



Cost of Education of the Health Professions: Interim Report (1973)

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Cost of Education
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INSTITUTE OF MEDICINE
OFFICE OF THE PRESIDENT

March 30, 1973

The Honorable Harrison A. Williams, Jr.
Chairman
Committee on Labor and Public Welfare
Washington, D. C.

Dear Senator Williams:

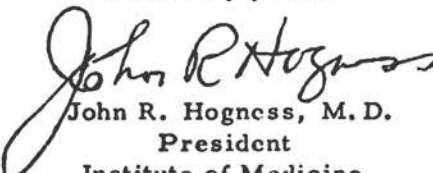
I have the privilege of presenting to the Senate Committee on Labor and Public Welfare an interim report on a study undertaken by the Institute of Medicine of the National Academy of Sciences to determine the national average annual per student costs of education in eight health professions. The study is being performed under a contract with the Department of Health, Education and Welfare, which became effective June 30, 1972.

The Comprehensive Health Manpower Act of 1971, P. L. 92-157, Sec. 205, requested the Secretary of Health, Education and Welfare to arrange for studies to determine the average annual costs of educating students in the schools of medicine, osteopathy, dentistry, optometry, pharmacy, podiatry, veterinary medicine, and nursing. The Act further requires the submission of an interim report by the contractee to designated Committees of Congress and to the Secretary of Health, Education and Welfare no later than March 30, 1973.

The enclosed report includes a legislative history of the support of health professions education, a description and aggregate data on the universe of health professional educational institutions, a discussion of the economic and other problems of determining average per student costs and of explaining variability among institutions, a description of the methodologies to be used, and the schedule of data gathering required to produce the information for the final report, due January 1974.

We shall be glad to discuss this interim report in greater detail with the members and staff of your committee.

Sincerely yours,


John R. Hogness, M. D.
President
Institute of Medicine

Enclosure

PREFACE

This is an interim report on a study being conducted by the Institute of Medicine of the National Academy of Sciences with funding from the Department of Health, Education, and Welfare. The study, scheduled for completion and a final report in January, 1974, was initiated at the request of the Congress. The conduct of the study is under the guidance of a committee of Institute members and other experts selected for their ability to evaluate programs of systems analysis and cost finding, and to comprehend the policy implications of analyses based on financial data provided by educational institutions. This interim report presents background information and an explanation of the proposed study methods.

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SUMMARY

- The 1971 Comprehensive Health Manpower Act requests that the National Academy of Sciences conduct studies to develop annual average per student costs in schools of medicine, dentistry, osteopathy, optometry, pharmacy, veterinary medicine, podiatry, and nursing. The study is to be based on the school years 1971-1972, 1972-1973, 1973-1974; is to examine the extent and causes of variation among schools within each profession; is to develop a uniform methodology for estimating per student costs on an annual basis; and is to offer recommendations to the Congress on the use of the data for the determination of capitation grants.

- The educational environment in health professional schools is a complex combination of activities that provide instruction to a variety of undergraduate and graduate students, patient care services, biomedical research, continuing education, and community service.

- The educational process is dynamic and has changed substantially during this century. It continues to undergo

considerable change in curriculum, specialization, technology and the proportions of activities needed for "education."

- School income is derived from many sources, often without clear distinctions as to which source is financing a particular activity in the school. Since financial data are based largely on income flows rather than actual costs of these activities, the process of establishing educational costs for the student working toward the first degree entails a series of highly complicated allocation decisions. For example, the costs attendant to the post-graduate student are an inseparable part of the undergraduate structure.

- In 1970-1971, the 1,600 health professional schools of medicine, dentistry, osteopathy, veterinary medicine, pharmacy, optometry, podiatry, and nursing spent nearly three billion dollars for all their programs of education and research, and for some programs of patient care. In that year more than 66,000 students were awarded their first professional degree in the eight fields, and 47,000 received advanced training as graduate students or house officers.

- The Federal government is a major contributor to the support of health professional education in the United States, with total Federal support increasing at a steady rate since the early 1960's. In 1972 more than one billion

dollars in Federal funds were made available to all health professional schools for research, community service, and health manpower training. Federal support accounted for 44 percent of the total income of medical schools and 16 percent of the total income of dental schools in that year.

- The President's budget for 1974, however, poses for the first time an absolute reduction in the level of Federal support for health professional schools, excluding patient care payments; DHEW obligations are estimated to decline from a 1973 level of \$1,355 million to a 1974 level of \$1,117 million, a reduction of 19 percent.

- The predominant role that the Federal government now plays in the financial structure of health professional education evolved from an early narrowly defined attention to public health. The evolution accelerated in the 1940s with a heightened Federal interest in research.

- By 1950 the Federal government had launched a comprehensive research program through the National Institutes of Health, which provided millions of dollars to medical schools for the expansion and improvement of their biomedical research efforts.

- With the passage of the Health Professions Education Act of 1965, the Federal support to medical schools also

began to include funds for institutional support based on enrollment. Later acts provided for financial distress grants and extended institutional support to the other categories of health professional schools.

- With the passage of Titles XVIII, and XIX of the Social Security Act, which established Medicare and Medicaid, the Federal government also began to support health professional education indirectly since the increase in patient care revenues permitted health care institutions to pay higher salaries to house officers and supervising physicians. Concomitant with this expansion of Federal funding for education and patient care was a leveling off of the growth of Federal obligations for biomedical research.

- The most recent legislation, the Comprehensive Health Manpower Act of 1971 (P.L. 92-157) and the Nurse Training Act of 1971 (P.L. 92-158), altered the Federal role to first dollar institutional support for the education of health professionals. These acts authorize annual operating grants to eight types of health professional schools by means of capitation formulas with bonuses for increases in enrollment. However, the administration is currently requesting termination of capitation for certain of the professions.

- In order to fulfill the Congressional request for determination of education costs, activities will have

to be classified and allocated to program functions of education, research, and patient care as reasonably as possible.

- Resource costs associated with the educational program of an institution have to be estimated as well as apportioned among the many types of health professional students being educated within the same classroom or clinical setting.

- In addition to the difficult judgments required to allocate costs within joint activity-joint product situations, there are further complexities in the cost-finding process. These include whether and how to attribute the full value costs to factors of production for which reduced or zero cash outlays can be identified, e.g. the value of instruction provided by house officers, volunteer or part paid faculty, depreciation of plant and equipment, transfers of service from one program to another, and educational costs borne by hospitals for which no reimbursement is received.

- Since costs can be defined in a number of ways, three methodological approaches to cost will be used, during the remainder of the study.

- The Net Expenditures approach defines education as the gross cash expenditure of the health professional school, less the revenue earned from patient care and sponsored

research, and prorates education costs based on student enrollment. Any secondary program activity to which the school commits faculty and other resources but for which it receives no revenue is considered essential to the "educational" environment.

Preliminary field studies indicate that this cost finding method may serve best in free-standing schools with a single type of health professional student. Its applicability to more complex schools will depend on additional studies to account for resource transfers and other non cash costs.

- The Program Cost approach seeks at the outset to identify all resources actually used by a school in its operation and to allocate an appropriate share of these resources to each of its programs independent of the source of funds or the actual cash outlays. The program cost method uses time log and activities analysis of faculty time and translates them into program costs, apportioning non-faculty salaries, equipment depreciation, and overhead to these programs.

The development of allocation rules is a critical factor in the estimation of program costs.

- The first major step in implementing the net expenditure and program costs approaches is the data gathering effort to be carried out in a representative sample of the

eight categories of health professional schools. Eighty-eight schools will be visited. Data on the educational environment will be collected to enable a statistical analysis of financial flows. The development of program costs will be based on an empirical survey of faculty activities within each institution in the sample and selected special studies.

- Similarly detailed data will be collected from a small representative sample of teaching hospitals. The purpose of this will be to determine the extent to which teaching hospitals incur additional costs as a function of educating health professionals. Personnel, including faculty and house officers, space, and equipment will be studied in areas such as clinics and laboratories where educational functions are likely to increase costs.

- Aggregate financial and non-financial data will be collected for all schools in each of the eight health professions to assist in analyzing the causes and magnitude of cost variation among schools in the same profession. These data will be obtained from existing reports and the schools' responses to questionnaires.

- The third methodological approach to determining per student costs, the Constructed Cost approach, makes explicit

some of the assumptions inherent in any cost finding methodology applied to education.

The Constructed Cost approach will attempt to arrive at a consensus on acceptable levels of resources for health professions education in different settings based on the best judgments of a group of experts in the field. The design of this methodology was prompted by the recognition that data from existing schools, regardless of how they are approached, reflects historical funding policies. Cost estimates based on such data may lead to definitions of education that are more representative of funding contingencies than ideals.

The succeeding chapters discuss in greater detail:

- Federal support to health professional schools
- The universe of health professional schools
- Cost finding approaches and their policy implications
- Study methodology

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COSTS OF EDUCATION OF THE HEALTH PROFESSIONS
INTERIM REPORT, MARCH 1973

INTRODUCTION: BACKGROUND, CHARGE, AND ORGANIZATION

Congressional Charge

The Comprehensive Health Manpower Act of 1971 (PL 92-157) represents a major change in public policy for financing health professional education: it shifted Federal aid from general institutional support of schools to support based on enrollment--capitation grants. To establish levels of capitation, and to analyze the effects of those grants on programs, the Congress required information on the actual costs of education for each of the eight health professions covered by the Act. Consequently, the Congress, in Section 205 of the Act, requested that the Secretary of Health, Education, and Welfare contract with the National Academy of Sciences to undertake certain cost studies:

Sec. 205. (a) (1) The Secretary of Health, Education and Welfare...shall arrange for the conduct of a study or studies to determine the national average annual per student educational cost of schools of medicine, osteopathy, dentistry, optometry, pharmacy, podiatry, veterinary medicine, and nursing in providing education programs which lead, respectively, to a degree of doctor of medicine, a degree of doctor of osteopathy, a degree of doctor of dentistry (or an equivalent

degree), a degree of doctor of optometry (or an equivalent degree), a degree of bachelor of science in pharmacy (or an equivalent degree), a degree of doctor of veterinary medicine (or an equivalent degree), a certificate or degree or other appropriate evidence of completion of a course of training for physicians assistants or dental therapists, or a certificate or degree certifying completion of nurse training.

(2) Such studies shall be completed and an interim report thereon submitted not later than March 30, 1973, and a final report not later than January 1, 1974, to the Secretary, the Committee on Labor and Public Welfare to the Senate, and the Committee on Interstate and Foreign Commerce of the House of Representatives.

(3) Such studies shall develop methodologies for ascertaining the national average annual per student educational costs and shall, on such basis, determine such costs for school years 1971-72, 1972-73 and the estimated costs for school years 1973-74 in the respective disciplines. The study shall also indicate the extent of variation among schools within the respective disciplines in their annual student education costs and the key factors affecting this variation. The studies shall employ the most recent data available from the health professional schools in the country at the time of the study.

(4) Such studies shall also describe national uniform standards for determining annual per student educational costs for each health professional school in the future years and estimates of the cost to such schools of reporting according to these uniform standards.

(5) The report shall also include recommendations concerning how the Federal Government can utilize educational cost per student data to determine the amount of capitation grants under the Public Health Service Act to each health professional school.

(b) (1) The Secretary shall request the National Academy of Sciences to conduct such studies....

Timetable of the Present Study

Pursuant to the Act, which was passed in November, 1971, the Department of Health, Education, and Welfare (DHEW) requested in a letter of February, 1972, that the Institute

of Medicine of the National Academy of Sciences (IOM/NAS) undertake the cost studies. In March, 1972, a contract was signed between IOM/NAS and DHEW to prepare a plan for the studies. The study design was submitted to the Department on June 5, a study contract signed on June 30, 1972, and work commenced immediately thereafter. Prior to that date, lacking a formal contract, the Institute of Medicine was unable to proceed with staff recruitment and substantive analyses to meet the Congressional request.

During the period from July, 1972, to February, 1973, the Institute of Medicine staff and their consultants have accomplished the following:

1. Analyzed the legislative history of support of health professional schools, including the implications of changes in funding patterns. The findings are summarized in Chapter 1.
2. Defined the magnitude and scope of health professional education by gathering and analyzing data on the outputs and gross costs of each of the eight categories of health professional schools. Summary data are presented in Chapter 2.
3. Explored the major concepts, problems, and implications of different cost-finding approaches. The findings are described in Chapter 3.

CHAPTER I

FEDERAL SUPPORT OF HEALTH PROFESSIONAL SCHOOLS - A BRIEF LEGISLATIVE HISTORY

* * *

Education, particularly higher education, is a complex process that includes far more than classroom and laboratory instruction. Higher educational institutions are engaged in numerous functions and activities that collectively create an "educational environment." For the health professions the educational environment includes instruction, clinical activities in a variety of inpatient and outpatient settings, research, counseling, and community service. Yet some of the activities necessary to education, notably research, patient care and community service, also produce results valuable in themselves. In medicine and dentistry particularly, the educational process begins before the first year of a professional training program and continues past the first degree for as many as seven years of postgraduate education; there is no meaningful dividing line between the first professional degree and postgraduate training.

Perhaps the ultimate in complex educational activities is seen in large health science institutions that seek simultaneously

- to educate undergraduate physicians, dentists, nurses, pharmacists, optometrists, allied health professionals, Ph.D. candidates, and house officers;
- to engage in programs of biomedical research;
- to provide clinical services in their own teaching hospitals, Veterans Administration hospitals, community mental health centers, neighborhood health centers, and children's centers;
- to provide continuing education to practicing professionals; and
- to perform public service in local communities.

Although health science centers may have been developed primarily to educate health professionals, they have become major clinical and research resources for their communities and for the nation. Faculty interact with undergraduate and graduate students in more than one discipline, perform research, and provide patient care and public service. Graduate students and house officers instruct undergraduate students, as well as provide patient care service and perform research.

There is no consensus, however, as to how many of these different activities and programs constitute an appropriate educational environment for the training and development of health professionals of different types.

Furthermore, because the educational process itself is not static, any consensus would be valid at only one time. Many changes occurred in the period from the 1910 Flexner Report to the Second World War, and the pace of change has accelerated since then, spurred by:

- new knowledge from biomedical research;
- advances in bioengineering and other technologies emphasized in the post-Sputnik era;
- new patterns of treatment and care;
- changes in the organization and delivery of services;
- changes in educational methods;
- rising expectations of the professions and the public at large for care, treatment, site of care, organization of care;
- role of the professions in community activity.

The education process continues to change in all fields with respect to curriculum, length of training, and methods of instruction, and in the proportions of basic and clinical sciences. These changes further blur distinctions between undergraduate and graduate education and alter the roles of faculty, house officers, and students. The structure of health education institutions also is changing, particularly in the variety of clinical settings available; each community hospital and local practitioner that becomes affiliated with a school expands its clinical base.

The pressures of rising health care costs, newly emerging policies on the objectives of research, education, patient care, and community service, and changes in the sources of support of patient care and service have forced administrators to begin to allocate costs among the range of programs offered by higher educational institutions, and to review the sources and levels of support for each of those functions. As a result, discussions on the program support necessary to create and maintain the educational environment will continue, particularly as the amounts of financing at stake continue to grow.

The Institute study group believes that a major part of its responsibility is to contribute to a full discussion of issues, even if no "true" answer can be reached. The joint activities involved in the educational process make attribution of costs to programs extremely difficult -- a judgmental art. Even if accounting were simpler, a health science center is more than the sum of its parts.

History of Federal Support

The Federal government recently has begun to invest substantially in institutions of higher education by supporting directly the "educational" functions of these institutions. Previously the government had provided considerable funding for sponsored research programs in these institutions and support to students through the National Defense Act and various other scholarships and loan programs. Until the late 1960s,

however, the Federal government had offered little direct institutional support for education, excluding the few types of special purpose grants it awarded as early as 1941.¹ The first major direct Federal support for health professional education occurred in 1963 with the passage of the Health Professions Educational Assistance Act (P.L. 88-129).

Before that, Federal funds had been provided primarily for research projects. Early Federal legislation, adhering to a circumscribed view of governmental duties and responsibilities in the health field, was designed to facilitate research in certain communicable disease and public health fields, and to a lesser extent, to assure delivery of health services to specially designated categories of military personnel.²

In 1912, governmental activities in medical research and health services were pulled together into the Public Health Service, which was authorized "to conduct field investigations and studies and, in particular, investigations of the diseases of man and pollution of navigable streams."³

While several acts in the following two decades sought to broaden the Federal government's role in the conduct and sponsorship of medical research, amendments to the passage of the Public Health Service Act in 1944 laid the legislative basis for a comprehensive national medical research program.⁴ Shortly thereafter when "it appeared probable that continuing large-scale support for medical research would materialize, a decision was reached...to select, as an institutional base for the effort, the nation's graduate schools and, in particular, its

medical schools."⁵ This action represented a deliberate and conscious policy choice to use universities as a base for the advancement of knowledge.

The next twenty years witnessed the Federal government's growing commitment to research as a national priority. Though funds from a number of government agencies began to flow to universities for a variety of research purposes, those from the National Institutes of Health soon became the major research support for health professional schools. As new categorical research institutes were established at NIH and additional extramural grant programs were authorized, additional Federal dollars went to the nation's medical schools, graduate science departments, and, to a lesser extent, other health professional schools. Because research programs were the primary Federal interest in some health professional schools, research funds constituted the primary Federal support of these institutions until the 1960s.⁶

Universities, particularly health science centers, responded to the Federal interest by expanding their biomedical research commitment. Research grants were used to enhance research capability directly and indirectly, and to enrich the educational environment of the health center. In 1947, only 11 percent of total medical school receipts were attributable to Federally sponsored research; by 1968, however, approximately 42 percent of total medical school revenues flowed into the schools through Federal research grants.⁷ By 1967-68, about 33 percent of the total faculty salary budget of the nation's

medical schools was supported by research and research training grants, with approximately 40 percent of the full-time faculty receiving some Federal research support.

The Federal government clearly had a strong influence for the expansion of health professional schools through research grant support.⁸ While the potential dangers of such a policy could be overlooked in a period of plenty, they could not be ignored in a time of decreasing Federal investment. As Federal research support was reduced in the late 1960s, health schools that expanded in the expectation of undiminished Federal money began to face a financial squeeze. School administrators had to honor previous multi-year commitments to faculty and maintenance of other research resources in a period of decreasing revenues and increasing inflationary pressures.

By 1970, the financial situation of many medical and dental schools had become serious enough to warrant legislative action, in the form of "special" grants to medical and dental schools in financial distress (P.L. 91-519). These financial difficulties had been anticipated as early as 1950 in a report authorized by the Surgeon General:

No matter what problems confront research in medical schools, they fade in the presence of the acute and dangerous general financial stringency faced by the schools. The research function is more adequately supported than the teaching function. But this disparity itself creates serious problems....As we reviewed the research picture, it became increasingly clear that general financial assistance, regardless of the source of aid, is the overriding need of medical schools.⁹

Financial difficulties were not a new experience for the nation's health professional schools. In 1952, a report issued by the President's Commission on the Health Needs of the Nation expressed concern over the schools' "reliance on research funds to support teaching personnel, so that the primary education objective is threatened" and recommended that "the Federal government should be prepared to assist both private and state schools whenever necessary." ¹⁰ But the schools' financial difficulties could not be attributed solely to lowered Federal research support; increasing patient care commitments also produced financial problems. ¹¹ Both a rising public pressure for additional health manpower and Congress' growing concern about the desirability of indirect support through research grants led to the decisive shift in Federal program philosophy and priorities which occurred in the 1960s.

Direct Federal Support for Health Professional Education
Prior to 1965

Direct Federal support to health professional schools for teaching purposes existed before 1963, although it was relatively insignificant and piecemeal. Designed primarily for public health training, early legislative enactments provided nurse training grants (1941); advanced professional nurse traineeships for teaching, supervisory, and administrative personnel, as well as graduate traineeships to offer physicians, engineers, nurses and other health professionals

specialized education in public health (1956); grants to schools of public health programs (1958); and grants to nursing and engineering schools to provide graduate training in the public health field (1960).¹²

The 1959 Bane Report recommended increased Federal involvement in the construction of new and expanded facilities for health professional education, and the full reimbursement of indirect costs incurred as a result of federal research grants.¹³ Bills proposing direct operational as well as construction support to medical schools were introduced in Congress as early as 1949, though none was passed.

In 1963, Congress passed the Health Professions Educational Assistance Act (P.L. 88-129), which, although not providing general institutional support, authorized matching grants for new, improved, and expanded teaching facilities in schools of medicine, osteopathy, dentistry, pharmacy, nursing (baccalaureate programs), podiatry, optometry, and public health. It also authorized loans for students in medical, dental, and osteopathic schools. The Veterinary Medical Education Act of 1966 (P.L. 88-709) extended these provisions to schools of veterinary medicine.

Another major change in Federal policy was manifested in 1964 with the passage of the Nurse Training Act (P.L. 88-581), which authorized construction grants for new, replacement, and renovated facilities in baccalaureate, associate degree, and diploma schools of nursing; special project grants to be used for funding limited duration programs designed to improve

and upgrade nursing education; limited capitation grant support to diploma nursing schools to "prevent further attrition and promote the development of public and nonprofit private diploma schools of nursing"; traineeships for preparing nurses for administrative, teaching and supervisory positions; and student loans with a maximum of \$1,000 per student and a "forgiveness" provision based on postgraduate professional service.

Federal Institutional Support: 1965-Present

Two new and potentially substantial funding mechanisms for health professional institutions -- direct educational support and patient care support -- became law in 1965.

General institutional support for health professional schools was authorized in the Health Professions Educational Assistance Amendments of 1965 (P.L. 88-290). Under the provisions of this Act, schools of medicine, osteopathy, dentistry, optometry, and podiatry could apply for both basic improvement and special improvement grants. Basic improvement grants awarded for fiscal year 1966 were to be computed by multiplying the number of full-time students by \$250 and adding \$12,500 per school; grants for fiscal years 1967 through 1970 were to be based on a multiplier of \$500 and adding \$25,000. Eligibility for the grants was made contingent upon the schools' provision of "reasonable assurances that first-year enrollments would be increased unless such expansion could not be accomplished without lowering the quality of training."

Special improvement grants, also authorized in the Act, were to be used only "(1) to contribute to the maintenance of, or to provide for, accreditation, or (2) to contribute toward the maintenance of, or to provide for, specialized functions which the school serves." In practice, however, the special project grants were awarded primarily on the basis of relative financial need. 15

In addition, the Amendments established a scholarship program for students from low income families who were enrolled in schools of medicine, osteopathy, dentistry, optometry, podiatry, or pharmacy. A limit of \$2,500 annually per student was imposed in the enabling legislation.

In 1965, Medicare and Medicaid were also enacted, providing a marked increase in patient care payments that affected large, multipurpose health facilities in two important ways. First, the programs provided financial relief to teaching and patient care institutions that previously absorbed much of the costs of care for the indigent and the aged, or were paid at levels below the actual cost of care. The overall impact of this change, however, was diluted in some instances because some of the rates charged previously were adjusted to more nearly reflect the actual costs of care. Second, with a rise in patient care revenues, interns and residents were successful in their efforts to increase salary levels, thereby reducing their former indirect subsidization of patient care activities.

The Allied Health Professions Act of 1966, (P.L. 89-751), contributed several provisions to existing legislation for health professional manpower.

The Health Manpower Act of 1968 (P.L. 90-490) extended the Health Professions Educational Assistance Act, the Nurse Training Act, and the Allied Health Professions Personnel Training Act, but with substantial modifications. Most significant was the change in the basis for distributing basic improvement grants. Under the new provisions, each medical, dental, osteopathic, pharmacy, optometry, podiatry, and veterinary medical school with an approved application would be awarded a flat grant of \$25,000; the remainder of the appropriation was to be distributed to the schools primarily on the basis of relative increases in enrollments and graduates. The act also revised the formula for distributing basic improvement grants to nursing schools, but set the flat grant for them at \$15,000 rather than \$25,000. The new scholarship program for nursing students, similar to the programs for the other health professions, was another provision of the 1968 Act.

In addition, the 1968 Act broadened the special project grant authority to

"assist schools in meeting the cost of special projects to plan, develop, or establish new programs or modifications of existing programs of education in such health professions or to effect significant improvements in curricula of any such schools or for research in the various fields related to education in such health professions, or to develop training for new levels or types of health professions personnel, or to assist any such schools which are in serious financial straits to meet their cost of operation or which have special

need for financial assistance to meet the accreditation requirements, or to assist any such schools to meet the costs of planning experimental teaching facilities or experimental design thereof, or which will otherwise strengthen, improve or expand programs to train personnel in such health professions or help to increase the supply of adequately trained personnel in such health professions needed to meet the health needs of the Nation."

The act provided that special project grants, although originally established for other purposes, could be awarded to alleviate financial distress.¹⁶ A scholarship program for nursing students, similar to the programs for the other health professions, was another provision of the 1968 Act.

The Health Training Improvement Act of 1970 (P.L. 91-519) extended through fiscal year 1972 the availability of special project funds "to assist any such schools which are in serious financial straits to meet their costs of operation...." The Act also called for the Secretary of HEW to report to Congress by June, 1971, on the financial needs of medical and dental schools, including recommendations on how best to alleviate the financial distress of such schools. The Harris Financial Distress Study, submitted to Congress in December, 1971, constituted the Secretary's response to the Congressional mandate. In addition to the financial distress clause, the 1970 Act authorized basic and special improvement, special project, traineeship, scholarship, and work-study grant programs for centers engaged in training allied health personnel.

The Comprehensive Health Manpower Training Act of 1971 (P.L. 92-157) is intended primarily to alleviate health manpower shortages, especially in certain critical areas. In an effort

to achieve this goal, the Act provides for annual operating grants to schools of medicine, osteopathy, dentistry, veterinary medicine, optometry, pharmacy, and podiatry, the amounts to be based on a multi-tiered capitation grant formula. Under the provisions of the Act, the basic grant per full-time student enrolled in medical, dental, and osteopathic schools is \$2,500; for veterinary medical schools it is \$1,750; for pharmacy, optometry, and podiatry schools it is \$800; and for dental therapist and physician assistant programs it is \$1,000. In addition, the Act makes available supplementary grants, in the amounts of \$1,000 for medicine, osteopathy and dentistry, \$700 for veterinary medicine, optometry, pharmacy, and podiatry, and \$320 for nursing, for each student expanding total enrollment. It also provides "start-up" grants for new medical, osteopathic, and dental schools as well as capitation support for selected types of medical and dental graduate programs. Although a provision for financial distress grants is included in the Act, the decreasing dollar amounts authorized for this program serve to underscore Congress' apparent intent to change from "last dollar" to "first dollar" support of health professional education.

The following table illustrates the level at which Congress intended to fund the capitation grant programs, compared with the level of funds appropriated for those purposes. Information on the capitation program of the Nurse Training Act of 1971, discussed below, is also presented.

Type of School	Fiscal 1972		Fiscal 1973 ^{a/}		Fiscal 1974 ^{a/}	
	Auth.	Approp.	Auth.	Approp.	Auth.	Approp.
Total	<u>\$312.0</u>	<u>\$186.7</u>	<u>\$332.0</u>	<u>\$169.0</u>	<u>\$367.0</u>	<u>\$152.5</u>
MOD GROUP (Medicine, Dentistry, Osteopathy)	200.0	130.0	213.0	138.5	238.0	152.5
VOPP GROUP (Veterinary Medicine, Optometry, Pharmacy, Podiatry)	34.0	25.2	37.0	13.7	41.0	--
Nursing Schools	78.0	31.5	82.0	16.8	88.0	--

a/ HEW Appropriation bills for 1973 and 1974 had not been enacted at the time of publication of this Report. The 1973 and 1974 columns therefore reflect the Administration's request included in the 1974 Budget submission.

As the table shows, the 1972 appropriation for the MOD group (schools of medicine, osteopathy, and dentistry) was \$130,000,000 or about 70 percent of the full funding level; for the VOPP group (schools of veterinary medicine, optometry, pharmacy, and podiatry), the 1972 appropriation was \$25,200,000 or about 84 percent of the full funding level. The administration budget request for 1973 as amended would fund only 65 percent of the authorized amount for schools of medicine, osteopathy, dentistry; 37 percent for optometry, pharmacy, podiatry, and veterinary medicine; and 20 percent for nursing. For F.Y. 1974 the Administration did not request any capitation for schools of veterinary medicine, optometry, podiatry, pharmacy, or nursing, and the request for the other fields was \$152,500,000.

Another section of the 1971 Act authorizes special project grants to schools of medicine, osteopathy, dentistry, pharmacy,

podiatry, optometry and veterinary medicine for projects leading to curriculum improvement, revision, and expansion with special emphasis on the areas of family practice, clinical pharmacology, alcoholism, drug abuse, and nutrition; innovative programs designed to train new categories of health personnel; and increased admissions, especially for minority and low-income groups. A companion section authorizes the Secretary to award grants and contracts to health and educational organizations for the purpose of developing and implementing projects to help alleviate health manpower shortages.

An expanded scholarship and loan program is also outlined in the 1971 Health Manpower Act. Besides raising the maximum for loans and scholarships available to all categories of health professional students, it makes available special student aid funds for students enrolled in foreign medical schools and medical school graduates who agree to enter primary care practice in locations designated as physician shortage areas. Traineeship and fellowship grants in family medicine are also provided.

The Nurse Training Act of 1971 (P.L. 92-158) extends most of the programs outlined in the Comprehensive Health Manpower Act to schools of nursing. Graduated capitation grants in the amounts of \$250 per full-time enrolled student, \$500 for each enrolled graduate student, and \$100 for each bonus enrollment student are authorized, as are special start-up grants for new nursing programs.

Special project grant authorization covers financial distress grants and provides for special research and development programs designed to increase the supply of nursing personnel, to improve nursing curricula, and to improve the utilization of available nursing manpower. Among the most significant of the projects designated as eligible for special grants are those intended to facilitate cooperative arrangements between hospitals and academic institutions leading to the establishment of nurse training programs, and to develop and carry out training programs for new types or levels of nursing personnel including programs for the training of pediatric nurse practitioners or other types of nurse practitioners.

Tables 1 and 2 illustrate Federal obligations for support of health professional schools from 1969 to the present. Table 1 provides data on DHEW obligations to health professional schools by type of activity supported. The increased emphasis on first-dollar institutional support is illustrated by the fact that obligations for institutional support increased by 132 percent since 1969, even though total obligations increased by only 19 percent during the same period. Obligations for research, including general research support, increased by 47 percent from 1969 to 1974.* Although it is not illustrated

*The figures are based on the 1974 budget request submitted to the Congress in January, 1973.

TABLE 1
DHEW Obligations to Health Professional Schools,^{a/} by Type of Activity
1969-1974

(in millions)

Type of Activity	1969	1970	1971	1972	1973 est. ^{b/}	1974 est. ^{b/}
Total	<u>\$940.5</u>	<u>\$1,018.4</u>	<u>\$1,104.9</u>	<u>\$1,336.6</u>	<u>\$1,355.2</u>	<u>\$1,117.0</u>
Research and Development Grants and Contracts	390.3	367.0	420.9	572.2	598.3	616.7
General Research Support	34.6	32.8	32.0	30.9	12.0	7.1
Training and Fellowships	185.1	237.1	218.5	240.2	196.7	137.4
Institutional Support	93.4	128.1	158.9	319.8	260.0	216.7
Formula/capitation grants	50.9	60.7	61.3	192.1	174.6	152.5
Special Project Grants	42.5	67.4	97.6	90.7	58.1	43.1
Other ^{c/}	--	--	--	37.0	27.3	21.1
Health Services and Child Development	14.1	17.0	28.1	36.5	64.2	20.0 ^{d/}
Construction ^{e/}	140.8	145.2	127.7	31.7	172.5	5.2
Scholarships	17.8	26.3	32.5	35.0	35.0	43.5
Other	64.4	64.9	86.3 ^{f/}	70.3	16.5	70.5

Source: U.S. Department of Health, Education and Welfare, National Institutes of Health, Office of Resources Analysis.

a/ Includes Schools of Medicine, Osteopathy, Dentistry, Veterinary Medicine, Optometry, Podiatry, Pharmacy, Nursing, Public Health, and Allied Health.

b/ Estimated amounts are based on a preliminary distribution of the President's 1974 Budget. These include allocations for NIH and HSMHA, accounting for 98% of the DHEW total to health professions schools. Data from other agencies of HEW are not currently available.

c/ Includes funds for start-up and conversion grants and financial distress grants.

d/ Decline in 1974 reflects legislative shift in maternal and child care project grants awarded to these schools to formula grants which will be awarded directly to the states.

e/ Includes R+D plant, teaching, and related facilities

f/ Includes office of Education obligations which should probably have been allocated to training and fellowships.

in the table, Federal support of loans to health professional students has also been expanding since 1969: support was valued at \$25.2 million in 1969 and the 1974 estimate is \$57.0 million. To some extent, this expansion reflects the increasing Federal interest in supporting the student directly.

Table 2 summarizes DHEW obligations to health professional schools by agency within DHEW. Consistent with the information supplied in Table 1, it can be seen that the bulk of DHEW support to these schools is directed through NIH and the Bureau of Health Manpower Education (BHME). NIH support ranged from 45 percent of the total in 1969 to 61 percent in 1974. BHME support grew from 33 percent of the total in 1969 to 36 percent in 1973. The reduction in BHME support to 25 percent of the total in 1974 reflects the Administration's decision to eliminate capitation grants for the VOPPs and nursing schools and to reduce the rate of growth of capitation support for the MODs.

The largest portion of DHEW support is directed toward medical and osteopathic schools. Their share of the total has ranged from 74 percent to 85 percent as shown in the following table.

Year	Total Obligations	Obligations to Medical and Osteopathic Schools	
	Amount (millions)	Amount (millions)	Percent
1969	\$ 940.5	\$ 774.4	82%
1970	1,018.4	791.3	78
1971	1,104.9	868.4	79
1972	1,336.6	993.4	74
1973 est.	1,355.2	1,067.9	79
1974 est.	1,115.2	947.7	85

TABLE 2

DHEW Obligations to Health Professional Schools, by Agency, 1969-1974

(in millions)

DHEW Agencies	1969	1970	1971	1972	1973 est. ^{b/}	1974 est. ^{b/}
DHEW ^{a/} total	<u>\$940.5</u>	<u>\$1,018.4</u>	<u>\$1,104.9</u>	<u>\$1,336.6</u>	<u>\$1,355.2</u>	<u>\$1,117.2</u>
National Institutes of Health, total	420.1	402.2	527.3	680.1	670.6	675.5
Bureau of Health Manpower Education	309.7	399.8	358.0	444.7	492.6	277.6
Health Services and Mental Health Administration	<u>162.1</u>	<u>185.6</u>	<u>196.6</u>	<u>193.5</u>	<u>192.0</u>	<u>162.1</u>
National Institute of Mental Health	74.0	77.8	80.1	90.0	80.4	79.2
Regional Medical Programs Service	53.2	45.6	43.1	26.9	13.0	--
All other HSMHA	34.9	62.2	73.4	76.6	98.6	82.9
All other DHEW	48.5	30.6	23.0	18.3	n.a.	n.a.

Source: U.S. Department of Health, Education, and Welfare, National Institutes of Health, Office of Resources Analysis.

a/Includes schools of Medicine, Osteopathy, Dentistry, Veterinary Medicine, Optometry, Podiatry, Pharmacy, Nursing, Public Health and Allied Health.

b/Estimated amounts are based on a preliminary distribution of the President's 1974 Budget. These include allocations for NIH and HSMHA, accounting for 98% of the DHEW total to health professions schools. Data from other agencies of HEW are not currently available.

Regional Medical Programs (RMP) were generally considered to be a factor in the income flows of medical schools, but Table 2 indicates that the level of RMP support has leveled off fairly rapidly since 1969 as the Administration has sought to direct RMP funds towards the support of activities other than continuing education. The 1974 budget request phases out RMP.

DHEW is the major source of Federal financial support to health professional schools, although the schools of veterinary medicine, as well as departments of Veterinary Studies, receive a significant amount of their research support from the U.S. Department of Agriculture. Obligations by the Department of Agriculture for this purpose are as follows:

Year	Obligations for Research in Schools of Veterinary Medicine ^{a/} (millions)
1969	\$1.4
1970	1.2
1971	1.4
1972	1.8
1973	1.8 est.
1974	1.4 est.

a/ includes obligations to Departments of Veterinary studies.

Federal Aid to Health Professional Education - Changes in Policies

From an initial, narrowly defined public health concept of limited government involvement in medical research and the delivery of health care, the Federal role has been steadily redefined. First came an increasing investment in biomedical research, an investment that eventually altered and enriched the environment in which health professional education occurs. The concept was expanded further with institutional support and large government programs for financing medical care -- Medicare and Medicaid -- began to provide a large source of funds directly for education and patient care of selected population groups. Since the late 1960s Federal policy has expanded once again to provide direct first-dollar support for undergraduate education. However the latest Administration proposals for support of health professional education begin to reverse this trend. Chart 1 traces this evolution along the legislative path of Federal involvement in health professional education.

The final policy choices as yet are incomplete. The outlines of Federal support to health professional education have been drawn, but public debate is just beginning over the mechanisms by which Federal aid is to be distributed, the sources of funds, the level of funding, the criteria upon which the awards are to be based, and the priorities that are to be emphasized.

All of these concerns require a definition of the educational environment. What functions and activities beyond instruction are necessary to provide the environment in which

a qualified professional is produced? Assuming that instruction alone is not education and that some research and patient care are integral components of the education process, how much research and patient care are needed and should be equitably allocated to "education"? And from whose viewpoint should "education" be defined? This is an important factor because the characteristics of an appropriate educational environment differ depending upon whether the perspective is that of the institution itself, its faculty or its students, the community in which it is located, or the Federal government.

Historically, research support has enabled schools to increase the number and diversity of faculty through faculty salary support, equipment and facilities, and research training support. Patient care funds also have provided support for salaries of residents, interns, teaching, and supervising physicians from payments of third party payers and patients. To what degree do and should these sources of revenue underwrite education costs? Can activities be allocated among the programs of education, research, and patient care if several activities occur jointly and simultaneously? The succeeding chapters describe some of the problems and the value judgments entailed in allocating these costs.

The concept of direct Federal financing of higher education has been accepted by the Congress. But the structure and organization of the process by which Federal health policy is established at the executive and legislative levels make

CHART 1

Federal Legislation Affecting Health Professional Education

<u>Year</u>	<u>Title</u>	<u>Summary of Major Provisions</u>
1930	Ransdell Act	Consolidated Federal biomedical research activities under National Institute of Health.
1944	Public Health Service Act	Public Health activities consolidated into one Act. NIH received legislative authority to conduct a broad program of biomedical research. Represented conscious policy choice to use universities as a base for the advancement of biomedical knowledge.
1963	Health Professions Educational Assistance Act (P.L. 88-129)	Authorized matching grants for construction and renovation of teaching facilities in eight categories of health professional schools. Authorized loans for students in medical, dental, and osteopathic schools.
1964	Nurse Training Act (P.L. 88-581)	Authorized (1) construction and renovation grants for teaching facilities in nursing schools; (2) limited capitation grants for diploma schools; (3) special project grants for upgrading nursing education; (4) special traineeship programs and (5) student loan programs.
1965	Health Professions Educational Assistance Amendments of 1965 (P.L. 88-290)	Authorized basic and special improvement grants to five types of health professional schools for increased enrollment. Provided for loans to low income students to continue their education in health professional schools.
1965	Medicare and Medicaid (Titles XVIII and XIX of the Social Security Act)	Through Federal support of medical care costs for the aged and indigent, provided financial relief to health professional institutions through third party payments which unified the rate structure and permitted salaries of house staffs to increase.

CHART 1 (Continuation)

Federal Legislation Affecting Health Professional Education

<u>Year</u>	<u>Title</u>	<u>Summary of Major Provisions</u>
1966	Veterinary Medical Education Act (P.L. 88-709)	Extended provisions of Health Professions Educational Assistance Act of 1963 to schools of veterinary medicine.
1968	Health Manpower Act of 1968 (P.L. 90-490)	Extended provisions of Health Professions Educational Assistance Act of 1963 and the Nurse Training Act of 1964, but with a \$15,000 flat grant for nursing schools and a \$25,000 grant for the other categories of schools. Bonuses to be distributed on the basis of increased enrollment. Special project grant authority expanded to include awards for financial distress.
1970	Health Training Improvement Act of 1970 (P.L. 91-519)	Authorized special funds for medical and dental schools in financial distress and requested DHEW to conduct a study on how best to alleviate financial distress. Modified the institutional grant provisions to be responsive to new schools.
1971	Comprehensive Health Manpower Training Act of 1971 (P.L. 92-157)	Authorized capitation grants for health professional schools; initiative awards to alleviate manpower shortages in underserved areas; special project grants to expand or improve training; increased loans and scholarships; traineeship and fellowship grants in family medicine. Reduced authorization amounts for financial distress grants.
1971	Nurse Training Act of 1971 (P.L. 92-158)	Extended most of provisions of P.L. 92-157 to schools of nursing.

* * * *

difficult the coordination of financing policies for the spectrum of programs at health science centers and other health professional schools. The relationships between different sources of support--financing of research grants, manpower training grants, and third party payments--are crucial but there is little coordination between the sources. The lack of coordination encourages special claims for increases in one or another type of support without a mechanism for balance, either Federally or within institutions.

If there were a single source of support for all of the functions and programs, the question of allocation among the programs would be a moot public policy issue although it would remain an issue within institutions. But the sources of support for research, education, patient care, and community services come from different revenue bases, with varying impacts on the ultimate payer and institution. Insurance companies, Medicare/Medicaid agencies, and other third party payers, for example, are beginning to question the extent and use of patient care funds for "education," particularly as medical care costs continue to increase. Reductions in one source of support without increases in other sources result in severe dislocations within academic health centers. The adoption of a national health insurance approach without full consideration of these issues could prove to be a major example of this kind of dislocation.

Notes for Chapter 1

1. U.S. Department of Health, Education and Welfare, National Institutes of Health, NIH Almanac 1972, (Prepared by Office of Information, NIH), p. 91.
2. Ibid., pp. 1, 2, 14, 15.
3. Ibid., p. 15.
4. Ibid. Among the most important were the Ransdell Act of 1930 which renamed the Hygienic Laboratory the National Institutes of Health and provided construction, as well as fellowship funds, to the new Institute; and P.L. 75-244 which established the National Cancer Institute and authorized funds for research projects, fellowships, and research training to be administered by the NCI.
5. Robert W. Berliner and Thomas Kennedy, "National Expenditures for Biomedical Research," Journal of Medical Education September, 1970, p. 672.
6. John Walsh, "Medical Schools: Federal Funds Increase, So Do Budget Ills," Science, August 16, 1968, p. 668.
7. Rashi Fein and Gerald I. Weber, Financing Medical Education: An Analysis of Alternative Policies and Mechanisms, (New York: McGraw Hill, 1971), p. 76.
8. "Federal Grant Support of Faculty Salaries," Journal of Medical Education, June 1969, p. 551.
9. U.S. Federal Security Agency, Public Health Service, Surgeon General's Study on Medical School Grants and Finances, 1951, p. 45, quoted in Fein, p. 196.
10. Fein and Weber, p. 197.
11. U.S. Department of Health, Education, and Welfare, Financial Distress Study, December, 1971, pp. 38-39, 44-46.
12. NIH Almanac, pp. 83, 91.
13. Fein and Weber, pp. 198-199.
14. Ibid.
15. Financial Distress Study, p. 35.
16. Ibid.



CHAPTER 2

THE UNIVERSE OF HEALTH PROFESSIONAL SCHOOLS

* * *

This chapter presents summary information on selected characteristics of health professional schools in medicine, osteopathy, dentistry, optometry, pharmacy, podiatry, veterinary medicine, and nursing. It covers the following:

- numbers and geographic locations of each type of professional school;
- numbers of students enrolled in each type of degree program and numbers graduated with the first professional degree;
- annual aggregate expenditures and aggregate incomes for schools in each profession;
- extent of Federal support for schools within each profession.

Source of the data

At present there are no sources of consistent annual financial data for all health professional schools. The Department of HEW publishes certain non-financial information

used in this chapter: the number of operating schools, undergraduate enrollment, and first degree graduates for each of the schools in the eight health professions. Although the Office of Education provides annual financial data on entire universities, including those which contain health professional schools, no separate financial data are available for the individual schools within these universities.

The financial data used in this chapter are derived from voluntary reports made by the schools themselves, either in response to formats designed by their respective professional associations or to formats designed by the study group to collect readily available figures. Because data from nursing schools were insufficient to be representative of the 1,355 schools in this category, they are not covered in this chapter in the same detail as the other professions. For schools that are covered, the degree and extent of detail on the aggregation varies from one professional group to another depending upon the kind of data gathering done routinely by each professional association.*

*Even when professional associations could supply the appropriate data, the concept or definitions of expenditures or income differ among the eight professions. Further, the various schools within a profession may follow different approaches. Some schools, for example, report indirect costs incurred for university overhead and others do not. Double counting or undercounting exist because there is only a partial attempt to separate out income or expenditures received or incurred by one health professional school for services rendered by another professional school.

This chapter presents financial information only for the school year 1970-1971. In the final report of the study, to be presented to the Congress in January, 1974, it is expected that data will be available for 1971-1972.

Diversity Among Health Professional Schools

Nearly 275 health professional schools -- excluding the 1,355 nurse training programs -- provided income and expenditure data presented in detail throughout this chapter. An aggregate expenditure figure for nursing education was estimated on the basis of an NIH study.* In total, almost \$2.6 billion was expended in health professional education during 1970-71, distributed among the professions as indicated in the next table.

Profession	Total Expenditures (millions)	Percent Distribution
Total	<u>\$2,593</u>	<u>100%</u>
Medicine	1,713a/	66
Osteopathy	41	2
Dentistry	177	7
Veterinary Medicine	74	3
Optometry	16	1
Pharmacy	65b/	3
Podiatry	7	-
Nursing	500	19

a/ Reported expenditures for 92 schools responding to annual AMA-AAMC questionnaire.

b/ Reported expenditures for 68 schools.

*Although income and expenditure data for nursing schools were not reported to the study group, a study undertaken for NIH in 1970 estimated the costs of providing nursing instruction in all of the nation's R.N. nursing programs for the 1968-69

Table 3 illustrates the wide differences in proportion of public and private support among these professions and suggests corresponding variations in the extent to which the schools rely upon different types of governmental support. Those professions with a preponderance of public schools are medicine (61 of 109 schools are public), dentistry (29 of 51 schools), pharmacy (54 of 73 schools), and veterinary medicine (16 of 18 schools). In contrast, only one of the six osteopathic colleges and none of the colleges of podiatric medicine is public.

Tables 4 through 7 illustrate other major variations in health professional schools, namely, types of programs and graduates, aggregate income and expenditures, and levels of Federal support.

Degree Programs and Graduates .

Health professional schools award a variety of degrees: doctoral degrees, baccalaureate degrees in nursing and some pharmacy schools, and a diploma of graduation in nearly 650 hospital-based and freestanding nursing schools. Table 4 shows that in 1971 the five podiatry schools graduated fewer than 250 Doctors of Podiatric Medicine -- the smallest number

school year. The total cost was estimated at \$458 million, distributed as follows: diploma programs, \$341 million; baccalaureate programs, \$78 million; associate degree programs, \$39 million. (Harold R. Rowe and Hessel H. Flitter, "Study of the Cost to Schools of Nursing for Providing Nursing Education," NIH Contract No. 70-4079, Chico State College, Chico, California, December, 1970, p. 56.) To arrive at the \$500 million figure we simply assumed an annual rate of increase in expenditures of approximately five percent.

TABLE 3

Health Professional Schools by Census Region and Type of Ownership

	No. of Schools	Location by Region in the United States ^{a/}				Type of Control	
		Northeast	North Central	South	West	Public	Private
b/							
1. Medicine	114	30	30	37	17	63	51
2. Osteopathy	6	1	5	--	--	1	5
3. Dentistry ^{c/}	48	10	15	15	8	25	23
4. Veterinary Medicine	18	2	8	5	3	16	2
5. Optometry ^{d/}	12	3	3	3	3	6	6
6. Pharmacy	73	16	21	23	13	54	19
7. Podiatry	5	2	2	--	1	--	5
8. Nursing Schools ^{e/}	1342 ^{f/}	416	392	364	170		
Total							
Baccalaureate	267	72	74	81	40		
Associate	438	81	106	151	100		
Diploma	637	263	212	132	30		

a/ Geographic regions used by U.S. Census Bureau

b/ Data from Journal of the American Medical Association, Nov. 20, 1972, Vol. 222, No. 8, pp. 966-968 and from AAMC Directory of American Medical Education, 1972-1973, Association of American Medical Colleges.

c/ Data from Annual Report: Dental Education 1971-72, American Dental Association and Health Resources Statistics 1972, Health Education and Welfare.

d/ Data from Optometry Careers with Vision, American Optometric Association.

e/ Data from State Approved Schools of Nursing R.N. 1971

f/ Includes number of programs except those in Guam, Puerto Rico, Virgin Islands.

TABLE 4

Health Professional Schools by Size and Type of Student Body
and Size of Faculty, 1970-1971

Profession	Number of Schools	Number of Students For the First Pro- fessional Degree	Number of Other Students Total	Interns & Residents	Graduate Students	1st Degree Graduates	Full-time faculty Equivalents or Full-Time Faculty only ^{a/}
Medicine	103	40,487	42,511	27,225	15,286	8,974	(26,504)
Osteopathy	7 ^{b/}	2,146	87	87	--	475	(292)
Dental	52	16,409	2,401	c/	2,401	3,719	1,002
Veterinary Medicine	18	5,006	626	43	583	1,206	1,918
Optometry	11	2,887	38	--	38	529	257 ^{d/}
Pharmacy	73	15,328	1,696 ^{e/}	--	1,696 ^{e/}	4,771	(1,232) ^{e/}
Podiatry	5	1,146	28	28	--	241	100
Nursing:							
Baccl.	270	48,897	5,077	--	5,077	9,913	NA
Assoc.	440	44,593	--	--	--	14,754	NA
Diploma	641	71,055	--	--	--	22,334	NA

a/ Includes equivalency of part-time faculty. Figures in parentheses report full-time faculty only.

b/ Includes Texas with first-year class only.

c/ The Council on Dental Education reported 1,077 interns and residents affiliated with non-dental school program in 1971-72.

d/ Ten schools only.

e/ 67 schools only.

of health professionals produced in any of the eight fields examined in this study. The 1,355 nursing schools produced the largest number of graduates, more than 47,000 in 1971, with at least half of that number coming from three-year diploma schools. New M.D. graduates numbered almost 9,000, and new dentists 3,700. In 1971, the osteopathic schools graduated 472 D.O.s, and 73 pharmacy schools produced nearly 4,800 pharmacists. That same year more than 1,200 Doctors of Veterinary Medicine and more than 500 optometrists were graduated from their respective health professional colleges.

In addition to illustrating the differences in the number of graduate and student enrollments in each of the health professional schools, Table 4 indicates a significant difference between the professions in the schools proportion of graduate and undergraduate students. The total of house staff and graduate students in medical schools is slightly greater than the number of students enrolled for the M.D. degree, while in the other professions the proportion of graduate students is considerably lower.

Aggregate Income and Expenditures.

The health professional schools are engaged in a wide variety of activities, which include instruction of different types of students, research, patient care, and community services. Tables 5 and 6 present, respectively, expenditure and income data for the academic year 1970-71 that illustrate the varied activities of these schools.

Expenditures are divided largely between regular oper-

TABLE 5

Reported Expenditures For Seven Categories Of Health Professional Schools, by Type of Expenditure

1970-1971

Type of Expenditures	Total	Medicine	Osteopathy	Dentistry	Veterinary Medicine	Optometry	Pharmacy	Podiatry
(in millions)								
Total	<u>\$2,090</u>	<u>\$1,713</u>	<u>\$41</u>	<u>\$177</u>	<u>\$74</u>	<u>\$15</u>	<u>\$64</u>	<u>\$6</u>
Regular Operations								
Programs	1,030	780	14	122	48	8	52	6
Sponsored Programs	991	933	2	22	19	5	10	a/
Research	515	481	a/	13	14	a/	7	
Teaching & Training	241	223	1	9	1	4	3	
Other	235	229	1	b/	4	1	a/	
Patient Care & Services	31	b/	22	b/	7	2	a/	a/
Other or non-distributed	37	--	3	32	--	--	2	--
Percentage Distribution								
Total	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>
Regular Operations								
Programs	49	46	34	69	64	53	82	97
Sponsored Programs	47	54	5	13	26	34	15	a/
Research	25	28	a/	7	18	3	10	
Teaching and Training	11	13	2	5	2	24	5	
Other	11	13	3	b/	6	7	a/	
Patient Care and Services	12	b/	54	b/	10	14	a/	3
Other or non-distributed	2	--	7	18	--	--	3	--

a/ Less than \$500,000 or 0.5%. Numbers may not add to totals due to rounding

b/ Not identified separately. In medicine, ninety-two schools reported medical college expenses paid by medical service funds equal to \$115 million in 1970-71. ("Medical School Expenditures", Journal of the American Medical Association, Vol. 222, November 20, 1972, Table 29.)

c/ Includes 67 pharmacy schools reporting expenditures. One School reported total expenditures only and is not included in this table, although it is included in the table on p.38.

ations budgets and sponsored programs, defined as programs being funded from income restricted to specific purposes.* As indicated in Table 5, this break varies significantly among the seven professions. In medicine, 54 percent of the schools' expenditures were for sponsored programs, with 28 percent spent on sponsored research alone. In other professions, sponsored programs, including sponsored research, accounted for a much smaller share of total expenditures: only 26 percent of the total in veterinary medicine; 15 percent for pharmacy; 7 percent in dental schools; 36 percent in optometry; and 5 percent in osteopathy. Podiatry schools reported negligible expenditures for sponsored research. (Nursing school data is not currently available.)

By accounting definition, income for sponsored programs tabulated in Table 6 is generally equal to expenditures for sponsored programs reported in Table 5. As would be expected, schools of medicine, optometry, and veterinary medicine receive more of their income for sponsored research than do the other schools. Table 6 also indicates that reported income from patient care services varies significantly among

*Some of the regular operations budget may actually support "sponsored" research projects, by paying part of the salaries of faculty members who are also research investigators. Such expenditures probably are small for all but the medical schools, but total research costs for medical schools may be underestimated because of these "hidden" and, therefore, unreported costs.

TABLE 6
Reported Income for Seven Categories of Health Professional Schools
by Source and Income, 1970-1971
(in millions)

	<u>Total</u>	<u>Medicine</u>	<u>Osteopathy</u>	<u>Dentistry</u>	<u>Veterinary Medicine</u>	<u>Optometry</u>	<u>Pharmacy</u>	<u>Podiatry</u>
Total	<u>\$2,061</u>	<u>\$1,713</u>	<u>\$39</u>	<u>\$159</u>	<u>\$74</u>	<u>\$15</u>	<u>\$55</u>	<u>\$6</u>
General Nonrestricted	<u>617</u>	<u>405</u>	<u>11</u>	<u>102</u>	<u>48</u>	<u>5</u>	<u>42</u>	<u>4</u>
Tuition & Fees	112	63	4	29	1	3	10	2
Government Grants	437	286	5	68	45	2	29	2
Endowment, Gift, etc.	68	56	2	5	2	d/	3	d/
Restricted (sponsored) Program Income	<u>992</u>	<u>933</u>	<u>2</u>	<u>23</u>	<u>19</u>	<u>5</u>	<u>10</u>	<u>d/</u>
For Research	515	481	d/	13	14	d/	7	--
For Teaching & Training	242	223	1	10	1	4	3	--
Other	235	229	1	--	4	1	d/	--
Income from Diagnostic Patient Care & Other Sources	254	197	26	20	7	2	1	1
Other Income	196	177	d/	14	--	3	1	1

- a/ American Dental Association reports an additional \$24 million as value of services provided by parent institutions at no charge to the schools.
- b/ Includes 67 schools reporting. One school reported total only and is not included in this table.
- c/ This figure may include Federal basic improvement grants which should be included under general nonrestricted income.
- d/ Less than \$500,000. Numbers may not add to totals due to rounding.

the seven professions shown. Medicine, dentistry, and optometry schools derive about 12-13 percent of their income from patient care services; osteopathy schools get more than 66 percent from this source.

Medicine and veterinary medicine reported the lowest share of general nonrestricted income derived from tuition and student fees, with the schools of medicine reporting 15 percent and veterinary medicine reporting only about one percent. In contrast, tuition and student fees accounted for a quarter to three-fifths of the nonrestricted income in the other professions. The low reliance on tuition fees in schools of veterinary medicine is made possible by heavy support from state appropriations; 16 of 18 veterinary schools are publicly supported and all have relatively low tuitions.

In all the health professional schools, annual tuition fees generally range from \$500 to \$3,100, depending on whether a school is public or private and whether a student is a resident of the state in which the school is located. In medicine, for example, students at private schools pay tuition fees ranging from \$1,100 to \$3,100. Students at public institutions who can demonstrate in-state residency may pay as much as \$1,300, but in a few state supported medical schools, state residents pay no tuition at all. Out-of-state students at public institutions are assessed from \$500 to \$2,600. All the professional schools derive additional income from student fees for books, student activities, supplies, and use of laboratories and technical equipment. Dental schools

require students to purchase equipment costing between \$500 and \$5,500 during their D.D.S. training and equipment expenses for optometry students range from \$300 to \$1,000.

Federal Support.

The distribution of Federal obligations for health professional schools parallels the information on expenditures and income reported in Tables 5 and 6. As illustrated in Table 7,* Federal obligations to all health professional schools totaled \$854 million in 1971, and \$1.1 billion in 1972. Approximately 60 percent of these funds were provided through NIH research grants and contracts, and 40 percent through Bureau of Health Manpower institutional and student support. For medical schools, approximately 40 percent of income in 1970-71 was derived from NIH/BHME support, and 71 percent of that amount came from NIH research grants--which shows the importance of sponsored research in expanding medical school income and expenditures. In contrast, although 40 percent of dental schools' income was also derived from NIH/BHME, only 26 percent of that amount came from NIH research grants; the bulk of dental school support came from BHME. BHME was the major source of Federal funds in the other health professions.** As illustrated in the next table, approximately 95 percent of NIH research support to these eight health professional schools in both fiscal 1971 and

*The data included in Table 7 and discussed in this Chapter refers only to the eight professions covered in this report: medicine, osteopathy, dentistry, veterinary medicine, optometry, pharmacy, podiatry, and nursing.

**The high BHME support for podiatry schools in 1971 reflects a single construction project and is not typical of the level of Federal funds for that profession.

TABLE 7
NIH and BHME Obligations for Health Professional Schools,
by Type of School and Type of Activity, 1971 and 1972
(in millions)

Type of School	Total NIH & BHME		Total NIH		Bureau of Health Manpower Education							
					Total		Capitation Grants		Student Assistance		Other BHME	
	Fiscal 1971	Fiscal 1972	Fiscal 1971	Fiscal 1972	Fiscal 1971	Fiscal 1972	Fiscal 1971	Fiscal 1972	Fiscal 1971	Fiscal 1972 ^c	Fiscal 1971	Fiscal 1972
Total	\$854	\$1,054	\$511	\$660	\$343	\$393	--	\$187	\$79	\$48	\$264	\$158
Medicine	678	801	481	624	197	180	--	90	20	8	177	82
Osteopathy ^{a/}	1	8	--	--	1	5	--	5	1	--	--	--
Dentistry	63	80	16	20	47	60	--	35	9	3	39	22
Vet. Medicine	23	19	9	10	15	9	--	7	2	1	12	1
Optometry	8	5	b/	b/	7	5	--	2	1	1	6	2
Pharmacy	24	28	5	6	19	21	--	15	6	3	13	3
Podiatry	6	3	--	--	6	3	--	1	1	b/	6	2
Nursing	51	110	b/	b/	51	109	--	31	39	32	11	46

Sources: Source of NIH obligations^{b/} the CASE Report, Fiscal Year-1971 and Fiscal Year-1972, U.S. Department of Health, Education and Welfare.

Source of BHME obligations are the official accounting records of the National Institutes of Health.

a/ For NIH data, obligations incurred for osteopathic schools are merged with obligations reported for medical schools.

b/ Less than \$500,000. Numbers may not add to totals due to rounding.

c/ Data on loans are excluded from the 1972 BHME data.

fiscal 1972 went to medical and osteopathic schools; NIH obligations to medical schools were \$481 million in 1971 and \$624 million in 1972.* This increase of 30 percent in one year resulted partly from the "Conquest of Cancer" program introduced in the 1972 budget. Medical and osteopathic schools received the largest share of BHME support in both 1971 and 1972, but the introduction of capitation grants in 1972 reduced medical schools share from 57 percent (\$197 million) in 1971 to 46 percent (\$180 million) in 1972.

Percentage Distribution of NIH/BHME Obligations to Health Professional Schools, Fiscal 1971 and 1972						
Type of School	Total		NIH		BHME	
	1971	1972	1971	1972	1971	1972
Total	100%	100%	100%	100%	100%	100%
Medicine	79	76	94	95	57	46
Osteopathy ^{a/}	b/	1	--	--	b/	1
Dentistry	7	7	3	3	14	15
Veterinary Medicine	3	2	2	1	4	2
Optometry	1	1	b/	b/	2	1
Pharmacy	3	3	1	1	6	5
Nursing	6	10	b/	b/	15	28

- a/ For NIH data, obligations incurred for osteopathic schools merged with the obligations reported for medical schools.
 b/ Less than .5 percent.

Conclusion

This chapter presents summary information on the universe of eight health professional schools from currently

*These figures include schools of osteopathy, which are not separated from medical schools in NIH accounts.

reported annual data. Significant differences in the reporting requirements of the professional associations make meaningful comparisons between professions impossible, and the information collected here is of limited utility for deriving cost information or comparing expenditure patterns even among schools within the same profession.

However, even from this data certain conclusions may be drawn:

- There are significant variations in the proportion of graduate and undergraduate students in different professions, with substantial numbers of graduate students reported in medicine, nursing, pharmacy, and dentistry.
- Medical schools provide varying educational environments, in terms of proportions of student types as well as types of programs operating simultaneously. More than half of all students enrolled in medical school programs are not candidates for the M.D. degree.
- There are significant variations in expenditures for research among professions, ranging from 28 percent of total expenditures for medical schools to negligible amounts in podiatry and osteopathy.
- The high level of Federal support for biomedical research -- \$749 million in 1972 -- accounts for much of the difference in total expenditures between medical schools and other health professional schools.

CHAPTER 3

COST-FINDING APPROACHES AND THEIR POLICY IMPLICATIONS

* * *

The Congress has asked the National Academy of Sciences-Institute of Medicine to develop average annual educational costs per student in each of eight health professions and to recommend the appropriate use of these per student costs in establishing the levels of capitation grants.

A response to this Congressional request demands a thorough exploration of the economics of health professional schools, starting from a definition of the activities that constitute "education". During the first six months of this study, the study group has reviewed existing research related to the cost of education, both at health professional schools and at other higher education institutions. It has studied at first hand the financial flows, accounting records, and available cost data of three academic health science centers and one freestanding medical school. These analyses have revealed major conceptual and methodological problems in defining what resources, in whole or in part, contribute

to the "cost of education," and in quantifying the proper value of these resources. The appropriate cost of faculty time, the value of house staff teaching efforts, and the appropriate depreciation charge for buildings and equipment are but a few examples.

The major findings of this investigation are the following:

- The Congressional request for "costs of education" entails more than a simple data collection effort; a definition of education, encompassing more than just instruction, must be made clear.
- Health professional schools are complex institutions in which education, especially of first degree candidates, may consume only a small portion of total resources. Expenditure and enrollment data in Table 8 illustrate resource consumption in a sample of three medical schools.
- Educational processes for first degree and advanced degree candidates are closely related. House staff can provide as much as 50 percent of faculty contact for undergraduates and also receive instruction themselves as they carry out their patient care responsibilities.
- Not all resources used in institutions carry a cash cost. Schools differ in their dependence on volunteer and non cash resources--volunteer faculty provide more than 50 percent of teaching effort in one

school and less than 5 percent in another.

- Because much activity in a health professional school produces more than a single output, e.g., instruction and patient care, (1) program (or output-related) costs require judgment about the allocation of resources used among programs; these evaluations cannot be eliminated even as accounting procedures improve; and (2) income normally received for only one output (program) cannot be directly related to the cost of that output without further estimations.

Notwithstanding the difficulties inherent in the assigned task, the study group has established a work plan to attempt to satisfy the Congressional charge. The end of this chapter describes the various cost finding approaches to be taken, each with its methodological strengths and weaknesses. These approaches can be evaluated only in relation to the major policy issue of this study, the definition of "education":

- how much research, patient care, and community service are required, in conjunction with what kinds of instruction for different levels of students, to produce different types and graduates of health professional schools.

Once judgments have been made on this issue, it will be possible to arrive at estimates of the cost of education. These estimates will be presented in the study group's final report.

Using these cost estimates to establish Federal education support, however, introduces additional policy issues:

- will other outputs, i.e., research, patient care, and community service, be funded adequately through other means?
- do proper incentives exist to move the outputs in socially desirable directions and to produce the outputs efficiently?

One of the functions of this study is to encourage debate and improve the general level of knowledge about these issues. In this regard, the conclusions of the final report will reflect the discussion in the Congress and other groups interested in the issues raised in this interim report.

The remainder of this chapter is devoted to an examination of the policy and methodological problems encountered in defining and measuring educational cost per student. The chapter is divided into three parts:

- (1) Characteristics of Health Professional Schools
- (2) Conceptual Issues Involved in Cost-Finding
- (3) Major Alternative Approaches to Computing per Student Costs

Characteristics of Health Professional Schools

Because certain economic and behavioral characteristics of health professional schools help to explain both the difficulties inherent in estimating health professional education costs and differences in existing costs, a brief review of these characteristics follows.

Multiple Outputs.

Health professional schools engage in a variety of educational programs; medical school faculty teach medical students, other health professions students, postgraduate Ph.D.s, house staff, continuing education students, undergraduates, and allied health professionals. The schools also engage in patient care and community service. Each school's choice of programs varies considerably according to its history, its own perceived role and mission, and, significantly, the availability of financing. The combination of programs in each school defines the educational environment uniquely for each institution.

These multiple programs exist not only to benefit from economies of scale in producing education, but also because health professionals are best educated in an environment that resembles the one in which they will later work. Even if the Federal government had not consciously decided to sponsor most biomedical research in university settings, it is reasonable that academic health science centers be major loci of biomedical research and of patient care and community service.

Mixed Outputs: The "Educational Environment".

There is considerable consensus that "instruction" is not equivalent to "education," that the "educational environment" comprises some patient care, research, and community service activities, and that the faculty must engage in all of these to instruct effectively. All health professional schools

reflect some degree of this philosophy in their programs. Unfortunately, there appears to be no general agreement on the amounts or types of activities essential to "education," or the portions of the cost of these activities that should be included as part of costs of education of health professionals.

Table 8 shows total expenditure figures and percentage distributions of expenditures for comparable programs at three schools of medicine. These schools were selected by only one criterion, that their total expenditure levels be approximately the same. Specifically, the total expenditures of the highest is no more than 10 percent greater than the total of the lowest.¹

While the three schools collectively spend \$32,634,000 on sponsored programs (on the average, 45 percent of their total expenditures), School I spends 61 percent of its budget in the same category. Schools I and III have nearly the same number of house officers, but School I has almost twice as many M.D. candidates.

The figures suggest that the educational environments for medical students differ radically both in the numbers of other kinds of students and the emphasis on other programs. However, the relative quality of these environments cannot be assessed directly and does not necessarily correlate with expenditures. The data further suggest the extent to which medical students may be trained as a small part of a wide variety of teaching, research, and patient care activities. However, the data do not indicate whether it is the higher

TABLE 8

Direct Expenditures And Number of Students, By Type, In Three Public Medical Schools

1970-1971

Type of Expenditures and Type of Enrollment	Amount	Percentage Distribution			
	Three School Total	Three School Total	School I	School II	School III
Total Expenditures	(in thousands) <u>\$60,435</u>	<u>100%</u>	<u>100%</u>	<u>100%</u>	<u>100%</u>
Sponsored Expenditures	32,634	54	61	45	55
Research	9,767	16	23	11	14
Teaching and Training	18,973	31	30	29	35
Other	3,894	7	8	5	6
Regular Budgeted Expenditures	15,806	26	29	23	26
a/					
Other Expenditures	11,995	20	10	32	18
Total Enrollment	<u>2,890</u>	<u>100%</u>	<u>100%</u>	<u>100%</u>	<u>100%</u>
M.D. Candidates	1,670	58	62	56	51
Interns and Residents	782	27	22	32	33
Graduate Students	340	12	16	2	12
Clinical Fellows	98	3	0	10	4
Total Number of Students	2,890	--	1,440	600	850

a/ Includes expenditures from medical service funds:

	<u>Percentage of Total Expenditures</u>
Three School Total	8%
School I	0%
School II	17%
School III	8%

level of sponsored expenditures in School I or other factors that permit it to support three times as many medical students as does School II.

Multiple Income Sources.

Because they produce a variety of outputs, health professional schools obtain income from a variety of sources, as indicated in Chapter 2. Financing and reimbursement policies vary considerably according to the purpose of the funding and the source; changes in financing policy adopted by one source of income may not necessarily be compensated by changes in the others. Moreover, some revenues earned by schools are based on cost, while others are not.

Certain health professional schools appear to have evolved a pattern of seeking funds to ensure that total income is sufficient to provide for a full range of activities carried out within a health center, rather than seeking selectively higher funding for specific programs. This suggests that changes in both financing policies and financing levels can directly affect a school's behavior.

Federal grants and contracts to medical schools for biomedical research increased 52 percent from 1965 to 1969, and the number of full-time medical school faculty members increased 59 percent, despite the fact that medical student enrollment increased only 16 percent.² Thus, the increased availability of research grant funds appears to have been a major factor in increasing medical faculty size and in changing

the relationship of faculty to the school. The educational environment was changed by the availability of funds, not necessarily because pedagogical needs required the change.

The opportunity to generate future income by incurring financial obligations under current financing policies may lead to financial difficulties if the policies are changed. For example, when patient care, service, or sponsored research revenues have permitted, some schools have benefited from the presence of large numbers of subspecialists. If the level of funding to support these subspecialists decreases, and the school does not wish to shrink the size of its faculty accordingly, the school has to arrange alternative financing arrangements to support these faculty, or the reported cost of the education programs will have to increase. If funding sources for educational programs are available, they may not be willing to absorb the full amount of this increase in reported costs. Therefore, a decision will have to be made on the extent to which these subspecialists are necessary for education, so that only that proportion of their salaries is allocated for that purpose.

*The Role of the First Professional Degree Programs
in Health Professional Schools.*

It may be assumed that health professional schools exist primarily to provide education, but in many schools education consumes only a portion of the resources. Although aggregate income data presently reported by schools are neither comparable nor directly relatable to programs, the 1970-71 reports

of the Association of American Medical Colleges (AAMC) suggest that about half of medical school budgets are provided by sponsored programs. According to the AAMC figures, sponsored research alone accounts for approximately 25 percent of all medical school expenditures. The data presented in Chapter 2 elaborates on this pattern for other health professional schools.

The fact that all health professional schools are engaged in many activities with multiple outputs, often including the education of postgraduate students, further complicates the cost allocation process. In some large medical schools, capitation grants defraying one-third of the cost of M.D. education would provide only about 3 percent of the schools' total revenues. In professional schools that devote a larger fraction of their resources to pure instruction, especially the instruction of first degree students, capitation grants play a larger role. It should also be noted that capitation funds, although perhaps a small fraction of total revenues, are a major source of flexible revenues, to be used to develop and improve educational programs.

The Role of Advanced Graduate Students (Ph.D., Interns and Residents).

Interns and residents, and to a lesser extent Ph.D. candidates, actively participate in the education of students working towards a health profession degree at the same time that they themselves are educated. The following table shows the distribution of student contact hours in one medical school by type of instructor.

<u>Type of Instructor</u>	<u>% of Total M.D. Student Contact by Instructor</u>
Interns and Residents	51%
Faculty (School of Medicine & Other, including volunteer)	38
Post-Doctoral Candidates	11
	<u>100</u>

The multiple role of house officers complicates the allocation of costs of house staff and graduate programs to undergraduate education. Little guidance can be obtained by looking at the funding for house staff and graduate training programs because the programs are funded as part of patient care, sponsored research, and training. The study group believes that attempts to allocate house officer costs to patient care, the education of medical students, and the education of house officers, can only be approximations because the programs are inextricably linked in the education process. The study group also believes that Federal support of patient care and health professional education should consider the multiple role of house officers, however house officers are paid. The study group plans to investigate the effect of this multiple role by gathering data on house staff and graduate student costs at the same schools in which data on undergraduate education costs are to be studied.

Non Cash and Undervalued Cash Costs.

An important characteristic of health professional schools is that many of the resources consumed are not paid for by the

schools, or are paid for at less than what might be considered their usual rate. Examples include volunteer or part-paid (not part-time) faculty, depreciation of facilities and equipment, and resource transfers within health science centers.

There is considerable variation across schools in their use of volunteer faculty. At the four schools that have been studied, volunteers range from 2 percent to 51 percent of full-time equivalent faculty.

Identification of School	Total FTE Faculty	Number of FTE Volunteers	Volunteer as a % of FTE Faculty
School A	540.1	95.7	17.7
School B	512.7	263.0	51.3
School C	683.0	157.0	23.0
School D	188.9	3.4	1.8

Based on the study group's findings at three health science centers, there seems to be similar variation in the use of volunteer faculty across disciplines within the same center.

a/ FTE Volunteers as a % of Total FTE Faculty in the Schools of:				
	<u>Medicine</u>	<u>Dentistry</u>	<u>Pharmacy</u>	<u>Nursing</u>
<u>Health Center</u>				
A	17.7	0.6	0.1	0.0
B	51.3	13.5	N/A	0.0
C	23.0	5.6	14.4	0.0

a/ Part-time faculty are not included in FTE faculty totals, although they account for a large part of faculty time in some schools, such as dentistry.

Variations among schools in the use of volunteer faculty appear to stem from differences in schools' historical policy toward volunteers, their prestige, their ability or inability to afford paid faculty, their medical practice plans, and their access to community physicians.

Historically, affiliation with a health professional school has been one of the principal ways of obtaining specialist training, and also has provided sufficient prestige to permit the professional to charge higher fees. As fees have become more uniform, affiliation offers fewer monetary benefits. Some health professionals doubtless find the teaching experience rewarding in itself, and others find it a convenient way to stay current in their fields.

A second example of non cash or undervalued costs is the value of resources assigned to one organizational unit that contribute to the programs credited to another unit. For example, at one school, 6 percent of medical school faculty time is devoted solely to the teaching of nursing school students. In many such situations, no effort is made to account for transfer of resources among the different units in the university complex. In other cases the complexities of cost accounting and the force of traditional arrangements have led many schools and their affiliated institutions to negotiate the value of these transfers without detailed data. The resulting transfer, often at less than replacement cost from an outside source, seems to be more a function of the

availability of reimbursement rather than a reflection of economic value.

If the estimated dollar value of volunteers and other resources obtained at below "fair market" prices is excluded from costs, then per student costs at different schools will not reflect resources used. Rather, the costs will reflect only past and current payment practices. On the other hand, imputing costs to contributed services not only is technically difficult, but the process itself may result in increased real costs if these costs are subsequently reimbursed. With new knowledge, those who have previously contributed their services may demand payment in order to capture the worth of their services.

Heavy Dependence on Joint Activities.

Not only do health professional schools conduct many different programs, but the activities that make up these programs are highly interrelated. A single faculty member frequently contributes to a number of programs at the same time. For example, a surgical researcher funded in part by a Federal research grant is simultaneously contributing to research, patient care, and instruction when he implants an experimental pacemaker system in the presence of medical students and house officers. This type of mixed contribution is not unusual. In one health science center examined by the study group, half of health professional instructional activities are performed jointly with patient care and/or research. The following table illustrates this situation.

Type of Activity	Distribution of Faculty Time		
	<u>Medicine</u>	<u>Dentistry</u>	<u>Nursing</u>
	<u>M.D.</u>	<u>D.D.S.</u>	<u>B.N.S.</u>
Pure Instruction	44%	34%	50%
Instruction with Research and/or Patient Care	<u>56</u>	<u>66</u>	<u>50</u>
Total	100	100	100

Because such a large portion of faculty time is spent on joint activities, estimates of the "cost of education" are greatly influenced by the methods used to allocate costs of joint activities to educational programs. The educational cost per medical student can more than double if all joint activities are allocated to education, compared with allocating no joint activities to education.

<u>Allocation Rule</u>	<u>Index of Resulting Cost Per Medical Student in One Health Science Center</u>
No joint activities allocated to education	1.0
50% joint activities allocated to education	1.6
All joint activities allocated to education	2.3

Because joint activities are important to education and their allocation is a major factor in estimating per student

costs, schools have some incentive to allocate joint costs to those programs which will lead to greater funding. The methodology that has been developed eliminates some of the activities previously classified as joint activities, thereby reducing the need for allocation decision. For example, the study group has modified existing faculty activity reporting methodologies by increasing the amount of preparation and administrative time that can be directly attributed to instruction.

Conceptual Issues Involved in Cost Finding

Although numerous studies of the cost of educating health professionals have been conducted, no consistent and widely accepted cost finding framework has yet been developed, partly because of the variety of programs within and across health professional schools, and also because of the absence of uniform cost data from the schools. As this section describes, there are two conceptual issues which must be considered in order to establish such a framework. Each of these issues bears closely on the ultimate policy objectives for which the cost data will be used.

Resource Costs vs. Expenditures.

Although the term *cost* is used to cover a variety of meanings, *resource costs* measure the value of all the resources that are consumed in performing an activity or in providing a service, whether or not financial transactions are involved and whether or not financial transactions reflect the full resource cost. Estimating the resource costs of educating a health professional therefore requires an evaluation of the numerous

in-kind resources consumed (e.g., voluntary faculty, and house staff supervision for certain services in affiliated hospitals and clinics), and of the services for which only part payment is made. Resource costs provide estimates of the cost of operating a school in which all costs are paid, independent of historical and present financing. Because resource costs do not depend on traditional financial arrangements, it is possible to make comparisons of costs across schools.

Expenditures, on the other hand, include only actual financial transactions, eliminating the need for imputing value to non cash resource costs. Expenditures can be verified by audit of existing financial statements because they do not include non cash costs and costs incurred in transfer of services among schools. These advantages are somewhat offset by the fact that resource costs not included in expenditure data can represent a large proportion of total resources. There are, for instance, wide variations in the use of volunteer and part-paid faculty. The existence of non cash differences among schools means that comparisons on an expenditure basis are not adequate. Therefore, the study group also proposes to estimate resource costs and to obtain costs based on actual outlays.

Historical vs. Constructed Costs.

This report has emphasized the extent to which the structure of health professional school programs reflects historical funding policies and practices. Estimating costs based on current and historical practice, therefore, may lead to

definitions of educational environment that are very different from what might have occurred under different funding patterns. Financing policies based on these estimates may lock institutions into current patterns, even if alternative programs would be acceptable.

An alternative method is to construct models of health professional schools in an effort to determine resource costs in educational institutions newly designed by planners knowledgeable about the operation of such schools. Although the results would be subject to question, the process of developing these estimates would provide a monitor on historical costs, and would shed light on the assumptions used by health professional school planners in defining an educational environment. The final section of this chapter describes in greater detail how these constructed costs will be estimated for a medical and a dental school.

Major Alternative Approaches to Computing Per Student Costs

The study group has identified three alternative methods for estimating the per student cost data requested by the Congress. The first two differ in their use of expenditures vs. resource costs; the third uses constructed costs to estimate resources consumed.

The *Net Expenditures* method defines total education costs as the gross cash expenditures of the health professional school, less revenues earned from patient care and sponsored

research, and prorates education costs based on student enrollment .

Program Costing seeks to identify all resources actually used by the school in its operation, and through special studies (for example, of the use of faculty time) to allocate an appropriate share of the value of these resources to each program, independent of the source of funds or the prices charged for services rendered.

Constructed Costs are arrived at by asking experts to describe the resources needed to engage in a specific set of educational programs (in the absence of funding peculiarities and constraints), and to estimate the cost of the resources consumed.

Per student costs at any one school estimated in each of these three ways will differ to the extent that

- non cash and undervalued costs, including volunteer and part-paid faculty and depreciation, are significant;
- inter-school fund transfers, such as payments for basic science instruction provided by a different school, cover substantially more or less than the value of the resources used; and the actual allocation of resources to program outputs differ substantially from the allocations implied from the sources of funds.

In general, the more homogeneous the operation of a school in terms of its products and funding sources, the closer

these three costs should be to each other. Chart 2 presents in summary form the definitions, advantages, and disadvantages of each approach.

Net Expenditures Approach.

The net expenditures approach provides a simple, direct, and verifiable means for computing the cost of education: it defines the cost of education in a health professional school as the difference between the school's gross expenditures (cash outlays) and the revenues it earns from research, patient care, and community service activities.

The resultant dollar figure represents the net expenditures for all the school's education programs (by definition), which then can be allocated to different types of student programs based on enrollment.

Assumptions of the Net Expenditure Approach. Four fundamental assumptions are implicit in the net expenditure approach:

- The basic purpose of a health professional school is education, primarily for the first professional degree (e.g., D.D.S., M.D., D.O., etc.).
- In the course of educating these students, health professional schools generate revenues through the operation of certain secondary programs--research, patient care and community service; however, the cost of the secondary program activities are equal,

CHART 2

A Comparison of Alternative Approaches Required to Estimate Per Student Costs

<u>Approach</u>	<u>Advantages</u>	<u>Disadvantages</u>
Net Expenditure	<ul style="list-style-type: none">. utilizes existing available data on expenditures, subject to audit. avoids judgmental allocations. considers financial needs of entire school	<ul style="list-style-type: none">. distortions may result from omissions of non cash costs. inter-school comparisons weakened because offsetting income and non cash costs varies across schools. year-to-year comparisons dependent on stable funding of research and patient care
Program Costing	<ul style="list-style-type: none">. provides a theoretical resource basis for funding. facilitates inter-school and year-to-year comparisons of consistent data. requires the same basic data (in addition to other information) as the net expenditure approach	<ul style="list-style-type: none">. requires judgmental allocations, no "true" answer. results are not subject to financial audit. may be expensive and time-consuming to gather data
Constructed Cost	<ul style="list-style-type: none">. permits experts' judgment on the level of resources needed to produce health professional undergraduates, independent of historical funding sources and bias. provides insight on the implications of various resource allocation decisions within a health professional school environment	<ul style="list-style-type: none">. time constraints prohibit the construction of enough prototypes to represent all types of schools. can address only a limited number of policy issues. level of aggregation may limit value of comparisons with data collected from field efforts

over the long run, to the revenues the school earns for these services.

- Any secondary program activity to which the school commits faculty and other resources for which it receives no revenue must be essential to the educational environment.
- The revenue sources for secondary programs, and the basis for determining third-party patient care reimbursement or obtaining sponsored research grants or contracts, will not change rapidly.

As part of the study group's early field tests, the reasonableness of these assumptions and the practicality of the basic methodology were tested. Field tests led to the following conclusions:

- The net expenditures approach provides a cost-finding methodology that is adequate for the freestanding schools with a single program and a single type of health professional student. In such schools, net expenditure and program cost approaches produce comparable results.
- When combined with certain supporting studies described below, this approach may serve as an adequate methodology for use within schools that have multiple programs but limited revenue generating capabilities.
- As the number of programs within a health professional school increases, and transfers of services

across programs becomes more common, the net expenditures approach becomes less useful as a cost-finding methodology.

- Because different schools have greatly varying access to educational resources, including Federal funds, the schools' costs--as computed under the net expenditure approach--will vary widely. Hence, inter-school comparisons of net expenditure costs may be misleading.

Special Studies Needed. Because the net expenditures approach produces results that represent the aggregate cost of education, some means must be found for apportioning this cost figure among the various types of students who are being trained in an institution. One way would be to develop estimates of the resources needed for each type of educational program on a school-by-school basis, using indicators such as student/faculty ratios by type of students, hours of instruction by type of program, etc. Alternatively, allocation criteria to be used in all schools could be developed from a detailed study in a limited but representative sample of schools. For example, were we to find that house officers cost an average of 1.5 times as much to educate as medical students, based on a study of a few schools, then undergraduate per pupil costs could be derived by using a standard formula.

$$\text{Net Expenditures} + \left(\text{Number of M.D. Candidates} \right) + (1.5) \left(\text{Number of House Officers} \right) = \text{Unit Cost of Educating an M.D. Candidate}$$

Special studies can ascertain existing expenditure data by determining the extent to which schools within a health science center provide services to each other and by assuring that overhead is properly allocated. These transfer costs, hidden in a pure net expenditure approach, appear to be significant. In one health science center, for example, 28 percent of medical school faculty time that was provided for undergraduate teaching was also received by students in other health professions. At the same health science center, 20 percent of the educational resources used in training pharmacists were provided outside of the pharmacy school budget.

Program Cost Approach.

The program cost approach apportions the resource costs of an institution among each of the programs carried on in the institution. In an organization as complex as a health professional school, however, the allocation of costs to each of several programs is difficult because many individuals are engaged in activities that contribute to different programs, often simultaneously.

Knowledge of program costs, despite the difficulty in obtaining them, provide several important benefits to public policy makers and purchasers of services from health science centers:

- Funding can be based on resource costs.
- Economic interrelationships and variabilities of programs can be developed for planning purposes.
- Inter-school analyses of cost variations are made possible because the costs of all schools are consistent.

This approach requires expertise both to allocate accounting costs to programs and to impute values for non cash costs, and it requires time to gather data from which to make these judgments. Some schools already plan and budget on a program format; for others, extensive one-time efforts to develop program costs will be necessary. Initial field efforts suggest that two to four man-months are required to gather even approximate program budget data at most health professional schools and health science centers that do not already have program budgets.

Program costs are generally developed in a four-stage process. *First*, the principal program outputs are identified. For example, the principal programs at a health science center might be

- medical student instruction,
- dental student instruction,
- instruction to other types of students,
- biomedical research,
- patient care, and
- community services.

The outputs would include various types of graduates, patients treated, papers published, etc.

The *second* step is to identify all the resources used, i.e., the facilities, organizations, institutions, and individuals that help to produce these health science center outputs. Generally, these resources will include personnel (faculty, support, and administrative); facilities and equipment (classrooms, libraries, laboratories, hospital beds, clinics); and overhead services (dean's office, computer processing, and utilities). Costs, whether actual or imputed, must be associated with each resource.

The *third* step is to identify each organization's personnel, facilities and equipment, and overhead costs that clearly contribute to only one program. For example, salary costs of full-time laboratory research assistants who engage only in research clearly contribute only to the research program, and these costs can be allocated directly to it.

Fourth, for those costs which contribute to more than one program, guidelines must be developed to govern the allocation of personnel, facilities and equipment, and overhead costs to each program. Because such a large percentage of the health science center's resources are consumed in activities supporting several programs simultaneously, a large fraction of total costs are subject to these allocation rules. In effect, the determination of allocation rules is the very essence of program cost estimating.

Four principal methodological aspects of program costing are described below in greater detail.

Defining Program Outputs. Varying levels of detail are possible in defining programs. For example, one school visited by the study group had defined 42 separate programs into which it was attempting to allocate its costs, a level of detail more suitable for internal management than for the needs of this study.

Two groups already have developed program definitions for health science centers. First, the AAMC developed "Guidelines for Academic Health Center Cost Allocation Studies" in 1971, which proposed a program cost structure used by many medical schools in their cost allocation studies. Second, the Western Interstate Commission for Higher Education (WICHE) developed a program cost structure which is intended for all institutions of higher education, not simply health science centers. They are currently testing their program cost structure in five locations.

With both of these efforts already in existence, the study group felt it was important to draw on their experience as well as to limit the number of different program cost approaches in use. As a result, the program output definitions proposed by the study group relied heavily on the AAMC guidelines, and also are compatible with those offered by WICHE.

All medical school costs will be allocated to one of several categories, according to rules that are discussed below.

Faculty Salary Allocation. Faculty salaries constitute the largest single component of the total costs of educating health professionals, and affect a high proportion of the remaining costs, e.g., secretaries, technicians, and space. At medical schools, faculty salary and benefits generally account for about 30 percent of total costs, and non-faculty support salaries are another 30 percent, while non-salary costs, including overhead, account for the remaining 40 percent. In many schools' cost accounting systems even these non-salary costs are allocated to programs on the basis of faculty salaries. Thus, a reliable methodology for allocating faculty salaries to programs is an essential part of program costing.

Theoretically, there are two approaches to allocating faculty salaries to programs. The first would allocate faculty time on the basis of the tasks faculty members are expected to perform in return for their salary, benefits, and privileges-- as measured either through employment or appointment agreements or based on published faculty schedules. The anticipated benefits of this approach, objectivity and ease of data collection, unfortunately failed to materialize in field tests. Employment agreements seldom existed, and published schedules, especially for clinical science courses, proved insufficiently detailed and reliable.

The second approach relies on an observation, either by the faculty members themselves or by others, of the ways in which faculty members actually spend their time.

There are three techniques to estimate the ways in which faculty members spend their time. First, time and motion studies could be undertaken, but were not considered feasible because of the expense. Second, effort reporting is a technique which requires faculty to allocate effort, by percentage of time, directly to program categories. It is widely known from its use in a series of AAMC studies and has provided essential and valuable insights into the faculty salary allocation process.³ Unfortunately, effort reporting seems to introduce more subjectivity and opportunity for bias than is acceptable. As a result, a number of schools have, on their own initiative, already adopted the third technique, activity reporting.

Activity reporting requires faculty members to specify the actual hours (or percentage of time) spent in clearly defined activities (ward rounds, classroom lectures, research without students, and the like), as opposed to allocation of "effort" to programs. In a separate and visible step, the time attributed to joint activities (i.e., those contributing to more than one program) is then allocated to programs based on explicitly defined allocation criteria. Thus, although judgment still is required for program allocation decisions, activity analysis preserves the allocation process explicitly and permits inter-school comparisons using standard allocation criteria. In addition, portions of activity reports submitted by faculty may be verified using, for example, course schedules.

Although activity reporting is an improvement over effort reporting, the techniques share some drawbacks. The individual reports cannot be guaranteed to be free of bias, and the portion of activities that are verifiable may be small. A large portion of total faculty time is spent in joint activities and, therefore, must be allocated to programs on the basis of arbitrary criteria. Finally, activity reporting, like effort reporting, requires faculty acceptance and participation, and requires preparation and processing of large amounts of data.

The study group believes that activity analysis presently provides the most reliable data from which to allocate faculty costs to programs. Because the allocation of faculty salaries is the basis on which most other costs are allocated to programs, the use of program costs in a continuing cost-finding system depends on the feasibility of implementing activity reporting. Activity reporting was pilot-tested by the study group in a major health science center, and will further tested on a large scale at other schools during the spring of 1973.

Expenditures Other Than Faculty Salaries. Because faculties of health science centers constitute the primary producers of the centers' major outputs--education, research, patient care and community service--their salaries are examined first in estimating education program costs. However, personnel support services and other non-faculty costs account for over two-thirds of total outlays in health science centers and

health professional schools. Different allocation of these costs, therefore, can cause dramatic variations in program costs.

There are two major problems in allocating these costs to programs:

- Identifying Support Costs. Health centers vary in their accounting for support costs, depending on organizational relationships with other education and patient care institutions. For example, at one center expenditures on plant operations and maintenance, such as library and student services, might be counted centrally for the entire health center and not reported as expenditures within the individual health professional school budget. At another center the costs might be fully distributed to individual schools.
- Allocating Costs to Programs. Once all costs have been identified, they must be allocated to programs, often by first distributing support costs to individual schools within a health science center, and then by apportioning each school's share of costs to its programs of education, research, patient care, and community service.

Some overhead costs vary with faculty number or rank or both. Research space costs, for example, may vary with faculty rank within disciplines. Other costs do not vary with faculty;

student services and library costs, for instance, vary with the number and type of users. Some health centers have conducted special studies for support costs and have found that the resulting allocations differ substantially from those which result from using faculty salaries as a basis for allocation.

Although there is no single "best" way to allocate these costs to programs, the study group proposes, in computing program costs, to

- divide support services costs into meaningful groups or cost categories,
- utilize special studies where they exist to allocate these costs, and
- use a rational allocation basis for each major cost category where a special study is not available.

Imputing Costs to Non Cash or Undervalued Services.

Because estimates of resource costs by program also demand estimates of the costs of services and resources that are consumed at less than full value, it is necessary to identify what these resources are and develop a method for assigning a monetary value to them.

Principal non cash costs seem to fall into three major categories:

(1) *Affiliated Hospital Costs.* The educational costs generally borne by affiliated hospitals in teaching undergraduate health professionals appear to represent an important

portion of the total resource cost of education of those students, and therefore should be included. On the other hand, it is difficult to estimate and allocate these costs objectively, because affiliated hospitals vary in ownership, size, type of service, fund transfers, affiliation agreements, number of other medical school affiliations, reasons for affiliation, and the degree of medical school influence on the hospital.

(2) Volunteer Faculty Effort. Health science centers rely to varying degrees on volunteer faculty to teach courses or instruct students in clinical situations.

(3) Depreciation and Capital Costs. Capital costs appear to represent between 3 percent and 10 percent of total educational costs, a substantial enough percentage to require careful and consistent attention.

Constructed Costs Approach

Because the study group believes that the range of educational programs and costs in existing health science schools is partly a result of historical accident, based on the availability of funding, it proposes an alternative method for estimating educational costs. The constructed cost approach will estimate what these costs might be in representative medical and dental schools that have been designed by educators and other planners who are knowledgeable about the operation of such schools.

In a seminar process, these planners will estimate the resource requirements--human, physical and financial--needed to operate these medical and dental schools. First, the planners will agree on the minimum level of resources needed to educate M.D. and D.D.S. candidates in a high quality environment. All of the resources identified by the planners at this level will be assumed to be utilized 100 percent in teaching medical students. The planners will be asked to allocate these resources among various educational activities, including instruction, patient care, and research.

Recognizing that at this level of resources the model does not reflect a real-world institution, the planners will then be asked to determine the type and amount of additional resources which should be included so that the model could be representative of a viable medical or dental institution. When the whole model has been specified, the planners and the staff will assign costs to the resources identified in the model.

The study group anticipates that the constructed costs effort may provide answers to some of the questions raised earlier in this chapter, such as defining an adequate level of resources for an M.D. and D.D.S. education program in an acceptable educational environment under certain circumstances. The constructed costs approach also could provide insights into the causes of variability in costs among different institutions by comparing the resources specified in the constructed costs models with real-world schools.

Finally, the constructed costs effort should illuminate some of the relationships involved in the multiple output and joint product conditions which pervade medical school environments.

Although the study group believes that this approach is worth pursuing because it offers freedom from the influence of prevailing and historical financing policies, it has several potential problems:

- it may be difficult to find exactly the right level of detail in the model so that useful information can be obtained without at the same time drowning the planners in so much data that they are unable to function in the planning process.
- most or all of the biases affecting the historical development of programs may be incorporated into the planners' recommendations.
- it will be impossible to construct enough models to provide a full range of examples for interschool variability analysis.

Notes for Chapter 3

1. AMA-AAMC Liaison Committee Report on Medical School Financing for 1970-71, unpublished data.
2. "Medical Education in the United States, 1971-72," Journal of the American Medical Association, November 20, 1972, Tables 6, 27, and 36.
3. T. J. Campbell, Program Cost Allocation in Seven Medical Centers, Association of American Medical Colleges and U.S. Department of Health, Education, and Welfare, 1969.

CHAPTER 4

STUDY METHODOLOGY

* * *

According to the Congressional authorization for this study, the final report is to be submitted in January, 1974. The study group has completed the preparatory organizational and pre-test phases of its work as described earlier in this report and will now begin to gather and analyze data from a sample of health professional schools. This chapter presents a summary of the work plan and schedule from the present until project completion and a detailed discussion of the major tasks to be undertaken as part of data gathering.

Work Plan and Schedule

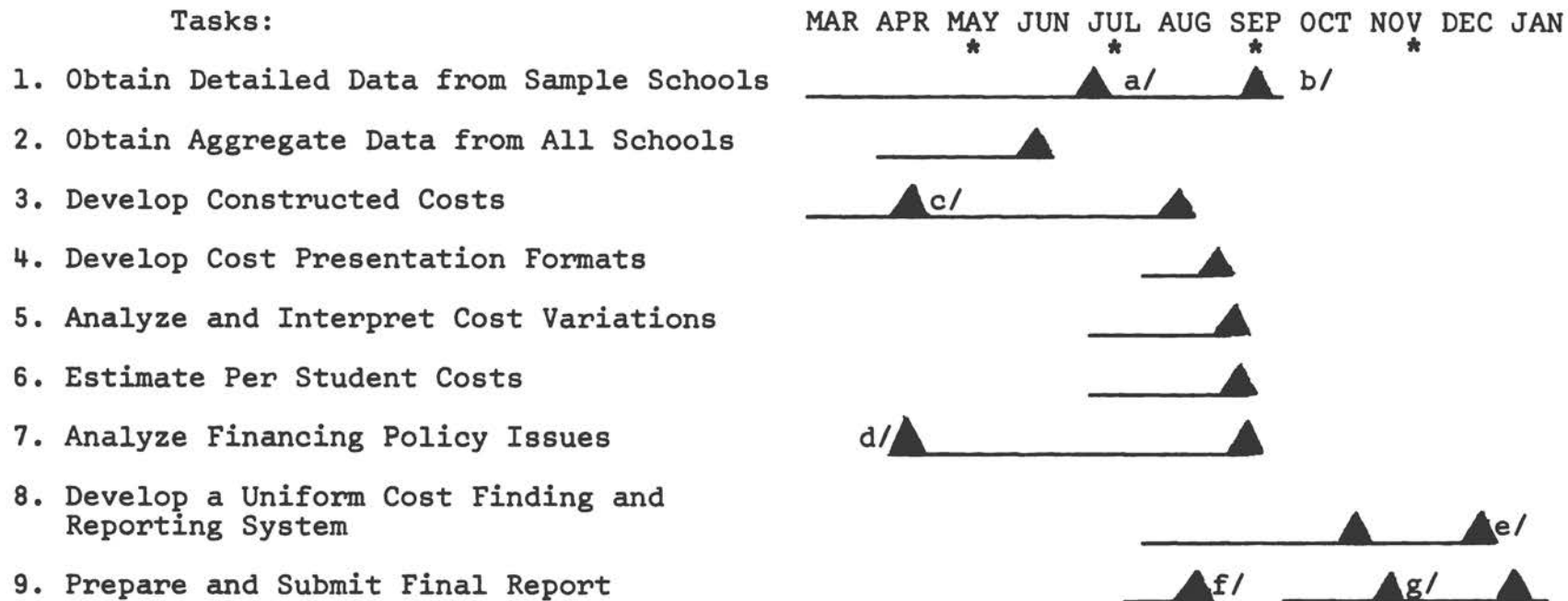
The study group will complete nine major tasks during the remainder of the study. Each of these tasks is described briefly below, and Chart 3 presents the time schedule for their completion.

1. Obtain Detailed Data from Sample Schools.

Studies will be conducted at a sample of 94 health professional schools if all institutions agree to participate. The procedures for selecting the sample

CHART 3

Cost Study of Education of Health Professionals
Overview and Timetable



* Dates of Steering Committee Meeting

a/Completion of Field Data Collection

b/Completion of Teaching Hospital Study

c/Review of Constructed Costs Methodology

d/Outline of Financing Policy Issues

▲ Major Milestones

e/Implementation Plan for Uniform Cost Finding and Reporting System

f/Outline of Final Report

g/First Draft of Final Report

and a summary of the sample are presented later in this chapter. Using pre-tested procedures, questionnaires, and faculty activity reports, field teams will collect data that subsequently will be used for three purposes:

- a. to analyze the sources of variability in educational costs
- b. to estimate educational costs by net expenditures
- c. to estimate resource costs by program.

In addition, as part of this task, a special study will be made of the educational costs incurred by a sample of teaching hospitals affiliated with some of the health professional schools to be visited.

In order to submit the final report by January, 1974, the study group plans to complete the major data collection effort by mid-July; follow-up and special studies will be completed by the end of September.

2. Obtain Aggregate Data from All Schools.

In addition to detailed data obtained from the sample schools, the study group will collect selected financial and non-financial data from all schools in each of the eight health professions to assist in analyzing cost variations across schools. These data will be obtained from existing reports from medical and dental schools, and from questionnaires based primarily on existing reporting requirements for all other schools. The information will be available during the summer.

3. Develop Constructed Costs.

Planning for estimating per student costs through the "constructed costs" approach was described in Chapter 3 and is already under way. A detailed methodology will be completed by April; seminars and planning sessions will take place during May and June; and estimation of "constructed costs" should be completed by the fall.

4. Develop Cost Presentation Formats.

By mid-September, decisions will be made as to the definition(s) of cost to be used in developing per student estimates, the formats in which these costs will be presented, and the procedures for projecting 1972-73 costs to 1973-74.

5. Analyze and Interpret Cost Variations.

As data are collected, they will be coded and prepared for cost estimation and analysis of cost variation. As part of the cost variation analysis, one of the major items in the Congressional charge, the study group will attempt to identify the principal factors that affect per student costs. Preliminary hypotheses have been developed from field studies and research by others. Additional hypotheses will be drawn from the forthcoming field effort. These hypotheses will be tested, using a variety of statistical techniques to isolate and quantify, where possible, the effect of financial and non-financial factors on cost. This process will be completed by early October.

6. Estimate Per Student Costs.

From the 1972-73 data collected at the sample schools, per student costs will be computed for each school in the sample. These per student costs will then be used to estimate per student costs for 1971-72 and 1973-74. Average costs and ranges will be presented for each field and for groups of schools within each field.

7. Analyze Financing Policy Issues.

Analysis of issues of financing policy will be developed over the next several months in response to the Congressional request for recommendations as to how per student costs may be used to develop capitation rates. Both the analysis and recommendations will be included in the final report. Policy issues under consideration will include such matters as imputing value to non cash resources (e.g., volunteers), the extent of incorporation of research and service costs into education cost, effects of alternative levels and forms of capitation financing, and relationships between capitation grants and other existing educational financing sources.

8. Develop a Uniform Cost Finding and Reporting System.

After the data gathering is completed, an evaluation of the net expenditure and program cost efforts will be made for their continued use and value. The field data collection effort will provide a practical test of these approaches and a framework for designing a uniform cost-finding methodology. The final report will contain the study group's recommendations

as to the form a uniform cost-finding and reporting system might take, and the feasibility, cost, and benefits of such a system to the schools. If resources and time permit, a separate report describing how such a system might be implemented is also planned.

9. Prepare and Submit Final Report.

Field Data Collection Effort

The major portion of the study group's effort from April to mid-July will be devoted to collecting the detailed and aggregate data required to estimate costs and analyze variations in cost. This section describes the two principal components of this data collection effort: (1) the collection of detailed data from a sample of schools; and (2) the collection of aggregate data from all schools in the eight fields.

Obtaining Detailed Data from Sample Schools.

As explained in Chapter 2, the aggregate data available from health professional schools provides an inadequate basis for computing per student costs. Therefore, the study group has concluded that additional data collection and analysis must be carried out at a sample of representative schools in each field.

The detailed data collected at the 88 schools selected will be used to estimate per student costs using the two methodologies described in Chapter 3--net expenditures and program costs--and also will provide a comprehensive and consistently defined body of data for analyzing cost variability.

The selection of the sample, the methodologies to be used in assembling data and in estimating program costs and net expenditures, and the special study of teaching hospitals are described briefly below.

Selecting the Sample of Schools. In selecting the sample of schools from which to collect detailed data, the study group attempted to balance different types of schools within each profession, both regionally and by type of program--size, emphasis, etc. Because the range of costs per student are as yet unknown, the sample could not be classified according to cost; instead strata were defined in terms of the factors which might be presumed to influence cost. These strata were developed in two different ways: for schools of medicine, dentistry, pharmacy, and veterinary medicine a combination of two statistical techniques was used--factor analysis and clustering; for the schools of nursing, podiatry, optometry, and osteopathy, more simple means of stratification were used.

Factor Analysis and Clustering were used to identify groupings of schools that are similar in terms of their expenditures, enrollment, faculty, etc. The groupings were developed by analyzing a large number of variables for which data were available for schools of medicine, dentistry, pharmacy, and veterinary medicine. There were 42 variables for medicine alone. These were reduced to six "synthetic" factors that can be used statistically to group like schools. For dental schools, for example, the synthetic factors represented

expenditure levels, income sources, entry requirements, and reliance on non-full-time faculty and on other schools for basic science instruction.

Based on their "scores" on each of these factors, the schools were grouped into clusters by an iterative (computer-based) process until like schools were grouped with each other and groups of schools were made as distinct from each other as possible. Schools were then selected from each cluster essentially at random, although further balance was required with respect to four additional criteria: affiliation with health science center, public vs. private support, geographic distribution, and size of school.

Stratification. For schools of nursing, osteopathy, optometry and podiatry, a small number of significant variables, such as public vs. private support base, and size, was used to categorize schools. An example of a school so categorized might be diploma nursing school/large/accredited/Southeast region. All schools were then assigned to a cell, and the sample drawn essentially at random from these cells. The sample reflects the total population of the four types of health science schools, based on the variables just mentioned.

The combined result of these two methods is the sample of 94 schools shown in Table 9. Because the sample is a modest one, it is important to the successful completion of the study that schools selected for participation agree to cooperate with the data collection effort. No sample can be wholly

TABLE 9

Sample of Schools for Detailed Data Gathering

Profession	Total Number of Schools	Sample Schools			
		Number	Percent of Total	Medical Health Science Center Based	University or Hospital Based
Medicine	108	15	14%	10	5
Osteopathy	6	3	50	-	3
Dentistry	52	9	17	8	1
Veterinary Medicine	18	5	28	3	2
Optometry	12	4	33	1	3
Pharmacy	73	11	15	5	6
Podiatry	5	3	60	0	3
Nursing	<u>1355</u>	<u>38</u>	<u>3</u>	<u>13</u>	<u>25</u>
Baccalaureate				<u>11</u>	<u>4</u>
Diploma				12	12
Associate Degree				-	9 ^{a/}

a/ Includes one school that offers both an associate degree and a baccalaureate degree program.

"representative" when the data are to be used to develop a variety of estimates, some of which will not be defined until later. The study group, therefore, has attempted to be reasonably balanced in its selection, but will not be able to provide precise estimates of statistical sampling errors with its final cost estimates. The study group believes, however, that other non-sampling errors in the data and the judgments involved in cost allocation would far outweigh the errors involved in sample selection.

Methodologies for Data Collection and Analysis. The study group will attempt to complete three major tests at each of the 88 schools in the sample: collection of environmental data for statistical analyses, development of net educational expenditures from analysis of financial flows, and development of program costs.

1. *Collection of Environmental Data.* Knowledge of each school's operating environment is essential

--to explain variations in expenditure and cost patterns between institutions or groups of institutions

--to make intelligent inquiries at the schools, and better relate the data to the characteristics of individual schools. In addition, because study group time is a limited resource, a thorough understanding of a school's environment is needed

to enhance the effectiveness of field trips and assure the eventual success of the study.

At each school, staff will collect as much of the environmental data as possible as soon as the participation agreement with the school has been completed.

Environmental data requested will include such basic financial and non-financial items as curriculum structure and offerings, faculty rosters, financial statements, explanation of medical service plans, enrollment by type of student, and school policy regarding student purchase of supplies, such as dental equipment.

2. Development of Net Expenditures. The principal source of data for computation of per student costs from expenditures data will be the schools' existing financial statements, budgets, and ledgers. Because the study group will have to understand the schools fiscal transactions and financial flows, we propose to concentrate special attention in three areas:

- identifying and understanding revenues and expenditures resulting from non-instructional activities of the school,
- identifying supportive services or instructional cross-subsidies provided by other organizational units,
- estimating the non cash costs identified with the school's educational programs.

3. *Development of Program Costs.* Collecting data for and constructing a program budget at each school will constitute a major portion of the field effort. Some aspects of this data collection effort will prove difficult because most schools do not maintain financial records by program. For example, in our field pre-tests we seldom could obtain non-faculty (e.g., secretaries and lab technicians) salaries by department, making it problematic to associate such costs with programs except in proportion to direct faculty salaries. In addition to technical problems of this nature, the principal task at each school will be to apportion faculty salary costs to programs based on an activity analysis of faculty time. A brief description of this component of our methodology follows.

At each school in the field study, we propose to ask faculty members, including full-time, part-time, and volunteers, to fill out an activity report covering one week's professional activities. The week selected will be representative of the school's activities, not necessarily of all of the individual faculty members. The faculty will be asked to write down in their own terms their activities for the week on a form which resembles a weekly calendar or time log. For those activities at which students were present, the faculty will be asked to indicate the number of each type of student. He will not be asked to allocate this time to any program categories. He will simply write down what he did and when.

During the following week, faculty members will be asked to attend a group meeting at which time they will assign a general activity description code (such as administration, joint teaching and patient care, etc.) to each specific activity. Field team members will be available to assist in coding these activities. Since faculty activities vary at many schools from one semester to another, an ideal approach might be to sample faculty activity at several times during the year. But because of the study's schedule we will be conducting a full-scale faculty activity analysis at all schools only during the spring semester. The activity analysis process will be repeated at a reduced sample of schools in the fall. If the seasonal data differ, adjustments to program cost will be made.

We plan to obtain information ultimately on 90 percent of the full-time faculty, 50 percent of the part-time, and 20 percent of the volunteers, recognizing that full response is unlikely. Staff will followup with individual faculty members to clarify coding and student information and to achieve the appropriate response rate. The data will then be summarized by computer according to appropriate categories based on allocation rules developed by the study group staff.

Direct activities, namely those associated with a single program such as a classroom lecture, will be attributed directly to their respective programs. Joint activities, such as patient care procedures in the presence of students, will

be apportioned according to rules that will be developed subsequent to the field work. This will be done in cooperation with the schools and based on special studies at each school.

Once all faculty time has been allocated to programs, faculty salaries will be distributed among the various programs in the same proportion as faculty time. The process is designed to elucidate the manner in which faculty time in joint activities can be assigned to programs. The results of all schools will be analyzed for similarity, in the hope of developing a simpler methodology for continuing use. It is hoped that these data can serve as a base to which adjustments can be made to reflect future staffing changes, program emphasis, and other important and appropriate developments.

Special Study: Educational Cost of Teaching Hospitals.

The extent of teaching hospitals' support of education and of the additional expenses incurred in providing educational support is not known, but is estimated to be a major proportion of educational cost. The study group therefore plans to study these costs at a small sample of teaching hospitals.

National comparisons show that teaching hospitals, as compared with non-teaching hospitals of approximately the same size, have 35 percent higher per day costs, 9 percent more in-patient days per case, and 5 percent more out-patient visits. The result is greater overall costs in teaching hospitals. Income sources, areas of expenditure, and internal organization also differ in teaching and non-teaching hospitals. Some of these differences are caused by the particular patient care

and public service roles served by teaching hospitals--many are a major source of specialty health care (a more expensive group of patients), trauma and emergency care, indigent care, and continuing education. Differences in cost also result from the special role teaching hospitals play in the community and from the requirements of their educational role, especially the training of medical students and house officers.

Because previous studies of educational costs of teaching hospitals either have covered a very limited sample, often only one hospital, or have dealt only with portions of potential costs, they are inadequate for the purposes of this study.

The proposed methodology for gathering data on teaching hospitals is to combine existing national data with detailed studies in a limited but representative sample of teaching hospitals. For the most part, the detailed studies will overlap with the detailed field data to be obtained from the sample of the health science schools. The activity analyses of faculty time will be applicable for both purposes. The study of educational costs of teaching hospitals will

- rely on completed activity analysis of faculty,
- conduct special studies of house officer activities,
- examine the major departments where educational functions may require additional resources: out-patient department and clinics, laboratory and diagnostic procedures, nursing and other personnel

- support, space and services provided to volunteer faculty, financially uneconomical departments considered essential for teaching, and indirect support costs,
- pursue alternative means for valuing the outputs of students,
- discuss causes of variation in costs among teaching hospitals.

Obtain Aggregate Data from All Schools.

In addition to the detailed data and analyses that will result from the schools and teaching hospitals to be studied in detail, the study group needs consistent and accurate data on all health professional schools in order to perform cost variation analyses, and to develop groupings of schools for cost per student estimates and presentations.

As explained in Chapter 2, there are at present no comparable cost data for all schools. Our effort entails using existing reports where possible, and obtaining additional information from a self-administered questionnaire to be mailed to each school.

For schools of medicine and dentistry we will rely on the annual reports submitted by these schools to the Association of American Medical Colleges (AAMC) and the Association of American Dental Schools (AADS) respectively. While the data from these reports do pose some specific problems of definition (particularly regarding sponsored program income), and some omissions (e.g., medical service plan income), the

1971-72 revisions in these reports provide an adequate base for the study's purposes and will not require further data from the schools. These data, for reasons enumerated earlier in this report, will not permit inter-school cost comparisons without further adjustment.

For schools in the other six professions, the study group is developing a self-administered questionnaire that these schools will be requested to complete. The questionnaire will be based on the American Council on Education's expenditure and revenue categories used in the U.S. Office of Education's Higher Education General Information Survey (HEGIS). HEGIS data are, unfortunately, submitted at the university or state system level and are too aggregated for program-costing purposes. However, all schools within a university or university system must report financial data to their parent institution according to the HEGIS format and, thus, should have these data readily available. In addition to the HEGIS financial data, the questionnaire also will request student enrollment figures, faculty salaries by rank, and financial transfers.

It should be emphasized that the methodology for collecting aggregate data described above will not necessarily be identical to the uniform cost finding and reporting methodology that will be recommended to Congress as part of the final report.

