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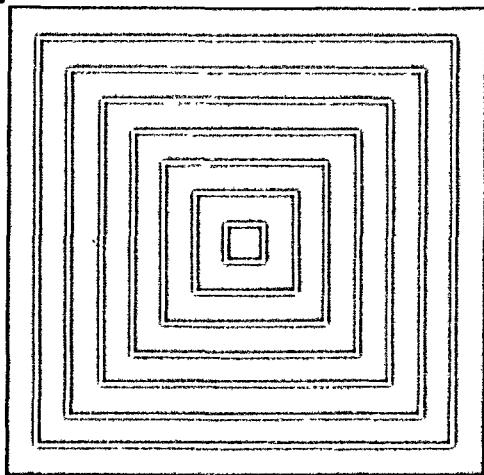
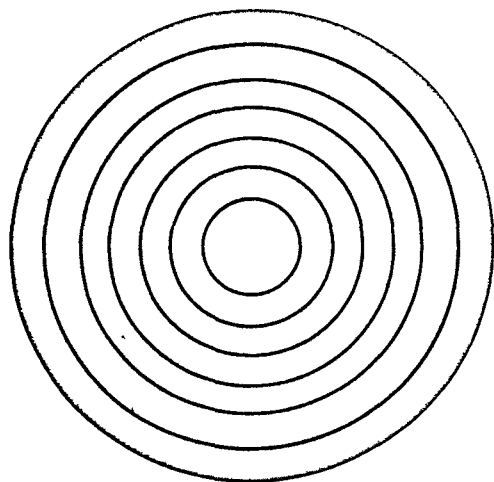
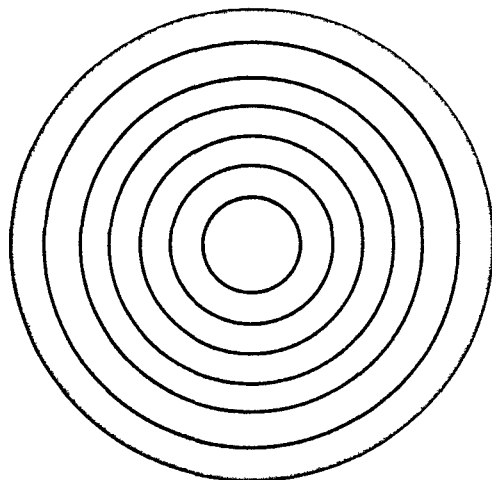
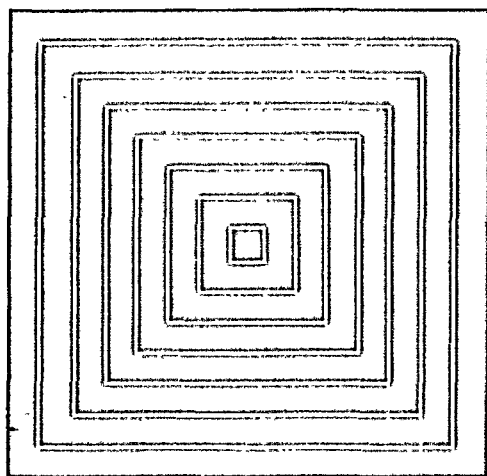
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Higher Education and the Nation's Health

POLICIES FOR MEDICAL AND DENTAL EDUCATION

A Special Report and Recommendations by
The Carnegie Commission on Higher Education

OCTOBER 1970



*Higher Education
and the Nation's Health*

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MCGRAW-HILL BOOK COMPANY

New York St. Louis San Francisco Dusseldorf

London Sydney Toronto Mexico Panama

Rio de Janeiro Singapore

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“The health of all the people is really the foundation upon which all their happiness and all their powers as a state depend.”

BENJAMIN DISRAELI

Foreword

The Carnegie Commission on Higher Education will issue its final report and recommendations in 1972, after all its research projects have been completed. But many problems in higher education are urgent and need early action. The Commission submits special reports on such matters as soon as it has had an opportunity to review the relevant issues and develop specific recommendations.

This present report, *Higher Education and the Nation's Health: Policies for Medical and Dental Education*, is concerned with the serious shortage of professional health manpower, the need for expanding and restructuring the education of professional health personnel, and the vital importance of adapting the education of health manpower to the changes needed for an effective system of delivery of health care in the United States.

To the many persons who were consulted and gave us helpful suggestions, we wish to express our appreciation. Particularly valuable contributions were made by Dr. Mark S. Blumberg, former director of health planning, University of California, and Dr. Robert Tschirgi, professor of neurosciences, School of Medicine, University of California, San Diego.

The Commission is also especially indebted to the members of its Advisory Committee on Medical Education, which includes—in addition to Dr. Blumberg and Dr. Tschirgi—Dr. Julius H. Comroe, director, Cardiovascular Research Institute, University of California, San Francisco; Dr. Robert Glaser, vice-president for medical affairs and dean, School of Medicine, Stanford University; Dr. Clifford Grobstein, vice-chancellor for health sciences and dean, School of Medicine, University of California, San Diego; Dr. David A. Hamburg, executive head, Department of Psychiatry, School of Medicine, Stanford University; Dr. Phillip R. Lee, chancellor, University of California, San Francisco; and Dr. James A. Shannon,

professor and special assistant to the president, The Rockefeller University.

We also appreciate the contributions of participants in conferences held in New York City on January 29, 1969, and June 8, 1970, including Dr. Robert S. Anderson, director, Comprehensive Health Services Program, Meharry Medical College; Dr. William Anlyan, vice-president for health affairs, Duke University Medical Center; Dr. Allan M. Cartter, chancellor, New York University; Dr. John Cooper, president, Association of American Medical Colleges; Dr. John T. Dunlop, David A. Wells professor of political economy, Harvard University; Dr. Robert Ebert, dean, Harvard Medical School; Dr. Rashi Fein, Center for Community Health and Medical Care, Harvard Medical School; Dr. Jon Joyce, Office of the Assistant Secretary for Planning and Evaluation, Department of Health, Education, and Welfare; Dr. Terrance Keenan, Commonwealth Fund of New York; Dr. Charles V. Kidd, director, Council on Federal Relations, Association of American Universities; Dr. Roy Lindahl, dental project director, Health Services Research Department, School of Dentistry, University of North Carolina; Margaret Mahoney, associate secretary and executive associate, Carnegie Corporation of New York; Dr. William Mayer, dean, School of Medicine, University of Missouri; Dr. Walsh McDermott, chairman, Department of Public Health, Cornell University Medical Center; Joseph Murtaugh, Association of American Medical Colleges; Dr. Quigg Newton, president, Commonwealth Fund of New York; Dr. Malcolm Peterson, director, Health Services Research and Development Center, Johns Hopkins University School of Medicine; Dr. Frederick C. Robbins, dean, School of Medicine, Case Western Reserve University; Dr. Ronald T. Taylor, Harvard Dental School; Dr. James V. Warren, chairman, Department of Medicine, Ohio State University College of Medicine; and Dr. John M. Weir, director, medical and natural sciences, The Rockefeller Foundation.

The Commission also received useful and constructive comments from Dr. Robert Graham, chairman, Joint Commission on Medical Education, Student American Medical Association; Dr. Seymour E. Harris, professor of economics and medical economics, University of California, San Diego; Dr. John S. Millis, vice-president, National Fund for Medical Education; Dr. David E. Rogers, vice-president for medical affairs and dean, School of Medicine, Johns Hopkins University, as well as several other members of the Hopkins medi-

cal faculty; Dr. C. H. William Ruhe, director, and Dr. Hayden Nicholson, Division of Medical Education, American Medical Association; Dr. Paul J. Sanazaro, director, National Center for Health Services Research and Development, U.S. Public Health Service; and a number of others, including medical students.

Particularly valuable reference sources in the preparation of the report were a study of the financing of medical education by Dr. Rashi Fein and Dr. Gerald Weber, soon to be published by McGraw-Hill for the Carnegie Commission, and a report on a seminar on medical education conducted at Harvard University in 1969 by Dr. John T. Dunlop and Dr. Robert Ebert.

We also wish to thank the members of our staff, and especially Dr. Margaret S. Gordon, for their work in preparing this report.

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Higher Education and the Nation's Health

1. *Major Themes*

- 1 *"Life . . . and the pursuit of happiness"* Americans deserve and can afford better health care. We have the highest standard of living, but not the highest standard of life—as measured by infant mortality and average life expectancy. A number of countries surpass us. In fact, in comparison with other nations, we are losing. Better health care is clearly a high national priority.
- 2 *The four components of better health care* To improve health care requires:
 - More and better health manpower
 - More and better health care facilities
 - Better financing arrangements for the health care of the population
 - Better planning for health manpower and health care delivery

This report is concerned with more and better health manpower, particularly at the level of doctors and dentists. The Commission believes that the provision of highly skilled health manpower is a special responsibility of higher education. The adequacy of health care facilities, however, is the responsibility, not of universities and colleges, but of federal, state, and local health authorities. As to the financing of individual care, the report assumes that as the result of public and private efforts, some form of health insurance will be available to all American citizens within this decade. Planning is partly a responsibility of higher education, particularly the planning for health personnel, but mostly of public agencies.

All four components of better health care mentioned above must be carefully developed in order to yield maximum benefits. This

report is primarily concerned with only one major aspect of these components—the contributions of university health science centers. Most health care personnel are trained outside these centers, and we recommend that the total spectrum of health care personnel be reviewed by a National Health Manpower Commission.

- 3 *A serious manpower shortage* The United States today faces only one serious manpower shortage, and that is in health care personnel. This shortage can become even more acute as health insurance expands, leading to even more unmet needs and greater cost inflation, unless corrective action is taken now. It takes a long lead time to get more doctors and dentists.
- 4 *Higher education and health* Higher education, as it trains the most skilled health personnel, has a great responsibility for the welfare of the nation. What colleges of agriculture once did for a rural society can now be done for an urban society by the health science centers—and that is to improve the quality of life for nearly all people in their areas.

The Carnegie Commission is giving special attention to medical and dental education because of their high importance to national welfare, their greatly increased complexity, and their heavy burden of costs. We have elsewhere identified the greatest priorities for higher education in the 1970s as being: (1) to provide greater equality of educational opportunity for all our youth, (2) to undertake reform and innovation, and (3) to provide more health care personnel. All three of these priorities are involved in this report. We know of no single area in all of higher education where more constructive action can be taken now than in medical and dental education.

- 5 *A propitious time to act* This is a most favorable period for new and improved endeavors:
 - The public has a great concern for health care.
 - Existing medical and dental schools are expanding, and new ones are being built; and a period of growth can also be a period of change and improvement.
 - The students of today are highly motivated to encourage and support constructive change.

- The medical and dental schools have a number of remarkably able leaders.
- The professional associations are open to new ideas and are anxious to find better ways to provide better health care—to their great credit and to the nation's great advantage.

As a consequence, medical and dental education are undergoing more constructive self-examination than they have since the Flexner report of 1910—and more self-examination is going on than in any other field of higher education. The second great transformation of medical education and research is now underway, and the United States, once again, will greatly benefit.

6 *The goals* We see these as major objectives:

- To provide more health care personnel of the right kinds
- To achieve a better geographic distribution of personnel and educational facilities, particularly for the sake of the central city and rural areas
- To ensure more equality of opportunity for women and members of minority groups
- To provide more appropriate training for the work actually to be performed and, in doing so, to respond to the constructive suggestions of students
- To relate health care education more effectively to health care delivery
- To bring about a more equitable distribution of the financial burden between the federal government and the states, and among the several states
- To limit costs to the greatest extent possible

We shall make recommendations toward achieving each of these goals. To the extent that they are achieved, inflation will be slowed and, at the same time, health care will be improved.

7 *The Flexner model and new models* The Flexner model, based on Johns Hopkins, Harvard, and, before them, German medical education, called for emphasis on biological research. Science was to be at the base of medical education. The Flexner model has been

the sole fully accepted model in the United States since 1910. Some schools have fulfilled its promise brilliantly; others have been pale imitations; but all have tried to follow it. It has led to great strides forward in the quality of research and the quality of individual medical practitioners. The Flexner, or *research* model, however, looked inward to science in the medical school itself. It is a self-contained approach. Consequently, it has two weaknesses in modern times: (1) it largely ignores health care delivery outside the medical school and its own hospital, and (2) it sets science in the medical school apart from science on the general campus with resulting duplication of effort. This second weakness is now being highlighted by the extension of medical concerns beyond science into economics, sociology, engineering, and many other fields. Medical schools have had their own departments of biochemistry, but to add their own departments of economics and sociology and engineering would accentuate the problem of duplication of faculty and equipment. Also, the better economists would rather be in a department of economics on a general campus than separated from their colleagues in a department of medical economics: members of other disciplines would have similar preferences. The self-contained Flexner model thus leads to expensive duplication and can lead to some loss in quality.

Two new models are arising: (1) the *health care delivery* model, where the medical school, in addition to training, does research in health care delivery, advises local hospitals and health authorities, works with community colleges and comprehensive colleges on the training of allied health personnel, carries on continuing education for health personnel, and generally orients itself to external service; and (2) the *integrated science* model, where most or all of the basic science (and social science) instruction is carried on within the main campus (or other general campuses) and not duplicated in the medical school, which provides mainly clinical instruction. In this model (as in England), the medical school may be, essentially, a teaching hospital; but this is not necessary—it may, rather, carry on all its “Flexner” functions except the traditional first one or two years of science education.

Mixtures are of course possible and are occurring among these “pure” types. The research and health care delivery models may be combined, as is being done at Harvard and Johns Hopkins; the research and integrated science models may be combined, as is

being proposed at Michigan and for the new Harvard-MIT endeavor; and the health care delivery and integrated science models may be combined, as at the new medical schools of the University of Illinois. All three, of course, could also be combined.

We believe that the new interests in health care delivery and in the integration of science and other disciplinary efforts are wise. The simple Flexner research model is no longer adequate as the sole model. A few schools, and many parts of schools, will, and should, stay with the Flexner model, but we believe that the nation will be better served as many schools move in different directions. A diversity of models and mixtures of models is now desirable. Not only can the developing and new schools experiment; but as existing schools expand, they can direct their expansion in new directions so that there can be diversity *within* schools—for example, the next group of 40 additional students admitted might be asked to take their science on the main campus of the parent university. The “cluster-college” approach of changing and diversifying—rather than just duplicating on a larger scale—when expanding a general campus can be undertaken also in a health science center.

Pacesetter schools, such as those noted above, are moving toward health care delivery, or the integration of science, or both. We support these directions of movement. The nation has a sufficiency of the pure research model type of school. New developments should be toward greater integration with social needs, or toward greater integration with the general campus, or both.

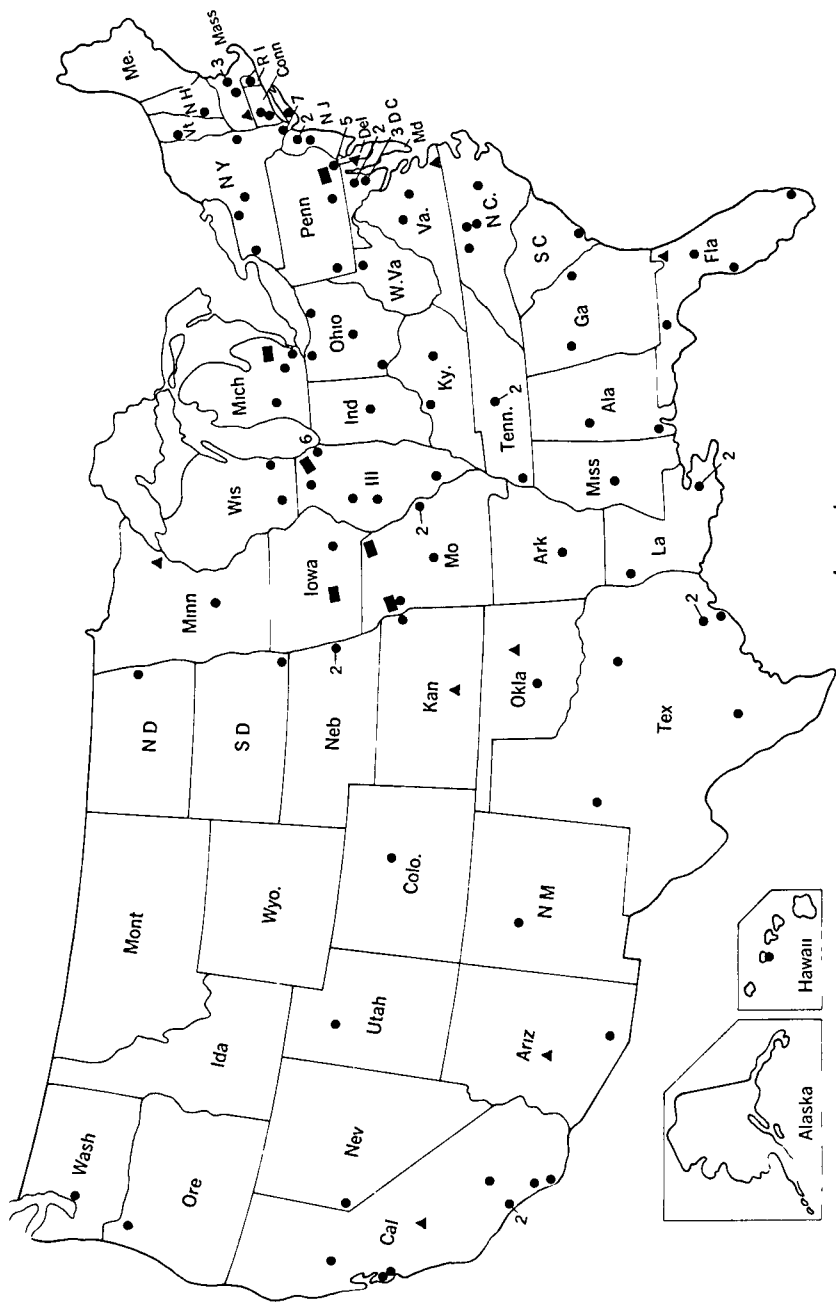
- 8 *More doctors and dentists* We see a need for expanding the number of places for training doctors during this next decade by 50 percent, and of dentists by 20 percent. Many of these new places should be filled by women and members of minority groups.
- 9 *More allied health personnel* The current ratio of all health care personnel to doctors is about 10 to 1; in the long run we see this ratio rising substantially. We particularly favor expanded training of medical associates who can work under the general supervision of doctors and expanded training of medical assistants who can work under the doctors' specific directions. We regard as especially promising the Medex program of training medical corpsmen with military experience to become doctor's assistants, and we note that as many as 3,000 a year might be trained with an all-out effort. We believe such an all-out effort is unlikely, however, and we estimate

that by the end of this decade about 3,500 associates and assistants may be trained each year. The public, of course, will need to be willing to accept the services of these associates and assistants, as they do in some other countries, and we believe they will. We similarly suggest the training of dental associates and dental assistants. Colorado, Duke, and Washington are among the universities now giving leadership in these directions.

Most of the allied health personnel will be trained in comprehensive colleges and community colleges, and their roles in this area will greatly expand. Allied health personnel can be trained more quickly and less expensively than doctors and dentists, and their availability will make possible the better use of the time and skill of doctors and dentists. Primary emphasis should be placed on increasing the supply of allied health personnel.

- 10 *To serve all the people everywhere* We believe in the geographic dispersion of health training centers, as our recommendations will make clear. The Flexner model school could be located anywhere, for research results are easily transported. The *health care delivery* model needs to be located where the people live.
- 11 *New health science centers* Twenty-seven health science centers are now being started around the United States. It is said that seventy more are being considered. We see a need for nine more (see Map 1) to give adequate regional coverage.
- 12 *Area health education centers* We recommend 126 area health education centers to serve localities without a health science center (see Map 2). Each of these centers would be at a local hospital. The centers' educational programs would be administered by university health science centers. They would train medical residents and M.D. and D.D.S. candidates on a rotational basis; they would carry on continuing education for local doctors, dentists, and other health care personnel; they would advise with local health authorities and hospitals; they would assist community colleges and comprehensive colleges in training allied health personnel; and, in other ways, they would help improve health care in their areas. We consider this development of basic importance. It would put most of the local advantages of a health science center into many localities which do not warrant a full-scale center. This proposal would put

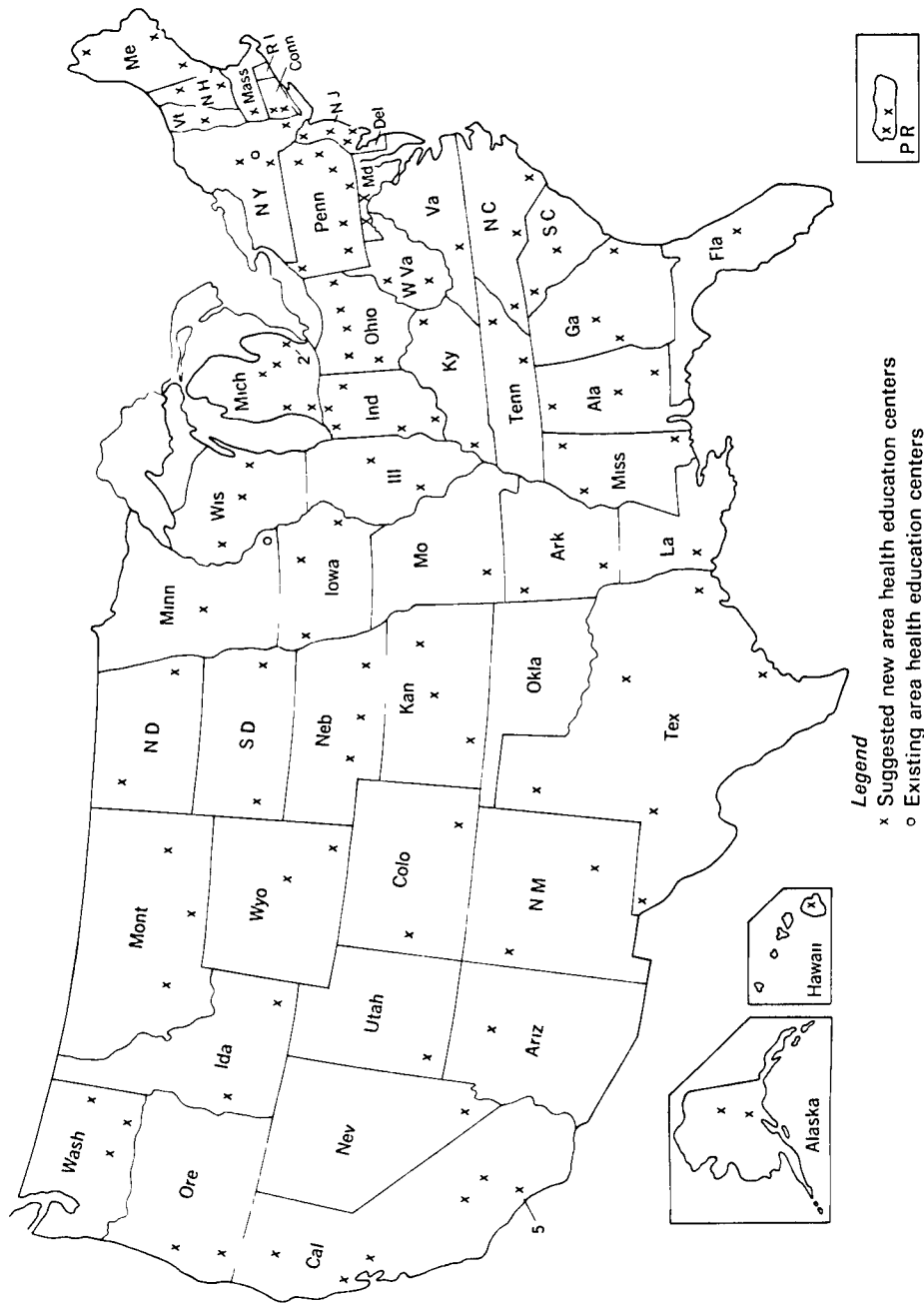
MAP 1 University health science centers and Carnegie Commission goals for new university health science centers by 1980, by state



Legend

- Existing and developing university health science centers
- Existing schools of osteopathy
- ▲ Recommended new university health science centers

MAP 2 Existing area health education centers and suggested area health education centers by 1980, by state



Legend
x Suggested new area health education centers
o Existing area health education centers

essential health services within one hour of driving time for over 95 percent of all Americans and within this same amount of time for all health care personnel. Much of the nation would be served by a higher level of expertise than is now locally available.

13 *Reforms* We favor:

- Shortening the time it takes to become a practicing medical doctor from eight years after the B.A. to six years.
- Providing an extra mobility point or decision-making point for both the student and the school by creating a degree between the A.B. and the M.D. It would normally be awarded after students satisfy the general science requirements. It might be called a Master of Philosophy in Human Biology, or a Bachelor of Medicine, or a Master of Science in Human Biology. The student could decide at that point whether to go on to the M.D., move in the direction of the Ph.D., or take employment as a teacher or a medical assistant or associate (perhaps after some additional practical training). At this point, the school would also be in a good position to advise the prospective M.D. candidate and to judge his quality.
- Improving the curriculum by tying more closely together basic science and clinical instruction—they now too often stand as unrelated worlds. Improvement could also be achieved by tying clinical instruction to work with “garden-variety” as well as “exotic” patients; by creating several paths, rather than only one, for students depending on their prior background and their special interests—for example, a psychiatrist needs less basic science than a person intending to become a research scientist; and by having the students help determine the curriculum. Case Western Reserve recently has given notable leadership in curricular innovation.
- Improving the residency by giving the young doctor a wider variety of experience and more of it under skilled supervision.
- Creating a National Health Service Corps.
- Providing an Educational Opportunity Bank for medical and dental students.
- Improving the planning of health manpower.

14 *Sharing the financial burdens* We recommend:

- That the federal government meet more of the costs of medical and dental education. It already supports most of the costs of medical research. Doctors can and do move from state to state, and some states are reluctant to educate M.D.'s for practice elsewhere.
- That the states support private medical and dental schools.
- That the levels of support among states be more nearly equalized. Some states exploit the investment other states make in medical education.
- That both the federal government and the states seek reforms and improvements as they expend their funds.

15 *Cutting costs* The expanded health manpower and external service programs we recommend will cost substantial sums of money, but total expenditures should be held to the lowest reasonable levels. Costs could be reduced by:

- Reducing from four to three the years it takes to get an M.D. degree. This change alone, if adopted by all medical schools, would increase the number of student places available by one-third, without further construction costs and with little further operating costs. It would also result in student support savings and will get students into practice sooner. Dartmouth is developing a program designed to meet some of these objectives.
- Reducing from four to three the years it takes to fulfill residency requirements. This, too, will save costs and get doctors into practice earlier.
- Combining science work on the campus and in the medical school, thus reducing duplication.
- Reducing the ratio of faculty to students, which is particularly high in medical education.
- Entering two classes a year and thus making better use of laboratory facilities and teaching personnel.
- Teaching during the summer period.
- Holding federal research expenditures steady as a percentage of GNP after a period of spectacular rise.

- Greatly increasing the number of allied health personnel and thus raising the productivity of doctors and dentists.
- Raising the minimum size of a medical class to 100 and thus obtaining economies of scale.
- Using outside hospitals for clinical training rather than, or in addition to, subsidizing a “university hospital.”

Expenditures of medical schools have gone up twice as fast in the past decade as expenditures in higher education generally, yet the number of students in medical schools has risen only half as fast as in the rest of higher education. It is high time to look more carefully at costs.

- 16 The nation has a good opportunity to improve the health care of its citizens. By its contribution to that improvement, higher education has a great opportunity to become more useful to society.

2. *The Crisis in Health Care Delivery and Health Manpower*

As the nation faces the 1970s, shortcomings in the system of delivery of health care in the world's most affluent society must have high priority among the issues calling for attention and decisive action. Shortages of health manpower play an important role in these deficiencies and they are likely to continue throughout the 1970s and probably into the 1980s.

The most serious shortages of professional personnel in any major occupation group in the United States are in the health services. Thus, one of the greatest challenges to higher education in the 1970s is to mobilize its resources to meet the need for expanding the education of professional health manpower. To accomplish this task the nation's medical and dental schools, along with educational institutions training allied health personnel, will need greatly augmented public financial support, but they will also need to give sustained attention to restructuring their educational and service programs to meet the nation's need for a more adequate system of delivery of health care.

THE PROBLEM OF UNMET NEED

The record of the United States in prolonging life expectancy and preventing infant mortality is not impressive when compared with the experience of many other industrial countries. Although the best medical care in this country is as good as any in the world, many Americans receive inferior care, and some health care needs go entirely untreated.

While life expectancy of both white and nonwhite males and females in the United States has gradually increased during the last half-century, the lengthening of life expectancy has leveled off during the last two decades. Among 22 industrial countries, the

TABLE 1 *Expectation of life at birth in 22 industrial countries*

Country	Males		Country	Females	
	Years of life	Date		Years of life	Date
Sweden	71.6	1961-1965	Netherlands	76.1	1966
Netherlands	71.1	1966	Norway	76.0	1961-1965
Norway	71.0	1961-1965	Sweden	75.7	1961-1965
Israel*	70.4	1967	France	75.4	1966
Denmark	70.1	1965-1966	Denmark	74.7	1965-1966
Switzerland	68.7	1958-1963	United States	74.2	1967
East Germany	68.5	1963-1966	Australia	74.2	1960-1962
New Zealand†	68.4	1960-1962	Canada	74.2	1960-1962
Canada	68.4	1960-1962	United Kingdom	74.2	1963-1965
Japan	68.4	1966	Switzerland	74.1	1958-1963
France	68.2	1966	New Zealand†	73.8	1960-1962
Ireland	68.1	1960-1962	Czechoslovakia	73.6	1966
United Kingdom	68.1	1963-1965	Israel*	73.6	1967
Australia	67.9	1960-1962	Japan	73.6	1966
Belgium	67.7	1959-1963	Belgium	73.5	1959-1963
West Germany	67.6	1964-1966	East Germany	73.5	1963-1966
Czechoslovakia	67.3	1966	West Germany	73.5	1964-1966
Italy	67.2	1960-1962	Austria	73.4	1967
United States	67.0	1967	Finland	72.6	1961-1965
Austria	66.6	1967	Italy	72.3	1960-1962
Finland	65.4	1961-1965	Ireland	71.9	1960-1962
Argentina	63.7	1960-1965	Argentina	69.5	1960-1965

*Jewish population only.

† European population.

SOURCE United Nations, *Demographic Yearbook*, 1968, New York, 1969

United States ranked nineteenth in male life expectancy and sixth in female life expectancy in 1967 (Table 1).¹

If we consider infant mortality, we find a somewhat similar pattern, although there has been an encouraging acceleration of the decline in our infant mortality rate in the last few years and a slight

¹ If data for all countries for which they are available are included, from 1959 to 1966, the life expectancy of males in the United States dropped from thirteenth to twenty-second place and female life expectancy from seventh to tenth place (1, pp. 14-15). However, data for some of the underdeveloped countries are not very reliable.

improvement in our international ranking. However, our ranking in 1968 was still below that of 1960 (Chart 1). Contrary to a widely held impression, the fact that the United States infant mortality rate is below that of a number of other industrial countries is not entirely attributable to higher rates for nonwhite people. The rate of 19.7 infant deaths per 1,000 live births for white people in the United States in 1967 was above the overall rate for 10 other countries in that year (2, p. 57, and 3).²

Not only are our rankings low, but the gaps between the United States rates and those in the highest ranking industrial countries are substantial. Among the factors that perhaps explain this situation are our relatively heterogeneous population, the fact that some of the other industrial countries have placed greater emphasis on preventive care and mass education relating to healthful practices, and the fact that every other industrial country has either a national health insurance system or a national health service (4).

The evidence of unmet need for dental care is equally disturbing. In the period 1960 to 1962 it was found that about 20 percent of persons aged 45 to 54 in the United States had lost all their teeth and that this proportion rose sharply with advancing age (5). The National Health Survey of 1963-1964 indicated that nearly three-fifths of the population had not seen a dentist in the preceding year and that one-sixth of the population had never seen a dentist (6, p. 14).

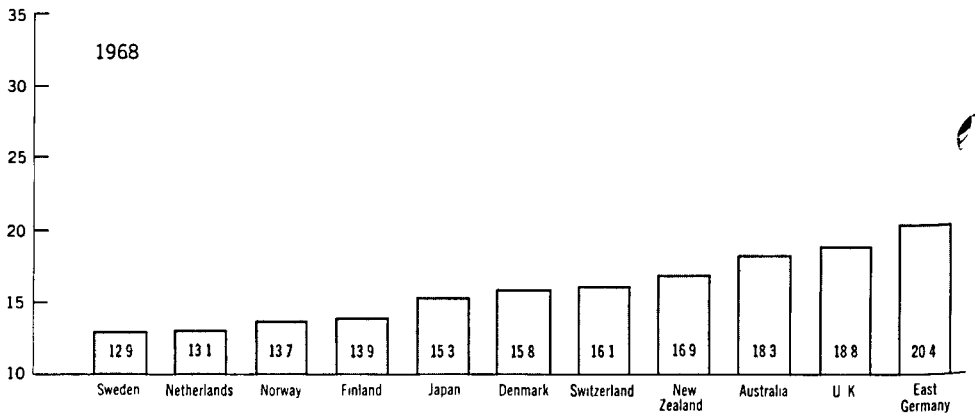
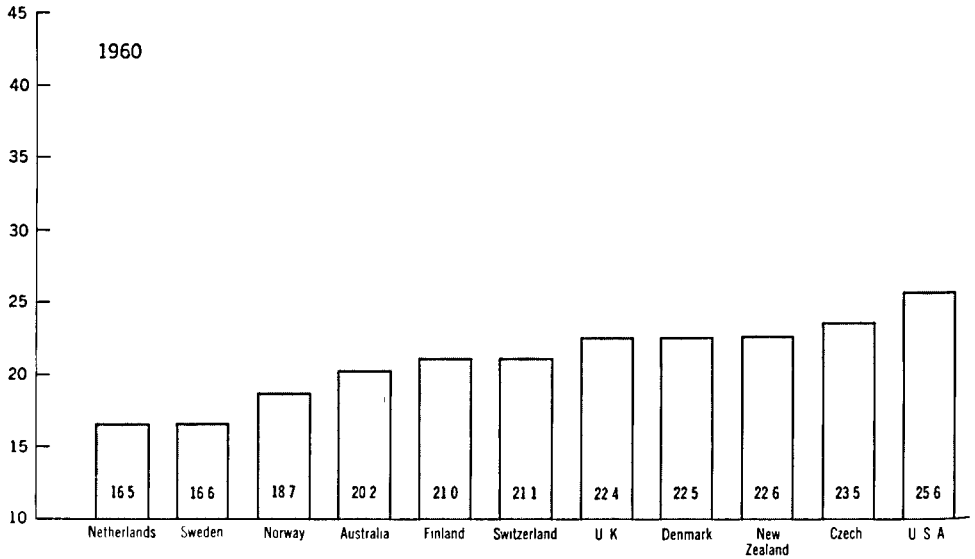
Increasingly, health care is coming to be regarded not only as a necessity but also as a right to which all persons are entitled. The trend toward ensuring the right to health care is virtually certain to continue until all Americans are guaranteed access to adequate care without regard to means. In June 1970, the House of Delegates of the American Medical Association adopted the following statement:

That the AMA reaffirm, as a statement of the primary purpose and responsibility of the Association and the medical profession, "the promotion of the art and science of medicine and the betterment of public health," and, as part of this purpose, apply all possible efforts to make medical services of high quality available to all individuals.

Increasingly experts predict that the United States will adopt a national health insurance system, perhaps within this decade.

²See *References* for complete citations.

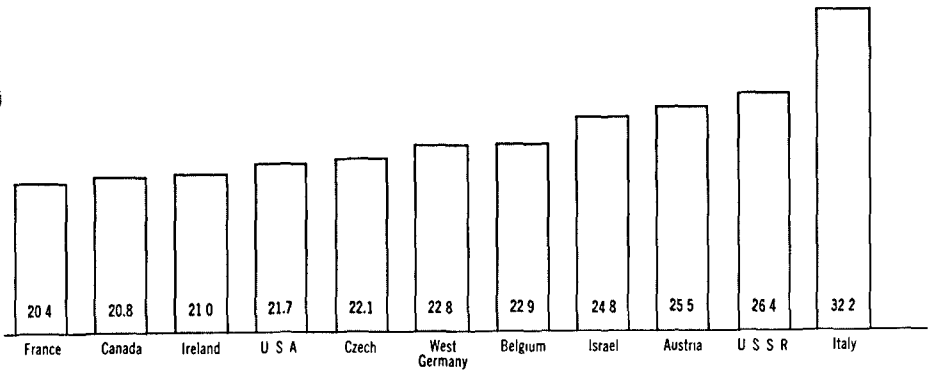
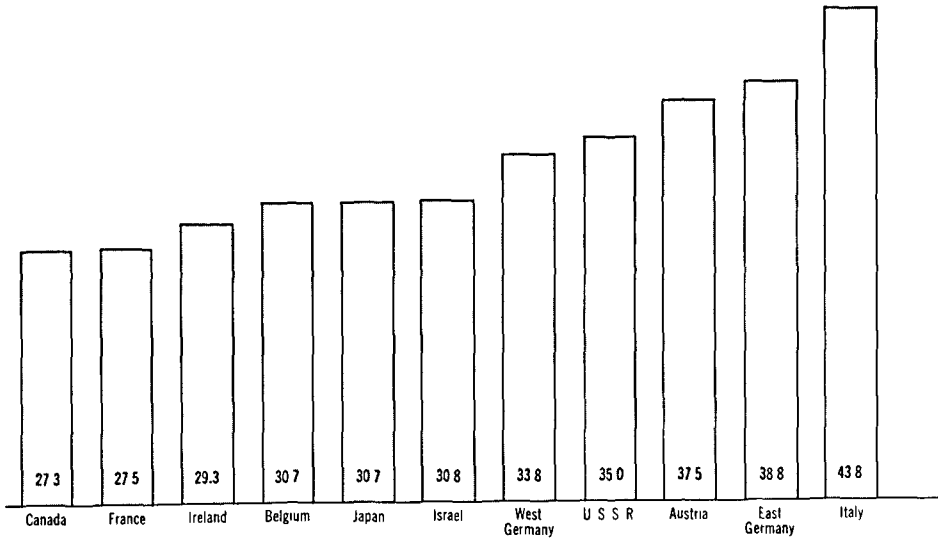


CHART 1 *Infant mortality rates for 22 industrial countries,* 1960 and 1968†*

*Deaths under one year of age per 1,000 infants born alive.

† Data for Sweden, Australia, and Belgium are for 1967, and data for the Netherlands, Finland, Japan, and New Zealand are for 1969.

SOURCE United Nations, Statistical Papers, *Population and Vital Statistics Report*, ser. A, vol. 14, no. 1, and vol. 22, no. 2.



We accept this prediction. But, with the advent of national health insurance, the shortcomings in our methods of health care delivery and the critical shortages of our health manpower and facilities will become even more glaringly apparent. Unless we overcome these deficiencies, the present crisis in health care will appear to be a mere ripple in comparison with the mounting waves of problems to be faced when financial barriers to health care are lowered.

The recent proposal of the administration for a federal health insurance program for low- to moderate-income families with children (7), as a partial replacement for the Medicaid program, is an important step forward, but it will not go far toward meeting the need for a comprehensive national health insurance program. If only the elderly, now covered by Medicare, and relatively low-income persons are included in federal health insurance programs, the programs' costs per person will continue to be excessively high because these are high-cost, high-risk groups. The great advantage of a comprehensive national insurance system would be the inclusion of all the good risks along with the poor risks, resulting in much lower average costs.

**THE PROBLEM
OF
INSUFFICIENT
HEALTH
MANPOWER**

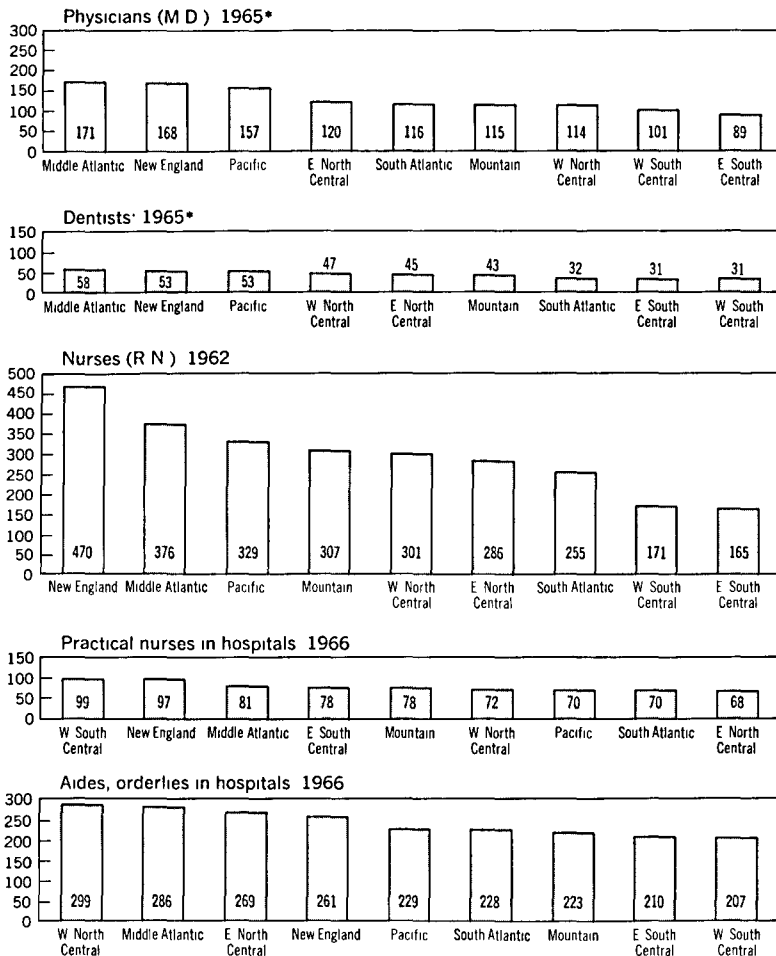
Although there is debate over the extent of shortages of health manpower, critical shortages do exist. Dr. Roger Egeberg, Assistant Secretary of the U.S. Department of Health, Education, and Welfare, recently stated that today the United States needs about 50,000 more physicians, "a couple of hundred thousand more nurses," and "almost 150,000 more technicians" (8, p. 73).

The geographic distribution of health manpower is highly uneven, and although there is no clear agreement on what ratio of, say, physicians to population is adequate, there is little question that the supply of health manpower is gravely deficient in some parts of the nation (Chart 2). Moreover, the fact that New York and Massachusetts have high ratios of physicians to population does not mean that a resident of a lower-income neighborhood of New York City or Boston has adequate access to a physician. As one writer on our "ailing medical system" recently put it (9, p. 86):

Private physicians are as hard to find in some neighborhoods of New York City as in backward rural counties of the South.

The uneven geographic distribution of health manpower is, of course, related to differences in per capita income among states and local areas and resulting differences in family expenditures on

CHART 2
Active health personnel per 100,000 population in United States by region



*Nonfederal per 100,000 civilian population.

SOURCE. U.S. Public Health Service, *Health Manpower, Perspective: 1967*, Washington, D C., 1967, p. 14

health care. But these variations are also related to differences in education, in the size of communities in which people live, and to racial background (10). Merely increasing the supply of physicians will not solve the problem of deficient health care in low-income areas. As we move toward a more adequate system of financing medical care, we may also need to devise special financial and nonfinancial incentives to induce physicians and other health personnel to work in low-income areas.

We also need to intensify our efforts to overcome inefficiencies in

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the use of health personnel. Expensively trained physicians are performing tasks that could well be carried out by less broadly trained personnel. Hospital personnel are also wastefully used in all too many instances. In fact, some critics of our health care delivery system go so far as to call it a "nonsystem." As the National Advisory Commission on Health Manpower put it (11, vol. 1, p. 3):

Medical care in the U.S. is more a collection of bits and pieces with overlapping duplication, great gaps, high costs and wasted effort than an integrated system in which needs and efforts are closely related.

**THE PROBLEM
OF
INEFFECTIVE
FINANCING**

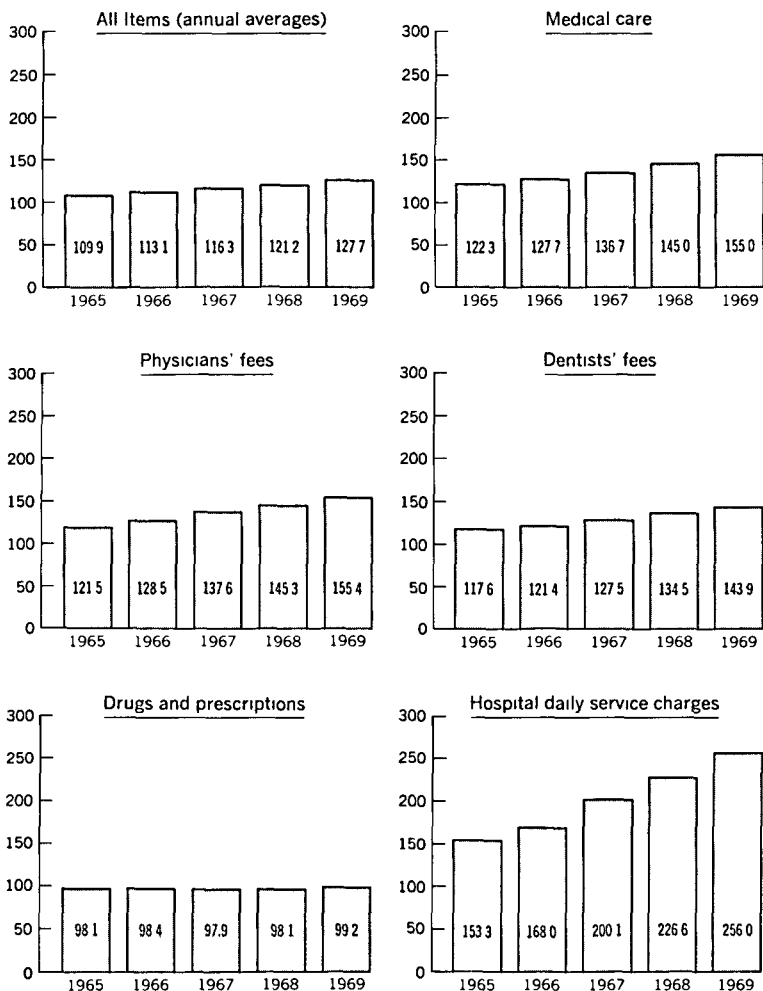
Americans are spending far more on health care than ever before. In 1928-1929, total health care expenditures amounted to \$3.6 billion, or less than 4 percent of the gross national product (GNP). By 1968-1969, they had risen to \$60.3 billion, or nearly 7 percent of the GNP (12, p. 12). Public expenditures, greatly augmented after the adoption of the Medicare and Medicaid programs in 1965, were meeting 36 percent of the total in 1968-1969, while private insurance benefits, despite the fact that about four-fifths of the population had some insurance protection, were meeting only 22 percent (12, p. 12, and 13, p. 20).

What accounts for the sharp contrast between the high proportion of persons with some insurance coverage and the small proportion of total expenditures met by insurance benefits? The answer lies in the weaknesses of private health insurance protection: (1) provision for services in the hospital is much more common than for services in the physician's office or in the home; (2) there are limitations on reimbursable charges; (3) psychiatric care is covered only on a highly restricted basis; (4) dental care is barely beginning to be covered, although dental insurance protection is now spreading quite rapidly; (5) charges for health services are typically made on a fee-for-service basis, and increases in costs are passed on in the form of higher premiums; (6) hospital services are overutilized, except under prepaid comprehensive plans, partly because so many people have hospital insurance but no protection for care outside the hospital; and (7) despite much talk about the need for preventive care, insurance plans are poorly designed to encourage it.

**THE PROBLEM
OF RISING
COSTS**

Of the increase of nearly \$50 billion in personal health care expenditures from 1928-29 to 1967-68, population growth accounted for 18 percent, increases in prices per unit of service for 38 percent, and all other factors, including an increase in the proportion of the

CHART 3
Consumer
price index:
Indexes for
all items and
for medical
care, 1965-1969



SOURCE U.S. Social Security Administration, *Medical Care Prices Fact Sheet, 1966-1969*, Research and Statistics note no. 2, February 23, 1970

population receiving health care and the growing use of complex and expensive equipment, for 44 percent (14, p. 12). The rate of increase in the costs of health care rose sharply after Medicare and Medicaid came into effect (Chart 3). The effect of these measures was to expand the demand for health care by bringing it more readily within the reach of two needy and high-risk groups—the elderly and the poor, but the expansion occurred suddenly, in an industry in which the supply of both physicians and hospital capacity tends to be inelastic and to respond slowly to increases in demand. In addition, the expansion of demand encouraged long

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overdue increases in the compensation of nurses, other allied health workers, and hospital service personnel, who have traditionally been among the lowest-paid workers in the labor force.

The problem of inflation in the costs of medical care is going to be with us for a long time to come. Among the various ways of meeting the problem, overcoming shortages of health manpower and striving for greater efficiency in the delivery of health care are of paramount importance. They will receive major emphasis in this report.

SUMMARY The crisis in the delivery of health care in the United States reflects the combined influences of five interrelated and overlapping factors: (1) unmet needs for health care, (2) rising expectations of the population for universal access to care, (3) critical shortages in, and inefficient utilization of, health manpower, (4) ineffective financing, and (5) rapidly rising costs.

3. *The Scope of This Report*

This report will be concerned primarily with the education of physicians and dentists and with the programs for training physician's and dentist's associates and assistants that are being developed in several university health science centers. The problems confronting medical and dental education are so broad in scope and so challenging that it would be impossible to deal with them adequately in this report if an attempt were also made to consider the education of all health personnel.

Shortages of nurses and allied health workers, as well as of physicians, are acute, and increased attention needs to be paid to the development of training programs for new types of health personnel. The Commission recognizes the importance of these problems, and in its report *Quality and Equality: Revised Recommendations, New Levels of Federal Responsibility for Higher Education*¹ it has recommended greatly expanded federal aid for higher education which will benefit students enrolled in nursing and allied health programs in all institutions of higher education, including comprehensive colleges and community colleges, which are playing increasingly important roles in the training of health personnel. In addition, our forthcoming report, *New Students and New Places*, will devote considerable attention to the changes that are occurring in the education of nurses and allied health workers.²

Throughout this report, a distinction is made between health care education and health care delivery. The Commission has not studied and is not competent to make recommendations about the

¹ This is a supplement to the Commission's first report, *Quality and Equality: New Levels of Federal Responsibility for Higher Education*.

² The forthcoming report of the National Commission for the Study of Nursing and Nursing Education (W. Allen Wallis, Chairman), summarized in reference 15, deals extensively with the problems of nursing education.

most suitable patterns of health care delivery. But it emphasizes that adequate health care education, while a prerequisite to adequate health care delivery, by no means guarantees it. No matter how many health professionals are trained, and no matter how adequately medical education facilities are distributed throughout the nation, Americans will not receive adequate health care unless a system is developed to deliver health care to those who need it, regardless of income, geographic location, age, or race. Unless health education efforts are coordinated with changes in the existing pattern of delivery of health care, the Commission's recommendations will not have maximum impact upon the actual health of Americans.

4. *Medical Education Today*

THE 60 YEARS
SINCE
FLEXNER

The famous Flexner report, issued in 1910, led to pronounced changes in medical education and in the quality of medical care in the United States. Briefly, it developed the themes that (a) medical care must be based on thorough knowledge of the biomedical sciences, (b) only high-quality medical schools should receive accreditation, (c) these schools should emphasize both laboratory work and extensive clinical experience, (d) the many inadequate proprietary medical schools which flourished in that period should be closed down, and (e) medical schools should be affiliated with universities (16).

The primary thrust of the post-Flexner development in medicine was the recognition of a scientific base in the natural sciences as a *sine qua non* for rational diagnosis and therapy. The reservoirs of scientific knowledge were in the universities, and, as a result, medical schools and teaching hospitals became more closely integrated with academic disciplines on the campus. This development was greatly encouraged following World War II by the expansion of federal expenditures for biomedical research from less than \$50 million to about \$1,200 million a year, with about \$350 million of the latter amount going to medical schools. From the research-oriented university medical centers have come new knowledge and techniques which have revolutionized the control of disease within a single generation.

The university medical centers have become loci of sophisticated diagnosis and treatment. Their influence extends to the practitioners of the surrounding communities, resulting in a general increase in the quality of health care in the areas. But the centers' effect on the quality of care in their communities is far less significant than it could be if an effective health care delivery system became a primary element of medical center concern.

**DOCTORS,
DENTISTS,
AND THEIR
ASSISTANTS**

One inescapable consequence of greatly increased medical knowledge and technology has been rapid specialization of health care personnel. Not only have professional health care workers become increasingly specialized, but they have steadily become a relatively more significant component of the labor force. In 1967, about 3,400,000 civilian workers were employed in health care (17, p. 8). Professionals constituted about 45 percent of the total, while non-professionals, including clerical workers and service workers in particular, were scattered through many other major occupation groups. Physicians (including osteopaths) constituted just about one-tenth of all health workers in 1967. A useful classification of health care jobs is presented in Table 2, but it excludes nearly 600,000 workers in health services who could not be identified in the 1960 Census occupational classification.

By 1969 women constituted about four-fifths of all persons employed in health services industries, largely reflecting their overwhelming predominance in nursing and some of the other allied health professions. But they were *not* well represented among physicians and dentists. Only about 6 percent of all physicians and surgeons and only about 8 percent of all medical students are women. This situation is in marked contrast to that in Western Europe, where in all countries women represent a considerably larger percentage of the medical profession than in the United States—for example, 30 percent in Germany and 20 percent in the Netherlands (18, p. 198). The representation of women in dentistry is even more limited—only 1 or 2 percent of American dentists are female (19, pp. 1-2).

Increasing the proportion of women in medical and dental schools, in the absence of other changes, would not increase the supply of physicians' and dentists' services, since many married women in these professions who have young children work only part-time or drop out of the labor force entirely.¹ But women are particularly well suited to serve as family physicians, pediatricians, psychiatrists, and in certain other specialties. The serious deficiency of child care centers in the United States is undoubtedly one of the factors that keeps women out of medical and dental schools, and out of professional practice later on.

Members of minority groups are also well represented only in the

¹ Among female medical school graduates active from 1931 to 1956, 45 percent were working full-time or part-time in 1964 (20, p. 491).

TABLE 2
Estimated
employment
in health care
jobs, by level
of job content
and occupation,
1960

<i>Health care job</i>	<i>Employment</i>	
	<i>Number</i>	<i>Percent</i>
<i>High level</i>		
<i>Psychiatrists and neurologists</i>	11,185	0.6
<i>Physicians and surgeons (M.D. and D.O.)*</i>	222,567	11.0
<i>Dentists</i>	86,887	4.3
<i>Veterinarians</i>	15,205	0.7
<i>Life scientists—health</i>	13,208	0.5
<i>Podiatrists</i>	7,600	0.4
<i>Biophysicists</i>	962	†
<i>Biochemists</i>	5,625	0.3
<i>Administrators—hospital and other health institutions</i>	12,000	0.6
<i>Psychologists—clinical</i>	5,888	0.3
<i>Optometrists</i>	16,205	0.6
<i>Pharmacists</i>	92,233	4.5
<i>Health education specialists</i>	1,000	0.8
<i>Sanitary engineers</i>	5,266	0.3
SUBTOTAL	495,791	24.4
<i>Middle level</i>		
<i>Social workers, psychiatric</i>	7,189	0.4
<i>Social workers, medical</i>	4,467	0.2
<i>Chiropractors</i>	13,853	0.7
<i>Rehabilitation counselors</i>	3,000	0.1
<i>Speech and hearing therapists</i>	6,200	0.3
<i>Sanitarians</i>	11,000	0.5
<i>Industrial hygienists</i>	1,300	0.1
<i>Physical therapists</i>	9,000	0.4
<i>Occupational therapists</i>	8,000	0.4
<i>Other therapists</i>	5,368	0.3
<i>Medical laboratory technologists-technicians</i>	53,720	2.6
<i>Dietitians and nutritionists</i>	26,470	1.3
<i>Medical record librarians</i>	8,000	0.4
<i>Medical x-ray technicians</i>	55,386	2.7
<i>Dental laboratory technicians</i>	19,711	1.0
<i>Opticians, lens grinders, and polishers</i>	20,406	1.0
<i>Nurses, professional</i>	581,289	28.6

TABLE 2
*Estimated
 employment
 in health care
 jobs, by level
 of job content
 and occupation,
 1960
 continued*

<i>Health care job</i>	<i>Employment</i>	
	<i>Number</i>	<i>Percent</i>
<i>Dental hygienists</i>	9,855	0.5
<i>Midwives</i>	896	†
SUBTOTAL	845,510	41.5
<i>Low level</i>		
<i>Dental assistants, dental office</i>	36,662	1.8
<i>Medical office assistants</i>	35,508	1.7
<i>Medical record technicians</i>	23,000	1.1
<i>Practical nurses</i>	207,966	10.2
<i>Attendants, hospitals and other institutions</i>	391,136	19.3
SUBTOTAL	694,272	34.1
TOTAL	2,035,573	100.0

* Excludes psychiatrists and neurologists.

† Less than 0.05.

SOURCE J. H. Weiss, "A Job Classification for Health Manpower," *Health Services Research*, Spring 1968, pp. 48-64.

lower echelons of health manpower—chiefly in service occupations. Notable exceptions are Japanese-Americans and Chinese-Americans who have entered the higher ranks of the health professions to a significant extent. Although more than 11 percent of the nation's population is black, less than 2 percent of American physicians are black (21, pp. 1-2). In 1969, only 2.8 percent of all M.D. candidates were black (22, p. 1), and the majority of the black medical students were enrolled at Howard University and Meharry Medical College. Although 54 medical schools had special programs to recruit black students, the programs were held back by lack of adequate financial assistance for the students and by lack of funds for special efforts to overcome the academic deficiencies of some of these students (23, pp. 96-100). However, many of the leading medical schools are vigorously recruiting extremely able black students who are not in need of remedial academic programs.

The situation in dentistry is very similar. In 1965 less than 2 percent of all dentists were black, and in 1969 only 2 percent of all dental students were black. Only 21 of the 50 dental schools, other than Howard and Meharry, had any black students, and most of these had only one (24, p. 78).

The need to train more minority-group physicians and dentists is crucial. They can play a leadership role in stimulating more

emphasis on adequate health care services and health education for minority groups, and they can undoubtedly relate to patients of their own races more effectively than white practitioners.

Medical education is very costly for students, regardless of race. They must meet tuition and subsistence expenses through, typically, four years of undergraduate premedical education and four years of M.D.-candidate education. Then, during the subsequent year of internship and three to five years of residency, their earnings are far less than these highly educated students would be capable of earning in regular jobs. Thus foregone earnings are high over a period of some 12 to 14 years. In view of this, it is not surprising to find that medical students are likely to come from families in the middle and upper-middle income brackets. In 1967, 63 percent of all medical students reported that they came from families with incomes of \$10,000 or more. Only 48 percent of all families with heads aged 45 to 54—the age group in which medical students' parents are most likely to be found—reported that much income (25).

Dental education is about as costly as medical education but not nearly as prolonged. Thus total costs and total foregone earnings are considerably lower in the case of dental students.

5. *The Future of Health Care Delivery*

Future changes in medical and dental education must be geared to impending changes in patterns of health care delivery. Although there is disagreement about the precise nature of the changes that are likely to occur, there is agreement that change is inevitable and imperative, and there is some consensus about its general outlines.

- 1 There will be a spread of prepaid group practice plans, such as Kaiser-Permanente plans, Detroit's Community Health Association, New York's Health Insurance Plan, the Group Health Cooperative of Puget Sound, and others. The Kaiser plans encourage preventive services by making a variety of them, including multiphasic screening and regular, periodic physical examinations, readily available. Members are either not charged for office visits or, at most, pay a nominal registration fee. There is a wide variety of specialists on the Kaiser staffs so that members are assured prompt attention by appropriate professionals. These physicians are all in group practice and are not compensated on a fee-for-service basis (26). Thus there are no incentives for excessive use of physician's or hospital services.
- 2 There will be much greater emphasis on achieving effective functioning of true health care teams in which the physician or dentist is at the center of the team and the work of allied health personnel is subject either to his direct or indirect supervision.
- 3 There will be a shift to greater emphasis on care outside the hospital in a wider variety of health care facilities than has been available. Neighborhood health clinics, facilities for ambulatory care of convalescing patients, and homemaker services to facilitate care in the home are all needed. There has been an encouraging beginning in the development of such facilities and services in the

1960s, but the movement is in its infancy and requires rapid expansion.

- 4 Gradually we are likely to shift toward a situation in which health care is a public utility. The government's role in protecting the health of the population will inevitably become broader in scope. In an era of increasing concern for the environment, greater attention will be paid to preventive epidemiology, population problems, control of water and air pollution, environmental sound levels, and related problems. As the trend toward a more comprehensive national health insurance system continues, the federal government will become increasingly concerned with adequacy and efficiency in the delivery of health care, with terms and methods of payment, and with the education and utilization of health manpower.
- 5 The rate of acquisition of new knowledge and technology in the biomedical sciences will continue to be impressive. Progress in diagnosis and therapy, involving increasingly complex facilities, as well as trained technicians and retrained physicians, will continue at a rapid rate. Perhaps the most important impact on the health care system will come from more extensive use of computers and automation techniques in institutional administration and patient care facilities.

Information networks will make possible the transmission of medical records for analysis and consultation without regard to geographic location. New therapeutic techniques will require new technologies, new kinds of trained personnel, and cooperation of many individuals as a closely integrated unit. Organ transplantation has been the subject of great public interest in the last few years, and intensive care units, hemodialysis, and high-intensity radiation therapy will become increasingly common.

As a result of the tremendous progress that has been made in overcoming and, in many cases, eliminating sources of acute illness, concern has shifted to the prevention of disease, diagnosis and treatment of degenerative diseases, and mental illness. Each of these will be affected by major developments in the next few decades.

The rate of advance of knowledge and technology is so rapid that physicians and other health professionals must remain students throughout their professional careers or face partial obsolescence in five to ten years. Expanded continuing education programs for physicians and other health workers, which are increasing in

availability and quality, will be essential if optimum health care is to be provided.

- 6 The education, service, and research functions of medical and dental schools will become more effectively oriented to the shift from a *nonsystem* to a *system* of health care delivery.

The nation's goal should be adequate and effective health care for the entire population, regardless of income. Many of the recommendations that will be made in this report—for example, the provision of 9 new university health science centers, the development of about 126 area health education centers, and provision for a national health service corps—should help to overcome the present maldistribution of health manpower. Physicians, dentists, and allied health workers are likely to be attracted to areas where there are well-developed area health education centers. Our proposal, which calls for a broad geographic distribution of such facilities, should go far toward achieving more equitable geographic distribution of health manpower. Health personnel may be more willing to practice in remote, rural areas if there is a health education center within a reasonable distance. However, the full effect of such centers in attracting health manpower will doubtless not be experienced until a national health insurance system, perhaps with built-in features to provide special financial and nonfinancial incentives to health personnel for locating in remote areas, becomes a reality. A national health service corps could also play a key role in bringing health personnel to areas now poorly served.

6. *The Future of Health Manpower Education*

THE EVIDENCE OF A SHORTAGE OF PHYSICIANS AND DENTISTS

An extensive series of reports and special studies in recent years have projected shortages of health care personnel, especially of physicians (27, pp. 135-138; 11, vol. 2, p. 243; and 28, chap. 4). Some observers, however, dispute the existence of a current or impending shortage of physicians. They argue that the real problem is the maldistribution and inefficient use of physicians. They also argue that (1) the ratio of other health workers to doctors and dentists is increasing rapidly, (2) the work of the health care team will soon be far more effectively coordinated than at present, and (3) physician's associates and assistants with less prolonged training than the fully certified doctor now receives will increasingly take over some of the physician's duties so that his time will be released for the use of his highest skills.

The Commission has carefully considered these arguments. It agrees that these changes are occurring and will undoubtedly be accelerated during the 1970s, but we do not believe they will take place rapidly enough to rule out the probability of continuing shortages throughout this decade. We fully support the efforts to develop training programs for physician's associates and assistants, but these programs are just beginning and cannot possibly have much impact on the shortage of physicians before the end of the 1970s. In addition, it is altogether unrealistic to suppose that practicing physicians, especially those in the middle and older age brackets, are going to change their patterns of practice or their locale suddenly and drastically in order to overcome problems of inefficient utilization and geographic maldistribution of physicians. These problems will be overcome as more young doctors complete their medical education, as financing mechanisms are designed to overcome the shortages of health manpower in low-income areas,

and as more vigorous efforts are made to achieve greater efficiency in the use of health manpower.

Whether or not one accepts as accurate the estimate of a current shortage of 50,000 physicians, cited by Dr. Egeberg, there is no question, in our judgment, that an *acute shortage exists*. One indication of it is the uneven geographic distribution of physicians discussed earlier. Another takes the form of long waiting lines for emergency services in hospital outpatient clinics. Another is the very long working week of the typical physician—for all reporting physicians, the median work week in 1968 was 60 hours (29, Table MD-9). In addition, the presence of large numbers of foreign medical graduates in the United States, especially among house officers (interns and residents), indicates that we are not training enough doctors.¹ In 1967 there were about 46,000 graduates of foreign medical schools in the United States, representing about 15 percent of all physicians. Approximately 19,000 of these worked in private practice, 14,000 as house officers, and nearly 9,000 as full-time medical staff of hospitals.² In recent years, many of these foreign graduates have come from relatively underdeveloped countries in which the quality of medical education is greatly inferior to the best medical training available in this country.

Although pressure to discourage the employment of foreign medical graduates from relatively underdeveloped countries may increase, it does not appear likely that such pressure will soon reverse the present trend toward increasing employment of physicians from abroad, at least as long as shortages of doctors in the United States continue. Yet it is widely regarded as an unsatisfactory solution of the United States physician shortage and is resented abroad as a "brain drain." Looking toward the future, the United States should become a net exporter of medical manpower, as part of the effort to raise the quality of medical education and medical care in underdeveloped countries. For similar reasons, more emphasis in American health science centers on research on diseases prevalent in underdeveloped countries is needed, and foreign students should be encouraged to enter United States medi-

¹ This is not to suggest that there is a clear-cut cause-and-effect relationship between the shortage of physicians in the United States and decisions of foreign medical graduates to come here. Many are attracted by the quality of our internship and residency programs.

² The remaining foreign medical graduates were chiefly medical school faculty members, administrators, or in research.

cal schools or to come here temporarily for training at the house officer stage, even if we eventually overcome the need to import them on a permanent basis.

The shortage of student places in United States medical schools, in relation to applicants, is such that the schools accepted only 52 percent of all applicants in 1967-68, and this ratio has not varied greatly for a number of years (29). As a result, many students go abroad for their medical education. About 11 percent of all American M.D. candidates attend foreign medical schools and, on their return, are among the foreign medical graduates appointed as interns and residents (although those who attend Canadian schools are not classified as foreign medical graduates). Until the number of entrant places in United States medical schools has expanded sufficiently to permit acceptance of a considerably larger proportion of applicants, medical students will continue to seek admission to foreign medical schools.

For all these reasons, the Commission believes that strong support must be given to expansion of the number of student places for M.D. candidates in medical schools as well as to the newly developing and innovative programs for the training of physician's associates and assistants. The great majority of experts on medical education who have been consulted in the preparation of this report agree.

On the whole, there is less evidence of a shortage of dentists than of physicians, *in relation to current demand*. However, dentists are unevenly distributed geographically (Chart 2), and unmet need is particularly acute in low-income areas. But dentists' hours of work tend to be much shorter than physicians' hours, averaging 43.2 hours a week in 1964 (30, p. 8). Moreover, very few foreign dental school graduates are employed in United States dentistry.

As in the case of physicians, it is very difficult to estimate the ratio of dentists to population that might be "adequate" in 1975 or 1980. Dentists' productivity has been rising steadily and, in the absence of an accelerated increase in the per capita demand for services, one would expect the ratio to decline. But the per capita demand for services may increase, not only because of the spread of privately financed dental care plans, but also because of such possibilities as a federal program to ensure dental services for children or eventual inclusion of dental care in a national health insurance system.

Existing projections of the demand for dentists are based on

maintaining the existing ratio of dentists to population and take no account of either an accelerated increase in demand, on the one hand, or a change in the rate of increase of productivity on the other (31). There has been an accelerated increase in dental school places in recent years, and estimates provided by the Council on Dental Education of the American Dental Association project an increase from 4,430 dental school entrants in 1970-71 to 5,400 in 1980-81. These projections have been used in estimating the cost of the federal aid to dental students and their institutions recommended in this report. The Commission believes that at least the expansion of dental school places indicated by these projections is needed.

Dental education is considerably less prolonged than medical education. Most dental schools require only two or three years of college education as a prerequisite for entry, although the proportion of entrants who have received a bachelor's degree has been growing and amounted to 59 percent of the total in 1968 (32, p. 16). As compared with M.D.'s, relatively few dental students go on beyond the four-year D.D.S.-candidate program to undertake advanced education in dentistry, but the proportion is increasing, and in 1968-69 about 10 percent of all dental school students were enrolled in advanced education courses (32, pp. 12 and 25).³

Despite the current progress in dental productivity, even more rapid progress could be achieved through more extensive use of dentist's assistants and dental hygienists and through greater emphasis on preventive programs. The view has been expressed that "dentistry has an excellent chance of being the first health profession to become truly preventive" (33, p. 9). Several other countries, notably New Zealand, have achieved impressive results through programs designed to ensure that all children receive dental care (34).

**THE
EXPANSION OF
HEALTH
MANPOWER
EDUCATION**

The Commission believes that vigorous efforts should be made in the 1970s to induce expansion of student places for M.D. and D.D.S. candidates in university health science centers and that these centers should also develop and expand programs for the training of physician's and dentist's associates and assistants.

The armed services have effectively used practically trained physician's assistants—the medical corpsmen, and there is growing interest in the development of programs for the education of phy-

³ The data do not include students in dental hygienist, dental assistant, and continuing education courses.

sician's associates and assistants in civilian life. A program for the training of physician's assistants at Duke University Medical Center has been underway for five years. Its students are recruited from those with previous health care experience, either as medical corpsmen or in civilian life as practical nurses. The course is two years in length and leads to a certificate (35, p. 151). For the last several years the University of Colorado School of Medicine has had a pediatric nurse practitioner education program and is now training at the bachelor's and master's level a new kind of pediatrics associate (36). Pediatrics lends itself particularly well to the use of associates, since so much of pediatric practice consists of routine checkups and treatment of minor illnesses.

Also of great interest is the Medex program at the University of Washington School of Medicine—a program specifically designed to take advantage of the training and experience of ex-military corpsmen, who are given three months of training at the medical school, followed by a year of preceptorship (a kind of apprenticeship) as assistant to a physician. The program is funded on a research and demonstration basis by the National Center for Health Services Research and Development (NCHSRD), and several replications at other institutions are now being supported. However, the Center cannot provide training funds as such because funds available for health manpower training are limited to specified occupational categories. The NCHSRD regards the Medex program as a promising model for the training of physician's assistants and estimates that, from about 30,000 corpsmen discharged each year, of whom about 10 percent are qualified at the independent-duty level of responsibility, and also from previously discharged corpsmen, approximately 3,000 independent-duty ex-corpsmen a year could be recruited for Medex programs (37 and 38).

There are now more than 40 programs for the training of physician's assistants and similar types of auxiliary personnel, while 66 programs for the training of pediatric nurse practitioners are in operation or in some stage of development. The majority of these programs are of very recent origin and are in comprehensive colleges or community colleges, but, according to the head of the health services manpower section of NCHSRD (38):

Because of the especially close and personal relationship of this mid-level worker to the physician, we are loath to see the rapid proliferation of this type of training outside of substantial medical centers, with the exception of the preceptorship training which we believe can best be given by the physician who will ultimately employ him.

Programs such as these are clearly in an experimental stage, as NCHSRD recognizes, but their graduates are in great demand, and they offer promise as a way of augmenting the supply of medical personnel, especially in small towns and rural areas, where the supply of general practitioners has been declining sharply as older men die and young doctors do not appear to take their places.

In 1968-69, 259 dental assistants were being trained in dental schools (32, p. 12). D.D.S. candidates are trained to work with them in dental school, with the result that when dentists enter practice they have experience in the most effective ways of using assistants. This type of experience should also be part of the M.D.'s education.

There is also considerable interest among medical educators in greater emphasis on the training of primary or family physicians, but many educators believe that the predominant trend will continue to be toward the provision of primary physician care by internists, pediatricians, and obstetricians. In line with this development, there should be increased emphasis, eventually encompassing all medical schools, on training associates and assistants for these three groups of specialists. But we also recognize that other types of allied health personnel not now envisioned may be developed and that the shape of medical health teams in the 1980s and the 1990s cannot be reliably predicted today. Meanwhile, as the Thirty-seventh American Assembly pointed out, there is an urgent need for modifications of licensing and legal liability provisions to permit effective utilization of physician's associates and assistants "while assuring quality of services" (39, p. 6).

There is also a need for more dental schools to experiment with and develop programs for the education of dentist's associates and to expand their existing programs for dental assistants. As we move toward provision of dental care on an insured basis, dentists will be hard pressed to meet the increased demand, and many more dentists are likely to seek the services of dentist's assistants and dental hygienists. Although many dentists use such assistants, the overall ratio of assistants to dentists in dental offices was only 1.35 per dentist in 1965 (30).

The Office of Health Planning of the University of California has prepared for the Carnegie Commission a number of alternative projections of the increase in the number of physicians per 100,000 population to the year 2002, based on differing assumptions with respect to the annual increase in the number of entrants to United

States medical schools. Three of these projections are included in Table 3.⁴

In view of the comparative stability of the physician-population ratio prior to the 1960s, the rapid increase in this ratio indicated by all these projections may seem surprising. There are two main reasons for it: (1) as the number of medical school graduates increases to a level well beyond that prevailing in the recent past, the number of graduates will exceed by large margins the number of physicians dying or retiring, and (2) the population is not expected to increase as rapidly in the next three decades as in the 20 years or so following World War II.

The Commission believes that projection C is based on an attainable and desirable estimate of the annual increase in the number of medical school places to about 1978. In fact, progress has been so rapid in the last few years that the number of entrants in the fall of 1970 is likely to exceed the 10,800 indicated by projection C.

Whether the number of medical school entrants should be expanded after 1978 is a question that cannot be answered at the present time, since it is impossible to predict the number of M.D.'s per 100,000 population that will be "adequate" in relation to the very different supply and demand situation which may prevail in the 1980s. On the one hand, we expect the increase in demand to rise sharply, particularly if a national health insurance system becomes effective. On the other hand, physician productivity may rise at an accelerated rate in the 1970s as increasing use is made of various substitutes for physicians. The net effect of these opposing trends in the next decade cannot be reliably predicted. Toward the end of the 1970s, the question of any additional increases in medical school entering places should be reappraised.

It is sometimes noted that the ratio of physicians to population in the United States is higher than in many other countries, including some that have a superior ranking in terms of life expectancy or infant mortality, and that the ratios indicated by the projections in Table 2 for 1977 or 1982 might well prove to be excessive. However, it must be kept in mind that the proportion of physicians en-

⁴A monograph providing a detailed explanation of the methodology of these projections, prepared under the direction of Dr. Mark S. Blumberg, formerly Director of Health Planning, University of California, will be issued by the Carnegie Commission. It should be noted that the definition of physicians used in preparing the projections differs from the definition (all nonfederal physicians) in Chart 2.

TABLE 3 Projections of number of physicians per 100,000 population, based on three alternative projections of number of medical school entrants, United States, 1967-2002

Year	Medical school entrants*			Active physicians (M.D. and D.O.) per 100,000 population†		
	A	B	C	A	B	C
1967	9,479	9,479	9,479	146.8	146.8	146.8
1968	9,863	9,863	9,863			
1969	10,200	10,200	10,200			
1970	10,800	10,800	10,800			
1971	11,400	11,400	11,400			
1972	12,000	12,000	12,000	153.9	153.9	153.9
1973	12,500	12,500	12,900			
1974	13,000	13,000	13,800			
1975	13,500	13,500	14,700			
1976	14,000	14,000	15,300			
1977	14,500	14,500	15,900	161.4	161.4	161.4
1978	15,000	15,000	16,400			
1979	15,000	15,500	16,800			
1980	15,000	16,000	17,100			
1982	15,000	16,000	17,700	168.8	168.9	171.3
1987	15,000	16,000	19,200	175.3	177.0	182.1
1992	15,000	16,000	20,400	180.7	184.3	194.2
1997	15,000	16,000	21,400	183.4	188.5	205.0
2002	15,000	16,000	21,600	185.8	192.4	216.4

* Excludes entrants to osteopathic medical schools.

† Assumes 13,000 foreign medical school graduates will permanently enter the United States between 1968 and 1977, but none will enter permanently thereafter. Excluded from the data are 10,500 foreign medical graduates in the United States in 1967 who were judged to be here temporarily. However, some temporary foreign medical school graduates are assumed to be in the United States in all subsequent years, although they are not included in the ratios above.

SOURCE: Office of Health Planning, University of California.

gaged part-time or full-time in research and the proportion in military service outside national boundaries are undoubtedly higher for the United States than for most other countries.⁵

It is extremely difficult to predict the rate of increase of physician's and dentist's associates and assistants likely to be trained in university health science centers. For purposes of estimating the

⁵ Recent comparative data indicate that eight countries—Australia, Austria, Czechoslovakia, Denmark, West Germany, Hungary, Israel, and the U.S.S.R.—had higher ratios of physicians to population than the United States (2, pp. 857-858).

cost of federal aid which we recommend for such programs, we project a gradual rise from about 500 students in 1970-71 to 3,500 in 1979-80. This projection could turn out to be excessively optimistic or seriously deficient, depending on the speed with which university health science centers develop such programs and the extent of aid available from federal and other sources. Despite the previously mentioned NCHSRD estimate that 3,000 independent-duty ex-corpsmen a year could be recruited for Medex programs, we do not believe it is realistic to predict that university health science centers will develop and expand programs rapidly enough to absorb such large numbers of ex-corpsmen for some time to come.

The acceleration in the increase of entrant places in both medical and dental schools in recent years has clearly been stimulated in large part by increased federal aid, especially in the form of construction grants. Similarly, much of the projected expansion for the 1970s is dependent on federal construction funds and will not be forthcoming in the absence of adequate appropriations. Recently, the appropriations have fallen considerably below amounts authorized by Congress.

The Commission believes that the number of medical school entrants or their equivalent should be increased from the 10,800 estimated for 1970-71 to about 15,300 by 1976 and to about 16,400 by 1978. The desired increase of 5,600 new places—52 percent—for medical school entrants by 1978 can be achieved in three ways:

- 1 If all existing medical schools shifted from four- to three-year programs between the B.A. and M.D. degrees by 1973-74, as suggested subsequently in this report, the estimated number of places for new students could be increased, without incurring construction costs, by about 4,500 more entrants by 1976-77—31 percent more than estimated for the latter year.
- 2 Existing schools can also add new places by physical expansion. The smaller and developing schools in particular may be expected to increase their average class size to at least 100 and, in some cases, to 200 or more. With physical expansion of present schools, places for new entrants could easily be increased by at least 8 to 13 percent, and potentially by much more.
- 3 Establishment of nine recommended new schools will provide perhaps 900 to 1,350 new places for entrants, an additional increase of 8 to 13 percent.

Thus acceleration of instruction and physical expansion of existing and developing schools can increase new places by 39 to 43 percent, and new schools can provide the balance in realizing a 52 percent increase in new places for medical school entrants. Some experts argue that expansion should be confined to existing medical schools—on the ground that expanding existing institutions is less costly than building new ones. However, the statistical evidence does not altogether support this view, since expansion of existing schools has frequently required the replacement of old, outmoded buildings at high cost. Moreover, the Commission believes that new university health science centers are needed to achieve adequate geographic distribution of such facilities. The case for broad geographic distribution rests primarily on the role we envisage for university health science centers in improving the quality of health care in the areas in which they are located. They will play an important role in augmenting the supply of health manpower in their areas, in part through their power to attract house officers (interns and residents) who are likely to practice there later, and in part through the role we believe they should play in stimulating and guiding the training of allied health personnel in nearby comprehensive colleges, community colleges, and high schools. However, in view of the interstate mobility of medical school graduates, broad geographic distribution of M.D.-candidate education may not in itself lead to a more even geographic distribution of physicians per capita. Financial and nonfinancial incentives to encourage physicians to practice in deficit areas are also likely to be needed.

The American Medical Association and the Association of American Medical Colleges have also called for rapid expansion of medical school entrant places and have been helpful in providing the Carnegie Commission with recent unpublished data on medical school expansion. The joint AMA-AAMC statements on health manpower of March 5, 1968, and April 16, 1968, are included in Appendix A.

The Commission recommends that the number of medical school entrants should be increased to 15,300 by 1976 and to 16,400 by 1978. Toward the end of the 1970s, the question of whether the number of entrant places should continue to be increased will need to be reappraised. The expansion in the number of medical school entrants should be accomplished through an average expansion of about 39 to 44 percent in existing and developing schools by 1978, with nine new schools accounting for about 900 to 1,350 entrant

places, adding another 8 to 13 percent. The number of dental school entrants should be increased at least to 5,000 by 1976 and to 5,400 by 1980.

We also recommend that all university health science centers consider the development of programs for the training of physician's and dentist's associates and assistants, where they do not exist, and that, wherever feasible, such programs be initiated forthwith. The Commission recommends, also, that in developing their plans for expansion, university health science centers should adopt programs designed to recruit more women and members of minority groups as medical and dental students.

In addition, the Commission recommends the conversion of schools of osteopathy to schools of medicine, wherever feasible.

THE ROLE
OF
UNIVERSITY
HEALTH
SCIENCE
CENTERS

The Commission believes that university health science centers should be responsible for the education of health care personnel and for cooperation with other community agencies in improving the organization of health care delivery. These centers should cooperate with comprehensive colleges, community colleges, and high schools in planning and evaluating training programs for allied health workers who will be educated in these institutions. An important function of the university health science centers, in cooperation with professional associations in their areas, should be continuing education for all health manpower occupations.

All university health science centers need not conform to a single model. Some will continue to be leading centers for biomedical research, but even though every center needs a research program to fulfill its educational function, not all of them should seek to develop extensive research programs. Medical and dental students do need to understand research procedures and methods, however, so that they will be prepared as practitioners to interpret reports on new research and so that they will have a thorough understanding of the contributions of research (as well as an understanding of its limitations) to improved practice.

Some university health science centers, like Case Western Reserve, will be leaders in curriculum reform and innovation (40). Others, like Harvard and Johns Hopkins (which are also leaders in research), will develop community experiments in health care delivery and financing systems. But all will need to broaden their faculties to include social scientists who have the training to analyze the social and economic aspects of medical and dental care.

Both the education and research programs of medical and dental

schools need to be broadened to include concern with needed improvements in health care delivery and with changes occurring in patterns of health care—such as group practice and prepaid health plans. This will require closer relationships between the health science centers and social science departments on main university campuses as well as with organizations and individuals in local communities.

Many of the most important innovations in the delivery of health care have been developed outside the universities by such agencies as the Kaiser Foundation on the West Coast, the Health Insurance Plan of Greater New York, and similar organizations. Closer relationships between university health science centers and these organizations would be highly desirable. Indeed, it is highly important that a genuine two-way relationship develop between university science centers and the communities adjacent to them. The health science centers can be a significant influence for improving the quality of health care and health manpower education in an area but should also be *responsive* to ideas and suggestions developed by community groups.

In the past, university health science centers and their parent universities have not considered improvement of the quality of health care in their areas as *primary goals*. We are pleased to note that several medical schools have recently taken important steps in this direction. America's land-grant institutions have been responsible for remarkable advances in agriculture and the quality of rural life. Although they now tend to be philosophically remote from such a concept, university health science centers could well play a similar role in urban life. Social concern, especially among students, favors this attitude, so the time may be right for university health science centers to meet the challenges of helping communities develop model health care systems throughout the nation.

Every health science center should encompass university activities related to the education of physicians, dentists, and other health professions. It should be capable of handling the most complex and sophisticated medical problems. It should serve as the coordinating hub and reservoir of expertise for a system of institutions that may include area health centers, neighborhood health centers, rural clinics, hospitals, group practice organizations, and medical societies.

Although teaching hospitals affiliated with university health science centers will perform important activities of the centers,

there is no need for a teaching hospital to be owned by a health science center. In fact, a center that is not involved in the complex problems of owning a teaching hospital will have advantages over those that do.

The Commission recommends that university health science centers should be responsible, in their respective geographic areas, for coordinating the education of health care personnel and for cooperation with other community agencies in improving the organization of health care delivery. Their educational and research programs should become more concerned with problems of health care delivery and the social and economic environment of health care. All new medical and dental schools should be parts of university health science centers, and, wherever feasible, existing separate medical and dental schools should likewise become parts of university health science centers.

ACCELERATION OF MEDICAL AND DENTAL EDUCATION

Many experts on medical and dental education believe that the entire period of education, especially for the medical students, is much too long. It is costly for the students, costly for the schools, and costly for agencies that provide student support.

The Commission believes that acceleration efforts are essential and structures its recommendations for federal aid in this report to stimulate it in medical and dental education. At the same time, we believe that a broad liberal arts education is essential for professionals in the health field and do not favor acceleration at the *expense* of an adequate liberal arts background. Consideration should be given, however, to the fact that students typically enter college today with more high school preparation in the humanities and the social sciences than was true several decades ago. They are also exposed to television and other communications media from an early age and tend to be far more aware of social, political, and economic problems than was formerly the case.

There are a number of ways in which the length of medical education could be reduced. These include: (1) straightforward revision of the curriculum for M.D. and D.D.S. candidates so that the required courses could be completed in a three-year period; (2) provisions for advanced standing for students entering with extensive pre-medical or predental preparation; (3) providing instruction for M.D. and D.D.S. candidates during all or part of the summer; (4) reducing the total number of years required for premedical and medical

education combined or for pre dental and dental education combined; and (5) eliminating the internship year, which is now indistinguishable from a residency year, since it also involves specialization. The American Medical Association approved elimination of the internship in June, 1970. Effective July 1, 1975, no internship will be approved unless it is integrated with a residency.

If all medical schools were to move from a four-year to a three-year program between the baccalaureate and M.D. degrees, the size of each class could be increased by nearly one-third without increasing the total number of students enrolled at any one moment of time and without requiring additional physical facilities. Since the training would be more intensive, additional faculty members would still be required, but substantial savings would nevertheless be possible. Nearly two-thirds of the construction costs needed to achieve a 52 percent increase in new student places if the four-year programs were continued would be saved by program acceleration. There might also be savings of up to one-third in operating expenses. Institutional cost per students would decrease by about one-third, and a similar reduction in the total amount needed for student assistance would be possible. Clearly, also, the students' loss of foregone earnings would be reduced, and the supply of physicians and dentists could be increased more rapidly if the total duration of the students' education could be reduced.

Savings may also be realized by accelerating programs during the residency period, but they will not be as dramatic as those effected in the years between the B.A. and M.D. and D.D.S. degrees.

Accelerated programs of medical education are in effect at Case Western Reserve, the University of Minnesota, the University of Nebraska, the Medical College of Ohio (Toledo), Ohio State, Temple, the University of Texas (Galveston), and the University of Washington. Dartmouth and Michigan State are shifting from a two-year program, after which a student has been obliged to transfer to a four-year medical school, to a program in which an M.D. can be obtained in three years. At Stanford, where the curriculum is individualized and highly flexible, it is possible for a student to graduate in considerably less time than the conventional four years. Yale also has an individualized and flexible curriculum. The California College of Medicine at the University of California, Irvine, is one of three medical schools now beginning freshmen classes in July, rather than September, in order to accelerate the medical

training program. Other acceleration programs are under consideration.

A proposal for pronounced acceleration has been developed at the University of Michigan but not as yet adopted. Premedical and medical education would be treated as an integrated unit, with a substantial reduction in the number of years required to obtain both the baccalaureate and M.D. degrees. Students completing the first few years of the program would have the option of shifting to one of a number of biological fields rather than going on to the clinical portion of the program (41).

The Commission recommends that all universities with health science centers develop plans for accelerating premedical and medical education. The Commission also recommends that plans be developed for shortening the total duration of predoctoral and dental education where it is unnecessarily prolonged. We particularly favor a program calling for three years (instead of four) after the B.A. to obtain the M.D. or D.D.S. and a three-year residency (instead of the typical four years of internship and residency).

**INTEGRATION
OF THE
CURRICULUM**

A number of universities have adopted or are developing plans for restructuring preprofessional and professional education in the health sciences. The plans differ somewhat in their objectives, but several of them would result in acceleration of premedical and medical education as well as in consolidation of all instruction in the basic sciences on main university campuses.

The Michigan proposal, discussed above, emphasizes integration of the premedical and medical curricula along with a sharp reduction in the total duration of premedical and medical education.

Harvard and the Massachusetts Institute of Technology are considering a proposal for a joint Harvard-M.I.T. School of Health Sciences and Technology, offering a program emphasizing courses in human biology and leading to a master's degree. Graduates would be qualified to enter medical school or to go on for a Ph.D. in the biological sciences, in the natural sciences, or in engineering as these subjects relate to biology, or in the social sciences as they relate to health, and to enter appropriate levels of teaching (42).

The Illinois Board of Higher Education recently approved a plan for reorganization of the College of Medicine at the University of Illinois, which, among other changes, would establish two types of schools: (1) schools of basic medical sciences at the Medical Center

campus in Chicago and at the university's Urbana-Champaign campus and (2) schools of clinical medicine. The schools of basic medical sciences will promote basic knowledge and understanding of sciences relevant to preparation for careers in dentistry, medicine, nursing, pharmacy, and associated medical fields. It is anticipated that the typical basic science curriculum for medical students will be one year in duration.

The schools of clinical medicine would offer students transferring from the basic science schools a three-year curriculum to complete the work for the M.D. degree (43). One of the clinical schools would include the regular faculty and clinical departments of the present College of Medicine based at the University of Illinois hospital in Chicago. Thus the structure of medical education would resemble that in Britain, where instruction in the basic sciences is given at Oxford, Cambridge, and other universities, followed by clinical instruction in hospitals in London and elsewhere. Plans are being developed for the establishment of a second school of clinical medicine in the Chicago area. Additional clinical schools in Peoria and Rockford are now in the development stage (Appendix B, Table 1).

A somewhat similar plan has been in effect at Indiana University for some time.

These plans, in differing ways, involve integration of instruction in the basic sciences in a program which could lead to entry into medical school for clinical instruction in what has conventionally been the second or third year of the M.D. candidate's education or could lead to work for the Ph.D. in biological or other sciences related to health. The Michigan proposal would treat premedical and medical education as an integrated curriculum.

At the University of California School of Medicine, San Diego, the academic master plan allocates some medical school faculty positions to other campus departments for individuals whose scientific interests are related to medicine and human biology. These departments occupy space in the School of Medicine and in return accept teaching responsibilities within the medical curriculum. The curriculum is divided roughly into the first, or basic sciences, year; the second, or medical sciences, year; the third, or clinical sciences, year; and a fourth year of electives. But integration of instruction in the basic and clinical sciences is sought by including clinical correlatives in the first two years and basic science correlatives in the last two years (44, p. 64).

An obvious advantage of shifting instruction in the basic sciences

out of the medical schools and on to main university campuses is the probable increase in overall student-faculty ratios in premedical and medical education in the basic sciences that would result. Medical schools tend to have very low student-faculty ratios, averaging 3.9 students per full-time faculty member in 1968, if all M.D. candidates and postgraduate medical students are included, and 1.6 students per full-time faculty member if only M.D. candidates are included (45, pp. 1558 and 1561). These ratios may be compared with an overall ratio for higher education of about 13 full-time-equivalent students per full-time-equivalent faculty member, but it must be kept in mind that the overall ratio includes community colleges, where faculty members are not engaged in research. In universities, and especially in medical schools, many faculty members spend a good deal of time on research. The ratio of graduate students to faculty in universities generally would be more nearly 6 or 8 to 1.

Objections have been raised to some of these proposals on the ground that they would conflict with a trend toward integration of instruction in the basic and clinical sciences and would not meet the strong desire of many medical and dental students for contact with patients early in their medical or dental education. However, if the plan involves integration of preprofessional and professional education, with an appreciable shortening of the period preceding clinical instruction, this objection is less valid. It would also appear to be less valid if the basic sciences program involves emphasis on human biology, as in the Harvard-M.I.T. proposal. In addition, opportunities can be created for early clinical experience through part-time or summer jobs for medical and premedical students in university health science centers and area health education centers.

However, in view of the various conflicting considerations, some universities are considering experimenting with variations of this type of change. The Johns Hopkins School of Medicine, for example, is giving consideration to transferring some, but not all, of the training in the basic sciences to the main university campus.

Also under consideration at Hopkins is the "possibility of creating a College of Medical Sciences that would take in at an earlier age all those interested in the health sciences. A broadly oriented core base of varying complexity and subsequent multiple-track options would allow final differentiation of nurses, radiobiologists, research scientists, and physicians" (46, pp. 32-33). This general concept is receiving increasing attention and needs more emphasis

in the health manpower curricula of comprehensive colleges and community colleges as well as in universities. Among other things, it might help to reverse the current trend toward proliferation of professional health workers' associations defined, like the traditional craft unions, on a narrow specialty basis.

The Commission believes, also, that as medical and dental curricula are reformed and accelerated, there is a strong case for awarding a master's degree at an appropriate stage, probably following completion of the basic science curriculum, as proposed for Harvard and MIT.

However, the student who receives a master's degree or completes the program at an existing two-year medical school, such as the schools at Brown University and the University of Hawaii, sometimes has difficulty in being admitted to another medical school to complete his M.D.-candidate program. The Commission believes that such two-year schools should be converted to provide full M.D.-candidate education as soon as possible and that no new two-year medical schools should be established unless they lead on to M.D.-candidate education within the same university system.

In connection with the integration of university curricula in the health sciences, the Commission also believes that new schools of public health should be parts of university health science centers and that existing schools of public health should become parts of health science centers wherever feasible. With their emphasis on the prevention of disease, public health programs would contribute to greater emphasis on prevention within the health science centers.

The Commission recommends that all universities with health science centers, and especially those developing new centers, consider plans for (1) greater integration of preprofessional and professional curricula, (2) increasing the student's options so that basic training in health-related sciences can lead on to training for a variety of health-related professions as well as medicine and dentistry, (3) awarding a master's degree at the end of this basic training period, and (4) integrating instruction in the basic sciences on main university campuses if this can be accomplished without major costs associated with the shift, without interfering with integration of basic science and clinical science instruction, and without delaying the opportunities for students to have early contact with patients.

In addition, the Commission recommends that existing two-year

medical schools that do not lead on to M.D.-candidate education within the same university system be converted to provide full M.D.-candidate education as soon as possible and that no new two-year schools of this type be established.

The Commission also recommends that new public health schools be made parts of university health science centers and that existing public health schools become parts of such centers as soon as possible.

The Commission recommends that new university health science centers consider providing clinical instruction in selected hospitals on the British model.

**OTHER
CURRICULUM
REFORMS**

The Commission believes that many of the reforms in medical and dental education increasingly being sought by students deserve serious consideration. Students are calling for more flexible admission standards to bring in applicants with varied educational and cultural backgrounds. They want students to be represented on admissions committees and to be given more opportunities than they now have to influence the curriculum. They believe that a larger proportion of the curriculum should be elective and that there should be more chance for independent study activities and individualized instruction. And, as previously mentioned, they are calling for early contact with patients and for more carefully integrated relationships between basic science and clinical instruction so that abstract parts of the curriculum become more meaningful in relation to the treatment of individual patients. They seek less compartmentalized instruction and more emphasis on comprehensive medicine, with the patient viewed as an individual in a family and in an environmental situation that may have an important bearing on his condition.

In addition, the Commission believes that medical students should be given more training than they now receive in the problem of alcoholism and in the growing problem of drug addiction.

The Commission also believes that, along with abolition of the internship, as already suggested, many changes are needed in graduate medical education. The deficiencies in residency training were clearly identified in the report of the Citizens Commission on Graduate Medical Education, which stressed among other things the need for (1) a more carefully integrated program for the resident, (2) responsibility of the entire faculty, rather than of individual departments, for continuous planning and evaluation of residency

programs, and (3) the establishment of a permanent commission on graduate medical education for the purpose of planning, coordinating, and periodically reviewing standards for graduate medical education (47). There is also a need for providing a broader educational experience for the resident. In the teaching hospital, he tends to see acutely ill individuals, frequently with unusual conditions. He also needs experience that would come from periods spent in community hospitals, neighborhood clinics, convalescent facilities, and, where feasible, in doctors' offices.

The Commission recommends that all university health science centers give serious consideration to curriculum reforms. Their admission policies should be made more flexible and their programs more responsive to the expressed needs of students. Greater emphasis should be placed on comprehensive medicine in both the M.D.-candidate program and in graduate medical education. In all phases of medical and dental education, including residency programs, there should be more careful integration of abstract theory and clinical experience. Residency programs should be planned and reviewed by the entire faculty, and residency training should include experience in community hospitals, neighborhood clinics, and other facilities, as well as in teaching hospitals.

**THE
LOCATION OF
NEW
UNIVERSITY
HEALTH
SCIENCE
CENTERS**

The Commission believes that there should be a university health science center in every metropolitan area with a population of 350,000 or more, except for those areas which can benefit from the impact of centers that already exist in other geographically convenient communities. The Commission has identified eight metropolitan areas of at least this size and an additional metropolitan area, Duluth-Superior, with a population falling somewhat below 350,000, in which we believe university health science centers should be established (Table 4). Duluth-Superior is located so far away from the nearest medical school (in Minneapolis-St. Paul) that its needs cannot be adequately served without a university health science center of its own. Moreover, a university health science center in the Duluth-Superior area would serve large parts of northern Minnesota, Wisconsin, and Michigan.

Not included in Table 4 are 27 communities, many of them with a population of 350,000 or more, that have medical schools in the development stage. These developing schools are included, along

TABLE 4
Carnegie
Commission
goals for new
university health
science centers
by 1980 (not
including
medical schools
in development
in 1970)

<i>Standard metropolitan area</i>	<i>Estimated population, July 1, 1967 (in thousands)</i>	<i>Percentage increase in population, 1960-1967</i>
<i>Phoenix, Arizona</i>	859	29.5
<i>Norfolk-Portsmouth, Virginia</i>	646	11.7
<i>Springfield-Chicopee-Holyoke, Mass.*</i>	557	4.6
<i>Jacksonville, Florida</i>	505	10.8
<i>Wilmington, Del.-N.J.-Md.</i>	481	16.0
<i>Tulsa, Oklahoma</i>	451	7.8
<i>Fresno, California</i>	416	13.6
<i>Wichita, Kansas</i>	396	3.7
<i>Duluth-Superior, Minn.-Wis.</i>	273	-1.4

*Metropolitan state economic area.

SOURCE U.S. Bureau of the Census, *Current Population Survey Population Estimates*, ser P-25, no. 411, Washington, D.C., 1968; and American Medical Association, *Medical Education in the United States, 1968-1969*, Chicago, 1969. Information on medical schools that have begun development since publication of the latter volume has been supplied by the Council on Medical Education of the AMA.

with existing university health science centers and recommended new health science centers, on Map 1 and in Appendix B, Table 1.

The Commission recognizes that plans are being formulated for new medical schools in some of the communities in Table 4 as well as in other communities not included. However, we believe that, for communities with populations below 350,000, the area health education centers suggested in the following section would be a more appropriate solution.

The Commission also recognizes that local initiative is desirable, and usually essential, in planning for a new university health science center. In the absence of local initiative, it may be difficult to develop centers in the nine communities we have identified.

The Commission recommends the development of nine new university health science centers.

THE ROLE
OF AREA
HEALTH
EDUCATION
CENTERS

In some parts of the country the distances between university health science centers are likely to be very great, as in the sparsely populated mountain states. Elsewhere, concentration of people in congested urban areas would overwhelm the facilities of even the larg-

est health science center. In both types of areas there should be "area health education centers," which would provide facilities for patient care, often on a referral basis from surrounding areas; educational programs for house officers and, to some extent, for M.D. candidates who could rotate through an area health education center from a university health science center; clinical experience for allied health students; and continuing education programs for health manpower.

These area health education centers, in essence, would be satellites of the university health science centers and would be visited on a regular basis by the faculty of the health science centers with which they were affiliated. Their educational programs would be developed and supervised by the health science faculty, and their patient care functions would rely on the expertise of the health science center personnel. The area centers in turn would provide assistance and counsel to the community and neighborhood health care facilities, including the private practitioner.

There are examples of existing institutions, including the Mary I. Bassett Hospital in Cooperstown, New York, which are serving such functions in their areas. In a somewhat different category is the Mayo Clinic in Rochester, Minnesota, if only because its reputation is such as to draw referral patients from all over the country. It trains about 700 residents in every specialty, is affiliated with the University of Minnesota Medical Center, and is developing plans for an M.D.-candidate program.

There are other examples of cooperative efforts to raise the quality of care in areas remote from university health science centers. These include Bingham Associates, centered in Boston, but carrying out field work throughout Maine; the Duke Foundation, which has funded a program to improve the quality of care in rural hospitals in North Carolina and South Carolina for 35 to 40 years; and a system of cooperative hospitals in the state of Wisconsin.

The nucleus of an area health education center would be a hospital, usually a community hospital, but perhaps in some cases a Veterans' Administration hospital. The house officers at the hospital would receive instruction from the faculty of the medical school with which the center was affiliated, in most cases on a visiting basis, but there would be a need for a small group of faculty members permanently located in the center to plan and administer both the educational programs for the house officers and continuing education programs for physicians and other health workers in the

surrounding area. M.D. and D.D.S. candidates would receive part of their clinical instruction in such centers on a rotating basis. Within the hospital, or adjacent to it, there would have to be office space for faculty members and other administrators of the educational programs as well as classrooms. Like the university health science centers, the area centers should cooperate with comprehensive colleges and community colleges in the area in planning curricula for allied health workers.

The functions of area health education centers would be as follows:

- 1 To maintain a community hospital of outstanding quality, many of whose patients would be admitted on a referral basis from smaller communities in the surrounding area
- 2 To conduct educational programs under the supervision of the faculty of the university health science center with which the area center is affiliated
- 3 To have these educational programs include
 - a Residency programs
 - b Clinical instruction for M.D. candidates and D.D.S. candidates who would come there from the university health science center on a rotating basis
 - c Clinical experience for students in allied health programs
 - d Continuing education programs for health manpower in the area, conducted in cooperation with local professional associations
- 4 To provide guidance to comprehensive colleges and community colleges in the area in the development of training programs for allied health professions
- 5 To cooperate with hospitals and community agencies in the planning and development of more effective health care delivery systems
- 6 To conduct limited research programs concerned primarily with the evaluation of health care delivery systems

In some of the sparsely settled states, area health education centers would have to be affiliated with university health science centers in neighboring states with larger populations. These ar-

rangements should be worked out on a regional basis, as suggested below in the section on regional planning.

The Commission recommends the development of area health education centers in areas at some distance from university health science centers which do not have sufficiently large populations to support university health science centers of their own, and in a few metropolitan areas needing additional training facilities but not full health science centers. These area centers would be affiliated with the nearest appropriate university health science center and would perform somewhat the same functions recommended for university health science centers, except that the education of M.D. and D.D.S. candidates would be restricted to a limited amount of clinical education on a rotational basis, and research programs would be largely restricted to the evaluation of local experiments in health care delivery systems.

THE
LOCATION OF
AREA HEALTH
EDUCATION
CENTERS

In developing its suggestions for the location of area health education centers, the Commission has carefully considered the following criteria: (1) distance from an existing university health science center, a developing center, or a recommended new health science center; (2) the population of the community and its surrounding area; and (3) the objective of providing for enough area centers so that no portion of a state or region would be remote from such a center. Nevertheless, in sparsely populated states the centers would inevitably have to be farther apart than in more thickly populated states.

The Commission believes that the final selection of locations for area health education centers should be based on careful regional planning. We are therefore *suggesting* the locations indicated by our analysis but are not firmly *recommending* them. However, we believe that the number of centers indicated by our analysis is probably quite close to the number that would be needed to provide adequate geographic distribution of such centers.

In addition to the criterion of geographic distribution, we have also applied a criterion of at least one university health science center or area health education center for every 1,500,000 persons in the larger metropolitan areas. On this basis, we are recommending the development of five area health education centers in the Los Angeles metropolitan area, one in the San Francisco-Oakland

metropolitan area (in the East Bay), two in Detroit, one in Pittsburgh, and one in the New York metropolitan area.

The Commission is suggesting, in all, 126 locations for new area health education centers, indicated on Map 2 and listed in Appendix B, Table 1. The appendix table indicates where there is a Veterans' Administration (V.A.) hospital that is not affiliated with a medical school in a community for which an area health education center is suggested. However, the Commission does not believe V.A. hospitals would be appropriate as nuclei for area health education centers unless their policies were changed to permit the admission of patients of all types instead of veterans only. Under present policies, their patients are almost exclusively male and tend to be older persons suffering from long-term disabilities.

As the population grows and the centers develop, there may well be a case for converting some of these proposed area health education centers into university health science centers in the future.

We estimate that, if our recommendations for new university health science centers and suggestions for area health education centers are carried out, by 1980 about 95 percent of the population will be within no more than an hour's traveling time from a university health science center or an area health education center.

The Commission recommends the development of 126 new area health education centers, to be located on the basis of careful regional planning.

7. *Financial Support and the Federal Government*

The Carnegie Commission believes that medical and dental education are critically underfunded and that greatly increased financial support is required to bring about (1) the development of a sufficient and effective supply of physicians and dentists and their associates and assistants, (2) equality of opportunity to enter these health professions, (3) effective use of educational resources, (4) regional dispersion of health manpower educational institutions, (5) equitable distribution of the cost burden, and (6) adaptation of health manpower education to changing patterns of health care delivery.

To achieve these objectives will require that the federal government play a major role in the financing of health manpower education. The federal government collects about two-thirds of all tax revenues and is in a position to rely much more heavily on the personal and corporate income taxes than is feasible for state and local governments. Its tax structure is more equitable and more income-elastic, yielding revenues that rise relatively more rapidly than the GNP, whereas the sources of revenue generally available to state and local governments are less equitable and less income-elastic. Thus, as the economy expands, the federal government is in a much better position to increase its expenditures on public services.

Furthermore, as a result of the adoption of the Medicare and Medicaid programs, the federal government is now far more heavily involved in the financing of health care than ever before. Yet these programs are placing a major strain on the nation's inadequate supply of health manpower and health care facilities. There is the additional consideration that states with low per capita incomes encounter serious difficulty in providing the substantial funds needed for expansion of health manpower education, although, with their limited capacity to attract M.D.'s educated elsewhere,

many of these states have developed more medical student places relative to their needs than some of the states with high per capita income.

The case for major federal financing is particularly strong in relation to M.D. candidates. Less than half of the graduates of United States medical schools are practicing in the state in which they received the M.D. degree, whereas well over half of those receiving residency training tend to practice in the state where they received that training (25). In other words, there is no very direct relationship between a state's investment in the education of M.D. candidates and the social return to the state. In view of this, there is considerable reluctance on the part of state governments to expand investment in the education of M.D. candidates. At the house officer level, the social return to the state can be more clearly demonstrated. This is also true of the education of allied health personnel, who are likely to be employed in the state in which they received their training.

Experimental programs for the training of physician's associates and assistants, though of much shorter duration, cost as much per student per year as the education of M.D. candidates, particularly in the early stages when classes are very small (35 and 38). Programs for dental assistants are also costly, partly because of the expensive equipment that must be used. Thus, if we are to expand the number of physician's and dentist's associates and assistants rapidly enough to have an appreciable impact on the productivity of physicians and dentists, a substantial federal contribution toward the cost of these programs is required. The federal aid for such programs and their students recommended in this report is confined to university health science centers or separate medical and dental schools. Programs for the training of physician's and dentist's assistants in comprehensive colleges and community colleges would be assisted by the federal aids to higher education recommended in the Commission's report *Quality and Equality: Revised Recommendations, New Levels of Federal Responsibility for Higher Education*.

In the years since World War II, the federal government has assumed major responsibility for providing funds for biomedical research. The Commission believes that this support should continue, but that the time has now come for an equally vigorous effort to expand the education of health manpower and to stimulate major changes designed to relate the future education of health manpower to probable changes in the delivery of health care.

Recently an HEW task force has called for direct federal aid to medical education and for the shifting of the responsibility for health manpower within the federal structure. On federal aid to medical education, the report said (48, p. 1):

Because of a traditional reluctance to directly involve the federal government in the financing of medical school education, desperately needed financial support has been funneled through research grants to medical schools. While biomedical and clinical research conducted by the medical schools has been of great value and is an important element in attracting outstanding scholars and researchers, it is frequently a counter-productive incentive to improving the efficiency and teaching aspects of medical education. Therefore, support of the educational function should be separate and distinct from support of the research function. A more direct approach, depending on stipends to both the student and the medical school, would help reduce the financial burden of medical education for the student and provide the medical schools with positive financial incentives to increase their productivity.

A particularly urgent problem is the plight of medical schools, chiefly private institutions, which are in grave financial difficulties. A total of 61 medical schools have been awarded Special Projects Grants by the federal government on the basis of some condition of financial distress (49, p. 2), and in July, 1970, a bill authorizing \$100 million in emergency aid to medical and dental schools "in financial distress" was passed by the Senate and sent to the House (50, p. 9).

The types of federal financial support recommended by the Commission include (1) student grants and loans, (2) institutional grants for educational expenses, (3) grants to university health science centers and university-affiliated area health centers for the advanced education of house officers, (4) grants and loans for construction, (5) start-up grants, (6) research grants, and (7) funds for manpower research and regional planning. The recommendations for grants to institutions are carefully designed to stimulate not only expansion of but also needed changes in health science education.

STUDENT GRANTS

In view of the high cost of medical and dental education, there is a particularly critical need for grants for students from low-income families who wish to undertake such education. The case for providing medical and dental education grants to students from low-income families also rests on the need to provide equal opportunity

to students who are members of minority groups, since there are indications that reluctance to incur indebtedness for the financing of education may be particularly prevalent among such groups.

In the light of the substantial financial return to the individual who invests in medical or dental education, it is sometimes argued that assistance to the medical or dental student should take the form exclusively of loans. The Commission does not fully support this position, in view of the psychological barriers to incurring indebtedness on the part of students from low-income families, an attitude that is undoubtedly explained in part by the tendency for low-income families to experience income instability.

In view of the high cost of medical and dental education, the Commission recommends a maximum grant of \$4,000 per year for medical and dental students, a larger amount than we have recommended for graduate students in higher education generally, partly because medical and dental students have less opportunity to work as teaching or research assistants. We do not agree with those who favor a maximum grant which would cover tuition at the individual's chosen school plus a subsistence allowance, on the ground that such a policy would encourage institutions to increase their tuition charges. As indicated below, the Commission believes that, in order to prevent an inflationary trend in tuition charges, university health science centers should be induced to adopt uniform tuition fees as a condition for the provision of federal cost-of-education supplements.

In determining the student's need, it will be necessary to derive a formula based on such factors as total family income over the past several years, total family assets, and the number and ages of children in the family. The income distribution of families with heads aged 45 to 54 is a more appropriate criterion for determination of the number of students potentially eligible for a grant than the income distribution of all families, since parents of medical and dental students are likely to be in that age group, and incomes of these families tend to be higher than those of families with younger or older heads. Median income for families with male heads aged 45 to 54 amounted to \$10,940 in 1968. The median incomes for the first and third quartiles were \$7,690 and \$12,240, respectively. The Commission assumes that a maximum grant would often be necessary for students from families with incomes falling within the lowest fourth of this income distribution and that partial grants would be available for those in the next fourth, with more lenient criteria for students from large families.

The Commission recommends a federal program of grants in amounts up to \$4,000 a year for medical and dental students from low-income families and for students from low-income families enrolled in associate and assistant programs in medical and dental schools.

STUDENT LOANS

Because medical education and dental education are expensive, and because medical education is exceptionally prolonged, only students from upper-income families are likely to be in a position to meet all the expenses of medical or dental education without the assistance of either grants or loans, and many students who are eligible for grants will also need to borrow funds. Indeed, a substantial percentage of all medical students now receive both grants and loans (25).

The Commission believes that the proposal for an Educational Opportunity Bank (EOB), as proposed by the report of the Panel on Educational Innovation to the U.S. Commissioner on Education and other federal officials (51) and by several independent economists, is particularly well suited to the financing of costs of medical and dental students. The returns to investment in education, especially for medical students, are high so that loan repayment obligations typically would not be burdensome. Under EOB proposals, a borrower would pledge a given percentage of his annual gross income for a fixed period of years after graduation. Thus, the amount repaid in dollars would vary directly with income. The plan would therefore involve an element of income redistribution and would provide a modest financial incentive for physicians and dentists to practice in areas where they could expect incomes below the average for their professions, since repayment obligations would likewise be lower.

The EOB would be a nonprofit agency established under the auspices of the federal government, with its capital made available by the United States Treasury through the sale of government bonds. The program would be administered through the institutions of higher education. There would be no income or means test as a condition of eligibility. Students could borrow a maximum amount equal to tuition plus a subsistence allowance (including dependents' allowances) plus necessary travel expenses for out-of-state students, *minus* any grant or fellowship stipends available to the student from any public or private source.

A medical student should be able to borrow funds for the full cost of his medical education in return for a pledge to pay 3 percent

of his medical earnings in each of his first 20 years of professional practice (52). The Commission suggests a 30-year repayment period, which would require a lower percentage of earnings.

Married women with children of preschool age would be excused from repayment obligations during this period if they worked half-time, as an incentive to encourage their participation in the labor force.

The Commission recommends an Educational Opportunity Bank for medical and dental students, including house officers, with repayment excused during periods of house officer training and during two years of military service.

**A NATIONAL
HEALTH
SERVICE
CORPS**

The Commission believes that a national health service corps should be developed to bring improved health care service to low-income and rural areas of the nation. The time is right for such a development. Medical students and other students in the health professions are increasingly interested in problems of delivery of health care to the poor, and many are motivated to participate in neighborhood clinics or other facilities in low-income areas. Furthermore, the Administration's policy of withdrawing troops from Vietnam should result in a decreased level of military need for physicians. The normal period of service in the corps would be two years.

As a financial incentive for service in the corps, in addition to modest compensation, the Commission believes that loan repayments should be excused during periods of service and that, in addition, 25 percent of the maximum indebtedness that a student is eligible to incur would be forgiven. This would mean that, for M.D.'s with only small amounts of indebtedness, the entire debt would be canceled.

The Commission recommends the development of a voluntary national health service corps. As an incentive for participation in the corps, an M.D. or D.D.S. would be excused from loan repayments during periods of service, and 25 percent of the maximum indebtedness he is eligible to incur would be forgiven.

**TUITION
POLICY**

One of the arguments against an EOB program is that institutions would be encouraged to raise their tuition charges, once a student could be certain of borrowing the full amount of his tuition. The Commission believes that, as a logical corollary to assumption of

major financial responsibility for the financing of medical and dental education by the federal government, a uniform tuition charge should be established for medical and dental education.¹ The charge would be adjusted from time to time to reflect changes in costs of education per student.

At present there are wide variations in tuition charges from institution to institution, but tuition charges tend to be quite high, particularly at private medical and dental schools. During the period 1957-58 to 1967-68, median tuition in public medical schools rose from \$500 to \$750, while median tuition in private medical schools rose from \$1,005 to \$1,920 (25). The federal aids proposed in this report would have the effect of making such wide variations unnecessary. Moreover, differentiation between residents and nonresidents of a given state would be inconsistent with the principle of major federal financing responsibility and with the goal of nationwide recruitment of students by the institutions and nationwide choice of institutions by the students.

In the absence of expanded federal aid, including the cost-of-instruction supplements recommended in this report, the trend toward higher tuition charges is certain to continue, especially in the private institutions. Somewhat ironically, also, the increases may have to be particularly large in the institutions that are in financial difficulties, since they tend to be especially dependent on tuition as a source of income.

If the student is required to pay high tuition over a prolonged period of M.D.- or D.D.S.-candidate education, it is readily apparent that the total cost is likely to be so high that many students will be faced with the unfortunate choice of abandoning medical or dental education or going very heavily into debt.² Yet for the institutions, the cost of both medical and dental instruction is very high. It is extremely difficult, however, to determine precise costs because the educational process is encompassed in a complex aggregate of teaching, research, and patient care functions. Yet the extent to which costs of research and patient care associated with the educational process are included in accounting of instructional costs

¹ The case for a uniform tuition charge is not as strong in other higher education programs, with the possible exception of education of Ph.D.'s, since the role of state governments in financing higher education is expected to be relatively greater than in the education of physicians, dentists, and Ph.D.'s, and states can be expected to vary greatly in their relative contributions to the cost of education for many years to come.

² Foregone earnings are also very high for medical and dental students, amounting to an estimated \$8,750 a year (54).

varies greatly among institutions. There is a need for more careful studies of these elements of costs for accurate determination of educational cost per student.

Not only are costs of instruction in medical and dental schools high, but they vary widely among schools. On the basis of data from a number of studies, they may amount to at least \$6,000 in a number of schools and exceed this amount in many, running as high as \$15,000 or \$16,000 in some of the leading medical schools. The Commission believes that tuition should represent only a relatively small proportion of this instructional cost and that the remainder should be met through federal support, state government support, and private endowment funds. The Commission is convinced that low tuition is likely to be more evenhanded in its impact than high tuition accompanied by a very complex package of grants and loans. Even if tuition is held to low levels, many students will have to meet the tuition charge through student aid and loans. All things considered, we suggest a uniform tuition charge of approximately \$1,000 a year.

It should be emphasized that the cost-of-education supplements recommended below far exceed any loss in tuition which university health science centers would experience as a result of this policy.

The shift to such a uniform tuition policy would have to take place gradually. An abrupt shift would disrupt existing relationships among institutions in their capacity to attract students. Moreover, provisions of state law and, in some cases, of state constitutions would have to be changed to permit uniform tuition fees for nonresidents and residents of a state. Thus the Commission believes that provisions of federal legislation directed toward requirement of a uniform tuition fee should not become effective until four years after the effective date of the legislation and that, in the interim, institutions should shift toward such a policy as rapidly as circumstances permit.

The Commission recommends a relatively low uniform national tuition policy for institutions providing medical and dental education.

**COST-OF-
INSTRUCTION
SUPPLEMENTS
TO
INSTITUTIONS**

To ensure not only maintenance of current effort but also expansion and change in health science education, the Commission believes that a substantial program of cost-of-instruction supplements per student should be undertaken by the federal government. This approach to financial assistance to institutions to aid in meeting

instructional costs is dependent upon the concept that *separate national funding* will continue to be provided for the research programs of these institutions and that patient care costs will be met, to a greater extent than at present in many teaching hospitals, by insurance or by such programs as Medicare and Medicaid.

Institutions would not, however, receive these instructional supplements automatically. The federal agency charged with the responsibility of administering the grants should negotiate with each institution to make certain that it is developing plans not only for the expansion of medical and dental education but also for their greater effectiveness and efficiency. In addition, the institution should be required to:

- 1 Use the funds for instructional costs and not for other purposes
- 2 Initiate the steps necessary for a gradual shift to the uniform tuition policy recommended above and for the elimination of admission requirements favoring residents of the state
- 3 Refrain from discrimination on the basis of race, creed, or sex and also pursue positive policies to encourage the admission of members of minority groups

In addition, the federal government should take into account whether each state is meeting its share of the costs in comparison with other states (Table 5, section 8).

Federal payments to institutions would be available in the following amounts:

- 1 An amount equal to the institutions' enrollment of students working toward the M.D. or D.D.S. or enrolled in a physician's associate or assistant program, multiplied by \$4,000. This amount is not by any means intended to cover the full instructional costs per student. As suggested above, these costs vary from an estimated \$6,000 to \$15,000 or \$16,000. The Commission believes, however, that the institutions should continue to receive part of their support for instructional costs from other public (state) or private sources.
- 2 In addition, an amount equal to that portion of the enrollment of students in the above programs in excess of enrollment in the fall of 1970, multiplied by \$4,000. These bonuses would be available for a total period of eight years following initiation of a substantial program of expansion by an institution, designed to achieve an increase of at least 20 percent in first-year student places within a

period of four years. Moreover, every institution should be expected to increase its average class size to at least 100.

Payment of the supplements would not begin until actual entry of additional students and would be based on the number of such entrants enrolled in a given year. If a university health science center had initiated a significant expansion plan for added student places at any time from 1967 through 1970, the bonuses would be available for the added students for the remainder of the eight-year period. The Commission believes that even though the expansion should be accomplished within a four-year period, higher costs would be incurred for as long as eight years—hence the stipulation that the bonuses should be available for eight years.

The amounts in 1 and 2 above should be adjusted for medical and dental schools with three-year programs to enable those schools to receive the same amount of institutional aid as they would if they were four-year schools. This adjustment should be made until about 1980 but then should be reviewed.

- 3 An amount equal to the total number of house officers in university health science centers and in university-affiliated hospitals or area health education centers, multiplied by \$2,250, provided that no individual house officer shall be counted for more than three years, and provided that a policy is in effect to encourage specialization in fields in which a shortage exists and discourage it in fields in which there is a surplus, such as surgery. These supplements should also be paid under the condition that the institution make an effort to reduce the duration of house officer education and make it more effective. As indicated above, the internship year is being eliminated in medical education, and the Commission believes that it should not be replaced by an *additional* year of residency.
- 4 As an incentive for *major* curriculum reform, additional cost-of-instruction supplements of \$2,000 a year per student enrolled in M.D.- or D.D.S.-candidate programs, in physician's or dentist's associate or assistant programs, and, under specified conditions, in the last year of premedical or pre dental programs, for up to three years. These bonuses would be available for the following types of changes:
 - a Introducing physician's or dentist's associate or assistant programs, with the bonuses to be available for such programs for a period of three years even if they had been initiated before the

effective date of the legislation, but only for the number of students enrolled in these programs

- b A program for major curriculum reform designed to provide greater efficiency, effectiveness, and flexibility in premedical and medical education or in pre dental and dental education, along the lines of proposals and plans discussed in the section on "integration of the curriculum" in this report

If the program is designed to achieve a reduction in the total duration of preprofessional and professional education, the number of bonuses would be based on the total number of students enrolled in M.D.- or D.D.S.-candidate programs and in the last year of preprofessional education. These bonuses would also be available for the number of postbaccalaureate students enrolled in integrated basic science programs designed to prepare a student to enter what is now the third year of a medical or dental school, as in the University of Illinois schools of basic sciences. The bonuses would not be provided for a program to reduce the length of M.D.- or D.D.S.-candidate education from four to three years without any other major change, since schools with three-year programs would be entitled to receive the same amounts under paragraphs 1 and 2 above as if they had four-year programs.

All the cost-of-instruction supplements recommended above would be based on the number of full-time-equivalent students rather than on the number of full-time students, as under the Health Manpower Act of 1968. This change would be designed to encourage schools to permit students to enroll on a part-time basis—a policy which might make it possible for some married women with young children to enter or complete their medical or dental education.

The Commission recommends (1) cost-of-instruction supplements to university health science centers for each medical and dental student enrolled; (2) bonuses for expansion of enrollment; (3) cost-of-instruction supplements to university health science centers and their affiliated hospitals for each house officer; and (4) bonuses for curriculum reform. The supplements and bonuses would also be available for each student enrolled in physician's and dentist's associate and assistant programs as well as for students in the last year of premedical or pre dental education if curriculum reform

is designed to achieve a reduction in the total duration of preprofessional and professional education.

CONSTRUCTION GRANTS AND LOANS

Construction funds should be allocated for new and expanding university health science and area health education centers and for renovation and replacement of existing buildings, with the federal government providing up to 75 percent of the total cost of construction in the form of grants and making available 25 percent in the form of loans, if the institution chooses to apply for a loan. These funds would also be available for separate medical or dental schools.³ The Commission believes that the present maximum federal contribution of 50 percent of construction costs is inadequate since institutions experience serious difficulty in obtaining the other 50 percent from public or private sources.

Since federal construction funds will inevitably be limited in relation to total sums involved in all applications, the allocations process should consider steps being taken by the institution to undertake curriculum reform, to implement the other policies recommended in this report, and to achieve maximum effectiveness and efficiency. Preference should be given to institutions that, among other things, plan new facilities involving innovations effecting lower building costs and more flexible interiors. In other words, the allocation process should encourage competition among institutions in meeting these objectives.

START-UP GRANTS

In view of the high costs associated with the developmental stage of a new university health science center and with the acquisition of land, especially in central city areas, the Commission believes that start-up grants should be made available for nonconstruction costs of new university health science centers. These funds should be provided for centers in the development stage by 1970 as well as for the nine new centers recommended for development during the 1970s. Funds would be made available from the time of issuance of a "certificate of reasonable assurance." As in the case of construction grants and loans, the start-up grants should be allocated on a competitive basis to ensure maximum effectiveness

³The construction grants and loans would be available for facilities which are primarily for teaching purposes but which might also be used for research purposes or for medical or dental library purposes, as provided by the Health Manpower Act of 1968.

and efficiency in the curriculum. The grants should not exceed \$10 million per center.

The Commission recommends (1) construction grants for university health science centers and area health education centers in amounts up to 75 percent of total construction costs, with the remaining 25 percent available in the form of loans; and (2) start-up grants for new university health science centers in amounts not exceeding \$10 million per center.

**SUPPORT OF
RESEARCH**

The Commission believes that a vigorous biomedical research program is essential for continued progress in combating disease and that it is an integral component of the process of medical and dental education. Our recommendations above for cost-of-instruction supplements to support this educational process are predicated on the continuation of federal support for biomedical research and for studies of the needed changes in health manpower education and in the delivery of health care.

It is the view of the Commission that the total amount provided to university health science centers for research by the federal government should be maintained at its current percentage of the GNP (0.042 percent). Changes in appropriations to reflect changes in the GNP should be made on the basis of a moving average of the total GNP in order to avoid abrupt or irregular shifts in amounts. Federal allocations for research should cover the full costs of research projects, since present requirements for institutional contributions frequently result in a diversion of funds from instructional and other expenses. The Commission recommends that not less than 10 percent and not more than 25 percent of the research grants to any university health science center take the form of institutional grants rather than grants for specific research projects.

The Commission recommends that federal financial support of research in university health science centers be maintained at its present percentage of the GNP; that funds should be made available to support research on methods of achieving greater efficiency in health manpower education and in the delivery of health care as well as for biomedical research; that federal allocations should cover the total cost of research projects, and that not less than

10 percent and not more than 25 percent of the research grants to any university health science center should take the form of institutional grants rather than grants for specific research projects.

**NATIONAL
AND
REGIONAL
PLANNING**

The Commission believes that existing federal legislation providing for regional, state, and local planning of health services should be strengthened and expanded. The legislation providing for Regional Medical Programs (Public Law 89-239 of 1965) was designed to ensure that the results of research relating to cancer, heart disease, strokes, and related diseases were made available in the treatment of the victims of these diseases. It provides funds for planning the expansion and improvement of appropriate treatment centers in existing hospitals and other health care facilities and for continuing education of physicians. The results have been encouraging in some parts of the country, although there is evidence that more progress has been made in relatively small communities and rural areas than in urban areas, especially in the ghetto areas of large cities (53). The legislation requires the representation of medical schools on regional advisory committees, and in a number of cases university medical centers have fiscal responsibility for the programs.

Also operating through state and local agencies is the Comprehensive Health Planning program authorized through Public Law 89-749 of 1966. The CHP agencies bring together at the state and local levels representatives of providers of medical care and of consumers to develop plans for filling gaps in available services and eliminating duplication and overlapping of services.

The Commission believes that existing legislation should be strengthened and expanded to provide for regional planning relating to (1) the location of health manpower educational institutions and (2) the expansion of and improvement in the delivery of all types of health care, including preventive care. One of the purposes of the strengthened legislation would be more adequate regional planning of appropriate locations for neighborhood health centers.

One of the most difficult concepts to comprehend is what constitutes a "region." . . . It is unfortunate that "geography" or boundaries should have played so dominant a role in the early discussions of what constitutes a region. Experience will indicate that a region can best be defined by reviewing the functional relationships that exist within any given area (55, p. 14).

The Commission believes that revised federal legislation should provide for studies designed to develop more appropriate identification of regions suitable for health planning. In sparsely populated areas of the country, a region might include several states. For example, under the auspices of the Western Interstate Commission on Higher Education, which includes all the Western states, a plan has been developed to design and implement a cooperative program to improve health care through medical education in the states of Idaho, Montana, Nevada, and Wyoming. Where such regional planning bodies in higher education already exist, they might well be incorporated in a federally supported regional health planning program, but other groups of sparsely settled states which have no such mechanism at present should be identified.

The strengthened regional planning legislation should also provide funds for broad programs of continuing education of physicians and other health personnel rather than the current limited programs for heart, cancer, and strokes. In fact, some of the regional planning bodies have developed programs that cover medical care more broadly. The Commission believes, also, that the present planning structure, comprising Regional Medical Programs, Comprehensive Health Planning agencies in the states, and separate provisions for the allocation of funds for hospital construction under the Hill-Burton Act is unduly complex. There should be a single group of regional planning agencies, which would develop plans in cooperation with state and local governments, university health science centers, area health education centers, and professional associations. Federal funds should be allocated to these regional planning bodies to cover 50 percent of the costs of continuing education programs, with the remainder to be met from other public and private sources, including professional associations. To the extent that costs are covered by fees paid by physicians and other health manpower personnel, they should be deductible from federal and state income taxes.

In connection with these regional planning activities, the university health science centers should have central responsibility for planning and coordinating all regional educational programs for health manpower, in cooperation with all the other agencies and institutions concerned, including professional associations. The central responsibility for planning changes in the delivery of health care, however, should be in the hands of regional agencies, in cooperation with state and local agencies, and with private institu-

tions, including group health plans. But there should be very close relationships between the university health science centers and the agencies responsible for problems of health care delivery. The goal should be adequate and effective delivery of health care in all parts of the nation as well as broad geographic distribution of health manpower educational institutions.

The Commission recommends the strengthening of existing federal legislation for regional, state, and local health planning to encompass regional planning of all health manpower education and health care facilities. The university health science centers, along with their affiliated area health education centers, should have central responsibility for the planning of health manpower education, while the central responsibility for planning changes in the delivery of health care should be in the hands of regional agencies, in cooperation with state and local agencies, as well as appropriate private institutions. Continuing education of health manpower should be a major concern of the university health science centers and area health education centers with federal funds providing 50 percent of the financial support of such programs.

RECERTIFICATION

In view of the rapid rate of progress of medical and dental knowledge and the associated problem of educational obsolescence of practicing physicians and dentists, the Commission recommends the development of national requirements for periodic reexamination and recertification of physicians and dentists. These functions should be carried out by specialty boards and other appropriate bodies, such as the Board of Family Physicians, which has adopted requirements for periodic reexamination and recertification. Among other advantages, such requirements would provide a powerful stimulus to participation in continuing education programs and to the expansion of existing efforts of professional associations to encourage continuing education.

The Commission recommends national requirements for periodic reexamination and recertification of all physicians and dentists by specialty boards and other appropriate bodies.

STUDIES OF HEALTH MANPOWER

The Commission believes that there is a critical need for continuous studies of growth and change in health manpower, analyses of future supply and demand and of the productivity of health manpower, and research on the development of new allied health

specialties. Present federal programs relating to health manpower research are seriously inadequate. Augmented funds should be provided for more comprehensive studies of health manpower, both within the federal government and through research grants to university health science centers and appropriate university research institutes. The program should be centered in the Department of Health, Education, and Welfare but should be conducted in close cooperation with the broader manpower studies of the Department of Labor.

The Commission recommends expansion and strengthening of the health manpower research programs in the Department of Health, Education, and Welfare, in cooperation with the Department of Labor, to encompass broad continuous studies of health manpower supply and demand. Research funds should be made available for specialized studies of these problems in university health science centers and appropriate university research institutes.

**A NATIONAL
HEALTH
MANPOWER
COMMISSION**

The Commission believes that the time has come for appointment of a National Health Manpower Commission to make a thorough study of changing patterns of utilization of health manpower, with particular reference to the development of new types of allied health personnel, including physician's and dentist's associates and assistants. The National Advisory Commission on Health Manpower submitted an extensive and authoritative report in 1967 (11), but its estimates of future supply and demand were limited to physicians, dentists, and nurses and were concerned only with the period to 1975. In view of the rapid development of training programs for various types of physician's assistants just in the last few years, an extensive and authoritative study of these programs and their future potential is needed, along with studies of the training and use of other novel types of allied health personnel.

The work of the proposed commission should include careful analysis of changing patterns of health care delivery, including the growth of prepaid health plans and group practice, and of the probable impact of various proposals for national health insurance on health care delivery. It should also encompass changes occurring in institutional arrangements for the education of health manpower, including the shift in the training of nurses and other allied health workers from hospitals to comprehensive colleges and community colleges.

The Commission also believes that the proposed commission should make a thorough study of existing problems in the licensing of health manpower personnel and should investigate the feasibility of a national licensing system. Such a national system might be developed under the leadership of the federal government but with the active participation of the American Medical Association, the Association of American Medical Colleges, the American Association of Universities, the American Dental Association, and the Association of American Dental Colleges as well as existing national certification bodies, such as the various medical specialty boards and the National Board of Medical Examiners. Professional associations in the allied health fields would also be involved.

The time has come not only for serious consideration of uniform national standards but also for the removal of barriers to interstate mobility of all health professionals, with a view to encouraging more effective adjustment of supply to demand in the various states.

The Commission recommends the appointment of a National Health Manpower Commission to make a thorough study of changing patterns of education and utilization of health manpower, with particular reference to new types of allied health workers, of changing patterns of health care delivery, and of the feasibility of national licensing requirements for all health manpower.

**ESTIMATED
COST OF
RECOM-
MENDED
FEDERAL AID**

The Commission's estimates of the cost of expanded federal financial support recommended in this report are as follows:

	<i>Assuming continuation of four-year M.D.- and D.D.S.-candidate programs (in millions of constant dollars)</i>	<i>Assuming that all schools shift to three-year programs by 1973-74 (in millions of constant dollars)</i>
1971-72	547.0	547 0
1972-73	635.8	635.8
1973-74	704 6	646 6
1974-75	770 9	623.9
1975-76	813 0	646.2
1976-77	857 5	671 7
1977-78	879 3	691 2
1978-79	908 1	719 3
1979-80	899 1	727 5

A breakdown of these costs is provided in Appendix B, Tables 3 and 4.

Total federal expenditures in 1969-70 for institutional support to medical and dental schools, scholarships and loans for medical and dental students, construction support for medical and dental schools, and Regional Medical Programs were approximately \$275 million. Thus the added cost of the federal aid recommended by the Commission would be about \$272 million in 1971-72.⁴

However, many of the Commission's recommendations would result in greater efficiency and, in the long run, a reduction in some types of federal support. Our cost estimates indicate substantial savings if all schools convert to three-year programs by 1973-74. Moreover, if this change should occur, there would be a case for discontinuation around 1980 of the policy of providing cost-of-education supplements to three-year schools *as if* they were four-year schools, since by that time the three-year programs would have been long established. In that case, there would be an additional saving in federal aid of about \$80 million in 1971-72 dollars. In practice, some schools are likely to accelerate their programs by conducting summer sessions, as at the University of California, Irvine, and in that case there would be no cost reduction and no case for reducing the number of cost-of-education supplements to be received by the institution.

Moreover, widespread conversion to three-year programs would facilitate more rapid expansion of entrant classes than our projections indicate, with the result that some of the savings might be offset by additional expansion costs. The Commission believes that this possibility serves to emphasize the need for continuing studies of demand and supply of physicians and dentists throughout the 1970s to determine whether even more rapid expansion of entrant places than we have recommended would be desirable.

⁴The increase would actually be slightly larger than this comparison suggests, since the federal government treats the entire amount of a loan obtained in a given year as an expenditure, whereas our estimates include only the interest paid by the federal government when it borrows funds for the loan program as a cost, because the loan funds are revolving funds.

8. *The Role of the States*

Although the Commission is recommending substantially expanded federal support for medical and dental education, it considers a strong element of financial support from the states to be of critical importance to the continued development and expansion of institutions providing education for physicians and dentists. The federal financial support which we have recommended will not by any means cover the full operational costs of medical and dental education, nor will it cover full construction or start-up costs. Moreover, the states have a crucial role to play in the support of house officer education and educational programs for allied health manpower.

Since the majority of students undertaking residency training remain to practice in the states where they received their training, as indicated above, it is decidedly in the interest of states to contribute to the construction and development of institutions where residents are to be trained, including university health science centers and area health education centers. Furthermore, medical residents will not be attracted to states in which their compensation will be low. Thus it is in the interest of the states to make certain that residents are adequately compensated, to the extent that their compensation is not fully covered by charges for patient care, including payments through insurance and public programs such as Medicare and Medicaid. By the time students graduate from medical or dental school, they are likely to be heavily in debt and anxious to avoid incurring additional indebtedness during their postgraduate education.

In the development and expansion of programs for the education of allied health workers, the states must be expected to play the major role. Increasingly education in these rapidly expanding and proliferating occupations is being provided in comprehensive colleges and community colleges. Although these institutions and their

students would benefit greatly from the expanded federal aid which the Commission has recommended in *Quality and Equality: Revised Recommendations, New Levels of Federal Responsibility for Higher Education*, we believe that the states should provide a substantial proportion of the financing of education in these colleges. Allied health workers, like house officers, tend to remain in the states where they were educated. Thus investment in their education provides a clearly demonstrable social return to the states.

In addition, the Commission believes that the states should provide financial support for private institutions involved in the education of health manpower. As indicated above, most of the medical schools that are encountering severe financial problems are private institutions. A number of them are parts of large urban universities which find that they cannot raise tuition sufficiently to meet rising costs.¹ Policies and criteria for state support for private institutions will be recommended in the Commission's forthcoming report *The Capitol and the Campus*.

The states should also play a very important role in the *planning* of health manpower education, in cooperation with the regional planning bodies and the universities. In some parts of the country, as suggested above, a regional conglomerate of several states may constitute a more rational planning entity than a state.

The variations in state financial support of medical and dental education are not only wide, but they also bear no rational relationship to differences in the financial capacity of the states (Map 3). This is strikingly revealed by a comparison of the ranking of the states in terms of expenditures on medical education per \$100,000 of personal income with their ranking in per capita income (Table 5). On this basis the 10 states with the lowest expenditures in relation to per capita income were Delaware, Connecticut, Illinois, Massachusetts, Nevada, Rhode Island, New Jersey, Maryland, New Hampshire, and California. All these states were in the upper half of states in terms of per capita income.

On the other hand, the states that ranked high in expenditures in relation to per capita income were all in the lower half of states in terms of per capita income, and some of them were among the states with the very lowest incomes. They were Arkansas, Ken-

¹ A study being conducted for the Commission by Dr. Earl F. Cheit will provide detailed information on the adjustments being made by a number of institutions in financial difficulties, including the discontinuation of some of their professional education programs.

TABLE 5
Ranking of
states in
expenditures
for regular
operating
programs of
medical schools
per \$100,000
personal income,
compared with
their ranking
in per capita
income, 1966*

<i>State</i>	<i>Ranking in expenditures (1)</i>	<i>Ranking in per capita income (2)</i>	<i>Difference (2) — (1)</i>
<i>Utah</i>	1	32	+31
<i>Vermont</i>	2	27	+25
<i>Kentucky</i>	3	42	+39
<i>Iowa</i>	4	18	+14
<i>West Virginia</i>	5	44	+39
<i>Louisiana</i>	6	40	+34
<i>Arkansas</i>	7	47	+40
<i>South Carolina</i>	8	46	+38
<i>Minnesota</i>	9	20	+11
<i>Mississippi</i>	10	48	+38
<i>Alabama</i>	11	45	+34
<i>Michigan</i>	12	11	— 1
<i>Oregon</i>	13	16	+ 3
<i>North Dakota</i>	14	36	+22
<i>Tennessee</i>	15	43	+28
<i>Washington</i>	16	8	— 8
<i>Texas</i>	17	31	+14
<i>Indiana</i>	18	12	— 6
<i>Nebraska</i>	19	22	+ 3
<i>Wisconsin</i>	20	17	— 3
<i>Ohio</i>	21	13	— 8
<i>Pennsylvania</i>	22	15	— 7
<i>South Dakota</i>	23	37	+14
<i>Colorado</i>	24	19	— 5
<i>New York</i>	25	4	—21
<i>Virginia</i>	26	28	+ 2
<i>California</i>	27	5	—22
<i>Georgia</i>	28	38	+10
<i>Kansas</i>	29	23	— 6
<i>Florida</i>	30.5	29	— 1.5
<i>Missouri</i>	30.5	21	— 9.5
<i>Oklahoma</i>	32	33	+ 1
<i>Maryland</i>	33	10	—23
<i>North Carolina</i>	34	41	+ 7
<i>New Jersey</i>	35	6	—29

State	Ranking in expenditures (1)	Ranking in per capita income (2)	Difference (2) - (1)
Wyoming	36	25	-11
Idaho	37	34	-3
Arizona	38	30	-8
Illinois	39	3	-36
Montana	40	26	-14
Maine	41	35	-6
Nevada	42	7	-35
Connecticut	43	1	-42
Massachusetts	44.5	9	-35.5
New Mexico	44.5	39	-5.5
New Hampshire	46.5	24	-22.5
Rhode Island	46.5	14	-32.5
Delaware	48	2	-46

*Expenditure data are averages for the academic years 1965 and 1966. Per capita income data are for 1966.

SOURCE Map 3 and *Statistical Abstract of the United States, 1967*, p. 327.

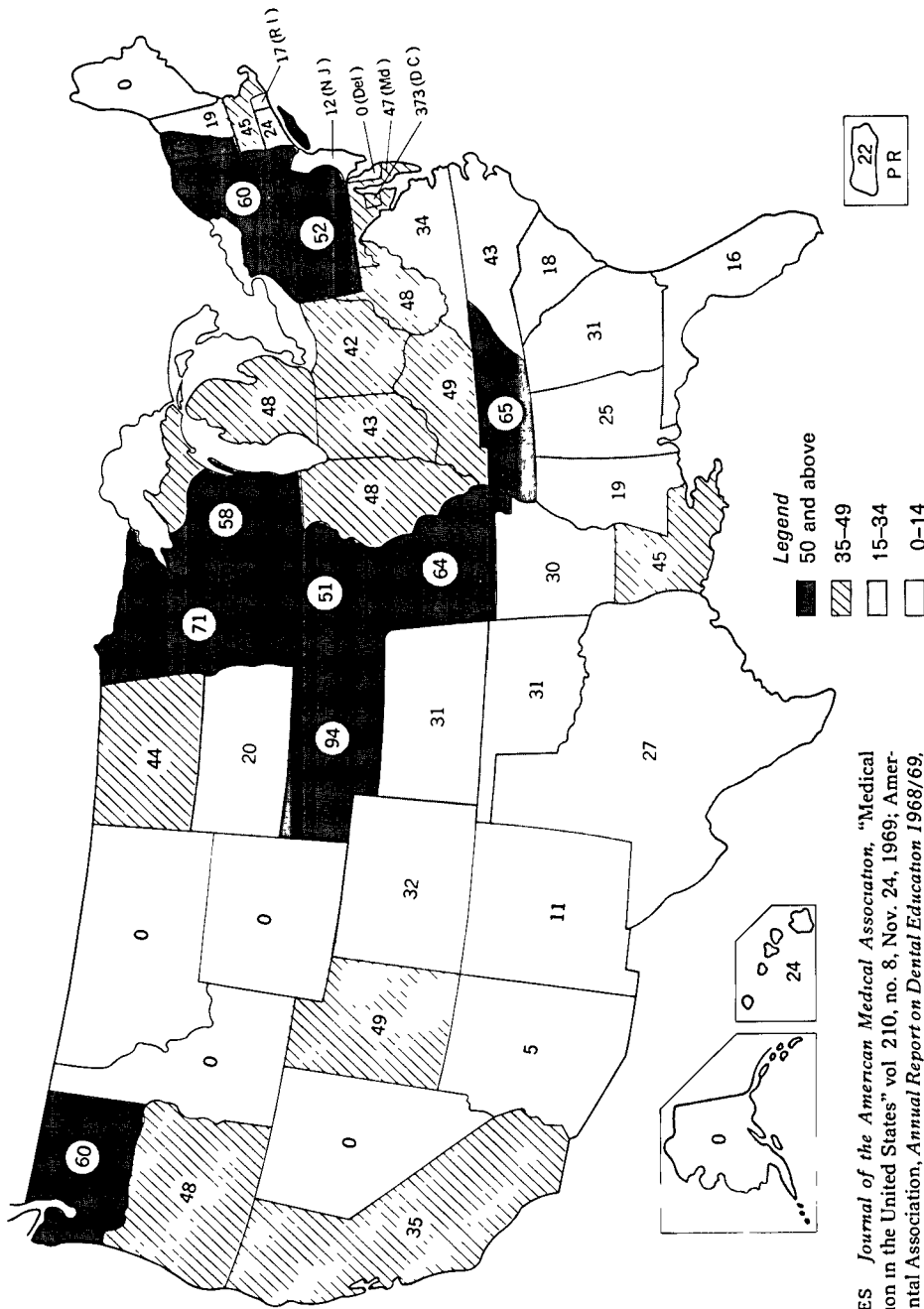
tucky, West Virginia, Mississippi, South Carolina, Alabama, Louisiana, Utah, Tennessee, and Vermont.

This odd and unusual set of relationships is partly, but not wholly, explained by the preponderance of private medical schools in the former group of states and of public medical schools in the latter. Of the 21 medical schools in the low-expenditure states in 1966, 14 were private, whereas, among the 14 medical schools in the high-expenditure states, 10 were public. Two of the low-expenditure states—Delaware and Nevada—had no medical school, although Nevada now has a developing school.

The ranking of the states in terms of medical and dental students (not including interns and residents) per 100,000 population differs appreciably from their ranking in terms of expenditures on medical education per \$100,000 personal income, although some of the states which rank high by the former measure also rank high by the latter (Map 4).² The 10 leading states on the basis of the former

²Medical students include M.D. candidates, postgraduate students in the basic sciences in medical schools, clinical fellows, and students in other health fields in medical schools in terms of equivalency to medical students with respect to faculty teaching responsibilities (45, p. 1561). Dental students include D.D.S. candidates; students in dental hygienist, dental assistant, and laboratory technician programs; and postgraduate dental students (32, pp. 12-13, 25).

MAP 4 Medical and dental students (other than interns and residents) per 100,000 population, by state, 1968



SOURCES *Journal of the American Medical Association*, "Medical Education in the United States" vol 210, no. 8, Nov. 24, 1969; American Dental Association, *Annual Report on Dental Education 1968/69*, part 1, *Statistical Abstract of the United States*, 1969, p. 12.

measure in 1968 were the District of Columbia (treated as a state for this purpose), Nebraska, Vermont, Tennessee, Missouri, New York, Washington, Wisconsin, Pennsylvania, and Iowa.

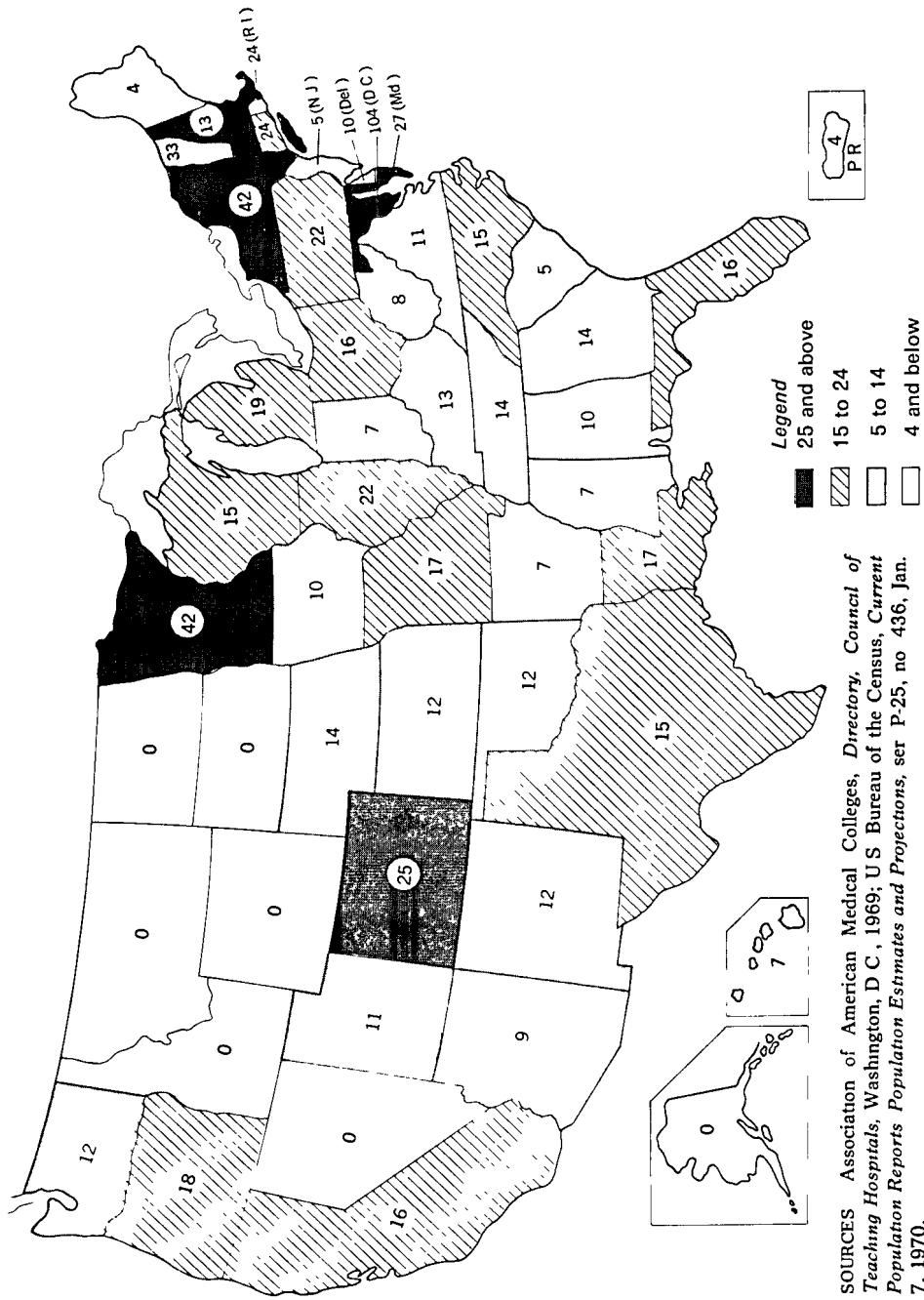
At the opposite end of the spectrum were the seven states without any medical or dental students—Alaska, Delaware, Idaho, Maine, Montana, Nevada (whose developing school had not yet admitted students), and Wyoming. Except in the case of Delaware, and Nevada, with its developing school, the Commission does not recommend new medical schools for these states because they lack cities or metropolitan areas with a population of at least 350,000. Instead, we are suggesting the development of area health education centers in these sparsely settled states.

One of the major functions of area health education centers, as previously suggested, would be the development of residency programs. There were seven states—Alaska, Idaho, Montana, Nevada, North and South Dakota, and Wyoming—that had no interns or residents in hospitals affiliated with medical schools in 1969 (Map 5). Other states that ranked very low in the number of interns and residents in affiliated hospitals per 100,000 population in 1969 were Maine, New Jersey, South Carolina, Arkansas, Indiana, Hawaii, Mississippi, West Virginia, Arizona, Alabama, and Iowa. Although some of these states had significant number of interns and residents in unaffiliated hospitals, most of them did not. The proportion of interns and residents in affiliated hospitals has been increasing rapidly, and, by 1968–69, 86 percent of all house officers who were United States medical graduates were in affiliated hospitals, while the proportion of foreign medical graduates in affiliated hospitals was somewhat smaller.

The states that lack interns and residents, or that have them in very small numbers, tend to be those with low per capita income. This is not, however, true of New Jersey, which ranked seventh in per capita income among the states in 1968.

Apart from the District of Columbia, which is unusually well endowed with medical schools in relation to its population, the states which had exceptionally large numbers of interns and residents in affiliated hospitals in relation to population were Minnesota, with its Mayo Clinic, and New York. Other states which ranked above the national average of 18 per 100,000 population were Vermont, Maryland, Massachusetts, Colorado, Connecticut, Rhode Island, Illinois, Pennsylvania, and Michigan—nearly all states with outstanding medical schools.

MAP 5 Interns and residents (M.D.'s) in hospitals affiliated with medical schools per 100,000 population, by state, 1969



The extremely uneven geographic distribution of interns and residents underscores the importance of the Commission's recommendation for the development of area health education centers, but in states with low per capita income special financial and nonfinancial incentives may also be required to attract residents to such centers and to induce them to remain in these states to practice later.

Our analysis of the geographic distribution of expenditures on medical education, of medical and dental students, and of interns and residents clearly indicates that a good many states have lagged seriously in support of medical and dental education. To the extent that these are states with low per capita income, this is understandable, but a number of the states with high per capita income have been seriously deficient in public support of medical and dental education. In some cases, as in Massachusetts, the deficiency is associated with the historical development of outstanding private institutions, but, as suggested above, many of the private institutions are now encountering serious financial problems and will require both federal and state support to maintain and expand their programs.

States with low expenditures should be expected to increase their contributions, particularly by supporting private medical schools, and the federal government, as noted above, should encourage them to do so as it negotiates levels of support.

Along with its recommendation for uniform tuition, the Commission also believes that medical and dental schools should be required to abolish state residency requirements and differential tuition for out-of-state students. Geographic considerations for admissions of students should not include preference for local residents; concern for a representative mixture from various regions of the United States and foreign countries should continue to be an important element of the educational experience.

The Commission recommends that states should continue to provide substantial financial support for medical and dental education and that states that have lagged in that past should plan for significant increases in expenditures for this purpose. The Commission recommends; also, that the states should provide financial support for medical and dental education in private institutions. In addition, the states should provide major financial support for house officer training and for the education of allied health personnel. The states, in cooperation with universities and with regional and local plan-

ning bodies, should also play a major role in the development of plans for the location of university health science centers, area health education centers, and comprehensive colleges and community colleges providing training for allied health personnel.

9. *The Role of the Universities*

Universities with affiliated health science centers should encourage these institutions to orient themselves toward assuming a central role in devising and supervising more coordinated and integrated health personnel education systems. They should also cooperate with other community bodies in the development of more effective systems of health care delivery. This will require major internal changes within the universities and their schools to enable them to increase greatly their public service role, develop new and more inclusive educational programs for health care personnel, and emphasize research on health delivery systems and medical sociology.

Among the responsibilities which they should undertake are:

- 1 To cooperate with other agencies in helping to develop more effective health care delivery systems in their communities and surrounding areas
- 2 To expand their medical and dental programs, to achieve acceleration and improved efficiency in these programs, and to introduce other curriculum reforms along the lines recommended in this report
- 3 To include medical economists, administration specialists, and behavioral scientists in their academic and service functions and to increase the educational emphasis in these fields as well as in preventive medicine and community health
- 4 To develop more effective integrated educational programs for the total health care team, including new specialties where needed, such as physician's associates and assistants, and to cooperate in the development of educational programs for allied health specialties conducted in comprehensive colleges and community colleges

- 5 To bring about a significant increase in continuing education programs for health care personnel in the area
- 6 To place greater emphasis on teaching as a rewarding scholarly activity for the faculty, especially in connection with salary and promotion policies
- 7 To undertake extensive research, in cooperation with appropriate university departments (economics, sociology, psychology, political science, etc.), on health care delivery systems

The university administration must, of course, play a major role in the development of plans for the expansion of university health science centers, working closely with regional and state planning agencies. In many cases, however, it is likely that the faculty and administration of the university health science centers will be oriented to research objectives to such an extent that they will not be prepared to expand the education and community planning roles of the centers in the manner envisaged in this report or to develop some of the new types of research recommended. Thus, it may be desirable in many universities to appoint a vice-president for health science affairs who will be concerned not only with plans for expansion but also with the changes in emphasis which the Commission envisages.

The university medical centers, moreover, are not organized administratively to undertake the broad roles that this report envisages for university health science centers. Without administrative reorganization, the result of any attempt to assume this expanded role might well be disastrous ineffectiveness. The Commission believes that universities should undertake careful study of this administrative problem and that in some cases the solution may well be a dual line of administration, with a dean in charge of academic programs and another administrator in charge of programs involving relations with other community agencies. In other cases, committees with specific functions may be more appropriate.

In their analyses of needed administrative changes, some of the very large universities may wish to consider the establishment of a separate advisory board for the university health science center and perhaps, in some cases, also for the teaching hospital, but the feasibility of such changes will vary among institutions.

Moreover, there is a need for much more careful integration of instruction in the biomedical sciences and in the social sciences

between the health science centers and the campuses of the universities. To a large extent, this integration should be accomplished, whenever feasible, through joint appointments of faculty members.

The Commission recommends that university administrations appoint appropriate officers to develop plans for the expansion of university health science centers and for their transformation to perform the broad educational, research, and community service functions recommended in this report. University administrations should also be actively involved in the planning of area health education centers. To accomplish these objectives will often require administrative changes in the university and in the health science center as well. Careful integration of instruction in the biomedical sciences and social sciences between university health science centers and departments on major university campuses should be achieved.



10. *The Role of the Comprehensive Colleges and Community Colleges*

The rapid expansion of demand for workers in the allied health professions is creating an increasing need for curricula designed to prepare young people for these professions in both four-year comprehensive colleges and two-year public community colleges. Some of these institutions have responded to the need by expanding existing programs and introducing well-planned curricula designed to provide training for the many new technical specialties in the health field. Elsewhere the response has been limited. As the Commission's report *The Open-Door Colleges: Policies for Community Colleges* pointed out, some of the states have taken vigorous steps to stimulate the development of such systems; elsewhere there has been little or no development of community colleges. Implementation of the Commission's recommendations for federal aid to higher education is essential if development of comprehensive colleges and community colleges is to be stimulated in the laggard states.

Just as the university health science centers and area health education centers must become increasingly involved in cooperating with the comprehensive colleges and community colleges in planning such curricula, so these colleges should welcome advice from the centers in developing their training programs in the allied health professions.

The Allied Health Professions Personnel Training Act of 1966 has provided expanded federal support for education in these critically important health fields and has contributed significantly to the development and expansion of allied health programs in comprehensive and community colleges (56).

The Commission recommends that comprehensive colleges and community colleges develop and expand their curricula in the

allied health professions where this has not been done and that they also seek and accept guidance from university health science centers and area health education centers in the planning and evaluation of these educational programs.

11. *The Role of the Foundations*

Some of the large private foundations have played an important role in providing financial support for medical education and research and in sponsoring studies of medical education. The Commission believes that the foundations should continue to give favorable consideration to proposals for this type of support and should also provide funds for research on health manpower and on problems in the delivery of health care. It is often more feasible for foundations to support studies or projects that are innovative or experimental than for government agencies to provide such support.

The Commission recommends that private foundations that have traditionally provided support for health manpower education and research should continue to do so and that foundations that have not provided such support in the past should consider expanding their programs to include it. The Commission also recommends that foundations expand their support for research on the delivery of health care.

12. *Carnegie Commission Goals To Be Achieved by 1980*

- Expansion of the functions of university health science centers so that they can play a central role in coordinating and guiding health manpower education and cooperating with other agencies in the development of improved health care delivery systems in their regions
- Development and expansion of programs for physician's and dentist's associates and assistants
- Acceleration of medical and dental education, thereby achieving greater efficiency
- Integration of the curriculum, including such changes as consolidation of instruction in the basic sciences on main university campuses, integration of preprofessional and professional education, and more carefully integrated and coordinated programs of post-graduate training
- Changes in medical and dental education so that they are more responsive to the expressed needs of students and more concerned with problems of delivery of health care
- A 50 percent increase in medical school entrant places
- Initiation of nine new university health science centers
- Positive policies to encourage the admission of women and members of minority groups to professional training in medicine and dentistry
- A 20 percent increase in dental school entrant places
- Development of approximately 126 area health education centers, affiliated with university health science centers

*Appendix A: Joint
Statements of the American
Medical Association and the
Association of American
Medical Colleges, March 5,
1968, and April 16, 1968*

**MARCH 5,
1968**

To meet national expectations for health services the enrollment of our nation's medical schools must be substantially increased. At a joint meeting held in Chicago on February 28, 1968, the representatives of the Board of Trustees of the American Medical Association and the Executive Council of the Association of American Medical Colleges emphasized the urgent and critical need for more physicians if national expectations for health services are to be realized.

National policy which would best meet this need and would be consistent with the American ideal of equal educational opportunity for all would provide such resources that every young person interested in and qualified for entry to the study of medicine would have this opportunity. Both Associations endorsed the position that all medical schools should now accept as a goal the expansion of their collective enrollments to a level that permits all qualified applicants to be admitted. As a nation, we should address the task of realizing this policy goal with a sense of great urgency.

In their endorsement of and call for broadening educational opportunity for the study of medicine, both Associations stressed that the length of time necessary to realize such a goal does not minimize the need to respond to today's critical shortage of physician manpower. In order to enable the nation's medical schools both to meet today's crisis and to attain the longer-range goal of

unrestricted educational opportunity, those responsible for allocation of resources must recognize the magnitude of these tasks.

There are both immediate and long range steps which should be taken. The immediate steps are:

- 1 To increase the enrollment of existing medical schools. Considering the time required to create new schools and to provide a student with a medical education there is no alternative to this step in meeting our present emergency.
- 2 To foster curricular innovations and other changes in the educational programs which could shorten the time required for a medical education and minimize the costs. In view of the increasing quality of preprofessional education and the growing competence of entering medical students, it should be possible to reduce the length of medical education without sacrificing quality. Also, as the amount of clinical experience provided medical students increases, the duration of internship and residency training should be reassessed. The process of educating a physician embraces the entire curriculum from high school through residency training.
- 3 To meet the need for innovation in educational programs and to encourage diversity in the character and objectives of medical schools. The development of schools of quality where a primary mission is the preparation of able physicians for clinical practice as economically and rapidly as possible is to be encouraged. Such schools may have less emphasis upon fundamental biologic research than is appropriate for a number of other schools.

A longer range approach to the need for physicians is the development of new medical schools. This approach will not solve our immediate, urgent need for more physicians, but it is essential for meeting the national needs of 1980 and beyond. The contribution of such schools to the total capacity of the medical education systems is important. The advantages of the organization of as many such centers of medical education and development through the country as consistent with strong programs should be kept in mind.

To implement the measures enumerated above will require adequate financial support from governmental and various private sources for:

- 1 Construction of facilities to expand enrollment of existing schools and to create new schools.

- 2 Support of the operational costs of medical schools.
- 3 Stimulation and incentive for educational innovation and improvement.

To implement these measures will further require that each medical school and its university reexamine its objectives, its educational program, and its resources to determine how it can contribute most effectively to the national need for more physicians and what financial help it will need to make this contribution. Also required is understanding by the public, the private foundations, industry, local and state governments, and the national Congress groups which must provide the financial support which is necessary.

Initiative for development of new schools and expansion of established institutions should be locally determined. Only the governing bodies of schools with ongoing programs in medical education can decide to expand such programs. Institutions wishing to organize new medical schools must assume the responsibility for marshalling the necessary support. Both Associations are prepared to lend any assistance they can to such efforts.

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Rising public expectations for health services and determination to upgrade quickly the health care of large segments of the population have created unprecedented demands for physician manpower. The public's challenge to medical education to respond by producing the necessary health manpower is clearly understood and has been accepted by the medical profession. At a second joint meeting of members of the AMA Board of Trustees and the Executive Council of the AAMC, these groups again expressed their determination to mobilize the support necessary for the medical schools to expand enrollments to desirable levels.

A medical college is a complex, multi-purpose enterprise with important obligations to various individuals, groups, organizations, and to society. It is impossible for a medical college to operate at a high level and to discharge these obligations without effective funding, planning, coordination, and control. Appreciation of the complexity of function and financing is necessary for any understanding of the fiscal predicament in which academic medical centers now find themselves.

At this time AMA and AAMC urge that increased emphasis be given to support of the educational component of academic medical

center activities with the intent that the production of physicians and other health personnel by such centers be assigned the highest possible priority. In their effort to mobilize support for medical education, AMA and AAMC leaders resolve to use all of their resources to achieve the desired results.

The problems of each academic medical center are unique to that institution. A blanket solution nationally designed and centrally imposed will not produce desired results. Rather, the interests and talents of governing boards, the magnitude and sources of assured support, the abilities and goals of faculties, the hopes and ambitions of students, and the influence of local, regional, and national attitudes must all go into determining in what fashion each academic medical center can make its optimal contribution.

A Increased Number of Graduates

1 Increased Enrollment

Each medical school is examining carefully what it can do. In September, 1968, about 200 more students will enroll in the first year classes of all existing medical schools than in the fall of 1967. By 1969 another increment of over 400 is expected. Incentives should be devised to assist those schools which elect to expand enrollment with increased construction funds and operating budgets.

2 More Medical Centers

In September, 1967, five new medical schools opened their doors, and in 1968 five others are expected to begin operation. Cities with a combination of population density, a strong undergraduate school, availability of adequate land, appropriate clinical facilities, and a reasonable source of financial support have been and should continue to be strongly encouraged when they seek to organize medical schools.

B Mobilization of Support

1 From Local Sources

The AMA is asking its field staff to highlight the urgency of the manpower question before county and state medical societies. These societies will be asked to form committees to marshal a response at city, county, and state levels

aimed at increased production of health manpower in both privately and publicly owned medical schools.

2 From Private Sources

Private sources—individuals, industries, and foundations—remain the largest contributors to the support of medical education. This fact must never be obscured by the prominence of federal and state tax support. Private support has allowed American medical education the flexibility which has made it strong. The AMA through its Education and Research Foundation and the AAMC in cooperation with the National Fund for Medical Education should join forces to convince industry and the foundations that it is in their vital interest to encourage diversity in the support of American medical education.

3 From the Federal Government

Federal support for the educational component of medical center activity should be further encouraged. The full sums of money authorized under existing legislation should be appropriated. Both AMA and AAMC have testified repeatedly and will continue to testify before both Senate and House committees during the coming year. Their testimony is virtually identical in request for support for medical education linked to increased enrollments. Passage of the Health Manpower Act of 1968, which provides for funding for construction, operation and educational innovation in medical centers, is being strongly advocated by both Associations.

C Other Specific Steps

In addition to the above-mentioned testimony before Congress for support of full appropriations for existing legislation, the call for passage of the Health Manpower Act of 1968, the development of local committees in state and county medical societies, and coordinated approaches to industry and other private sources, other measures are underway. Medical schools are (a) continuing to seek ways to enroll more students and to reduce dropout rates; (b) exploring methods for allowing entry into medical schools from many backgrounds, and at different levels; (c) organizing curricula which will permit progress through medical school at different rates; and (d) introducing

measures to increase the educational effectiveness and productivity of medical schools. The modern medical curriculum, a continuum which includes college, medical school and the internship and residency years, is being examined with the objective of achieving optimal investment of the time of each student and faculty member.

The AMA and AAMC will continue to lend all of their support to a national program encompassing the features outlined in this statement.

Appendix B: Tables

TABLE 1 *University health science centers and Carnegie Commission goals for new university health science centers and area health education centers by 1980, by state*

<i>State and city</i>	<i>Institution</i>	<i>Enrollment</i>		
		<i>MD candidates</i>	<i>Total</i>	<i>Population</i>
Alabama				
<i>Birmingham</i>	Medical College of Alabama	339	840	735,500*
<i>Mobile</i>	University health science center (developing)			383,200*
<i>Dothan</i>	Suggested area health education center			31,440†
<i>Huntsville</i>	Suggested area health education center			72,365†
<i>Montgomery</i>	Suggested area health education center (V A hospital).			134,393†
Alaska				
<i>Anchorage</i>	Suggested area health education center			44,237†
<i>Fairbanks</i>	Suggested area health education center			13,311†
Arizona				
<i>Tucson</i>	University of Arizona	63	79	212,892†
<i>Phoenix</i>	Recommended new university health science center			858,900*
<i>Flagstaff</i>	Suggested area health education center			18,214†
Arkansas				
<i>Little Rock</i>	University of Arkansas	395	723	318,800*
<i>El Dorado</i>	Suggested area health education center			25,292†
<i>Fort Smith</i>	Suggested area health education center			52,991†
California				
<i>Davis</i>	University of California	48	290	8,910†
<i>Irvine</i>	University of California	262	580	1,231,200*

TABLE 1 *University health science centers and Carnegie Commission goals for new university health science centers and area health education centers by 1980, by state continued*

<i>State and city</i>	<i>Institution</i>	<i>Enrollment</i>		
		<i>M.D. candidates</i>	<i>Total</i>	<i>Population</i>
<i>Loma Linda</i>	Loma Linda University	357	604	2,000†
<i>Los Angeles</i>	University of California	389	1,993	6,857,200*
	University of Southern California	289	1,474	6,857,200*
<i>Palo Alto</i>	Stanford University	327	927	959,200*
<i>San Diego</i>	University of California	47	230	1,198,100*
<i>San Francisco</i>	University of California	523	1,818	3,009,100*
<i>Fresno</i>	Recommended new university health science center (V.A. hospital)			415,700*
<i>Bakersfield</i>	Suggested area health education center			327,300*
<i>Redding</i>	Suggested area health education center			12,773†
<i>Santa Rosa</i>	Suggested area health education center			31,027†
<i>Los Angeles</i>	Five suggested area health education centers (V.A. hospital)			6,857,200*
<i>San Bernardino</i>	Suggested area health education center			1,085,900*
<i>San Francisco-Oakland</i>	Suggested area health education center (East Bay area)			3,009,100*
Colorado				
<i>Denver</i>	University of Colorado	360	982	1,089,800*
<i>Grand Junction</i>	Suggested area health education center			18,694†
<i>Pueblo</i>	Suggested area health education center			91,181†
Connecticut				
<i>Hartford</i>	University of Connecticut	32	56	793,400*
<i>New Haven</i>	Yale University	347	848	721,200*
<i>Bridgeport</i>	Suggested area health education center			772,700*
<i>Waterbury</i>	Suggested area health education center			107,130†
Delaware				
<i>Wilmington</i>	Recommended university health science center			481,000*
District of Columbia	Georgetown University	464	943	2,704,100*
	George Washington University	414	890	2,704,100*
	Howard University	393	899	2,704,100*

<i>State and city</i>	<i>Institution</i>	<i>Enrollment</i>		
		<i>M.D. candidates</i>	<i>Total</i>	<i>Population</i>
Florida				
<i>Gainesville</i>	University of Florida	246	622	29,701†
<i>Miami</i>	University of Miami	332	982	1,114,000*
<i>Tallahassee</i>	Florida State University (developing)			48,237†
<i>Tampa</i>	University of South Florida (developing Fall 1971)			891,000*
<i>Jacksonville</i>	Recommended new university health science center			504,600*
<i>Orlando</i>	Suggested area health education center			383,900*
Georgia				
<i>Atlanta</i>	Emory University	293	1,018	1,288,500*
<i>Augusta</i>	Medical College of Georgia	393	615	70,626†
<i>Columbus</i>	Suggested area health education center			116,779†
<i>Macon</i>	Suggested area health education center			69,764†
<i>Savannah</i>	Suggested area health education center			149,245†
Hawaii				
<i>Honolulu</i>	University of Hawaii (2-year school)	59	191	619,500*
<i>Hilo</i>	Suggested area health education center			25,966†
Idaho				
<i>Boise</i>	Suggested area health education center (V A. hospital)			34,481†
<i>Pocatello</i>	Suggested area health education center			28,534†
Illinois				
<i>Chicago</i>	Chicago Medical School	294	413	6,770,700*
	University of Chicago	289	939	6,770,700*
	University of Illinois	793	1,490	6,770,700*
	Chicago College of Osteopathy	301		6,770,700*
	Northwestern University	547	1,546	6,770,700*
	Loyola-Stritch School of Medicine	383	608	6,770,700*
	Rush Medical College (developing)			6,770,700*

TABLE 1 *University health science centers and Carnegie Commission goals for new university health science centers and area health education centers by 1980, by state continued*

<i>State and city</i>	<i>Institution</i>	<i>Enrollment</i>		<i>Population</i>
		<i>M.D. candidates</i>	<i>Total</i>	
<i>Carbondale-Springfield</i>	University of Southern Illinois (developing)			97,941†
<i>Peoria</i>	University of Illinois (developing)			103,162†
<i>Rockford</i>	University of Illinois (developing)			126,706†
<i>Champaign-Urbana</i>	Suggested area health education center			76,877†
<i>East St Louis</i>	Suggested area health education center			81,712†
Indiana				
<i>Indianapolis</i>	Indiana University	857	1,857	1,041,600*
<i>Evansville</i>	Suggested area health education center			141,543†
<i>Fort Wayne</i>	Suggested area health education center (V A hospital)			161,776†
<i>Gary</i>	Suggested area health education center			602,800*
<i>South Bend</i>	Suggested area health education center			271,400*
<i>Terre Haute</i>	Suggested area health education center			72,500†
Iowa				
<i>Des Moines</i>	College of Osteopathic Medicine and Surgery	348		208,982†
<i>Iowa City</i>	University of Iowa	494	1,311	33,443†
<i>Davenport</i>	Suggested area health education center			358,100*
<i>Sioux City</i>	Suggested area health education center			89,159†
<i>Waterloo</i>	Suggested area health education center			71,755†
Kansas				
<i>Kansas City</i>	University of Kansas	483	932	1,214,400*
<i>Wichita</i>	Recommended new university health science center	395	600	395,600*
<i>Dodge City</i>	Suggested area health education center			13,520†
<i>Salina</i>	Suggested area health education center			43,202†
<i>Topeka</i>	Suggested area health education center (V A. hospital)			119,484†
Kentucky				
<i>Lexington</i>	University of Kentucky	300	674	62,810†
<i>Louisville</i>	University of Louisville	367	761	795,000*

<i>State and city</i>	<i>Institution</i>	<i>Enrollment</i>		
		<i>M.D. candidates</i>	<i>Total</i>	<i>Population</i>
<i>Ashland</i>	Suggested area health education center			31,283†
<i>Paducah</i>	Suggested area health education center			34,479†
Louisiana				
<i>New Orleans</i>	Louisiana State University	510	830	1,059,100*
	Tulane University	506	1,015	1,059,100*
<i>Shreveport</i>	Louisiana State University, Shreveport School of Medicine (developing Fall 1969)			288,300*
<i>Lake Charles</i>	Suggested area health education center			63,392†
Maine				
<i>Bangor</i>	Suggested area health education center			38,912†
<i>Presque Isle</i>	Suggested area health education center			12,886†
<i>Portland</i>	Suggested area health education center			72,566†
Maryland				
<i>Baltimore</i>	Johns Hopkins University	373	1,046	1,990,000*
	University of Maryland	521	941	1,990,000*
<i>Cumberland</i>	Suggested area health education center			33,415*
<i>Hagerstown</i>	Suggested area health education center			36,660†
Massachusetts				
<i>Boston</i>	Boston University	306	880	3,249,800*
	Harvard Medical School	577	577§	3,249,800*
	Tufts University	458	1,044	3,249,800*
<i>Worcester</i>	University of Massachusetts School of Medicine (developing Fall 1970)			618,800*
<i>Springfield</i>	Recommended new university health science center			557,100*
<i>Pittsfield</i>	Suggested area health education center			57,879†
Michigan				
<i>Ann Arbor</i>	University of Michigan	807	2,601	67,340†
<i>Detroit</i>	Wayne State University	531	1,161	4,113,600*
<i>East Lansing</i>	Michigan State University	78	462	353,500*

TABLE 1 University health science centers and Carnegie Commission goals for new university health science centers and area health education centers by 1980, by state continued

State and city	Institution	Enrollment		Population
		M D candi- dates	Total	
<i>Pontiac</i>	Michigan College of Osteopathic Medicine	20		82,233†
<i>Detroit</i>	Two suggested area health education centers			4,113,600*
<i>Flint</i>	Suggested area health education center			476,800*
<i>Grand Rapids</i>	Suggested area health education center			514,300*
<i>Kalamazoo</i>	Suggested area health education center			82,089†
<i>Saginaw</i>	Suggested area health education center (V A. hospital)			98,265†
Minnesota				
<i>Minneapolis</i>	University of Minnesota	685	2,281	1,636,200*
<i>Duluth- Superior</i>	Recommended new university health science center			272,600*
<i>Rochester</i>	Mayo Clinic—existing area health education center			40,663†
<i>St Cloud</i>	Suggested area health education center			33,815†
Mississippi				
<i>Jackson</i>	University of Mississippi	319	587	144,422†
<i>Biloxi</i>	Suggested area health education center (V.A. hospital)			44,053†
<i>Greenville</i>	Suggested area health education center			41,502†
<i>Tupelo</i>	Suggested area health education center			17,221†
Missouri				
<i>Columbia</i>	University of Missouri	358	1,079	36,650†
<i>Kansas City</i>	University of Missouri, Kansas City School of Medicine (developing Fall 1971)	0	0	1,214,400*
	Kansas City College of Osteopathy and Surgery	446		1,214,400*
<i>Kirksville</i>	Kirksville College of Osteopathy and Surgery	421		13,123†
<i>St. Louis</i>	St. Louis University	461	781	2,311,400*
	Washington University	359	871	2,311,400*
<i>Springfield</i>	Suggested area health education center			95,865†

<i>State and city</i>	<i>Institution</i>	<i>Enrollment</i>		
		<i>MD candi- dates</i>	<i>Total</i>	<i>Population</i>
Montana				
<i>Billings</i>	Suggested area health education center			52,851†
<i>Butte</i>	Suggested area health education center			27,877†
<i>Miles City</i>	Suggested area health education center (V.A. hospital)			9,665†
Nebraska				
<i>Omaha</i>	Creighton University	302	423	514,600*
	University of Nebraska	365	602	514,600*
<i>Grand Island</i>	Suggested area health education center (V A. hospital)			25,742†
<i>Lincoln</i>	Suggested area health education center (V A. hospital)			128,521†
<i>North Platte</i>	Suggested area health education center			17,184†
Nevada				
<i>Reno</i>	University of Nevada (developing Fall 1971) (V A. hospital)			51,470†
<i>Las Vegas</i>	Suggested area health education center			64,405†
New Hampshire				
<i>Hanover</i>	Dartmouth Medical School (2-year school)	100	224	5,649†
<i>Berlin</i>	Suggested area health education center			17,821†
<i>Manchester</i>	Suggested area health education center			88,282†
New Jersey				
<i>Jersey City</i>	New Jersey College of Medicine and Dentistry	306	536	620,000*
<i>New Brunswick</i>	Rutgers Medical School (2-year school)	30	61	40,139†
<i>Newark</i>	New Jersey College of Medicine (campus under construction)			1,888,500*
<i>Atlantic City</i>	Suggested area health education center			59,544†
<i>Camden</i>	Suggested area health education center			117,159†
<i>Patterson- Clifton-Passaic</i>	Suggested area health education center			1,341,000*
<i>Trenton</i>	Suggested area health education center			114,167†

TABLE 1 *University health science centers and Carnegie Commission goals for new university health science centers and area health education centers by 1980, by state continued*

<i>State and city</i>	<i>Institution</i>	<i>Enrollment</i>		
		<i>MD candidates</i>	<i>Total</i>	<i>Population</i>
New Mexico				
<i>Albuquerque</i>	University of New Mexico School of Medicine	97	202	201,189†
<i>Gallup</i>	Suggested area health education center			14,089†
<i>Roswell</i>	Suggested area health education center			39,593†
New York				
<i>Albany</i>	Albany Medical College	284	997	710,200*
<i>Brooklyn</i>	State University of New York	770	1,471	11,555,900*
<i>Buffalo</i>	State University of New York	407	1,355	1,331,600*
<i>New York City</i>	Cornell University Medical College	353	826	11,555,900*
	Albert Einstein College of Medicine	402	1,204	11,555,900*
	Columbia University	499	1,612	11,555,900*
	Mt Sinai School of Medicine	59	2,003	11,555,900*
	New York Medical College	495	944	11,555,900*
	New York University	514	1,209	11,555,900*
<i>Rochester</i>	University of Rochester	308	809	838,900*
<i>Syracuse</i>	State University of New York	399	786	619,100*
<i>Stony Brook</i>	State University of New York (developing Fall 1971)	0	0	3,548†
<i>Cooperstown</i>	Mary I. Bassett Hospital—existing area health education center			2,553†
<i>Binghamton</i>	Suggested area health education center			301,100*
<i>New York City</i>	Suggested area health education center			11,555,900*
<i>Utica</i>	Suggested area health education center			349,500*
North Carolina				
<i>Chapel Hill</i>	University of North Carolina	287	1,080	12,573†
<i>Durham</i>	Duke University	333	1,023	78,302†
<i>Winston-Salem</i>	Bowman-Gray School of Medicine	226	437	582,000*
<i>Greenville</i>	East Carolina University (developing)			22,860†
<i>Asheville</i>	Suggested area health education center			60,192†
<i>Charlotte</i>	Suggested area health education center			378,000*
<i>Wilmington</i>	Suggested area health education center			44,013†

<i>State and city</i>	<i>Institution</i>	<i>Enrollment</i>		
		<i>M.D. candidates</i>	<i>Total</i>	<i>Population</i>
North Dakota				
<i>Grand Forks</i>	University of North Dakota (2-year school)	98	276	34,451†
<i>Fargo</i>	Suggested area health education center (V.A. hospital)			46,662†
<i>Minot</i>	Suggested area health education center			30,604†
Ohio				
<i>Cincinnati</i>	University of Cincinnati	407	882	1,361,000*
<i>Cleveland</i>	Case Western Reserve University	374	1,391	2,050,100*
<i>Columbus</i>	Ohio State University	611	2,262	859,600*
<i>Toledo</i>	Medical College of Ohio (developing Fall 1969)	0	0	670,700*
<i>Akron</i>	Suggested area health education center			660,000*
<i>Dayton</i>	Suggested area health education center			820,400*
<i>Lima</i>	Suggested area health education center			51,037†
<i>Mansfield</i>	Suggested area health education center			47,325†
<i>Youngstown-Warren</i>	Suggested area health education center			525,400*
Oklahoma				
<i>Oklahoma City</i>	University of Oklahoma	418	997	597,900*
<i>Tulsa</i>	Recommended new university health science center			451,400*
<i>Enid</i>	Suggested area health education center			38,859†
<i>Lawton</i>	Suggested area health education center			61,697†
Oregon				
<i>Portland</i>	University of Oregon	351	846	933,300*
<i>Eugene</i>	Suggested area health education center			50,977†
<i>Medford</i>	Suggested area health education center			24,425†
Pennsylvania				
<i>Hershey</i>	Pennsylvania State University	88	104	6,851†
<i>Philadelphia</i>	Hahnemann Medical College	432	731	4,774,400*
	Jefferson Medical College	717	1,093	4,774,400*

TABLE 1 *University health science centers and Carnegie Commission goals for new university health science centers and area health education centers by 1980, by state continued*

<i>State and city</i>	<i>Institution</i>	<i>Enrollment</i>		
		<i>M D. candi- dates</i>	<i>Total</i>	<i>Population</i>
	Temple University	552	887	4,774,400*
	University of Pennsylvania	520	1,380	4,774,400*
	Woman's Medical College	237	342	4,774,400*
	Philadelphia College of Osteopathic Medicine	461		4,774,400*
<i>Pittsburgh</i>	University of Pittsburgh	388	924	2,386,100*
<i>Allentown- Bethlehem- Easton</i>	Suggested area health education center			525,500*
<i>Altoona</i>	Suggested area health education center (V A. hospital)			69,407†
<i>Erie</i>	Suggested area health education center (V.A hospital)			138,440†
<i>Reading</i>	Suggested area health education center			290,600*
<i>Pittsburgh</i>	Suggested area health education center			2,386,100*
<i>Scranton- Wilkes-Barre- Hazleton</i>	Suggested area health education center			579,000‡
<i>York</i>	Suggested area health education center			311,900*
Puerto Rico				
<i>San Juan</i>	University of Puerto Rico	268	584	225,000†
<i>Mayaguez</i>	Suggested area health education center			83,850†
<i>Ponce</i>	Suggested area health education center			99,000†
Rhode Island				
<i>Providence</i>	Brown University (2-year school)	20	313	749,100*
South Carolina				
<i>Charleston</i>	Medical College of South Carolina	326	599	69,925†
<i>Columbia</i>	Suggested area health education center (V A hospital)			97,433†
<i>Greenville</i>	Suggested area health education center			66,188†
South Dakota				
<i>Vermillion</i>	University of South Dakota (2-year school)	86	132	6,102†

<i>State and city</i>	<i>Institution</i>	<i>Enrollment</i>		
		<i>M.D. candidates</i>	<i>Total</i>	<i>Population</i>
<i>Rapid City</i>	Suggested area health education center			42,399†
<i>Sioux Falls</i>	Suggested area health education center			65,466†
Tennessee				
<i>Memphis</i>	University of Tennessee	738	1,362	760,500*
<i>Nashville</i>	Meharry Medical College	278	379	531,100*
	Vanderbilt University	227	709	531,100*
<i>Chattanooga</i>	Suggested area health education center			299,000*
<i>Knoxville</i>	Suggested area health education center			393,500*
Texas				
<i>Dallas</i>	University of Texas Southwestern	411	1,068	1,404,800*
<i>Galveston</i>	University of Texas Medical Branch	606	945	67,175†
<i>Houston</i>	Baylor University	351	857	1,787,600*
	University of Texas Medical School (developing Fall 1971)			1,787,600*
<i>San Antonio</i>	University of Texas Medical School	105	265	834,000*
<i>Lubbock</i>	Texas Technological University (developing)			128,691†
<i>Amarillo</i>	Suggested area health education center (V A. hospital)			137,969†
<i>Beaumont</i>	Suggested area health education center			315,500*
<i>Corpus Christi</i>	Suggested area health education center			292,400*
<i>El Paso</i>	Suggested area health education center			348,300*
<i>Fort Worth</i>	Suggested area health education center			657,700*
<i>Odessa</i>	Suggested area health education center			80,338†
Utah				
<i>Salt Lake City</i>	University of Utah	259	661	189,454†
<i>Cedar City</i>	Suggested area health education center			7,543†
Vermont				
<i>Burlington</i>	University of Vermont	232	462	35,531†
<i>Rutland</i>	Suggested area health education center			18,305†

TABLE 1 *University health science centers and Carnegie Commission goals for new university health science centers and area health education centers by 1980, by state continued*

State and city	Institution	Enrollment		
		MD candi- dates	Total	Population
Virginia				
<i>Charlottesville</i>	University of Virginia	319	697	29,427†
<i>Richmond</i>	Medical College of Virginia	451	1,037	508,500*
<i>Norfolk- Portsmouth</i>	Recommended new university health science center (V A. hospital nearby at Hampton)			646,400*
<i>Roanoke</i>	Suggested area health education center			97,110†
Washington				
<i>Seattle</i>	University of Washington	334	1,940	1,261,600*
<i>Spokane</i>	Suggested area health education center (V.A. hospital)			266,300*
<i>Walla Walla</i>	Suggested area health education center			24,536†
<i>Yakima</i>	Suggested area health education center			43,284†
West Virginia				
<i>Morgantown</i>	West Virginia University	250	667	22,487†

*Estimated population of Standard Metropolitan Statistical Areas, 1967, from U.S. Bureau of the Census, *Current Population Reports Population Estimates*, ser. P-25, no 411, Washington, D.C., 1968.

†Population of urban place, from *U.S. Census of Population, 1960*

‡1967 population of Wilkes-Barre-Hazleton, plus 1960 population of Lackawanna County, of which Scranton is the county seat.

§ Interns, residents, and other postdoctoral students were not reported.

<i>State and city</i>	<i>Institution</i>	<i>Enrollment</i>		
		<i>M.D. candidates</i>	<i>Total</i>	<i>Population</i>
<i>Charleston</i>	Suggested area health education center			87,796†
<i>Parkersburg</i>	Suggested area health education center			44,797†
Wisconsin				
<i>Madison</i>	University of Wisconsin	403	1,307	126,706†
<i>Milwaukee</i>	Marquette University	412	1,001	1,342,400*
<i>Eau Claire</i>	Suggested area health education center			37,987†
<i>Green Bay</i>	Suggested area health education center			62,888†
<i>Wausau</i>	Suggested area health education center			31,943†
Wyoming				
<i>Casper</i>	Suggested area health education center			38,930†
<i>Cheyenne</i>	Suggested area health education center (V.A. hospital)			43,505†
TOTAL ENROLLMENT		35,833	89,195	

SOURCE: American Medical Association: *Medical Education in the United States, 1968-69*, Chicago, 1969, pp. 1467 and 1560-1561. Identification of locations of recommended university health science centers and area health education centers is based on analyses by the Carnegie Commission staff. Enrollment data are for 1968-69, and developing medical schools with no enrollment figures had not admitted any students by that time.

TABLE 2
Enrollment in
dental schools,
United States,
fall, 1968

<i>State</i>	<i>Institution</i>	<i>Total enrollment, 1968*</i>
<i>Alabama</i>	University of Alabama	258
<i>California</i>	University of the Pacific	304
	University of California	364
	University of California at Los Angeles	295
	University of Southern California	518
	Loma Linda University	334
<i>Connecticut</i>	University of Connecticut	17
<i>District of Columbia</i>	Georgetown University	428
	Howard University	353
<i>Georgia</i>	Emory University	318
<i>Illinois</i>	Loyola University of Chicago	513
	Northwestern University	417
	University of Illinois	458
<i>Indiana</i>	Indiana University	567
<i>Iowa</i>	University of Iowa	340
<i>Kentucky</i>	University of Kentucky	237
	University of Louisville	261
<i>Louisiana</i>	Louisiana State University	30
	Loyola University, New Orleans	248
<i>Maryland</i>	University of Maryland	402
<i>Massachusetts</i>	Harvard University	76
	Tufts University	481
<i>Michigan</i>	University of Detroit	448
	University of Michigan	552
<i>Minnesota</i>	University of Minnesota	343
<i>Missouri</i>	Saint Louis University	192
	University of Missouri at Kansas City	582
	Washington University	217

*Includes D.D.S. candidates and students in dental hygienist, dental assistant, and laboratory technician programs and in postgraduate dental studies.

<i>State</i>	<i>Institution</i>	<i>Total enrollment, 1968*</i>
<i>Nebraska</i>	Creighton University	192
	University of Nebraska	263
<i>New Jersey</i>	Fairleigh Dickinson University	299
	New Jersey College of Dentistry	181
<i>New York</i>	Columbia University	250
	New York University	908
	State University of New York at Buffalo	319
<i>North Carolina</i>	University of North Carolina	291
<i>Ohio</i>	Ohio State University	805
	Case Western Reserve University	261
<i>Oregon</i>	University of Oregon	378
<i>Pennsylvania</i>	Temple University	654
	University of Pennsylvania	693
	University of Pittsburgh	573
<i>South Carolina</i>	Medical College of South Carolina	47
<i>Tennessee</i>	Meharry Medical College	151
	University of Tennessee	484
<i>Texas</i>	Baylor University	512
	University of Texas	528
<i>Virginia</i>	Medical College of Virginia	319
<i>Washington</i>	University of Washington	420
<i>West Virginia</i>	West Virginia University	297
<i>Wisconsin</i>	Marquette University	641
<i>Puerto Rico</i>	University of Puerto Rico	174
TOTAL		19,193

SOURCE: American Dental Association, *Annual Report on Dental Education, 1968-69*, part 1, Chicago, 1969.

TABLE 3
Estimated cost of federal aid for medical and dental education,* assuming continuation of four-year program, 1971-72 to 1979-80 (in millions of constant dollars)

Year	Student grants	Student loans	Cost-of-instruction supplements	Construction grants
1971-72	64.6	2.0	329.8	75.6
1972-73	69.8	4.0	369.7	117.3†
1973-74	75.6	6.2	411.1	136.7
1974-75	82.4	9.2	450.2	154.1
1975-76	87.1	11.9	486.0	153.0
1976-77	91.7	14.7	524.1	152.0
1977-78	96.1	17.5	564.0	141.7
1978-79	100.1	21.5	598.4	128.1
1979-80	103.1	23.2	618.7	94.1

*Does not include federal aid for biomedical research, which was included in the estimated cost of federal aid recommendations in *Quality and Equality Revised Recommendations, New Levels of Federal Responsibility for Higher Education*

† Includes \$10 million a year for expansion of area health education centers from 1972-73 on.

SOURCE Carnegie Commission staff

TABLE 4
Estimated cost of federal aid for medical and dental education* assuming that all schools shift to three-year programs by 1973-74, 1971-72 to 1979-80 (in millions of constant dollars)

Year	Student grants	Student loans	Cost-of-instruction supplements	Construction grants
1971-72	64.6	2.0	329.8	75.6
1972-73	69.8	4.0	369.7	117.3†
1973-74	73.9	6.1	406.1	85.5
1974-75	75.1	8.2	432.7	32.9
1975-76	73.7	10.3	454.3	32.9
1976-77	71.4	12.2	478.5	34.6
1977-78	74.8	14.2	505.8	36.4
1978-79	77.6	16.2	529.1	36.4
1979-80	79.8	18.3	533.0	36.4

*Does not include federal aid for biomedical research, which was included in the estimated cost of federal aid recommendations in *Quality and Equality New Levels of Federal Responsibility for Higher Education*

† Includes \$10 million a year for expansion of area health education centers from 1972-73 on

SOURCE Carnegie Commission staff.

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<i>Start-up grants</i>	<i>Regional planning</i>	<i>Continuing education</i>	<i>Total</i>
15 0	50.0	10 0	547.0
15 0	50.0	10.0	635.8
15 0	50 0	10 0	704 6
15 0	50 0	10.0	770.9
15 0	50 0	10 0	813 0
15 0	50.0	10.0	857.5
	50 0	10.0	879 3
	50 0	10.0	908.1
	50.0	10 0	899 1

<i>Start-up grants</i>	<i>Regional planning</i>	<i>Continuing education</i>	<i>Total</i>
15 0	50 0	10.0	547.0
15 0	50 0	10.0	635.8
15.0	50 0	10.0	646.6
15.0	50.0	10 0	623.9
15.0	50.0	10.0	646.2
15 0	50 0	10 0	671 7
	50.0	10 0	691 2
	50.0	10 0	719 3
	50 0	10 0	727 5



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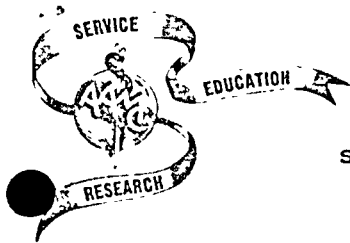
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ASSOCIATION OF AMERICAN MEDICAL COLLEGES

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THE POSITION OF THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES ON THE CARNEGIE COMMISSION REPORT, "HIGHER EDUCATION AND THE NATION'S HEALTH"

DECEMBER, 1970

The Association of American Medical Colleges has studied the Carnegie Commission Report, "Higher Education and the Nation's Health: Policies for Medical and Dental Education." After careful consideration, the Association finds that it is in substantial agreement with the report, and finds its major objectives sound.

The recommendations in the report relating to expansion of health manpower, support of medical education and research, and the role of academic institutions in health services, are of particular interest to the AAMC. Providing for the progressive expansion of these functions and the means to assure the stability and well being of the institutions involved are fundamental elements of any sound national health policy.

We are fully in accord with the Commission's view on the need to expand medical and dental education and advance the role of other health professions and occupations in meeting health manpower needs. Independent examination of these matters by a committee of the AAMC has reached essentially the same conclusions concerning the increased number of medical school entrants to be reached by the Bicentennial Year of 1976; the continued need for the expansion of existing medical schools, as well as the establishment of new schools carefully located geographically; and the need for continued innovation in curriculum and educational programs.

We are pleased that the Commission substantiates the critical role of the Federal Government in supporting medical education while not diminishing the continued need for other public and private support. Of prime importance in this respect is the Commission's recommendation for a substantial ^{AND} ~~Federal program of~~ ^{FEDERAL} continuing support for the instructional process in medical and dental education on a per-student basis. This approach would establish as national policy the concept of basic support for medical and dental education as a national resource, distinct from the special actions needed to increase enrollment, engender program and curriculum reform, and advance biomedical research.

The adoption of such a policy would be a landmark event in the evolution of Federal health programs. The AAMC, through its own study of these matters, has also concluded upon the necessity and wisdom of such an approach to assure the stability of the nation's medical educational institutions and their basic educational programs.

The full range of the matters to which the Commission report speaks is impressively broad. The position taken in respect to each of these matters has been developed with deep concern for achieving real health progress and for sound public policy.

While we are pleased at the close concurrence between the basic objectives being sought by the AAMC and the views expressed by this disinterested and prestigious group, there are several areas in the report in which the AAMC takes a different view of the key factors involved. In respect to certain of the findings and recommendations by the Carnegie Commission, the Association is in disagreement.

The detailed comment of the Association of American Medical Colleges follows. In this comment, we have attempted to set forth the position of the Association in respect to the key matters covered in the Carnegie Commission's report.

These comments will be given under two headings: General Considerations, and Financial Support and the Federal Government.

THE POSITION OF THE ASSOCIATION OF AMERICAN MEDICAL
COLLEGES ON THE CARNEGIE COMMISSION REPORT, "HIGHER
EDUCATION AND THE NATION'S HEALTH"

December, 1970

GENERAL CONSIDERATIONS:

- o FACTORS INVOLVED IN IMPROVING THE NATION'S HEALTH.

ASSOCIATION POSITION

We are disappointed that the report dealing with "Higher Education and the Nation's Health" did not discuss all of the factors that must be considered in improving the health of a people. The advancement of the nation's health requires more than better health care. The state of health depends upon:

The Environment and Quality of Life. Health is related to the quality of a man's life and the environment in which he lives and works. Optimum health cannot be achieved without adequate pure water and safe food and clean air to breathe. Further, the national Commission on Community Health Services observes:

"It (also) means assuring hygienic housing to provide space for adequate privacy and family availability, for places of rest and quiet and places for activity and recreation. It means assuring an external milieu for man designed to stimulate his greatest growth potential."

("Health is a Community Affair", National Commission on Community Health Services, Harvard University Press, Cambridge, Massachusetts, 1967)

Attitudes, Understanding, and Behavior. Health also depends on the mores and habits of man; his dietary habits, exercise patterns, taboos, and superstitions can be influenced by education. Health education is an important change agent which deserves more serious attention in modifying man's health-related attitudes and behavior. Thus, health education is a crucial element of comprehensive health care.

Genetic Heritage. Health also depends on man's heritage and his genetic make-up. To achieve optimal health, we must develop more effective understanding of the genetic basis of health and disease and achieve better public acceptance of measures required to control the rate of accumulation of deleterious genes in the population.

Health Care. This is the principal topic considered in the report in terms of the relationships to and implications for academic institutions.

o PRIORITIES FOR HEALTH CARE. The Commission believes there is a crisis in health care and the reasons given for the crisis are five interrelated and overlapping factors (page 22):

1. Unmet needs for health care.
2. Rising expectations of the population for universal access to care.
3. Critical shortages in, and inefficient use of, health manpower.
4. Ineffective financing.
5. Rapidly rising costs.

The Commission believes further that:

Americans deserve and can afford better health care. (page 1)

As the nation faces the 1970's, shortcomings in the system of delivery of health care in the world's most affluent society must have high priority among issues calling for attention and decisive action. (page 13)

ASSOCIATION POSITION

The AAMC concurs with these conclusions of the Commission and has made public statements on all of them. The Association has taken an official position supporting universal health insurance as a necessary component for eliminating arbitrary financial barriers to health care for those not now adequately served while pointing out that dollars alone will not guarantee access and availability of care. We further agree that better health care should rank high in the Nation's priorities and that given our affluence we "deserve and can afford better health care."

However, we question whether better health care has yet reached the level of a high national priority (page 1), particularly of the Federal Government. The failure to include better health or better health care as a national goal in the President's Staff Report on

National Goals and the levels of support requested by the Administration, or appropriated by the Congress, for programs to improve health and provide better health care, for education of health professionals and to advance knowledge through biomedical research suggests that the Federal Government has not given clear evidence of a high national priority for health care.

In our opinion, there is ample evidence that the benefits from our high level of medical competence and the fruits of biomedical research are not available in sufficient quantity and with equity to all citizens.

o COMPONENTS OF BETTER HEALTH CARE. The Commission has identified four factors as necessary to improve health care:

1. More and better health manpower.
2. More and better health care facilities.
3. Better financing arrangements for the health care of the population.
4. Better planning for health manpower and health care delivery. (page 1)

ASSOCIATION POSITION

Health Manpower. *The Association has long argued for the need of more health manpower. In the 1950's it was one of the few voices recommending an expansion of education for the health professionals and undertook a vigorous campaign to establish new medical schools and expand existing schools. The substantial increase in entering class size since the middle 1960's in spite of inadequate financial support to the academic medical centers is largely the result of*

this effort.

The Association has formally adopted the recommendations of its Committee on the Expansion of Medical Education for a substantial increase in the entering class size by the middle 1970's. The Bicentennial Program for the Expansion of Medical Education recommends an expansion of entering class size to 15,070 by 1976, a figure not significantly different from that proposed by the Commission. Both the AAMC Committee and the Carnegie Commission make the point that it is difficult under the present circumstances of health care to make a meaningful assessment of physician need but that an evident shortage exists and the increases proposed are both a necessary and feasible response.

With regard to "better manpower," the Association and its members have been major factors in improving the quality of health professionals. They concurred in and implemented the recommendations in the Flexner report that brought the medical schools into the university and introduced biomedical science into the educational program. They believe that the basic Flexner concept of rooting medical education in science is still valid, even though the scope of medical education must encompass health care delivery. Adequate scientific knowledge is still the hallmark of a properly trained physician. The Association is committed to the maintenance of quality in the face of pressures to rapidly increase the output of their schools. It is convinced that any other approach would derogate the intellectual integrity of medicine as a science-based profession and would thus be inimical to the best interests of society.

Health Care Facilities. The Association agrees that in most cases health care facilities should be the responsibility of local, state, and Federal government. However, because of the unusual circumstances with regard to university hospitals, we believe that Federal construction support should be provided in the same manner as for other health professions teaching facilities to permit efficient and effective planning of structures to reflect educational programs.

Financing Arrangements. As discussed above, the Association has adopted an official position recommended by its Committee on Health Insurance that better financing arrangements are critical to the improvement of health care delivery. The Commission did not point out clearly enough that any financing system must accommodate the special aspects of patient care in the teaching setting, support and sustain the particular role of teaching hospitals in educating health manpower, and recognize their critical function in the process of health care.

Planning. It is gratifying that even though the Commission's report is concerned largely with health manpower, it recognized that just producing more manpower will not in itself correct all of the shortcomings of present health care. In fact, that action, taken alone, would improve health care for the urban and rural poor, who have the greatest need. It would probably serve to increase the disparity in health care between the "haves" and the "have nots."

The Association has repeatedly pointed out the errors of those who propose such simplistic solutions to the health care problem as:

1. Increasing health manpower alone.
2. Taking the relatively small number of research scientists from laboratories and putting them into the health care system.

3. *Exclusive concentration on training more family physicians.*
4. *Apprenticing medical students to practicing physicians for clinical training.*

o BASIC ASSUMPTIONS AND CONDITIONS. There are many implicit assumptions as well as explicit conditions in proposals for achieving the objectives and recommendations in the report.

Health Care Delivery. (pages 31-33)

1. A spread of prepaid group practice plans.
2. Much greater emphasis on achieving effective functioning of true health care teams in which the physician or dentist is at the center of the team and the work of allied health personnel is subject either to his direct or indirect supervision.
3. A shift to greater emphasis on care outside the hospital in a wider variety of health care facilities than has been available.
4. A shift toward a situation in which health care is a public utility.
5. Biomedical research and new technology will continue to revolutionize medicine and health care delivery.
6. A shift from a non-system to a system of health care delivery which will have an influence on education, research, and service functions of the academic health science centers.

Federal Role. The Federal Government has a major and continuing role in:

1. The financial support of health manpower, education, biomedical research, and health system planning. (pages 61-63)
2. A broader role in protecting the health of the population, assuring adequacy and efficiency in the delivery of health care, with the terms and methods of payment and with the education and utilization of health manpower.

State Role. The Commission recommends that states should continue to provide substantial support for medical and dental education and that states which have lagged in the past should plan for significant increases in expenditures for this purpose. The Commission also recommends that the states should provide financial support for medical and dental education in private institutions. In addition, they should provide major financial support for house officer training and for the education of allied health personnel. The states, in cooperation with universities and with regional and local planning bodies, should play a major role in the development of plans for the location of university health science centers, area health education centers, and comprehensive colleges and community colleges providing training for allied health personnel. (pages 89-90)

University Role.

Number and Scope of University Health Science Centers:

1. Create nine additional university health science centers in population areas not now served by them. (page 55)
2. Convert existing two-year medical schools to full programs and not establish additional two-year schools. (page 53)
3. Establish new public health schools as part of academic health science centers and incorporate existing schools into such centers as soon as possible. (page 53)

Area Health Education Centers. The Commission recommends the development of 126 area health education centers in areas at some distance from university health science centers. These area centers would be affiliated with the nearest appropriate university health center and would perform somewhat the same functions except that the education of the M.D. would be restricted to a limited amount of clinical education and research to the evaluation of local experiments in health care delivery systems.

Undergraduate Medical Education.

1. Increase substantially the number of health professionals educated. (page 44)

2. Shorten the period of education to three years. (page 49).
3. Increase the flexibility of the programs and the options available to students. (page 52)
4. Extend clinical education into community hospitals. (page 53)
5. Stress comprehensive medicine. (page 54)
6. Integrate more carefully abstract theory and clinical experience. (page 54)
7. Integrate instruction in the biomedical sciences and social sciences between university health science centers and university departments. (page 93)

Graduate Medical Education.

1. Establish corporate responsibility for residency programs. (page 53)
2. Stress comprehensive medicine. (page 54)
3. Include experience in community hospitals, neighborhood clinics, and other facilities, as well as in teaching hospitals. (page 54)
4. Better relate the number of students in residency programs to health care needs. (page 70)
5. Shorten residency training. The year saved by elimination of the internship should not be replaced by an additional year of residency training. (page 70)

Education of Other Health Professionals:

1. The university health science centers should develop new specialties where needed, such as physicians' associates and assistants. (page 91)
2. They should cooperate in the development and evaluation of educational programs for health professionals in comprehensive and community colleges. (pages 91 and 96)

Continuing Education.

1. Bring about a significant increase in continuing education programs for health care personnel in the area. (page 92)

Biomedical Research.

1. Continue a vigorous program in biomedical research. (page 73)

Health Care Delivery.

1. Undertake extensive research, in cooperation with university departments in health care delivery systems (page 92) and the social and economic environment of health care. (page 47)
2. Cooperate with other community agencies in improving the organization of health care delivery. (page 47)
3. Serve as the institution for handling the most complex and sophisticated medical problems and act "as the coordinating hub and reservoir of expertise for a system of institutions that may include area health centers, neighborhood health centers, rural clinics, hospitals, group practice organizations, and medical societies." (page 46)

Role of the Comprehensive Colleges and Community Colleges.

The Commission recommends that comprehensive and community colleges develop and expand their curricula in the allied health professions where this has not been done and that they also seek and accept guidance from university health science centers and area health education centers in planning and evaluation of these educational programs.

Role of the Foundations. The Commission recommends that private foundations that have traditionally provided support for health manpower education and research should continue to do so and that foundations that have not provided such support in the past should consider expanding their programs to include it. The Commission also recommends that foundations expand their support for research on the delivery of health care. (page 97)

ASSOCIATION POSITION.

The Association believes that all of the above basic assumptions and explicit conditions of the Carnegie Commission are, in general, sound; and it is in agreement with their conclusions and the roles assigned to various segments concerned with health care, education of health professionals, and biomedical research. However, it is important to recognize that achieving these objectives will require adequate financial support to the academic institutions, and the specific proposals recommended by the Carnegie Commission in this respect are discussed later.

The Association is disappointed that the report did not more clearly describe the important contributions of biomedical research to the improvement of the nation's health. We believe that only through a better understanding of health and disease through research can we institute effective preventive measures and convert empirical and palliative medicine into definitive and effective intervention.

The creation of nine additional academic health science centers is essentially in agreement with the recommendation of the Association's Bicentennial Program for the Expansion of Medical Education, which called for twelve new schools. The new institutions would be located in areas not served by medical schools to provide the benefits derived from the presence of a school. The Association recommends, but does not insist, that medical schools be a part of a university, as does the Carnegie Commission by implication.

The relation of the area health centers to the academic health science centers furnishes a means to begin the regionalization of

health care services. Many university health science centers have already entered into cooperative programs with surrounding community hospitals. The Commission recommends an extension of this approach which the Association agrees could provide an important way to improve health care, provide additional clinical training facilities, and avoid overlap and unnecessary duplication of resources.

o HEALTH MANPOWER STUDIES. The Commission recommends expansion and strengthening of health manpower research programs in the Department of Health, Education and Welfare, in cooperation with the Department of Labor, to encompass broad continuous studies of health manpower supply and demand. Research funds should be made available for specialized studies of these problems in university health science centers and appropriate university research institutes. (page 77)

ASSOCIATION POSITION

The Association agrees completely with the need to expand studies in health manpower. It believes that equally important are studies, innovation, and demonstration in health care systems. The university health centers furnish an obvious focus for this research and the involvement of unique university resources in operations research, the social sciences, management and technology in the joint efforts that are necessary to meaningful approaches to the problems which confront us.

o NATIONAL AND REGIONAL PLANNING. The Commission recommends the strengthening of existing Federal legislation for regional, state, and local health planning to encompass regional planning of all health

manpower education and health care facilities.

The university health science centers, along with their affiliated area health education centers, should have central responsibilities for planning health manpower education, while the central responsibility for planning changes in the delivery of health care should be in the hands of regional agencies, in cooperation with state and local agencies, as well as private institutions. (page 76)

ASSOCIATION POSITION:

Highly trained health professionals are national rather than regional, state, or local resources. Migration patterns substantiate this view. For this reason the Association believes that planning in relation to the educational programs in academic medical centers must be related to a national as well as state and local purposes. Since the health care activities of the academic medical centers are more related to the geographical area, closer coordination with regional, state, and local planning groups is more appropriate in this area. However, due consideration must be given in extending university health care activities to the particular needs of clinical training and educational programs of the centers.

The Association believes that the creation of a true reorganization program with the academic health science center as a hub is essential to effective and efficient use of scarce resources. The Comprehensive Health Planning program can serve to provide consumer and provider input for identifying gaps in service and avoiding duplication and overlap of service. The Regional Medical Programs can serve as the mechanisms for accomplishing the regionalization and integration required

to meet the needs identified. However, to accomplish this, the mission of the RMP and the operation of its programs must be redirected.

The ultimate institutional framework in which health care will be delivered has not yet been designed. It will have to encompass all of the health care services within an appropriate geographical boundary and provide the means by which the accessibility, quantity, quality, and cost of care can be determined by an appropriate interaction of providers and consumers. The health care corporation described in the Perloff Report is an example of such an approach.

o NATIONAL HEALTH MANPOWER COMMISSION. The Commission recommends the appointment of a National Health Manpower Commission to make a thorough study of changing patterns of education and utilization of health manpower, with particular reference to new types of allied health workers, of changing patterns of health care delivery, and of the feasibility of national licensing requirements for all health manpower. (page 78)

ASSOCIATION POSITION

The Association is disappointed that the Carnegie Commission was not more explicit in proposing a rational and effective mechanism for planning in the health field on a continuing basis. The report does not clearly state who should appoint the Commission, whether it would be a temporary task force or a continuing group, or how it would implement its recommendations.

The Association is convinced that the market place cannot provide the necessary control for the number of health professionals with

sufficient speed. The lag time in the feedback and the complexities and span of education for health professionals makes this an ineffective and costly method. Some responsible and authoritative body must assess and project the need for the number of types of health professionals on a rational basis, including the number of the various specialists. There must be an effective way in which the recommendations of this body can influence the educational programs. It is obvious that assessment and projection of need will be heavily influenced by the nature of the system in which health care is to be delivered.

The proposed expansion of the AMA-AAMC Liaison Committee on Medical Education with the ultimate creation of a Commission on Health Professional Education could serve in this role. Through involvement of appropriate organizations and government representatives, a mechanism might be provided for implementation of the Carnegie Commission's recommendations. The newly created Institute of Medicine of the National Academy of Sciences might also play an important role.

Although the Federal Government has not really developed a national planning role, with its greater involvement in the financing of health care delivery and the education of health professionals this may change.

The Association is on record in favor of the establishment of a Council of Health Advisors to the President that could increase the effectiveness of growing Federal expenditures in health in the Department of Health, Education and Welfare, the Department of Labor, the Department of Defense, and the Veterans' Administration. We do not believe that the Council should be the single national planning body, but it could work with a non-governmental organization to

relate Federal programs better to the civilian needs. In the longer run, it seems both desirable and necessary to consider a complete restructuring of our policy development framework for health in the Executive branch. The national importance of these issues is increasingly incompatible with the present subordinate location of health within the Department of Health, Education and Welfare.

o RECERTIFICATION. The Commission recommends national requirements for periodic re-examination and recertification of all physicians and dentists by specialty boards and other appropriate bodies.

ASSOCIATION POSITION

The Association agrees that some method must be found to assure that physicians are capable of providing adequate care using current medical knowledge. However, re-examination may not be the best way in which to accomplish this goal.

A properly organized health care system which used an auditable record, such as the problem-oriented record, would make it possible to carry out a continuing assessment of the physicians' performance in a more logical and accurate way than by a periodic examination. Furthermore, the areas in which physicians had deficiencies could be identified and incorporated into the continuing education program in the setting in which he provides health care.

FINANCIAL SUPPORT AND THE FEDERAL GOVERNMENT:

The Commission clearly establishes a substantial and continuing role of the Federal Government in the financial support of the academic health science centers and their educational and research activities. These will be considered under the major programs proposed in the report.

o FINANCIAL AID TO MEDICAL AND DENTAL STUDENTS.

Student Grants. The Commission recommends a Federal program of grants in amounts up to \$4,000 a year for medical and dental students from low-income families and for students from low-income families enrolled in associate and assistant programs in medical and dental schools. (page 65)

In determining the student's need, it will be necessary to derive a formula based on such factors as total family income over the past several years, total family assets, and the number and ages of children in the family. (page 64)

ASSOCIATION POSITION

The Association strongly supports the concept of non-refundable grants for students in which financial need can be established. It concurs in the view that the national interest is best served if all students have available adequate financial resources to permit them to achieve the highest level of education to which they aspire and can achieve. Grants are essential to the meeting of this objective. We feel that the views held by some, including highly placed officials in the Administration, that every student should pay for his entire costs of education because of the higher income it permits him to earn

is not the way to develop the most precious national resource of the nation--an educated citizenry.

We agree on the importance of developing a more rational basis for establishing need and the Association is expanding its efforts in this direction. We do not believe that need can be determined from a simple assessment of gross family income and we object to the regulations instituted by the National Institutes of Health restricting grants to students from families with less than \$10,000 annual income.

Student Loans. The Commission recommends an Educational Opportunity Bank for medical and dental students, including house officers, with repayment excused during house officer training and during two years of military service. (page 66)

ASSOCIATION POSITION

The Association does not believe an Educational Opportunity Bank is a desirable method for providing loans to medical students. The present method of providing loan funds through the academic institution under the Health Professions Educational Assistance program should be continued. Loan funds should be available at a level consistent with the requests from the institutions and the attempts being made to broaden the socio-economic base of medical school classes. The Association strongly opposes a guaranteed loan program as inappropriate to, and ineffective for, medical students and contrary to the national interest in increasing the number of physicians.

o A NATIONAL HEALTH SERVICE CORPS. The Commission recommends the development of a voluntary National Health Service Corps. As an incentive for participation in the Corps, an M.D. or D.D.S. would be excused from loan repayments during periods of service and 25 percent of the maximum indebtedness he is eligible to incur would be forgiven. (page 66)

ASSOCIATION POSITION

The Association supports the concept of a National Health Service Corps and has testified favorably on bills to establish such a Corps in the Congress.

However, we are concerned about the form and structure of the Corps and believe that it should not be restricted to physicians and dentists, but should incorporate all health professionals. Further, all should share in the benefits from service in the Corps, including draft deferment and excuse from loan repayment.

The Association believes strongly that the Secretary of Health, Education and Welfare should be able to designate areas and organizations in which members of the Corps should work without the need for formal approval by medical societies or the profession.

o TUITION CHANGES. The Commission recommends a relatively low uniform national tuition policy for institutions providing medical and dental education. (page 68)

ASSOCIATION POSITION

The Association does not believe that this recommendation can be implemented and is unnecessary if the Educational Opportunity Bank is

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ASSOCIATION POSITION

The Association does not believe that this recommendation can be implemented and is unnecessary if the Educational Opportunity Bank is

not established. The ability of students to pay for their total educational costs will exert a control over tuition costs, particularly if there are larger numbers of students from low-income families. It is not anticipated that grants and loans will ever be provided in sufficient amounts to permit tuition to be raised without regard to the student's ability to pay.

o COST OF INSTRUCTION SUPPLEMENTS. The Commission recommends that funds be provided to institutions to help stabilize their fiscal situation. The funds could be used only for instructional purposes and the institutions receiving them would have to take steps to shift towards a uniform tuition policy and eliminate residency requirements favoring in-state students. They would also have to refrain from discrimination and undertake measures to increase minority enrollments. If these conditions were met, the schools could receive the following support:

1. A grant of \$4,000 annually for students enrolled in the M.D., D.D.S., or physician associate or assistant programs.
2. A bonus of \$4,000 per year for a maximum period of eight years for students in excess of those enrolled in the fall of 1970. The institution would have to initiate a program to expand by 20 percent in first-year places within four years. Moreover, each school would be expected to increase its average class size to 100.

ASSOCIATION POSITION

The Association strongly supports the concept of a capitation grant to provide "first dollar in" over proposals to provide project grants which would furnish "last dollar in". The capitation route would be easier to administer and would preserve the freedom of action necessary for an educational institution. It would allay the financial stringencies under which most institutions are operating and drastically reduce the

number seeking "disaster aid".

The Executive Council and the Assembly have adopted a Bicentennial Program for the Expansion of Medical Education which agrees in principle but differs in some detail from the Carnegie Commission recommendations. The Association plan recommends an educational allowance of \$5,000 per student with an annual increase to cover inflationary and other rising costs to \$9,000 by 1980. For expansion of at least fifteen students, \$9,000 a year per student is recommended with no escalation, under the assumption that after start-up costs are met, the regular subsidy is adequate.

The Association believes that its formulation is more rational and preferable to that made by the Carnegie Commission. It does not see the need for the other stipulations which are either difficult to enforce or covered by laws now in force. For example, the use of cost of education supplements only for instructional costs depends upon a definition of what constitutes instruction--an unresolved problem.

The Association also has warned that capitation support would accomplish little if research funds were not adequate and the institutions were not fully reimbursed for health care. Some provisions must also be provided for the few schools whose financial base is now so inadequate that they cannot maintain educational programs of the required quality, even with a capitation grant.

o INCENTIVES FOR CURRICULUM REFORM. The Commission proposes an additional cost-of-education supplement of \$2,000 per student enrolled in programs leading to the M.D. or D.D.S. degree or students enrolled in physician's or dentist's associate or assistant programs and in

specified cases those in the last year.

The bonuses would be given for three years to schools introducing new programs to train physician's or dentist's associates or assistant programs, or for schools that undertake major curriculum reform along lines recommended in the report. (pages 70, 71)

ASSOCIATION POSITION

The Association agrees with the concept of providing funds to stimulate and make possible curriculum reform, but believes this can be better accomplished through project grants than through the capitation mechanism.

o COST-OF-EDUCATION ALLOWANCES FOR HOUSE OFFICERS. The Commission recommends a cost-of-education allowance of \$2,250 per year for each house officer enrolled in a graduate training program under university control. The grant would be made for a maximum of three years for any student and would be dependent upon the institution's controlling the number of students in particular specialties to better meet needs and efforts to reduce the duration of training. (page 70)

ASSOCIATION POSITION

The Association agrees with the Commission's view that institutions need more funds to cover the costs of graduate education. The propriety of charging educational costs to patient care is being increasingly questioned. Universal health insurance would remove some of the objections, since the costs would be spread over the entire population and would not fall only upon those who were ill.

This is a very complex matter and one that is very dependent on the method developed to pay for health care. Since the number of interns and residents in the academic health center and its graduate training programs are more closely related to the health care delivered, it would seem more appropriate to cover the costs of their education from the health service payments.

o CONSTRUCTION GRANTS AND LOANS. The Commission recommends construction grants for university health science centers and area health centers in amounts up to 75 percent of construction costs, with the remaining 25 percent available in the form of loans.

ASSOCIATION POSITION

The Association concurs with the recommendation to provide the major support for new construction, remodeling and renovation through grants. It opposes plans to shift all construction support to loans, even with interest subsidy. Many public institutions are prevented by law from borrowing money. In addition, the financial status of academic health science centers makes it difficult, if not impossible, to make the required payments for interest and principal. The loan plan only delays costs and does not decrease but actually increases the total funds required.

The availability of loan funds for 25 percent of the cost would, however, be useful to those schools that can take advantage of the program. It would assist private institutions that are finding increasing difficulty in obtaining matching funds. The level of support involved would make it easier to pay interest and capital out of the annual budget.

The Association believes that the provision in its Bicentennial Program for the Expansion of Medical Education to provide a minimal level of construction support for schools undertaking expansion by a capitation formula is sound. This permits more rational planning and better assurance that the facilities required will be available when needed. However, other programs would be necessary to provide support for additional or other requirements on a project basis.

o START-UP GRANTS. The Commission recommends start-up grants for new university health science centers in amounts not exceeding \$10 million per center.

These grants would be available on issuance of a "(letter) of reasonable assurance and would be allocated on a competitive basis to assure maximum effectiveness and efficiency in the curriculum."

ASSOCIATION POSITION

The availability of start-up funds has been an important consideration in the establishment of new academic health science centers, and this proposal by the Commission would help solve this problem. Since start-up costs are always present, it would seem more logical to provide them to new schools on a capitation basis, as recommended by the Association in its Bicentennial Program for the Expansion of Medical Education. Since existing schools undertaking major expansion have similar initial costs, they should also receive "start-up" grants. The stipulations proposed by the Carnegie Commission on curriculum might produce more rather than less rigidity in devising new approaches.

o CONTINUING EDUCATION. Continuing education of health manpower should be a major concern of academic health science centers and area health education centers with Federal funds providing 50 percent of the financial support of such programs. (page 76)

ASSOCIATION POSITION

The academic health science centers are the logical institutions to direct continuing education of health professionals. If they have not assumed their proper role, it is probably due to lack of support for the activity and the ineffectiveness of present approaches to this difficult area of education.

Meaningful continuing education remains a problem of concern to the academic health science centers, the profession, and the consumer. Present programs are for the most part episodic rather than continuing. They do not provide education in the context of the physician's patients in the way that medical students learn in the health care setting.

Continuing education will probably not be effective until there can be an ongoing assessment of the care provided by a physician and an identification of the areas in which his behavior must be changed. The problem-oriented record may provide such an opportunity. If this kind of approach can be instituted for the practicing community in an effective organizational framework for health care, the centers might be stimulated to become more involved in continuing education.

o BIOMEDICAL RESEARCH. The Commission recommends that Federal financial support of research in university health centers be maintained at its present percentage of the GNP; that funds should be made available

to support research on methods of achieving greater efficiency in health manpower education and in the delivery of health care as well as for biomedical research; that Federal allocations should cover the total costs of research projects, and that not less than 10 percent and not more than 25 percent of research grants to any university health science center should take the form of institutional grants rather than grants for specific research projects.

ASSOCIATION POSITION

The Association strongly disagrees with the proposal to maintain the current level of research at its percentage of the GNP. In the first place, we are convinced, along with most authoritative bodies, that currently biomedical research is below the optimum level. We agree with the conclusions in this respect of the Committee on Research in the Life Sciences of the Committee on Science and Public Policy of the National Academy of Sciences:

"From the best estimate we can make, in the current year (fiscal year 1970) appropriations for research, per se, are approximately 20 percent less than required to ensure that the Nation's truly qualified academic life scientists are fully and usefully engaged."

In the second place, we believe that the level and growth of biomedical research should be determined by more substantive considerations that bear upon the relationship of research to important national objectives. Federal support of biomedical research should be derived from three basic factors:

- 1. The level of research support necessary to sustain the integral relationship of research to undergraduate and graduate education in the health professions;*

2. *The additional level of scientific effort to continue U.S. leadership at the scientific frontier of the biomedical sciences;*
3. *The further scientific effort required to exploit fully specific scientific opportunities to control disease, disability, and solve health problems.*

While we do not have as yet the calculus that will integrate these factors into an appropriate dollar number and rate of increase, we believe a reasonable approximation can be made. In the interim, we support the National Academy of Sciences Life Sciences Committee's view that,

"...The frequently proposed formula of an annual increment in research support of about twelve to fifteen percent appears to us to be a rational approximation of desirable growth as long as the system continues to expand to meet the perceived needs of society...

...Research grant awards should be of such character as to assure support for several years, conditioned only by reasonable progress and pursuit, in good faith, of the research that had been proposed, following where it leads."

We also agree with the Commission for the need for research in medical education and the delivery of health care and, indeed, the university health science centers have already increased their efforts in this field by ten-fold in the past two years. However, these programs should be funded in their own right, and not by transfer of funds from the support of biomedical research.

The appropriate level of institutional grants for research depends upon the amount of support for the other activities of the university health science centers. If adequate allocations are made under other institutional grants, it is possible that the basic level of research required to meet the needs of the educational programs could be provided by this mechanism.

MEMORANDUM

TO: Council on Medical Education

FROM: C. H. William Ruhe, M.D., Secretary

DATE: November 27, 1970

SUBJECT: Report of the Carnegie Commission on Higher Education

A special report and recommendations by the Carnegie Commission on Higher Education entitled "Higher Education and the Nation's Health: Policies for Medical and Dental Education" was presented to the public in a press conference held at the time of the AAMC Annual Meeting in Los Angeles in October 1970. This is a part of a larger study of higher education in the United States which is expected to be completed in 1972. Because of what it felt to be urgent problems in the health field, the Commission chose to submit this special report on higher education in health before the full report was completed.

In "Higher Education and the Nation's Health," the Carnegie Commission examines and analyzes some of the major problems in the health field and offers recommendations concerning the ways in which institutions of higher education might help to solve these problems. Primarily, emphasis is given to the need for health manpower and ways in which health manpower production might be expanded promptly to relieve current shortages. A target date of 1980 is established for the relief of manpower shortages although the Commission acknowledges that the problem may have to be reexamined at or before that time to deal with changing conditions.

The report in general is comprehensive, although certain suggestions such as certification, licensure and continuing medical education are dealt with quite superficially. In general, the recommendations are in line with present trends and there is not much which can be considered new or startling. The physician manpower goals in particular are quite modest and are likely to be met or exceeded without any unusual measures if present trends continue.

For the most part, the recommendations are consistent with the policies and proposals of the AMA and the Council on Medical Education. If anything, they are disappointingly conservative when measured against current AMA thinking. There are, however, some specific proposals which will probably be regarded by the Council on Medical Education as inappropriate or undesirable. These proposals will need careful consideration. In some instances, the recommendations relate to areas which are more directly the concern of the Council on Health Manpower or the Council on Medical Service than the Council on Medical Education. In these instances, some attempt should be made to develop an acceptable AMA position which would represent the joint thinking of the three councils.

The AAMC Assembly adopted a position statement on the Carnegie Report which was essentially laudatory and supportive. The AAMC was particularly pleased by the Commission's proposals for substantial increase in federal financial assistance for medical schools. The AAMC statement expressed some reservations about the Commission's recommendations relating to the Educational Opportunity Bank and federal support of biomedical research. The AAMC did not attempt to consider each

individual recommendation nor to deal with the specific details of the reasoning upon which the recommendations were based.

It is difficult to prepare an organizational position to the Carnegie Commission Report since it deals with a number of matters which are rather complex. There is a strong temptation to settle for a rather general statement such as the AAMC Assembly adopted and perhaps that is the best course to follow. However, the Council on Medical Education should review the individual proposals to determine whether it wishes to respond to them separately rather than to be content with general statements about the entire report.

For convenience and consideration, the recommendations have been extracted from the body of the report and some comment is offered about each. In addition, much of what is contained in the staff review of the AAMC proposal for medical school enrollments is pertinent to the Carnegie recommendations as well.

Some of the earlier chapters are devoted to a discussion of problems associated with the delivery of health care, with particular reference to unmet needs, rising expectations of the population, increasing costs, and ineffective financing. Considerable detail is presented on the subjects of life expectancy and infant mortality, subjects which are usually cited as evidence of the need for more physicians and for a more effective system for the delivery of health care. The implication is strong that increase in the supply of health manpower and modification of the system of delivery of health care will result in major improvement in life expectancy and infant mortality. The AAMC statement notes that such expectations are not necessarily justified and emphasizes the role of poverty as a cause of ill health and disease. While this fact is usually acknowledged, the nation's affluence may be just as important a factor in view of such things as the large number of deaths and injuries caused by automobile accidents and the high incidence of disease due to overeating and underexercising. None of these problems is likely to be solved either by massive increase in the supply of health manpower or by national health insurance or by a change in the system of delivery of health care. As noted in the AAMC statement, "the responsibility for improvement of health far transcends the capabilities of health professionals."

The major recommendations and comments about them are given below:

RECOMMENDATION 1: The Commission recommends that the number of medical school entrants should be increased to 15,300 by 1976 and to 16,400 by 1978. Toward the end of the 1970s, the question of whether the number of entrant places should continue to be increased will need to be reappraised. The expansion in the number of medical school entrants should be accomplished through an average expansion of about 39 to 44 percent in existing and developing schools by 1978, with nine new schools accounting for about 900 to 1,350 entrant places, adding another 8 to 13 percent. The number of dental school entrants should be increased at least to 5,000 by 1976 and to 5,400 by 1980.

COMMENT: The Commission's recommendations on medical school enrollments are based upon projections prepared by Dr. Mark Blumberg. A monograph giving the details of these projections will be published separately, but is not available at this

time. Unfortunately, these details are lacking from the present report and for this reason it is impossible to make exact comparisons with other projections. Table 3 on page 42 gives projections of physician-to-population ratios based on three alternative projections of medical school enrollments. Unfortunately, Dr. Blumberg has chosen to use an index of "active physicians" per 100,000 population rather than the standard total physicians per 100,000 population and this makes it impossible to compare his ratios with others; furthermore, the definition of "active physicians" is lacking from the present report. A footnote to the table states that the projections assume that no foreign medical graduates will enter the country permanently after 1977. This is a very strange assumption for which there appears to be no reasonable grounds. Furthermore, for the 10 years proceeding 1977, the assumption is made that 13,000 foreign medical graduates will permanently enter the United States; i.e., he assumes a growth in physician population from foreign medical graduates of 1,300 per year. This figure is substantially below recent figures for foreign medical graduate accretions and there is no reason to believe that the numbers of foreign medical graduates will decline in the years ahead. Consequently, Dr. Blumberg's projections seem likely to be significantly in error--on the low side.

The bases for the three alternative projections for medical school entrants are not given, but the Column "C" projections are those cited in recommendation #1. These appear to be based upon the expectation that most medical schools will shift from a 4-year to a 3-year program and that this will permit a 30% increase in entering class size. Theoretically this may be true, but there are many complications which may prevent such a proposed increase automatically with the reduction in the length of program. Furthermore, although many schools are now considering 3-year programs, it seems unlikely that all schools will change from 4-year to 3-year programs within the next few years.

The recommendation calls for nine new medical schools to provide from 900 to 1,350 new entering places. As noted in the review of the AAMC report, there are already 13 new schools in development and it is likely that there will be still more before 1980. However, it is not certain how quickly they will be able to grow to full class size.

In spite of the uncertainties and discrepancies, the goals proposed by the Commission appear to be reasonable and readily attainable. If anything, they are too modest and, with special effort, could easily be exceeded. It is interesting to note that Dr. Blumberg is among those who believe that it is possible for us to produce an excess of physicians. He believes further that it would be an improper use of public funds to do so in view of the high cost of medical education.

RECOMMENDATION 2: We also recommend that all university health science centers consider the development of programs for the training of physician's and dentist's associates and assistants, where they do not exist, and that, wherever feasible, such programs be initiated forthwith. The Commission recommends, also, that in developing their plans for expansion, university health science centers should adopt programs designed to recruit more women and members of minority groups as medical and dental students.

COMMENT: The Commission Report devotes considerable space to the concept of the physician's assistant and recommends that all university health science centers consider the development of physician assistant programs. Since the AMA is currently engaged in developing a position on this subject, it is impossible to express approval or disapproval of the proposal at this time.

The Commission recommends recruitment of more women and more minority-group students for medicine and dentistry. Active efforts are currently underway and substantial gains have been made in the enrollment of women and minority students in medical schools in the past two years. However desirable it might be to have more women physicians, it must be observed that increasing the numbers of women physicians does not provide a unit-for-unit increase in physicians' services since a substantial number of women do not engage in full-time practice.

RECOMMENDATION 3: In addition, the Commission recommends the conversion of schools of osteopathy to schools of medicine, wherever feasible.

COMMENT: The AMA is already on record in favor of the conversion of schools of osteopathy to schools of medicine. The Commission offers no proposals as to how the conversion might be effected.

RECOMMENDATION 4: The Commission recommends that university health science centers should be responsible, in their respective geographic areas, for coordinating the education of health care personnel and for cooperation with other community agencies in improving the organization of health care delivery. Their educational and research programs should become more concerned with problems of health care delivery and the social and economic environment of health care. All new medical and dental schools should be parts of university health centers, and, wherever feasible, existing separate medical and dental schools should likewise become parts of university health science centers.

COMMENT: Educational and research programs of medical schools are increasingly becoming involved with problems of health care delivery and the social and economic environment of health care as recommended by the Commission. The AMA would support such activities to the extent that they do not interfere with the primary concern of the medical school for the education of physicians.

With regard to the recommendation that all new medical schools should be university health science centers and that existing separate medical schools should become parts of university health science centers, it would be contrary to existing AMA and Liaison Committee policy to support this recommendation. While new medical schools are urged to become affiliated with universities wherever possible, there is no requirement that this be done. Furthermore, some medical schools have existed for many years apart from universities and it would not seem appropriate to attempt to force them to affiliate with universities if they do not wish to do so.

RECOMMENDATION 5: The Commission recommends that all universities with health science centers develop plans for accelerating premedical and medical education. The Commission also recommends that plans be developed for shortening the total duration of premedical and dental education where it is unnecessarily

prolonged. We particularly favor a program calling for three years (instead of four) after the B.A. to obtain the M.D. or D.D.S. and a three-year residency (instead of the typical four years of internship and residency).

COMMENT: While no formal statements have been made, the AMA and the Council on Medical Education have been favorably inclined toward plans for shortening the duration of medical education where this can be done without sacrificing quality unduly. It is significant that many medical schools are now engaging in such programs or are seriously considering their implementation.

RECOMMENDATION 6: The Commission recommends that all universities with health science centers, and especially those developing new centers, consider plans for (1) greater integration of preprofessional and professional curricula, (2) increasing the student's options so that basic training in health-related sciences can lead on to training for a variety of health-related professions as well as medicine and dentistry, (3) awarding a master's degree at the end of this basic training period, and (4) integrating instruction in the basic sciences on main university campuses if this can be accomplished without major costs associated with the shift, without interfering with integration of basic science and clinical science instruction, and without delaying the opportunities for students to have early contact with patients.

COMMENT: These recommendations appear to be progressive and in line with developments on many campuses at the present time. The greater integration of preprofessional and professional curricula and provision of instruction in the basic medical sciences on main university campuses appear to be the major hope for "breaking the basic science bottleneck" which has been primarily responsible for restrictions in medical school enrollments.

RECOMMENDATION 7: In addition, the Commission recommends that existing two-year medical schools that do not lead on to M.D. -candidate education within the same university system be converted to provide full M.D.-candidate education as soon as possible and that no new two-year schools of this type be established.

COMMENT: In spite of the reservations expressed in the Commission's report, there is good evidence that the existing two-year medical schools have been the means of providing access to the medical profession for many deserving students who would have otherwise lost this opportunity. Since the basic science years have been the main reason for the small size of medical school classes, two-year schools of the basic medical sciences have been a means of increasing physician production. It is true that most two-year schools eventually expand to offer the full program leading to the M.D. degree; however, at some institutions, this has been impossible and it is likely that this will also be true in the future. It would be unfortunate if arbitrary restrictions were imposed to eliminate these institutions.

RECOMMENDATION 8: The Commission recommends that new university health science centers consider providing clinical instruction in selected hospitals on the British model.

COMMENT: The Council on Medical Education is in favor of full utilization of affiliated hospitals to provide clinical instruction. Such affiliations permit a broader base for such instruction and, when properly directed, consti-

tutes available additional resources for student instruction. There is a strong trend toward more instruction in community hospitals as medical schools become more involved in community problems.

RECOMMENDATION 9: The Commission recommends that all university health science centers give serious consideration to curriculum reforms. Their admission policies should be made more flexible and their programs more responsive to the expressed needs of students. Greater emphasis should be placed on comprehensive medicine in both the M.D.-candidate program and in graduate medical education. In all phases of medical and dental education, including residency programs, there should be more careful integration of abstract theory and clinical experience. Residency programs should be planned and reviewed by the entire faculty, and residency training should include experience in community hospitals, neighborhood clinics, and other facilities, as well as in teaching hospitals.

COMMENT: The Council on Medical Education would be in general agreement with this recommendation.

RECOMMENDATION 10: The Commission recommends the development of nine new university health science centers.

COMMENT: As noted earlier, the number of new medical schools proposed is quite conservative. It is interesting to note that the Commission has identified nine specific metropolitan areas where new medical schools should be established. Of these, one already has a medical school in development and two or three others have been considered in the past. However, for several of the centers there has been no local initiative in the direction of a new medical school. The Commission report recognizes the desirability of local initiative, but implies that some kind of national planning should be carried out to implement the development of new schools in all of these areas. As noted in the staff report on the AAMC proposal, the question of whether new schools should be established through national planning or local initiative is one which deserves serious consideration.

RECOMMENDATION 11: The Commission recommends the development of area health education centers in areas at some distance from university health science centers which do not have sufficiently large populations to support university health science centers of their own, and in a few metropolitan areas needing additional training facilities but not full health science centers. These area centers would be affiliated with the nearest appropriate university health science center and would perform somewhat the same functions recommended for university health science centers, except that the education of M.D. and D.D.S. candidates would be restricted to a limited amount of clinical education on a rotational basis, and research programs would be largely restricted to the evaluation of local experiments in health care delivery systems. The Commission recommends the development of 126 new area health education centers, to be located on the basis of careful regional planning.

COMMENT: The concept of the health education center seems rational and, in fact, expresses formally what has developed informally in many community hospitals around the country. While not many of these hospitals have all four of the

educational programs identified by the Carnegie report, many more have one or more of these programs and might easily expand to include them all. At the present time, there are 25 hospitals outside of university medical centers which have "M" classifications in the DIRECTORY OF INTERNSHIPS AND RESIDENCIES. Most of these would qualify as health education centers. The thing which is new and different about the recommendation of the Commission is that such centers be established at geographic locations selected for their potential, strategic relation to population groups. No educational programs exist in many of the cities suggested in Appendix B, Table 1. It is difficult to say whether effective educational programs could be established and could endure in such locations. Presumably, if regional planning agencies decided to establish such centers, they might be afforded the necessary local and regional support to enable them to survive. The concept has merit and is worthy of careful consideration.

RECOMMENDATION 12: The Commission recommends a federal program of grants in amounts of up to \$4,000 a year for medical and dental students from low-income families and for students from low-income families enrolled in associate and assistant programs in medical and dental schools.

COMMENT: Although the recommendation is opposed by current AMA policy, the Council on Medical Education is on record as being in favor of such a proposal.

RECOMMENDATION 13: The Commission recommends an Educational Opportunity Bank for medical and dental students, including house officers, with repayment excused during periods of house officer training and during two years of military service.

COMMENT: The concept of an Educational Opportunity Bank is consistent with AMA policy and has many attractive features. While certain details of the provisions for granting the repayments might be subject to negotiations, it would appear that the AMA and CME would support this recommendation.

RECOMMENDATION 14: The Commission recommends the development of a voluntary national health service corps. An incentive for participation in the corps, an M.D. or D.D.S. would be excused from loan repayments during periods of service, and 25% of the maximum indebtedness he is eligible to incur would be forgiven.

COMMENT: The AMA is currently on record in support of "a voluntary national service corps," but does not see forgiveness of military service for participating in the health service corps. The details of the provisions of such a plan might still be subject to negotiations.

RECOMMENDATION 15: The Commission recommends a relatively low uniform national tuition policy for institutions providing medical and dental education.

COMMENT: A uniform national tuition policy for medical schools would appear to be impractical under present conditions. There is at the present time such a wide variation in operating costs, in political conditions, and in public

attitudes among the separate states and regions where medical schools are located that it would be virtually impossible to reconcile the variations unless all schools received a major portion of their financial support from a single source, presumably the federal government. Perhaps, as the Commission recommends, a shift to a uniform tuition policy could take place gradually over a period of many years. However, assuming adequate financial support for students who need assistance, there does not appear to be any real need for uniform tuition. In the final analysis, uniform, low tuition is simply another form of subsidy for the enrolled students. It is difficult to justify providing such subsidy from public funds for students who do not need it to enable them to enter a relative high income profession.

RECOMMENDATION 16: The Commission recommends (1) cost-of-instruction supplements to university health science centers for each medical and dental student enrolled; (2) bonuses for expansion of enrollment; (3) cost-of-instruction supplements to university health science centers and their affiliated hospitals for each house officer; and (4) bonuses for curriculum reform. The supplements and bonuses would also be available for each student enrolled in physician's and dentist's associate and assistant programs as well as for students in the last year of premedical or predental education if curriculum reform is designed to achieve a reduction in the total duration of preprofessional and professional education.

COMMENT: This group of recommendations would provide direct federal support for cost of construction with special bonuses for expansion, curriculum reform, and house officer education. The AMA is already on record as favoring federal support of medical education. The question at hand is whether funding should be allocated for the specific purpose of meeting costs of construction and whether financial incentives should be offered for operational purposes. Given the present financial straits of medical schools and the present manpower needs, there is a strong temptation to recommend "categorical" support of this nature. However, in the long run, the best interest of medical education, the profession and the nation might be served by general institutional grants without specific reservations. Until such time as there is more complete justification of the production and use of physician's assistants, it would seem unwise to provide financial incentives for the development of these specialized educational programs.

RECOMMENDATION 17: The Commission recommends (1) construction grants for university health science centers and area health education centers in amounts up to 75 percent of total construction costs, with the remaining 25 percent available in the form of loans; and (2) start-up grants for new university health science centers in amounts not exceeding \$10 million per center.

COMMENT: The Commission recommends more generous provisions for encouragement of construction of university health science centers and a completely new category of financial support in the form of "start-up grants" for new medical schools. While the ideas do not seem inappropriate, there really is no evidence that such new or greater support is necessary to encourage medical school construction and the development of new health science centers. If funding authorized under present health legislation were to be made available in the full amounts authorized, medical school construction and the development of new medical schools would have proceeded much more smoothly. The fact is that, even

with the limited funding available, new schools have been developed at a record rate. Many more are in the offing and will materialize if funding is available under present conditions.

RECOMMENDATION 18: The Commission recommends that federal financial support of research in university health science centers be maintained at its present percentage of the GNP; that funds should be made available to support research on methods of achieving greater efficiency in health manpower education and in the delivery of health care as well as for biomedical research; that federal allocations should cover the total cost of research projects, and that not less than 10 percent and not more than 25 percent of the research grants to any university health science center should take the form of institutional grants rather than grants for specific research projects.

COMMENT: The AMA is on record as favoring maintenance of federal support for biomedical research at a steady level with sufficient growth in support to cover reflectionary increase in costs. The Commission recommendation would fix research support at its current percentage of the gross national product. This principle deserves careful consideration.

RECOMMENDATION 19: The Commission recommends the strengthening of existing federal legislation for regional, state, and local health planning to encompass regional planning of all health manpower education and health care facilities. The university health science centers, along with their affiliated area health education centers, should have central responsibility for the planning of health manpower education, while the central responsibility for planning changes in the delivery of health care should be in the hands of the regional agencies, in cooperation with state and local agencies, as well as appropriate private institutions. Continuing education of health manpower should be a major concern of the university health science centers and area health education centers with federal funds providing 50 percent of the financial support of such programs.

COMMENT: This group of recommendations should be considered in cooperation with the Council on Health Manpower and the Council on Medical Service.

RECOMMENDATION 20: The Commission recommends national requirements for periodic reexamination and recertification of all physicians and dentists by specialty boards and other appropriate bodies.

COMMENT: Report F of the Board of Trustees which is currently before the House of Delegates relates directly to this recommendation.

RECOMMENDATION 21: The Commission recommends the appointment of a National Health Manpower Commission to make a thorough study of changing patterns of education and utilization of health manpower, with particular reference to new types of allied health workers, of changing patterns of health care delivery, and of the feasibility of national licensing requirements for all health manpower.

COMMENT: The question of whether there should be a national advisory commission on health manpower deserves careful consideration. The relation

of such a group to the AMA, the AAMC and other organizations would have to be defined very carefully if such an organization were to be established and to function effectively. A national licensing system has often been recommended, but would require that states relinquish their rights in this area. The idea of "uniform national standards" has an attractive ring, but also poses a great many difficult problems.

RECOMMENDATION 22: The Commission recommends that states should continue to provide substantial financial support for medical and dental education and that states that have lagged in that in the past should plan for significant increases in expenditures for this purpose. The Commission recommends, also, that the states should provide financial support for medical and dental education in private institutions. In addition, the states should provide major financial support for house officer training and for the education of allied health personnel. The states, in cooperation with universities and with regional and local planning bodies, should also play a major role in the development of plans for the location of university health science centers, area health education centers, and comprehensive colleges and community colleges providing training for allied health personnel.

COMMENT: These recommendations appear to be consistent with AMA and Council on Medical Education policy.

RECOMMENDATION 23: The Commission recommends that university administrations appoint appropriate officers to develop plans for the expansion of university health science centers and for their transformation to perform the broad educational, research, and community service functions recommended in this report. University administrations should also be actively involved in the planning of area health education centers. To accomplish these objectives will often require administrative changes in the university and in the health science center as well. Careful integration of instruction in the biomedical sciences and social sciences between university health science centers and departments on major university campuses should be achieved.

COMMENT: Most universities which are undertaking active expansion of their health centers have already identified appropriate officers or groups to develop plans for such expansion. In addition, many universities are involved in regional planning and in the development of affiliations with geographically separate hospitals which might qualify as area health education centers. Such plans should, of course, be developed in conjunction with medical societies and appropriate community agencies.

RECOMMENDATION 24: The Commission recommends that comprehensive colleges and community colleges develop and expand their curricula in the allied health professions where this has not been done and that they also seek and accept guidance from university health science centers and area health education centers in the planning and evaluation of these educational programs.

COMMENT: This recommendation appears reasonable although it may be wishful thinking to expect comprehensive colleges and community colleges to "seek and accept guidance" from university health science centers.

RECOMMENDATION 25: The Commission recommends that private foundations that have traditionally provided support for health manpower education and research should continue to do so and that foundations that have not provided such support in the past should consider expanding their programs to include it. The Commission also recommends that foundations expand their support for research on the delivery of health care.

COMMENT: We agree.

SUMMARY

The Report of the Carnegie Commission on Higher Education includes many recommendations which are consistent with current developments and are supported by AMA attitudes and policies. In general the proposals and objectives are acceptable to the medical profession. The manpower proposals are modest and the goals should easily be achieved or exceeded. Several of the specific proposals require further consideration. A final AMA position should be developed in conjunction with the Council on Health Manpower and the Council on Medical Service.

RECOMMENDATION

The Council on Medical Education should work cooperatively with the Council on Health Manpower in the development of an AMA "White Paper" on medical education and health manpower.

Memorandum

TO : Mr. Robert E. Patricelli
Deputy Under Secretary, DHEW

FROM : Director, NIH

SUBJECT: Carnegie Commission Report and NIH Policy Position

DATE: November 18, 1970

As you requested, my staff has prepared a critique of the recently published Special Report and Recommendations by the Carnegie Commission on Higher Education entitled "*Higher Education and the Nation's Health: Policies for Medical and Dental Education*". Two attachments amplify our comments on the National Health Service Corps and on the Educational Opportunity Bank concept. Enclosed also with this critique is a policy paper reflecting the attitude of this Agency on the issue in this Report most immediately relevant to the Department, namely the principle instrument(s) to be used by the Federal government to support medical and dental education.

The Report is extraordinarily comprehensive and detailed. For the moment we have not analyzed critically each of its hundred-odd specific recommendations but have focused on what we believe to be its central and critical thrust. As the parallel position paper indicates, we perceive the central issue at this time to be whether Federal financial support should be *first dollar/capitation/formula-type* of assistance or *last dollar/special project/negotiated agreements*. Presently, the Health Professions Educational Assistance Act provides both formula and special project support to institutions with the balance between them being determined by the appropriations process. The action we recommend is to substantially increase total Federal support, a requirement we view as inevitable under any conditions, and in doing this, to place heaviest emphasis on the formula or capitation mechanism.

A flood of other reports on the problems of health manpower education has flowed across my desk in the last couple of months in either final or draft form. They include

- "*A Bicentennial Anniversary Program for the Expansion of Medical Education*" developed by the Association of American Medical Colleges.
- "*The Life Sciences*", a report about to be published by the Committee on Science and Public Policy of the National Academy of Sciences.



- *"Scientific and Educational Basis for Improving Health"*, a report of the Panel on Biological and Medical Science of the President's Science Advisory Committee, a confidential document which, if approved by PSAC, should be published soon.
- *"Priorities in Higher Education"*, the report of the President's Task Force on Higher Education, August 1970, chaired by Dr. James M. Hester.
- *"The Health Professions Educational Assistance Program"*, a report to the President and the Congress prepared by the DHEW, September 1970.
- *"Progress Report on Nurse Training"*, a report to the President and to the Congress, prepared by the DHEW, August 1970.
- *"Federal Health Manpower Programs 1970"*; a draft report prepared by the NIH in response to the request from the Senate Appropriations Committee and now under consideration in the Department.

As the staff of this Agency has deliberated about the various options open to the Federal government at this time, several inescapable realities continually emerge and demand recognition and consideration.

- Health care costs are likely to continue to rise through the coming decade. Federal action may be able to modulate these; some can be transferred "off" the Federal budget; and sound Federal decisions could increase the probability that the rising costs would buy real improvements in the health of the American people. But in any case powerful forces will continue to force costs upwards.
- The Federal government requires the most exact data obtainable on the costs incurred by institutions engaged in medical, dental and other health professional education, to be able to determine the position it should take on the support of these institutions. All proposals extant include this assumption and none are distinguishable on the basis of it. With respect to this issue, the NIH contracted with the AAMC over two years ago for a cost allocation methodology study. Under this contract, work is presently going on in 21 medical centers with additional studies in progress.
- The allocation of costs incurred simultaneously and jointly in the production of multiple "outputs" always poses difficult conceptual and operational problems. As a practical matter

such an allocation is basically indeterminable and can only be resolved by arbitrary operating decisions. In organizations as varied and complex as the nation's 100-odd medical centers, it is by no means certain that the implications of such arbitrary rulings are identical for each institution. Therefore, the securing of uniform compliance would be a real problem that would not be solved rapidly.

- The availability of cost information will, in all probability, not effect substantial cost reductions. Recommendations for improving management may emerge, but rather than result in savings these in turn often require increased expenditures.
- The availability of cost information will certainly not provide automatic solutions to the problems of institutional deficits or the need for these institutions to request assistance from any and every possible source. The magnitude of deficits attributable to various programs will certainly be defined more exactly, and the quantitative support for allegations--for example, that Medicare doesn't cover full costs in academic teaching settings--will be strengthened. But the problems will remain.
- Finally, many of the alternative solutions theoretically open to institutions to reduce deficits are unacceptable in terms of: the traditions of the particular institutions; the local socioeconomic or political realities; and broad public policy considerations. If the prevailing view is correct, that deficits are almost entirely due to inadequate reimbursement for health care costs in the teaching hospitals affiliated with medical schools, it should be recognized that most institutions are in no position to solve the problem by terminating care for indigent patients. As a matter of fact, many are under pressure or even threat to expand this money losing function.

The official position of the NIH is strongly in favor of using substantial capitation (formula) support as the major and primary mechanism to support medical and dental education for the reasons outlined. In this respect, this Agency's position is congruent with the Carnegie Commission and with the official posture of the Association of American Medical Colleges. The logical basis for the NIH views are set forth cryptically in the attached paper. If adopted, this proposal would provide the institutions with a substantial, stable and predictable floor of support and each could then match its requests to other sponsors in keeping with its own particular traditions and aspirations. Implicit

in this proposal is the assumption that institutions unable to stay afloat with this degree of Federal support are fundamentally not viable unless taken over and fully supported by the Federal government, a contingency which the NIH would not support.

Alternatives, such as the proposal developed by Dr. Pesch and included in the most recent Encyclopedia of Health Options, besides requiring an altogether unprecedented degree of interference by the Federal agencies in the governance of non-Federal institutions: commits the government in principle, to the open ended support of whatever requirements emerge from reasoned negotiations with each of a wide variety of institutions; and presents responsible program managers with the need to make *ad hoc* decisions on a myriad of complex problems that will almost inevitably and predictably be non-coherent and inequitable.

Obvioulsy, the NIH recommendation may not find acceptance in the light of the total set of conditions that face the DHEW and the Administration. The NIH would hope that its proposals would be given a full and open airing, with Agency representatives participating in the dialogue. Be assured, however, that this Agency will lend its full and total support to whatever decision is eventually reached.

It goes without saying that the parochial interests of the NIH are best served by a vigorous, open, positive, and constructive debate leading to the development of Federal policy to:

- Maintain and strengthen the biomedical research competence of our nation's medical educational institutions because of the promise they hold for solving the still intractable problems of disease responsible for so much suffering, premature death and economic loss.
- Upgrade the quality of the educational programs of these institutions to provide better physicians for the people of this nation.

Clearly, the ultimate purpose of both efforts is *better health* and *better health service*. To attain this manpower and knowledge are the necessary instruments and means.


Robert Q. Marston, M.D.

Enclosures

cc: Dr. Egeberg

NIH VIEWS ON THE CARNEGIE COMMISSION REPORT,
"HIGHER EDUCATION AND THE NATION'S HEALTH -- POLICIES
FOR MEDICAL AND DENTAL EDUCATION"

Background

The Carnegie Commission Report issued in October 1970 integrates and synthesizes many ideas and concepts that have emanated from a wide variety of study groups and distinguished individuals over the past 40 years. ^{1/} This Report brings together in a single document opinions, descriptions of programs in medical and dental education, indications of trends in health services and recommendations for changes in medical and dental education. In so doing, it draws heavily upon many of the more advanced concepts set forth in the 28-volume Report of the Committee on the Costs of Medical Care in 1928. The Carnegie Commission is to be commended for the comprehensive scope and timeliness of its Report and the sharpness with which it has posed some of the choices related to the problems of medical and dental education today and to meeting the health needs of the American people in the decades ahead. However, many of the concepts and recommendations require extensive critical evaluation since they pose potential threats to the quality of medical education.

The present Report has been issued at this time because of the Commission's conviction that the problems linking higher education and the Nation's health are especially urgent and need early action.

^{1/} One of the most recent reports is the Association of American Medical Colleges' proposal, "A Bicentennial Anniversary Program for the Expansion of Medical Education" whose key recommendations are in most instances congruent with those of the Carnegie Commission.

Specifically, the Report is concerned with

- the serious shortage of professional health manpower
- the need for expanding and restructuring the education of professional health personnel, and
- the vital importance of adapting the education of health manpower to the changes needed for an effective system of delivery of health care in the United States.

The main elements of the Report call for:

1. Action to increase first-year enrollments of medical and dental education through curriculum modification and to accelerate and expand the output of M.D.'s and D.D.S.'s.
2. Reform of medical and dental education through curriculum modification and acceleration of the educational process.
3. Creation of University Health Science Centers which would be responsible for *coordination* of health manpower planning and education in the region and *cooperation* with other community agencies in improving the organization of health care delivery.
4. Development of 126 Area Health Education Centers which would be affiliated with the nearest appropriate University Health Science Center. These Area Centers would serve as focal points for the coordination of health manpower education in their respective areas, except that education of M.D. and D.D.S. candidates would be restricted to a limited amount of clinical education on a rotational basis.

The Report presents a very large number of specific and occasionally contradictory recommendations of different levels of significance and complexity directed to many audiences -- the Federal Government, universities, States, professional associations, and private foundations.

After considered deliberation and careful review, NIH has concluded that the major objectives are sound (with some reservations), warrant consideration at the highest levels of the Executive Branch, and selected proposals concerning the Federal role should be included in the health options being submitted by the Department.

Objectives of the Report

The main objectives expressed in the Report (p.3) are to:

- Provide more health care personnel of the right kinds--with a clear statement that "the supply of health manpower is gravely deficient in some parts of the nation." The Commission's evaluation of disputes concerning the physician shortage is especially insightful:

"The Commission has carefully considered these arguments. It agrees that changes in distribution of physicians and delegation of tasks are occurring and will undoubtedly be accelerated during the 1970s, but we do not believe they will take place rapidly enough to rule out the probability of continuing shortages throughout this decade. We fully support the efforts to develop training programs for physicians' associates and assistants, but these programs are just beginning and cannot possibly have much impact on the shortage of physicians before the end of the 1970s. In addition, it is altogether unrealistic to suppose that practicing physicians, especially those in the middle and older age brackets, are going to change their patterns of practice or their locale suddenly and drastically in order to overcome problems of inefficient utilization and geographic maldistribution of physicians.

"Whether, or not one accepts as accurate the estimate of a current shortage of 50,000 physicians. . . . there is no question, in our judgment, that an acute shortage exists."

The other objectives as set forth on p. 3 of the Report are as follows:

- To achieve a better geographic distribution of personnel and educational facilities, particularly for the sake of the central city and rural areas
- To ensure more equality of opportunity for women and members of minority groups
- To provide more appropriate training for the work actually to be performed and, in doing so, to respond to the constructive suggestions of students
- To relate health care education more effectively to health care delivery
- To bring about a more equitable distribution of the financial burden between the Federal Government and the States, and among the several States
- To limit costs to the greatest extent possible

Most of these objectives coincide closely with public statements by the President, other Administration leaders including DHEW officials.

In addition to the objectives listed above, the Report identified additional goals for 1980. No unambiguous Administration policy on those issues has yet emerged.

- A 50 percent increase in medical school entrant places
- A 20 percent increase in dental school entrant places
- Development of nine new University Health Science Centers [in major metropolitan areas not now served by a medical center]
- Development of approximately 126 Area Health Education Centers [primarily in sparsely populated areas] affiliated with University Health Science Centers
- Acceleration of medical and dental education, thereby achieving greater efficiency

- Development and expansion of programs for physician's and dentist's associates and assistants
- Expansion of the functions of University Health Science Centers so that they can play a central role in *coordinating* and guiding health manpower education and *cooperating* with other agencies in the development of improved health care delivery systems in their regions
- Integration of the curriculum, including such changes as consolidation of instruction in the basic sciences on main university campuses, integration of pre-professional and professional education, and more carefully integrated and coordinated programs of postgraduate training
- Changes in medical and dental education so that they are more responsive to the expressed needs of students and more concerned with problems of delivery of health care.
- Positive policies to encourage the admission of women and members of minority groups to professional training in medicine and dentistry

Assumptions of the Carnegie Commission

In considering the recommendations, it is helpful to identify the assumptions which seem to be basic to the proposals:

- *That States should retain an interest in and provide partial financial support for health manpower education and health system planning, but that the Federal Government by virtue of its greater and more flexible income should assume a larger and continuing responsibility.*
- *That some form of national health insurance will be adopted within the next decade and will result in greatly increased demands for health services. That these increased demands will make "the present crisis in health care appear to be a mere ripple in comparison with the mounting waves of problems to be faced" unless an organized health care delivery system, with expanded facilities and manpower production capability is implemented now.*

- That university medical centers have become the loci of sophisticated diagnosis and treatment and that their influence extends to practitioners of the surrounding communities, resulting in a general improvement in the quality of health care. That the centers' effect on quality of care would be enhanced if a more effective health care delivery system became a primary element of medical center concern.
- That Federal financial support of research in University Health Science Centers be maintained at its present percentage of the GNP. (The derivation of the actual number--0.042 percent--is obscure and appears to seriously underestimate current support to academic medical centers).
- That financial incentives offer powerful motivation for change.
- That a simple linear relationship exists between physician/dental productivity and numbers of assistants, associates and allied health workers available.
- That, even though the health labor force has increased materially over the past decades and now represents at least 3,400,000 persons, further rapid expansion is justified within the next decade and that *the development of an organized system will result in greater efficiency and savings which will at least partially offset the additional costs incurred in the development of new and expanded facilities, additional manpower and additional services to people not now receiving them.*

Major Recommendations and NIH Position on Each

The major recommendations calling for increased Federal support are set forth below with NIH's position on each of them.

- Substantial capitation grants as the major mechanism of Federal support to schools of medicine, osteopathy, and dentistry in order to provide a floor of stable institutional funds. *NIH favors this recommendation, in principle. A substantial capitation award would unequivocally demonstrate the Federal Government's clear and specific interest in providing a base of support for education in the key health professions. We are convinced that capitation provides the most equitable and administratively feasible mode of Federal support. In essence, it is "first dollar" support, assuring each school of a threshold level of operation. (The essential arguments for the "first dollar" approach are presented in the position paper submitted with this document.)*

- Substantial capitation premiums to provide incentives for expansion. *NIH favors capitation premiums which have been demonstrated to be effective incentives for expansion.*
- Capitation grants for house staff. *This proposal requires further study and consultation with the medical education community and SSA.*
- Capitation grants for curriculum improvement. *NIH believes project grants awarded in national competition are a more effective mechanism.*
- Construction grants with 75% Federal matching. *NIH is well aware of the Department's firm position favoring loans in lieu of grants for construction. The Department is cognizant of the achievement of construction grants in upping the number of first-year medical students from 8.8 thousand in 1963 to 11.4 thousand in 1970 -- a 30% increase. Construction grants are "hard" money. Amortization grants will be viewed as "soft" money akin to Federal support for research and training which can vanish at Executive discretion or Congressional judgment -- leaving the institution with its commitment to meet principal and interest charges. After much soul-searching, I would be less than candid if I failed to express again NIH's support for construction grants to expedite the building of a predetermined and finite number of sorely needed facilities (1) to establish new medical schools in metropolitan areas not now served by a school and (2) to assure major urban complexes such as Los Angeles, the Bay Area of Northern California, New York, Cleveland, Detroit, Dallas, Atlanta, and St. Paul an opportunity to establish additional medical centers, when needed.*
- Grants and loans to students. *NIH favors these recommendations, in principle, with explicit reservations. We favor grants to low-income students but oppose the "Educational Opportunity Bank," as described in the Report (see Attachment A). It seems poorly thought-through, extremely expensive and puts the high-risk, low-income student at a distinct disadvantage while appearing to aid him. Also we are highly skeptical of the utility of the proposed 25% loan forgiveness feature as an effective mode of recruiting a voluntary National Health Service Corps.*

In addition to the above, there are numerous substantive recommendations which require judicious assessment and critical evaluation of feasibility on matters that are now the responsibility of individual medical schools, universities and States.

Reservations

While NIH agrees, in general, with many of the objectives enunciated in the Report, we have serious reservations about some of the specific recommendations, the lack of supporting data and significant omissions.

Expansion of Supply

The Report recommends a 50 percent increase in enrollment of first-year medical students and a 20 percent increase in enrollment of first-year dental students by 1978. The NIH feels that the proposed increase for medical students is minimal and the rate of growth is hardly responsive to the current doctor shortage, and the predicted needs based on population growth and the expectations of rising demand. In sharp contrast, many of the developed countries of Europe plan substantial expansion of M.D. output and project physician/population ratios. For example, Sweden has projected requirements for 300 physicians per 100,000 by 2000 A.D. ^{1/} In 1968, Russia had a ratio of 224 physicians per 100,000. Extrapolations to the year 2000 suggest that the ratio may range between 350 to 450 physicians per 100,000. The Carnegie Commission projections

1/ Demography of Medical Education. WHO, Copenhagen.

for the United States range from about 150 at the present time to a range of 186-216 per 100,000 in the year 2002, *assuming that no foreign medical graduates enter the U. S. between 1977 and 2002.*^{1/}

In addition to health services, more physicians will be needed for health care administration, assuming major changes in delivery systems; for academic medicine, especially if an increasing share of clinical training is to be gained in community hospitals, neighborhood health centers, and community facilities; and for research. Even though a small fraction of all M.D.'s actually pursue research careers, a substantial fraction desire the benefits of research experience.

The Commission also stated "on the whole, there is less evidence of a shortage of dentists than of physicians, in relation to current demand." The Commission's conclusion is based on dentists' hours of work and the fact that very few foreign dental graduates are employed in U. S. dentistry. This evaluation neglects the vast unmet dental needs of the American people and rising expectations which have already triggered the trend toward increasing specialization in dentistry. Accordingly, the recommendation for a 20 percent increase in dental school first-year places seems low. Even though there is a reasonable basis for assuming that research will lead to the eradication of dental caries, unmet needs related to the *residua* of caries and to other forms of dental disease in all age groups and income categories call for a more substantial increase in the number of dentists.

^{1/} Higher Education and the Nation's Health, p. 42.

National Health Service Corps

The proposal for a voluntary National Health Service Corps is aimed at improved distribution. Loan forgiveness for 25 percent of the maximum amount which could be borrowed is offered as an inducement for students from low-income families to enlist in the Health Service Corps. It is unlikely that this proposal would even scratch the surface of the maldistribution problem. Moreover, it would place an inequitable burden upon the low-income students to staff such a voluntary Corps. In our view, consideration should be given now to coupling a substantive capitation payment with a universal health service corps requirement. An alternative proposal along these lines was submitted for consideration more than a year ago; an identification of the issues to be resolved before establishing such a Corps and a proposal to appoint a Task Force to critically examine these issues and to recommend appropriate action to the Secretary followed a few months later (See Attachment B).

Models of Education

The Report, in the chapter "Medical Education Today", describes accurately the impact of the Flexner Report of 1910 on medical education and on the quality of medical care in the United States.

"Briefly, it developed the themes that (a) medical care must be based on thorough knowledge of the biomedical sciences, (b) only high-quality medical schools should receive accreditation, (c) these schools should emphasize both laboratory work and extensive clinical experience, (d) the many inadequate proprietary medical schools which flourished in that period should be closed down, and (e) medical schools should be affiliated with universities.

"The primary thrust of the post-Flexner development in medicine was the recognition of a scientific base in the natural sciences as a *sine qua non* for rational diagnosis and therapy. The reservoirs of scientific knowledge were in the universities, and, as a result, medical schools and teaching hospitals became more closely integrated with academic disciplines on the campus. . . ."

The importance of university affiliation of medical schools was also reinforced by the Coggeshall Report of 1965, entitled "Planning for Medical Progress Through Education".

Although it is difficult to cite chapter and verse, many of the NIH staff, in reviewing this Report, noted statements that could be interpreted to recommend abandonment of all or most aspects of the Flexner model for the majority of medical schools.

Flexner basically advocated general adoption of the system of medical education prevailing in Germany in the latter third of the Nineteenth Century. Research was emphasized in his model only to the extent that the quest for new knowledge was an integral and indispensable function of a full-time university faculty. The prevailing level of research activity in many medical schools

could not have been envisioned by Flexner sixty years ago and is in nowise an essential element in his conception of medical education. Actually, until the early 1950s, research was pursued at a modest level of effort in the medical schools of this country and drew its support principally from general university operating funds, from endowment and from private sector gifts and grants. The current level of research is a phenomenon of the last two decades. While some of the experimental "modifications" of the educational process now under examination and evaluation are viewed as "non-Flexnerian" or "post-Flexnerian", it is inconceivable that medical education should ever prescind from its deep roots in science.

Whenever educational innovation is introduced, a primary concern should be the preservation of the quality of that process. The central issue is what type of education best prepares the physician to offer the highest quality of health services and best enables him to continually incorporate improved methods of diagnosis, therapy, and rehabilitation. In delivering health care, the physician bears direct and immediate responsibility for the life and well-being of his patients. Throughout his career averaging forty years, he is daily confronted with difficult intellectual problems which must be resolved through appropriate selection from a vast, complicated, and growing body of knowledge. Surely, the most wasteful and discouraging cost aspect of medicine is that

associated with inadequate, harmful, and usually more expensive practice of medicine by the incompetent. Since the period during which the physician must acquire the basic knowledge and understanding of health and disease is relatively short, he should have the maximum opportunity to master the present "state of the art" and to acquire the capacity and motivation for "lifetime learning".

In this context, one may properly voice cautions about the new models proposed. The Report appropriately stresses the deep dependency between the basic sciences and clinical medicine in its development of specifications for the University Health Science Center. However, extraordinary care must be taken lest, in the realization of the "integrated science" model, an ever deepening and widening chasm develop between science and medicine. The isolation of the teaching of clinical medicine in community hospitals from the teaching of basic medical sciences on university campuses could attenuate the fruitful interplay that occurs when these two functions are discharged under one roof. While medical education may not in the past have placed sufficient emphasis on "how to do it", i.e., on the organization and delivery of health services, too early and too much attention to this important practical facet might compromise the time devoted to, and the status accorded, the theoretical scientific content of a medical curriculum. It cannot be emphasized too strongly that a competent physician, adept at diagnosis and skilled in therapy--both problem-

solving exercises with very high intellectual content--can function effectively in a wide variety of institutional and organizational systems for the delivery of health care. On the other hand, without these skills, effective function is impossible, whatever the system.

The NIH supports efforts to expedite the educational process, to winnow unnecessary material from the curriculum, and to take advantage of the spectacular upgrading of secondary and collegiate education of the last decade. Unquestionably, matriculants in medical schools are far better prepared today than was the case even a few years ago. Acceleration based on these realities should not compromise the quality of medical education.

Finally, the meaning of the term "experimentation" as applied to medical education differs importantly from its usage in the context of natural science. Controlled conditions are impossible, the number and force of uncontrolled variables are large, the time course is prolonged, criteria for evaluation are as yet undeveloped. Therefore, expectations for unambiguously interpretable results are unreasonable. The current process of medical education is reasonably well understood and its products reasonably predicatable. It is far from perfect, and some dramatic changes have been introduced in the last decade. There is considerable merit in concentrating more on continuing these.

improvements rather than adopting radically different processes which might turn out, a generation hence, to have been fatally flawed.

Biomedical Research

The Carnegie Commission Report recommends that

- Federal financial support of research in university health science centers be maintained at its present percentage of the GNP
- Funds should be made available for support of research on methods of achieving greater efficiency in health manpower education and in the delivery of health care as well as for biomedical research
- Federal allocations should cover the total cost of research projects, and
- Not less than 10% and not more than 25% of the research grants to any university health science center should take the form of institutional grants rather than grants for specific research projects.

Biomedical research is an investment in improving the quality of health care. The Federal intent was and remains clear: biomedical research funds are dedicated to the creation and/or the application of new knowledge to health problems. The fact that a substantial fraction of these funds has been awarded to institutions engaged in medical education has indubitably upgraded both research and education.

The level of Federal support has been and should continue to

be determined by annual Executive and Congressional review of specific needs and opportunities. The proposal to define the appropriate aggregate level of Federal expenditure as a (roughly) fixed fraction of the gross national product or of the nation's total expenditures for health care can provide no more than a useful perspective and a rough guide.

The outlook for continued vigor throughout the Nation's biomedical research enterprise could be significantly improved if the Federal Government were to make a long-term commitment to a floor below which its biomedical research investments would not drop. In the FY 1970 Health Program Memorandum, the DHEW felt that, in the face of the prevailing fiscal stringencies, it could do no more than try to maintain a constant program level of biomedical research through FY 1975. The NIH would expect and advocate an intensification of research efforts as economic conditions improve and as new research opportunities emerge.

Funding for other types of research--on the educational process and on health care delivery--should be justified similarly--on the basis of need and opportunity. The NIH, as noted elsewhere, views the special project grant as the appropriate vehicle for support of research on education.

The NIH is favorably disposed to the payment of full costs of Federally-sponsored research. However, any such major change in current Federal policy should be preceded by a full exploration

of the consequences upon institutions, upon Federal-university relations, and upon costs.

One important aspect of the funding of biomedical research not considered in this Report is the nature of the decision-making processes by which total Federal funds are distributed and sub-allocated in the effort to deploy science and technology to achieve broad social objectives in the domain of health. The calculus involves the extent to which selection and funding of research projects are relevant to, and impact on society, *vis a vis*, the professional perceptions of scientific opportunities and capabilities for successful attach on it. It is becoming increasingly important to articulate the principles governing such decisions since dilemmas of growing severity will be precipitated by overall limitations on funds and by public attention focusing on problems in which there is sharp discordance between social import and scientific capability or opportunity. Open public debate, based on as broad as possible an understanding of both societal and scientific evaluations, is a clear imperative for these difficult problem areas.

Omission of Faculty Needs

No recommendation relates to the preparation of faculty for professional and auxiliary schools, in the face of recommended increases in enrollments and new institutions. Expanded teaching requirements will further deplete existing resources for delivery of services.

Uniform Tuition Rates

The proposal for uniform tuition rates, "as a condition for Federal cost of education supplements", though desirable in some respects, probably would result in a windfall to most States (not State medical centers) and impose even greater strains upon the viability of private institutions. This position should also be viewed in the context of the NIH views on the EOB (see Attachment A).

Location of New University Health Science Centers

The Commission recommends that new University Health Science Centers be located in major metropolitan areas not now served by a medical school, e.g., Phoenix, Fresno, Jacksonville, Norfolk, Springfield, Mass., Wilmington, Tulsa, Duluth, and Wichita. It is equally important that rapidly growing metropolitan areas such as Los Angeles, the Bay Area of Northern California, Cleveland, Dallas, Detroit, St. Paul, and Atlanta add additional medical centers (1) to provide opportunities for the young people in their areas who aspire to careers in the health professions and (2) to upgrade the quality of health care. *More important, we favor a deliberate selection of a finite number of new*

institutions for early identification for Federal support. The level of construction applications, now approved but unfunded, demonstrates the need for clarification of the Federal intent.

Costs of the Proposal

The Report fails to set forth the key assumptions which underpin the various cost elements of the proposal, summarized in Appendix B, Table 3. Until these assumptions are laid bare, it is not possible to appraise the validity of the Commission's cost estimates. In any event, these estimates are restricted solely to the Federal estimates recommended for expanding the supply of physicians and dentists. These figures do not reflect the total Federal investment required for the education of health manpower because they exclude Federal funds for the education of nurses, allied health professionals, pharmacists, veterinarians, podiatrists, and optometrists.

NIH Views on Recommendations Calling for Early Federal Action

The Federal Role

The Carnegie Commission believes that medical and dental education are critically underfunded and greatly increased financial support from the Federal Government is required to bring about (1) the development of a sufficient and effective supply of physicians and dentists and their associates and assistants, (2) equality of opportunity to enter these health professions, (3) effective use of educational resources,

(4) regional dispersion of health manpower educational institutions, (5) equitable distribution of the cost burden, and (6) adaptation of health manpower education to changing patterns of health care delivery.

The types of Federal financial support recommended by the Commission include (1) student grants and loans, (2) institutional grants for educational expenses, (3) grants to University Health Science Centers and university-affiliated area health centers for the advanced education of house officers, (4) grants and loans for construction, (5) start-up grants, (6) research grants, and (7) funds for manpower research and regional planning.

NIH concurs with the recommendation that (1) the Federal Government substantially increase support for medical education and (2) the most equitable mechanism is a capitation payment sufficiently large to meet a significant fraction of the cost of instruction and to encourage rapid expansion in entering classes and in class size. On the other hand, it is our firm conviction that project grants, awarded in national competition, are a more effective mechanism than uniform capitation payments for supporting serious research and extensive experimentation in medical education.

Increased State Aid

NIH also agrees with the Commission recommendation that the States also provide increased support for medical and dental education. State support does yield significant social returns to citizens and taxpayers as it:

- Improves the quality of health care in the immediate vicinity of the medical center and throughout the State.
- Encourages young people to enter the health professions.
- Enlarges opportunity of qualified college graduates for low cost, high quality medical and dental education.

Implications for Legislative Action

The Commission recommendations, if accepted in principle, have clear implications for the DHEW legislative proposals to be presented to the Congress in the session ahead.

- *The Health Manpower Act of 1968 expires June 30, 1971*
- *NIH favors the extension of the existing statutory authority with modifications incorporating many of the Carnegie Commission proposals.*
 - *A substantial increase in the level of capitation grants as a basic mode of support to schools of medicine, osteopathy, and dentistry and to University Health Science Centers*
 - *Additional substantial capitation grants providing incentives for significant (at least 20%) expansion over the 1970 enrollment base*
 - *The Commission's recommendation for capitation grants for house officers poses issues which require further study and consultation with the medical education community and SSA*
 - *Continuation of some form of authorization to assist in the construction of teaching and related facilities*
 - *Start-up grants to each new school to cover non-construction costs*
 - *Continuation of authority for project grants for research and experimentation in medical education.*

-- Student aid through grants to low-income students and loans.

Fiscal Implications for 1972-76 Budgets

The Carnegie Commission recommendations are premised on the assumption that medical education is seriously underfunded at the present time. In FY 1970, NIH obligated \$31.6 million for basic improvement grants to schools of medicine, osteopathy, and dentistry, \$50.0 million for special projects, \$10.8 million for scholarships, and \$131.7 million for construction. An approximation of the fiscal implications of the Commission's Report for the 1972 and 1976 budgets is indicated (for schools of medicine, osteopathy, and dentistry) below:

	<u>1972</u>	<u>1976</u>
	(in millions)	
<u>Estimated Total</u> ^{1/}	<u>\$533</u>	<u>\$666</u>
Capitation Grants	262	290
Expansion Capitation	25	53
Special Projects	40	80
Student Grants	50	75
Start-up Grants	40	40
Construction	126	126

It should be emphasized that these estimates are limited to schools of medicine, osteopathy, and dentistry; they do not include funds required for education of all other categories of health manpower nor for health manpower research and planning.

1/ Excluding loans. Capitation grants at recommended level of \$4,000 per student; student grants for low-income students @ \$4,000 each would cover roughly 20 percent of enrollment in schools of medicine, osteopathy, and dentistry; construction grants are held constant at current authorization.

Feasibility of Some of the Substantive Recommendations
of the Report

In many instances there is a need to assess the feasibility of the Commission's recommendations on matters that are now the responsibility of individual medical schools, universities, and States. Essentially, the key issue is the extent to which Federal funds should be used as leverage to influence uniformity or to encourage diversity.

National Health Manpower Commission

The Commission has recommended the appointment of a National Health Manpower Commission ". . . to make a thorough study of changing patterns of education and utilization of health manpower, with particular reference to new types of allied health workers, of changing patterns of health care delivery, and of the feasibility of national licensing requirements for all health manpower." *This Commission, which NIH favors, would be an appropriate vehicle for examining some of the other recommendations requiring further study. We wish to reiterate, however, that NIH favors action now to implement the major recommendations, thereby defining more sharply the charge to the proposed National Health Manpower Commission.*

(As "Originally" Proposed)

Note: Two caveats are necessary for any acceptance or denial of the following reservations pertinent to an Educational Opportunity Bank: (a) the Federal mix of support (if any) that would be available to students along with loans from the Bank could affirm or negate certain criticisms (e.g., special loan programs for the disadvantaged would alleviate some of the problem presented under point 3); and (b), since this material has been drafted on the basis of past discussions of the Bank, most recent presentations may contain answers or arguments refuting some of the reservations. Reservations pertinent to the latest report of the Carnegie Commission follow this section.

1. There is no experience upon which one can base judgement on the viability of an Educational Opportunity Bank. In discussions of a contingent loan program, the Carnegie Commission on Higher Education in its study, Quality and Equality: New Levels of Federal Responsibility for Higher Education, stated:

A loan program of this sort must be viewed as clearly experimental; it is difficult to predict the extent to which it will be used.... It is also difficult to predict the level of federal expenditures which would be required by this loan program. (Italics added)^{1/}

In effect, the Bank may be unworkable as planned; i.e., the Federal government might have to bail out the Bank to an extent not presently envisioned.

2. It is generally agreed that to be fiscally solvent, the Educational Opportunity Bank must have a proportionate share of borrowers who will be financially successful in relationship to those who will not earn a high income. With a disproportionate share of borrowers repaying on a low income base, the Bank would have to raise repayment rates in order to obtain more money for solvency purposes from borrowers who would be successful. Confident borrowers (i.e., those who expect high incomes)^{2/} would turn to fixed loans creating an "adverse selection" population for the Bank.

In this context medical and dental students as a group must be considered at the present time as confident borrowers who would prefer fixed loans to contingency repayment plans. "Opt-out" provisions have been proposed for such borrowers; i.e., confident borrowers could buy up their contracts by treating the loans in a conventional fashion (fixed loan) and possibly paying some extra charge.^{3/} In these cases, the essence of the Educational Opportunity Bank changes from contingency repayments to a mix of fixed loan repayments and contingency repayments. Thus, reservations in terms of the feasibility of the Bank for medical and dental students may be expressed; i.e., if the end result is a fixed loan pattern, why bother with a program of contingency repayments? Further, it appears that the Federal government would have to subsidize confident borrowers in some manner in order to make loans from the Bank fiscally attractive to them.

3. It has been argued that the Bank would "contribute significantly to a further equalization of educational opportunity."^{4/} Yet, for the Bank to be solvent, it has been suggested that borrowers would have to pay 1 percent of gross income over 30 years for each \$3,000 borrowed. Students who borrowed from the Bank for their undergraduate education would be facing even greater indebtedness if they wished to undertake a medical or dental education. The Zacharias Panel in recommending the Bank in 1967 recognized the limits to borrowing:

The Bank would be able to lend enough to cover subsistence and tuition at any college. This would currently mean a 4-year maximum loan of at least \$15,000, rising in subsequent years. We doubt that many students would choose to borrow this heavily, since this would mean committing about 5 percent of their future earnings. (Italics added)^{2/}

Whether disadvantaged or not, there appears to be a limit to the amount for which even a confident borrower will mortgage his future. As a sole source of Federal loan funds, the Bank could be an accelerative factor in reaching these limits.

4. The inadequate level of funding of present Federal loan programs is cited as a point in favor of the Bank; i.e., it is assumed that the Bank will have sufficient funds to enable any student "to borrow enough money to cover his tuition, costs, and subsistence at whatever college, university, or other postsecondary institution he is admitted to."^{6/}

However, the availability of such funds to all students could lead institutions "to shift to the student the cost, at an escalating rate, of higher education."^{7/} Medical and dental schools with their present financial difficulties would probably be tempted to raise tuitions and fees in order to overcome deficits. Further, it has been argued that private institutions of higher education in depending more and more on tuition and fees would be "relatively worse off under operations of the Bank unless states reduce(d) their support of public colleges and universities and force(d) increases in student charges."^{8/}

As discussed under (3) above, there is also a limit to the amounts students will borrow. As the costs of medical and dental education rise, it can be expected that more and more capable students will elect not to apply or go to medical or dental schools and will opt for other careers because of price (in this case, the commitment of too large a percentage of their future earnings).

5. Medical and dental schools and their students are national resources. Dr. Karl Shell, who is in favor of the Bank, stated in an article in the Harvard Medical Alumni Bulletin:

Of course, there are benefits from medical education that are diffused throughout society and do not accrue to the specific "buyer" of medical education. For this reason it may be desirable that the "average interest rate" charged by the Conditional Repayment Loan Scheme be lower than the market rate of interest.^{9/}

It should be noted that this proposition of lowering "interest rates" for a special body of "confident" borrowers would create solvency problems for the Bank unless Federal payments to the Bank (subsidies) made up the difference (see 2 above). More important, once the argument is accepted that benefits accrue to society, one may question the value of the concept of the Bank in contributing to these benefits; i.e., is it the best financial plan available to attract the most capable students to careers in medicine or dentistry at the least cost to the students, the schools, the Federal government?

6. Except for point 5, the reservations above are mainly economic in nature. There are philosophical and historical reservations that should be expressed.

The American Association of State Colleges and Universities and the National Association of State Universities and Land-Grant Colleges adopted various recommendations for national action affecting higher education in November of 1969. The following quotation taken from these recommendations is of import:

Higher education in the United States has been the means of providing genuine equality of opportunity for increasing numbers of young men and women because the American people have recognized that education is primarily a social responsibility. They have supported our colleges and universities both directly through public channels and indirectly through voluntary support encouraged by special tax treatment, thus keeping down the financial barriers to education. The philosophy that financing education is primarily the responsibility of the student is directly contrary to this great and sound tradition.^{10/}

In the United States each generation has striven to pass on to the younger generation the opportunities to achieve what was not available to the parents. Today there is a gap of understanding between the generations, but this should not deter the older generation from its traditional role. In discussing loans and banks, in considering an education as the financial responsibility of the student, we are on the threshold of making decisions that will change the historical pattern of financing education in this country. Rather than emphasizing the student's financial role in his education, it is open to consideration that we should also be exploring the means whereby costs to the student could be lowered until eventually a free higher education would be a right guaranteed to any capable student.

Footnotes

- 1/ Carnegie Commission on Higher Education, Quality and equality: new levels of federal responsibility for higher education, 1968, p. 30.
- 2/ The term "confident borrowers" comes from Roger E. Bolton's paper "The Economic and Public Financing of Higher Education: an Overview," in The Economics and Financing of Higher Education in the United States by the Joint Economic Committee, 1969, p. 91.
- 3/ Karl Shell, "A New Approach to the Financing of Medical Education," Harvard Medical Alumni Bulletin, Vol. 43, Winter 1969, No. 3, p. 4.
- 4/ Carnegie Commission on Higher Education, op. cit., p. 30.
- 5/ Jerrold R. Zacharias, Joint Economic Committee, op. cit., p. 658.
- 6/ Ibid., p. 657.
- 7/ American Association of State Colleges and Universities, and the National Association of State Universities and Land-Grant Colleges, Recommendations for National Action Affecting Higher Education, January, 1970, p. 8.
- 8/ Ibid., p. 9.
- 9/ Karl Shell, op. cit., p. 3.
- 10/ American Association of State Colleges et. al., op. cit., pp. 9-10.

Summary

Reservations Concerning the Educational Opportunity Bank as Previously Proposed

1. There is no evidence that the concept of the Bank is workable or viable as planned. The Federal government might have to subsidize the Bank to an extent not presently envisioned.
2. Confident borrowers (that is, those who expect high income), well exemplified by medical and dental students, would probably prefer fixed loans rather than contingency repayments. This type of "adverse selection" would work against the solvency of the Bank. "Opt-out" provisions for such confident borrowers would be more akin to fixed loans than contingent loans; thus, the question is raised as to the need for the Bank for medical and dental students.
3. There is a limit to the amount for which even a confident borrower will mortgage his future. For medical and dental students, the Bank, as a sole source of Federal loan funds, could be an accelerative factor in reaching these limits.
4. Since the Bank would provide funds to pay all costs of tuition and fees, medical and dental schools in their present financial straits would be tempted to raise their tuitions and fees. The availability of funds to all students could lead institutions to shift to the student the cost, at an escalating rate, of higher education. With rising costs of this nature, more and more capable students will elect not to apply or go to medical or dental schools and will opt for other careers because of price.
5. The suggestion has been made that since benefits accrue to society from a medical education, the contingency rate for such students be lower. Once the argument is accepted that benefits accrue to society, one may question the value of the Bank in contributing to these benefits; i.e., is it the best financial plan available to attract the most capable students to careers in medicine or dentistry at the least cost to the students, the schools, and the Federal government?
6. There are philosophical and historical reservations. In the United States each generation has striven to pass on to the younger generation the opportunities to achieve what was not available to the parents. "...the American people have recognized that education is primarily a social responsibility." Rather than talking about loans and banks, it is open to consideration that we should also be exploring the means whereby costs to the student could be lowered until eventually a free higher education would be a right guaranteed to any capable student.

Further Reservations on the Educational Opportunity Bank as
Proposed in Higher Education and the Nation's Health

With the new report of the Carnegie Commission on Higher Education, Higher Education and the Nation's Health, there are now two extant proposals for an Educational Opportunity Bank (EOB) endorsed by the Commission with a third possibility implied. In its previous report, Quality and Equality: New Levels of Federal Responsibility for Higher Education, the Commission endorsed an EOB for all students in higher education. Reservations about this approach have already been presented (copy attached).

The Commission in its latest report appears to be endorsing an EOB only for medical and dental students in a holistic approach (almost gestalt in nature) to medical and dental education. In this context the Commission has presented, as will be shown below, an EOB of extremely limited value for medical and dental students. A third possibility, implied, would be an EOB only for medical and dental students that would not depend upon other proposals of the Commission in its latest report.

Reservations on the EOB in Higher Education and the Nation's Health

The Commission has recommended (a) a student grant program that will cut or do away with costs to a large number of medical and dental students, (b) three-year programs for medical and dental schools that will cut costs by one-fourth for those students who would have formerly had to go four years, and (c) a standard tuition rate of \$1,000 per student, again cutting costs to students in a number of schools. For discussion purposes, it has been assumed that the three conditions would be in force in 1971-72.^{1/}

(1) A large number (25-35 percent of the students) will (or could) receive student grants. For medical and dental students receiving student grants and having to borrow to finish medical or dental training, the flat 3 percent of earnings for 20 years proposed as EOB repayments would make commercial loans rather than those from EOB more attractive.

The report recommends a Federal program of grants up to \$4,000 a year for medical and dental students and for those in associate and assistant programs in medical and dental schools. In so doing, the Commission recognizes that there is a "psychological" barrier to borrowing large sums for students from low-income families.

The Commission estimates that \$64,600,000 should be available for such grants in 1971-72. Obviously in 1971-72 the vast majority of recipients of the grants would be medical and dental students rather than those in associate and assistant programs. It may also be stated that since the Commission shows increasing amounts in subsequent years for student grants, medical and dental students would remain in the ascendancy. Assuming that each student would receive the maximum \$4,000, it becomes apparent that over 16,000 students would be supported; at \$3,000 per student, over 21,500.

^{1/}The Report does not recommend that all three conditions be implemented immediately; e.g., the uniform tuition rate would not become effective for four years.

Thus, approximately 25-35 percent of the medical and dental student body either would not have to borrow from the Bank or would have to borrow comparatively reasonable sums with a standard tuition of \$1,000. An unpublished report by BIME on the financing of education by medical students in 1967-1968 showed average expenses of \$4,394 including \$1,511 in school expenses. Including cost-of-living increases and a standardized \$1,000 tuition rate, present average yearly expenses would probably be close to \$4,300-4,400. Thus, students receiving \$3,000 student grants would on the average only have to borrow at the most \$1,500 a year for a total of \$4,500 for three years. Medical and dental students would consider the Commission's "recommendation" of repayment of such sums at a total of 3 percent of their future income for 20 years as unrealistic. (It should be noted that students in associate or assistant programs would not be eligible to borrow from the EOB.)

(2) Pegging EOB repayment at a flat percentage of future earnings rather than a percentage of future earnings that relates to the amount borrowed will make EOB loans unattractive to still another large group of medical and dental student borrowers. In effect, the EOB as now proposed is not answering the financial needs, in terms of borrowing, for what appears to be at least the majority of medical and dental students. For these students the Guaranteed Student Loan Program as proposed is a better alternative.

The Commission has proposed repayments at a flat 3 percent of earnings rather than having the percentage based on the amount borrowed; e.g., one percent of future earnings for each \$3,000 borrowed. It becomes readily apparent that medical and dental students would measure the amounts that would have to be repaid to the EOB as against those to commercial banks for the same loans especially if the Guaranteed Student Loan Program with a secondary market existed. For example, \$5,000 borrowed from the EOB would require repayments of \$18,000 if the student averaged \$30,000 per year in income for 20 years, and only \$11,000-13,000 as a fixed loan for the same period at the relatively high rate of 9 percent simple interest under proposals for the Guaranteed Student Loan Program. The student would have to "plan" on averaging less than \$20,000 per year for 20 years to make the EOB more attractive than such a fixed loan. Thus, another relatively large group of medical and dental students would find fixed loans preferable to the EOB.

(3) Under the new EOB, adverse selection would still occur especially when consideration is given to the proposition that the Commission's other recommendations either negate or lower the need for borrowing for most medical or dental students.

Only those medical and dental students who had to borrow comparatively large amounts of money and would expect to earn average or less than average incomes for 20 years would find the EOB attractive. For example, a student who borrowed \$10,000 would have to average \$40,000 per year before his repayments (\$24,000) would approximate those proposed under the Graduate Student Loan Program at 9 percent simple interest. Since average net income of physicians presently appears to be in the neighborhood of \$30,000 to \$33,000, a student would be subsidized by the EOB if his income did not approximate an average of \$40,000 per year and he borrowed \$10,000

But, will medical and dental students have to borrow large amounts of money? As noted above, the Commission recommends \$1,000 flat tuition rate for all medical and dental schools and further recommends cutting curriculum from 4 to 3 years. It does not appear through manipulation of these factors, plus the student grant program proposed, that a majority of students would need to borrow anywhere near \$10,000 to complete their training; i.e., since a medical student could obtain his medical or dental training at a total cost of between \$10,000-\$15,000 for the three years, those not able to afford this amount would be on student grants, those who could afford some of the amount would probably not be borrowing more than \$7,500.^{1/} Thus, the EOB appears to be losing all potential customers except a very small minority who for some reason did not obtain a student grant or who were not "confident borrowers."

4. The Commission in proposing a uniform tuition rate recognizes the concept of a buyer's resistance on the part of medical or dental students in terms of "going very heavily into debt." Yet, the Commission does not appear to pay any attention to the problem of debt incurred by these students during their undergraduate days. Again, the most recent proposal for the EOB does not appear to serve the needs of medical and dental students.

In the latest report, the Commission in recommending a uniform tuition rate recognizes the concept of a buyer's resistance:

If a student is required to pay high tuition over a prolonged period of M.D.- or D.D.S.-candidate education, it is readily apparent that the total cost is likely to be so high that many students will be faced with the unfortunate choice of abandoning medical or dental education or going very heavily into debt. (p. 67)

Yet, the Commission does not appear to have recognized that previous indebtedness is a most important factor in any decision to assume more debt. Potential medical and dental students may already be heavily in debt from their undergraduate education. Thus, a major problem not touched upon in the report focuses on loan programs that will be available for undergraduates and the method of repayment of these loans. The EOB as originally presented covered undergraduate education as well as graduate but now does not appear to involve undergraduates. (Note: Previous reservations, copy attached, were for the EOB as originally proposed.) In effect, the EOB provides no answer to this financial problem of medical and dental students and is not serving their needs.^{2/}

^{1/}It appears that students who would have to borrow over \$2,500 per year for the three years might find the EOB more profitable than the Guaranteed Student Loan Program as proposed.

^{2/}The Commission can not be implying that the EOB would be available to potential medical and dental students during their undergraduate education. If so, "adverse selection" and the larger amounts of indebtedness would make the 3 percent flat rate of future earnings completely unrealistic.

5. The new EOB is still experimental in nature, there is still no experience upon which one can base judgement on its viability, and it is still difficult to predict the level of Federal expenditures necessary for the truncated version proposed by the Commission.

The new EOB for only the minority of medical and dental students, as discussed above, would still be experimental in nature. There is little doubt that even in this truncated version the EOB would not reach a degree of liquidity for a long period due to the length of time of repayments. Unless interest was subsidized by the Federal government, the sale of EOB bonds would be difficult. As presently recommended, it appears that adverse selection would still occur in the EOB; thus, a contention that the Bank might never be solvent does not appear to be farfetched.

6. By recommending subsidization of a large number of students, standard tuition rates, and subsidization of medical and dental schools, the Commission is close to answering the philosophical and historical reservations previously expressed (see point 6 in attached copy). Further dollar increases in certain recommendations of the Commission would negate any need for the EOB for medical and dental students.

Raising the subsidy to medical and dental schools to \$5,000 per student instead of \$4,000 would make the standard \$1,000 tuition rate unnecessary in terms of the Commission's report. Doubling the amount of student grants would probably cover the financial needs of all students (i.e., without the need to pay tuition, over two-thirds of the medical and dental students could receive an average of \$3,000 for expenses in 1971-72; five-sixths of the students an average of \$2,500). Based on estimates of the Commission, another \$125,000,000 in 1971-72 (and similar amounts in subsequent years) divided between per capita payments and student grants would make an EOB unnecessary.

An EOB Exclusively for Medical and Dental Students Separated from Other Proposals of the Carnegie Commission

There is little doubt that the Federal mix of support to medical and dental students (and medical and dental schools) would play a large role in determining the feasibility of an EOB. Previous presentations of the EOB have never placed it in the position of being the only source available to students for financing their higher education. Recognition of the needs of the financially "disadvantaged" students has always been evinced in the inclusion of grant programs for this group. But, we have already seen that a large grant program for this group cuts across the need for an EOB.

Some previous presentations of the EOB have discussed it in terms of medical students alone, but in so doing have not touched upon the students' undergraduate debts. An EOB that does not take this factor into consideration underestimates debts of medical students. Could

the EOB consolidate such debts? In discussions of an EOB for all students in higher education, it has been recognized that students will not pledge more than a certain percentage of future income:

We doubt that many students would choose to borrow this heavily (\$15,000), since this would mean committing about 5 percent of their future earnings. (Zacharias, Joint Economic Committee, The Economics and Financing of Higher Education in the United States, p. 91)

This factor of a buyer's resistance to pledging a relatively high percentage of future earnings may be considered a reason for the Commission's stipulating a flat 3 percent in its latest report. But with a flat percentage pledged, students will not borrow from the EOB if other sources such as the Guaranteed Student Loan Program are available unless larger sums are needed^{1/} or lower earnings expected (see point 3 above). In a four-year instead of a three-year curriculum, more students would have to borrow over \$7,500, a figure that appears to make the EOB a more profitable source of loans than the Guaranteed Student Loan Program as proposed for the "average" medical student who might not be too confident a borrower and would pledge 3 percent of his future earnings. But, would not this type of "adverse solution" work against the solvency of the Bank?

Again, the EOB would still be experimental in nature, its viability would still be open to question especially in terms of liquidity with the long periods of repayment proposed, and the level of Federal expenditures necessary to finance the Bank would still be difficult to predict. In summary, the EOB does not appear to be the best financial plan available to attract the most capable students to careers in medicine or dentistry at the least cost to the students, the schools, and the Federal government.

^{1/} Students who find it necessary or advantageous to borrow from an EOB with repayments based on any flat percentage of future earnings will, of course, borrow the maximum amounts available.

A National Health Service Corps:
A Tentative Identification of Issues

The problem. The purpose of this paper is to identify some of the issues that ought logically to be taken into account in considering the need--and an appropriate concept--for a National Health Service Corps. We begin with the assumption that present delivery of health services is deficient to the degree that the establishment of such a mechanism (to assure more efficient use of existing health personnel) at least warrants careful study. We note that:

- (1) The promise of better health for all, held out by the great advances in medical knowledge achieved during the past two decades, has only been partly fulfilled.
- (2) Access to health care services remains tragically uneven. This is true despite major new commitments to support of health services, including Medicare and Medicaid.
- (3) A number of factors contribute to what has come to be described as a "health care crisis." Economic, social, educational, and nutritional factors are involved. But one major cause, surely, is the lack of physicians, dentists, nurses, and other health personnel in many parts of our country.
- (4) Shortages of health personnel result from two sets of influences: demand for services increasing much more rapidly than the output from health professional schools can be raised, and a distribution of these personnel in actual practice that leaves large numbers of people--in both urban and rural areas--disadvantaged in terms of opportunities for adequate health care.
- (5) The objective of this Administration is to ameliorate the health care crisis--particularly for the disadvantaged--within a reasonable period of time.
- (6) A proposal for a National Health Service Corps addresses only one aspect of a very complex problem: improved distribution of health care personnel. But within these limits, no alternative to the Corps promises as much.

The major questions to be considered, therefore, are whether a National Health Service Corps would be of benefit in view of the many as yet unsolved problems relating to the financing and delivery of medical care; and, if so, under what terms and conditions it should be encouraged.

The Concept

Let us assume that the major issue--the need for a National Health Service Corps--has been answered affirmatively. What, then, are some of the related issues?

Implications for Federal Support of Related Education Processes. Society has faced up to the support of its medical schools. Even though the approach taken thus far may be less than perfect, the investment in the aggregate for research and educational purposes is substantial. How adequate is the present return to the public on that investment? Would it be reasonable to contract with physicians for their services through the mechanism of a National Health Service Corps, which would permit, encourage, or require a period of time in public service, including community service wherever needed? Is it appropriate to propose a coupling between such a national requirement to serve and a commitment to substantial Federal support for the education process relevant to that service? Would such service justify a new level of student assistance which would facilitate the matriculation of adequate numbers of qualified students without respect to race, creed, and economic status and provide support at a level which would enable them to devote their full energies to academic pursuits and thus accelerate their graduation?

The Nature of the Commitment. The commitment required of young physicians must be matched by the purposes to be served by such a program. Could the country's needs be adequately served by reliance on a voluntary Corps, or is the challenge sufficiently massive to warrant assignment of all graduates to public service? Would the gains to be achieved by a required commitment be sufficient to outweigh the need to preserve individual choice in determining the style and location of one's professional practice?

If a required commitment would be deemed desirable, are there insurmountable constitutional or legal difficulties related to compulsory service? Would such discrimination with regard to specific professions be consistent with the concept of equality before the law? And what effect would such a requirement have on the recruitment of students to the profession of medicine or other professions which might be included?

Physicians and Dentists Only or the Full Health Team? While primary recognition should be given to the needs for dentists and physicians, the role of nurses and allied health personnel should not be forgotten. Should the concept of the NHSC be expanded to include the entire health team? If not, how might all of the health professions be integrated into a well-functioning

team? If physicians and dentists could be assigned nationally, could other health professionals be provided locally? Could provision of supportive personnel be one of the prerequisites for the assignment of physicians and dentists from the NHSC to a community?

Relationship with Selective Service. Currently, approximately 70 percent of medical school and ___ percent of dental school graduates are required to serve in the military. If an NHSC were obligatory, would this requirement be in addition to, or a substitute for, military service? Should the NHSC be limited to those not inducted by the military, or should there be a common manpower pool from which both civilian and military needs are met with some means of assigning personnel to each?

Relationship with the Public Health Service. Should the NHSC be envisioned as an expansion of the mission and capability of the PHS Commissioned Corps and built upon its long-established base? Would it be preferable to establish a parallel organization?

Financing of the National Health Service Corps. What would the cost of an NHSC be and what method of financing would be most satisfactory? Should the community served be responsible for payment of an appropriate salary to the practitioner, or provide in some way for his support through prepaid or fee-for-service arrangements? Should there be a central national fund from which all salaries are drawn? Could such a fund be replenished by earnings from third-party payments and other sources? Would a system of direct Federal appropriation for the salaries of physicians and dentists in the NHSC be preferable?

What relationship would this program bear to other Federal participation in the health enterprise, specifically Title XVIII and XIX? Could these mechanisms be adapted to subsidizing the entire burden of salaries for professionals in the NHSC?

Administrative Arrangements.

Issues here relate to:

Organizational Locus. Consideration should be given to the appropriate relationship of the NHSC to the Federal Government and the location of program responsibility within the Federal Government. The relationship to the Selective Service System and the PHS Commissioned Corps have already been mentioned as prominent issues. Would an agency such as the Health Services and Mental Health Administration, which has immediate concern with the delivery of health services, be an appropriate organizational locus for the administration of the NHSC?

Assignments. A mechanism must be developed to identify, inventory, and classify the settings in which such public service would be performed. What criteria should be developed for determining need, for establishing priorities among the relative needs, for measuring progress and determining when the NHSC should terminate its commitments to an activity?

A related but distinct problem is the development of a structure to administer such a program. Some mechanism should be developed which could relate qualifications of the man to demands of the assignment. Also to be considered: at what time, or what stage, in the professional development should individuals serve--as students, or during or after internship or residency?

Should criteria for assignments include adequacy of facilities, adequacy and availability of supportive personnel, arrangements for permanent staff surrounding the temporary or limited staff who are replaced on a rotational basis be part of the criteria for selection of appropriate assignment sites? Could the Corps be a stimulus to creation of needed facilities?

Length of Service. Having determined the manpower available for service and the nature of the commitment, what period of service would be required to make a significant impact upon the problem? What is it reasonable to ask of the individuals involved? What length of time would be necessary for continuity and for sufficient expertise to be developed?

Level of Remuneration. Should the compensation be commensurate with peers not in the NHSC, with the military, other public officials, with VISTA or Peace Corps volunteers? What is required in the way of remuneration to make such service attractive and reasonable?

Other Considerations

Public Acceptance. No program such as an NHSC could reach fruition without public support, both from the professions and the consumers. Also, legislation would be required to bring it into existence; public funds would be required to implement it. Some assessment should be made of the potential for public and professional acceptance, and the types of problems that might be encountered in this regard. The relationship of the NHSC member to the practicing profession in the community where he might be assigned, as well as the relationship of the NHSC to the local establishment, the State and local public health agencies, etc., would be important considerations.

Impact on the Local Community. Central to such deliberations would be the assessment of the effect of the program on amelioration of the health care deficiencies currently recognized in many communities. Some thought should be given not only to the practical and tangible aspects of the problem, but to some of the more intangible considerations such as community pride, local prejudices, necessity for consumer participation, etc., which underlie the success or failure of such community projects.

Attractiveness of Careers and Incentives for Physicians to Serve in Deprived Areas. Certainly, such a proposal would be of little value if it would tend to inhibit the development of the very resources which we are attempting to utilize in the public interest. It is, therefore, necessary to gauge the impact of such a program on the career choice of the potential medical student or other students who might be involved, and the future attractiveness of the professions affected. If the NHSC promises to have deleterious effects on such professions, consideration should be given to identifying this potential and the probabilities for mitigating its impact.

It is possible that for some time to come that, except for a small permanent staff, some areas could be adequately provided with professional services only by individuals serving on a rotational basis. Incentives for physicians to practice permanently in deprived areas must be developed. How realistic is the hope that temporary service in areas of greatest need would serve as an inducement to permanent commitment?

HEALTH MANPOWER OPTIONS: A POSITION PAPER

The purpose of this paper is to examine certain critical issues in current Federal support of medical and dental education, to analyze options open to the Department for dealing with these issues, and to recommend to the Department a specific course of action. Two inter-related issues will be discussed: the need for a better method of dealing with the problem of medical and dental schools in financial distress, and the need for a clearer definition of the Federal role with respect to these institutions. The Federal programs most pertinent to these discussions are those for Health Professions Educational Assistance, ^{/1} which are administered by the Bureau of Health Manpower Education within the National Institutes of Health. The expiration of these program authorities on June 30, 1971, makes this discussion both practical and urgent.

Critical Issues in Federal Support
of Medical and Dental Education

By most indicators, one would have to say that present Federal programs of educational assistance to the health professions are well conceived and reasonably successful. They provide a modest level of broad, multi-purposed support--mainly to institutions but also to individual students--with the result that the pool of most critically needed manpower is growing steadily, though somewhat less rapidly than might be wished. Further, there is program latitude for curriculum innovation and even for development of new types of personnel. Also evident are the breadth and flexibility of programs needed

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1. Title VII of the PHS Act.

in a time of transition (for health care and therefore for health manpower) through which the Nation clearly is passing. Nevertheless, *the managers responsible for these programs are struck by the seeming inadequacy of program tools available to them in dealing with a particular set of problems which is fast becoming a major threat both to program balance and integrity:* There is a rapidly rising competition among medical and dental institutions for HPEA special project funds, based on claims of acute financial distress. Last year, 53 schools received such assistance. This year, 74 applications have been received. The still unresolved crisis of support for George Washington and Georgetown Medical and Dental Schools is a classic example. Main concerns of managers responsible for these Federal programs may be stated under four points.

Financial distress

Claims of acute financial distress put the Federal Government in an all but impossible position. If a medical or dental school states that it will have to cease admitting new classes unless given "X" additional dollars immediately, the bargaining position of Federal program managers is a poor one. As the number and level of individual requests have increased rapidly, the problem of choosing those most worthy of Federal support has become increasingly difficult and may soon be impossible. A part of the problem is the lack of adequate cost data for these institutions. A part is the lack of accepted definitions that distinguish between education costs and service costs, when the two functions are interdependent and the same institution is responsible for both. And a part is the lack of a clear Federal policy. But even in the light of these uncertainties, it is questionable whether the

Federal Government could afford to let schools close by withholding at least emergency aid. Decisions here are complicated not only by doubts as to the appropriate role of the Federal Government with respect to these institutions, but by the claim--made on many sides--that Federal programs contribute directly to financial distress by specifying less than full cost reimbursement for services purchased by the Federal Government from these institutions in Medicare, Medicaid, biomedical research, etc.

Federal support policies

Present program policies do not provide either a clear incentive for distressed institutions to help themselves, or persuasive devices (leverage) on other sources of funding. Present policies, in fact, may actually provide disincentives for any solution to financial distress other than Federal funds. Because there is a Federal program (HPEA Special Projects) that can aid at least some schools, other potential funding sources, such as State and local governments, foundations, and so forth, are encouraged to withhold help from schools until they are certain that Federal health options have been exhausted. At the very least, present policies encourage institutions to compete to demonstrate that their programmatic and fiscal situation is worse than others.

Equity

There is concern also with problems of equity in terms of medical education support by the individual States. Some States make a substantial contribution to even the privately endowed medical institutions within their boundaries; other States do not. Some States (for example, Wisconsin) make

what could be called a disproportionate investment in medical education, since half the physicians trained in State-supported schools leave to practice elsewhere. Other States (for example, California) reap a benefit inversely proportional to their investment by attracting physicians mainly trained elsewhere. But the Federal Government has no way to tell a State (such as California) to start training a fairer share of the doctors it uses; nor could it object if a physician-exporter State such as Wisconsin decides to reduce its medical school support. And finally, the Federal Government has no leverage, nor is it clear that it should have, to encourage a reasonable level of State support to private institutions.

Federal role

This is the most critical point. There is concern with the need to enunciate a carefully considered statement of Federal role (or policy) with respect to health professional schools--in particular, medical and dental schools. Such a statement should seek to clarify: (a) the basis of Federal involvement with these schools, that is, the specific educational purpose they serve that the Government is willing to invest in; (b) related to this purpose, the nature and limits of Federal investments in these institutions (for example, whether the Federal Government should provide "first dollar" or "last dollar" financing); and (c) the extent to which the Federal Government views these institutions as a kind of public utility and therefore takes responsibility for their viability and survival. This clarification of Federal role in the health manpower area is really a *prerequisite* for practical solution of the present crisis in medical and dental school support.

It would also facilitate a joint effort, with all interested parties, to see what can and should be done over the long run (and by whom) to assure the viability of these schools.

Some of the issues to be explored in the development of a policy statement on the Federal role in health manpower include the following:

- Should the Federal financial role with respect to medical and dental schools be the same for privately endowed schools as for tax-supported schools? Should it be the same in rich States as it is in States with a weak tax base?
- To what extent is a commitment to continuing Federal support of particular institutions compatible with a policy of nonfederal interference in internal governance of those institutions?
- By what criteria can one base a differential Federal role in the support of the various health professions? Would it be possible to identify a major Federal role in certain health professions (for example, medicine, dentistry, osteopathy, public health, and appropriate parts of veterinary medicine) and suggest a regional or local focus of governmental responsibility for other professions (such as nursing, allied health, and optometry, podiatry, pharmacy)?

Main Options for Dealing with Critical Issues
in Medical and Dental Education

The following three options--from the perspective of NIH program managers--appear to be the main ones requiring Departmental consideration in view of the rapidly deteriorating position of the Federal Government, as it seeks to increase output, maintain quality, and assist distressed institutions.

Advantages and disadvantages are stated for each, with a recommended Administration position at the end:

Option #1. *Continue present legislative authorities and fiscal arrangements, making relatively minor program changes to minimize the impact of financial distress considerations on other program objectives.* The same relative distribution between project grants and formula grants would continue at about the same level of funding, with the most significant program change being the setting up of a separate (and clearly limited) HPEA fund for awards to schools in financial distress. Such aid would be in lieu of HPEA special projects now used for this purpose. Awards under this new fund would be strictly an emergency rescue subsidy, and they would be limited to a single year. Such awards could be made irrespective of the cause of financial distress (current special project awards are limited to financial distress arising from educational causes only). Any institution requesting such emergency aid would be required--as a condition of award--to present its financial records for such audit as Federal program managers determine.

Advantages

1. Of the three options, this would require the least change to existing arrangements and therefore would have the greatest possibility for ready acceptance by Congress, the institutions involved, and interested professional groups. Any greater changes would certainly generate greater opposition in one place or another.

2. Federal responsibilities would be restricted to short-term emergency assistance, and it would be limited also in total dollars committed to the purpose. Schools clearly would need to look elsewhere for long-term deficit correction.
3. There are advantages to maximum program continuity available under this option, both from the perspective of program administrators and institutions seeking year-by-year support.
4. Finally, this option would represent the minimum cost to the Federal Government.

Disadvantages

1. There is no assurance under this option that the Federal Government will ever be able to get out of the current crisis with medical and dental schools. Present Federal support to basic operations of a school is inadequate to ensure stability of the institution. Even if a separate, clearly limited fund of money is established to handle the problem of emergency assistance to medical and dental schools, there is no assurance that the Administration will be able to avoid the unpleasant choice between finding more money in a difficult budget year or seeing certain institutions close.
2. The decision to use educational funds, even on a temporary basis, to aid schools in general financial distress may well raise serious policy questions. This might occur if funds specifically appropriated by Congress for educational purposes were awarded and eventually used by a school for other purposes.

3. It would not constitute a resolution of the question of basic Federal policy.

Option #2. *Continue present legislative authorities but expand substantially the emphasis on formula grants (based on capitation) as the primary Federal mechanism for funding the educational segment of the medical and dental teaching program.* The Administration could move toward a substantial capitation award to medical, dental, and osteopathic schools (up to a ceiling of \$4,000 or \$5,000 per student rather than the \$500 plus now provided), representing a clear and specific interest on the part of the Federal Government in *the educational output* of these institutions. The objective in setting the capitation level would be to assure meeting a substantial part (though not all) of the institution's educational costs per student. The institution, then, would be responsible for getting from other sources whatever additional support it needs to round out its educational and other programs. Under this option, the Federal Government would assume no additional responsibility for viability of specific institutions. *Program managers would have to be prepared to accept the possibility that some schools might close.*

This major program and policy change--which would make best sense within the context of carefully considered statements of the Federal role in the health manpower area--should be made with these understandings: (1) that the capitation approach relates mainly to the problems of institutional instability and that present HPEA programs for other purposes would still be needed; (2) that immediate and continuing effort would have to be made to

secure improved cost information from institutions so that potential future causes for financial distress can be identified as a basis of funding and policy decisions; and (3) that every effort should be made to restrict eligibility for the increased capitation to medicine, dentistry, osteopathy, and public health, and (perhaps only in part) veterinary medicine, with entitlements for other health professions remaining unchanged.

Advantages

1. This is the best opportunity for the Administration to resolve the current financial crisis for medical and dental schools and to identify a rational, long-term role for Federal assistance to these institutions.
2. The proposal should prove reasonably attractive from the political point of view, because it is seemingly even-handed, simple to apprehend, and probably acceptable to the various establishments in the medical education field. The capitation approach recommended is close to the recent proposals of the Carnegie Commission and Association of American Medical Colleges.
3. It requires minimum Federal intervention in the internal operations of nongovernmental institutions, and would simplify the administration of Federal programs with an impact on medical and dental schools.
4. It has the advantages of
 - clear definition of Federal commitment
 - an incentive for greater local and State support
 - specific amounts per student on which schools may depend for stable support
 - simplicity of administration

- at least a modest incentive for more efficient management of funds by institutions because a specific limited level of Federal support is understood
- predictable cost.

Disadvantages

1. This option does not take into account the problem of institutional differences in setting capitation levels. The apparent even-handedness, therefore, applies more to the funding source than the impact on specific institutions.
2. It does not assert ultimate Federal responsibility for the viability and survival of every individual institution.
3. This option may be more costly than Option #1. Moreover, health professions not proposed for preferential capitation along with medicine, dentistry, and osteopathy might very well be able to convince Congress that they should receive the same treatment. This would escalate costs.

Option #3. *Continue present legislative authorities but emphasize project grants--on a "last dollar" approach--as the primary Federal mechanism for support of institutions and the relief of financial distress. Use institution-by-institution negotiation to get the fairest, most cost-effective price (based on full-cost information) for student output. Under this option, the Federal Government would assume responsibility for the survival of individual institutions. Concurrently, leverage should also be exerted through the Department to reduce the drain on insitutional resources through unreimbursed costs of health care (Medicare, Medicaid, etc.) and unreimbursed costs of research.*

Advantages

1. This option would recognize the heterogeneity and diversity of individual institutions, while attempting to assure the viability and survival of each.
2. It would require the careful identification of each of the cost elements in health professions education (teaching, research, health care) and could point to problem areas requiring adoption of improved internal management practices or changes in external funding policies.
3. It would provide maximum accountability for economic use of Federal funds as well as maximum leverage to effect desired program objectives (including use of State and local resources).
4. It would provide for coordination of all HEW programs (teaching, research, and service) related to teaching medical centers and, if effectively implemented, could assure that program instabilities or deficits incurred by one of these Federal programs is not transferred to another.

Disadvantages

1. This option would present a number of problems in terms of political saleability. It proposes a radically new Federal role with respect to medical and dental institutions. It would place HEW in an aggressive policymaking-cost-effectiveness position which reverses traditional approach of "non-interference in academic institutions" which has long governed HPEA and other HEW grant-in-aid programs.
2. Implementation will require within teaching medical centers the identification of all program costs and the application of common methods of

cost accounting. It requires coordination of all funding policies of agencies relating to these institutions. In these developments lie the potential of major Federal control of the health education industry (comparable to a public utility).

3. This option would necessarily require a fair amount of time for effective implementation, and it would require a large increase (numbers uncertain) in program or related audit staffs.
4. The costs of assuring viability (on a "last dollar" approach) for all medical and dental schools could run very high. For the first time, it could confront NIH administration with an open-ended expenditure account, over which very little control could be exercised.
5. The metric of effectiveness is by no means clear and, as a result, the Federal Government might be negotiating nothing more than the least expensive product.
6. More accurate identification of cost versus income patterns will not solve the major problems which are sure to emerge especially in the area of reimbursement of health care rendered.

RECOMMENDATION

The NIH recommends that the Department propose funding the educational segment of the medical and dental teaching center program on a per capita basis (Option #2).

As was evident in the earlier discussion of the three major options available, inherent in each option are certain advantages and disadvantages.

In weighing each of these, it is NIH's position that per capita funding is the most reasonable and practical option and would represent a long-term rational approach based on a clearly identified Federal role. A per capita form of Federal support would promote diversity and maintain the independence of medical and dental schools. In contrast with other more drastic proposals, a per capita form of support would not place the Federal Government in the position of trying to run the schools.

It seems increasingly apparent that *there is no way to avoid increased levels of Federal expenditures in the area of medical and dental education.* The only uncertain feature remaining is the mode of Federal investment. Adopting Option #2 would represent a clear and specific and limited interest on the part of this Administration, in the educational output of these institutions as a group, and yet would not make the Federal Government responsible for the viability of specific institutions..

ALTERNATIVE RECOMMENDATION

If per capita funding is considered unfeasible, at this time, Option #1 (extension of existing legislation with minor improvements to achieve improved program effectiveness) is recommended.

NIH-OD-OADPPE
November 18, 1970

Preliminary Draft

CONFIDENTIAL

HIGHER EDUCATION AND THE NATION'S HEALTH

Carnegie Commission on Higher Education
1947 Center Street
Berkeley, California 94704

February 1970

1. The Crisis in Health Care Delivery and Health Manpower

As the nation faces the problems of the 1970's, the major shortcomings in the system of delivery of health care in the world's most affluent society must surely be granted high priority among the issues calling for sustained attention and decisive action. Although the deficiencies in our health care delivery system are many-faceted, critical shortages of health manpower play a major role and will continue to do so throughout the 1970's and probably into the 1980's.

The most serious shortages of professional personnel in the United States are in the health services. Thus, one of the greatest challenges to higher education in the decade of the 1970's is to mobilize its resources to meet the need for expanding the education of professional health manpower. To accomplish this task the nation's medical and dental schools, along with educational institutions training para-medical personnel, will need greatly augmented public financial support, but they will also need to give sustained attention to restructuring their educational and service programs in such a way as to play a major role in meeting the nation's need for a more adequate system of delivery of health care.

The problem of rising costs

The problem of rising costs of health care has been dramatized in the last few years, largely as a result of two important pieces of federal legislation (1965) which provided health insurance for the aged and greatly expanded federal grants-in-aid for state programs to meet the cost of medical care for the poor--Medicare and Medicaid. The effect was to expand the demand for health care by bringing it more readily within the reach of two groups in the population that had been experiencing

extreme difficulty in meeting health care costs. But the expansion occurred suddenly, in an industry in which the supply of both professional personnel and hospital capacity tends to be inelastic } responding only slowly to increases in demand and requiring long lead times for the training of personnel and the expansion of facilities. Thus it is not surprising that the medical care component of the consumer price index rose at an accelerated rate after 1965, giving rise to serious concern over inflation in the cost of medical care. From a level of 122.3 in 1965 (1957-59 = 100), the index reached 144.6 in 1968 and an average of 154.5 in the first ten months of 1969. Although hospital charges had risen much more rapidly than physician fees prior to 1965, the rate of increase of both hospital charges and physician fees accelerated after 1965 (Table 1).

To a considerable extent the increase in hospital charges has been unavoidable, reflecting the impact of two major influences--the greatly increased complexity of hospital equipment and long overdue increases in the compensation of professional and nonprofessional hospital personnel, who have traditionally been among the lowest paid workers in the labor force. But the problem of mounting hospital charges also reflects another problem which can be overcome, if we have the will and determination to attack it. This is the problem of wasteful use of hospitals, which is partly associated with the inadequate structure of health insurance in the United States, to be discussed at a later point.

The problem of inflation in the costs of medical care is almost certainly going to be with us for a long time to come. Among the various ways of meeting the problem, overcoming shortages of health manpower and striving for greater efficiency in the delivery of health care are of paramount importance. They will receive major emphasis in this report.

Table 1

CONSUMER PRICE INDEX: Indexes for All Items
and for Medical Care, 1965-1969

	1965	1966	1967	1968	1969 ^a
ALL ITEMS (Annual Averages)	109.9	113.1	116.3	121.2	127.1
MEDICAL CARE	122.3	127.7	136.7	145.0	154.5
Drugs and Prescriptions	98.1	98.4	97.9	98.1	99.1
Professional Services					
Physicians fees	121.5	128.5	137.6	145.3	154.6
Dentists fees	117.6	121.4	127.5	134.5	143.2
Other Professional Services					
Examination, prescription, dispensing of eyeglasses	113.0	116.1	121.8	125.7	130.6
Routine laboratory tests	103.5	105.7	109.2	113.0	117.0
Hospital Services Charges					
Daily service charges	153.3	168.0	200.1	226.6	253.8
Operating room charges	106.4	113.7	128.4	143.2	164.1

^a Figures for 1969 are averages for January 1, 1969 through October 31, 1969.

Source: U.S. Bureau of Labor Statistics, Consumer Price Index, 1965 - Oct. 1969.

The problem of unmet need

There are many indications of unmet need for health care in the United States. For example, the geographical distribution of both health care facilities and health manpower is highly uneven, and although there is no clear agreement on what is an adequate ratio of, say, physicians to population, there is little question that the supply of health manpower is gravely deficient in parts of the nation. In such low-income states as Mississippi and South Carolina, the ratios of non-federal physicians providing patient care to 100,000 population were 69 and 76 in 1967, respectively, whereas in such comparatively high-income states as New York and Massachusetts, the corresponding ratios were 199 and 181. But this does not mean that a resident of one of the lower-income neighborhoods of New York City or Boston had access to an adequate supply of physicians. As one writer on our "ailing medical system" recently put it:

"Private physicians are as hard to find in some neighborhoods of New York City as in backward rural counties of the South. In general, doctors are plentiful only in the suburbs and in prosperous middle-sized cities, they are scarce in parts of large metropolitan centers, and in rural areas" (Cordtz, 1970, p. 86).

Not only physicians but other types of health manpower as well are unevenly distributed on a geographical basis (Table 2), and there is little question that the supply of hospitals and other health care facilities is inadequate in low-income and rural areas. Moreover, in many communities there is a need for health clinics within a reasonable distance of the homes of low-income residents. The Neighborhood Health Center program initiated by the Office of Economic Opportunity has represented an important step toward meeting this need, but the appropriations have been limited and

Table 2

SELECTED CATEGORIES OF ACTIVE HEALTH PERSONNEL PER 100,000 POPULATION,
BY GEOGRAPHIC DIVISION: VARIOUS DATES

Geographic Division	Physicians (M.D.) ^a 1965	Dentists ^a 1965	Nurses-- R.N. 1962	In hospitals, 1966	
				Practical nurses	Aides, orderlies
United States	132	45	298	79	258
New England	168	53	470	97	261
Middle Atlantic	171	58	376	81	286
South Atlantic	116	32	255	70	228
East South Central	89	31	165	78	210
West South Central	101	31	171	99	207
East North Central	120	45	286	68	269
West North Central	114	47	301	72	299
Mountain	115	43	307	78	223
Pacific	157	53	329	70	229

^a Non-Federal per 100,000 civilian population.

Source: U.S. Public Health Service, Health Manpower, Perspective: 1967,
U.S. Government Printing Office, Washington, D.C., 1967, p. 14.

the 49 centers that had been opened by the end of 1969 did not begin to reach all those who could benefit from such facilities (Schmeck, 1969). The Medicaid program has had the effect of highlighting some of these deficiencies. Poor persons in many areas are now assured that the costs of care will be financed at least with respect to covered services, but they often have to travel many miles to receive it, wait for hours in hospital outpatient clinics, or encounter difficulties in locating a physician who will treat "welfare" patients.¹

The uneven geographical distribution of health manpower and facilities is related, of course, to geographical disparities in income levels. That health care expenditures vary directly with family income has long been known as a result of studies conducted over at least the last four decades, but more careful recent analyses have indicated that family income status exerts its influence in conjunction with many other factors and is not by itself a particularly decisive influence. Race, geographical location, age of the family head, type of health insurance coverage, and educational level are all significant determinants of health expenditures. Among the factors limiting adequate health care to minority groups, the extremely small representation of members of minority races among practicing physicians is particularly relevant to the concerns of this report. As for the aged, the special problems of financing medical care which they faced for so many years have been greatly alleviated by the Medicare program, but nevertheless the problem of access to adequate services and facilities remains difficult

¹ The President's Commission on Income Maintenance Programs (Ben W. Heineman, Chairman) held public hearings in 17 large and small communities throughout the United States in 1968-69 and heard testimony revealing each of these types of problems. (President's Commission on Income Maintenance Programs, 1969.)

for elderly people in some areas, as does the cost of deductibles and other uncovered expenses.

Finally, among the indications of unmet need, is the evidence of higher mortality and morbidity rates in the United States than in a number of other industrial countries. Although the best medical care in this country is as good as any in the world, many Americans receive inferior care and some health care needs go entirely untreated.

While life expectancy of both white and non-white males and females in the United States has gradually increased during the last half century, the lengthening of life expectancy has leveled off during the last two decades. Moreover, as Rutstein has put it:

"Indeed, we have failed to keep up with the improved life expectancy in many other countries, and the trend has worsened in the last several years. Let us compare United Nations statistics compiled in the years 1959 and 1966. During this interval, the life expectancy of males in the United States dropped from thirteenth to twenty-second place . . . and female life expectancy from seventh to tenth place among the countries of the world . . ." (Rutstein, 1967, pp. 14-15).

If we look at the infant mortality data, we find a similar pattern. Although there has been a great improvement in infant survival in the last half century, the improvement has slowed down in the last two or three decades. Moreover, the discrepancy between the nonwhite infant mortality rate and the white rate has been increasing. Again, on the basis of this measure our international ranking has been slipping. In 1959, the United States was eleventh in the world in infant mortality. By 1965 we had dropped to eighteenth from the top of the list (Rutstein, 1967, p. 24). However, perhaps reflecting the impact of the Medicaid program and

expanded NIH grants for infant and maternal care programs, there has been some improvement since then. By 1969, this country ranked fourteenth on the basis of infant mortality rates (Pediatrics, December 1969).

Not only is our ranking low, but the gap between the U.S. rates and those in the highest ranking industrial countries is wide (Table 3). For example, male life expectancy in the U.S. was only 66.6 in 1963, as compared with 71.4 in The Netherlands in 1956-60, while our infant mortality rate in 1965 was 24.8, as contrasted with Sweden's 14.2 in 1964. A comparison of death rates for males aged 15 to 44 in the U.S. and Sweden by cause of death in 1961 indicates that the U.S. rate exceeded the Swedish rate by a substantial margin with respect to deaths caused by malignant tumors; strokes; rheumatic heart disease; arteriosclerotic and degenerative heart disease; hypertension; influenza, pneumonia, and bronchitis; cirrhosis of the liver; motor-vehicle accidents; other accidents; and homicide. Only with respect to suicides was the Swedish rate higher (Rutstein, 1967, p. 20).

The problem of inadequate financing

Americans are spending far more on health care than ever before in dollars and in terms of the percentage of the Gross National Product represented by health care expenditures. In 1928-29, the first year for which adequate data are available, total health care expenditures amounted to \$3.6 billion, or 3.6 percent of GNP. By 1968-69, total health expenditures had risen to \$60.3 billion, or 6.7 percent of GNP (Skolnik and Dales, 1969, p. 12). Yet, in spite of the rapid expansion of private health insurance plans since World War II and the recent injection of substantially increased government funds into the health expenditure stream through Medicare and Medicaid, the individual consumer still meets more than two-fifths of all health care expenditures on a noninsurance basis. This is in marked contrast to the situation in nearly every other industrial country.

Table 3
SELECTED VITAL STATISTICS FOR 15 INDUSTRIAL COUNTRIES

Country	Expectation of life at birth				Infant mortality ^c	
	Males		Females			
	Years of life	Date reported	Years of life	Date reported	Rate	Year
Australia	67.1	1953-55			19.1	1964
Canada	68.4	1960-62	74.2	1960-62	24.7	1964
Czechoslovakia	67.2	1962			21.2	1964
Denmark	70.4	1956-60	73.8	1956-60	18.7	1965
England and Wales	68.0	1961-63	73.9	1961-63	19.0	1965
France	67.2	1963	74.1		22.1	1965
Israel ^a	70.9	1963			22.7	1965
Japan	67.2	1963			20.4	1964
Netherlands	71.4	1956-60	74.8	1956-60	14.4	1965
New Zealand ^b	68.2	1955-57			19.5	1965
Norway	71.1	1951-55	74.7	1951-55	16.8	1964
Sweden	71.3	1962	75.4	1962	14.2	1964
Switzerland	69.5	1959-61			17.7	1965
United States	66.6	1963	73.4	1963	24.8	1965
West Germany	66.9	1960-62			23.9	1965

^a Jewish population.

^b European population.

^c Deaths under one year of age per 1,000 infants born alive.

Source: David D. Rutstein, The Coming Revolution in Medicine (Cambridge, Mass. and London: The M.I.T. Press, 1967), pp. 16, 17, and 23.

By 1968-69, public expenditures had risen to 35.6 percent of all funds spent on health care, having increased particularly rapidly from 1965-66 on. Private insurance benefits were meeting only 22.3 percent of the total expenditures, although about four-fifths of the population had some insurance protection for hospital care (Skolnik and Dales, 1969, p. 12, and Reed, 1969, p. 20).

What accounts for this sharp contrast between the proportion of persons with some insurance coverage and the proportion of total expenditures met by private health insurance benefits? First of all, most persons have coverage for hospital care and for surgical services in the hospital, whereas coverage for such services as office and home visits is considerably less common. Secondly, all private health insurance plans have limitations on the types of services covered, even when they provide some protection for care outside the hospital. The plans vary greatly in this respect, and the most complete range of services covered tends to be found in some of the so-called independent plans, such as that of the Kaiser Foundation on the West Coast.

Ten years ago, protection for psychiatric care was practically nonexistent. During the last decade, many plans have been expanded to include some provision for mental illness, but invariably on a relatively restricted basis, in view of the very high costs associated with the prolonged duration of mental illness. Similarly, a decade ago it was a rare plan that included any provision for dental care. However, in the 1960's unions began to negotiate for dental care coverage under collectively bargained health and welfare plans, and just in the last few years this type of protection has begun to expand rapidly, although only 2.9 percent of the population had dental care coverage at the end of 1968 (Nikias, 1969, and Reed, 1969, p. 30).

A third limitation on the proportion of expenditures met by private insurance takes the form of ceilings on reimbursable charges--for hospital rooms, laboratory expenses, surgeons' and physicians' fees, and other services. Again, the plans vary greatly, and some come close to being true service or prepayment plans in the sense that the patient is guaranteed full insurance coverage of the service rendered. This is true of many features of the independent plans and of Blue Shield provisions for families in the low-income and lower-middle-income range. Ceilings on reimbursable charges also tend to be less restrictive in major medical and comprehensive plans than in the so-called "basic" plans. Nevertheless, there are still many cases in which the patient is billed for the difference between the allowable and the actual charge, and the difference can be very large in connection with episodes of serious illness.

Whether or not the individual is protected by some type of health insurance, with relatively rare exceptions, the charge for health services is made on a fee-for-service or "piece rate" basis, rather than on a salaried basis.² There are advantages and disadvantages associated with the various alternative methods, but there is little question that the fee-for-service method lends itself to inflationary tendencies and in some instances to the performing of services, including operations, that are not clearly necessary. Moreover, although there has been an attempt in some areas to develop procedures for scrutiny of hospital and doctors' charges by representatives of the county medical society or some other appropriate agency, and standards have been developed for allowable types of hospital costs under Medicare and Medicaid, the prevailing situation in the

² Under the British version of the capitation system, the physician receives a fixed annual amount for each individual who signs up for his "panel" of patients.

United States is one in which both hospitals and doctors respond to rising costs and increases in demand by raising their charges. In general, moreover, the response of the various insurance carriers is to pass these increases on to the consumer in the form of increased monthly charges for health plan protection, in some instances paid entirely by the employer but more often paid partly by the employer and partly by the employee--and in the end largely passed on to the consumer.³

The fact that so many persons are protected for hospital care, but not for services in the doctor's office or the home, is also in part responsible for another problem--overutilization of hospital services. Where insurance provisions call for reasonably adequate coverage of care outside the hospital, as in the prepaid medical group practice plans that provide comprehensive benefits, hospitalization rates tend to be appreciably lower than under the typical insurance plan, in which there are severe limitations on coverage of expenses incurred outside the hospital (Klarman, 1965, and National Advisory Commission on Health Manpower, 1967). The absence of adequate coverage for nonhospital care inevitably tends to encourage hospitalization in cases in which it is not clearly necessary, so as to take advantage of insurance provisions.

In addition, although there is much interest in the development of greater emphasis on preventive health care, existing insurance plans fail to encourage this. Again, except in the prepaid plans that provide comprehensive benefits, there tends to be no provision for covering the cost of an "annual checkup." The plans are designed solely to provide some degree of protection in episodes of illness.

³ A report to the U.S. Civil Service Commission recently predicted that health insurance premiums would double by 1975 because of rising costs for medical services (U.S. Civil Service Commission, 1970).

Growing public awareness of these problems of inadequate financing has led to rising support for some form of national health insurance. Also playing an important role in connection with this trend is widespread recognition of some of the problems associated with Medicare and Medicaid. The adoption of these two programs reflected resistance to a more comprehensive approach to public health insurance in the United States, which led eventually to special provisions for two of the neediest groups. But they are also relatively high-cost groups, with the result that our publicly subsidized programs of Medicare and Medicaid fail to benefit from the averaging associated with broad pooling of risks. We have, to a large extent, included the poor risks and excluded the good risks, whereas broader coverage (perhaps with a strong element of private insurance involved) would reduce the costs per covered individual.

Although this report is concerned primarily with the education of health manpower, we emphasized at the outset the intimate relationship between probable changes in the health care delivery system and desirable changes in the future education of health manpower. As the Commission considers the likelihood that a national health insurance program may be adopted in the not too distant future, it views with considerable dismay the critical shortages of health manpower and facilities which would then become glaringly apparent in the lower-income areas of the nation, once the present financial barriers to more adequate health care were at least partially removed. Unless we move decisively and soon to develop vigorous programs to overcome these shortages, the present crisis in health care will appear to be a mere ripple in comparison with the mounting waves of problems to be faced in such an event. The long lead time required for expanding the number of places in university health science centers and

for developing adequate hospitals and health clinics in areas now poorly served means that we should not wait until the crisis is upon us to overcome the problems.

The problem of ineffective use of health manpower

The health care services currently provided to the public range from bandaging minor cuts and alleviating anxiety to organ transplants and hospital administration. The problem of highly unequal access to medical care has been discussed above. In addition, the utilization of manpower is in many cases inefficient, largely as a result of the historic role of the physician as the primary and even sole dispenser of health care. Reluctance to relinquish this image, even in the educational programs for physicians, has resulted in continued performance by these extensively trained professionals of tasks which could equally well be performed by less trained, more specialized personnel, such as routine history taking, initial physical examination, technical procedures, instruction of patients, and other routine tasks.

Summary

Thus the crisis in the delivery of health care in the United States reflects the combined influences of (a) rapidly rising costs, (b) unmet needs for health care, (c) an inadequate financing structure, and (d) the ineffective use of health manpower. Although these problems require efforts in many directions, a critical part of the effort will be the mobilization of the institutions of higher education in the United States to expand the education of professional health manpower and adapt that education to the changing patterns of delivery of health care which may be perceived as likely to occur in the coming decades.

II. The Evolution of the U.S. Health Care and Health Education Systems

Unlike the concept of liberal arts education whose function is to provide a broad general background of accumulated human experience as a foundation for any and all life roles, medical and allied health sciences education attempts the narrower goal of presenting a summary of the accumulated useful knowledge plus associated mental and physical skills requisite to achieving and maintaining a state of health. It is expected that the graduates of these educational programs will enter the health industry and service the health care delivery system in all of its aspects, including its evolution toward increased effectiveness.

Because of this primarily goal-oriented concern, any critical analysis of medical and allied health sciences education as well as any attempt to recommend guidelines for future development must begin with a description of the functions which the educated graduates are expected to perform. This in turn requires a thorough understanding of the mechanisms of the health care delivery system as it now exists and as it will change in the future.

During the sixty years following the Flexner report, medical education and health care delivery in the United States evolved in a pattern which, at its best, provided for the fortunate patient the highest quality of professional care supported by the best scientific resources. Most of the population, however, does not now receive this high quality service, because of economic, geographic, organizational and educational factors. The statistical achievements of some elements of the health care delivery system in the United States, as described in the previous section, are inexcusably low, and the U.S. population is not characterized by outstanding freedom from disease in comparison with other technologically advanced

nations whose resources are considerably less. These failures of the health care delivery system to provide equitable service to all segments of the population are in sharp contrast to the unsurpassed record of the American medical industry in producing new knowledge applicable to the eradication of disease.

The primary thrust of the post-Flexner development in medicine was the recognition and incorporation of a scientific base in the natural sciences as a sine qua non for rational diagnosis and therapy. Scientific research in basic biomedical disciplines was seen to be the effective route for progress in treatment of disease. The reservoirs of scientific knowledge and research competence were in the universities, and so the medical schools and teaching hospitals became more closely integrated with academic disciplines on the campus. They assumed more and more the inward-directed vision and intellectual values of traditional academe, becoming increasingly concerned with basic biomedical research and esoteric medicine and less with the production of practitioners for the general market. This development was greatly encouraged following World War II by the growth of federal contributions to biomedical research from less than \$50 million to over \$1,500 million a year.⁴ From these great basic research oriented university medical centers have come new knowledge and techniques which have revolutionized health care within a single generation. Through their research efforts the entire epidemiology of acute disease has been altered and many of the infectious scourges of the last century are now only trivial inconveniences. Furthermore, the means to treat and prevent the degenerative diseases, heart disease, cancer and

⁴ Approximately \$350 million of this total goes to medical schools.

stroke, will unquestionably come primarily from the past, present, and future work of these centers.

The physicians educated by the best of these university-based schools are of the highest scientific and professional competence, and the intern and residency programs in affiliated hospitals produce an educated product equal to the best in the world. The total period of training is long (usually eleven to fifteen years after graduation from secondary school) and incomes are low for many years. The income foregone during the period of education, by the standards of other occupations, is very high.

The university medical centers also have become loci of high quality and high cost medical care, usually largely referral, emphasizing pathologies of research interest to the staff. Their influence extends to the practitioners of the surrounding community resulting in a general increase in the quality of health care. However, this effect on the community is far less than it could be if such a role were to become a primary element of medical center concern.

During the past half century, the hospital changed from a shunned institution of last resort to become the central facility for the delivery of medical care. This development resulted from the increasing urban concentration of the population and the advancing technology of medicine which required the facilities and skills of a sizeable organization to provide the armamentarium of diagnostic and therapeutic services. Movement of patients to a central facility rather than visitations by physicians to private homes emerged as the pattern of medical practice.

Hospitals were created to fill these needs by private resources, either philanthropic or as a capital investment, and by local, state, and federal governments. They were characterized by a double system of

management in which physicians associated with the hospital represented the line of authority concerning professional activities, and business management of the hospital controlled all other aspects of operation.

As in the pre-Flexner era, the practice of medicine has continued to be largely based on the private physician who is self-employed and provides medical care as an entity to patients who freely choose his services. Group practice under organized management, in which a patient receives attention from more than one physician according to his specialized needs, is relatively rare. Most physicians' groups have been formed for economic reasons such as decreasing office overhead costs and sharing certain facilities. They seldom have any significant integration or coordination of their professional activities beyond substituting for one another to enable more regular hours of work and periods of vacation.

Similarly, as indicated above, compensation of physicians has remained essentially unchanged as a fee for service, a form of piece-rate or commission basis of payment. In general, these fees have not been adjusted downward as the physician's efficiency has increased through technological advances and his charity work without compensation has been reduced.

For a variety of sociological and economic reasons, this pattern of health care delivery has become increasingly unsatisfactory, though the acquisition of new biomedical knowledge has been remarkable through the university-based medical centers. Unfortunately for educational planning, there is no inclusive study of changing patterns in the total health care delivery system of the United States; no centralized organization for coordinating and guiding changes in the system; and no mechanism for evaluating the effectiveness and efficiency of the system. In the absence of any of these elements, planning future educational programs in medical and

allied health sciences must rely primarily on predictions and opinions obtained from observers both within and outside the health care professions as to the nature of the future health care delivery system and the allotment of functions among health care personnel.

There is great diversity of opinion among members of the health care professions in predicting the probable form of health care delivery in the United States two and more decades hence. Indeed, there is little agreement on the most effective and efficient plan for the health care delivery system if it could be implemented. However, certain convictions about the future of health care have achieved wide currency within the professional enclave of the health sciences and form the most experienced base on which to make recommendations concerning the educational system. These can be summarized as follows:

Inevitable change

There is almost universal agreement that the health care delivery system of the United States will undergo major changes in facilities, organization, and functions of personnel within the next two decades. These changes will result from changes in the public attitude toward health care, changes in the economic structure underlying health care, changes in the federal government's role in providing, guiding and monitoring health care, changes in knowledge and technology relevant to health care, and changing sociological imperatives within the population of the United States.

Public attitude toward health care

There is abundant evidence that the trend of public attitudes in the United States is to identify health care as a right of citizenship independent

of socio-economic status. To the extent that this concept influences legislative action, increased tax revenue support and concomitant governmental surveillance will modify the health care delivery system. Greatly increased health care facilities and personnel will be required to fill the unmet needs of that portion of the population which currently receive less than optimum health care, primarily low-income groups, welfare recipients, and the aged. Medicare and Medicaid are initial stages in providing financial assistance to these groups, and public sentiment will most likely encourage expansion of these programs into some form of universal national health insurance.

As public awareness of disease etiology increases, there is more demand on the health care system to prevent as well as cure illness. Preventive medicine will undoubtedly assume a major role in the future health care system both through public pressure and the consequence of increased knowledge in this area.

Changing sociological imperatives

The demography of the U.S. population has undergone very large changes in the last half century, many of which will sharply influence the form of the future health care system.

Increasing levels of education of the general public, both formally in school and through the mass media, have greatly increased their sophistication in evaluating the health care they receive. These greater expectations will provide pressure to upgrade all elements of the health care system. If the current decline in the birth rate continues, the percentage of the population in various age groups will shift toward a larger proportion of older people, and geriatric problems and chronic care facilities will require more attention. Increasing mobility of the population will

necessitate a nation-wide network of medical record distribution and organization of the health care system to provide continuity of care without continuity of personnel. Increasing urbanization promotes the establishment of health care centers to which the patient comes for treatment and predisposes toward epidemiology characteristic of high density populations. The shift from an industrial to a service-oriented economy with increasing leisure time will undoubtedly influence the character of health problems which must be met.

The economic structure of the health care system

Although the fee-for-service method of compensation to physicians will probably continue for a long time, the amount of payment for various procedures will become more standardized through negotiations and regulatory mechanisms. An increasingly larger percentage of physicians will be paid on a salary basis and the trend toward guaranteed health care will accelerate to include the majority of the population. Lower paid echelons of the health care service personnel, such as nurses, technicians, and other specialized persons, are likely to experience salary increases relative to physicians, and the compensation to house officers (interns and residents) will continue to rise.

Tax revenues will support a growing percentage of health care facilities and services, and the health industry, both as an employer of service personnel and producer of material goods (drugs, equipment, buildings, etc.) will increase in size to become an even more major component of the national economy.

As indicated above, the cost of health care in the United States is rising considerably faster than the cost of living index. Although a combination of socio-economic factors are responsible for this rise, it

stems in considerable measure from the scientific advances in diagnosis and treatment which require greatly expanded facilities and personnel. Whereas in the nineteenth century the armamentarium of medical care could be contained in a small black bag and the physician's head, easily transported from house to house, today a vast array of costly equipment and procedures plus the services of a variety of trained specialists are necessary. There has been relatively little market pressure to halt this inflationary trend, but the cost-pass-through methods of establishing most medical care prices are now beginning to arouse the organized consumer, who must ultimately pay the premiums in any form of prepaid health plan. Clearly, it is not the avarice of the medical profession which is primarily responsible for these spiraling costs, but the inherent increase in scientific health care capability. Therefore, new and more efficient methods of health care delivery must be devised if output is to be increased, if productivity is to rise, and if the rate of medical cost inflation is to be constrained. These will certainly require new uses of manpower and new educational programs.

Changes in the federal role

Although the role of government in protecting the health of the population from harmful and misrepresented commercial products, especially food and drugs, has been a public tradition for nearly half a century, there is increasing demand that the governmental function be expanded to include a much broader spectrum of health related agents. Generally, these are represented by environmental situations that affect a sizeable number of people, such as preventive epidemiology, water and air pollution, environmental sound levels, nutrition, safety standards, etc. Thus governmental surveillance and control have been, and will continue to be,

major agencies for prevention of disease. Governmental responsibility for providing health care to individuals after they have contracted a disease has been limited to special categories of citizens who have either "earned" such benefits through national service, such as military personnel, are elderly, or are sufficiently indigent to qualify for welfare aid. The future will see increasing numbers of people included within this category of governmental responsibility for personal health care. Federal tax revenues are likely to become a major source of support of the health care system, and as a consequence federal scrutiny and control of the system will increase. The size and economic significance of the health industry, as described earlier, will invite increased governmental control as it becomes a major factor in the stability of the national economy.

Whatever form the health care system of the United States assumes in the future, it will necessarily require greatly increased coordination and integration on a national level if it is to approach the objective of optimum care for all with efficient use of the available resources. It is most likely that such organization will be undertaken by the governmental sector and a considerable amount of local autonomy will need to be relinquished in order to minimize inefficient duplication of facilities and services.

In addition to maintaining and elaborating national standards for quality of materials such as drugs, equipment, and facilities, national standards for performance of services through national licensing procedures are needed. The present state licensing authority has become unwieldy and disruptive, as a result of the high mobility of health care personnel and lack of comparability among the various licensing agencies.

New knowledge and technology

The rate of acquisition of new knowledge and technology in the biomedical sciences over the past sixty years has been staggering. Indeed, it has been largely responsible for the institutional character of current medical care. It is quite likely that progress in diagnosis and therapy, involving increasingly complex and costly facilities as well as trained technicians and re-trained physicians, will continue at a rapid rate, even if federal research expenditures are restricted to their present level in relation to GNP. The evolving system of health care delivery must be designed to accommodate this progress in terms of facilities and personnel, organization, and economics.

Probably the most immediate impact on the health care system will come from more extensive use of computers and automation techniques in the institutional administrative organization and patient care facilities. In addition to the rapidly evolving uses of computers for housekeeping and even middle managerial functions in large organizations, which are applicable to health care facilities, the enormous amount of data handling relative to patient care can be computer processed. Patient records, billing, pharmaceutical usage, doctors' and nurses' orders, etc., are all readily adaptable to computer processing, and soon continuous information of the patient's condition with analysis of needed attention will be computer managed. In addition to this real-time nursing surveillance and low-level decision making function of computers, they will be used increasingly to guide automated processes such as clinical chemistry analyses, radiation therapy, intravenous administration, hemodialysis, etc. In the near future, routine history taking and suggested diagnoses can be accomplished by computers for the physician's review. Multiphasic screening and other forms of health monitoring will become increasingly important as prevention of

disease assumes greater significance. Techniques for automating these screening procedures are already receiving considerable study. The implications for types of personnel and educational programs to utilize effectively this technology are obvious.

The almost universal and practically instantaneous information network which will exist--is, indeed, now in existence--enables medical information from records and x-rays to physiological variables such as EEG's, EKG's, cardio-vascular parameters, visual images, etc., to be transmitted for analysis and consultation without regard to geographical location. Patients at any point in the system can receive the benefit of specialized knowledge from any other point in the system almost immediately. This information network is also available for educational programs applicable to all segments of the health care system.

In addition to the ability to transmit information quickly, the ability to move patients and physicians rapidly over vast distances will greatly influence the form of the future health care system. Greater specialization and concentration of facilities and services will be possible, as the area from which patients can be conveniently transported enlarges. In less populated areas, networks of air ambulances can partly answer the need for rural health care facilities, and specialists can make "rounds" to peripheral smaller health care centers.

New therapeutic techniques will be introduced that require new technologies, new kinds of trained personnel, and cooperation of many individuals as a closely integrated unit. Organ transplantation has gained great public visibility already, and intensive care units, hemodialysis, and high intensity radiation therapy, are only a few examples of the enormously complex science and technology which will characterize future health care.

Relatively high and rapid cure rates and in some cases elimination of many prominent sources of acute illness have significantly changed the epidemiology of disease in the U.S. population. From infectious diseases, the major foci of concern throughout the health care industry have become prevention of disease, diagnosis and treatment of degenerative diseases, and mental illness. Each of these will see major developments in the next two decades. For example, advances in the psycho-social and behavioral sciences, as well as increased knowledge of neurophysiology and neurochemistry, can be expected markedly to alter the forms of treatment and rehabilitation for the mentally ill who now account for more chronic hospital beds than all other diseases combined.

The health care team

The inescapable consequence of greatly increased medical knowledge and technology has been rapid specialization of health care personnel. By the end of the nineteenth century specialization within the medical profession was assuming the pattern of its present form, though general practitioners were still in the majority. With nurses, midwives, dentists, and the rising speciality of pharmacists, the health care team was small and the functions of its units clearly defined. The resources of medical science could, for the most part, be brought to the patient by a single individual, the physician, and his education was predicated on that assumption. Though useful, no other health care personnel were indispensable to the physician in his capacity to administer the healing arts, and his unaided eye, ear, nose and hand were the only absolutely necessary tools for diagnosis. To a surprising extent, this attitude still pervades the medical profession and the educational programs of medical schools, despite the growth of essential knowledge and technology far beyond the capacity

of a single mind and the resources of a roll top desk.

Contemporary high quality health care is characterized by the involvement of various specialized personnel according to the needs of the patient. This dependence on a "team" of health care workers will increase as new knowledge and technology burgeon, and as the volume of demand for health care increases.

The numbers and specialties of the team members will vary throughout the course of the patient's disease. At the onset of an acute illness, the patient's first contact might be a social service worker who makes a referral to a diagnostician, a physician whose specialty is family medicine, or some other appropriately trained person with the skill to diagnose and treat many of the more obvious and less complex health care problems. For example, several European and Asiatic countries have had considerable success with a form of adjunct or semi-physicians whose training is considerably briefer and less theoretical than that of the physician. Generally, these adjunct physicians, such as the feldsher in the Soviet Union (usually a woman) treat patients primarily in rural areas or in large outpatient clinics. The more highly trained physicians confine their practice to hospitals, for the most part. The educational program for the adjunct physician is characterized by shorter total duration, an emphasis on ambulatory and home care rather than hospital procedures, and minimal dependence upon sophisticated laboratory diagnostic and therapeutic facilities.

Recommendations have been made from time to time in the United States for the creation of a health care professional with competence between the present registered nurse and the fully trained physician. The armed services have effectively used practically trained physician's assistants such as the Navy corpsmen, but it is questionable to what extent such

"second class" personnel would be acceptable to the American public or the medical profession. However, the pharmacist has assumed an "underground" role in health care in the United States, in which he recommends to his customers on the basis of their symptoms or self-diagnosis from the endless array of proprietary nonprescription nostrums which line his shelves. It is estimated that the majority of pharmacological agents consumed by the American public are of this proprietary type and are taken with the supporting advice of local pharmacists. The educational program for pharmacists does not adequately prepare them for this role. The majority of the ills to which the flesh is heir are readily diagnosed, easily treated, and for the most part self-limiting, and can be adequately managed with less training than now occupies the education of a physician. The critical facility for such limited health care professionals should be the ability to recognize serious problems beyond their capacities and make appropriate referrals to other specialists in the health care system.

It has become increasingly common for patients to refer themselves to a hospital emergency department or outpatient clinic as an initial approach to the health care system at the onset of acute illness. A nurse or staff physician of the hospital then becomes their first professional contact.

Thus, there is considerable confusion in the public mind, and in the organization of the health care system, concerning the appropriate route for a patient to obtain health care services when needed. Highly specialized physicians will not undertake the task of general diagnostics and routine health management. Family physicians are in short supply and it is questionable how effective the creation of a specialty board in general medicine will be in fulfilling this need.

The reservoir of health care personnel has been estimated to contain over 200 identifiable specialties at the present time. For any given patient situation, the necessary functions of these specialists are to be called into play by the physician in charge. In large urban medical centers, especially university-affiliated ones, this system works fairly well for the treatment of episodic major illnesses within the organizational confines of the institution. The private or small clinic practitioner and the rural doctor are poorly equipped to avail themselves of these teams. Physician undergraduate education does not emphasize the team concept of health care and it is only through post-doctoral in-house training at large medical centers that physicians function intimately with the para-medical professions. The specialties within the team have developed largely independently and there is little coordination of educational programs or licensing procedures. The increasingly complex technology of diagnostic and therapeutic procedures has necessitated the inclusion of doctoral level chemists, biophysicists, sociologists, and psychologists in addition to the traditional para-medical specialties.

The primary lack is not the need for more kinds of health care specialties in the hospital milieu, but for a planned organization to define and integrate the roles of the team members and provide coordinated educational programs suitable for these roles. The hospital-based physician should be educated to assume a role of team leadership involving considerably more administrative skill than he currently acquires, and the overall health care system should be organized so that the medical-center-based reservoir of specialized personnel and facilities is integrated with the extra-mural health care segments.

Rapid professional obsolescence

The rate of acquisition of new knowledge and technologies for health care is so rapid that the physician must remain a student throughout his professional career or face professional obsolescence in five to ten years. Continuing education programs for physicians and for the other members of the health care team are essential if optimal health care is to be provided to the public. These programs are slowly increasing in availability and quality in major urban areas, but are still largely inaccessible to the health care worker in rural and less populous areas. Furthermore, the academic medical centers have been reluctant to invest more than a token of their resources in continuing education programs and will require considerable incentive to do so.

Continuing education is of such significance to the future health care system that periodic re-examination for continued licensure of health care personnel is needed.

Health care centers

Health care services are delivered to an increasingly large extent in institutional settings. Serious acute episodic illness is treated in hospitals for the majority of urban dwellers who present themselves to the health care system. For efficiency of access and various other economies, health care institutions tend to group themselves in a common geographical location within metropolitan areas and to create health care centers containing a variety of facilities and services, including the offices of private practitioners. Frequently the most elite and sophisticated of these centers develop around university operated medical schools. These will contain the best equipped patient care facilities, educational programs for physicians (pre- and post-doctoral) and other health care personnel

(dentists, nurses, pharmacists and frequently technicians for radiology, physical therapy, laboratory procedures, etc.), and extensive research facilities. In addition, contemporary education in the health professions is of necessity broadening to include areas of the physical, biological and social sciences once considered remote from medicine. New knowledge of the molecular bases of disease require a fundamental understanding of molecular and cell biology; electrical, magnetic, optical, and other physical parameters of pathological processes necessitate competence in biophysics; and the overwhelming effects of sociological factors on personal and public health have reached a level of social crisis. It should become the responsibility of academic medical centers to supervise the education of all members of the health care team from technician to physician and doctoral level medical chemists, biophysicists and behavioral scientists. Thus the university health care centers are emerging as health science universities, and any academic medical center that wishes to fulfill its responsibilities to the health care system must expand its educational objectives to encompass the full spectrum of these educational goals.

It appears inescapable that the trend of future health care will depend more and more on the resources, services, expertise, and facilities of these inclusive university health science centers. A coordinated system must be developed through which these centers can provide the organizational and directive leadership for health care in the surrounding community through satellite centers, community clinics, or other forms of regional service.

Specialization of health care facilities

As a result of the increased demand for health care services and the rapidly rising costs of conventional hospitalization, a variety of new health care institutions is developing. Ambulatory care clinics and out-patient departments have expanded considerably in the urban medical centers to minimize the need for patients to occupy hospital beds. Nursing homes and convalescent facilities are proliferating to provide less expensive nursing care for chronic disabilities, and during recovery and rehabilitation from acute diseases. The trend is for further growth and development of these specialized care institutions, including motel-type accommodations near the medical centers where transient patients can stay with their families during recovery.

Summary

The Carnegie Commission anticipates inevitable changes in the delivery of health care in the United States in the 1970's, with the momentum for change continuing during the 1980's and 1990's. The major factors contributing to these changes will be: (a) changes in public attitudes, which increasingly regard health care as a right of citizenship independent of socio-economic status; (b) sociological imperatives, associated particularly with the rising educational levels of the population; (c) highly probable changes in the economic structure of the health care system; (d) changes in the role of the Federal Government in relation to the financing of health care and the education of health manpower; (e) advances in health care knowledge and technology; (f) expansion and greatly improved coordination of the health care team; (g) greatly expanding responsibility for university health science centers in relation to the education of all professional health manpower and both research and planning for improved delivery of health care; and (h) specialization and division of labor among health care facilities.

III. Growth and Change in Health Manpower

We have traced past changes in the delivery of health care, as well as changes that are likely to occur in the next decade or two. Now let us take a more careful look, in statistical terms, at growth and change in health manpower.

The past

In 1967, it was estimated that approximately 3,400,000 civilian workers were employed in health care (U.S. Public Health Service, 1968, p. 8). They represented about 4.5 percent of all civilian employed workers, and their numbers were rapidly growing. An increase of slightly more than 30 percent had occurred in health service employment since 1960, while total civilian employment rose 13 percent. Thus, health care employment was not only rising at a considerably faster rate than employment as a whole, but, along with education and other services, was one of the most rapidly expanding sectors of the economy in terms of its manpower needs.

In 1910, when the Flexner report was issued, the picture was very different. Only about 430,000 workers could clearly be identified as employed in health services, representing 1.2 percent of all gainful workers (Edwards, 1943, pp. 111 and 178). There may have been some additional persons, such as nuns in Catholic hospitals, or service workers in hospitals and other institutions, who could not be identified in the somewhat crude classification used in the 1910 Census.

Many changes had occurred in the intervening years to explain the pronounced expansion in health services employment. Among these were the urbanization of the population; the related shift of many types of medical care from the home or the doctor's office to the hospital; the remarkable advances in medical science and technology, bringing a growing need for such

groups as radiologists and medical technicians to man the new equipment; and, perhaps above all, the rise in real per capita income, which encouraged an increase in the proportion of the Gross National Product expended on services.

Along with its growth, the composition of the health team had changed strikingly in the years from 1910 to 1967. In 1910, professionals constituted nearly 70 percent of all health personnel identifiable in the census returns. They included physicians and surgeons, osteopaths, chiropractors, veterinary surgeons, dentists, trained nurses, dentists' assistants and attendants, physicians' and surgeons' attendants, and a small residual group of "other healers." The nonprofessional group included midwives and untrained nurses.

Treating dentistry as a separate service, physicians (including osteopaths and chiropractors) constituted nearly 40 percent of the total identifiable medical team in 1910, or, in other words, the team appeared to include 1.5 other health workers for each doctor. If we make a rough adjustment for health workers who cannot be identified in the 1910 Census, it is probable that the true situation was more nearly 2 other workers for each doctor. In dentistry, the dentist himself represented 95 percent of the total team, with dentists' assistants and attendants making up the remainder.

By 1967, professionals comprised about 45 percent of all health manpower (U.S. Public Health Service, 1968, pp. 8-11). The nonprofessionals were scattered through all the other major occupation groups, but the great majority were either clerical workers (receptionists in hospitals, secretaries in doctors' offices, etc.) or service workers (hospital attendants, practical nurses and nurses aides, kitchen workers, chamber maids, etc.).

Again treating dentistry as a separate service, we find that physicians (including osteopaths) constituted just about one-tenth of the health manpower

team in 1967. The entire team included numerous workers who did not require specialized training for the health field, e.g., janitors in hospitals, but the number of trained specialties has proliferated greatly in recent decades.

[A useful list is presented by Greenfield, in his recent volume on Allied Health Manpower, drawing on extensive work on occupational classifications within the Department of Labor and the National Center for Health Statistics, (Table 4).

The dentist was also surrounded by many more assistants, relatively, than his 1910 counterpart. His team included dental hygienists, dental assistants, dental laboratory technicians, and clerical workers. If we assume that about a fourth of the secretaries and office assistants employed in health services in 1967 were in dentists' offices, we find that the dentist represented about a third of the dental team in 1967.

To a rather considerable but probably immeasurable extent, the change in the composition of the health team represents a shift from unpaid workers in the home to paid workers in the market place, much like the long-term trend in the food industry. When the country was predominantly rural, and hospitalization was much less common, the farmer's wife would care for her ailing husband or children. In childbirth, there was likely to be a grandmother, maiden aunt, or kindly neighbor available to see her through the postnatal period. Moreover, and perhaps less often recognized, the doctor's family was far more involved than is typical today in providing clerical and other types of assistance. The physician's office was very likely to be in a wing of his residence, and his wife, housemaid, or children frequently handled telephone calls (tracing him from farmhouse to farmhouse over primitive rural telephone connections). The wife was also likely to provide bookkeeping services, as well as occasional assistance when an office procedure could not be handled by the physician alone.

Table 4

PROPOSED CLASSIFICATION OF HEALTH MANPOWER OCCUPATIONS

<p>1. <u>Autonomous Health Professionals</u></p> <p>Physicians Osteopaths Dentists Podiatrists Optometrists</p>	<p>2. <u>Allied Health Professionals (Cont'd)</u></p> <p>Occupational therapists Physical therapists Rehabilitation counselors Speech pathologists and audiologists Virologists X-ray technologists Pharmacists Bioengineers Health administrators Health educators Music therapists Medical social workers</p>
<p>2. <u>Allied Health Professionals</u></p> <p>Professional nurses Clinical psychologists Cytotechnologists Dental hygienists Dieticians Food technologists Hospital administrators Immunochematologists Medical illustrators Medical record librarians Medical technologists Biostatisticians Computer programmers Health economists Manual arts therapists Recreation therapists Psychometlists Mycologists Nuclear medical technologists Nutritionists</p>	<p>3. <u>Allied Health Technicians</u></p> <p>X-ray technicians Registered nurses (Associate degree or diploma) Medical records technicians Occupational therapy assistants Medical technicians Medical and dental assistants</p> <p>4. <u>Allied Health Assistants</u></p> <p>Licensed practical nurses Nurse's aides Psychiatric aides</p>

Source: Harry I. Greenfield, Allied Health Manpower: Trends and Prospects, Columbia University Press, New York and London, 1969, pp. 26-27.

The pronounced increase in labor force participation rates of married women that has occurred in the years since World War II, along with such trends as the virtual disappearance of the maiden aunt and the more widespread geographical separation of elderly parents and their adult children, place severe limitations on the provision of care in the home by relatives. The wife who holds a full-time job cannot provide daytime care for an ailing husband or elderly parent. In this connection, it should be recognized that homemaker services, publicly subsidized in the case of low-income families, have been developed to a considerably greater extent in such countries as Sweden and Great Britain than in the United States, facilitating care in the home for aging invalids, for example, when no member of the family is available.

Another highly significant change that has occurred since 1910 is that women play a far more important role, relatively, in the health manpower scene than was true 60 years ago. By 1967, women constituted nearly four-fifths of all persons employed in health services industries (U.S. Bureau of Labor Statistics, 1968). This largely reflected their overwhelming predominance in nursing and in many of the nonprofessional sectors of the health services industry. They were also reasonably well represented in some of the para-medical professional occupations. But they were not well represented at the center of either the medical or dental team. /

At the end of 1965, there were 19,181 women physicians and surgeons in the United States, representing only about 6.2 percent of all persons in these professions (Lopate, 1968, p. 198 and Fein, 1967, 135). Nor was the probability of any significant change in this situation at all great--in that same year, only 7.7 percent of all medical students and 7.3 percent of all medical school graduates were women. The situation is in marked contrast to that in Western Europe, where in all countries women represent a considerably larger percentage

of the medical profession than in the United States--for example, 30 percent in Germany and 20 percent in the Netherlands. In the Soviet Union some 65 to 85 percent of the doctors are women, although most of them are feldshers who have received some medical training but are not fully qualified physicians (Lopate, pp. vi and 193). There are undoubtedly many factors accounting for these differences, but probably among the more important are greater emphasis on the provision of child care centers for married women students and workers in many European countries, as well as more comprehensive programs of student aid, and, in some countries, student loans.

Opportunities for women to enter dentistry appear to be even more limited. Only one or two percent of U.S. dentists are female (American Association of Dental Schools, 1967, pp. 1-2).

Even more than in the case of women, members of minority groups are well represented only in the lower echelons of health manpower--chiefly in service occupations. Notable exceptions--though this is difficult to document on the basis of recent statistics--are Japanese-Americans and Chinese-Americans, who have penetrated the higher ranks of the health professions to a significant extent.

A report prepared by Dr. Alfred Haynes for a Liaison Committee of the American Medical Association and the National Medical Association indicated that the growth in the number of black physicians had lagged behind the growth of the black population. Although more than 11 percent of the nation's population is Negro, less than 2 percent of American physicians are black. A Negro physician is highly likely to have graduated from either Howard University Medical School or from Meharry Medical College and to migrate to California to practice (Haynes, 1969, pp. 93-95).

The Liaison Committee also authorized another study which found that most

medical schools have less than 2 percent black enrollment. About half of the schools are trying to increase their black enrollment by special recruitment programs, but the most serious weakness in these attempts is the lack of adequate financial assistance for individual black students and the lack of funds for special programs to overcome the academic deficiencies of such recruits (Crowley and Nicholson, 1969, pp. 96-100).

In 1969, medical schools were asked, for the first time, to report the racial origin of students. The enrollment of blacks was 2.2 percent of the total, while only the West South Central region reported as much as 1 percent Mexican-American enrollment (American Medical Association, 1969).

The future

An extensive series of commission reports and special studies conducted in the postwar period have projected shortages of health care personnel, especially in the case of physicians. Confining our attention to the more recent and more significant of these studies, we find that the projections are concerned with doctors, dentists, and nurses (excluding other health personnel for the most part), and that there is little disagreement in their findings.

Rashi Fein estimated that the number of physicians in the United States would rise from about 305,000 in 1965 to 362,000 by 1975, assuming continued substantial immigration of foreign-trained doctors. In the absence of a rise in productivity, this increase would not be sufficient to meet the increased demand resulting from rising incomes. However, with "nominal" productivity gains, the increase in supply would be sufficient to meet the increased demand stemming from higher incomes, but not the rise in demand which might result from a shift in consumer "taste" toward more health care or from the development of new financing mechanisms designed to expand the amount of medical care available to part, or all, of the population (Fein, 1967, pp. 135-318).

Shortages of doctors, dentists, and nurses have been predicted on the basis of several other studies (National Advisory Commission of Health Manpower, 1967, Vol II, p. 243; Folger, Astin, and Bayer, 1970, pp. --; and Moore, 1969, p. 708).

All these projections assume a continuation of the trend toward increasing demand for health services, as well as continued increases in productivity, but they do not assume a major change in the financing of health care. A prediction of a different type has recently been developed by the U.S. Bureau of Labor Statistics, which estimates that the nation will "need" 250,000 more doctors by 1980. Quite evidently, this projection of need assumes removal of existing financial barriers to health care by that time, since it is much larger than any of the other available estimates of increased demand.

However, no such increase can conceivably be brought about, in view of the fact that even to have been awarded his M.D. by 1980 a student would have to enter medical school by 1976, and the increase of medical school places which can be achieved by 1976, to be discussed at a later point, is already large determined on the basis of existing plans for expansion and falls far below this level of increase.

The Office of Health Planning of the University of California has prepared for the Carnegie Commission, under the direction of Dr. Mark Blumberg, four alternative projections of the increase in the number of M.D.'s at five-year intervals from 1967 to 2,002 (Table 5). All four projections are based on the assumptions (a) that of the 46,000 foreign medical graduates present in the United States in 1967 (not including graduates of Canadian medical schools, 13,000 will not remain in the U.S. and no new foreign medical graduates will be employed here and (b) that the total U.S. population will increase at the rate indicated by Series 1-D of the U.S. Bureau of the Census.

Table 5

PROJECTIONS OF M.D.'S, TOTAL NUMBER AND NUMBER PER 100,000 POPULATION,
 BASED ON ALTERNATIVE INCREASES IN THE NUMBER OF MEDICAL SCHOOL
 ENTRANTS, UNITED STATES, 1967-2002

Year	Alternative assumptions ^a			
	Rapid sustained	PAP ^b	Medium long	Medium short
Number of M.D.'s - U.S. Graduates Only (in thousands)				
1967	279.9	279.9	279.9	279.9
1972	306.5	306.5	306.5	306.5
1977	327.3	330.4	327.4	327.4
1982	369.7	371.7	364.1	364.1
1987	419.0	409.6	403.5	402.1
1992	472.1	444.4	442.1	436.9
1997	528.5	476.4	478.9	469.0
2002	587.4	506.4	513.8	499.3
Total Number of M.D.'s per 100,000 Population				
1967	140.7	140.7	140.7	140.7
1972	143.7	143.7	143.7	143.7
1977	148.9	150.2	148.8	148.8
1982	158.5	159.4	156.1	156.1
1987	169.3	165.5	163.0	162.5
1992	181.3	170.7	169.8	167.8
1997	192.3	173.4	174.3	170.7
2002	203.8	175.7	178.3	173.2

^a See Appendix Table A-1, for the four alternative series of projected medical school entrants.

^b Physician Augmentation Program Series proposed by the Association of American Medical Colleges.

Source: Office of Health Planning, University of California.

The data on the total number of M.D.'s in Table 5 do not include projected foreign medical graduates, whereas these graduates are included in the number of M.D.'s per 100,000 population.

The projections suggest that there might be little additional need for expansion of medical student places after 1980. However, the Carnegie Commission believes that it is impossible to predict the number of M.D.'s per 100,000 population that will be "adequate" in relation to the very different demand and supply situation which may prevail in the 1980's. On the one hand, as suggested above, we expect the increase in demand to rise sharply if a national health insurance system becomes effective. On the other hand, physician productivity may rise at an accelerated rate in the 1970's. The net effect of these two conflicting influences is likely to call for a considerably higher ratio of M.D.'s to population than that prevailing today, in view of the clear evidence of a physician shortage today and the likelihood of an even more severe shortage in the future, but just what the ratio should be cannot be predicted.

Some observers of the health manpower scene are skeptical about impending shortages of doctors, and perhaps dentists as well, on the grounds that (1) the ratio of other health workers to doctors and dentists is increasing rapidly, (2) the work of the health care team will soon be far more effectively coordinated than at present, and (3) physician's assistants or coordinators of health services with less prolonged training than the full-fledged doctor now receives will increasingly take over some of the physician's duties, so that his time will be more effectively released for the use of his highest skills.

The Carnegie Commission agrees that these changes are occurring and may well be accelerated during the 1970's, but we do not believe they will take place rapidly enough to rule out the probability of continuing shortages throughout the 1970's.

In this connection it is important to recognize that there is a serious shortage of M.D.'s at the present time. The Association of American Medical Colleges has recently estimated the shortage at 50,000 physicians (Association of American Medical Colleges, 1969, p. 1). The indications of a shortage are numerous. Quite apart from the highly uneven geographical distribution of physicians, discussed earlier, there are other indications that there is a severe shortage of physicians today. One such indication takes the form of long waiting lines in doctors' offices and hospital outpatient clinics. Another is the very long working week of the typical physician--for all reporting physicians, the median work week in 1968 was 60 hours (Blumberg, 1970, Table MD-9). In addition, the presence of large numbers of foreign medical graduates in the United States, especially among house officers, is a clear indication that we are not training enough doctors. In 1967, as indicated above, there were about 46,000 graduates of foreign medical schools in the United States, representing about 15 percent of all physicians. Approximately 19,000 of these worked in private practice, 14,000 as house officers, and nearly 9,000 as full-time medical staff of hospitals. In recent years many of these foreign graduates have come from such countries as the Philippines, India, Iran, and Cuba (Blumberg, 1970, p.), in which the quality of medical education is not considered comparable with the best medical training available in this country.

Moreover, although pressure to discourage the employment of foreign medical graduates from relatively undeveloped countries may increase, it does not appear likely that such pressure will soon reverse the present trend toward increasing employment of physicians from abroad, at least as long as shortages

of physicians in the United States continues. Increased employment of foreign medical graduates would result in a more rapid increase of physicians per 100,000 population than Blumberg's projections indicate, but it is widely regarded as an unsatisfactory solution of the U.S. physician shortage and is resented abroad as a disadvantageous "brain drain." Looking toward the future, there are grounds for suggesting that the United States should become a net exporter of medical manpower rather than a large importer, as part of the effort to raise the quality of medical education and medical care in under-developed countries. For similar reasons, more emphasis on research on tropical diseases is needed.

In addition, there are acute shortages of medical faculty members today, and there is a large and growing need for faculty members in comprehensive and community colleges with the requisite training to teach para-medical specialties.

All things considered, the Carnegie Commission believes that there should be a major effort to increase medical student places in the 1970's, based on our projections in Table 6, below. By 1980, the situation might be such as to call for a reappraisal of the need for further expansion.

Moreover, the very recent mushrooming of provisions for dental care in collectively bargained health and welfare plans is likely to bring about an acceleration in the increase in demand for dental services that was not anticipated in connection with projections developed in the mid-1960's. Our projections of needed dental student places take this into account.

IV. The Future Health Care and Health Education System

In view of the trends and pressures acting on the U.S. health delivery system described above, certain organizational and educational consequences appear necessary to fulfill the goal of optimum health care for all citizens. Health care delivery and the education of health care personnel must be integrated into a cooperative enterprise with fully coordinated goals and programs. Generally, this will involve a national system of geographically distributed university-based health science centers responsible for the education of health care personnel and for the supervision of health care delivery through extra-mural area centers and other organizations. These university health science centers would be responsible for coordinated educational programs for all health care personnel, whether taught exclusively within their institutional confines or in cooperation with affiliated hospitals and other institutions of secondary and higher education. A significant element of these educational programs should be continuing education for all health care personnel.

The types of health care personnel whose education should be a responsibility of the university health science centers, at least in a supervisory capacity, should be enlarged to include administrators, social scientists, behavioral scientists, and others who seek a role in the public sector. Although many of the less extensively and less theoretically trained allied health care technicians need not receive their didactic education directly within the high cost academic health science centers, their curricula, breadth of training, and professional standards should be established and monitored by these health science centers. To accomplish this, it will be necessary for community colleges and possibly some secondary schools to assume a major role in the education of a variety of

para-medical personnel. Not only must the health science centers supervise the establishment of curricula in these other institutions, but the programs must be truly cooperative to enable these para-medical students to receive experience with the health care team in the environment of the hospital and health center.

Although changes in the size and characteristics of the health team are likely to occur, there will continue to be a need at the center of the medical and dental teams for high level health practitioners whose education can be adequately completed only within the milieu of the university health science centers. For these professionals, a substantial formal university education will be required. Apprenticeship training in itself will not be adequate and must be accompanied by broad and intensive theoretical and laboratory curricula. Their education will involve extensive patient contact with graduated responsibility for the patient's welfare. Consequently, it will be relatively long and costly. Post-degree education (M.D., Ph.D., and other professional degrees or certificates) will continue to be an important aspect of obtaining and maintaining professional skills. These high level health practitioners will continue to seek and find positions in a national market place with little possibility of their replacement by alternatives within the foreseeable future.

Nevertheless, many experts on medical and dental education believe that the present four-year program for the M.D. or D.D.S. candidate could be reduced in duration. This could be accomplished in a number of ways: (1) through a straightforward revision of the curriculum so that the required courses could be completed in a three-year period, (2) through provisions for advanced standing for students entering with extensive pre-medical preparation, (3) through providing M.D. or D.D.S. candidate instruction during all or part of the summer, (4) through

joint appointments with appropriate teaching departments on the university's main campuses may often be the most desirable method of accomplishing this expansion. Nor can manpower needs be considered independently from the issues of alternative methods of providing health care, which as stated above, should become a matter of primary concern to the health science centers.

Although some health care service to the community has been a consequence of the academic educational and research programs of university health science centers, it has not been a primary goal. To expect these institutions to undertake the national responsibility for reorganizing and supervising the health care delivery system will require very major shifts in policies and priorities. Generally, even the professional M.D. faculty members are not primarily service oriented. The medical school administration has not been designed for major service functions, nor is the budgetary structure organized to accomplish any significant service role with a view toward economic efficiency. Parent universities are also not primarily service directed and do not promote this goal in their associated schools. Although the land grant institutions fulfilled the agricultural goals of their creation superbly well, bringing to the U.S. remarkable advances in agronomy and the quality of rural life, the university medical schools of the mid-twentieth century are philosophically remote from the practical operations of social service. Fortunately, the ambience of social concern is modifying this attitude, especially among the students, so that the time may be right to extend to these institutions the challenge of creating a model health care system for the nation.

If the university health science centers are to be the intellectual center of the health care system, then they must be distributed geographically throughout the nation with peripheral organizations appropriate for

the demography within their sphere of influence. Under the leadership of the Federal Government, regional planning of health care needs to be broadened to include analysis of desirable locations for university health science centers, as well as other health education and health care facilities. The university health science centers, working with state and regional planning agencies, should be encouraged to assume major responsibility within this planning framework, while the Federal Government would be concerned primarily with providing leadership, financial aid, and support for broad national studies of health manpower needs.

For example, the peripheral networks for health care delivery associated with a health science center for Wyoming, Montana, Idaho, and Nevada might be quite different from the organization around a center in New York or Los Angeles. However, every such health science center should be affiliated as closely as possible with a university and should consist of a set of professional schools and teaching facilities to accommodate the needs of its entire area of responsibility, capability to handle the most complex and sophisticated medical problems, and capacity to provide technical assistance to satellite and associated institutions. It should serve as the coordinating hub and reservoir of expertise for a system of institutions consisting of area health centers, neighborhood health centers, rural clinics, hospitals, group practice organizations, or whatever the institutional needs of an area may be.

While each university health science center would be expected to conduct programs directed toward the acquisition of new knowledge, the amount and direction of these programs would vary. Basic biomedical research would be minimized in some to favor research on health delivery systems, the socioeconomics of disease, and other medico-social problems.

In some regions of the country the distance between university health science centers would be very great, as in the sparsely populated western states. Elsewhere, the metropolitan concentration of people would overwhelm the facilities of even the largest health science center. In such regions there should be established "area health education centers", containing most of the facilities for total patient care plus educational programs for house officers, clinical experience for para-medical students, and possibly for M.D. candidates who could rotate through the area health education center from university health science centers. A further major responsibility would be continuing education programs for health care personnel in the vicinity.

These area health education centers would be in essence satellites of the university health science center and they would be visited on a scheduled basis by the faculty of the health science center. Their educational programs would be developed and supervised by the health science center faculty, and their patient care functions would rely on the expertise of the health science center personnel. The area centers in turn would provide assistance and counsel to the community and neighborhood health care facilities, including the private practitioner, as well as provide direct patient care--probably largely on a referral basis from the local health care personnel.

The network of Veterans' Administration hospitals could provide excellent facilities and organization, as well as personnel, to serve as area health education centers in some regions. Public Law 89-785 enacted in 1966 provided for the training of health service personnel and for the expansion of specialty training programs within V.A. hospitals under affiliation with medical schools. Presently, at least 50 percent of all

medical school graduates receive some of their training in V.A. hospitals and in 1968 approximately 15 percent of all medical and dental residencies were in these hospitals. As a result of this partnership, the V.A. has become and remains a hospital system in which standards of patient care are outstanding, as a result of the major participation in medical education and scientific research.

The V.A. follows the policy of building its new and replacement hospitals in proximity to existing and developing medical schools. However, approximately 80 hospitals are geographically removed from medical centers and are a clear counterpart of community hospitals. These hospitals might well become area health education centers through functional affiliation with university health science centers at some distance. Maximum use of information networks and rapid transportation could at least partially overcome the geographical separation.

V. Major Goals for Future Educational Programs in the Health Sciences

The primary goal of all educational programs in the health sciences should be the provision of manpower for optimum health care, both therapeutic and preventive, for all members of society. Obviously such a mission includes, in addition to delivery of available services to every citizen, advancement of knowledge in all relevant areas, production of teachers, and an organizational complex in which governmental support and control, private enterprise, health care institutions and personnel, and educational institutions are effectively integrated.

Provision of optimum health care to all involves increasing both the availability and the quality of services rendered to a significant portion of the U.S. population. This in turn requires increased efficiency and equality of distribution in the delivery system as well as increased numbers of health care personnel plus increased facilities.

Goal 1. To increase efficiency and equality of distribution in the health care delivery system.

- a. To promote national and regional integration of the health care system.
- b. To remove financial barriers to receipt of optimum health care by all citizens, although the solution to this problem lies in social legislation and is not a direct goal of this report.
- c. To improve the functional structure and coordination of the health care team.

Goal 2. To increase the numbers of health care personnel.

Goal 3. To increase and equitably distribute health care facilities.

VI. Recommendations

To a very considerable extent, our discussion of deficiencies in the delivery of health care in the United States, our emphasis on current and future shortages of health manpower, and our formulation of goals for needed changes are all consistent with the findings of other recent studies and the recommendations of other commissions. For more than ten years, inadequacies of health care and education for the health professions have been discussed and evaluated at the state and national levels with similar conclusions. Our analysis of the needs and our delineation of desirable changes is neither unique nor novel.

Yet, despite the plethora of reports, all in essential agreement, there has been relatively little implementation of the recommendations by medical practitioners, hospitals, educational institutions, or local, state, and federal governments. The Carnegie Commission believes that if effective implementation is to be achieved, the organizational changes and funding mechanisms required to provide adequate incentives for change must be spelled out very carefully. Thus our recommendations have been developed in considerable detail with a view to stimulating action.

(108) A summary of recommendations of previous studies and commissions with direct implications for health manpower education is provided in Appendix 1.

The expansion of health manpower education

The Carnegie Commission believes that vigorous efforts should be made in the 1970's to induce accelerated expansion of student places for M.D. candidates in university health science centers and for D.D.S. candidates, whether dental education is provided in existing university health science centers or in separate dental schools. The Commission also recommends similar efforts

to expand student places for the training of para-medical personnel in four-year comprehensive colleges and community colleges. As suggested at a later point, we believe that the Federal Government should play a major role in stimulating the expansion of places for M.D. and D.D.S. candidates and a significant, but more limited, role in relation to the education of house officers and para-medical personnel. In the latter endeavor, state and local jurisdictions may ^{LOGICALLY} be expected to play a relatively greater role.

In the last few years, there has been an encouraging acceleration in the rate of increase of places for M.D. candidates, and very rapid increases are indicated in several of the projections presented in Appendix Table A-1. It is quite clear that the increased federal aid available in recent years, especially in the form of construction grants, has been a powerful stimulus to the development and implementation of plans for expansion of medical schools and the establishment of new schools. However, much of the projected expansion for the 1970's is dependent on federal construction funds and will not be forthcoming in the absence of adequate appropriations for this purpose. Recently, the appropriations have fallen considerably below the amounts authorized by Congress.

The Carnegie Commission believes, for reasons discussed above, that a major effort to expand medical and dental education in the 1970's is needed. Moreover, we believe that expansion can be achieved at a more rapid rate than that indicated by the "rapid sustained" projection of medical school entrants presented in Appendix Table A-1. Extending the most recent AAMC projection from 1975-76 to later years, the "rapid sustained" projection reflects all that is currently known about plans for expansion in existing and developing medical schools. The Commission believes that the program of expanded federal aid which we are recommending would stimulate additional

expansion in existing and developing institutions from 1970-71 to 1975-76, as well as expansion in new university health science centers not now in the development stage. More specifically, we are convinced that, by 1975-76, 1,000 new first-year places could be added in existing institutions over and above those anticipated on the basis of existing plans and reflected in the recent projections developed by the Association of American Medical Colleges and others. This would bring the total number of first-year places in existing institutions or those in the process of development to about 15,700 by 1975-76 representing an average entering class size of about 150 per school, as compared with the current 103 (Table 6).

We have also developed estimates of the probable rate of expansion of student places in new university health science centers not now planned from 1976-77 to 1979-80, based on our goal of more adequate geographical distribution and calling for 25 new centers with an average entering class of 80 by 1979-80. The estimates allow for the fact that new institutions typically admit relatively few students, as compared with established medical schools.

All told, this expansion would bring the number of first-year places to about 19,800 by 1979-80. Assuming no change in the present four-year duration of the M.D. candidate's education or in the attrition rate for students during the four years, even this highly desirable rate of expansion would yield only about 11,500 graduates by 1975-76 and 15,500 by 1979-80. If, however, the average length of the M.D. candidate's education could be reduced as a result of other types of changes suggested in this report, and the attrition rate lowered somewhat, it should be possible to increase the number of graduates to _____ by 1975-76 and to _____ by 1979-80. [Estimates to be developed.]

Even in the absence of a reduction in the duration of the M.D. candidate's

Table 6
 ENROLLMENT IN U.S. MEDICAL SCHOOLS, 1965-66
 TO 1969-70, AND CARNEGIE COMMISSION GOALS
 FOR EXPANSION, 1970-71 TO 1979-80

Academic Year	Entrants	Total M.D. Candidates	Graduates
1965-66	8,759 ^a	32,835 ^a	7,574
1966-67	8,964 ^a	33,423 ^a	7,743
1967-68	9,479 ^a	34,538 ^a	7,793
1968-69	9,863 ^a	35,833 ^a	8,059
1969-70	10,200 ^a	37,167	8,441
1970-71	10,900 ^c	38,837	9,014
1971-72	11,650 ^c		9,091
1972-73	12,450 ^b		9,401
1973-74	13,550 ^c	To	10,045
1974-75	14,650 ^c	be	10,736
1975-76	15,700 ^b	Completed	11,474
1976-77	16,800 ^c		12,487
1977-78	17,800 ^c		13,478
1978-79	18,800 ^c		14,634
1979-80	19,800 ^c		15,456

^a Actual enrollment provided by Association of American Medical Colleges.

^b Adapted from projected enrollments provided by Association of American Medical Colleges (see Appendix Table A-1), and allowing for additional expansion expected to be stimulated by Carnegie Commission recommendations.

^c Adapted from estimates developed by Dr. Mark Blumberg, but allowing for additional expansion expected to be stimulated by Carnegie Commission recommendations. For additional details, see Appendix Table A-1.

education, our projection of the annual numbers of graduates in the 1970's indicates that, after allowing for estimated replacement needs and assuming no additional employment of foreign medical graduates, the total net increase in the number of physicians for the decade as a whole would amount to nearly 71,000, or an average of 7,100 a year. This would represent a highly encouraging increase, as compared with the experience of recent decades, but it would not begin to meet the "need" for 250,000 additional physicians projected by the BLS.

There is a tendency for some experts to argue that major emphasis should be placed on expansion of enrollment in existing medical schools rather than on plans for new university health science centers, on the ground that expansion of existing institutions is far less costly than development of new institutions. The Carnegie Commission has carefully weighed this consideration but has reached the conclusion that the advantages of achieving a more adequate geographical distribution of university health science centers are sufficiently great to justify the higher cost associated with development of new institutions. The case for broad geographical distribution rests primarily on the role we envisage for university health science centers in improving the quality of health care in the areas in which they are located. These centers will also play an important role in augmenting the supply of health manpower in the area, in part through their power to attract house officers who are likely later to practice in the area and in part through the role we believe they should play in stimulating and guiding the training of para-medical personnel in comprehensive colleges and community colleges in the area. However, in view of the interstate mobility of medical school graduates, to be discussed later, broad geographical distribution of M.D. candidate education may not in itself lead to a more even geographical

distribution of physicians per capita. Changes in the financing of health care would be needed to accomplish this end,

It is for these reasons that, in projecting the increase of first year places, we have allowed for only 1,000 additional places in existing or developing institutions, over and above those already planned, as compared with 2,000 in new institutions not now in the development stage.

Recommendation

The Carnegie Commission recommends that existing university health science centers add at least 1,000 first-year M.D. candidate student places, not now contemplated in their plans for expansion, by 1975-76, and that plans be developed for 25 new university health science centers which would provide 2,000 additional student places by 1979-80. Assuming adequate appropriations under existing legislation and prompt adoption and implementation of the recommendations for federal aid included in this report, the contemplated expansion would bring the number of first-year student places to about 16,800 by the fall of 1976 and 19,800 by the academic year, 1979-80.

[Dental student estimates to come]

Location of new university health science centers

On the basis of studies that have been conducted of the population required in a metropolitan area to justify location of a university health science center, with its teaching hospital, in the area, the Carnegie Commission believes that there should be a university health science center in every metropolitan area with a population of 350,000 or more. The Commission has identified 19 metropolitan areas of at least this size which do not now have a medical school and an additional metropolitan area, Duluth-Superior, with a population falling somewhat below 350,000, but located so far away

from the nearest medical school (in Minneapolis-St. Paul) that its needs cannot be adequately served without a university health science center of its own (Table 7). There is the additional consideration that a university health science center in the Duluth-Superior area would serve the needs of large parts of northern Minnesota, Wisconsin, and Michigan.

Not all of these 20 metropolitan areas lack any plans for development of a university health science center. Springfield, Massachusetts has active plans for a medical school, while less definite plans also exist for Norfolk, Virginia and Mobile, Alabama.

Not included in Table 7 are 19 communities, many of them with a population of 350,000 or more, that have medical schools in various stages of development (Table 8).

The Commission also believes that in sparsely settled states, where there are no metropolitan areas with a population of 350,000 or more, the location of university health science centers should be planned on a regional basis and that a criterion of at least one medical school for every 1,500,000 persons would be appropriate.

Similarly, in very large metropolitan areas, the Commission believes that there should be at least one university health science center for every 1,500,000 persons. New centers of this type might well take the form of additional health science campuses of existing universities or medical schools.

On the basis of these additional criteria, we have identified five other areas in which plans should be developed for new university health science centers in the 1970's (Table 7).

Table 7

CARNEGIE COMMISSION GOALS FOR NEW UNIVERSITY HEALTH SCIENCE CENTERS BY 1980
(not including medical schools now in development)

Standard metropolitan area	Estimated population, July 1, 1966 (in thousands)	Percentage increase in population, 1960-66
<u>Moderate-sized areas</u>		
Paterson-Clifton-Passaic, N.J.	1,318	11.0
Phoenix, Arizona	838	26.3
Akron, Ohio	652	7.8
Fort Worth, Texas	638	11.3
Norfolk-Portsmouth, Virginia	637	10.0
Jersey City, N.J.	616	0.9
Gary-Hammond-East Chicago, Ind.	599	4.5
Springfield-Chicopee-Holyoke, Mass. ^a	547	2.7
Youngstown-Warren, Ohio	525	3.1
Allentown-Bethlehem-Easton, Pennsylvania, N.J.	516	4.8
Grand Rapids, Michigan	505	9.3
Jacksonville, Florida	500	9.8
Flint, Michigan	469	12.6
Wilmington, Del.-N.J.-Md.	466	12.4
Tulsa, Oklahoma	441	5.4
Fresno, California	409	11.7
Wichita, Kansas	391	2.6
Knoxville, Tennessee	388	5.3
Mobile, Alabama	385	6.1
Duluth-Superior, Minn.-Wis.	268	-3.3
<u>Other areas</u>		
[five to be identified]		

^a Metropolitan state economic area.

Sources: U.S. Bureau of the Census, Statistical Abstract of the United States, 1966; and Association of American Medical Colleges, Medical School Admission Requirements, U.S.A. and Canada, 1968-69, AAMC, Chicago, 1968.

Table 8

MEDICAL SCHOOLS IN DEVELOPMENT, 1968-69

Location and school	Actual or expected starting date	Year first class will graduate
Providence, R.I., Brown University Program in Medical Science	1963	1969
New Brunswick, N.J., Rutgers Medical School	1966	1970
East Lansing, Michigan, Michigan State University College of Human Medicine	1966	1970
Tucson, Arizona, University of Arizona College of Medicine	1967	1971
Honolulu, Hawaii, University of Hawaii School of Medicine	1967	1971
Hershey, Penna., Pennsylvania State University-M.S. Hershey Medical Center	1967	1971
Davis, California, University of California School of Medicine	1968	1972
San Diego, California, University of California School of Medicine	1968	1972
Hartford, Ct., University of Connecticut School of Medicine	1968	1972
New York, N.Y., Mount Sinai School of Medicine	1968	1970
San Antonio, Texas, University of Texas- South Texas Medical School	1968	1970
Shreveport, La., Louisiana State Univer- sity School of Medicine	1969	1973
Worcester, Mass., University of Massachusetts School of Medicine	1970	1974
Toledo, Ohio, Medical College of Ohio at Toledo	1969	1974
Stony Brook, N.Y., State University of New York School of Medicine	1971	1975
Tampa, Fla., University of South Florida College of Medicine	1971	1975
Kansas City, Mo., University of Missouri- Kansas City School of Medicine	1971	1975
Houston, Texas, University of Texas- Medical School at Houston	1971	1975
Reno, Nevada, University of Nevada, School of Medical Sciences	1971	1973

Source: American Medical Association, Medical Education in the United States, 1968-69, Chicago, 1969, pp. 1466-1474.

Recommendation

The Carnegie Commission recommends the development of 25 new university health science centers by 1980 in the areas listed in Table 7.

Area health education centers

We have stressed the need for area health education centers in communities that are too small to justify the location of a university health science center and too remote from such a center to be directly affected by its impact on the quality of health care. We have also described the functions of such centers and have indicated that they should be directly affiliated with the nearest university health science center. Examples of such communities are Bakersfield, California, in which an area health education center might be affiliated with the university health science center recommended for Fresno, and Eureka, California, in which an area center might be affiliated with the University of California health science center in San Francisco.

As suggested above, approximately 80 V.A. hospitals are geographically removed from medical centers and might well become area health education centers through affiliation with university health science centers at some distance. Although the V.A. hospitals would have to be expanded to perform all the functions envisaged for area health education centers, the costs of expansion would clearly be far less than those associated with the development of an entirely new center. Similarly, existing hospitals in areas lacking a V.A. hospital might well form the nuclei for development of area health education centers, with comparable resulting economies. The Commission believes that plans should be developed for the establishment of _____ area health education centers by 1980, including areas in which the 80 V.A. hospitals mentioned above are located.

Recommendation

The Commission recommends that plans for the geographical location of area health centers centers should be developed by universities working closely with state and regional planning agencies. Approximately ? such centers should be developed by 1980.

The responsibilities of the Federal Government

The Carnegie Commission believes that there is a strong case for assumption by the Federal Government of major responsibility for stimulating and providing financial support for the expansion and modification of university health science centers as recommended in this report. The case for a major role on the part of the Federal Government is especially strong in relation to the education of M.D. candidates, for the following reasons:

1. A number of studies have shown that less than half of the graduates of U.S. medical schools are practicing in the state in which they received the M.D. degree (Fein, 1970, p.). Significantly, however, for physicians with residency training, well over half tend to practice in the state of their residency training. The situation varies from state to state--some states, e.g., California, are very large net importers of medical graduates, whereas others, e.g., Illinois, are net exporters. Nevertheless, the broad picture is one in which there is no very direct relationship between a state's investment in the education of M.D. candidates and the social return to the state. In the light of this evidence, there is understandably a growing reluctance on the part of state governments to expand investment in the education of M.D. candidates. At the house officer level, the social return to the state can be more clearly demonstrated. This is also true of the education of

para-medical workers, who are relatively likely to be employed in the state in which they received their training.

2. States with low per capita incomes encounter serious difficulty in providing the substantial funds needed for expansion of medical education. It is most unlikely that adequate expansion will occur in such states in the absence of major financial support from the Federal Government.

3. The Federal Government has assumed major responsibility for providing funds for biomedical research. Although this has made possible a highly desirable expansion of biomedical research activity, the time has now come for an equally vigorous effort to expand the education of health manpower and to stimulate major changes designed to relate the future education of health manpower to probable changes in the delivery of health care.

4. Largely as a result of the Medicare and Medicaid programs, the Federal Government is now far more heavily involved in the financing of health care than ever before. Yet the programs are placing a major strain on the nation's inadequate supply of health manpower and health care facilities. For this reason, the Commission believes that the Federal Government should become more extensively involved in stimulating expansion and change in the education of health manpower, although the responsibility for the development of detailed plans for new university health science centers and area health education centers should center in the universities, working in close cooperation with state and regional planning agencies.

The types of federal financial support recommended by the Commission include student grants, student loans, institutional grants for educational

expenses, more modest grants to university health science centers and university-affiliated area health centers for the advanced education of house officers, grants and loans for construction, start-up grants and loans, and research grants. The recommendations for grants to institutions are carefully designed to stimulate not only expansion of, but also needed changes in, health science education.

Student grants

In view of the substantial financial return to the individual who invests in medical or dental education, it is sometimes argued that assistance to the medical or dental student should take the form exclusively of loans. The Commission does not fully support this point of view, in view of the psychological barriers to incurring indebtedness on the part of students from low-income families, an attitude that is undoubtedly explained in part by the tendency for low-income families to experience income instability. The case for providing grants to students from low-income families also rests on the need to provide equal opportunity to students who are members of minority groups, since there are indications that reluctance to incur indebtedness for the financing of education may be particularly prevalent among such groups.

In view of the high cost of medical and dental education, the Commission recommends a maximum grant of \$4,000 per year for medical and dental students, a considerably larger amount than we have recommended for undergraduate or graduate students in higher education generally. We do not agree with those who favor a maximum grant which would cover tuition at the individual's chosen school plus a subsistence allowance, on the ground that such a policy would encourage institutions to increase their tuition charges. As indicated

below, the Commission believes that, in order to prevent an inflationary trend in tuition charges, university health science centers should be induced to adopt uniform tuition fees as a condition for the provision of Federal cost-of-education supplements.

In determining the student's need, it will be necessary to derive a simple need formula based on such factors as total family income over the past several years, total family assets, and number and ages of children. The distribution of incomes of families with heads aged 45 to 54 is a more appropriate criterion for determination of eligibility for a grant than the distribution of income of all families, since parents of medical and dental students are likely to be in that age group, and incomes of these families tend to be higher than those of families with younger or older heads. Median income for families with male heads aged 45 to 54 amounted to \$10,940 in 1968 (U.S. Bureau of the Census, 1969, p. 52). The first and third quartiles were \$7,690 and \$12,240, respectively. The Commission assumes that a maximum grant would often be necessary for students from families with incomes falling within the lowest quartile of this income distribution, and that somewhat lower grants would be provided for students from families with incomes falling within the next higher quartile.

Student loans

Because medical education is expensive and prolonged, only students from upper-income families are likely to be in a position to meet all the expenses of a medical education without the assistance of either grants or loans, and many students who are eligible for grants will also need to borrow funds. Indeed, a substantial percentage of all medical students now receive both grants and loans (Fein, 1970, p.).

The Carnegie Commission believes that the proposal for an Educational Opportunity Bank, as developed by Karl Shell and others, is particularly well suited to the financing of medical and dental education and should be adopted on a pilot basis for medical and dental students.

The EOB would be a nonprofit agency established under the auspices of the Federal Government, with its capital made available by the U.S. Treasury through the sale of government bonds. The program would be administered through the institutions of higher education. There would be no income or means test as a condition of eligibility. Students could borrow a maximum amount equal to tuition plus a subsistence allowance (including dependents' allowances) plus necessary travel expenses for out-of-state students, minus any grant or fellowship stipends available to the student from any public or private source.

Repayment would be made on the basis of a fixed percentage of income per \$1,000 borrowed, over a period of 30 years. No repayment would be required from an M.D. until he had completed his internship and residency, as well as his two years of military service. Married women would be excused from repayment obligations for periods when they were entirely out of the labor force, but, on returning to the labor force, would be required to make repayments at a rate slightly above the standard rate. If a married woman remained out of the labor force for more than ten years in all, her repayment obligations would become a family income liability. It has been estimated that such a plan for medical students would be self-sustaining on the basis of a standard repayment rate of three percent of net income for 20 years, or a lower rate for a 30-year period.

Tuition policy

One of the arguments against an EOB program is that institutions would be encouraged to raise their tuition fees, once a student could be certain

of borrowing the full amount of his tuition. The Commission believes that, as a logical corollary to assumption of major financial responsibility for the financing of medical and dental education by the Federal Government, a uniform tuition fee should be established for medical and dental education. The fee would be adjusted from time to time in accordance with changes in costs of education per student.

At present there are wide variations in tuition charges from institution to institution [insert data from Fein], as well as higher tuition fees for nonresidents than for residents of the state in public institutions. The federal aids proposed in this report would have the effect of making such wide variations unnecessary. Moreover, differentiation between residents and nonresidents of a given state would be inconsistent with the principle of major federal financing responsibility and with the goal of nationwide recruitment of students by the institutions and nationwide choice of institutions by the students.

Determination of the standard tuition fee would be based on the principle that the medical or dental student should meet a proportion of the costs of his medical or dental education corresponding to the ratio of the average individual return from investment in medical or dental education to the average social return. Although this ratio has not been satisfactorily determined for higher education, the Commission believes that there are grounds for estimating the ratio at approximately two-thirds.

Among the costs to the individual, foregone earnings are relatively high for medical and dental students, amounting to about \$8,750 a year, on the average.⁵

⁵ Estimated from data in National Register of Scientific and Technical Personnel, Summary of American Science Manpower, 1968, National Science Foundation, Washington, D.C., 1970.

On the basis of data from a number of studies, average costs of education per medical or dental student, including costs associated with research and patient services, as well as instructional expense, may be estimated at about \$6,000. A student might reasonably be expected to meet two-thirds of the sum of foregone earnings and average costs of education, or of \$14,750. This would suggest a standard tuition fee of about \$1,100, with the remaining \$4,900 of educational costs per student to be met by the institution from other sources. The actual remaining cost would, of course, vary substantially from institution to institution, as would the total resources available to institutions.

For several reasons, the shift to such a uniform tuition policy would have to take place gradually. An abrupt shift would disrupt existing relationships among institutions in their capacity to attract students. Moreover, provisions of state law and, in some cases, of state constitutions, would have to be changed to permit uniform tuition fees for nonresidents and residents of a state. Thus the Commission believes that provisions of federal legislation directed toward requirement of a uniform tuition fee should not become effective until four years after the effective date of the legislation but that, in the interim, institutions should shift toward such a policy as rapidly as circumstances permit.

Recommendation

The Commission recommends a uniform national tuition policy for institutions providing medical and dental education, based on the principle that the individual should meet approximately two-thirds of the cost of his medical or dental education, including foregone earnings. It is assumed that in practice a large proportion of medical and dental students would meet the tuition fees through a combination of grants and loans.

Cost of education supplements to institutions

To ensure not only expansion, but also change, in health science education, the Commission believes that a substantial program of cost-of-education supplements per student should be undertaken by the Federal Government. Institutions would not, however, receive these supplements automatically. The federal agency charged with the responsibility of administering the grants should negotiate with each institution to make certain that it is developing and implementing plans to achieve the following results:

1. Use the funds for instructional costs, and not for any other purposes;
2. Develop sound cost accounting procedures which will make possible a clear distinction between the costs associated with instruction, patient services, and research.
3. Initiate the steps necessary for a gradual shift to the uniform tuition policy recommended above and for the elimination of admission requirements favoring residents of the state.

Payments to institutions would be available in the following amounts:

1. The institution's enrollment of students working toward the M.D. or D.D.S. multiplied by \$4,000. This amount is not by any means intended to cover the full instructional costs per student. As suggested above, those costs probably average at least \$6,000.

The Commission believes, however, that the institutions should continue to receive part of their support for instructional costs from other public (state) or private sources:

2. In addition, that portion of the enrollment working toward the M.D. in excess of enrollment in the fall of 1969 multiplied

by \$4,000. These bonuses would be available for a total period of eight years following initiation of a substantial program of expansion by an institution, designed to achieve an increase at least 10 percent in first-year student places within a period of four years. Moreover, every institution should be expected to increase its average class size to at least 80.

Payment of the supplements would not begin until actual entry of additional students and would be based on the number of such entrants enrolled in a given year. If a university health science center had initiated a significant expansion plan for added student places at any time from 1966 through 1969, the bonuses would be available for the added students for the remainder of the eight-year period. The Commission believes that, even though the expansion should be accomplished within a four-year period, higher costs would be incurred for as long as eight years--hence the stipulation that the bonuses should be available for eight years.

3. The total number of house officers in university health science centers, and in university-affiliated hospitals or area health centers, multiplied by \$2,250, provided that no individual house officer shall be counted for more than four years.

The amounts in 1. and 2. above should be adjusted for medical schools with three-year programs to enable those schools to receive the same amount of institutional aid as four-year schools.

4. As an incentive for major curricular reform, additional cost-of-education supplements of \$2,000 a year per M.D. or D.D.S. candidate for up to four years. These bonuses would be available for such innovations as providing for two entering classes a year,

introducing greater flexibility into the curriculum, adjusting training for the specialties to discourage specialization in fields that are in oversupply, e.g., surgery, and to encourage training for fields in which there are shortages, as well as increasing student/faculty ratios in institutions in which they are low relative to those in other medical or dental schools.

Construction funds

Construction funds should be made available for new university health science centers and area health centers, with the Federal Government providing up to 75 percent of the total cost of construction in the form of grants and making available 25 percent in the form of loans, if the institution chooses to apply for a loan. In the case of renovation or replacement of existing buildings, the Federal Government's grant would be limited to a maximum of 50 percent of the total construction cost, with 50 percent to be available in the form of loans.

Start-up grants

In view of the high costs associated with the developmental stages of a new university health science center and with the acquisition of land, especially in central city areas, the Commission believes that start-up grants should be made available for non-construction costs of new university health science centers. These funds should be provided for centers in the developmental stage by 1969, as well as for the 25 new centers recommended for development in the course of the 1970's. Funds would be made available from the time of issuance of a "certificate of reasonable assurance." The amount available per center should average approximately a million dollars, and the maximum grant should be ten million dollars.

Research grants

The Commission believes that the Federal Government should continue a vigorous program of support of biomedical research and also provide research funds for studies of needed changes in health manpower education and in the delivery of health care. In view, however, of the serious current and impending shortages of health manpower, the Commission recommends that during the 1970's, a high priority be given to overcoming these shortages, while the total amount provided to university health science centers by the Federal Government for research should be maintained at its current percentage of GNP (0.042%). Moreover, the Commission recommends that not less than 10 percent and not more than 25 percent of the research grants to any university health science center take the form of institutional grants rather than grants for specific research projects.

Regional planning

The Carnegie Commission believes that existing federal legislation providing for Regional Medical Programs should be strengthened and expanded to encompass the needs for regional planning outlined in other sections of this report. The existing legislation is designed to ensure that the results of research relating to cancer, heart disease, and strokes are made available in the treatment of the victims of those diseases. It provides funds for planning the expansion and improvement of appropriate treatment centers in existing or new hospitals and other health care facilities and for continuing education of physicians in the treatment of these diseases. The results have been encouraging in some parts of the country, although there is evidence that more progress has been made in relatively small communities and rural areas than in urban areas, especially the ghetto areas of large cities.

The Commission believes that, without in any way diluting the original objectives of the RMP, the legislation should be strengthened and expanded to provide for regional planning relating to (1) the location of university health science centers and area health centers and (2) expanding and improving the delivery of all types of health care, including preventive care. One of the purposes of the strengthened legislation the Commission contemplates would be more adequate regional planning of appropriate locations for Neighborhood Health Centers.

As Paul Ward, the California Executive Director of RMP, has pointed out:

"One of the most difficult concepts to comprehend is what constitutes a 'region' . . . It is unfortunate that 'geography' or boundaries should have played so dominant a role in the early discussions of what constitutes a region. Experience will indicate that a region can best be defined by reviewing the functional relationships that exist within any given area." (Ward, 1967, p. 14).

The Commission believes that revised federal legislation should provide for studies designed to develop more appropriate identification of regions suitable for health planning. In sparsely populated parts of the country, a region might include several states. For example, under the auspices of the Western Interstate Commission on Higher Education, which includes all the western states, a plan has been developed "to design and implement a cooperative program to improve health care through medical education in the states of Idaho, Montana, Nevada, and Wyoming (Western Interstate Commission for Higher Education, 1969, p. 1). There is no medical school in any of these states at present, and a regional cooperative effort to expand medical education would appear to be far more appropriate than steps to

develop medical schools in each of these sparsely settled states. Where such regional planning bodies already exist, they might well be incorporated in a federally supported regional health planning program, but other groups of sparsely settled states which have no such mechanism at present should be identified. There are also parts of the country, such as New England, in which some states (Massachusetts and Connecticut) are more populous than the others, and, in the case of Massachusetts, much more fully provided with medical schools. In this type of situation as well, a regional group of states might be desirable.

On the other hand, a state like California, which has both a very large population and a large geographical area, might appropriately be divided into several regions for health planning purposes, and there might, indeed, be grounds for combining the most northerly counties with parts of southern Oregon in connection with health planning.

The strengthened regional planning legislation should also provide funds for broad programs of continuing education of physicians, rather than the current limited programs relating to heart disease, cancer, and strokes.

National licensing of professional health manpower personnel

The Carnegie Commission recommends the development of a procedure for national licensing of all professional health manpower personnel under the leadership of the Federal Government, but with the active participation of the American Association of Universities and Association of American Medical Colleges, as well as existing national certification bodies, such as the various medical specialty boards. The time has come, not only for the development of uniform national standards, but for the removal of barriers to interstate mobility of all health professionals, with a view to encouraging more effective adjustment of supply to demand in the various states.

Moreover, in view of the rapid rate of progress of medical and dental knowledge, and the associated problem of educational obsolescence of practicing physicians and dentists, the Commission recommends development of national requirements for periodic reexamination and re-licensing of all physicians and dentists. Among other advantages, such requirements would provide a powerful stimulus to participation in continuing education programs.

National planning for growth and change in health manpower personnel

The Commission believes that there is a serious need for continuous studies of growth and change in health manpower personnel, analyses of future demand and supply, and research on the development of new paramedical specialties. Such studies should be centered in the Department of Health, Education, and Welfare, but should be conducted in close cooperation with the broader manpower studies of the Department of Labor. In addition, as suggested above, research funds should be provided for more specialized studies of these problems in university health science centers and appropriate university research institutes.

The role of the states

The crucial immediate need for solving the short- and long-term problems of the nation for health care and health personnel education is coordinated planning on a national, regional and state level. In this planning process, the states occupy a central role because many of the present educational and service aspects of the U.S. health care system are organized on a state basis. In some areas of the country, as suggested above, regional conglomerates composed of several states may be a more rational primary planning entity.

Under federal sponsorship, a national health care planning agency

would provide direction, coordination and supervision of regional and state planning bodies charged with analyzing the health education, service and facilities apparatus within their purview. They would define area needs and recommend solutions consonant with the demography and other pertinent characteristics of the region.

Although it is recommended that the Federal Government assume a considerably larger share of health professions education support (see above), it is essential that the states continue to provide additional funds for these programs. Moreover, the states should develop policies for partial subsidization of private medical and dental schools that are consistent with, and supplemental to, the federal aids recommended in this report. The national significance of the health care educational resources, on which the recommendation for increased federal support is based, does not deny the uniquely local and regional value of these institutions. It is, therefore, appropriate that a portion of their support should come from local and state sources. Moreover, the states should provide a proportionately larger share of the costs of education in the allied health professions than in the primary health professions. Those in the allied health professions tend to secure their education in their area of residence and to work there after their training is completed. A large share of the costs of educating these groups and a large share of the benefits from their education are local. However, there are potential benefits to all areas of the country deriving from activities which no one of them can afford. These benefits are to be found in raising the quality of education. It is logical for the Federal Government to assist with the financing of such programs.

Similarly, since physicians tend to remain in the area where they received their house office training (internship and residency) and since they provide service to the community during their training period, it is

appropriate for the state to supplement the federal contribution for their support.

Once constructed, the area health centers, described earlier, should be partly subsidized by state funds, but would also receive much of their operating income from hospital and medical charges.

With major financing of the educational programs of the university health science centers derived from federal sources, these institutions, including those affiliated with state supported universities, should be required to abolish residency requirements and differential tuition for out of state students. Geographical considerations for admission of students should not include preference for local residents, although concern for a representative mixture from various regions of the U.S. and foreign countries should continue to be an important element of the educational experience.

The role of universities

Universities with affiliated medical centers should reorient these institutions toward assuming the central role in devising and supervising a coordinated, integrated national health personnel education and health care system. This will require major internal changes within the universities and their schools to enable them to increase greatly their public service role, develop new and more inclusive educational programs for health care personnel, and emphasize research on health delivery systems and medical sociology.

Among the responsibilities which they should undertake are:

1. Through federal sponsorship, provide planning manpower to develop, with national, regional, state and local planning bodies, an integrated health education and care system.

2. Increase the number of trained health care personnel graduating from their educational programs by increasing the number of students and decreasing the educational span, where possible.

3. Include medical economists, administrators, sociologists and behavioral scientists in their academic and service functions and increase the educational emphasis in these fields, as well as in preventive medicine and community health.

4. Develop more effective integrated educational programs for the total health care team, including new specialties where needed such as a "health care coordinator" or physician's assistant. Supervise and contribute to educational programs for para-medical specialties based in other educational institutions.

5. Significantly increase continuing education programs for extramural health care personnel.

6. Place greater emphasis on teaching as a rewarding scholarly activity for the faculty.

7. Undertake extensive research, in cooperation with appropriate university departments (economics, sociology, psychology, political science, etc.) on health care delivery systems.

8. Assume area leadership in a coordinated system of health care as a "health science center" providing the most sophisticated services, facilities, and expertise to other institutions and personnel operating in the region.

The university administration must, of course, play a major role in the development of plans for the expansion of university health science centers, working closely with regional and state planning agencies. In many cases, however, it is likely that the faculty and administration of the university health science centers will be oriented to research objectives

to such an extent that they will not be prepared to expand the education and community planning roles of the centers in the manner envisaged in this report or to develop some of the new types of research recommended. Thus, it may be desirable in many universities to appoint a vice president for health science affairs who will be concerned not only with plans for expansion but also for the changes in emphasis which the Commission envisages.

Moreover, there is a need for much more careful integration of instruction in the biomedical sciences and in the social sciences between the health science centers and the campuses of the universities. For example, if the health science center is located on one of the major university campuses, it should not be necessary for the center to have its own full-fledged separate faculties in the biomedical sciences and in the social sciences. It may need enough faculty members in those fields to identify needs that are peculiar to the health science center faculty but staffed in large part on the basis of joint appointments with regular university departments. Even if the health science center is located at some distance from a major campus, such integration should be sought to the greatest possible extent.

Recommendation

The Commission recommends that university administrations appoint appropriate officers to develop plans for the expansion of university health centers and for their transformation to perform the broad education, research, and community service functions recommended in this report. University administrations should also be actively involved in the planning of area health centers. Careful integration of instruction in the biomedical sciences and social sciences between university health science centers and departments on major university campuses should be achieved.

The role of comprehensive colleges and community colleges

Two-year and four-year institutions of higher education, as well as some high schools, should introduce and/or expand programs in para-medical (allied health) professions. These curricula should be developed in close coordination with a university health science center or area health center so that students receive appropriate experience in the hospital milieu and apprentice training as an integral member of the health care team. Quality standards should be supervised by the university health science center.

Still to come

The Role of Foundations

Goals for 1972, 1976, 1980, and 2000

Brief concluding section stressing urgency

Appendix materials

Appendix Table A-1
 PROJECTIONS OF ENTRANTS TO U.S. MEDICAL SCHOOLS ON
 THE BASIS OF FOUR ALTERNATIVE ASSUMPTIONS,
 TO THE YEAR 2002

Year	Rapid sustained	PAP ^c	Medium long	Medium short	
1969-70	10,200 ^a				
1970-71	10,800				
1971-72	11,400	12,000			
1972-73	12,000	13,000	12,000	12,000	
1973-74	12,900	14,000	12,500	12,500	
1974-75	13,800	15,000	13,000	13,000	
1975-76	14,700 ^b	↓	13,500	13,500	
1976-77	15,300		14,000	14,000	
1977-78	15,900		14,500	14,500	
1978-79	16,400		15,000	15,000	
1979-80	16,800		15,100	15,100	
1980-81	17,100		15,200	15,200	
1985-86	18,600		15,700	15,700	
1990-91	20,000		16,000	16,000	
1995-96	21,000		↓	↓	↓
2001-2002	22,200				

^a Actual number of entrants, 1969.

^b Number of entrants in 1975-76, according to the most recent projection of the Association of American Medical Colleges.

^c Physician Augmentation Program Series of the AAMC.

Source: Office of Health Planning, University of California.

Appendix Table A-2

U.S. MEDICAL SCHOOLS, BY STATE AND TOTAL ENROLLMENT, 1969

State	Medical school	Total enrollment of students ^a	
		M.D. candidates	All students
Alabama	Medical College of Alabama	339	840
Arizona	University of Arizona Medical School	63	79
Arkansas	University of Arkansas Medical School	395	723
California	University of California, Davis	48	290
	University of California, Irvine	262	580
	Loma Linda University	357	604
	University of California, Los Angeles	389	1,993
	University of Southern California	289	1,474
	Stanford University	327	927
	University of California, San Diego	47	230
	University of California, San Francisco	523	1,818
Colorado	University of Colorado Medical School	360	982
Connecticut	University of Connecticut Medical School	32	56
	Yale University Medical School	347	848
District of Columbia	Georgetown University Medical School	464	943
	George Washington University Medical School	414	890
	Howard University Medical School	393	899
Florida	University of Miami Medical School	332	982
	University of Florida Medical School	246	622
Georgia	Emory University Medical School	293	1,018
	Medical College of Georgia	393	615
Hawaii	University of Hawaii Medical School	59	191
Illinois	Chicago Medical School	294	413
	Northwestern University Medical School	547	1,546
	Stritch School of Medicine	383	608
	University of Chicago Pritzker School of Medicine	289	939
	University of Illinois Medical School	793	1,490
Indiana	Indiana University Medical School	857	1,857

(Table continued on next page)

Appendix Table A-2 (continued)

State	Medical school	Total enrollment of students ^a	
		M.D. candidates	All students
Iowa	State University of Iowa Medical School	494	1,311
Kansas	University of Kansas Medical School	483	932
Kentucky	University of Kentucky Medical School	300	674
	University of Louisville Medical School	367	761
Louisiana	Louisiana State University Medical School	510	830
	Tulane University Medical School	506	1,015
Maryland	Johns Hopkins University	373	1,046
	University of Maryland	521	941
Massachusetts	Boston University Medical School	306	880
	Harvard Medical School	577	577
	Tufts University School of Medicine	458	1,044
Michigan	University of Michigan Medical School	807	2,601
	Wayne State University Medical School	531	1,161
	Michigan State University Medical School	78	462
Minnesota	University of Minnesota Medical School	685	2,281
Mississippi	University of Mississippi Medical School	319	587
Missouri	University of Missouri Medical School	358	1,079
	Saint Louis University Medical School	461	781
	Washington University Medical School	359	871
Nebraska	Creighton University Medical School	302	423
	University of Nebraska Medical School	365	602
New Hampshire	Dartmouth Medical School	100	224
New Jersey	New Jersey College of Medicine and Dentistry	306	536
	Rutgers--The State University Medical School	30	61
New Mexico	University of New Mexico Medical School	97	202

Table continued on next page)

Appendix Table A-2 (continued)

State	Medical school	Total enrollment of students ^a	
		M.D. candidates	All students
New York	Albany Medical College	284	997
	State University of New York at Buffalo Medical School	407	1,355
	Albert Einstein College of Medicine	402	1,204
	Columbia University Medical School	499	1,612
	Cornell University Medical School	353	826
	Mount Sinai School of Medicine	59	2,003
	New York Medical College	495	944
	New York University Medical School	514	1,209
	State University of New York at Brooklyn Medical School	770	1,471
	University of Rochester Medical School	308	809
State University of New York at Syracuse Medical School	399	786	
North Carolina	University of North Carolina Medical School	287	1,080
	Duke University Medical School	333	1,023
	Bowman-Gray School of Medicine	226	437
North Dakota	University of North Dakota Medical School	98	276
Ohio	University of Cincinnati Medical School	407	882
	Case Western Reserve University Medical School	374	1,391
	Ohio State University Medical School	611	2,262
Oklahoma	University of Oklahoma Medical School	418	997
Oregon	University of Oregon Medical School	351	846
Pennsylvania	The Pennsylvania State University-Hershey Medical School	88	104
	Hahnemann Medical College and Hospital	432	731
	Jefferson Medical College	717	1,093
	Temple University Medical School	552	887
	University of Pennsylvania Medical School	520	1,380
	Woman's Medical College	237	342
University of Pittsburgh Medical School	388	924	
Puerto Rico	University of Puerto Rico Medical School	268	584
Rhode Island	Brown University Medical School	20	313

(Table continued on next page)

Appendix Table A-2 (continued)

State	Medical school	Total enrollment of students ^a	
		M.D. candidates	All students
South Carolina	Medical College of South Carolina	326	599
South Dakota	University of South Dakota Medical School	86	132
Tennessee	University of Tennessee Medical School	738	1,362
	Meharry Medical College	278	379
	Vanderbilt University Medical School	227	709
Texas	University of Texas Southwestern Medical School	411	1,068
	University of Texas Medical Branch	606	945
	Baylor University Medical School	351	857
	University of Texas Medical School at San Antonio	105	265
Utah	University of Utah Medical School	259	661
Vermont	University of Vermont Medical School	232	462
Virginia	University of Virginia Medical School	319	697
	Medical College of Virginia	451	1,037
Washington	University of Washington Medical School	334	1,940
West Virginia	West Virginia University Medical School	250	667
Wisconsin	University of Wisconsin Medical School	403	1,307
	Marquette University Medical School	412	1,001
Total	99 schools	35,833	89,195

^a Enrollment data are for 1968-69.

Source: American Medical Association, Medical Education in the United States, 1968-69, Chicago, 1969, pp. 1560-1561 (reprinted from JAMA, Vol. 210, No. 8, November 24, 1969).