5)	22 (55)	41
Average	5 (17.2)	9 (22.5)	14
Poorly	2 (6.9)	3 (7.5)	5
Total	28 (100%)	37 (100%)	65

Note: Mean score for chairmen is 2.17, for all others, 2.15. Not significant; χ^2 = .1445 (df = 1, based on exclusion of extreme categories--"Very well" and "Poorly.")

TABLE 29

ATTAINMENT OF SCHOOL OBJECTIVES, BY DIFFERENTIATION

Evaluation	Differentiation		
	Low	High	Total
Very well	2 (6.7)	3 (7.9)	5
Well	17 (56.7)	24 (63.2)	41
Average	8 (26.7)	8 (21)	16
Poorly	3 (10)	2 (5.3)	5
Total	30 (100%)	37 (100%)	67

Note: Mean score for low differentiation is 2.40, for high differentiation, 2.18. Not significant; χ^2 = .0821 (df = 1, based on exclusion of extreme categories).

TABLE 30

ATTAINMENT OF SCHOOL OBJECTIVES, BY PUBLIC-PRIVATE STATUS

Evaluation	Public	Private	Total
Very well	3 (8.8)	2 (5.9)	5
Well	16 (47)	25 (73.5)	41
Average	11 (32.4)	5 (14.7)	16
Poorly	4 (11.8)	1 (2.9)	5
Total	34 (100%)	33 (100%)	67

Note: Mean score for public medical schools is 2.47, for private schools, 2.09. Not significant; χ^2 = 2.9738 (df = 1, based on exclusion of extreme categories).

the sizable number of persons who simply did not respond to this question (Question 9).

TABLE 31

PERCEIVED CHANGE IN DEPARTMENTAL AND SCHOOL OBJECTIVES

Perceived Change	Departments	Schools
Very marked (1)	3 (4.1)	1 (1.4)
Quite a bit (2)	15 (20.5)	22 (30.1)
Slight (3)	12 (16.4)	9 (12.3)
About the same (4)	21 (28.8)	15 (20.5)
Not at all (5)	5 (6.8)	5 (6.8)
Not ascertained	17 (23.3)	21 (28.8)
Total	73 (100%)	73 (100%)

Note: Mean score for departments is 3.18, for schools, 3.01. Chi square computed on just categories 2, 3, and 4. Not significant; $\chi^2 = 2.7$ (df = 2).

Table 32 shows the reasons cited by respondents for the change or lack of change in objectives. Aside from the large nonresponse to this question, a total of twenty-nine, the most significant responses are those citing pressure from the public in the form of changes in philosophy and funding and change in faculty philosophy--although the latter may also, to an unspecified extent, reflect public pressure. Not to be ignored are those who saw overall goals as remaining the same over the preceding several years. On the whole there is more differentiation in the explanation of change than in the explanation of stability.

Following are excerpts from some respondents'

TABLE 32

REASONS CITED FOR CHANGE OR LACK OF CHANGE

Reasons	Frequency
Reasons for Change	
New personnel in department	5
Change in public philosophy and funding	11
No school existed then	5
New emphases, e.g., post-graduate education	-
Technological changes	1
New knowledge	1
Increase in school size	2
Change in philosophy	8
Reasons for Lack of Change	
Overall goals and philosophy remain the same	6
Change is slow	3
Other	4
Total	46

Note: Based on multiple responses and 29 non-responses.

accounts for change or lack of change in objectives:

The new department chairman and staff began work five years ago.

. . . represent eternal verities.

Much more emphasis on humanistic aspects and basic science.

We have well-developed dept. program but swim against mainstream. School seems to be moving because of outside pressure with considerable reluctance.

(School): A very different view of medical education.

Emphasis in past few years has been in developing post-graduate training under aegis of medical school rather than the hospitals.

Federal funding of research has diminished and has redirected attention to health care delivery.

Satisfaction with objectives.

There is the natural desire of the faculty and school to upgrade our performance vis a vis other schools. Also grudging response to public concern about health care delivery.

Our institution is going through a relocation phase and is building from scratch new clinical depts.

More recent feeling of caring for a family.

1. Social needs. 2. Changing culture.

School has changed curriculum without accounting for constraints.

School has gone from less than 30 full-time faculty to over 250.

Graduate, 1948--Faculty, 1975.

Community pressure.

Systems Analysis

Some questions were centered more or less directly around systems analysis--as a whole or in some of its aspects. Question 10 explored the past, present, and future analysis of operations, including identification of constraints and resources, by departments and schools. Table 33 shows that a predominant majority of respondents believed both their departments and their schools were involved, are involved, or will be involved in such analysis. Table 34 shows a similarly marked inclination to define or redefine terminal objectives on the part of both departments and schools. Finally, there is an equally pronounced trend in the definition or redefinition of

current input status--or prerequisites--as shown in Table 35.

TABLE 33

PERCEIVED IDENTIFICATION OF CONSTRAINTS AND RESOURCES

	Yes	No	NA	Total
Is department analyzing operations?	53 (72.6)	15 (20.5)	5 (6.8)	73 (100%)
Is school analyzing operations?	60 (82.2)	4 (5.5)	9 (12.3)	73 (100%)

TABLE 34

PERCEIVED DEFINITION OF OBJECTIVES

	Yes	No	NA	Total
Is department defining objectives?	52 (71.2)	15 (20.5)	6 (8.2)	73 (100%)
Is school defining objectives?	55 (75.3)	13 (17.8)	5 (6.8)	73 (100%)

TABLE 35

PERCEIVED DEFINITION OF INPUT

	Yes	No	NA	Total
Is department defining input?	43 (58.9)	25 (34.2)	5 (6.8)	73 (100%)
Is school defining input?	50 (68.5)	12 (16.4)	11 (15.1)	73 (100%)

Questions 10, 11, and 12 probed respondents' perceptions of aspects of systems analysis that were specified

in the question and defined at the beginning of the questionnaire. Question 13 tapped the individual's awareness both of systems analysis in general and of how it is being used in his school or department. In this question, systems analysis is defined as "defining and measuring input and output and an analysis of components to accomplish the stated objectives" (see Appendix B, p. 99). Table 36 displays the array of respondents' assessments of the general status of systems analysis. The distribution of opinions ranges from ignorance of systems analysis, on the one hand, to awareness that evaluative data have been collected on the other. Indeed, these extremes of responses constitute the most numerous kinds of responses. While those who perceived systems analysis as being used constituted 49.3 per cent of the total sample, they made up 54.5 per cent of those who answered the question. A very small proportion professed to have no knowledge of systems analysis at all.

The last part of Question 13 tapped the overall attitude of respondents toward systems analysis. As is shown in Table 37, the modal response was "acceptance in certain areas" while the mean response lay to the neutral side of partial acceptance--2.28, where total acceptance has a value of 1 on a five-point scale. Opposition to systems analysis in medical education was virtually nonexistent.

TABLE 36

PERCEIVED STATUS OF SYSTEMS ANALYSIS

Category	Frequency	Percentage
Don't know anything about systems analysis.	13	17.8
Systems analysis not being used here.	17	23.2
Don't think it has any use here at this time.	6	8.2
We plan to use it but have not.	2	2.7
We need more information to consider its use here.	9	12.3
Systems analysis is being used here	36	49.3
We have just begun to use it.	10	13.7
We have set up an evaluation program but no data gathered.	4	5.5
We have accumulated evaluative data.	22	30.1
Not ascertained	7	9.6
Total	73	100

TABLE 37

ATTITUDE TOWARD SYSTEMS ANALYSIS IN MEDICAL EDUCATION

Attitude	Frequency	Percentage
Total acceptance in medical education	4	5.5
Acceptance in certain areas of medical education	33	45.2
Neutral as to its value in medical education	16	21.9
Of little value in medical education	-	-
Of no value in medical education	1	1.4
Not ascertained	19	26
Total	73	100

A number of factors were explored that might conceivably affect attitude. Using just the most populated response categories--"acceptance in certain areas" and "neutral as to its value"--a number of tables were compiled to assess possible association with different factors. Table 38 shows a strong association between attitude toward systems analysis and whether or not it is being used: where it is being used, the inclination is for partial, cautious acceptance. Tables 39-43 fail to show any association between attitude and the following factors: chairman status; public vs. private medical school; differentiation of school; years in present position; and medical degree.

TABLE 38

ATTITUDE TOWARD SYSTEMS ANALYSIS, BY EXPERIENCE WITH IT

Attitude	Experience with Systems Analysis		
	Not being used	Being used	Total
Partial acceptance	3	27	30
Neutrality	10	5	15
Total	13	32	45

Note: Significant $< .001$; $\chi^2 = 12.99$ (df = 1).

A number of respondents volunteered additional comments about their experiences with, or attitudes toward, systems analysis in medical education. Some of these are presented below:

TABLE 39

ATTITUDE TOWARD SYSTEMS ANALYSIS, BY CHAIRMAN STATUS

Attitude	Chairmen	Others	Total
Partial acceptance	12	21	33
Neutrality	7	9	16
Total	19	30	49

Note: Not significant; $\chi^2 = .04$ (df = 1).

TABLE 40

ATTITUDE IN PUBLIC AND PRIVATE MEDICAL SCHOOLS

Attitude	Public	Private	Total
Partial acceptance	20	13	33
Neutrality	6	10	16
Total	26	23	49

Note: Not significant; $\chi^2 = 1.48$ (df = 1).

TABLE 41

ATTITUDE, BY DIFFERENTIATION OF SCHOOL

Attitude	Differentiation		
	Low	High	Total
Partial acceptance	14	17	31
Neutrality	7	9	16
Total	21	26	47

Note: Not significant; $\chi^2 = .05$ (df = 1).

TABLE 42

ATTITUDE, BY YEARS IN PRESENT POSITION

Attitude	Years in Present Position			
	1-5	6-10	11 or more	Total
Partial acceptance	19	7	7	33
Neutrality	8	2	4	14
Total	27	9	11	47

Note: Not significant; χ^2 = .45 (df = 2).

TABLE 43

ATTITUDE, M.D.'S ONLY AND OTHERS

Attitude	M.D.'s only	Others	Total
Partial acceptance	20	13	33
Neutrality	9	7	16
Total	29	20	49

Note: Not significant; χ^2 = .00036 (df = 1).

We have begun to define objectives, have difficulty in formulating some of the desirable objectives in evaluative terms, or difficulty in finding adequate means to measure. Too many still end up as value judgments.

The administration has just set up an Office of Medical Education and hired a person to lead program evaluations. This person has just begun to collect data on our graduates of the past 7 years to see how their present satisfaction with career situation relates to their feelings about their medical school training.

I believe this is the one area where systems analysis breaks down in medicine.

Systems analysis is only as good as the design of

the analysis. Quality systems analysis I favor.

One of the troubles with educational/administrative personnel in, or in association with, an applied art--like medicine, swimming, football, music, etc.--in which a service is involved (treat, entertain, advise) rather than a product, like McDonald's burgers which are effectively computerized, is that such people and their programs generate paper work, function in accordance with Parkinson's laws, and tend to encourage standardized mediocrity.

Without enough input material one cannot use systems analysis but it can stimulate one to obtain the material knowledge necessary, thus leading the way to a solution.

We (Med. School Faculty) spent about 2 years at Executive Committee level plus some ad hoc committees of the faculty studying Systems Analysis and applying it to our school. The almost universal reaction was that it consumed enormous amounts of time, produced no new or useful information or understanding, was not helpful in "process" problems because the most crucial issues were the ones it could not take into account. It was rejected. Initially, I was one of the advocates!

Summary

Such statements, and the tabular data presented throughout the chapter, represent a variety of experiences and points of view with regard to systems analysis in medical education. There appears to be widespread use of systems analysis in the sample of medical schools studied, and a moderate acceptance of it. Strong opposition does not appear. These findings and their significance are discussed in greater detail in the following chapter.

CHAPTER V

FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

The present study has explored the opinions and perceptions of medical educators at nineteen medical schools in the Midwest. In particular, attitudes toward the use of systems analysis in medical education were examined. In addition, however, other information was collected that, it was believed, would shed further light on these attitudes.

Findings

A number of findings about systems analysis in medical education were educed by this investigation. To what extent these findings can be generalized to medical education as a whole in the United States is an issue that must be dealt with separately. External validity may be attributed to the findings on the following bases: (1) Nineteen schools is a sizable sample of schools in the Midwest. (2) Assuming similarity between the Midwest and other parts of the country, these findings would reasonably be applicable outside the Midwest as well. (3) Of the nineteen schools involved, a broad spectrum of departments, in both the basic and clinical sciences, was involved in regard to respondents who filled out and returned

questionnaires. (4) In all but two schools, more than one respondent answered the questionnaire; in fourteen schools, more than two respondents answered the questionnaire. At least there was a greater chance that the school as a whole, rather than a particular department, would be represented in the survey. (5) A sample size of seventy-three is adequate, for most purposes, for drawing inferences regarding a population--at least regarding the population of the midwestern medical schools involved. (6) An even number of respondents represented public and private medical schools, facilitating statistical comparisons based on this dichotomy. (7) The numbers of respondents from basic science and clinical science departments were roughly proportional to the numbers of basic science and clinical science departments at the schools. (8) A full range of ranks was represented, from departmental chairmen through non-administrative full professors to those lower in rank.

Some reservations on external validity may also be raised. These are as follows: (1) Some schools are far better represented in the sample than are others. Thus, it may be more legitimate to draw inferences about the better represented schools than about all the schools in the sample, or all midwestern medical schools. (2) While basic sciences constitute a minority of all departments, and of all respondents, it might be meaningful for purposes of statistical comparison to sample more adequately the respondents from basic science departments. (3) While a

sample size of seventy-three was sufficient for most descriptive purposes and for detecting some significant statistical associations, a larger sample size might have permitted detection of more associations than were in fact found in this study. The principal positive findings of the investigation are set forth below.

Backgrounds of Medical Educators

One of the more significant attributes of medical educators sampled is their own academic background. Department chairmen--whether they were also respondents or merely chaired departments of the respondents--tended overwhelmingly to have the M.D. degree, either alone or in combination with other higher degrees: over 60 per cent had the M.D. alone, with almost 90 per cent having the M.D. in combination with one or more higher degrees (Table 4). More than half had the M.D. alone, and almost 80 per cent had the M.D. in combination with another higher degree (Table 5). This is certainly consistent with the fact that the M.D. is the "principal product" of the medical school.

Whether the proportion of other degrees has increased up to the present--i.e., whether faculty have included other degrees with or without an M.D.--is subject to speculation; even more indefinite is whether that proportion will increase in the future. In terms of the objectives of medical education, one may speculate that the

educational background of educators may have a pervasive influence: the objectives of medical education when they were students--even if only vaguely specified--may persist in their present-day world view; but there is no guarantee that they will. Similarly, there is no guarantee that a Ph.D. will influence one to view research as an important overall objective for medical education, although he may view it as such for his specialty.

Most respondents were relative newcomers to their present positions: half had been incumbent five years or less, about 70 per cent ten years or less. Private schools tended significantly to have faculty of less tenure than public schools (Table 10). There was no clear explanation for the difference, but at least three possibilities suggest themselves: (1) there is generally more mobility among private schools; (2) private schools are receiving more of an influx of recently graduated instructors; and (3) the newer schools in the sample are private. The third possibility is ruled out, since two of the four schools founded since 1964 are private, but their influence is not sufficient; five of their seven respondents have been at their position five years or less, but that is only five of a total of twenty-five respondents from private schools in the one-to-five year bracket. The study produced insufficient data to determine whether the first or second alternative, or some other, is more explanatory. Data on ages of respondents or on time elapsed since

receiving the last degree would be useful in this regard.

The public-private dichotomy, on the other hand, is not associated with other variables: distribution of respondents in basic and clinical sciences (Table 8); proportion of chairmen in the sample (Table 9); or faculty specialization or differentiation (Table 11). In this context, the first two variables provide information descriptive of the sample. The third variable, as depicted in Table 11, gives information on a possible relationship between public-private status and differentiation. The possible relationships among these variables is shown in Figure 1. It should be pointed out that Table 11 is based

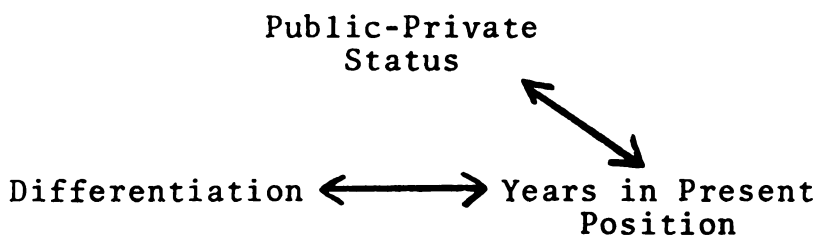

Fig. 1--Associations Among Background Variables

on the schools (n = 19) rather than respondents (n = 73), which makes it more difficult to arrive at a significant association; but a Chi-square test based on respondents is still not significant (χ^2 = 2.396). Since public-private status and differentiation were characteristics of the schools, it would make sense to test for association for a larger sample of schools. On the basis of the present evidence, one may cautiously state that there is no relationship between differentiation and public-private status

but that both private and highly differentiated medical schools among this group of schools tend to have more recently arrived faculty. The significance of such a trend is not discernible on the basis of available evidence.

Educational Objectives

The desirability of using systems analysis in medical education may or may not depend on whether educational objectives have changed or are currently in a process of change. For example, where objectives are perceived to be essentially the same over the past several years, systems analysis might still be used as a means of defining and implementing those objectives.

In the sample of respondents, opinion was divided on the question of whether terminal objectives in medical education have changed in the past decade--with a somewhat greater tendency to believe that stability has continued. The main reason given was the stability of the physician's role, while emphasis on primary health care was seen as the principal locus of change. As one respondent suggested, there can be both change and stability, depending on what level one is examining. Thus, in defining the physician's role, which appears to lie on a relatively global level, there may well be stability. Emphasis on primary health care was not a "new" part of a physician's role; its <u>degree</u> of emphasis, however, may well be. It appears that, for these respondents, the overall role of the physician

remains the same, and presumably the set of objectives for education; what has changed slightly is the priority given the set of existing objectives. Perception of change appeared to be uniform throughout the sample, as it was not affected by public-private status (Table 15), years in present position (Table 16), or differentiation (Table 17).

The ranking of educational objectives is seen as essentially the same for American medical education as a whole, the respondent's school, and the respondent's department (Tables 18, 19, 20, 21). In all three spheres, clinical training, research, and emphasis on the whole person ranked as the three leading objectives. Overall, departments--in contrast to schools--tended to rank whole person treatment above research (Table 21). Some "maverick" departments appeared to be more research-oriented than anything else (Table 20). Even "maverick" schools, however, seemed to agree with the majority in choosing clinical training, research, and whole person treatment in that order (Table 19). This general consensus corroborates initially-held intuitions about the relative uniformity of medical education in the United States. Such a deduction remains supposition since a national sample or other regional samples should be tapped before such a generalization is advanced.

Agreement among schools is one thing, agreement within schools another. The above findings suggest that there may be some disagreement between some departments

and their schools on objectives. Within departments, agreement is apparently high among faculty and between faculty and chairmen (Table 22); the latter comparison was borne out in terms of specific objectives espoused by chairmen and non-chairmen (Table 23). By contrast, perceived agreement between department faculty and the medical school dean is considerably lower, although still fairly high--roughly three-fifths of those who responded acknowledged agreement with the dean, as opposed to about four-fifths for faculty or faculty and chairmen. When confronted directly with the issue of agreement with their school or dean, respondents were inclined to be somewhat more critical than if such comparison was not stated explicitly. Moreover, personification of the comparison in terms of the dean, rather than the impersonal comparison with the school as a whole, may provoke a more critical response. In any case, some disagreement between departments and schools was evident, but there was less disagreement among schools. Whether the first kind of disagreement is endemic or specific to certain departments or types of departments is debatable; the question is worth additional investigation. The highest degree of consensus may safely be said to reside within departments, among faculty members, and between faculty and chairmen.

A possible schism appears between departments and schools on definition of what terminal objectives should be. There is definite division of opinion on how well

departments and schools are attaining those objectives: departments were perceived as attaining objectives to a significantly greater extent than are schools. Chairmen and faculty were in essential agreement as to how well their own departments were attaining their objectives (Table 25) and how well their schools were attaining their objectives (Table 28). Factors such as differentiation or public-private status did not seem to be predictive of perceived attainment of department objectives (Tables 26 and 27) or of school objectives (Tables 29 and 30). There was some suggestion that this difference may be long-standing: very slight change in objectives was seen for both departments and schools, although departments were seen as changing slightly more--though not significantly more (Table 31). This may be interpreted as evidence of (1) relative stability of objectives and (2) long-standing differences between departments, or at least some departments, and schools. Where change has occurred, it was attributed to external constraints, such as changes in public philosophy or funding (Table 32).

Systems Analysis

A very high proportion of respondents was aware that different aspects of systems analysis were in use in both their departments and their schools. The school was seen as using these components in more instances than was the department. Such components included identification

of constraints and resources, definition of terminal objectives, and definition of input (Tables 33, 34, and 35, respectively). Asked about their awareness of systems analysis per se, a somewhat lower proportion of respondents was found to answer positively than answered in this way regarding components. But roughly four-fifths of the respondents indicated either awareness of its existence or awareness of its use at their school. While departmental use of systems components was lower than school use in every case, in no case did it approach the lower figure for systems analysis as a whole (Table 36). Such a result may simply indicate the obvious: that components of systems analysis may be in more widespread use than is systems analysis as a whole.

The modal attitude toward systems analysis was acceptance in certain areas of medical education. Roughly three-fifths of those who responded to this question responded in this manner; 30 per cent gave a neutral response; 7 per cent indicated total acceptance; and only one person gave any kind of negative response (Table 37). Thus cautious acceptance may be described as the overall attitude of this sample of respondents. Differences in attitude--as defined by partial acceptance or neutrality--were found to be strongly predicted by experience with systems analysis at the schools: those who had seen it in use were more inclined to accept it.

Other variables, however, were not predictive of

acceptance. Such variables included: chairman vs. non-chairman; public-private status; differentiation; years in present position; and whether the M.D. was the sole higher degree held by the respondent (Tables 38, 39, 40, 41, 42, and 43, respectively). In short, attitude toward systems analysis tends to be fairly specific, a function only of experience with systems analysis rather than with type of school or personal background.

Among other things, this means that systems analysis tends to be evaluated on rational grounds: the kinds of results observed from using it, or probable results. Some of the comments by respondents directly reflected this experience-based kind of evaluation: from difficulty in pinning down objectives in this area through consumption of much time and energy and on to stimulation of solutions even when systems analysis cannot be carried out to the letter. Experiences obviously varied among users. It was not clear, however, why such experiences should vary. Why is there so much partial acceptance, rather than total acceptance? Why, indeed, is there so little rejection of systems analysis? These are questions that might require further examination.

Conclusions

On the basis of the above findings, the following conclusions are offered:

1. Respondents tended to see educational objectives

in medical education as not changing substantially over the past several years. The principal reason for stability in terminal objectives was seen as perceived stability in the physician's role. Even where change was perceived, it was not in terms of the doctor's role as a whole, but rather in terms of a slight reordering of priorities within that role.

2. There was broad agreement among medical educators in the sample as to what the most important terminal objectives in medical education are: clinical training, research, and emphasis on the whole person. Only in the case of some departments did the rank order among these three objectives differ: research was uppermost for some departments, but clinical training was for departments in general. If there is a public image of medical practice as exhibiting insensitivity to the patient as a whole person, it was certainly not reflected in the stated objectives. Whether those objectives are being attained is another question.

3. While there was broad agreement on objectives for medical education as a whole, within schools and within departments, agreement was stronger within departments--both among faculty members and between faculty and chairmen. Thus there is not only disagreement regarding the content of objectives, but also in degree of consensus.

4. There is a greater tendency to believe that schools are not attaining their objectives than there is

to believe that departments are not attaining their objectives. What this means concretely is hard to ascertain. If clinical training is the foremost objective for both departments and schools, the possibility exists that departments are more effective in training students in clinical specialties than are schools in providing general clinical skills and orientation.

5. Since neither departments nor schools have changed their objectives much over the past decade, the differences that exist between departments and schools must also have existed for some time. This suggests that there may be an enduring tension between general medical education and specialization, as evidenced in part by the variation in priorities between departments and schools.

6. Most change in educational objectives in medicine can be attributed to external constraints. These constraints tend to take the form of changes in public philosophy or in public funding. Changes in funding may operate in either a negative way--for example, in reduced funding of research that may force a renewed interest in clinical areas--or in a positive way--for example, funding may be redirected to clinical or primary care areas.

7. The use of systems analysis procedures is widespread at a component level. Such components include identification of constraints and resources, definition of objectives, and definition of input. The use of systems analysis as a total approach is widespread, but not as

widespread as the use of analysis of particular components of systems.

8. Even though the use of systems analysis appears to be far from universal in this sample of schools, the awareness of systems analysis--whether accurate or not--is very widespread even where systems analysis is not being used.

9. A general attitude of cautious acceptance of systems analysis in medical education appeared in the study's sample of educators. Attitude emerges almost entirely as a function of experience with its use: where it is used, there is more inclination for at least partial acceptance. Rejection of systems analysis is almost universally lacking in the present sample.

10. Virtually no association exists between type of medical school, on the one hand, and use of systems analysis or attitudes toward systems analysis on the other. Thus there was no difference between public and private medical schools regarding use of, or attitude toward, systems analysis. Similarly, there was no difference between schools with high differentiation, or specialization in curriculum, and schools with low differentiation. Similarly, these variables did not predict conception of terminal objectives in schools or departments, or whether they have changed.

11. Personal backgrounds or roles do not predict conception of terminal objectives or attitude toward

systems analysis either. Thus, chairman status or years in present position have no association with these variables. Consequently, rational considerations appear to play the major role in how respondents define the situation.

12. The above conclusions have applicability to medical schools in the midwestern area. They may also have applicability to the national system of medical education, but with less assurance. The assumption of uniformity in American medical education has some support in the perceptions of respondents, but needs further documentation.

Recommendations

On the basis of the above findings and conclusions, the following recommendations are offered:

1. Since there is fairly widespread use of systems analysis in the midwestern region, similar studies of receptivity to it should be undertaken in other regions and for the country as a whole. This would allow region-by-region comparison.

2. Future studies should be undertaken with larger samples of respondents. Such a procedure would allow for statistical comparisons that are more sensitive to important differences and associations. For example, in the present study, chi-square tests might have detected more associations with school types.

3. Future studies could profit from a comprehensive

assessment of all medical schools in a region or in the country as a whole. Such a project could well be undertaken or underwritten by a group such as the Association of American Medical Colleges. Since the number of medical schools in this country is large, but not astronomical, it would be advisable to study the entire population of medical schools in a geographic area rather than carry out a sample survey of that area. On the other hand, respondents from these schools could well be reached through sample survey procedures.

4. Comparisons of natural subdivisions within medical schools could profitably be undertaken. Thus, department-by-department comparisons could pin down precisely the ecology of use of systems analysis within a particular medical school or between comparable departments in different schools. More generally, comparisons between basic science and clinical science areas could be undertaken. Such studies could well be of a documentary sort, examining the operations of a particular unit rather than an opinion survey of its faculty or administrators.

5. Examination of schools and departments could well take the form of a systems analysis. Dressel and his associates have advocated a format for the study of departments, as follows:

Philosophy of department
Image of department
Human resources
Financial resources and management
Organization and administration

Curriculum
Instruction
Physical facilities, equipment, and supplies
Liaison with other departments or colleges
Role of department in college or university
Summary of findings and recommendations[1]

Analysis of the curriculum components above would, in this context, include such elements as: number and levels of courses and credits; balance between general and specialized offerings; relation of curriculum to student demands; relation of curriculum to faculty qualifications; relation of courses to courses and programs in other departments; and views about and approaches to curriculum revision.[2] Specific courses could be analyzed according to descriptive information, including statement of objectives; analytical information, including hours and facilities used for various instructional modalities; and historical information--that is, how analytical information has varied over time or in cycles.[3] Finally, an input-output analysis could be conducted. Input would consist of personnel of varying ranks employed in the department while output would consist of the various activities of instruction, research, services, and management.[4] Thus knowledge of the distribution

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[1]Paul L. Dressel, F. Craig Johnson, and Philip M. Marcus, The Confidence Crisis: An Analysis of University Departments (San Francisco: Jossey-Bass, Inc., 1971), pp. 156-161.

[2]Ibid., p. 159.

[3]Ibid., pp. 179-182.

[4]Ibid., p. 204.

of inputs might shed light on why objectives have or have not taken a particular direction in one department. Examining a sample or population of departments in a school or region along these lines might yield some probability statements about the influence of structural factors on the nature of objectives or on their attainment.

6. A permanent or standing unit, of national or regional scope, could be established to coordinate the gathering and exchange of research into the use of systems analysis in medical education. Such a unit or organ could initiate or underwrite such research as well as promote the dissemination of results.

7. With the development of statements of objectives on a widespread basis, it should be possible to export a systems-developed curriculum from one department to another with similar objectives. It may be that one department or school has more resources with which to develop a full-blown systems analysis of its curriculum. It seems reasonable that such a department would share the fruits of its labors with another department not so well endowed. Such a curriculum--or at least course--could be tried and evaluated in its new setting. The standing unit described above could serve as a clearinghouse for information on departments who need such curricula and departments who could supply them, as well as information on the performance of such curricula in their transplanted settings.

8. The influence of a number of factors explored

in this study should be assessed more systematically. Thus, while school factors like public-private status, differentiation of faculty, and personal and role factors such as chairman status and years in present position were not found to be predictive, that does not preclude their possible predictive function. Two strategies might be adopted that might facilitate detection of such a function: (1) use of a larger sample size to facilitate detection of statistically significant associations, and (2) use of more precise kinds of measurements that allow for use of statistical tests and measures of association which make use of more stringent assumptions--for example, the Pearson Correlation Coefficient or the t-test.

9. The range of opinions regarding the use of systems analysis in medical education should be explored more systematically. The present study found little evidence for rejection of systems analysis on the basis of the sample used. However, it is important to determine whether any systematic objections to systems analysis in medical education exist, precisely what those objections are, and the sources of those objections. It may well be that there are valid reasons for not employing systems analysis as well as reasons for rejecting it that can be rectified. It is curious that acceptance of systems analysis has been largely partial or qualified. One might conjecture that such partial acceptance is due to respondents seeing its use only in delimited spheres of

medical education.

10. It is important to examine the experiences of faculty with systems analysis. It is one thing to conduct opinion studies or to perform a systems analysis or some other analysis on paper; it is another to examine how participants are experiencing the process of using systems analysis. It may be, as some respondents maintained, that medical practice, and medical education in particular, is largely an art and therefore not susceptible to quantitative procedures like systems analysis. Assuming a core of truth to this assertion, it seems valuable to take some measure--such as an experiential study--in order to conceptualize the extent to which medical education is an art and the extent to which it can be quantified. Such a study might set definitive limits on the usefulness of systems analysis--and in the process eliminate both naiveté and cynicism.

APPENDICES

APPENDIX A

COVERING LETTER

Michigan State University
University Health Center - OLIN
East Lansing, Michigan 48824

February 27, 1975

Dear Dr. _____:

Your medical school administrative office was kind enough to provide me with a list of faculty members from which your name was selected at random.

Now I need your help.

This questionnaire has been approved by my Ph.D. guidance committee, as a part of my study of attitudes of leaders in medical education toward the use of the technique of Systems Analysis in curriculum designs and curriculum changes.

Your prompt response will enable me to proceed on schedule and earn my grateful thanks.

Thank you,

Loren L. Hatch
Ph.D. Candidate
Higher Education
Michigan State University

APPENDIX B

THE QUESTIONNAIRE, OR BASIC INSTRUMENT

AN ATTITUDINAL SURVEY OF SELECTED
MEDICAL SCHOOL FACULTY MEMBERS

Institution _____

Name of Medical School Dean
or Chief Administrative Officer _____

Your Department (Division)
and address _____

_____ Phone ( ) _____

Your Department
(Division) Chairman _____ Degree(s) _____

Your Name Title
(Optional)_____ (Rank)_____ Degree(s) _____

How long in present position? _____

Instructions to respondent:

You have been selected to participate in a study of medical education. Would you please answer the following questions as fully and as frankly as possible? Please be assured that this questionnaire is completely confidential. Your name is not needed except for purposes of control but we would like your professorial rank and degrees, for analysis of results. Please use the other side of the page if you need more space. For this study Objectives means statements that are capable of both measurement and planning. Prerequisite objectives means statements of specific behaviors such as skills, attitudes or knowledge. Constraints stand in contrast to an objective and are mainly financial and physical. Terminal objectives means the final objectives for a particular process or activity.

1. Is your medical school involved in any way with offering a Ph.D. degree?
Yes ____ No ____

2. Do you believe the terminal objectives of medical education have changed in any way since you first held your present position? Yes ____ No ____

   a. If yes, how have the objectives changed? _____

   _____

   b. If no, why do you believe they have not changed?

   _____

3. Rank in order of importance the terminal objectives of medical education in general regardless of personal opinion (e.g., 1. g, 2. a).

   EXPERTISE IN:

   ____a. Clinical training (diagnosis, treating, prevention).

   ____b. Research (theories) of disease; their diagnosis and treatment.

   ____c. Whole (total) person treatment (social, biological, spiritual, economic unit).

   ____d. Environmental medicine.

   ____e. Public health (bio-statistics).

   ____f. Continuing medical education.

   ____g. Mental health.

   ____h. Humanistic approach (patient interactions).

   ____i. Other _____

   ____j. Other _____

4. Do you believe that the objectives listed in 3 above would rank similarly in your school? Yes ____ No ____

   If No, how does this differ from your school? a. ( ), b. ( ), c. ( ), d. ( ), e. ( ), f. ( ), g. ( ), h. ( ), i. ( ), j. ( ).

5. Do you believe there is a predominant opinion on medical education terminal objectives at your school?

   a. Among faculty members within your department? Yes ____ No ____

   b. Between your department chairman and the predominant opinion of faculty members of your department? Yes ____ No ____

   c. Between the Dean's office and the predominant opinion of faculty members of your department? Yes ____ No ____

6. Is there any department (or departments) that differs substantially (in what it considers to be the most important educational objectives) from any of those objectives listed in 3 above? Yes ____ No ____. If yes, how do they differ? _____

   _____

7. What are your department's, school's present terminal objectives (not necessarily in order), both medical and educational?

	Department	School
a.	_____	_____
b.	_____	_____
c.	_____	_____
d.	_____	_____
e.	_____	_____

8. How well do you believe your department, school is meeting its objectives whether they are the same as yours or not? Circle one of the marks on each line.

   a. Department

x	x	x	x	x
Very well	Well	Average	Poorly	Very poorly

   b. School

x	x	x	x	x
Very well	Well	Average	Poorly	Very poorly

9. Do the objectives of your department, school (7 above) differ from those in the decade prior to 1970? Circle one of the marks on each line.

   a. Department

x	x	x	x	x
Very markedly	Quite a bit	Slightly	About the same	Not at all

   b. School

x	x	x	x	x
Very markedly	Quite a bit	Slightly	About the same	Not at all

   c. Why do you believe this is so? _____

   _____

10. Is your department or school doing anything now or is it planning to do anything or has it done anything in the recent past to analyze its operations (identify constraints and resources)? Department Yes____ No____ School Yes____ No____

11. Is your department or school doing anything now or is it planning to do anything or has it done anything in the recent past to define or redefine its terminal objectives? Department Yes____ No____ School Yes____ No____

12. Is your department or school doing anything now or is it planning to do anything or has it done anything in the recent past to define or redefine its current input status (prerequisites)? Department Yes____No___ School Yes____ No____

13. Questions 10-11-12 embody systems analysis. Although there are many definitions, for this last question consider systems analysis as defining and measuring input and output and an analysis of components to accomplish the stated objectives. Please check one choice from a, b, or c, and if you check c answer 1, 2, or 3. Then answer d.

   a. Don't know anything about systems analysis _____

   b. Systems analysis not being used here _____

      1. Don't think it has any use here at this time__

      2. We plan to use it but have not _____

      3. We need more information to consider its use here _____

c. Systems analysis is being used here _____

1. We have just begun to use it _____

2. We have set up an evaluation program but no data gathered _____

3. We have accumulated evaluative data _____

d. Your attitude concerning systems analysis can best be considered as which of the following? Check one please.

____ Total acceptance in medical education

____ Acceptance in certain areas of medical education

____ Neutral as to its value in medical education

____ Of little value in medical education

____ Of no value in medical education (non-acceptance)

If you use systems analysis, copies of documentary data of evaluative results would be most appreciated and credit will be given where requested.

Thank you very much for your cooperation.

Loren L. Hatch

APPENDIX C

SUPPLEMENTARY TABLES

TABLE 44

A LISTING OF DEPARTMENTS IN SCHOOLS SAMPLED

Basic Sciences	
Anatomy	Medical Genetics
Anthropology	Medical Statistics
Biochemistry	Medical Technology
Biomedical Engineering	Microbiology
Biometry	Pathology
Biophysics	Pharmacology
Developmental Biology	Physiology
Endocrine Research	Physiological Chemistry
Environmental Health	Sociology
Epidemiology	Theoretical Biology
Genetics	Virology
Laboratory Medicine	Zoology
Med. Ed. Research and Dev.	

TABLE 44 (cont'd.)

Clinical Sciences	
Anesthesiology	Ophthalmology
Audiology	Oral Surgery
Clinical Pathology	Orthopedics
Community and Family Med.	Orthopedic Surgery
Community Health	Otolaryngology
Community Health and Preventive Medicine	Otorhinolaryngology
Dentistry	Pediatrics
Dermatology	Physical Medicine-Rehab.
Endocrinology	Postgraduate Medicine and Health Professions Ed.
Environmental Medicine	Preventive Medicine
Family Practice--Family Med.	Primary Health Care
Human Development	Psychiatry
Laboratory Animal Medicine	Radiation Therapy
Medical Economics	Radiology
Obstetrics-Gynecology	Reproductive Biology
Occupational and Environmental Health	Surgery
Oncology	Surgical Pathology
	Urology

Source: Association of American Medical Colleges, 1973-1974 AAMC Curriculum Directory (Washington: Association of American Medical Colleges, 1973).

TABLE 45

A LISTING OF DIVISIONS WITHIN CLINICAL DEPARTMENTS

Medicine and Internal Medicine

- Allergy, Immunology
- Arthritis and Metabolism
- Cancer Chemotherapy
- Cardiology, Cardiovascular Diseases
- Clinical Pathology
- Clinical Pharmacology
- Dermatology
- Development of Health Care System
- Endocrinology
- Gastroenterology
- Geriatrics
- Hematology
- Hypertension
- Infectious Diseases, Hypersensitivities
- Medical Immunology, Rheumatic Diseases and Allergy
- Metabolism and Endocrinology
- Nephrology
- Neurology
- Nuclear Medicine
- Nutrition
- Physical Medicine and Rehabilitation
- Preventive Medicine
- Psychosomatics
- Pulmonary Diseases, Pulmonary Medicine
- Renal and Hypertension
- Rheumatology
- Thoracic Diseases

Neurology

- Pediatric Neurology

Obstetrics and Gynecology

- Gynecological Surgery
- Obstetrics and Medical Gynecology

Oncology

- Medical Oncology
- Therapeutic Radiology

Physical Medicine and Rehabilitation

- Physical Therapy
- Speech and Hearing Sciences

Preventive Medicine and Environmental Health

- Agricultural Medicine
- Biostatistics

Primary Health Care

- Geriatrics

Psychiatry

- Adult
- Child, Adolescent
- Health Care Psychology
- Mental Health Research
- Neuropsychiatry
- Psychology

Radiology

- Nuclear Medicine
- Pediatric Roentgenology
- Radiation Physics
- Radiation Research
- Radiation Therapy, Radiotherapy
- Radiobiology

TABLE 45 (cont'd.)

Surgery

Gastroenterologic	Peripheral Vein
General	Plastic
Head and Neck	Proctologic
Neurosurgery	Thoracic
Ophthalmology	Thoracic and Cardiovas.
Oral	Transplantation and Surgical Immunology
Orthopedic	Trauma and Reconstruction
Otolaryngology	Urology
Pediatric	

Note: This listing is as exhaustive as is practical. Some duplications are omitted. For example, within Surgery there are both "Thoracic and Cardiovascular" and "Cardiovascular and Thoracic." On the other hand, where duplication is apparently not total and there is overlap with other areas, there is a separate listing. For example, within Medicine both "Nephrology" and "Renal and Hypertension" are listed. Finally, a second entry may be listed after a comma, on the same line, to indicate that some divisions have both fields under their coverage. For example, in Medicine there are some divisions titled "Allergy and Immunology" and others simply "Allergy."

TABLE 46

NUMBER OF CLINICAL SPECIALTIES, BY SCHOOL

School	Num. of Specialties within Medicine	Num. of Specialties within Surgery	Num. of Other Depts. with Specialties	Num. of Specialties within Them
Case-Western Reserve	6	9	0	0
Indiana	0	3	0	0
Loyola	0	0	1	2
Mayo	11	7	4	9
Med. Coll. of Ohio	0	0	0	0
Med. Coll. of Wis.	0	0	0	0
Michigan State	0	0	0	0
Northwestern	8	0	2	4
Ohio State	0	0	0	0
Pritzker - U. of Chicago	10	8	0	0
Southern Illinois	13	8	0	0
Univ. of Cincinnati	11	7	2	5
Univ. of Health Sciences	11	6	2	4
Univ. of Iowa	9	5	2	5
Univ. of Michigan	13	7	2	6
Univ. of Minnesota	0	0	4	9
Univ. of Nebraska	9	4	0	0
Univ. of Wisconsin	9	9	1	4
Wayne State	0	0	0	0

Note: Where one specialty is listed for a department, or where more than one is listed but do not appear to exhaust the coverage of the department, the department as a whole is counted as another specialty--a "general" specialty. For example, if Physical Therapy is the one specialty within a Department of Rehabilitation Medicine, then Rehabilitation is itself also counted as a specialty; i.e., all parts of Rehabilitation Medicine that do not deal specifically with Physical Therapy.

TABLE 47

PRESENCE OF A DEPARTMENT OF FAMILY MEDICINE OR EQUIVALENT, BY SCHOOL

School	Department of Family Medicine	Equivalent	Neither
Case-Western Reserve		x	
Indiana	x		
Loyola	x		
Mayo	x		
Med. Coll. of Ohio	x		
Med. Coll. of Wis.			x
Michigan State			x
Northwestern		x	
Ohio State			x
Pritzker - U. of Chicago			x
Southern Illinois	x		
Univ. of Cincinnati			x
Univ. of Health Sci.		x	
Univ. of Iowa	x		
Univ. of Michigan			x
Univ. of Minnesota	x		
Univ. of Nebraska	x		
Univ. of Wisconsin	x		
Wayne State	x		

Notes:

The equivalent departments are as follows: Case--Community Health; Northwestern--Community Health and Preventive Medicine; Univ. of Health Sciences--Primary Health Care.

Of the six schools that do not have a department of Family Medicine or equivalent, none even have a division of Family Medicine within an existing department.

Seven of the ten schools with departments of Family Medicine are public. All three schools with the equivalent are private. Thus there is an even split between public and private schools in having Family Practice or equivalent.

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