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ABSTRACT

Enrollment and financial trends in Southern medical schools are examined and comparisons are made to national trends. Statistical tables and supporting text cover trends and current status of undergraduate (preparation for the M.D. degree) and graduate (training of resident physicians) medical education enrollment, graduation, and financing. Attention is directed to: changes in the numbers of medical schools and medical school enrollments, graduate medical education and the trends toward increased specialization in medicine, and medical schools' revenues by source to expenditures by function, and a methodology for estimating a current average and range of cost-per-student for undergraduate medical education and for estimating the proportion of a medical school's expenditures that are allocated to undergraduate and graduate medical education. Additional topics include: enrollments of minorities and women, enrollments in private and public medical schools, number and percent of residents on duty in 1981; new medical school entrants by residency status and percent in-state, the number of full-time medical school faculty, and changes in teaching responsibilities. Enrollment data are provided by medical school, but financial data are provided as totals or by all private or all public medical schools. (SW)

TRENDS IN MEDICAL EDUCATION IN THE SOUTH: ENROLLMENTS AND FINANCING

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FOREWORD

Medical education has been a major commitment of the state governments of the South, but because of the large amount of funding that has come from federal research grants and patient care fees, it has received relatively little financial analysis. Now with federal support declining and costs increasing, the states are asking more critical questions about medical schools and their funding. This publication is intended as a reference work on the trends in enrollments and financing of medical schools for state policymakers and the budget analysts who must make decisions about state support for medical schools.

Not only have the medical schools grown in number and in size in the South during the past 25 years, they have also changed their missions to emphasize graduate medical education in the medical specialties, education of biomedical specialists, and research. This publication documents the extent of these changes and the extent of variations in the emphasis given to each of these missions in the various schools. There is no such thing as an "average" medical school, but this publication should provide state analysts with some understanding of the changes and how they may have affected the figures in any particular state.

Harold L. McPheeters
Director, Commission on Mental Health
and Human Services

INTRODUCTION

This report has been prepared as a ready working reference on medical education and related subjects to meet the needs of state higher education planners, legislators, administrators, educators, investigators, individual physicians, and others. Statistical tables with supporting text provide data and information about trends and current status of medical education enrollments and graduations in undergraduate and graduate medical education programs for the South and the United States.

The report is organized in four major sections, labeled from Section A through Section D:

Section A presents an overview of undergraduate and graduate medical education in the U.S. and the South; Section B examines the changes in the numbers of medical schools and medical school enrollments. Section C discusses graduate medical education and the trends toward increased specialization in medicine; and, Section D reviews the financing of U.S. medical schools, compares medical schools' revenues by source to expenditures by function, and provides a methodology for estimating a current average and range of cost-per-student for undergraduate medical education and for estimating the proportion of a medical school's expenditures that are allocated to undergraduate and graduate medical education.

The majority of the data was supplied by U.S. medical schools to the Liaison Committee on Medical Education, the federally-recognized accrediting body for medical programs leading to an M.D. degree, and to the National Resident Matching Program. Through the cooperative efforts of the Association of American Medical Schools and the American Medical Association, these data are published annually in JAMA, a publication of the

American Medical Association. These data are provided voluntarily by public and private medical schools to their professional organizations, with the understanding that confidentiality be maintained in reporting financial data. Therefore, enrollment data were available by medical school, but financial data were reported as totals or by all private or all public medical schools. In spite of this limitation, these data provide valuable insights into the sources and disposition of medical school revenues.

SUMMARY AND CONCLUSIONS

Spurred by federal and state legislative initiatives to increase physician manpower, U.S. medical schools have experienced phenomenal growth over the past 20 years, resulting in dramatic increases in undergraduate and graduate enrollments, size of faculty, research programs, and public services. Although expenditures continued to increase, the rate of growth in both actual and constant dollars decreased in the Seventies, compared to the Sixties. Annual expenditures by U.S. medical schools now exceed $6 billion.

There was a slight decline in first-year enrollments in 1982. If this continues, total enrollments should stabilize in the early Eighties and begin a measurable decline during the late Eighties, accompanied by a leveling off of expenditures. Since most medical school graduates (over 98 percent) now elect to specialize, there has been a drastic increase in the number of students enrolled in graduate medical education. With the number of undergraduate medical students already in the medical education pipeline, enrollments in graduate medical education programs will remain high or increase through the Nineties. Therefore, a reduction in total expenditures for all medical education is unlikely before the year 2000.

Growth in medical education was greater in the South than for the U.S., with the bulk of the growth occurring in the public sector. In less than 20 years, 14 new medical schools have been established in the SREB states, 11 of which are public schools. Seventy percent of the South's 40 medical schools are state-supported public schools; many of the South's private schools also receive state subsidies.

As physician manpower increased, federal funding of medical schools began to decrease. Yet, without exception, public and private medical education have continued to grow. Federal fund losses have been offset primarily by increased state appropriations in the public sector and increased tuitions in the private sector.

The high proportion of public higher education dollars expended for medical education has stimulated much interest in assessing the actual costs of medical education. The variable interrelationships between the education, research, and service functions of medical schools do not easily accommodate cost analysis; although the broad missions of medical schools are similar, their goals, objectives, and programs vary greatly from school to school.

Medical school expenditures can be assessed by function. For FY 1981, the expenditures that U.S. medical schools allocated to undergraduate and graduate medical education were estimated to be 46 percent of the total, with undergraduate medical education accounting for approximately 27 percent. The balance was expended for research and for public service. These proportions will vary widely from school to school; however, reliable estimates for individual schools can be determined.

The average annual education costs per undergraduate medical student in 1982 was estimated to be $27,750, with a range from $21,100 to $40,950. Using the average cost per student, plus an assessment of the proportion of expenditures each medical school allocates to education, a state can determine the relative proportion of the cost of undergraduate medical education that is supported. This approach, however, will not permit a comparison of one medical school to another.

The overall growth in medical education and the sizable shift toward increased enrollments in public medical schools in the nation and the South reflect policy decisions to increase the number of physicians and to improve the distribution of physicians.

Medical schools have virtually met the state and federal mandates to adequately supply the nation with physicians; a surplus is predicted by 1990. Yet, old problems still exist and new ones have arisen. Many states have an imblance between the number of medical school graduates and the number of first-year graduate medical education positions available, causing reduced physician retention. A maldistribution of physicians remains, particularly shortages in inner-city and the more rural areas, in some specialties, and in public service settings. And, there are severe shortages of minority physicians, particularly among black Americans. All minorities and women are still underrepresented in the medical student population, and the proportion of black Americans is now declining. Increased tuitions and a reduction in available scholarships has made entry into medical schools more difficult for many students, primarily minorities and those from low income families.

Complicating these problems is a depressed economy that limits all higher education funds. Meanwhile, state appropriations for medical education represent an increasingly larger portion of the higher education dollar. The most common reactions to these issues are: mandated enrollment reductions; enrollment caps; and/or reductions in funds appropriated--any of which may be more costly unless based on a thorough assessment of the role and function of a state's medical school(s) and its physician manpower needs.

As the number of medical graduates increase, medical schools are being pressured to increase opportunities for graduate education, particularly in the more costly primary care specialties. There is little likelihood that modest undergraduate enrollment reductions will reduce the total costs for medical education in most medical schools; rather, if enrollment reductions were large enough to significantly affect tuition revenues, but not large enough to reduce faculty requirements, costs could increase.

In view of the cost of medical education, the continuing decline in resources available for all public education, and the projected surplus of physicians, Southern states should reassess their medical education needs.

The cogent questions for individual states are: (1) How much of what kinds of medical education, research, and public service does the state want and/or need? (2) What is now being supported? (3) To what extent are medical education policies designed to meet specific state needs, such as access for segments of the population who are underrepresented in the medical student and physician population, increased state retention of medical school graduates, and improved distribution of physicians? (4) What proportion of medical education costs should be supported by tuition? There are no universally applicable answers to these questions.

Individual states must make their own decisions based on their particular needs, resources, and desires. Historical, economic, and political considerations in each state make it impossible to develop a national or regional formula to address the diversity among states. However, this report provides the framework with which a state may begin to explore its own medical education policy issues.

SECTION A--MEDICAL EDUCATION

Medical education has undergone significant changes since Abraham Flexner condemned much about medical education in the United States in his r w famous 1910 report, Medical Education in the United States and Canada. At that time, there were 66 Class A, 43 Class B, and 22 Class C approved medical schools in the United States. Numerous others operated without benefit of formal professional sanctions. These 131 "approved" schools graduated 4,400 physicians in 1910. There was an appalling lack of consistency found in the quality of medical education. The curricula of the class B and C schools often did not include the basic sciences, while the unapproved schools were little more than apprenticeships. Flexner postulated that medical education in the United States at that time was dangerous to the health of the citizens, because, in his opinion, many medical schools were providing inferior medical education.

Major reforms were undertaken over the next 40 years. By 1930, all class B and C schools were either upgraded or closed, leaving 76 schools awarding 4,565 M.D. degrees. In 1982, 126 medical schools awarded 16,325 M.D. degrees. Flexner would be most impressed to view the extent to which his recommendations have been implemented. He called for more basic sciences, medical research, and a more structured ongoing review of all medical schools to assure quality medical education. Today's critics of medical education complain that now there is too much emphasis on science and research in medical schools and not enough on "patient care."

Accreditation and Licensure

Today, the Liaison Committee on Medical Education (LCME), comprised of representatives of the American Medical Association and the Association of American Medical Colleges, evaluates and accredits medical education programs conferring M.D. degrees in the United States and Canada. The LCME is formally recognized by the federal government as the agency to accredit medical schools. Accreditation is considered voluntary, a process whereby medical practitioners and medical educators determine whether a program demonstrates substantial compliance with validated standards . However, accreditation is quasi-regulatory in that state medical licensure boards mandate that an individual must hold an M.D. degree from an accredited medical school in order to be eligible for licensure as a medical practititioner. Most states also require at least one year of residency (graduate medical education) before candid es are eligibile for licensure.

New two-year basic science medical schools (schools that offer only the first two years of education toward an M.D. degree) or new four-year medical schools may be granted provisional accreditation by the LCME until the first class of students completes the course of studies. Then, full accreditation may be awarded. A school may be accredited for a period from one to 10 years, depending on the stability of the school and the conditions found by the accrediation review team. Data are collected annually by the LCME. Should these data suggest that conditions have changed since the last accreditation survey, a school's next survey date can be moved forward to assure that the school warrants continued accreditation. Thus, medical schools seek to maintain standards that will provide reasonable assurance that students receive a quality education.

Medical Schools' Missions

Medical educators, like their counterparts in all of academe, are expected to conduct scholarly research and to publish. Superimposed on the traditional academic mission of teaching and research is a major responsibility for service. Medical students and residents must learn the art, as well as the science, of medicine. Medical school faculties are composed of approximately 25 percent basic scientists and 75 percent physicians who are medical scientists, educators, and highly skilled clinicians. These clinicians teach the practice of medicine by demonstrating the provision of patient care and by supervising medical students and residents as they learn to provide patient care.

The growth of teaching hospitals and medical research centers operated by medical schools exemplifies the tripartite mission of most medical schools. However, schools may have varying unstated missions about placing primary emphasis on graduate medical education in specialized fields or in the conduct of research. Critics of medical education complain that medical schools have overemphasized research and specialization, causing the demise of the general practitioner. Medical educators argue that advanced technologies require increased specialization.

The mission of some medical schools began to change or expand in the early Seventies with the development of family practice as a medical specialty. Federal and state initiatives sought to increase the number of family practitioners and other primary care specialists, most often defined as general internists, general pediatricians, and obstetricians, or those specialists who provide broad-based, entry level, general patient care. Continued maldistribution of physicians, particularly shortages in the inner-city and more rural areas, also contributed to a focused public policy toward increasing the number of primary care practitioners. Thus began formal changes in the mission statements of some medical schools. Indeed, some of the newer medical schools were developed in response to this

need. Those medical schools whose mission includes a major emphasis on research and the more specialized practice of medicine are very necessary to teach tertiary care practice and to provide tertiary care services; however, these schools are less able and/or less willing to recruit and educate the primary care practitioner, particularly the family practice specialist.

Medical schools continue to vary significantly. While all have one common mission--to provide undergraduate medical education leading to an M.D. degree--differences become apparent when their missions in research, service, and graduate medical education programs are examined.

Medical Schools in the South

In 1981, 39 medical schools--11 private and 28 public--were located in the 14 SREB states. These schools enrolled 29.1 percent of the nation's medical students (see Table 1).

In 1982, a new medical school at Mercer University in Macon, Georgia, received provisional accreditation to enroll its first class. The nation now has 127 medical schools, 40 of which are in the SREB states.

Diversity of medical education is perhaps more apparent in the South than in the rest of the nation primarily due to the larger number of new and developing schools since 1960. Table 2 shows some of the variations in the size and type of teaching responsibilities of medical school faculties. Faculty are responsible for instruction of under 300 students at five Southern schools compared with over 2,000 at seven schools. In 1981-82, the number of medical students ranged from 81 at Morehouse Medical School and 133 at Marshall University Medical School (both new developing schools) to over 800 enrolled at both the Galveston and Southwestern campuses of the University of Texas. Similar variations are evident for the numbers of residents, basic science students, and other students (dental, nursing, pharmacy, and allied health).

Graduate Medical Education

The diversity in the mix of specialties in which medical residents receive graduate medical education adds to the variations found among the nation's medical schools (see Table 3). Most established medical schools operating a teaching hospital as a part of a health science center offer a full range of graduate medical education programs. Enrollments in each program may vary from as few as one or two students in specialties such as therapeutic radiology to over 100 in specialties such as internal medicine or surgery.

The majority of graduate medical education (GME) today is provided by medical schools or hospitals affiliated with medical schools (see Table 4). U.S. medical schools reported teaching responsibilities for over 47,000 GME students in 1981, roughly 70 percent of the total. For the South, the proportion is somewhat higher (77 percent).

Table 1

NEW ENTRANTS AND TOTAL ENROLLMENTS IN PRIVATE AND PUBLIC MEDICAL SCHOOLS*
UNITED STATES AND SREB STATES
1981-82

Geographic Area	Number of Schools	New Entrants		Enrollments, All Years		Total Enrollments
		Private	Public	Private	Public	All Schools
United States	126	6,489	10,171	26,352	40,133	66,485
SREB States	39	1,252	1,625	5,056	14,297	19,353
South as a Percent of U.S.	31.0	19.3	35.6	19.2	35.6	29.1
Alabama						938
University of Alabama		-	150	-	672	
University of South Alabama		-	64	-	266	
Arkansas						549
University of Arkansas		-	135	-	549	
Florida						1,392
University of Florida		-	114	-	461	
University of South Florida		-	96	-	289	
University of Miami		136	-	642	-	
Georgia						1,274
Emory University		110	-	464	-	
Morehouse School of Medicine		32	-	81	-	
Medical College of Georgia		-	178	-	729	
Kentucky						1,007
University of Kentucky		-	104	-	437	
University of Louisville		-	128	-	570	
Louisiana						1,737
Louisiana State University-New Orleans		-	180	-	725	
Louisiana State University-Shreveport		-	103	-	403	
Tulane University		148	-	609	-	
Maryland						1,189
Johns Hopkins University		126	-	479	-	
University of Maryland		-	169	-	710	
Mississippi						603
University of Mississippi		-	149	-	603	
North Carolina						1,727
Bowman Gray School of Medicine		108	-	429	-	
Duke University		116	-	490	-	
University of North Carolina		-	160	-	636	
East Carolina University		-	52	-	172	
South Carolina						801
Medical University of South Carolina		-	165	-	638	
University of South Carolina		-	51	-	163	
Tennessee						1,845
Meharry Medical College		112	-	484	-	
Vanderbilt University		104	-	418	-	
University of Tennessee		-	204	-	797	
East Tennessee State University		-	48	-	146	
Texas						4,298
Baylor College of Medicine		168	-	663	-	
University of Texas-San Antonio		-	202	-	798	
University of Texas-Southwestern		-	205	-	817	
University of Texas-Galveston		-	203	-	801	
University of Texas-Houston		-	202	-	758	
Texas Tech University		-	100	-	336	
Texas A&M University		-	32	-	125	
Virginia						1,317
Eastern Virginia Medical School		96	-	297	-	
University of Virginia		-	139	-	550	
Virginia Commonwealth University		-	168	-	670	
West Virginia						476
University of West Virginia		-	88	-	343	
Marshall University		-	36	-	133	

*Includes enrollments in approved schools of Basic Medical Sciences.

Source: American Medical Association, "Medical Education in the United States." JAMA, 248, December 1982.

Table 2

ESTIMATED TOTAL TEACHING RESPONSIBILITIES OF MEDICAL SCHOOL FACULTIES
UNITED STATES AND SREB STATES
1981-82

	Medical Students	Residents	Master's Basic Science Students	Doctoral Basic Science Students	Postdoctoral Basic Science Students	Other Students	Total
United States	66,485	87,049	3,139	9,893	3,669	90,269	220,904
SREB States	19,353	12,676	735	2,625	1,108	17,692	54,189
South as a Percent of U.S.	29.1	26.7	23.4	26.5	30.2	19.6	24.5
Alabama							
University of Alabama	672	630	16	93	0	357	1,968
University of South Alabama	266	133	0	33	10	172	614
Arkansas							
University of Arkansas	549	292	32	23	0	0	896
Florida							
University of Florida	661	307	16	103	28	826	1,701
University of Miami	669	454	17	67	22	19	1,221
University of South Florida	289	280	0	26	7	0	602
Georgia							
Emory University	664	570	3	62	38	673	1,810
Medical College of Georgia	729	286	5	40	0	1,003	2,063
Morehouse School of Medicine	81	6	9	8	0	155	259
Kentucky							
University of Kentucky	637	299	6	40	15	1,699	2,696
University of Louisville	570	310	48	65	17	572	1,582
Louuisiana							
Louisiana State University-New Orleans	725	372	27	54	32	694	1,704
Louisiana State University-Shreveport	403	190	2	15	4	71	685
Tulane University	609	323	3	40	14	0	989
Maryland							
Johns Hopkins University	679	436	24	115	86	20	1,160
University of Maryland	710	402	36	63	57	579	1,847
Mississippi							
University of Mississippi	603	240	29	45	2	449	1,368
North Carolina							
Bowman Gray School of Medicine	429	323	17	77	12	126	984
Duke University	490	532	8	205	86	445	1,766
East Carolina University	172	88	0	7	6	94	367
University of North Carolina	636	379	141	229	82	2,109	3,576
South Carolina							
Medical University of South Carolina	638	830	25	75	40	1,380	2,988
University of South Carolina	163	136	0	7	4	439	749
Tennessee							
East Tennessee State University	146	72	2	10	0	134	364
Meharry Medical College	484	79	4	27	3	107	704
University of Tennessee	797	581	16	57	0	698	2,149
Vanderbilt University	418	379	3	113	74	247	1,234
Texas							
Baylor College of Medicine	663	708	0	131	131	96	1,729
University of Texas-Galveston	801	358	12	102	99	653	1,965
University of Texas-Houston	758	333	1	42	0	334	1,468
University of Texas-San Antonio	798	388	9	75	27	1,453	2,750
University of Texas-Southwestern	817	641	110	171	123	127	1,989
Texas A&M University	125	103	4	3	12	2	249
Texas Tech University	336	202	18	31	12	15	614
Virginia							
Eastern Virginia Medical School	297	218	0	45	1	35	596
Medical College of Virginia	670	556	52	155	78	864	2,375
University of Virginia	550	233	1	104	29	466	1,383
West Virginia							
Marshall University	133	43	10	5	0	30	221
University of West Virginia	343	164	29	62	17	749	1,364

Source: American Medical Association, "Medical Education in the United States 1981-82." JAMA, 248, December 1982.

Table 3

NUMBER AND PERCENT OF RESIDENTS ON DUTY
SEPTEMBER 1, 1981, BY SPECIALTY
UNITED STATES

Specialty	Number	Percent of Residents
Allergy and Immunology	203	0.3
Anesthesiology	2,930	4.3
Colon and Rectal Surgery	40	0.1
Dermatology	808	1.2
Dermatopathology	30	0.1
Family Practice	7,004	10.3
Internal Medicine	17,514	25.8
Neurological Surgery	608	0.9
Neurology	1,211	1.8
Nuclear Medicine	197	0.3
Obstetrics/Gynecology	4,687	6.9
Ophthalmology	1,543	2.3
Orthopedic Surgery	2,652	3.9
Otolaryngology	995	1.5
Pathology	2,384	3.5
Blood Banking	26	...*
Forensic Pathology	31	...*
Neuropathology	40	0.1
Pediatrics	5,832	8.6
Pediatric Cardiology	111	0.2
Physical Medicine and Rehabilitation	596	0.9
Plastic Surgery	375	0.5
Preventive Medicine		
General	161	0.2
Aerospace Medicine	43	0.1
Occupational Medicine	67	0.1
Public Health	25	...*
Psychiatry	4,324	6.4
Child Psychiatry	499	0.7
Radiology, Diagnostic	3,114	4.6
Radiology, Diagnostic (Nuclear)	56	0.1
Radiology, Therapeutic	345	0.5
Surgery	8,082	11.9
Pediatric Surgery	27	...*
Thoracic Surgery	281	0.4
Urology	1,027	1.5
Total	67,868	100.0

*Less than 1/10th of one percent.

Source: American Medical Association. '82-83 Directory of Residency Training Program, 1982, pp. 58 and 59.

Table 4

GRADUATE MEDICAL EDUCATION PROGRAM ENROLLMENTS, TOTAL COMPARED TO NUMBER AND PERCENT IN MEDICAL SCHOOLS OR THEIR AFFILIATED PROGRAMS UNITED STATES AND SREB STATES 1981-82

	Graduate Medical Education Students		
	Total	Number in Medical Schools*	Percent of Total
United States	67,868	47,449	69.9%
SREB States	16,492	12,676	76.9

*Estimated and reported by medical schools as the number of graduate medical students for whom medical school faculties have teaching responsibilities.

Sources: American Medical Association, "Medical Education in the United States," JAMA, 248, December 1982; and American Medical Association, Directory of Residency Training Programs, 1982.

SECTION B—TRENDS IN MEDICAL EDUCATION

The growth in medical education over the past two decades parallels the growth of scientific knowledge and technologies, however, many other factors contributed to the overall growth. Among these are: (1) rapid growth in the population; (2) an improved economy; (3) increased emphasis on higher education for all citizens; (4) increased availability of health insurance; (5) increased demand for medical services; (6) a national declaration of a physician shortage; (7) readily available federal and state dollars earmarked for expansion and/or development of medical schools; and (8) the social and economic rewards for physicians.

Medical Schools, Students, and Graduates

Figure 1 depicts the proportionate increase in the number of medical schools, students, and graduates in the U.S. and the South between 1960 and 1980, compared to the period from 1940 to 1960. While the number of medical schools increased only 32 percent between 1960 and 1980, this was almost three times the 12 percent increase betweeen 1940 and 1960. Medical students and medical school graduates increased 42 percent and 33 percent respectively between 1940 and 1960. In stark contrast, the number of students increased 116 percent and graduates 124 percent between 1960 and 1980. In the South, the increase during the past four decades was greater than for the U.S. Between 1940 and 1960 the number of medical schools increased by 53 percent, students by 64 percent, and graduates by 62 percent. From 1960 to 1980, the number of medical schools increased by 50 percent, students by 131 percent, and graduates by 137 percent.

In 1960, there were 86 medical s competing for a limited number of qualified applicants and federal funds. By 1970, there were 103 medical and basic science schools with 40,487 medical students enrolled, granting 8,974 degrees. Ten years later, there were 126 medical and basic science schools with 65,497 medical students, granting 15,667 M.D. degrees.

No new medical schools were accredited fully between 1979 and 1982. However, Morehouse College of Atlanta, Georgia, formerly a two-year basic science medical school, is now provisionally accredited as a four-year M.D. degree-granting school. Mercer University Medical School received provisional accreditation to enroll its first class of medical students in 1982. These two new schools increased to 14 the number of new medical schools developed in the South between 1960 and 1982, accounting for 34 percent of the total number of new medical schools in the United States.

Medical School Applicants

The attraction to medicine as a career has varied in the past three decades. There were three applicants for every accepted student in 1950. This declined to 1.7:1 in 1960. Concern was expressed by medical educators about the decreasing number of qualified students who applied for admission to medical schools, despite the fact that there were increasing numbers of college graduates. Medical schools reported the necessity to initiate a nationwide recruitment strategy to increase the number of qualified applicants. Medical school applicants in 1960 faced significantly less competition, since 59.4 percent of those applying were accepted for admission. By 1975, this trend was reversed. There were again roughly 3 applicants for every one accepted and the schools were accepting only 36.3 percent of those who applied. The number of applicants began another decline in the late Seventies, while the number of accepted applicants increased due to the expanded enrollment capacities in new and developing schools. This edged the applicant acceptance ratio near that seen in 1960 (see Table 5).

All public, and some private, medical schools give preference for admission to applicants who are state residents. There was a decided increase in the last two decades in the proportion of in-state residents who entered medical schools in their home state. For the U.S., 67.4 percent of the 1960 new entrants to U.S. medical schools were in-state residents compared to 72.8 percent in the SREB states. This increased to 75.8 percent and 81.7 percent, respectively, by 1980 (see Table 6). In 1981, 93 percent of the new entrants to public medical schools in the SREB states were in-state residents compared to 47.7 percent in private schools (see Table 7). Generally, private schools admitting larger numbers of in-state residents are those schools that receive direct state subsidies or appropriations (usually based on the number of in-state residents admitted).

The extent to which the trend toward increased admission of in-state residents influenced the decline in the number of medical school applicants would be speculative at best. Since the majority of undergraduate medical education is provided by public medical schools and supported by state tax dollars, it is unlikely that this trend will be reversed.

It appears that the decline in the number of 22 year-olds, the attractiveness of other careers, such as engineering, and the potential for a surplus of physicians by 1990 combined to create the decline in the number of medical school applicants. If this continues , medical schools will be forced to consider either sizable enrollment reductions as a means of assuring adequate numbers of qualified applicants or to institute an active recruitment program. The latter would be highly questionable in view of the predicted surplus of physicians.

Enrollments

Enrollment increases have occurred for several decades in all U.S. medical schools. However, the trend toward an increasing proportion of medical education occurring in

public institutions warrants comment. In 1960, over 50 percent of the nation's medical students were enrolled in private medical schools, compared to roughly 37 percent in the South. By 1980, the proportion of medical school enrollments in private schools had declined to 39.8 percent in the U.S. and 26.4 percent in the South. In 1980, the proportion of medical education provided by public medical schools in the South was considerably higher than the national rate of 60 percent. Nearly three-fourths (73.6 percent) of the medical students in the 14 SREB states were enrolled in public medical schools (see Table 8).

The growth trend in medical education may be waning. The number of new entrants to medical schools declined in the fall of 1982, with the Southern schools accounting for roughly half of the decline. This occurred in spite of the fact that five new and developing schools in the South increased enrollments in 1982. Seven schools (six public and one private) reported declines of from 5 to 36 students, compared to their 1981 level. The size of the decline is relatively insignificant--about 0.1 percent; however, it is the first decline in more than two decades and could signal a reversal of the growth trend (see Table 9).

With several new or developing schools yet to reach their projected maximum enrollment levels, a substantial decline in total medical school enrollments or graduates is unlikely for several years. The data presented in Table 10 illustrate the time lag between increased enrollments and increased medical school graduates. Even if enrollments remain steady or continue to decline, with the time lag to complete three or more years of graduate medical education, roughly 16,000 U.S. medical school graduates will enter practice per year until well past 1990.

The net attrition of physicians averaged roughly 600 per year between 1970 and 1980. This represented the difference between the number of U.S. medical school graduates and the increase in the physician supply. This low net attrition reflects the immigration

of large numbers of foreign physicians. With the estimated 5,000 U.S. citizens in foreign medical schools who are likely to return to the U.S. to practice, the annual net attrition of physicians should remain low. Therefore, the physician supply can be expected to increase by over 1,500 per year through 1990.

Minority Enrollments

In the fall of 1981, minority medical students comprised 8.3 percent of all U.S. medical students and 8.8 percent of those enrolled in medical schools in the South. Southern schools accounted for 30.8 percent of all minorities enrolled. The proportion for black Americans was somewhat higher (32.9 percent) (see Table 11). Of the 5,503 minority medical students in the U.S., 3,884 (70.6 percent) were black Americans. In the South, there were 1,697 minorities enrolled in 1981, of which 1,277 were black Americans. Minorities are defined by the Association of American Medical Schools as those groups in the American population who are underrepresented in the physician population. These include black Americans, American Indians, Mexican Americans and Mainland Puerto Ricans.

More blacks are enrolled in private medical schools in the South (55 percent) than in public (45 percent). This is not an accurate indication of public support for minority education, however, because nine states, through interstate contract agreements with the Southern Regional Education Board, support state residents at Meharry and Morehouse medical schools, both private predominantly black medical schools. This is reflected by the fact that 36.5 percent of the South's black medical students are enrolled in Meharry (411) and Morehouse (55) medical schools compared to 18 percent (236) enrolled in other private medical schools in the South (see Figure 2).

The three predominantly black private medical schools in the U.S.-- Meharry, Morehouse and Howard--enroll 873 or 22.5 percent of all black Americans. Meharry and Morehouse enroll an even larger proportion of all black medical students in the South (see Table 12).

In 1972, a move emerged among U.S. medical schools to increase black student enrollments to 12 percent of the total medical school population. This movement was related both to federal equal opportunity legislation that mandated increased educational opportunities for all minorities and to the recognized gross underrepresentation of blacks in the physician population. Progress was made halfway toward that goal. The proportion of black students in all classes at U.S. medical schools reached 6.3 percent in the 1974-75 academic year. However, the proportion of black medical students has declined almost every year since, and was down to 5.8 percent in the fall of 1981.

The proportion of black Americans enrolled in U.S. medical schools is not expected to increase due to the decline in the economy and a relaxation of federal policies affecting access to education for minorities. In fact, many educators express concern that the reduction in federal loans and other student assistance programs could cause further decline in the proportion of black Americans or other minorities enrolled in medical schools.

Black M.D.s have been estimated to comprise only 3.4 percent of the supply of U.S.-trained active M.D s in 1980; yet, 11.7 percent of the U.S. population is black. Projections for the year 2000 show blacks as 12.6 percent of the population, and black M.D.s as no more than 5.5 percent of the total supply of U.S.-trained physicians. If the proportion of black medical students continues to decline, the proportion of black M.D.s in the physician population will fall short of current projections.

Women in Medical Schools

Women have traditionally been underrepresented in the medical student population. They comprised less than 10 percent of all medical school applicants and enrolled students prior to 1970. By 1981, the proportion of women in the medical student population increased to 28 percent, and rose to 31 percent of the new entrants in 1982. In spite

of the increased proportion of women in the medical student population, in 1982 over two-thirds of entering medical students were men. The proportion of women medical students in the South was less than for the U.S., 4.6 percent and 24.8 percent compared to 5.7 percent and 27.9 percent in 1960 and 1981, respectively (see Table 13). The proportion of women among new entrants in 1982-83 was also lower in the South, 29 percent compared to 31.4 percent for the nation. The same pattern is seen when the South, as a percent of U.S., is compared. For example, in 1981-82, total medical school enrollments in the South reached 19,353 students, or 29.1 percent of the U.S. total. The number of women medical students in the South for the same year was 4,808, or 25.9 percent of all U.S. women medical students. The declining financial assistance to medical students may also affect the proportion of women in medical schools, particularly in the South, because 43 percent of the black American medical students are women.

Prognosticators have speculated that the increased numbers of women entering the physician population may negate or diminish the projected surplus of physicians. These observations were apparently based on studies reporting that practicing women physicians work shorter hours, see fewer patients, and spend more time per patient visit. In addition, historically, women physicians have dropped out of active practice for longer periods than did male physicians. However, the impact of larger numbers of women physicians on total future physician supply is speculative at best. Only time will reveal how the changing work patterns of women will affect the total work force. Factors such as the economy, smaller families, more women electing to remain single, the longer life expectancy of women, and the relatively recent attitudinal changes among women regarding their career choices and professional goals will inevitably influence the practice patterns of women physicians.

Medical School Faculties

Medical school faculties are composed of basic science and clinical faculty. The numbers of full-time filled and budgeted unfilled faculty positions by department for 1981-82 are displayed in Table 14. Over 70 percent of all full-time medical school faculty are physicians teaching in various clinical departments. If the pathology departments' faculty (composed primarily of physicians) are included, the number of medical school faculty who are physicians increases to approximately 75 percent of the total. These proportions will vary by school.

Size

The number of full-time medical school faculty in the SREB states is estimated to be 15,607. Using the national 1.24:1 ratio of medical students to full-time faculty members, the number of medical school faculty in 1981-82 was estimated for each of the SREB states (see Table 15). The ratio may vary somewhat from school to school, depending on such factors as the size and type of graduate medical education programs, the amount of patient care provided, and the research responsibilities of the faculty. These data do not include paid part-time faculty or large numbers of unpaid volunteer faculty.

The growth rate in the number of U.S. medical school faculty members has been higher than that of medical students. The number of medical students increased 73 percent between 1964 and 1975, and 16.5 percent between 1975 and 1980; the number of faculty increased 154 percent and 28.5 percent, respectively, for the same time periods. However, a more realistic assessment of medical schools' faculty growth is obtained by comparing the growth of full-time basic science and clinical faculty to that of basic science students, medical students, and physicians in graduate medical education programs who are taught by these faculties.

Between 1965 and 1975, the number of basic science students increased 124 percent; medical students, 73.4 percent; and residents, 97 percent. Altogether the number of these students increased by 87 percent (see Table 16). Although total faculty increased 154 percent for this time period, basic science faculty increased 109 percent and clinical faculty increased 175 percent. As would be expected, increases in enrollment of all students and the number of faculty in medical schools were much less between 1975 and 1980 than for the period 1965 to 1975. However, the increases have a similar pattern in that the largest increase in students taught by medical school faculties was in the number of residents, who increased by 24 percent, followed by an increase in medical students of 16.5 percent, and a 10.5 percent increase in basic science students--for an overall increase in these students of 18 percent. This compares to an overall increase in faculty for the 1975-80 period of 28.5 percent, with basic science faculty increasing 20 percent and clinical faculty increasing again considerably more (32 percent). Some of the faculty growth can be attributed to large increases in research and patient care responsibilities; however, it would appear that the number of clinical faculty is influenced more by the number of residents in the graduate medical education program than by the number of undergraduate medical students enrolled.

Teaching Responsibilities

A closer examination of the teaching responsibilities of medical school faculties reveals that the faculties of U.S. medical schools are responsible for the instruction of a variety of students in addition to basic science students, medical students, and residents. For example, during the 1975-76 academic year, the composite faculty of U.S. medical schools reported providing instruction to 56,244 medical students; 37,288 physicians in graduate medical education programs; 15,251 graduate and postgraduate

basic science students; and 501,060 other students that included: 11,641 dental students; 7,244 pharmacy students; 22,929 nursing students; 2,970 physician's assistant students; 24,626 undergraduate students in arts and sciences; 6,916 graduate students not in basic sciences; 21,415 other allied health students; 6,748 other miscellaneous students; and 398,522 physicians who registered for continuing education courses. In 1980, the number of "other" students taught by medical school faculties declined to 92,596. This is more related to changes in reporting than to an actual decline. Physicians taking continuing educaiton courses who were taught by medical school faculties were not included in the 1980 data nor were other non-medical students whose instruction accounted for only a small portion of medical schools' faculty time.

Data regarding the number and type of medical school faculties are not reported by state and/or school. Overall, the South's medical schools would be expected to have a mix similar to that for the U.S. in clinical and basic science faculty. However, the rate of growth in the number of medical school faculty in the South may be greater than that of the U.S. because of the number of new and developing medical schools. These schools usually recruit a full complement of specialized faculty prior to enrolling the optimum number of students. In addition, the number of basic science and medical students increased proportionately more in the South than the U.S. between 1975 and 1980; the former by 10.5 percent, the latter by 16.5 percent. In the South these students increased 22.3 and 23.6 percent, respectively, during the same period. On the other hand, the percent increase in the number of residents taught by medical school faculties did not increase as much in the South (21 percent) as for the United States (24 percent) (see Table 17).

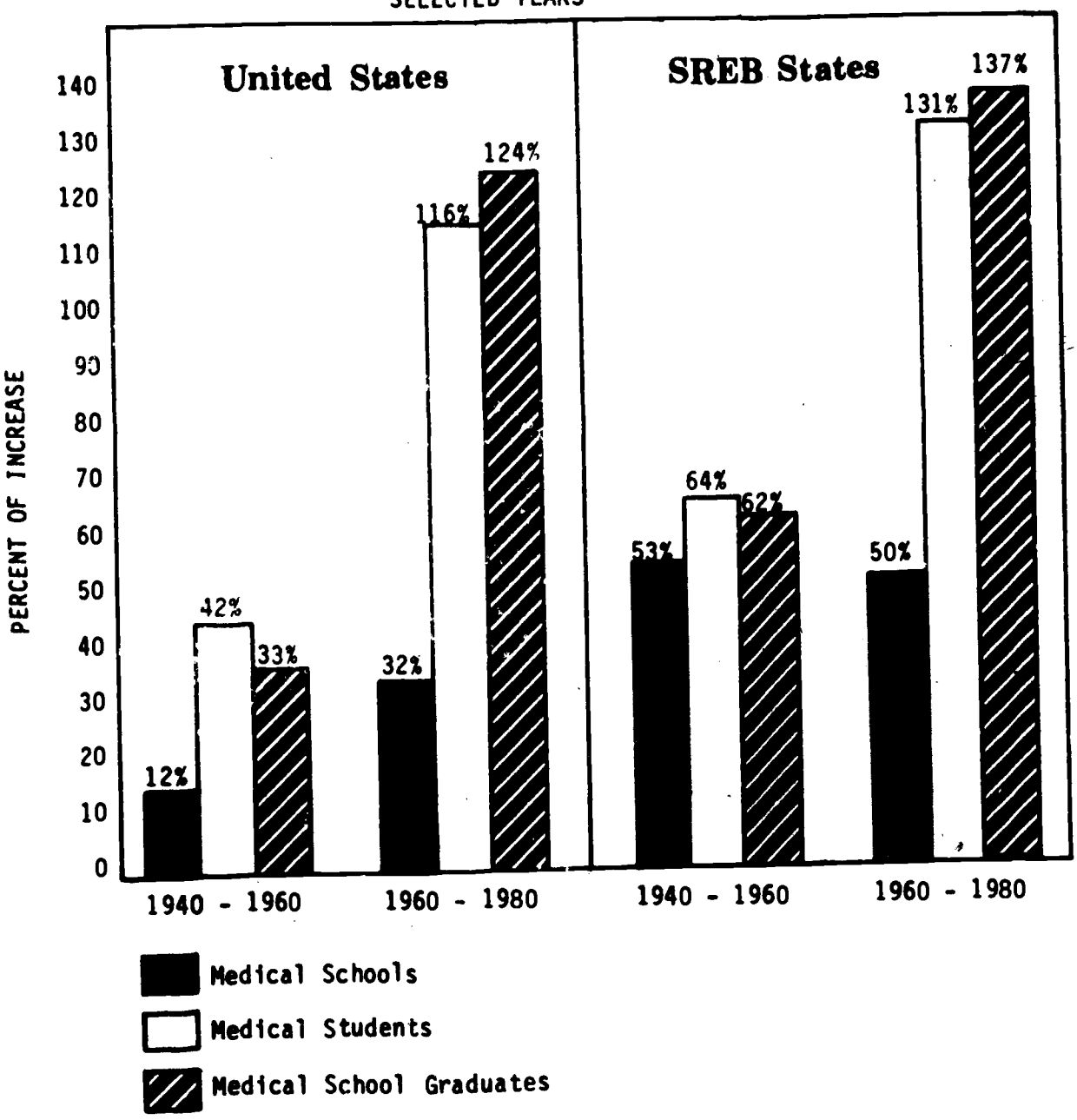
These data illustrate the fallacy of using an average undergraduate medical student to faculty ratio in making policy decisions. In addition, they demonstrate that the

increased numbers of undergraduate medical students enrolled are not the major driving force behind the phenomenal growth in the number of medical school faculty members. It would be unreasonable, based on these data, to assume that modest undergraduate medical student enrollment reductions would significantly reduce the number of faculty in most medical schools. As the number of medical school graduates increases during the next four years due to the high number of medical students currently enrolled, the number of medical school faculty members could continue to increase in order to accommodate new M.D.s seeking graduate medical education. Since faculty salaries comprise the bulk (over 60 percent) of medical schools' expenditures, the cost implications for continued faculty growth should be kept in mind when reviewing the section on financing medical education.

Figure 1

GROWTH IN MEDICAL EDUCATION
UNITED STATES AND SREB STATES

SELECTED YEARS



Sources: American Medical Association, "Medical Education in the United States." JAMA, 246, December 1981. Also prior annual reports.

Table 5

SUMMARY OF MEDICAL SCHOOL APPLICANT ACTIVITY,
SELECTED YEARS, 1947 THROUGH 1981
UNITED STATES

1st Year Class	Total Applicants	Accepted Applicants	Applicant/ Acceptance Ratio	Percent Accepted
1947-48	18,829	6,512	2.9:1	34.6%
1950-51	22,279	7,254	3.1:1	32.6
1955-56	14,937	7,969	1.9:1	53.4
1960-61	14,397	8,550	1.7:1	59.4
1965-66	18,703	9,012	2.1:1	48.2
1970-71	24,987	11,500	2.2:1	46.0
1975-76	42,303	15,365	2.8:1	36.3
1980-81	36,100	17,146	2.1:1	47.5
1981-82	36,727	17,286	2.1:1	47.1

Note: The number of accepted applicants will not compare with the new entrant data in this report because not all accepted applicants matriculate; thus, the number of new entrants is generally less than the number accepted, for example, the number of new entrants in 1980-81 was 16,591; in 1981-82, it was 16,644.

Sources: American Medical Association, Medical Education in the United States," JAMA, 214, November 1970, p. 1512; 236, December 1976, p. 2691; and 248, December 1982, p. 3249.

Table 6

NEW ENTRANTS TO MEDICAL SCHOOLS BY RESIDENCY STATUS AND PERCENT IN-STATE
UNITED STATES AND SREB STATES
1960 AND 1980

	1960			1980			Percent in State	
	In-State	Out-of-State	Total	In-State	Out-of-State	Total	1960	1980
United States	5,508	2,665	8,173	12,574	4,016	16,590	67.4	75.8
SREB States	1,669	624	2,293	4,003	898	4,901	72.8	81.7
South as a Percent of U.S.	30.3	23.4	28.1	31.8	22.4	29.5	-	-
Alabama								
University of Alabama	71	9	80	163	3	166	88.8	98.2
University of South Alabama*	-	-	-	60	4	64	-	93.8
Arkansas								
University of Arkansas	90	2	92	136	-	136	97.8	100.0
Florida								
University of Florida	46	3	49	111	4	115	94.0	96.5
University of South Florida*	-	-	-	92	4	96	-	95.8
University of Miami	76	5	81	126	10	136	93.8	92.6
Georgia								
Emory University	38	39	77	56	54	110	49.4	50.9
Morehouse School of Medicine*	-	-	-	20	12	32	-	62.5
Medical College of Georgia	102	-	102	178	2	180	100.0	99.0
Kentucky								
University of Kentucky	40	-	40	102	7	109	100.0	93.6
University of Louisville	82	17	99	130	5	135	82.8	96.3
Louisiana								
Louisiana State University-New Orleans	128	-	128	179	-	179	100.0	100.0
Louisiana State University-Shreveport*	-	-	-	100	-	100	-	100.0
Tulane University	21	111	132	45	103	148	15.9	30.4
Maryland								
Johns Hopkins University	9	69	78	13	108	121	11.5	10.7
University of Maryland	77	23	100	163	8	171	77.0	95.3
Mississippi								
University of Mississippi	76	4	80	151	1	152	95.0	99.3
North Carolina								
Bowman Gray School of Medicine	28	27	55	65	43	108	50.9	60.2
Duke University	27	49	76	31	83	114	35.5	27.2
University of North Carolina	63	6	69	145	15	160	91.3	90.6
East Carolina University*	-	-	-	39	1	40	-	97.5
South Carolina								
Medical University of South Carolina	80	0	80	147	17	164	100.0	89.6
University of South Carolina*	-	-	-	47	-	47	-	100.0
Tennessee								
Meharry Medical College	8	71	79	20	105	125	10.1	16.0
Vanderbilt University	18	34	52	19	85	104	34.6	18.3
University of Tennessee	150	53	203	193	12	205	74.0	94.2
East Tennessee State University*	-	-	-	46	2	48	-	95.8
Texas								
Baylor College of Medicine	47	37	84	114	54	168	56.0	67.9
University of Texas-San Antonio*	-	-	-	185	17	202	-	91.6
University of Texas-Southwestern	98	6	104	182	20	202	94.2	90.1
University of Texas-Galveston	147	1	148	186	17	203	99.3	91.6
University of Texas-Houston*	-	-	-	186	16	202	-	92.1
Texas Tech University*	-	-	-	99	-	99	-	100.0
Texas A&M University*	-	-	-	28	4	32	-	87.5
Virginia								
Eastern Virginia Medical School*	-	-	-	93	3	96	-	96.9
University of Virginia	48	28	76	104	35	139	63.2	74.8
Medical College of Virginia	54	30	84	136	32	168	64.3	81.0
West Virginia								
University of West Virginia	45	0	45	78	10	88	100.0	88.6
Marshall University*	-	-	-	35	2	37	-	94.6

*Schools established after 1965

Source: American Medical Association, "Medical Education in the United States." JAMA, 174, November 1960 and 296, December 1981.

Table 7

PERCENT OF MEDICAL SCHOOLS' NEW ENTRANTS WHO ARE IN-STATE RESIDENTS, BY PRIVATE, PUBLIC, AND ALL SCHOOLS UNITED STATES AND SREB STATES 1981-82

	New Entrants, Percent In-State Residents		
	Private Schools	Public Schools	All Schools
United States	50.8	90.9	74.7
SREB States	47.7	93.0	81.4

Source: American Medical Association, "Medical Education in the United States," JAMA, 248, December 1982.

Table 8

MEDICAL SCHOOL ENROLLMENTS, BY SCHOOL OWNERSHIP; AND PERCENT CHANGE 1960-1980 UNITED STATES AND SREB STATES

	ENROLLMENTS									
	1960					1980				
Geographic Area	Private	Percent of Total	Public	Percent of Total	Total	Private	Percent of Total	Public	Percent of Total	Total
United States	15,792	52.5	14,292	47.5	30,084	26,078	39.8	39,419	60.2	65,497
SREB States	3,051	36.9	5,217	63.1	8,268	5,052	26.4	14,082	73.6	19,134
South as a Percent of U. S.	19.3	-	36.5	-	27.5	19.4	-	35.7	-	29.2
Alabama	-		300		300	-		960		960
Arkansas	-		343		343	-		554		554
Florida	273		177		450	647		754		1,401
Georgia	293		365		658	528		736		1,264
Kentucky	375		-		375	-		1,001		1,001
Louisiana	499		437		936	613		1,118		1,731
Maryland*	286		369		655	468		718		1,186
Mississippi	-		274		274	-		598		598
North Carolina	526		266		792	917		791		1,708
South Carolina	-		299		299	-		800		800
Tennessee	469		760		1,229	938		892		1,830
Texas	330		907		1,237	666		3,484		4,150
Virginia	-		638		638	275		1,214		1,489
West Virginia	-		82		82	-		462		462

*Excludes the Uniformed Services University.

Source: American Medical Association, "Medical Education in the United States." JAMA, 176, November 1960, and 246, December 1981.

Table 9

COMPARISON OF NUMBERS OF NEW ENTRANTS TO MEDICAL SCHOOLS
UNITED STATES AND SREB STATES
1981-82 TO 1982-83

	1981-82	1982-83	Change
United States	16,660	16,567	-93
SREB States	4,897	4,850	-47
Alabama	214	216	+02
Arkansas	135	135	--
Florida	346	345	-01
Georgia	322	347	+25
Kentucky	243	220	-23
Louisiana	431	423	-08
Maryland*	299	295	-04
Mississippi	150	150	--
North Carolina	434	447	+13
South Carolina	216	205	-11
Tennessee	468	413	-55
Texas	1,112	1,114	+02
Virginia	403	403	--
West Virginia	124	137	+13

*Excludes the Uniformed Services University

Sources: American Medical Association, "Medical Education in the United States," JAMA, 248, December 1982; and Association of American Medical Colleges, unpublished 1982 medical school enrollment data.

Table 10

NUMBER OF MEDICAL SCHOOL ENROLLMENTS AND GRADUATES, PERCENT CHANGE, SELECTED YEARS, 1930 THROUGH 1982 UNITED STATES

Years	Enrollments				Graduates	
	First Year	Percent Change	Total	Percent Change	Number of Graduates	Percent Change
1930-31	6,456	--	21,982	--	4,735	--
1940-41	5,837	-9.6	21,379	-3.0	5,275	11.4
1950-51	7,177	23.0	26,186	22.5	6,135	16.3
1955-56	7,686	7.1	28,639	9.4	6,845	11.6
1960-61	8,298	8.0	30,288	5.8	6,994	2.2
1965-66	8,759	5.6	32,835	8.4	7,574	8.3
1970-71	11,348	29.6	40,487	23.3	8,974	18.5
1975-76	15,351	35.3	56,244	39.0	13,561	51.1
1980-81	17,204	12.1	65,497	16.5	15,667	15.5
1981-82	17,320	0.7	66,485	1.5	15,985	2.0
1982-83	17,254	-0.4	66,748	0.4	--	--

Note: The number of first-year students enrolled will not compare to the number of new entrant data presented in other tables of this report since first-year enrollments includes new entrants, repeaters, and transfers.

Sources: American Medical Association, "Medical Education in the United States," JAMA, 214, November 1970; 246, December 1981; 248, December 1982; and Association of American Medical Colleges, unpublished 1982 medical school enrollment data.

Table 11

MINORITY MEDICAL STUDENTS ENROLLED IN MEDICAL SCHOOLS UNITED STATES AND SREB STATES, FALL 1981

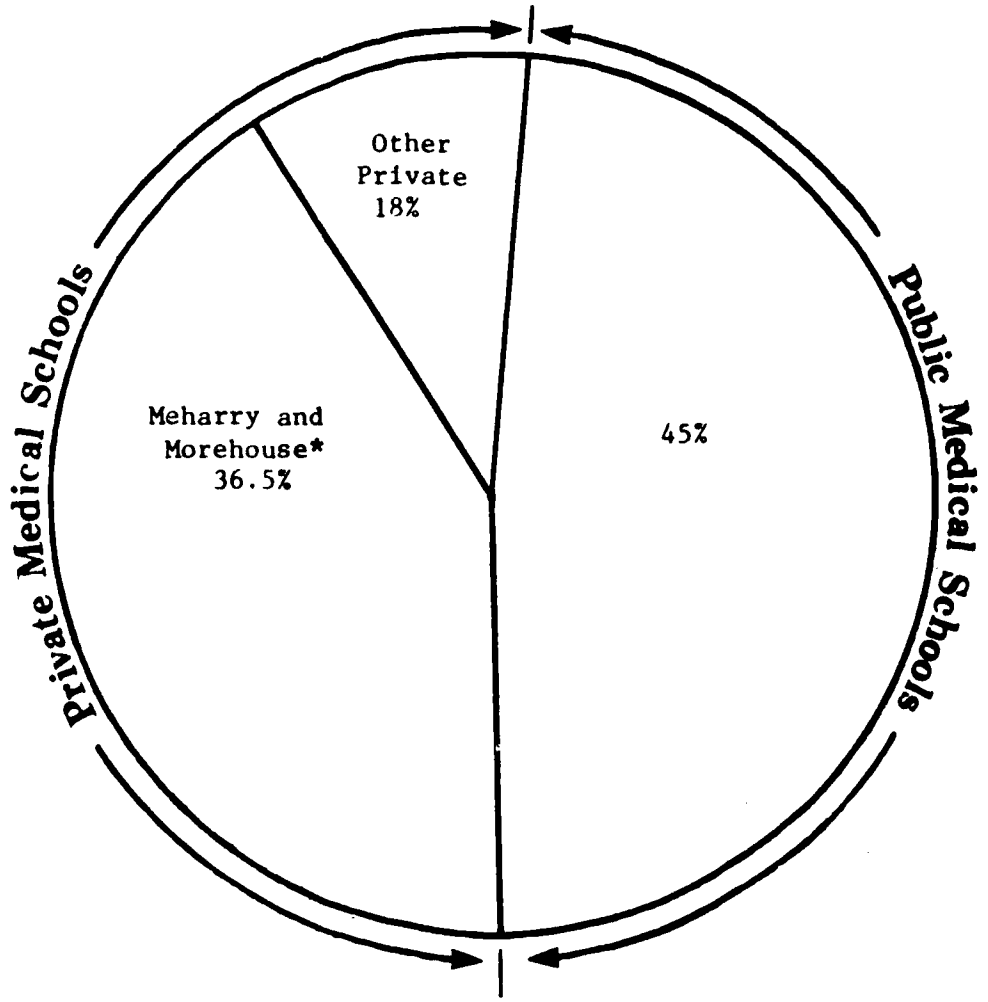
	Total	Black American	Percent of Total	American Indian	Percent of Total	Mexican American	Percent of Total	Mainland Puerto Rican	Percent of Total	Total Minority	Percent of Total
United States	66,485	3,884	5.8%	229	0.3%	1,040	1.6%	350	0.5%	5,503	8.3%
SREB States	19,353	1,277	6.6	53	0.3	339	1.8	28	0.2	1,697	8.8
South as Percent of U.S.	29.1	32.9	--	23.1	--	32.6	--	8.0	--	30.8	--

Sources: Association of American Medical Colleges, Medical School Admission Requirements 1983-84, 33rd Ed., 1982; and American Medical Association, "Medical Education in the United States," JAMA, 248, December 1982.

Figure 2

PERCENT OF BLACK MEDICAL STUDENTS ENROLLED IN PRIVATE AND PUBLIC MEDICAL SCHOOLS; PERCENT IN PRIVATE SUPPORTED BY INTERSTATE CONTRACTS SREB STATES

FALL 1981



Notes: 100 percent of black American medical students enrolled in medical schools in SREB states = 1,277. Percentages shown do not equal 100 due to rounding.

*20.2 percent of students are attending Meharry and Morehouse Medical Schools through interstate contract arrangements with SREB.

Sources: Association of American Medical Colleges, Medical School Admission Requirements, 1983-84, 33rd Ed., 1982; and SREB contract files.

Table 12

BLACK AMERICAN MEDICAL STUDENTS ENROLLED IN MEDICAL SCHOOLS, PERCENT OF TOTAL
UNITED STATES AND SREB STATES
1981

	Enrollments All Schools			Blacks Enrolled in Predominantly Black Schools*	
	Total	Black Americans	Percent of Total	Total	Percent of Black Americans
United States	66,485	3,884	5.8%	873	22.5%
SREB States	19,353	1,277	6.6	466	36.5
South as Percent of U.S.	29.1	32.9	--	53.3	--

*Howard University College of Medicine, Meharry Medical College, and the Morehouse School of Medicine.

Sources: Association of American Medical Colleges, Medical School Admission Requirements 1983-84, 33rd Ed., 1982; and American Medical Association, "Medical Education in the United States," JAMA, 248, December 1982.

Table 13

REPRESENTATION OF WOMEN IN THE MEDICAL STUDENT POPULATION, SELECTED YEARS
UNITED STATES AND SREB STATES

	1960-61			1981-82			1982-83		
	Total Enrollments	Total Women	Percent Women	Total Enrollments	Total Women	Percent Women	Total New Entrants	Total Women	Percent Women
United States	30,084	1,710	5.7%	66,485	18,555	27.9%	16,567	5,210	31.4%
SREB States*	8,268	377	4.6	19,353	4,808	24.8	4,850	1,405	29.0
South as Percent of U.S.	27.5	22	--	29.1	25.9	--	29.3	27.0	--

*Excludes Uniformed Services University.

Source: American Medical Association, "Medical Education in the United States," JAMA, 174, November 1960; 248, December 1982; and unpublished data from the Association of American Medical Colleges.

Table 14

FULL-TIME FACULTY IN U.S. MEDICAL SCHOOLS,
BY DEPARTMENT, 1981-82

Departments	Full-Time Budgeted Positions	
	Positions Filled	Positions Vacant
Basic Sciences		
Anatomy	1,974	92
Biochemistry	1,776	77
Microbiology	1,554	95
Pathology	3,669	204
Pharmacology	1,541	88
Physiology	1,759	75
Other	1,000	37
Subtotal	13,273	668
Clinical		
Anesthesiology	2,228	147
Dermatology	355	23
Family Practice	1,852	183
Medicine	10,773	499
Neurology	1,458	71
Obstetrics/Gynecology	2,036	149
Opthalmology	896	72
Orthopedics	665	58
Otolaryngology	544	25
Pediatrics	4,715	204
Physical Medicine	601	27
Psychiatry	4,979	201
Public Health and Preventive Medicine	988	59
Radiology	3,570	220
Surgery	4,061	273
Urology	306	20
Other	448	33
Subtotal	40,475	2,264
TOTAL	53,748	2,932

Source: American Medical Association, "Medical Education in the United States," JAMA, 248, December 1982.

Table 15

NUMBER OF MEDICAL STUDENTS AND NUMBER OF FULL-TIME FACULTY
UNITED STATES AND SREB STATES
1981-82

Geeographic Area	Number of Medical Students	Number of Faculty*
United States	66,485	53,748
SREB States	19,353	15,607
Alabama	938	756
Arkansas	549	443
Florida	1,392	1,123
Georgia	1,274	1,027
Kentucky	1,007	812
Louisiana	1,737	1,401
Maryland**	1,189	959
Mississippi	603	486
North Carolina	1,727	1,393
South Carolina	801	646
Tennessee	1,845	1,488
Texas	4,298	3,466
Virginia	1,517	1,223
West Virginia	476	384

*Number of faculty estimated based on the U.S. medical student to full-time faculty ratio in 1981-82 of 1.24:1.

**Excludes Uniformed Services University.

Source: American Medical Association, "Medical Education in the United States," JAMA, 248, December 1982.

Table 16

CHANGES IN TEACHING RESPONSIBILITIES OF MEDICAL SCHOOL FACULTIES AND IN NUMBER OF FACULTY, SELECTED YEARS UNITED STATES

	1964-65	1975-76		1980-81	
	Number	Number	Percent Change	Number	Percent Change
Responsibilities					
Basic Science Students	6,806	15,251	124.0	16,849	10.5
Medical Students	32,428	56,244	73.4	65,497	16.5
Subtotal	39,234	71,495		82,346	15.2
Residents*	18,947*	37,288	97.0	46,266	24.0
Total	58,181	108,783	87.0	128,572	18.2
Full-Time Faculty					
Basic Science	5,133	10,728	109.0	12,840	19.7
Clinical	10,381	28,602	175.0	37,696	31.8
Total	15,514	39,330	154.0	50,536	28.5

*Includes those classified as interns in 1965.

Sources: American Medical Association, "Medical Education in the United States," JAMA, 194, November 1965; 236, December 1976; 246, December 1981.

Table 17

COMPARISON OF ESTIMATED TEACHING RESPONSIBILITIES OF MEDICAL SCHOOL FACULTIES AND PERCENT CHANGE, SELECTED INDICES UNITED STATES AND SREB STATES 1975 AND 1980

	Basic Science Students			Medical Students			Medical Residents		
	1975	1980	Percent Change	1975	1980	Percent Change	1975	1980	Percent Change
United States	15,251	16,849	10.5%	56,244	65,497	16.5%	37,288	46,266	24.0%
SREB States	3,641	4,452	22.3	15,484	19,134	23.6	9,833	11,851	20.5
South as Percent of U.S.	23.9	26.4	--	27.5	29.2	--	26.4	25.6	--

Source: American Medical Association, "Medical Education in the United States," JAMA, 236, December 1976; and 246, December 1981.

SECTION C—GRADUATE MEDICAL EDUCATION

Historically, graduate medical education, commonly referred to as residency training, was not the most common route to the practice of medicine for new medical school graduates. The typical medical school graduate in the Thirties and Forties either began practicing general medicine immediately after graduation and licensure, or completed only a one-year internship program. Both options are still available, but most states (35) now require one year of postgraduate medical training as a prerequisite for licensure, and two states require two years of postgraduate education.

If physicians complete the prescribed training in any specialty field, they are eligible for credentialing as board-certified specialists in that field upon passing the examinations required by the respective specialty board. In the past, many physicians who entered graduate specialty programs elected to enter medical practice prior to completing the entire graduate program. Also, some who completed specialty programs did not elect to compete for board certification.

No state requires physicians to be board-certified specialists in order to practice medicine; yet, today over 98 percent of U.S. medical school graduates enter a postgraduate program and over 90 percent express an intent to complete one of 36 graduate medical specialty programs that range in duration from three to five (or sometimes seven) years. A one-year flexible (more recently referred to as transitional) residency program is available for physicians who still elect only one year of postgraduate training. This program also serves to meet the requirements of some medical specialty programs that require at least a year of general graduate education prior to admission.

Graduate medical education programs are generally offered by medical schools and/or hospitals. The majority of freestanding residency training programs are in some way affiliated with medical schools. New U.S. medical school graduates, graduates of Canadian and other foreign medical schools, and graduates of osteopathic medical schools all compete for admission to residency programs. Most seek admission through the National Resident Matching Program (NRMP) that serves to "allow all applicants seeking residency positions and institutions offering those positions the opportunity to rank their preferences confidentially at a uniform date as late as possible in the senior year, and to match students to the programs ranked highest on their listing that offer them a position" (NRMP, 1982). The NRMP has been operating for 27 years and maintains that its success in matching students to positions, with most students obtaining their first choice, is due to the voluntary cooperation of students and the institutions offering the programs. In 1982, 14,949 physicians entering first-year residency programs were matched to programs of their choice through NRMP. This number accounts for 82 percent of the 1982 first-year positions offered in the U.S. (see Table 18).

Accreditation

Graduate medical education programs are accredited by the Accreditation Council for Graduate Medical Education (ACGME) using specialty specific Residency Review Committees (RRC). Each program must meet general and special requirements that are specified by published standards as the "Essentials of Accredited Residencies."

The ACGME is composed of representatives of the American Board of Medical Specialties, the American Hospital Association, the American Medical Association, the Association of American Medical Colleges, and the Council on Medical Specialty Societies. In addition, the federal government names a representative and the Council

names one public member. The RRCs consist of representatives appointed by the Council on Medical Education of the American Medical Association (AMA), by the specialty boards concerned, and, in some cases, by a national professional association of the specialty field. Information about all accredited residency programs in the United States and standards for accredited residency programs are published annually by the AMA in a directory of residency training programs.

Specialization

Figure 3 depicts the most typical patterns for the duration of graduate medical education programs by specialty and subspecialty. For example, a medical school graduate may enter a residency program in internal medicine, complete three years, and be eligible for board certification as an internist. Or, after completing one year of an internal medicine residency, he or she could enter any one of three medical subspecialties--dermatology, neurology, or ophthalmology. The types of graduate programs that require no previous graduate education are presented in Table 19, and a comparison is made between the numbers of first year residents with and without previous training who were in these programs in 1981. With the exceptions of family practice, internal medicine, pediatrics, and general surgery, many first-year students enter programs with some previous graduate education.

Specialization as the norm for most M.D.s is a relatively recent occurence. This change can be seen by the increased numbers of physicians electing to enter graduate medical education residency programs and the discontinuance of the traditional internship (see Table 20). Between 1964 and 1974, the number of internships offered declined by 18 percent and those filled declined by 3 percent. During the same period the number of residency positions offered increased 50 percent and those filled increased 71 percent.

A more dramatic change occurred between 1974 and 1981. Internships were discontinued and substituted by the flexible or transitional one-year program. These one-year programs offered and filled under 1,500 positions in 1981, more than 85 percent less than for internships in 1974. This decline was directly related to the fact that most medical school graduates now perceive medical specialization as the most appropriate route to the practice of medicine.

Medical educators attribute this shift toward virtually total specialization to the increased amount of knowledge that is now necessary in order to practice medicine safely. Others attribute the change to the creation of the family practice specialist. As more physicians specialized, there was an alarming decline in the number of general practitioners available to deliver what has been classified as "primary care." This stimulated the development of the family practice specialist whose 3 years of graduate medical education allow equal status with the internist, the pediatrician, and the general surgeon. As the perception of physician shortages continued in the late Sixties and Seventies, federal and state initiatives focused on increasing the number of family practitioners and other primary care specialists, thus increasing the options to specialize for all new medical school graduates.

The success of these initiatives can be seen in Table 21. In 1981, over 54 percent of the M.D.s entering first-year graduate medical specialty programs selected one of the four primary care specialties and over 48 percent of all graduate medical students were in these programs. The specialty choices of U.S. medical school graduates on entering graduate programs are presented in Table 22 for 1977 and 1980. Four specialties-- family practice, internal medicine, pediatrics, and surgery--accounted for 72 percent of U.S. graduates entering first-year graduate medical programs [illegible]th years. The preponderance of all physicians (79 percent) in graduate medical education programs

in the United States are graduates of U.S. and Canadian medical schools. However, foreign graduates account for slightly over 19 percent, while osteopathic graduates represent 1.4 percent. It should be noted that 44 percent of the 13,194 foreign medical graduates in U.S. residency programs in 1982 were U.S. citizens who attended a foreign medical school and returned to the United States for their graduate education (see Table 23).

There are adequate first-year graduate medical education positions available to meet the needs of new U.S. medical school graduates; however, many programs report capacity enrollments. The over 16,000 new U.S. medical school graduates per year, plus graduates from osteopathic schools and foreign medical schools, may find competition for admission to the graduate specialty program of their choice more intense in the future. Should federal and state funding for primary care graduate programs decline substantially, it is very likely that many existing programs would be forced to reduce enrollments and some could close.

Graduate Medical Education in the SREB States

The South has experienced even greater change than the U.S. in the numbers of graduate medical education programs and students. Between 1974 and 1981, there was a slight decline in number of specialty training programs in the U.S., while the South's programs increased by over 10 percent. The number of residents enrolled in graduate programs in the U.S. increased 29 percent during the same period compared to a 46 percent increase in the South. While every state in the SREB region experienced an increase in the numbers of residency programs and graduate students between 1974 and 1981, the increase in graduate students exceeded 50 percent in 6 states (see Table 24).

The number of foreign medical school graduates in graduate medical education programs in the South varies by state, from as few as 5 in Arkansas to as many as 463 in Maryland. Overall, foreign medical school graduates in graduate programs in the SREB states comprise 11 percent of the total compared to 19 percent for the U.S. (see Table 25).

When the first-year graduate medical education positions offered are compared by type of medical specialty, it is evident that internal medicine positions are the most numerous for the U.S. and the South; however, only 20.5 percent of these positions are available in the South. On the other hand, slightly over 30 percent of all first-year family practice positions are in the South. The number of first-year positions by specialty varies widely among the SREB states, from a high of 238 internal medicine positions in Texas to a low of 4 obstetrics-gynecology positions in Arkansas and 4 psychiatry positions in Mississippi (see Table 26).

Multiple factors affect the ultimate practice location of physicians. Many states have increased their medical schools' undergraduate enrollments and restricted enrollments to state residents in order to increase the retention of graduates. Where M.D.s receive their graduate education also influences their practice locations. Some states have large numbers of their medical school graduates who must leave the state in order to gain access to graduate education. Thus, many are "lost" to other states. Not all medical school graduates desire to enter graduate programs in the same state where they receive their undergraduate medical education. However, when high quality graduate medical education positions are available in sufficient numbers, physician retention is increased. These programs attract medical school graduates from other states, many of whom elect to establish a practice in nearby locations.

John Graettinger (1978) developed the notion of "balance" in medical education networks. A network consists of a medical school and participating hospitals involved in graduate medical education. These generally follow state boundaries. He found that states could be classified as importers, deporters, or exporters of medical school graduates based on how the number of first-year residency positions offered and filled by U.S. medical school graduates compared to the state's number of medical school graduates.

In 1977, he classified five SREB states as importers: Alabama, Florida, North Carolina, South Carolina, and Texas. For these states, the number of first-year graduate (G-1) positions filled by U.S. medical school graduates (USGs) was greater than the number of graduates from schools in the state. Four SREB states were classified as deporters: Kentucky, Louisiana, Mississippi, and Tennessee. In these states, the number of G-1 positions offered and filled by USG was less than the number of graduates from schools in the state. The remaining five SREB states were classified as exporters: Arkansas, Georgia, Maryland, Virginia, and West Virginia. In these states, the number of G-1 positions offered was greater than the number of medical school graduates; but, the number of G-1 positions filled by USGs was less than the number of graduates. Thus, 10 SREB states had adequate numbers of graduate medical education positions available, but in five of these states the positions filled by graduates of their own medical schools or graduates from other U.S. medical schools did not equal the number of medical school graduates in the respective states.

It is reasonable to assume that the "balance" status for states that was described by Dr. Graettinger for 1977 may change from year to year depending on three factors: (1) the number of medical school graduates; (2) the number of first-year positions offered by their graduate medical education programs; and (3) the attractiveness of those

programs to their own and other U.S. medical school graduates. Thus, having more first-year graduate medical education positions than medical school graduates will not assure "balance." It is clear that, although graduate medical education programs may meet accreditation standards, new medical school graduates perceive some graduate residency programs more suitable or of higher quality than others.

At least nine SREB states were net exporters of their medical school graduates in 1982 (see Table 27). Collectively, these SREB states exported at least 146, or 3 percent, of their graduates in 1982. Using Graettinger's terminology, the number of "deporter" states in the South increased from four to nine between 1977 and 1982. It is probable that the overall net export rate was much higher than 3 percent in 1982 if graduate positions in the South were filled with USGs to the extent found in 1977. It is unlikely that most SREB states will attain a "balance" between their number of medical school graduates and the number of G-1 positions offered and filled by U.S. medical school graduates as long as current undergraduate enrollment levels are maintained.

If physician retention is the primary purpose for state medical education expenditures, those states with more graduates than G-1 positions could improve the return on their investment by seeking to bring into balance the number of medical school graduates from its schools and the number of first-year graduate medical education positions offered and filled by their own medical school graduates or by graduates from schools in other states.

Table 18

COMPARISON OF FIRST-YEAR GRADUATE MEDICAL EDUCATION POSITIONS OFFERED AND FILLED THROUGH THE NATIONAL RESIDENT MATCHING PROGRAM, BY SELECTED SPECIALTIES; PERCENT U.S. MEDICAL SCHOOL GRADUATES
UNITED STATES
1982

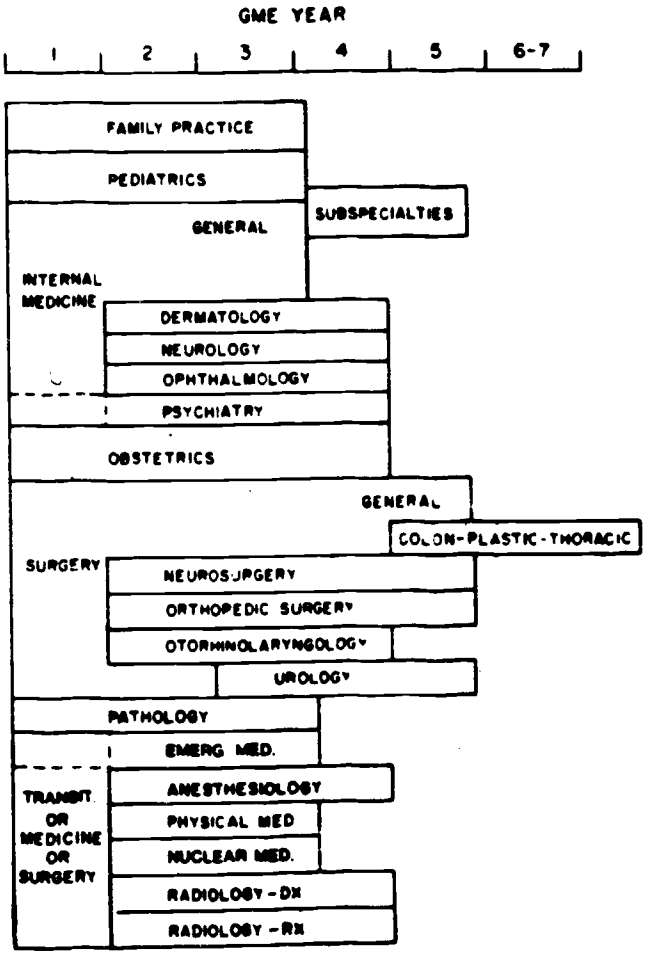
	Positions			
	Offered	Filled	Percent Filled	Percent Filled by U.S. Medical School Graduates
*Family Practice	2,362	1,940	82.1	74.4
*Internal Medicine	6,260	5,248	83.8	71.6
*Pediatrics	1,810	1,475	81.5	66.5
*Obstetrics and Gynecology	1,035	962	92.9	81.3
Psychiatry	922	603	65.4	58.7
General Surgery	2,340	2,045	87.4	75.9
Flexible	1,343	1,109	82.6	74.4
Other	2,228	1,567	70.3	63.7
Total	18,300	14,949	82.0	71.2

*Primary Care Specialties

Source: National Resident Matching Program, NRMP Directory, October 1982.

Figure 3

YEARS OF GRADUATE MEDICAL EDUCATION GENERALLY REQUIRED FOR CERTIFICATION BY VARIOUS SPECIALTY BOARDS



Source: National Resident Matching Program. NRMP Directory, October 1982, pg. 37.

Table 19

NUMBER OF FIRST-YEAR RESIDENTS ON DUTY SEPTEMBER 1, 1981
IN THOSE SPECIALTIES OPEN TO PHYSICIANS WITH NO
PREVIOUS POSTGRADUATE MEDICAL TRAINING,
BY THOSE WITH AND WITHOUT PREVIOUS
POSTGRADUATE TRAINING
UNITED STATES

Specialty	First-Year Residents		Total
	With Previous Postgraduate Training	Without Previous Postgraduate Training	
Anesthesiology	452	497	949
Family Practice	207	2,268	2,475
Internal Medicine	1,258	5,969	7,227
Neurological Surgery	116	39	155
Neurology	346	58	404
Obstetrics and Gynecology	225	1,076	1,301
Opthalmology	476	14	490
Orthopedic Surgery	432	236	668
Otolaryngology	231	54	285
Pathology	178	596	774
Pediatrics	341	1,821	2,162
Physical Medicine and Rehabilitation	124	121	245
Preventive Medicine, General	52	5	57
Occupational Medicine	29	1	30
Psychiatry	306	927	1,233
Radiology, Diagnostic	496	409	905
Radiology, Diagnostic (Nuclear)	10	4	14
Radiology, Therapeutic	69	59	128
Surgery	432	2,606	3,038
Urology	226	50	276
Flexible	--	1,521	1,521
Total	6,006	18,331	24,337

Source: American Medical Association, '82-'83 Directory of Residency Training Programs, 1982, pp. 59 and 60.

Table 20

CHANGING PATTERNS OF GRADUATE MEDICAL EDUCATION
UNITED STATES
1964-1981

	Positions Offered				Positions Filled			
	Internships	Percent Change	Residencies	Percent Change	Internships	Percent Change	Residencies	Percent Change
1964	12,728	--	38,373	--	10,097	--	30,797	--
1974	10,441	-18.0	57,681	50.3	9,827	-2.7	52,685	71.1
1981	1,521*	85.4	73,784	27.9	1,521*	-84.5	69,738	32.4

*"Flexible" or "Transitional" programs replaced the traditional 1-year internship programs. They serve as the route to enter practice in 37 states or to enter a specific graduate specialty program.

Sources: American Medical Association, "Medical Education in the United States," JAMA, 194, November 1965; 236, December 1976; and 248, December 1982.

Table 21

NUMBER AND PERCENT OF ACCREDITED GRADUATE MEDICAL RESIDENCY PROGRAMS, AND ENROLLMENTS BY ALL PROGRAMS AND PRIMARY CARE PROGRAMS
UNITED STATES

SEPTEMBER 1981

	Programs		Residents Enrolled			
			First-Year		Total	
	Number	Percent	Number	Percent	Number	Percent
All Programs	4,742	100.0	24,072	100.0	69,738	100.0
Primary Care Programs	1,377	29.0	13,165	54.7	33,858	48.6

Source: American Medical Association, '82-'83 Directory of Residency Training Programs, 1982; and American Medical Association, "Medical Education in the United States," JAMA, 248, December 1982.

Table 22

SPECIALTY DISTRIBUTION OF U.S. MEDICAL SCHOOL GRADUATES ENTERING FIRST-YEAR GRADUATE PROGRAMS THROUGH THE NATIONAL RESIDENCY MATCHING PROGRAM, SELECTED YEARS

	U.S. Graduates in First-Year Positions*			
	1977		1980	
Specialty	Number	Percent of Total	Number	Percent of Total
Family Practice	1,721	13	2,022	14
Internal Medicine	4,827	36	5,142	34
Pediatrics	1,375	10	1,428	10
Obstetrics and Gynecology	759	6	937	6
Psychiatry	592	4	527	4
General Surgery	1,710	13	2,086	14
Anesthesiology	211	1	316	2
Pathology	351	3	315	2
Radiology	295	2	378	2
Flexible	1,141	9	1,217	8
Other	433	3	562	4
Sub-Total	13,415	100	14,930	100
Unknown	65	--	58	--
No Post Graduate -1	167	--	134	--
Total	13,647		15,122	

*Graduates participating in the NRMP represented 95 percent of all 1977 graduates and 97 percent of the 1980 graduates.

Source: National Resident Matching Program, NRMP Directory, October 1982, p. 27.

Table 23

RESIDENTS ON DUTY IN U.S. RESIDENCY PROGRAMS, SEPTEMBER 1, 1981, BY TYPE OF MEDICAL SCHOOL*

	School of Undergraduate Medical Education			
	U.S. and Canadian	Foreign**	Osteopathic	Total
Number	53,704	13,194	970	67,868
Percent	79.1	19.5	1.4	100

*Data from 96 percent of U.S. residency programs

**5,778, or 44 percent, of the foreign medical graduates are U.S. citizens who attended a medical school in a foreign country.

Source: American Medical Association, '82-'83 Directory of Residency Training Programs, 1982, pp. 60 and 63.

Table 24

NUMBERS OF GRADUATE MEDICAL EDUCATION PROGRAMS AND RESIDENTS ON DUTY ON SEPTEMBER 1 OF 1974 AND 1981, AND PERCENT CHANGE UNITED STATES AND SREB STATES

	1974		1981		Percent Change 1974-1981	
	Programs	Residents	Programs	Residents	Programs	Residents
United States	4,565	52,499	4,553	67,868*	-0.3	29.3
SREB States	1,038	11,289	1,146	16,493	10.4	46.1
South as a Percent of U.S.	22.7	21.5	25.2	24.3	--	--
Alabama	47	432	56	747	19.1	72.9
Arkansas	21	195	23	339	19.0	73.8
Florida	93	1,261	103	1,629	10.8	29.2
Georgia	63	647	70	1,154	11.1	78.4
Kentucky	48	544	46	611	-4.2	12.3
Louisiana	72	761	81	1,222	12.5	60.6
Maryland	129	1,384	132	1,765	2.3	27.5
Mississippi	21	250	21	339	0.0	35.6
North Carolina	88	987	101	1,425	14.8	44.4
South Carolina	37	391	45	679	21.6	73.7
Tennessee	85	868	89	1,222	4.7	40.8
Texas	207	2,351	245	3,733	18.4	58.8
Virginia	93	982	94	1,289	1.1	31.3
West Virginia	34	236	38	339	11.8	43.6

*Note: Numbers of residents were estimated from U.S. data providing the percent of total residents by state from 96 percent of the programs.

Sources: American Medical Association, "Medical Education in the United States," JAMA, 236, December 1976; and American Medical Association, '82-'83 Directory of Residency Training Programs, 1982.

Table 25

FOREIGN MEDICAL SCHOOL GRADUATES ON DUTY IN U.S. RESIDENCY PROGRAMS, FOREIGN MEDICAL GRADUATES AS PERCENT OF ALL RESIDENTS ON DUTY, SEPTEMBER 1981 UNITED STATES AND SREB STATES

	Number of Foreign Medical School Graduates	Percent of All Residents
United States	13,194*	19.4%
SREB States	1,838	11.1
Alabama	44	5.8
Arkansas	5	1.5
Florida	324	19.9
Georgia	84	7.3
Kentucky	90	14.7
Louisiana	169	13.8
Maryland	463	26.2
Mississippi	13	3.8
North Carolina	57	4.0
South Carolina	13	2.0
Tennessee	134	11.0
Texas	300	8.0
Virginia	95	7.4
West Virginia	47	13.7

*5,778 are U.S. citizens who attended a foreign medical school.

Source: American Medical Association, '82-'83 Directory of Residency Training Programs, 1982, p. 63.

Table 26

FIRST-YEAR GRADUATE MEDICAL EDUCATION POSITIONS OFFERED THROUGH THE NATIONAL RESIDENT MATCHING PROGRAM, BY SELECTED SPECIALTIES UNITED STATES AND SREB STATES 1982

	Family Practice	Internal Medicine	Pediatrics	Obstetrics &Gynecology	Psychiatry	General Surgery	Flexible/ Transitional	Totals
United States	2,362	6,260	1,810	1,035	922	2,340	1,343	16,072*
SREB States	714	1,284	475	296	222	556	263	3,810
South as a Percent of U.S.	30.2	20.5	26.2	28.6	24.1	23.8	19.6	23.7
Alabama	58	74	20	11	8	37	17	225
Arkansas	31	17	12	4	6	8	23	101
Florida	62	124	54	32	15	62	3	352
Georgia	35	94	24	21	16	27	30	247
Kentucky	29	60	25	10	15	25	--	164
Louisiana	43	107	45	32	21	57	53	358
Maryland*	25	151	47	35	9	66	8	341
Mississippi	14	17	6	5	4	7	--	53
North Carolina	67	103	41	23	31	28	8	301
South Carolina	66	41	16	9	14	24	14	184
Tennessee	44	124	27	20	12	55	40	322
Texas	143	238	110	64	45	101	52	753
Virginia	70	99	34	20	16	40	15	294
West Virginia	27	35	14	10	10	19	--	115

*Represents 87.8 percent of all first-year positions offered.

Source: National Resident Matching Program, NRMP Directory, October 1982.

Table 27

FIRST-YEAR MEDICAL SCHOOL ENROLLMENTS, GRADUATES, AND FIRST-YEAR GRADUATE MEDICAL EDUCATION POSITIONS OFFERED
UNITED STATES AND SREB STATES
1982

Geographic Area	First-Year Enrollments, 1981-82	Graduates 7-1-81 to 6-30-82	G-1 Positions Offered, 1982	Difference in Number of Graduates and Number of G-1 Positions
United States	17,320	15,985	18,300	2,315
SREB States	5,121	4,623	4,477	-146
South as a Percent of U.S.	29.6	28.9	23.7	--
Alabama	231	235	246	11
Arkansas	143	134	122	-12
Florida	353	377	413	36
Georgia	336	301	296	-05
Kentucky	248	258	202	-56
Louisiana	442	425	418	-07
Maryland*	309	298	359	61
Mississippi	155	146	69	-77
North Carolina	448	405	385	-20
South Carolina	220	181	210	29
Tennessee	541	403	368	-35
Texas	1,153	964	918	-46
Virginia	417	388	339	-49
West Virginia	125	108	132	24

*Excludes Uniformed Services University.

Sources: American Medical Association, "Medical Education in the United States," JAMA, 248, December 1982; and National Resident Matching Program, NRMP Directory, October 1982.

SECTION D--FINANCING MEDICAL EDUCATION

The amount of tax funds required to support medical schools is an increasing concern of states. This section provides data and information to assist states in determining (1) required support to public medical schools; and (2) required subsidy to private medical schools within their borders that provide medical education to state residents.

1950-51 academic year the orted budgets of 72 medical schools and sev medical science schools in the U. S. totaled approximately $67.5 million. Individual schools' budgets ranged from under one-half million dollars to over $2 million. Public schools accounted for $31 million (46 percent) and private schools $36.5 million (54 percent) of the total. Resident tuitions charged medical students ranged from $97 to $867. Tuition revenues were estimated to provide 22.5 percent of the medical schools' budgets.

By contrast, in the 1980-81 academic year 119 medical schools reported expenditures of over $6.3 billion. Individual schools' expenditures ranged from $1.9 million to $164 million, with the median $45 million and the average $53.2 million. Public schools accounted for $3.5 billion (56 percent) and private schools accounted for $2.8 billion (44 percent) of the uitions ranged from under $100 to over $23,000. Revenues from tuition and fees, however, provided only 5.5 percent of the total.

Thus, in three decades, monies to finance medical school operations increased over 900 percent and the dollars expended by public medical schools increased from 46 to 56 percent of the total. Tuition and fees in some medical schools increased over 1,000 percent. However, tuition as a proportion of all medical school revenues decreased over 300 percent. During the same period, the number of medical students enrolled increased roughly 125 percent.

It is clear that the growth in medical school expenditures outpaced the growth in the number of undergraduate medical students educated, even though inflation contributed significantly to the gross increase in expenditures. Although the basic function of medical schools--education, research, and service--have remained the same, missions have changed and/or expanded over the past 30 years. The scope and configuration of these functions varies widely by school.

The range of medical school expenditures reflects these differences in the functions and missions. The difficulty in determining the cost of undergraduate medical education stems in part from these differences. Factors that complicate the assessment of the cost of undergraduate medical education are discussed in another SREB publication, "Factors that Influence the Financing and Cost of Medical Education."

Trends in Medical Schools' Revenues and Expenditures

Medical school revenue data for fiscal years ending June 30, 1969, 1974, 1980, and 1981 are reported for general operations of the medical schools and for sponsored and restricted programs in Table 28. The latter includes all earmarked funds that must be [illegible]o support the specific purpose for which the funds were awarded, that is, federal research grants, federal or state funds for graduate medical education, endowments for cancer centers, etc. Between FY 69 and FY 81, the increase for general operation revenues was more than twice as high (575 percent) as that for sponsored and restricted programs (220 percent). As general operation revenues increased as a proportion of the total from 42 to 60 percent, sponsored and restricted revenues decreased by similar proportions, from 58 to 39 percent. This shift was due primarily to a decline in federal funding for research and to an increase in state funding for medical education as well as increased revenues from patient services.

Medical schools' growth during the 1960s is compared with growth in the 1970s in Table 29. Between 1960 and 1970, full-time faculty increased by 139 percent; expenditures increased over 290 percent; undergraduate enrollments increased 34 percent; and graduate enrollments 60 percent. The growth in new medical schools and in undergraduate and graduate enrollments was greater during the Seventies than during the Sixties. Although growth in full-time faculty continued in the Seventies, it was significantly less than during the Sixties. Growth in expenditures was only slightly less than during the Sixties.

Another assessment is obtained by comparing growth in actual expenditures to that of constant dollars, and by comparing constant dollar growth with enrollment and faculty growth (see Table 30). Inflation accounted for 96 percent of the growth in expenditures for the decade of the Sixties and 205 percent in the Seventies, but the total growth was 293 percent. The constant dollar growth of 197 percent for the Sixties more accurately reflects the massive influx of federal funds to medical schools for research and to stimulate increased undergraduate enrollments during that period. The 65.4 percent growth in constant dollar expenditures in the Seventies is more in line with the 62 percent growth in undergraduate enrollments, 70 percent growth in graduate enrollments, and 91 percent growth in full-time faculty.

Thus, we see a deceleration in medical school expenditures in the 1970s. Although expenditures continued to increase, the growth rate in both actual and constant dollars decreased. As enrollments stabilize in the mid-Eighties and begin a measurable decline during the late Eighties, expenditures should level off; however, a decline in total expenditures before the year 2000 is unlikely.

Medical School Expenditures

U. S. medical data are usually reported by institutional and functional categories: instruction, research, academic support. The difficulties in assigning expenditures to these functions are many, medical schools use different criteria and often report expenditures of several functions in a single category (see Table 31). It is obvious that the category "instruction and departmental research" is a mixture of education and research. Opinions regarding levels of research expenditures which are appropriate or essential to medical education vary greatly. Also, the category for "health services" includes expenditures for hospital and clinical house staff stipends. This mixes education and service expenditures. Further, the expenditure category "academic support" includes items that are clearly a mixture of education, research, and service, such as, administration, animal resource centers, libraries, and computer centers.

These data provide limited information about the relative proportion of funds that were expended for the basic functions of medical schools. Association of American Medical Colleges (AAMC) representatives caution that these data cannot be used to compare individual schools. Nevertheless, knowledge of the approximate proportion of total expenditures that are allocated to education, research, and service by a medical school provides a rough estimate of these expenditures that can be compared to the amount of revenues generated by tuition and state appropriations.

Using what could be described as an "educated guesstimate," the expenditures reported in Table 31 were assigned to either education, research, or service and the proportions for each of the basic functions have been calculated (see Table 32). From this approximation, figures by basic function were found to be roughly: education, 46 percent; research, 37 percent; and service, 17 percent. If the same methods are

used to divide expenditures for general operations and sp[illegible]tricte[illegible] programs into these three functional categories, it is likely that education would amount to more two-thirds o[illegible]neral op[illegible]ns expenditures; research would essentially equal the expenditures for sponsored and restricted programs.

Another way to examine medical school expenditures is through an analysis of the proportions of total expenditures expended by the various medical school departments. For all U. S. medical schools, clinical science departments accounted for over 61 percent of the total expenditures, and basic science departments for 20 percent. This large difference is due to the fact that clinical faculty teach and supervise both undergraduate and graduate medical students, usually at a very low student/faculty ratio. Basic science faculty primarily teach undergraduate medical students during their first two years of medical education and basic science master's and Ph.D. students. The bulk of the instruction by basic science faculty is by lecture, permitting a higher student/faculty ratio. In addition, the majority of clinical faculty are physicians who command higher salaries than do the basic science faculty. These proportions will also vary widely by school and, on the surface, would appear spurious information to public decision-makers. However, these data, if examined by each basic science and clinical depa tment, can assist states in determining the relative strength and emphasis of the various departments in a particular medical school (see Table 33).

Medical School Revenues

Medical school revenues come from a variety of sources. The proportions by source varies by school depending on the school's ownership, age, prestige, size, the amount and type of patient care provided by its faculty, and the amount and type of research conducted. The older, more prestigious schools generate more gifts and endowment, and they usually attract more federal as well as private research funds. The

mix of revenue will also vary considerably depending on the type of graduate medical education progra[illegible] offered. Secondary and tertiary care graduate medical education spe[illegible]y pr[illegible] generate more patient care revenues for a school than will primary care programs.

Pr[illegible]ate schools gener[illegible] greater proportion of their revenues from tuition and fees than do public schools. [illegible]tion and fees provided 8.7 percent of private schools' revenues in the 1981 fiscal year, compar[illegible] to 2.8 per[illegible]nt for public schools. For the same year, state appropriations provided 33.4 percent of public schools' revenues while state subsidies to private schools accounted for 3.1 percent of their total revenues. The amount of federal funds received by private medical schools is roughly 11 percent more than that of public schools; 35 percent of private schools' total revenues compared to 24 percent for public schools. The non-tax revenues of U. S. medical schools are a substantial portion of the total. Excluding tuition and fees, public schools generated $1,191 million dollars in non-tax revenues and private schools generated $1,300 million. When tuition and fees are included, the non-tax revenues account for 35.6 percent of public schools' total revenues compared to 55 percent of the private schools (see Table 34). Revenues from tuition and fees increased 449 percent and professional fee income increased 770 percent between the FY 1974 and FY 1981 (Table 35). These increases are partially due to the increased numbers of students and clinical faculty; however, the steady decline of all federal funds and the discontinuation of federal capitation funds forced medical schools to offset these fund losses.

Tuition and fees charged by public and private medical schools illustrate the differences in the role of tuition in the two sectors as well as the great variability among states in their willingness and/or ability to fund medical education. The average resident tuition for SREB public schools in the 1982-83 academic year was $1,659 compared to $7,367 for private schools. The contrast is even greater when the range is

considered. Public school resident tuitions in the SREB states ranged from zero to $3,929, compared to $400 to $9,750 for private schools (see Table 36). The average and range of tuitions charged by all U. S. schools are higher than those charged by medical schools in the SREB states. Tuitions charged by private schools are more uniform than tuitions charged by public schools. The amount of fees charged varies considerably by school; tuition and fees can vary among public schools in the same state. A listing of the tuitions and fees charged by medical schools in SREB states for the 1982-83 academic year is provided in Table 37.

The impact of the decline in federal capitation funding on state support as well as tuition and fee income is seen in Table 38. When federal capitation funds, state appropriations, and tuition income are examined for their relative support for medical schools for 1974, 1978, and 1980, increased tuition was used by private schools as the means to offset the loss of federal funds. For public schools, the loss of capitation funds was offset more by increased state support than by increased tuitions.

Cost of Medical Education

The variations between and among medical schools are reflected by an absence of either compatible or comparable financial data from medical schools. This has deterred the determination of an average cost-per-student that would permit reliable comparisons of medical schools. Some authors indicate that it would be futile to attempt to evaluate the budgets of two or more medical schools which do not have uniform accounting systems. Others discount the value of uniform accounting systems in accurately determining an average cost-per-student, because such systems would not accommodate the differences in goals, objectives, and programs of medical schools. In order to be compatible, financial data from two or more sources must be uniformly defined and

consistently aggregated and, to be comparable, these data must be measurements of the same or very similar activities. Rarely do medical schools' financial data meet these criteria. Past attempts to assign "joint product" (undergraduate education, research, and service) costs to individual products introduced ambiguity and arbitrariness into the accounting process, resulting in inaccurate figures. Generally, there are few references to provide policymakers with information about the nature of medical education, the variations in goals and objectives among schools, and the functional interrelationships of education, research, and service that produce "joint product" costs. However, policymakers continue to express the need for cost-per-student information.

In the 1971 Comprehensive Health Manpower Training Act, Congress requested a study to: 1) estimate the average annual costs of educating a student to the first professional degree in each of eight health professions; and 2) develop a recommendation for the use of cost data for federal capitation payments in support of health professions education.

In 1972, the National Academy of Sciences' Institute of Medicine (IOM) undertook the task using a study group of health professions educators. The methodology recognized the complex nature of health professions education in which graduate medical education, research, and patient care are inextricably woven throughout undergraduate medical education.

To estimate the annual average costs per student, the study group's methodology used a combination of three processes: 1) program costs allocation that required the identification of total resources used by a school or health science center and an apportionment of that cost on a consistent basis to the three major programs--education, research, and patient care; 2) constructed cost seminars that sought a consensus of judgment among

medical, dental, and veterinary medicine educators and administrators in defining components of an educational program; and 3) income and expenditure analysis to determine net educational expenditures.

A detailed analysis of a nationwide sample of 82 health professions schools was conducted, resulting in a recommendation to use net education expenditures. This concept, while not a cost concept of classic economics, was thought by the IOM to be the only practical method of using educational cost figures to identify the financing required by a school.

No other national health professions education cost study has been conducted since the Institute's 1972 study. For the most part, state funds have been allocated on an incremental basis rather than on the basis of any defensible data as to the actual costs of various health professions education. Unfortunately, the state of the art in determining the precise cost-per-student of undergraduate medical education has changed little since the early Seventies.

If one accepts that the IOM cost study accurately determined an average cost-per-student for undergraduate medical education in 1972, then a current average cost-per-student for undergraduate medical education can be calculated. By using the Department of Labor's Urban Consumer Price Index (CPI) to adjust for inflation between 1972 and the year being considered, an average and range for the costs of undergraduate medical education can be estimated. For example, the $12,650 average cost-per-student determined in the IOM study increased to $23,650 in FY 1980 and $27,750 in 1982. The range of cost-per-student in FY 1973 was from $6,900 to $18,650. This converts in 1982 dollars to a range of from $21,100 to $40,950 (see Table 39).

Using the average cost-per-student, total expenditures and total undergraduate enrollments, expenditures for undergraduate medical education in the U. S. were estimated to be $601 million or 27.6 percent of all expenditures by U.S. medical schools

in Fy 1973. By FY 1980, the total costs of undergraduate medical education was estimated to be $1,549 million or 27.7 percent of total U. S. medical school's expenditures. For FY 1981, these costs increased to $1,722 million or 27.2 percent of the total (see Table 40).

Thus, from the financial analysis methods presented in this section, it is possible to construct a model that may be used to examine the relative contributions of state appropriations and tuition revenues to the cost of undergraduate and graduate medical education. This model is displayed in Table [illegible], based on selected average indices calculated for all U.S. medical schools and for public and private schools in FY 1981.

The data for the "hypothetical average" schools clearly differentiate public and private medical schools in terms of the proportion of undergraduate medical education costs supported by tuition and state tax revenues. For the "average" public school in FY 1981, state and local tax revenues support roughly 146 percent of the estimated cost of undergraduate medical education compared to 44 percent of the cost for the "average" private school. These differences illustrate the impact of tuition revenues. For the average private medical school, tuition revenues were roughly 40 percent of the expenditures for undergraduate medical education compared to about 10 percent in the average public school. In addition, the average public medical school has slightly higher undergraduate and lower graduate enrollments than does the average private school. The larger number of graduate medical students in most private medical schools could account for the fact that private schools generate substantially higher professional fee revenues than do public schools (see Table 34).

These data provide useful comparisons of "average" schools. It should be noted that the range of total revenues for U. S. medical schools in FY 1981 was from $2 million to $180 million, illustrating again the wide variations found among medical schools.

In fact, in new or developing schools one may find that state and federal funds plus tuition and fee income would account for virtually 100 percent of their revenues.

The "average medical schools" presented here probably would not typify any single U. S. medical school. However, this type of analysis can be applied to a specific medical school using existing data for that school. All medical schools collect and annually report expenditures that are allocated to education, research, and service. For individual medical schools, these data should be adequate for an analysis using the procedures discussed earlier and illustrated in Tables 39, 40, and 41. The results will provide information regarding the relative contribution of state appropriations and tuition revenues to the cost of medical education in a single medical school. It will not, however, provide data that will permit comparisons of one medical school to another.

Table 28

SUMMARY OF U.S. MEDICAL SCHOOL REVENUES FOR GENERAL OPERATIONS AND SPONSORED AND RESTRICTED PROGRAMS FOR FISCAL YEARS 1969, 1974, 1980, AND 1981, IN MILLIONS

	1968-69	1973-74	1979-80	1980-81
Number of Medical Schools Reporting	90	107	119	119
Revenues (Totals)	$1,366.0	$2,524.3	$5,701.0	$6,425.0
General Operations	576.5	1,204.0	3,316.0	3,891.0
Percent of Total	42.1	47.7	58.2	60.6
Sponsored and Restricted Programs	$ 790.5	$1,320.3	$2,386.0	$2,534.0
Percent of Total	57.9	52.3	41.9	39.4

Note: Totals may not equal sum of parts because of rounding.

Source: American Medical Association, "Medical Education in the United States," JAMA, 246, December 1981, and 248, December 1982.

Table 29

GROWTH INDICES OF U.S. MEDICAL SCHOOLS
FOR FISCAL YEARS 1961, 1971, and 1981

Indices	1960-61 Number	1970-71 Number	Percent Change 1960-1970	1980-81 Number	Percent Change 1970-1980
Number of Medical Schools*	87	101	16.0	126	25.0
Enrollments					
Undergraduate	30,288	40,487	34.0	65,497	62.0
Graduate**	17,000	27,225	60.1	46,266	70.0
Full-Time Faculty	11,111	26,504	139.0	50,691	91.3
Total Expenditures in Millions †	$ 436	$ 1,713	293.0	$ 6,334	270.0

*Includes basic science schools and developing medical schools.

**These are interns and residents that were reported as teaching responsibility of U.S. medical school faculties.

† Expenditures reported by all schools in 1960-61; 92 schools in 1970-71; and 119 schools in 1980-81.

Sources: American Medical Association, "Medical Education in the United States," JAMA, 178, November 1961; 182, November 1962; 218, November 1971; 222, November 1972; 246, December 1981; and 248, December 1982. Also, Bureau of Labor Statistics, Public Information Office, Atlanta, Georgia.

Table 30

COMPARISON OF GROWTH IN U.S. MEDICAL SCHOOL EXPENDITURES (ACTUAL AND CONSTANT DOLLARS IN MILLIONS) WITH GROWTH IN ENROLLMENTS AND NUMBERS OF FACULTY
1960, 1970, and 1980

	1960-61 Dollars	1970-71 Dollars	Percent Increase 1960-61 to 1969-70	1980-81 Dollars	Percent Increase 1970-71 to 1980-81
Expenditures					
Actual	$ 436	$ 1,713	293.0	$ 6,334	270.0
Constant Dollars*	475	1,412	197.0	2,335	65.4
Enrollments					
Undergraduate	30,288	40,487	34.0	65,497	62.0
Graduate	17,000	27,225	60.1	46,266	70.0
Full-Time Faculty	11,111	26,504	139.0	50,691	91.3

*Calculations based on a 1967 Consumer Price Index of 100 and measured by the June 30 Urban Consumer Price Index for the fiscal years involved, for example, 1961=89.6; 1971=121.3; and 1981=271.3.

Sources: American Medical Association, "Medical Education in the United States," JAMA, 178, November 1961; 182, November 1962; 218, November 1971; 222, November 1972; 246, December 1981; and 248, December 1982. Also, Bureau of Labor Statistics, Public Information Office, Atlanta, Georgia.

Table 31

U.S. MEDICAL SCHOOL EXPENDITURES IN MILLIONS OF DOLLARS, BY FUNCTION, 1980-81*

	General Operating	Sponsored and Restricted Programs	Total
Total Expenditures	$3,800	$2,534	$6,334
Instruction and departmental research	1,840	527	2,367
Research	112	1,366	1,477
Health services†	565	389	954
Multipurpose	87	132	219
Academic support ‡	259	52	312
Institutional support §	415	9	424
Operation and maintenance of physical plant	351	6	356
Student services‖	47	4	51
Scholarships and fellowships	28	39	67
Other	96	11	107

*Data reported by 119 medical schools. Totals may not equal the sum of the parts because of rounding.

†Includes expenditures for hospital and clinic house staff.

‡Includes expenditures for overall medical school administration and for such services as animal resource centers, audiovisual services, libraries, and computer centers.

§Includes expenditures for such activities as legal services, space management, employee personnel records and administration, supplies procurement, printing and transportation.

‖Includes expenditures for admissions and registration offices, student tivities such as student newspaper, remedial instruction, counseling, and career guidance.

Source: American Medical Association, "Medical Education in the United States," JAMA, 248, December 1982, p. 3262.

Table 32

ESTIMATED DISTRIBUTION OF U.S. MEDICAL SCHOOLS' EXPENDITURES BY FUNCTION
1980-81

	Education	Research	Public Service, Multi-purpose & Other	Totals
Instructional and Departmental Research	$1,840	$ 527	-	$2,367
Research	-	1,477	-	1,477
Health Services	239	-	715	954
Multipurpose	-	-	219	219
Academic Support	234	78	-	312
Institutional Support	318	106	-	424
Operation and Maintenance of Physical Plant	203	117	36	356
Student Services	51	-	-	51
Scholarships and Fellowships	27	27	13	67
Other	-	-	107	107
Totals	$2,912	$2,332	$1,090	$6,334
Percent of total	46.0	36.8	17.2	100

Note: Expenditures for education, research, and public service multi-purpose and other were estimated based on data and information from Table 31.

Table 33

DISTRIBUTION OF MEDICAL SCHOOL EXPENDITURES BY DEPARTMENTS
UNITED STATES
1979-80

	Percent of Total	Dollars in Millions
Basic Science Departments	20.14	$1,126
Clinical Science Departments	61.90	3,462
Other Academic Departments	2.04	114
Interdisciplinary Centers and Institutes	5.81	325
Other	10.11	565
Total	100.00	$5,592

*Based on data from 119 reporting medical schools. Includes general operations plus sponsored and restricted programs.

Source: American Medical Association, "Medical Education in the United States," JAMA, 246, December 1981.

Table 34

U.S. MEDICAL SCHOOLS' REVENUES BY SCHOOL OWNERSHIP, SOURCE AND PERCENTAGE 1980-81

	All Schools	Percent All Schools	Public	Percent of Public	Private	Percent of Private
Number of Medical Schools Reporting	119		73		46	
Total Revenues	$6,425		$3,628	100	$2,797	100
State and Local Governments	1,707	26.6	1,442	39.7	265	9.5
Appropriations			1,212	33.4	—	—
Subsidies			3	0.1	88	3.1
Restricted States			34	0.9	4	0.1
General University Funds			82	2.3	—	—
Sponsored Programs			111	3.1	173	6.2
Federal Government	1,880	29.3	893	24.6	987	35.3
Recovery of Indirect Costs on Grants and Contracts			157	4.3	251	9.0
Sponsored Programs			736	20.3	736	26.3
Total Tax Revenues	3,587	55.8	2,335	64.4	1,252	44.8
Total Non-Tax Revenues	2,837	44.2	1,293	35.6	1,544	55.2
Professional Fee Income			495	13.6	505	18.1
Recovery of Indirect Costs on Grants and Contracts Non-Federal			13	—	23	—
Tuition and Fees			102	2.8	244	8.7
Endowment and Gift Income			19	0.5	83	3.0
General University Funds			—	—	22	0.8
Income from College Services			47	1.3	26	0.9
Hospital and Clinics			308	8.5	283	10.1
Miscellaneous Sources			106	2.9	108	3.9
Sponsored Programs, Non-Government			203	5.6	250	8.9

Note: Dollars in millions.
The parts will not equal the sum of the total due to rounding.

Source: American Medical Association, "Medical Education in the United States," JAMA, 248, December 1982, p. 3267

Table 35

GROWTH IN REVENUES FROM TUITION AND PROFESSIONAL FEE INCOME, U.S. MEDICAL SCHOOLS, FISCAL YEARS 1971 AND 1981

	1970-71	1980-81	Percent Increase
Tuition and Fees Income	$63	$ 346	449%
Professional Fee Income	115	1,000	770

Note: Dollars in Millions

Source: American Medical Association, "Medical Education in the United States," JAMA, 222, November 1972; 248, December 1982.

Table 36

AVERAGE AND RANGE OF MEDICAL SCHOOL TUITION CHARGED FOR RESIDENT AND NON-RESIDENT UNDERGRADUATE MEDICAL STUDENTS, BY PRIVATE AND PUBLIC SCHOOLS UNITED STATES AND SREB STATES
1982-83

	United States		SREB States	
	Private	Public	Private	Public+
Number of Schools	52	75	12	28
Average:				
Resident	--	$ 2,697	$ 7,367	$ 1,659
Non-Resident*	$ 10,721	6,198	8,500	4,539**
Range:				
Resident	--	Zero-6,681	400-9,750	Zero-3,929
Non-Resident*	3,500-19,000	900-26,337	7,000-12,004	900-10,560

+Some public schools charge no tuition; however, student fees are usually comparable to other schools' tuitions (see Table 37).

*Nine private schools report lower tuition rates for state residents.

**Excludes three public schools that admitted no out-of-state residents in 1982-83 (see Table 37).

Source: Unpublished data from the Association of American Medical Colleges.

Table 37

TUITION AND FEES CHARGED BY MEDICAL SCHOOLS FOR 1982-83
SREB STATES

State	Medical School	Student Fees	Tuition	
			Resident	Nonresident
Alabama	University of Alabama	$1,369	$2,640	$10,560
	University of South Alabama	340	3,600	7,200
Arkansas	University of Arkansas	275	2,650	5,300
Florida	University of Florida	75	2,037	4,811
	University of South Florida	52	1,528	3,572
	University of Miami*	300	8,670	8,670
Georgia	Emory University*	190	9,750	9,750
	Mercer University*	97	7,000	7,000
	Morehouse School of Medicine*	1,530	8,000	8,000
	Medical College of Georgia	159	2,052	6,156
Kentucky	University of Kentucky	100	2,404	4,790
	University of Louisville	135	2,435	4,819
Louisiana	Louisina State University-New Orleans	2,108	-0-	NA
	Louisiana State University-Shreveport	2,040	-0-	NA
	Tulane University	321	8,010	12,004
Maryland	Johns Hopkins University*	1,640	8,550	8,550
	University of Maryland	487	3,929	7,322
Mississippi	University of Mississippi	61	3,000	9,000
North Carolina	Bowman Gray School of Medicine*	-0-	7,150	7,150
	Duke University*	523	7,770	7,770
	University of North Carolina	280	972	2,790
	East Carolina University	296	972	2,790
South Carolina	Medical University of South Carolina	-0-	1,979	3,653
	University of South Carolina	-0-	2,020	3,995
Tennessee	Meharry Medical College*	749	7,500	7,500
	Vanderbilt University*	300	7,600	7,600
	University of Tennessee	200	3,492	5,772
	East Tennessee State University	3,767	-0-	5,832
Texas	Baylor College of Medicine*	538	400	8,000
	University of Texas-San Antonio	515	300	900
	University of Texas-Southwestern...	187	300	900
	University of Texas-Galveston	493	400	1,200
	University of Texas-Houston	225	300	900
	Texas Tech University	395	300	NA
	Texas A&M University	559	300	900
Virginia	Eastern Virginia Medical School*	425	8,000	10,000
	University of Virginia	36	3,190	8,110
	Medical College of Virginia	232	3,850	7,000
West Virginia	University of West Virginia	360	1,110	3,110
	Marshall University	630	700	2,100

Note: All figures rounded to nearest dollar; where no fees are listed these are usually included with the tuition. "NA" indicates that these schools do not accept out-of-state residents.

*Private Medical Schools

Source: Unpublished data from the Association of American Medical Colleges.

Table 38

PERCENT OF RELATIVE CONTRIBUTIONS OF FEDERAL CAPITATION, STATE SUPPORT, AND TUITION FOR MEDICAL EDUCATION, PRIVATE, PUBLIC, AND ALL SCHOOLS UNITED STATES 1974, 1978, AND 1980

	Federal Capitation			State Institutional Support			Tuition and Fees		
	1974	1978	1980	1974	1978	1980	1974	1978	1980
Private Schools	29.5	13.1	9.9	34.7	29.9	26.9	35.8	57.0	63.2
Public Schools	11.9	5.2	3.3	82.3	87.5	90.0	5.8	7.3	6.7
All Schools	16.0	7.1	4.7	71.1	73.6	76.6	12.9	19.3	18.6

Note: The three proportions together add up to 100 percent and, therefore, do not show the proportion of revenue to schools from all sources.

Source: Congressional Research Service, State Support for Health Professions Education, U. S. Government Printing Office, December 1980, p. 22.

Table 39

AVERAGE AND RANGE OF ANNUAL EDUCATION COSTS PER UNDERGRADUATE MEDICAL STUDENT IN 1972-73 COMPARED TO ADJUSTED COSTS for 1979, 1980, 1981

	Average	Range
1972-73	$12,650	$6,900-18,650
1979-80*	23,650	12,900-34,900
1980-81*	25,900	14,150-38,200
1981-82*	27,750	21,100-40,950

Note: Dollars are rounded to the nearest $50.

*Calculations based on the June 30 Urban Consumer Price Indexes for the fiscal years involved 1967=100; 1973=132.4; 1980=247.6; 1981=271.3; and 1982=290.6.

Sources: U.S. Labor Department; Bureau of Labor Statistics; and National Academy of Sciences, Report of a Study of Costs of Education in the Health Professions, Parts I and II, U.S. Department of Health, Education, and Welfare, January 1974.

Table 40

COMPARISON OF MEDICAL SCHOOL EXPENDITURES WITH
COSTS OF UNDERGRADUATE MEDICAL EDUCATION
UNITED STATES
1972, 1979, and 1980

	Expenditures	Undergraduate Medical Education Costs	Undergraduate Medical Education Costs as Percent of Expenditures
1972-73	$2,181	$ 601*	27.6
1979-80	5,592	1,549**	27.7
1980-81	6,334	1,722**	27.2

Note: Dollars in millions.

*Calculated by multiplying the 1972-73 average cost-per-student of $12,650 by the 47,546 undergraduate students enrolled in 1972-73.

**Calculated by converting the 1972-73 average cost-per-undergraduate medical student to 1980 dollars ($23,650) and 1981 dollars ($25,900) and multiplying by the number of undergraduate medical students enrolled in 1979-80 (65,497) and 1980-81 (66,485), respectively.

Sources: American Medical Association, "Medical Education in the United States," JAMA, 246, December 1981, and 248, December 1982; National Academy of Sciences' Institute of Medicine. Report of a Study of Costs of Education in the Health Professions, Parts I and II, U.S. Department of Health, Education, and Welfare, January 1974; and Department of Labor, Bureau of Labor Statistics.

Table 41

AVERAGES FOR ENROLLMENTS, REVENUES BY SOURCE AND EXPENDITURES BY FUNCTION; PUBLIC AND PRIVATE MEDICAL SCHOOLS
UNITED STATES
1980-81

	Average Medical Schools		
	United States	Public	Private
Number of Schools Reporting	126	75	51
Average Enrollments			
Undergraduate	520	526	511
Graduate*	379	342	433
Average Revenues**	$54.0	$49.7	$60.8
State and Local Tax	14.3	19.8	5.8
Federal Tax	15.8	12.2	21.5
Tuition	2.9	1.4	5.3
Other	20.9	16.3	28.3
Average Expenditures**	$53.2	$49.1	$59.9
Undergraduate †	13.5	13.6	13.2
Graduate Education ‡	11	9	14.4
Research and Public Service	28.7	26.5	32.3

Note: Dollars in millions; and, the parts may not equal the sum of the total due to rounding.

*Includes graduate medical students for whom medical schools reported teaching responsibilities.

**Calculations based on revenues and expenditures reported by 119 medical schools (73 public and 46 private).

†Calculated by multiplying average number of undergraduate medical students enrolled in 1980-81 (All U.S., 520); (Public, 526); and (Private, 511) and the estimated average cost-per-undergraduate medical student in 1981 ($25,900). See Table 39.

‡Calculated based on estimate that 46 percent of U.S. medical school expenditures are allocated to undergraduate and graduate medical education. See Table 32.

Sources: American Medical Association, "Medical Education in the United States," JAMA, 246, December 1981, and 248, December 1982.

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