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ABSTRACT

Trends in the supply of physicians in the United States and in the South are reviewed, along with physician distribution, retention of medical school graduates, minority physicians, and migration of physicians into the South. During the 1970s and 1980s, the 14 states making up the Southern Regional Education Board (SREB) region experienced explosive growth in physician supply relative to that of the nation. The region's rate of growth in the number of medical school graduates also surpassed the nation's. There are considerable variations in growth rates among the SREB states and in the distribution of physicians within the states. The more urban states not only had greater increases in the number of physicians, but physicians tended to be better distributed; the predominantly rural states experienced a persistent maldistribution of physicians. Many SREB states need to reassess their medical education needs in view of the South's increased retention of its medical school graduates and increased in-migration of physicians from outside the South. However, minority physicians, particularly black physicians, are underrepresented in relation to the proportion of minority population in the region. Focusing attention on graduate medical education programs and recruiting minority medical students are recommended. (SW)

SUPPLY AND DISTRIBUTION OF PHYSICIANS IN THE SOUTH: EFFECTS OF MIGRATION AND RETENTION PATTERNS

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FOREWORD

Historically, the Southern states which make up the region served by the Southern Regional Education Board have been short of physicians to meet the medical needs of their people. They also had fewer medical schools and residency training programs in which to educate young physicians. In addition, a significant portion of the region's new medical graduates migrated to other parts of the nation to set up their practices.

During the 1960s and 1970s the South doubled its undergraduate and graduate medical education capacity by establishing a dozen new medical schools, increasing the enrollments in existing schools, and developing new residency training programs. In addition, the expanding economy and the Sunbelt psychology of the South have reversed much of the emigration from the South. Indeed, the region has come to be a major importer of young physicians.

There has been a general awareness of these trends, but few studies have been done to demonstrate the extent of these changes. The staff of SREB has undertaken this report to let policymakers, and medical planners and educators, know just how extensive these changes have been and identify problems states will have to address. The major problems for most states lie in the areas of geographic and specialty distribution and in the recruitment and retention of black physicians rather than in the overall supply of physicians. In fact, the region has the potential to create a considerable oversupply of physicians in the metropolitan areas, but that surplus will do little to improve the shortages of black physicians and rural primary care practitioners unless specific strategies are directed to those needs.

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SUPPLY AND DISTRIBUTION OF PHYSICIANS IN THE SOUTH: EFFECTS OF MIGRATION AND RETENTION PATTERNS

INTRODUCTION

More physicians are moving into the South and fewer are leaving. Nearly three-fourths of the graduates of Southern medical schools are staying in the South to practice. Although there are no precise data on the total number of physicians in-migrating, the increase in the number of physicians in the region exceeded the total number of medical school graduates by 1,247 in 1981 and 1,461 in 1982. It is clear that in-migration is producing new physicians for the South in numbers that would compare to the graduates of 11 additional medical schools each graduating 133 graduates per year.

Increases in the years ahead may be expected because of the large numbers of students currently in the "medical education pipeline." Medical schools in the United States are now producing 16,000 new graduates each year. Most will spend 7 to 11 years to acquire a medical education--4 years in a medical school plus 3 to 7 years in an advanced medical education residency program before beginning to practice medicine. Although there are now limits on the number of foreign-born and-educated medical school graduates who can immigrate to the United States, the number of U.S. citizens entering foreign medical schools has not declined. This group is expected to add over 1,000 more physicians per year, at least through the next decade. In addition, osteopathic medical schools are producing over 1,000 graduates per year--a trend which is expected to continue through this decade and most of the 1990s.

Because two-thirds of all physicians have graduated from medical schools since 1960, and because the nation continues to have large numbers of new medical school graduates each year, there is now a much younger physician population. Therefore, for at least the next two decades, there should be a steady decline in the number of physicians who leave medical practice due to death or retirement. Thus, it is reasonable to expect that the total number of all physicians will increase by 18,000 or more per year through 1995. With no significant decline in the number of medical school graduates for the next 10 years, these annual increases are likely to continue into the next century.

Historically, physician shortages were experienced in the Southern states. During the 1960s, the South produced only a small portion of the nation's physicians, many of whom attended private schools and then left the region to practice. To meet physician manpower needs, states responded by increasing enrollments in existing schools and developing new schools of medicine. Between 1965 and 1980, 11 public and 3 private medical schools were established in the South--each with a substantial investment of state and federal funds. By 1980, roughly 82 percent of all medical students enrolled in Southern medical schools attended medical schools in their state of residence. State policymakers believed that limiting enrollments primarily to state residents would increase the retention of graduates. There was also a general belief that the production of large numbers of physicians would offset the traditional losses due to migration of physicians out of the region.

While most states have monitored the retention of their own medical school graduates, little attention has been given to how well the South as a whole retains its medical school graduates or the extent to which in-migration of physicians from other states and countries have affected the supply of physicians. This paper examines the changes in migration and retention patterns and their influence on the supply and distribution of physicians in the South.

THE SUPPLY OF PHYSICIANS

The American Medical Association reported a total of 501,958 federal and non-federal physicians in the United States as of December 1982. This was a 3.5 percent increase over the 485,123 physicians reported for December 1981. The Bureau of Health Professions of the U.S. Department of Health and Human Services, estimated that the number of physicians will range between 658,100 to 706,800 by the year 2000. The low estimate is based on an assumption that first-year enrollments will decline by 10 percent between 1982 and 1987; the basic estimate of 667,900 assumes a 5 percent decline in first-year enrollments between 1982 and 1987; the high estimate assumes essentially no decrease in the enrollment levels. The latter assumption projects a cumulative gain of 380,600 graduates between 1980 and the year 2000. Approximately 29 percent of the graduates (110,374 new physicians) will be produced by medical schools in the South.

First-year enrollments in medical schools have declined only marginally since 1982--0.5 percent between 1982 and 1983 and 0.3 percent between 1983 and 1984. If this trend continues, the

number of physicians in the United States is likely to exceed the high estimate by the Bureau of Health Professions. This would increase the number of allopathic physicians (M.D.s) per 100,000 population from 218 in 1982 to about 264 in the year 2000. When the increases in the number of osteopathic physicians (D.O.s) are added to the total supply of physicians (M.D.s and D.O.s), the ratio could reach 280 per 100,000 population by 2000. This would be a 21 percent increase between 1982 and 2000. Moreover, this rate of growth in the supply of physicians would be substantially higher than the growth rate expected for the population during the same time period.

Osteopathic physicians (D.O.s) tend to locate in states having osteopathic schools. Three states in the region--Texas, Florida, and West Virginia--now have osteopathic medical schools. In 1982 there were 19,171 D.O.s in the 50 states and the District of Columbia. Sixteen percent (3,065) were in the SREB states; of those, 78.3 percent were located in Florida and Texas. The numbers in the other SREB states ranged from 11 in Louisiana to 153 in Georgia. Although osteopathic physicians contribute to the medical services provided to the population of the region (in 1982 they comprised 2.3 percent of all physicians in the South), the balance of this report will refer only to allopathic physicians (M.D.s).

The supply of physicians in the South has increased at a higher rate than has been true for the nation. Between 1970 and 1982, the number of non-federal physicians per 100,000 population in the United States increased by 39.2 percent (from 148 to 206); in the South, the increase was 48.3 percent (from 120 to 178). Some

states in the South increased considerably more than others. For example, the increase for Maryland was 63.9 percent (from 183 to 300 physicians/100,000 population), while the increases for the other Southern states ranged from 40.2 percent in Texas to 57.6 percent in Virginia (see Table 1).

Although the ratio of physicians-to-population in the South has historically been behind the national average, the rapid growth in the number of physicians is narrowing the gap. In 1970, the South's ratio was 81.1 percent of the United State's ratio; that had increased to 86.4 percent by 1982. Interestingly, the relative status of each Southern state has varied little during the past 12 years. Those with the highest physician-to-population ratios in 1970--Maryland with 183, Florida with 155--continued to attract physicians in sufficient numbers so that their ratios remained higher than other Southern states in 1982--Maryland 300 and Florida 219. Those with the lowest ratios also maintained their relative status.

The South's higher rate of growth in number of medical school graduates, number of physicians, and population is more apparent when the South's percentage change for each item is compared with that of the United States as a whole. Table 2 reveals a steady increase in the number of non-federal physicians from 1970 to 1982. From 1970 to 1975, the number of physicians in the United States increased 19.4 percent, compared to 27.7 percent in the South. By 1982, the number of physicians nationally had increased 58.8 percent, while the South's increase was 86.7 percent. The largest percentage increase was in the number of medical school

Table 1

Ratios of Non-Federal Physicians to Civilian Population;
Rank, and Relative Increase
United States and SREB States
1970-1982

	Physicians per 100,000 Population		Rank Order of SREB States		Relative Increase
	1970	1982	1970	1982	1970-1982
United States	148	206	-	-	39.2%
SREB States	120	178	-	-	48.3
South as Percent of U.S.	81.1	86.4	-	-	-
Maryland	183	300	1	1	63.9
Florida	155	219	2	2	41.3
Virginia	125	197	3	3	57.6
Louisiana	120	170	4	5	41.7
Tennessee	119	172	5	4	44.5
Texas	117	164	6	7	40.2
North Carolina	111	170	7	5	53.2
Georgia	108	156	8	8	44.4
West Virginia	104	153	9	9	47.1
Kentucky	102	151	10	10	48.0
South Carolina	93	131	11	13	40.9
Arkansas	92	140	12	11	52.2
Alabama	90	139	13	12	54.4
Mississippi	84	120	14	14	42.9

Source: American Medical Association, Physician Characteristics and Distribution in the U.S., 1983 Edition, 1984.

Table 2

Percent Change from 1970 in Number of Medical School Graduates, Non-Federal Physicians, and Civilian Population
United States and SREB States
1970 to 1975, 1979, 1980, 1981, and 1982

	Number	Percent Change from 1970				
	1970	1975	1979	1980	1981	1982
Medical School Graduates						
U.S.	8,367	52.0%	78.9%	80.9%	87.2%	91.0%
SREB	2,334	49.6	84.3	82.1	98.5	102.4
Non-Federal Physicians						
U.S.	298,745	19.4	43.0	47.1	52.6	58.8
SREB	69,599	27.7	62.3	70.9	77.9	86.7
Civilian Population*						
U.S.	201,722	4.8	8.3	11.8	13.0	14.1
SREB	58,209	8.7	14.5	21.3	23.4	25.6

*Population in millions

Sources: American Medical Association, "82nd Annual Report on Medical Education in the U.S., 1981-82." JAMA December 1982, and prior reports; American Medical Association, Physician Characteristics and Distribution in the U.S., 1983 Edition, 1984, and prior editions; and U.S. Bureau of the Census, Current Population Reports, Series P. 25, No. 944, U.S. Government Printing Office, January 1984, and prior issues (Nos. 450, 876, 911).

graduates. Between 1970 and 1982, it was 91 percent for the United States compared to 102.4 percent for the South. A similar but less pronounced trend is seen for the population. Civilian population in the United States increased by 14.1 percent for the 12-year period, while the South's population increased 25.6 percent. Clearly, the growth rate in the number of medical school graduates and in the number of physicians has been significantly greater than that of the population for both the U.S. and the South--but the South's rate of growth in each category has outstripped the United States.

While the relative increase in the ratio of physicians per 100,000 varies by state, a greater variation is found when growth in the actual number of non-federal physicians is compared. The average growth rate in numbers of physicians in the region between 1970 and 1980 was 70.9 percent, compared to 47 percent for the nation. Table 3 reveals that the growth rate varies significantly by state, ranging from a low of 50.6 percent for West Virginia to a high of 95.2 percent for Florida. The number of physicians increased by more than 70 percent in four SREB states; between 60 and 70 percent in six states; and in only four states--Kentucky, Louisiana, Mississippi, and West Virginia--was the rate of growth below 60 percent.

Some changes in growth patterns are seen when the rate of increase between 1970 and 1980 is compared to that found between 1980 and 1982. Four states with the lowest growth rate between 1970 and 1980 essentially equaled or exceeded the region's average of 9.2 percent for 1980-1982. The number of non-federal

Table 3

Number of Non-Federal Physicians and Percent Change
United States and SREB States
1970-1980 and 1980-1982

	1970	1980	Percent Change 1970-1980	1982	Percent Change 1980-1982	Estimated* 1990	Estimated* Percent Change 1982-1990
United States	298,745	439,301	47.0%	474,401	8.0%	626,209	32.0%
SREB States	69,599	118,939	70.9	129,909	9.2	177,715	36.8
South as a Percent of U. S.	23.3	27.1	--	27.4	--	28.4	--
Alabama	3,061	5,039	64.6	5,436	7.9	7,154	31.6
Arkansas	1,767	2,939	66.3	3,207	9.1	4,374	36.4
Florida	10,437	20,374	95.2	22,683	11.3	32,936	45.2
Georgia	4,879	8,060	65.2	8,718	8.2	11,578	32.8
Kentucky	3,261	5,059	55.1	5,515	9.0	7,500	36.0
Louisiana	4,323	6,752	56.2	7,405	9.7	10,278	38.8
Maryland	7,105	11,745	65.3	12,678	7.9	16,684	31.6
Mississippi	1,849	2,797	51.3	3,066	9.6	4,243	38.4
North Carolina	5,524	9,354	69.3	10,089	7.9	13,277	31.6
South Carolina	2,349	4,362	85.7	4,711	8.0	6,219	32.0
Tennessee	4,658	7,460	60.2	7,990	7.1	10,259	28.4
Texas	12,977	22,511	73.5	24,927	10.7	35,596	42.8
Virginia	5,586	9,682	73.3	10,482	8.3	13,962	33.2
West Virginia	1,823	2,745	50.6	3,002	9.4	4,131	37.6

*Estimate based on the assumption that growth will continue at the rate experienced between 1980 and 1982.

Source: American Medical Association, Physician Characteristics and Distribution in the U.S., 1983 Edition, 1984.

physicians in the South is continuing to increase at a faster rate than that of the United States. States in the region that have historically experienced significant shortages are now experiencing growth at rates that equal or exceed those of the nation and the region. Despite these changes, Florida continued to lead the region's growth, with an 11.2 percent increase between 1980 and 1982.

If we assume that the growth pattern seen for the region between 1980 and 1982 continues through 1990, there should be a 36.8 percent growth rate for the South compared to 32 percent for the U.S. If the growth in population in the South continues at the same rate and the economy of the South continues to grow, the rate of increase in number of physicians could exceed the estimated 36.8 percent by 1990.

PHYSICIAN DISTRIBUTION

All of the SREB states have counties or parts of counties designated as primary care health manpower shortage areas by the Secretary of Health and Human Services. These designations are for the purpose of placing National Health Service Corps physicians who have received federal financial assistance in completing their medical education and are obligated to serve in shortage areas. Most of the shortage areas are in rural areas, although some are in the inner cities.

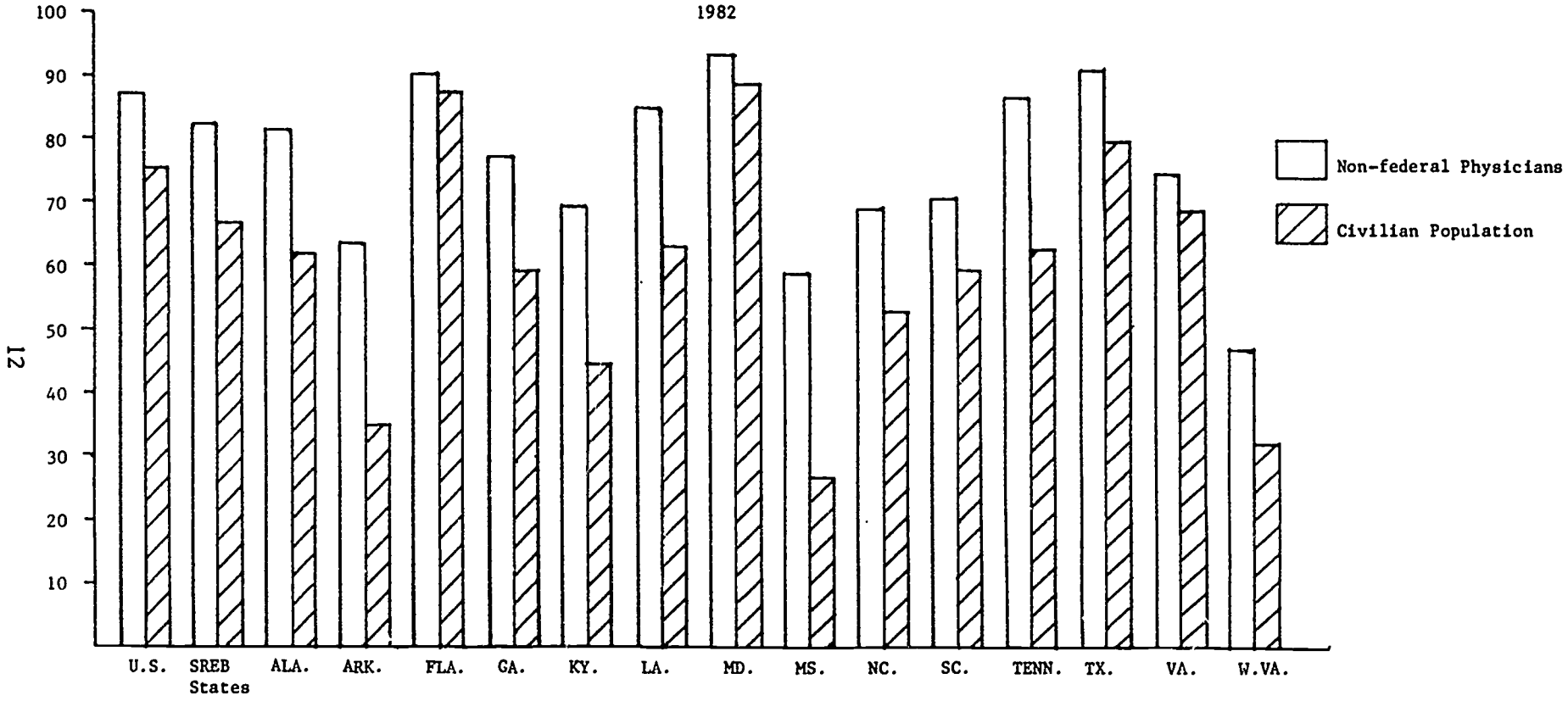
The predominantly rural states tend to have the greatest maldistribution, and physicians tend to concentrate in the more urbanized areas, even in rural states. Thus, the ratio of

physicians per 100,000 varies significantly between urban and non-urban areas. One should expect to find greater physician density in the urban areas because specialists, for the most part, must be concentrated where the population is large enough to accommodate the use of the highly technical equipment and technicians associated with the ever increasing specialization of medicine. There do not appear to be any firm guidelines suggesting how many and what type of physician specialists should be practicing in the urban areas, but there is a growing consensus that the urban areas already have an oversupply of tertiary care physicians--particularly surgeons and radiologists. The increase in the number of specialists found in non-metropolitan counties (25,000 to 50,000 population) suggests that overcrowding in the urban areas is forcing specialists into smaller cities where they do some primary care in addition to their specialty work. The greatest need in all areas, but especially in rural areas, is for primary care physicians, particularly those who specialize in family practice. Studies show that the retention of family practitioners in rural areas is greater than for other primary care specialties, such as pediatricians, obstetricians, and internists.

The extent of the concentration of physicians in the metropolitan areas can be seen in Figure 1. In 1982, 87.6 percent of all non-federal physicians and 74.8 percent of the civilian population in the United States were in Metropolitan Statistical Areas (MSAs); the South had 82.3 percent of the physicians and 66.7 percent of the population in MSAs. Although MSA and non-MSA data analysis will not identify physician distribution problems in

Figure 1

Percent of Non-Federal Physicians and Civilian Population in Metropolitan Areas
United States and SREB States
1982



Sources: American Medical Association. Physician Characteristics and Distribution in the U.S., 1983 Edition, 1984; and University of Georgia, Computing and Information Services, "1980 Census of Population and Housing Summary Tape File," (STF 3C), June 1985.

inner cities and the more sparsely populated rural counties, these designations do provide a sufficiently sharp contrast to signify a marked imbalance in physician distribution in most of the rural states. For example, in 1982, Mississippi had 59 percent of its physician population in its metropolitan areas, while only 27 percent of the population lived in these areas. Florida and Maryland are predominantly urban states with roughly comparable proportions of the physicians (over 90 percent) and populations (88 percent) in metropolitan areas. Arkansas, Kentucky, Mississippi, and West Virginia are the most rural of the Southern states. The smallest proportion of their population is in metropolitan areas and, with the exception of West Virginia, the majority of their physicians are in the urban areas. West Virginia is a very rural state. Only 10 of its 55 counties were classified as metropolitan in 1982. Over one-third of the physicians in the state are located in the largest non-metropolitan counties (50,000 or more people); only 20 percent are in the smallest rural counties where 47 percent of the population resides. Texas is another example of the imbalance--80 percent of Texas' population resides in metropolitan areas served by 91.3 percent of the state's physicians; 20 percent of the population is in rural areas that contain 8.7 percent of the physicians. These proportions do not appear to present a serious problem until one considers the fact that of the 254 counties in Texas, 54 contain 91.3 percent of the physicians and 80 percent of the population of the state; 200 Texas counties account for only 8.7 percent of the physicians and 20 percent of the population--a rather clear picture of the state's maldistribution.

In general, the smaller counties--those with populations under 10,000 and no town having more than 2,500 population--are the most severely medically underserved. The exceptions are those small counties that are located adjacent to metropolitan areas where transportation into the metropolitan area is readily available.

When metropolitan and non-metropolitan areas are compared by the number of physicians per 100,000 population, there are, with few exceptions, wide differences in the availability of physicians. Metropolitan areas in both the United States and the South have adequate numbers of physicians. For the nation in 1981 there were 231 non-federal physicians per 100,000 civilian population in the metropolitan areas, compared to 111 for the non-metropolitan areas. For the South, these ratios were 215 and 99, respectively. Although physician shortages exist in some inner-city areas, this is often more related to economics than to availability of physicians. For many rural areas the problem is often two-fold--there are no physicians available within reasonable distances of the population and many persons cannot afford to travel or to pay for services in neighboring communities.

Disparities between physicians per 100,000 population in metropolitan and non-metropolitan areas are generally more pronounced in states with large rural areas. In the region, the ratio of physicians/100,000 population in metropolitan areas to physicians/100,000 population in non-metropolitan areas ranged from 1.4:1 in Florida to 3.4:1 in Louisiana in 1981. Eight states--Alabama, Arkansas, Georgia, Kentucky, Louisiana, Mississippi, Tennessee, and Texas--had more than two physicians in metropolitan

areas for every physician in non-metropolitan areas (see Table 4). It appears that West Virginia, South Carolina, and North Carolina have made great strides in improving the distribution of physicians in the non-metropolitan areas, since their ratios of metro and non-metro physicians per 100,000 population are comparable to the more urban states in the region--less than two to one. However, as has been noted, states may experience increases in the density of physicians in the more populated non-metropolitan counties.

More important is the need to recognize that an oversupply of physicians in the urban and more populated non-urban counties will have little effect on physician distribution to the most rural counties (those with less than 10,000 population having no town with over 2,500) unless states undertake a variety of strategies designed to influence the type of practice and the practice location of their medical school graduates. Thus, increasing the number of physicians trained in family practice or one of the other primary care specialties improves the chance that more physicians will elect to practice in rural areas. Increasing the numbers of other specialties, such as surgeons, urologists, and radiologists, almost guarantees that they will elect to practice in the more urbanized areas. Similarly, selecting medical students from rural areas will increase the number of physicians electing to practice in rural areas. As Harold McPheeters noted in an earlier SREB report, all the strategies designed to influence the distribution of physicians are important but success is greater when several strategies are combined. Strategies include selective recruitment

Table 4

Non-Federal Physicians Per 100,000 Civilian Population
by Metropolitan and Non-Metropolitan Areas
United States and SREB States
1981

	Metropolitan Areas	Non-metropolitan Areas	Ratio of Metropolitan to Non-metropolitan Physicians
United States	231	111	2.1:1
SREB States	215	99	2.2:1
South as a Percent of U.S.	93.1	89.2	
Alabama	179	85	2.1:1
Arkansas	219	80	2.8:1
Florida	229	167	1.4:1
Georgia	197	94	2.1:1
Kentucky	227	81	2.8:1
Louisiana	227	66	3.4:1
Maryland	301	204	1.5:1
Mississippi	216	79	2.7:1
North Carolina	217	113	1.9:1
South Carolina	168	119	1.4:1
Tennessee	228	69	3.3:1
Texas	191	77	2.5:1
Virginia	205	165	1.2:1
West Virginia	183	125	1.5:1

Sources: American Medical Association, Physician Characteristics and Distribution in the U.S., 1982 Edition 1983; and University of Georgia, Computing and Information Services, "1980 Census of Population and Housing Summary Tape File," (STF 3), June 1985.

and admissions, instruction and clinical training in rural areas, financial assistance, counseling, and community assistance in setting up practice in rural areas.

RETENTION OF MEDICAL SCHOOL GRADUATES

In the past, the South exported a considerable number of its new medical school graduates to states outside the region because 1) a large portion of the older established medical schools in the South were private, drawing many of their students from outside the region; and 2) residency programs in the South were not as numerous or as prestigious as those found in states outside the region. Graduates whose home state was outside the region often went home to practice; and many graduates who were from the South received their specialty training outside the region and then elected to remain in those states to practice.

As the number and quality of residency programs and the number of public medical schools increased, states in the region began to retain more of their graduates. In 1967, the South retained only 57.8 percent of its medical school graduates, in contrast to 71 percent by 1979, the last year for which data by school of graduation are available (see Table 5).

Retention rates of graduates in their state of graduation varied by medical school. In 1967, the average in-state retention rate of medical school graduates was 42.1 percent. In 1979, the average was 44 percent; the range was from 10 percent to 71.7 percent, and the median 44.9 percent. For 12 of the region's 33 medical schools

Table 5

Number and Percent of Federal and Non-federal Physicians
who are Graduates of Medical Schools in the South,
by Practice Location
1967 and 1979

	All Graduates	Practice Location: State of Graduation		SREB States*		Outside SREB States	
		Number	Percent	Number	Percent	Number	Percent
1967	56,315	23,734	42.1%	32,581	57.8%	23,764	42.2%
1979	89,469	39,480	44.1	63,528	71.0	25,941	29.0

*Includes the numbers that are practicing in state of graduation.

Sources: American Medical Association, Medical School Alumni, 1967, Chicago, 1968; and U.S. Department of Health and Human Services, Characteristics of Physicians, 1979, published as individual volumes by state, 1982.

having graduates by 1979, over 50 percent of the graduates remained in the state where they had graduated (11 of the 12 were public medical schools). Texas, Louisiana, Alabama, South Carolina, Georgia, and Mississippi retained the highest proportion of their public medical school graduates; the schools with the lowest proportion tended to be the private schools or public schools located in the border states (see Table 6.)

The medical school with the largest proportion of its graduates remaining in the South was Louisiana State University at Shreveport, with 87.3 percent. It is understandable that all but two of the schools that ranked in the top 16 in terms of percent of graduates remaining in the region are public schools. The exceptions are Emory University with 80.6 percent of its graduates in SREB states and Bowman Gray with 72.1 percent. Nine of the sixteen schools ranked below the median are private schools and seven are public; five of the seven public schools are located in border states of the region.

Meharry Medical College, one of two predominantly black medical colleges that accepted black students from all parts of the nation prior to desegregation, has served the South well. The Southern states, through interstate contract arrangements with Meharry Medical College, have assured many black students access to medical education. The 42.5 percent of Meharry Medical College's graduates retained by Southern states compares favorably with the South's average in-state retention rate of 44.1 percent.

Although the average in-state retention rate for medical school graduates increased by only 2 percent between 1967 and 1979, the South as a region increased the retention of its medical school

Table 6

Number of Federal and Non-federal Physicians who are Graduates of Medical Schools in SREB States; Percent of Those who Remained in State of Graduation and Those in SREB States, Ranked by School of Graduation
December 1979

School of Graduation	Number of Graduates	Percent in State of Graduation	Rank	Percent in SREB States	Rank
University of Texas-Galveston	5,589	71.7%	1	79.3%	11
University of Texas-Houston	364	68.7	2	80.5	9
University of Texas-Dallas	3,356	65.3	3	74.5	15
Louisiana State University-Shreveport	315	60.3	4	87.3	1
Louisiana State-New Orleans	4,273	59.6	5	84.5	5
University of Alabama-Birmingham	2,535	57.8	6	83.5	6
Medical College of South Carolina	3,274	57.2	7	86.6	2
University of Texas-San Antonio	918	57.1	8	69.7	21
Texas Tech	193	57.0	9	70.5	19
Medical College of Georgia	3,631	55.7	10	86.5	3
Baylor College of Medicine (Texas)	3,905	55.0	11	64.8	27
University of Mississippi	1,783	51.7	12	86.1	4
University of Arkansas	3,522	49.9	13	75.6	14
University of South Alabama	197	49.2	14	82.2	7
University of North Carolina	1,967	48.8	15	77.7	13
University of Miami (FL)	2,147	48.5	16	65.5	25
University of Tennessee	6,622	44.9	17	80.2	10
University of South Florida	301	41.9	18	78.7	12
Eastern Virginia Medical School	165	41.8	19	66.1	24
Medical College of Virginia	4,376	41.8	19	70.8	18
University of Louisville	4,340	41.4	21	61.6	30
University of Florida	1,284	41.2	22	71.3	17
Bowman Gray (NC)	1,953	40.8	23	72.1	16
Emory University (GA)	3,232	40.4	24	80.6	8
University of Kentucky	1,226	40.2	25	65.3	26
University of Maryland	5,044	38.5	26	58.2	31
West Virginia University	1,134	33.9	27	67.0	23
University of Virginia	3,402	27.9	28	64.8	27
Vanderbilt University (TN)	2,628	25.1	29	70.2	20
Duke University (NC)	3,337	23.6	30	62.3	29
Tulane University (LA)	5,824	18.8	31	69.3	22
Johns Hopkins (MD)	4,083	18.8	32	40.6	33
Meharry Medical School (TN)	2,644	10.0	33	42.5	32
All schools					
Average	-	44.1	-	71.0	
Median	-	44.9	-	71.3	

Schools in bold print are private.

Note: The above does not include graduates from the seven newest medical schools in the region since there were no graduates prior to 1979.

Source: U.S. Department of Health and Human Services, Characteristics of Physicians, 1979, published as individual volumes by state, 1982.

graduates from roughly 58 of every 100 graduates in 1967 to 71 per 100 graduates in 1979. With the steady growth in both the economy and the population of the South, the proportion of medical school graduates that remain in the region could easily exceed 80 percent by 1990.

MINORITY PHYSICIANS

Very limited information is available on the supply, distribution, or migration patterns of minority physicians. The American Medical Association does not include questions about race on their annual survey of physicians, and such information is not routinely collected by state licensure boards. Crude estimates of the number of minority physicians by place of residence were obtained from the 1980 census data. The accuracy of the census data is affected by errors in classification and its reliance on self-reporting for job titles. With those caveats, the data provided the following distribution trends.

In 1980, nearly one half of all Hispanic physicians resided in the South, with the heaviest concentration (30 percent) in the South Atlantic Division (Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, and West Virginia). Hispanic physicians comprised 7 percent of all physicians in the South, where Hispanics represent 6 percent of the population. However, in the West South Central Division of the South (Arkansas, Louisiana, Oklahoma, and Texas), Hispanics comprise 13 percent of the population and only 7 percent of all physicians.

The heaviest concentration of black physicians was in the South--estimated to comprise 4 percent of all physicians--but that is significantly below the 19 percent representation of blacks in the population. The black physicians per 100,000 black population in the South was estimated to be 33 per 100,000 compared to 185 white physicians per 100,000 white population. Clearly black physicians are the most underrepresented minorities in the physician population of the South. Unfortunately, blacks as a proportion of all medical students have declined recently in the United States and the South. Increased efforts should be made to recruit and retain black medical students and to recruit more black physicians into the South.

MIGRATION OF PHYSICIANS INTO THE SOUTH

Precise data on the migration patterns of physicians are not readily available, but data compiled by the American Medical Association for 1967, 1975, and 1979 provides a breakdown of the practice location of non-federal physicians by state and county of graduation. With these data, and comparing the increase in the number of physicians in the South with the number of medical school graduates, a fairly reliable approximation of in-migration can be determined.

As noted earlier, the region as a whole is now retaining nearly three-fourths of a substantially increased number of medical school graduates. However, because of the in-migration, the proportion of the South's practicing physicians who are graduates of Southern

schools has steadily declined. In 1967, 59.8 percent of the non-federal physicians in the South were graduates of medical schools in SREB states; 30.7 percent were graduates from schools in other states and Canada; and 9.5 percent were graduates from schools located outside the United States and Canada. The proportion of graduates from schools in the region declined to 56.5 percent by 1975, and to 53.9 percent in 1979; the proportion from other states and Canada declined to 28.1 percent in 1975, but increased to 29 percent by 1979.

The most significant change was in the proportion of foreign medical school graduates (those from outside the U.S. and Canada). This proportion almost doubled between 1967 and 1975--from 9.5 percent to 15.3 percent. The proportion of foreign medical school graduates continued to increase, but at a much slower rate of growth, reaching 17.1 percent in 1979 (see Table 7). With the recent restrictions on the numbers of foreign medical school graduates permitted into the United States, the number of foreign medical school graduates as a proportion of all physicians should begin to reverse by the late Eighties. Figure 2 illustrates the growth pattern associated with in-migration of physicians into the South.

It is reasonable to assume that all states in the South have attracted new physicians from outside the region, however, when the increase in the number of non-federal physicians is compared to the number of medical school graduates, it is clear that some states are major importers of physicians while others continue to experience a slight net out-migration of physicians. For 1981 and

Table 7

Non-Federal Physicians in the South,
by Location of School of Graduation
1967, 1975, and 1979

	1967		1975		1979	
	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total
SREB States	43,157	59.8%	50,253	56.5%	60,905	53.9%
Other States and Canada	22,109	30.7	24,991	28.1	32,756	29.0
Outside the U.S. and Canada	6,855	9.5	13,634	15.3	19,282	17.1

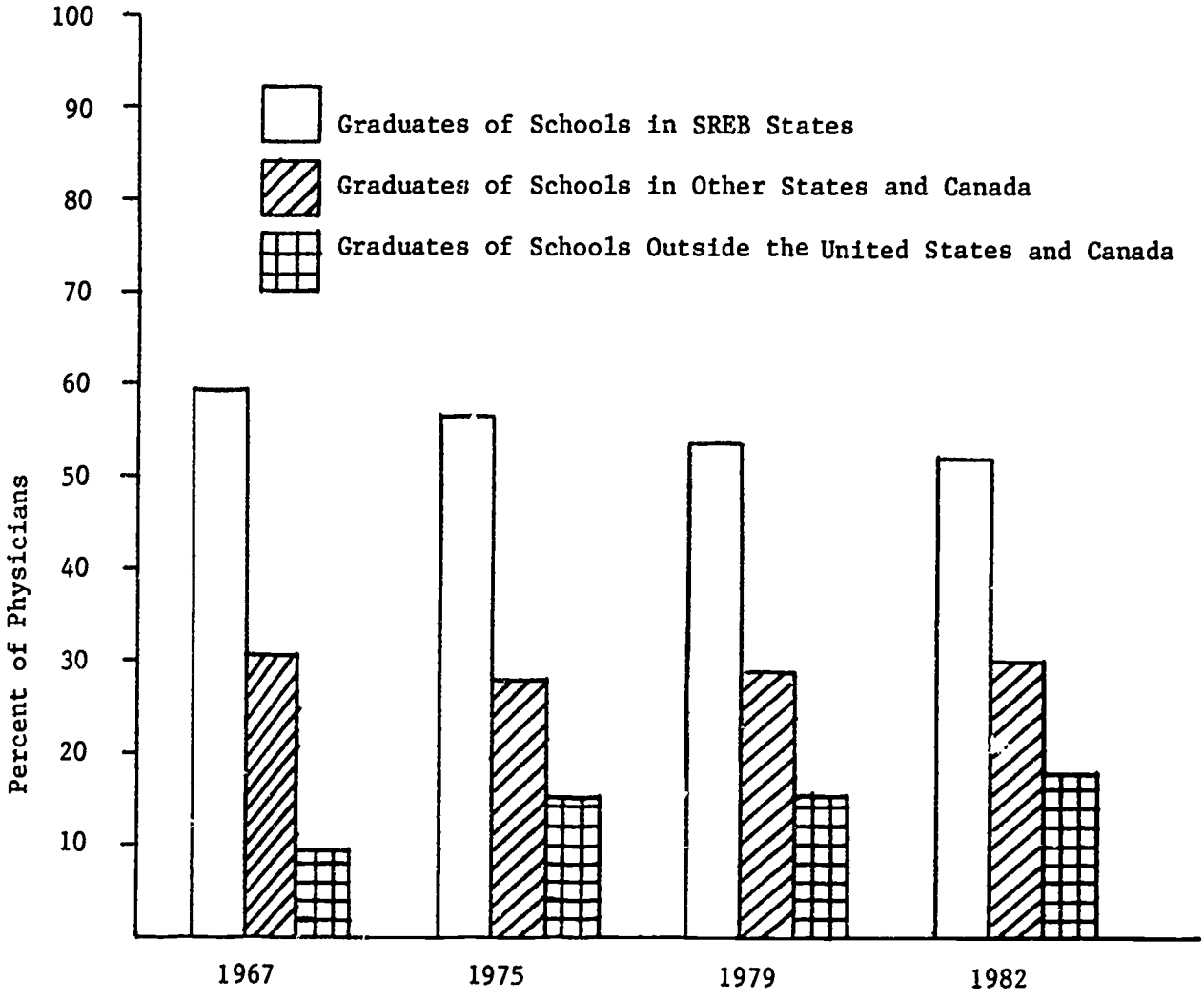
Sources: American Medical Association, Medical School Alumni, 1967, 1968; and U. S. Department of Health and Human Services, Characteristics of Physicians, 1975, and 1979, published as individual volumes by state, 1977 and 1982, respectively.

1982, in the nation and in the South, the increase in the number of federal and non-federal physicians exceeded the number of medical school graduates. Even though the South produced roughly 29 percent of the medical school graduates in the United States for the two years, the region's increase in number of physicians represented 33.3 percent of the growth in the U.S. in 1981 and 36.1 percent in 1982 (see Table 8).

Table 9 shows the degree to which individual states in the region varied in terms of in-migration or net loss of physicians. For the nation, the increase in the number of physicians as a

Figure 2

Percent of Non-federal Physicians in SREB States,
By State and Country of Graduation
1967, 1975, 1979, and 1982*



*Note: Estimated percentages: Data by state unavailable for 1982.

Sources: American Medical Association, Medical School Alumni, 1967, 1968; and U.S. Department of Health and Human Services, Characteristics of Physicians, 1975 and 1979, published as individual volumes by state, 1977 and 1982, respectively.

Table 8

Comparison of the Number of Medical School Graduates
with the Increase in Numbers of Federal
and Non-federal Physicians
United States and SREB States
1981 and 1982

	Number of Medical School Graduates		Increase in Number of Physicians	
	1981	1982	1981	1982
United States	15,667	15,985	17,444	16,835
SREB States	4,564	4,622	5,811	6,083
South as a Percent of U.S.	29.1	28.9	33.3	36.1
Alabama	231	234	240	208
Arkansas	136	134	125	133
Florida	387	377	1,127	1,223
Georgia	307	301	427	392
Kentucky	238	258	233	228
Louisiana	416	425	295	346
Maryland	293	298	616	583
Mississippi	415	146	112	146
North Carolina	414	405	375	424
South Carolina	188	181	202	198
Tennessee	395	403	269	291
Texas	935	964	1,140	1,330
Virginia	376	388	420	457
West Virginia	103	108	130	124

Sources: American Medical Association, Physician Characteristics and Distributions in the U.S., 1983 Edition, 1984, and prior editions; American Medical Association, "82 Annual Report on Medical Education in the U.S., 1981-82," JAMA, December 1982, and prior reports.

Table 9

Relative Migration: Increase in Number of Federal and Non-federal Physicians as a Percent of Medical School Graduates
United States and SREB States
1981 and 1982

	1981	1982
United States	111.3%	105.3%
SREB States	127.3	131.6
South as a Percent of U.S.	-	-
Alabama	103.9	88.9
Arkansas	91.9	99.3
Florida	291.2	324.4
Georgia	139.1	130.2
Kentucky	97.9	88.4
Louisiana	70.9	81.4
Maryland	210.2	195.6
	210.2	195.6
Mississippi	77.2	[illegible]0.0
North Carolina	90.6	104.7
South Carolina	107.4	109.4
Tennessee	68.1	72.2
Texas	132.6	138.0
Virginia	111.7	117.8
West Virginia	126.2	114.8

Sources: American Medical Association, Physician Characteristics and Distribution in the U.S., 1983 Edition, 1984, and prior editions.; American Medical Association "82 Annual Report on Medical Education in the U.S., 1981-1982," JAMA, December 1982, and prior reports.

percent of medical school graduates was 111.3 percent in 1981 and 105.3 percent in 1982. In contrast, for the South the increase was 127.3 percent and 131.6 percent, respectively. States within the South varied from a low of 68.1 percent in 1981 for Tennessee to a high of 324.4 percent for Florida in 1982. For both years, the number of physicians increased more than the number of medical school graduates in seven SREB states--Florida, Georgia, Maryland, South Carolina, Texas, Virginia, and West Virginia. Florida and Maryland have experienced the greatest in-migration of physicians--for Florida, the increase represents retention of 100 percent of the graduates from the three medical schools in Florida plus in-migration of the equivalent of graduates from 6.7 additional medical schools averaging 125 graduates per year.

Some of the more rural states tend to be net exporters of physicians. Tennessee's lower retention of its medical school graduates may be due to the fact that two of the three medical schools in the state are private, and that traditionally, some 50 percent of Meharry Medical College's graduates set up their practices outside the region. The 1982 physician increase in North Carolina was 104.7 percent of the number of medical school graduates from one public and two private schools in the state compared to 72.2 percent for Tennessee. From these data, one can assume that North Carolina not only retains more of its own medical school graduates but also experiences more in-migration of physicians than does Tennessee.

SUMMARY AND RECOMMENDATIONS

Over the decade of the Seventies and continuing into the Eighties, the SREB region experienced an explosive growth in physician supply relative to that of the nation. These growth rates were seen for both the absolute numbers of physicians as well as the proportion of physicians per 100,000 population. The SREB region still lags behind the nation in the number of non-federal M.D.s per 100,000 population (178/100,000 vs. 206/100,000), but the gap is steadily narrowing. Of the nation's non-federal physicians, 23 percent were located in the South in 1970 compared to 27 percent in 1982.

The growth rate in the number of medical school graduates and the number of physicians has exceeded the population growth rate for both the United States and the South, with the region's rate of growth in each category outstripping the nation's.

As might be expected, the more populated states experienced the highest rate of growth. However, between 1980 and 1982 the number of physicians in those states that had the lowest rate of growth between 1970 and 1980 began to increase at rates comparable to the regional and national averages. If the same rate of growth continues through 1990, the number of physicians in the South is expected to increase by approximately 37 percent by the end of the decade.

In spite of the large increases in numbers of physicians in the South, there are considerable variations in growth rates among the states and in the distribution of physicians within the states. The more urban states not only had greater increases in the number

of physicians, but physicians tended to be better distributed; the predominantly rural states experienced a persistent maldistribution of physicians. Overall, the disparity among states was less evident when only the metropolitan areas were considered. In 1982, 11 of the 14 SREB states had more than 190 non-federal physicians per 100,000 civilian population in the urban areas; only 7 of 14 had more than 90 per 100,000 population in the rural areas.

Although the increase in the average retention rate of medical school graduates by individual states has not been remarkable, the South as a region experienced a considerable shift from its historical out-migration pattern. In 1979, 71 percent of the region's medical school graduates were practicing in the South, compared to 57.8 percent in 1967. This trend should continue with the region estimated to retain over 80 percent of its medical school graduates by 1990.

The rapid growth in the number of physicians in the South is only partially attributable to increased numbers of Southern medical school graduates remaining in the South. For 1981 and 1982, in-migration added new physicians at a rate that would equal the graduates of 11 additional medical schools averaging 133 graduates per year. However, minority physicians, particularly black physicians, are underrepresented in relation to the proportion of minority population in the region.

In view of the South's increased retention of its medical school graduates and increased in-migration of physicians from outside the South, many states in the region should reassess their medical education needs. Those states with high physician/population ratios and high in-migration patterns should increase

efforts to concentrate their medical education resources on special areas of need, such as rural areas or public services. States with low physician/population ratios tend to be the more rural states that have lower retention rates and chronic maldistribution patterns. These states should focus on increasing retention of their medical school graduates as well as improving the distribution of physicians.

Some states could more effectively use their medical education resources by reducing undergraduate enrollments and shifting their support to graduate medical education positions in the primary care specialties, and strengthening programs to influence the distribution of physicians to geographic areas and settings where they are most needed. All states should give particular attention to their graduate medical education programs by focusing on those that produce the kinds of physician specialists needed to meet most urgent physician manpower requirements of the individual states.

By almost any projection of need, there appears to be an adequate or more than adequate supply of surgeons and medical subspecialists and not enough generalists in most states. Because physicians who specialize in one of the primary care specialties are more needed and tend to distribute themselves more evenly than do other specialties, incentives may be necessary not only to attract more medical school graduates into the primary care specialties but to retain them in the state and in those areas of a state where they are most needed.

In spite of the rapid increases in the number of physicians, minority physicians, particularly black physicians, are clearly

underrepresented in the physician population. Efforts should be made to recruit and retain minority medical students and to recruit minority physicians into the states of the South in sufficient numbers to improve the imbalance in the proportional distribution of minority physicians in relation to the minority population.

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