### Infant Mortality

**No. 120. Infant, Maternal, and Neonatal Mortality Rates and Fetal Mortality Ratios, by Race: 1970 to 1991**

<table>
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<tr>
<td>Infant deaths 1</td>
<td>20.4</td>
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<td>17.6</td>
<td>15.2</td>
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<tr>
<td>White</td>
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<td>12.1</td>
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<tr>
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<td>14.6</td>
<td>14.1</td>
<td>13.6</td>
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<td>13.6</td>
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<td>19.2</td>
<td>18.4</td>
<td>18.0</td>
<td>17.7</td>
<td>17.5</td>
<td>17.3</td>
<td>17.3</td>
<td>17.3</td>
<td>17.3</td>
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<tr>
<td>White</td>
<td>17.0</td>
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<td>15.0</td>
<td>14.0</td>
<td>14.0</td>
<td>13.0</td>
<td>13.0</td>
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<td>13.0</td>
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<tr>
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<td>8.5</td>
<td>8.5</td>
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<td>16.0</td>
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<tr>
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<tr>
<td>White</td>
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<td>10.0</td>
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<tr>
<td>Black and other</td>
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<td>16.0</td>
<td>15.0</td>
<td>14.0</td>
<td>14.0</td>
<td>13.0</td>
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**No. 121. Fetal and Infant Deaths—Number and Percent Distribution: 1970 to 1990**

<table>
<thead>
<tr>
<th>YEAR</th>
<th>Total</th>
<th>Early 1</th>
<th>Late 2</th>
<th>Neonatal 3</th>
<th>Postneonatal 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Early 1</td>
<td>Late 2</td>
<td>Neonatal 3</td>
<td>Postneonatal 4</td>
</tr>
<tr>
<td>1970</td>
<td>127,629</td>
<td>17.50%</td>
<td>4.40%</td>
<td>45.69%</td>
<td>35.31%</td>
</tr>
<tr>
<td>1980</td>
<td>167,460</td>
<td>17.00%</td>
<td>4.39%</td>
<td>45.60%</td>
<td>35.01%</td>
</tr>
<tr>
<td>1985</td>
<td>193,940</td>
<td>17.00%</td>
<td>4.39%</td>
<td>45.60%</td>
<td>35.01%</td>
</tr>
<tr>
<td>1990</td>
<td>224,250</td>
<td>17.00%</td>
<td>4.39%</td>
<td>45.60%</td>
<td>35.01%</td>
</tr>
</tbody>
</table>

**No. 122. Infant Deaths, by Cause of Mortality: 1980 to 1991**

<table>
<thead>
<tr>
<th>CAUSE OF DEATH</th>
<th>NUMBER</th>
<th>PERCENT DISTRIBUTION</th>
<th>INFANT MORTALITY RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>51,634</td>
<td>51.3%</td>
<td>0.7%</td>
</tr>
<tr>
<td>Congenital anomalies</td>
<td>2,720</td>
<td>2.7%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Sudden infant death syndrome</td>
<td>1,640</td>
<td>1.6%</td>
<td>0.3%</td>
</tr>
<tr>
<td>Respiratory distress syndrome</td>
<td>1,190</td>
<td>1.2%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Disorders relating to short gestation and unspecified low birth weight</td>
<td>2,610</td>
<td>2.6%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Newborn affected by maternal complications of pregnancy</td>
<td>3,410</td>
<td>3.4%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Intraventricular hemorrhage and birth asphyxia</td>
<td>1,570</td>
<td>1.6%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Infectious diseases specific to the perinatal period</td>
<td>1,190</td>
<td>1.2%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Neonatal affected by complications of placenta, cord, and membranes</td>
<td>3,410</td>
<td>3.4%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Pneumonia and infections</td>
<td>1,640</td>
<td>1.6%</td>
<td>0.3%</td>
</tr>
<tr>
<td>All other causes</td>
<td>5,730</td>
<td>5.7%</td>
<td>0.9%</td>
</tr>
</tbody>
</table>

**Notes**

1. Deaths of infants under 1 year old per 1,000 live births.
Historical Overview

It is important to document a nation's historical experience with health, disease, death, and medical care. The resulting data reflect the evolution of many dimensions of society. Over the course of the twentieth century—through economic development; improvements in housing and sanitation; implementation of public health programs to prevent and control certain diseases; and development of improved medical technology for diagnosing, assessing, and treating medical problems—both the characteristics and the life and death experience of the population of the United States have been dramatically altered. As in the past, however, the nation's experience is not uniform; considerable variation exists from state to state in each dimension of the experience. It is the authors' belief that by describing and illustrating the differences between states we can contribute to a better understanding of the complex mosaic which is the United States. In this volume we hope to demonstrate some of the differences and their significance.

Population Changes

As mentioned above, important changes in the population characteristics of the United States have taken place during the twentieth century. In 1900 the total population of the United States was just over 76 million people. By 1990, the population had more than tripled, to over 250 million people. The total 1900 population of the United States is today equalled by the combined populations of only four large states: California, New York, Texas, and Pennsylvania. The U.S. population is projected to increase to an estimated 270 million by the year 2000. While a substantial proportion of this population growth is due to immigration, a large part is also due to changes in the rate of natural increase, that is, to the relationship between birth rates and death rates.

People are living longer today. The average life expectancy for a child born in the United States in 1900 was about 47 years—46 years for males and 48 years for females. By contrast the average life expectancy for a child born in 1991 exceeds 75 years—almost 72 years for males and over 78 years for females. Moreover, on average, a person who was 65 years old in 1980 could expect to live an additional 12 years. Today the average life expectancy of a 65-year-old person is over 17 years—about 15 years for males and 19 years for females.

Deaths and Diseases

More children are also surviving the crucial first year of life today than in the past. Today, on average, for every 1,000 live births fewer than 10 children die before their first birthdays. While this may seem a high figure, it is lower by a factor of 10 than the estimated infant mortality rate of well over 100 for every 1,000 live births at the turn of the century.

Just as there has been a decrease in infant mortality, there has also been a gradual decrease in the overall death rate in the United States. In 1900 more than 17
people out of every 1,000 people in the United States died. In contrast, the most recent data indicate that the annual death rate has been reduced to about 5 people out of every 1,000.

The major causes of death have also changed substantially. Diseases which were once major killers have now been reduced to minor roles, while other diseases and conditions have taken their place as major threats to health. Tuberculosis and pneumonia were the leading killers in 1900. Almost 200 of every 100,000 deaths in 1900 were caused by tuberculosis; today tuberculosis in all its forms accounts for fewer than 1 death in 100,000. An additional 200 of every 100,000 deaths resulted from pneumonia. In addition, substantial numbers of deaths were attributed to diarrheal diseases, diphtheria, typhoid fever, bronchitis, and even cholera. Many of the causes of death in 1900 have been substantially reduced in importance, some to virtual insignificance today. Others have retained or even increased their significance. While heart disease in all its forms was among the leading killers in 1900, today it is the primary cause of death, followed by cancer, cerebrovascular disease, and accidents.

Most diseases are continuously circulating through the population. From time to time, however, old or new diseases emerge or occur in acute epidemic form. This phenomenon severely affects morbidity and mortality patterns in the United States. In 1918, for example, the population of the United States was hard hit by a pandemic (worldwide epidemic) of influenza, the worst in recorded history. In the winter of 1918-1919, more than 500,000 people in the United States died of influenza and its complications. In a more recent development, which is not as acute and not yet as devastating, since 1981 over 170,000 persons in the United States have died of diseases and conditions associated with what is believed to be a new form of disease, the acquired immune deficiency syndrome (AIDS). To date there is no cure for this fatal infectious disease, and the future course of this pandemic has yet to be accurately charted for the United States and the world.

Apart from diseases, other factors that pose significant threats to health have developed in the United States. The twentieth century has witnessed the rise of the automobile to dominance, and the concomitant modification of United States society in many ways. The proliferation of the automobile has had and continues to have serious consequences, which pose both direct and indirect threats to health. Certainly, the pollutants emitted in exhaust from combustion engines have contributed to a deterioration of the atmosphere and increased the number of health problems and deaths in the United States. More directly, the number of traffic-related deaths per year, which was not even listed in 1900, has risen to over 50,000. The number of persons who receive nonfatal injuries in automobile accidents is over 3.5 million annually. The automobile represents both a way of life and a significant threat to health and life for most people. Among certain groups, particularly males 16 to 24 years old, the automobile is the major threat to life.

The Death Registration Area

The annual collection of mortality statistics by the Bureau of the Census began with the calendar year 1900. The statistics were not collected from all the states, however. In effect, states had to qualify to be included in the developing national Death Registration Area. (The official name for the emerging national system.)

To be included in the system, a state had to have a minimum of 80 percent of deaths regularly registered and was also required to adopt a standard death certificate by January 1, 1900. Only 10 states, plus the District of Columbia (which was included as a state), and 123 registration cities located in nonregistration states were included in the initial Death Registration Area. To qualify, as a distinct geographical unit, cities had to have a minimum of 5,000 residents, and the registration of deaths under local laws and ordinances had to be sufficiently accurate for use by the Census Office. Though the cities were widely distributed, the initial group of states was located predominantly in the Northeast. These states and cities were estimated to include about 38 percent of the entire population in 1900. Periodically, additional states qualified to be included in the Death Registration Area. Occasionally, a state (Delaware, South Dakota, and Georgia are examples) would fail to maintain the necessary standards of reporting and would be temporarily dropped from the list. By 1910, the Death Registration Area included 21 states and the District of Columbia. More states were added, and the addition of Nebraska in 1920 brought the total to 34. With the inclusion of Texas in 1933, the national system of reporting was complete; it included all 48 states. Alaska was added upon its admission in 1959. Hawaii, admitted later in the same year, was added to the Death Registration Area in 1960.

The changing composition of the Death Registration Area is important because it was impossible to obtain geographically comparable state mortality data for the entire nation prior to 1933. Nevertheless, the published rates based on this expanding group of registration states and cities do approximate national rates over the period, and general comparisons over long periods are made in this book.

Medical Care

A number of factors, some known and many more unknown, contribute to changes in vulnerability to dis-
ease and death. Improvements in sanitation, nutrition, and housing during this century have contributed substantially to a longer-lived and healthier population. Major public health programs of immunization and preventive health care have significantly reduced the threats of some specific diseases, especially those which occur most frequently among children. Certain treatments have extended the lives of many elderly people. While debate continues about the relative significance of the medical care sector, including hospitals and physicians, for individual health, the population as a whole are undoubtedly dependent upon them in times of sickness or injury.

The Use of Hospitals

In the late nineteenth and early twentieth centuries, hospitals were shunned by everyone but the very poor. A radical transformation has occurred: for most people today hospitals represent the use of surgical intervention and specialized medical care and research. Perhaps because of an inability to determine the appropriate number and distribution of hospital beds for a given population, the history of hospital growth has been variable. Periods of rapid expansion have been intermingled with periods of stagnation and even decline. In 1909 there were approximately 4,300 community hospitals in the United States, containing just over 400,000 beds. There are now about 5,500 short-term registered non-federal and non-state-supported community hospitals in the United States, with a little less than one million beds.

Within the hospital sector the most significant changes have come about in terms of long-term hospital facilities for the mentally ill. From 1900 through 1955 there was a steady increase in the number of hospital beds in state-supported asylums or hospitals for the mentally ill. By 1955, over 500,000 patients resided in these facilities. The confluence of a number of developments in the philosophy and treatment regimen of the mentally ill subsequently led to a wholesale dismantling of the mental hospital system and to deinstitutionalization of many mentally ill people. The number of state-supported long-term hospital beds for the mentally ill and the number of patients in these facilities has fallen to about 100,000. Today this process is considered by many to be a mistake.

The Role of the Physician

The pivotal figure in medicine in the United States throughout the twentieth century has been the physician. The history of the physician supply in the United States has been variable, reflecting periods of undersupply and oversupply. The early part of the century was characterized by a relatively high physicians-to-population ratio of over 170 physicians for every 100,000 people in the United States. Significant changes in educational and licensing requirements beginning in 1912 forced the closure of many medical diploma mills, decreased the number of practicing physicians, and severely restricted the production of physicians, with a subsequent decline in the ratio to about 130:100,000 in 1940. More recently, as the supply of physicians has increased, there has again been concern about a "glut" of physicians. As is the case with uncertainty about the appropriate number of hospital beds, part of the problem may lie in a continuing inability to determine and agree on either a proper physicians-to-population ratio or a distribution of physicians that would be conducive to some equally elusive optimal level of medical care.

Dental Care

For the majority of people in the United States in 1900, dental care was virtually nonexistent. There were only 25,000 dentists in the entire country, or 33 for every 100,000 people. While the number of dentists and the dentists-to-population ratio increased and remained steady for a number of years, in the past 20 years the ratio has actually decreased, perhaps reflecting a decreased demand for dental care as a result of fluoridation of most major public water supplies. Today there are approximately 130,000 dentists, creating a ratio of about 46:100,000.

Conclusion

Even this introductory overview of selected population, health, and medical care characteristics of the United States reflects dramatic changes in the life and death experience of the nation. The events and changes described here have not been uniformly experienced across the nation; cumulative or aggregate national experience with health, death, and medical care at any particular moment is composed of a mosaic of geographic variations. Death rates, major threats to health, the major causes of death, and the provision of medical care have not been and today are not uniformly distributed from place to place. In this volume we examine the historical and geographic variation in national mortality and medical care experience during the twentieth century and assess the most recent patterns as the twenty-first century approaches.

This review has several foci. In order to provide a context for examining morbidity, mortality, and health care, we begin by discussing general trends and geographic variations in selected population characteris-
tics, including age structure, racial mixture, population density, and per capita income. Attention is then directed to geographic and temporal patterns of the mortality experience in the United States. Our assessment of mortality patterns is necessarily limited in terms of both number and scale. It has been necessary to select a relatively few causes of death and the associated mortality rates. The selection was based primarily upon the relative significance of each cause at some time during the twentieth century. Among the items included for discussion and description are general characteristics of infant mortality and specific patterns of death related to tuberculosis, heart and cerebrovascular diseases, selected cancers, and motor vehicle accidents. In addition, we treat the major epidemics of influenza and AIDS.

Subsequently, we examine changes in selected components of the medical care sector. The changing production, supply, and distribution of physicians and dentists, as well as changes in the supply and distribution of general and mental hospital beds, are displayed and discussed.

Information on population, mortality, and medical care is presented and illustrated on a state-by-state basis. Certainly, choosing state-based data masks important differences which occur within each state, and it might be argued that a more detailed analysis would provide more insight. The purpose of this book, however, is to illustrate the state and regional experience of the United States. Also important to the decision was the availability of data. We made our decision to assess patterns at the interstate level on the basis of the availability of data over a considerable period of time. Even at this level, uniformly collected vital statistics did not become available for each and every state until completion of the Death Registration Area in 1933. We hope that the geographic and historic perspectives adopted here will contribute to an understanding of important dimensions of twentieth-century life and death in the United States.
Physician Supply and Distribution

If provision of medical care were simple and straightforward, there would be little need for discussion of physician demography: the supply and distribution of physicians. Because it is complex, however, reaching agreement about how many doctors (let alone considerations of what types of doctors) a community needs is difficult or impossible. There are even problems associated with attempts to define “community” in a way that would be appropriate to the measurement of physician distribution. Finally, there is the problem of lack of evidence directly linking the number of doctors in a community to the health status of its residents. Many factors pertaining to the health of any individual and of the community as a whole lie beyond the realm of physician intervention and are more closely related to individual behavior and organized public health measures.

Nevertheless, physicians continue to be the keystone of the health enterprise and medical care experience of most people in the United States. The vast majority of people turn to a physician for care and comfort when they are faced with acute and chronic medical conditions, from minor ailments to the life-threatening sicknesses. Physicians will remain central to the medical care process in the foreseeable future, and it is therefore appropriate for us to discuss the evolution of physician demography in the United States in the twentieth century.

Nineteenth-Century Concerns

The number of physicians practicing in each state and some measure of their quality were important matters to delegates to the first National Medical Convention in 1847. Delegates were instructed to determine as far as was practicable the numbers of men who were practicing medicine in their respective states. This was apparently the first U.S. attempt to systematically collect information on the number of physicians in each state. In 1850 the U.S. Census reported a total of 40,564 practicing physicians—a physicians-to-population ratio of about 175:100,000, or 1 physician for each 571 people.

There is also evidence of early concern about replacing and replenishing the supply of physicians. In the mid-1850s, an attempt was made to predict an expected “vacancy” rate of physicians per year to be filled by medical school graduates. The number of practicing physicians increased to 50,000 by the end of 1870. In 1870, therefore, there were 128 physicians for every 100,000 people in the United States. By 1895, there were 200 physicians for every 100,000 people residing in the United States—64 percent higher than the ratio (128:100,000) 25 years earlier. Many of these physicians were perceived to be matriculating through less than adequate medical schools, however.

Concern was also expressed about the possibility that the United States had excessive numbers of doc-
tors and medical schools for the population. Concern was directed especially at the proliferation of inadequate medical schools and the lack of well-educated physicians being turned loose upon communities. It was believed then, as now, that a good doctor is much better than a poor doctor but only little better than no doctor. Some people thought that a poorly educated physician might do more harm to patients than leaving them untreated.

Review and Reform in the Twentieth Century

Concern about inadequate medical training led to two major reviews of medical education in the United States shortly after the turn of the century. In 1905 the Council on Medical Education noted five states with weak programs in medical education: Illinois, Kentucky, Maryland, Missouri, and Tennessee. While this report was important, the report entitled Medical Education in the United States and Canada—the so-called Flexner Report, which was written by Simon Flexner and published in 1910—had a more far-reaching effect on medical education and the production of physicians in the United States. This strongly worded report concluded that the country was suffering from an excess of underqualified physicians. The author believed this to be the result of a century of over-production of doctors which resulted in too many physicians, with even the smallest towns being oversupplied with low-grade practitioners. Towns with total populations of fewer than 100 persons had as many as 5 physicians, and towns with fewer than 50 residents frequently had 2 or more.

While few states and sections of the country emerged unscathed in this report, special criticism was directed at southern medical schools. The South was considered to be generally overcrowded with substandard medical schools with which nothing could be done. For example, in Alabama satisfactory medical education could not be found. In Arkansas neither of two medical schools had a very good evaluation. The outlook in Kentucky was not promising and the University of Louisville was singled out as without resources and the University of Kentucky was totally unequal to the task of providing medical education because it was judged to have low standards. Indeed, Kentucky was delineated as one of the largest producers of low-grade doctors in the country.

Though the South suffered severe criticism as a region, states in other areas also received barbed and stinging criticisms. For example, Oregon’s two medical schools were considered to be without resources and ideals. The Flexner Report said that there was no justi-

Geographic Patterns of Physician Distribution

1906-1933. In 1906 there were an estimated 120,000 physicians in the United States and a national average of 152 physicians per 100,000 population. The ratios ranged from 73:100,000 in South Carolina to 360:100,000 in Montana. South Carolina and North Carolina (with 74:100,000) had the lowest physicians-to-population ratios in 1906. Two regions of the United States, the South and the upper Midwest, were characterized by rather low physicians-to-population ratios (Figure 12.1). Ratios from Louisiana eastward to Florida were between 101:100,000 and 123:100,000, a range which was also found in the Dakotas, Minnesota, and Wisconsin. In the same category, the lowest ratios were generally found in the South. Only Georgia (with 119:100,000) had more than 110 physicians per 100,000 population. Conversely, only Minnesota (with 105:100,000) among the northern states had fewer than 110 physicians per 100,000.

About average (152:100,000) physicians-to-population ratios, ranging from 138:100,000 to 162:100,000, were found throughout the northeastern states from Maine southward; through West Virginia; in the cen-
Physician Supply and Distribution

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Many states contiguous to the Deep South also had very low physicians-to-population ratios. These included Louisiana (101:100,000), Arkansas (93:100,000), Tennessee (113:100,000), Kentucky (96:100,000), Virginia (108:100,000), and West Virginia (98:100,000). At the other end of the physicians-to-population ratio spectrum, the states with the highest ratios included New York (186:100,000), Colorado (181:100,000), and California (179:100,000). The upper midwestern states of Minnesota, Wisconsin, Iowa, Michigan, and Indiana had moderate physicians-to-population ratios ranging from 110:100,000 to 127:100,000. The most consistent pattern of physician distribution from 1936 through 1956 appears to be the low ratios of the southeastern states. Higher-income states (e.g., California and New York) had higher-than-average rates.

In 1948 a very different perspective on physician supply and levels of adequacy was reported to the President in *The Nation's Health*. In this report, the National Health Assembly suggested that a realistic standard for physicians-to-population ratios should be based on the levels of physicians attained by the top quartile of states. In this group, the average physicians-to-population ratio was 150:100,000—almost double the recommendation of only 15 years earlier! Using this figure, it was estimated that the nation had only about 80 percent of the physicians it needed and, further, that the current distribution of physicians reflected the distribution of social and economic advantage.

The National Health Assembly reported that by 1960 the nation would need 254,000 physicians but would have a supply of only 212,000, and made an urgent plea that U.S. medical schools increase their production of physicians.

1936. Though the number of physicians in the United States was about 163,000 in 1936, the physicians-to-population ratio had decreased from 152:100,000 in 1906 to 128:100,000—still well above the ratio (83:100,000) recommended by the Committee on Medical Costs. As in 1906, the South had the majority of states with the lowest ratios (Figure 12.2). South Carolina had only 72 physicians per 100,000 people, and Alabama had only 73, closely followed by North Carolina (with a ratio of 74:100,000) and Mississippi (75:100,000). By 1936, however, Louisiana, Georgia, and especially Florida had increased their physicians-to-population ratios sufficiently to remove them from the lowest category. Other states in this lowest category included Maine (with a ratio of only 58:100,000), North Dakota (75:100,000), South Dakota (81:100,000), and Idaho (84:100,000).

1967. By 1967 the number of physicians in the United States was almost 267,000, and yet the physicians-to-population ratio average had increased to only 135:100,000. The familiar pattern of low physicians-to-population ratios continued in the South in 1967 (Figure 12.3). However, the upper midwestern and mountain states also had low ratios. In 1967, Mississippi had the lowest ratio, only 71:100,000. It was closely followed by Alabama (82:100,000) and South Carolina (86:100,000). South Dakota, with a ratio of only 83:100,000, was in the lowest tier of states. Fewer than 100 physicians per 100,000 population were found in Idaho, Nevada, Iowa, New Mexico, Indiana, Kentucky, and West Virginia as well. New York (with a ratio of 207:100,000), Connecticut (177:100,000), and California (170:100,000) had the highest ratios in 1967. The largest cluster of low ratios was located in the upper midwestern and mountain states. This represented a shift from the earlier pattern dominated by deficiencies...
in the southeastern states, both because of population losses due to migration out of these states and because of migration of physicians to coastal areas.

In 1980 it was estimated that by 1975 the nation would need 320,000 physicians, with an annual medical school graduation rate of 11,000. Thus there was continued pressure to produce more physicians by increasing the capacity of medical schools. Indeed, in 1985 it was suggested that it was probably not possible in the U.S. to educate as many physicians as really needed. In 1970 the Carnegie Commission on Higher Education expressed urgency regarding the serious physician shortage. Despite increased levels of production, the numbers of physicians still fell short of what it was thought the nation needed.

In 1980, however, a 4-year study, the Report of the Graduate Medical Education National Advisory Committee (GME National Advisory Committee), the most comprehensive and extensive reports ever completed on physician demography, projected the nation’s need for physicians through 1980. The major conclusion was that the nation would be faced with a surplus of practicing physicians, rather than a shortage, and that the surplus would be between 45,700 and 94,350 physicians. Somehow, the physician shortage had turned into a surplus almost overnight! Estimates for the year 2000 were even worse. The required number of physicians was placed at 493,000 and the most reasonable estimate of the number of physicians at 643,000—an excess of 150,000. Thus the nation moved from a physicians-to-
population ratio of 140:100,000 in 1950 to 200:100,000 in 1980 to between 240:100,000 and 280:100,000 by the end of the twentieth century. Needless to say, the argument about whether the United States is faced with a glut or shortage of physicians continues. However, relatively accurate information on the 1989 distribution is available.

1989. Based on the preliminary estimates of state populations in the 1990 Census and on data from the American Medical Association, the distribution of current physicians-to-population ratios is presented in Figure 12.4. In 1989 the total number of practicing physicians was approximately 469,000, and the physicians-to-population ratio was 190:100,000. This ratio was certainly lower than that projected by the GMENAC study.

Of states with the lowest physicians-to-population ratios, only one, Mississippi (119:100,000) was located in the Southeast. The bulk of states with the lowest physicians-to-population ratios (116:100,000 to 137:100,000) were found distributed across the northern Midwest and the mountain states; they included Iowa (137:100,000), South Dakota (132:100,000), Wyoming (126:100,000), and Idaho (116:100,000). Idaho had the lowest ratio of any state, and Alaska (118:100,000), had the second lowest.

The states with the highest physicians-to-population ratios were concentrated in the Northeast. They included New York (275:100,000), Maryland
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(274:100,000) Connecticut (259:100,000), and Massachusetts (283:100,000), which had the highest ratio. Other states in the Northeast, including Vermont, Pennsylvania, and New Jersey, also had very high physicians-to-population ratios, ranging from 212:100,000 to 221:100,000. In the far West, California had the highest ratio (217:100,000).

Generally, with exceptions such as Minnesota, it appeared that states west of the Mississippi and east of the Rocky Mountains comprised the largest group of states with the lowest physicians-to-population ratios.

Conclusion

Too many? Too few? Just enough? Throughout the twentieth century, the question of what constitutes the correct number of physicians has apparently puzzled physician groups, public policy makers, and health services researchers and planners, the public, and the body politic. Through the years, the pendulum of majority opinion swung from oversupply to undersupply; apparently it has now returned to oversupply. It will continue to swing during the remainder of this century and into the next.

Within several decades, from the mid to the late twentieth century, there has been a revolution in the provision of medical care, from both the scientific and the supply perspectives. Yet the problem of maldistribution of physicians continues. In this chapter we have presented characteristics of the distribution of physicians from state to state. Certain sections of the country have been traditionally undersupplied with physicians, as measured against the national average. At the same time, some states appear to be oversupplied, using the same standard. Again, it is difficult to draw direct conclusions about the variable distribution of physicians and the health of any population because of the complex nature of the relationship alluded to at the beginning of this chapter. In addition to variations in physicians-to-population ratios from state to state, there are major inner city–outer city differences in these ratios. During the first half of the twentieth century, great concern was directed toward the depletion of physicians, especially primary physicians, in the rural areas of many states. Since about 1950, however, an additional concern has been the depletion of physician resources in the low-income and minority sections of many of the larger U.S. cities. In each instance, inevitably the concern is directed toward the relative accessibility of physician services. It is apparent that this problem will continue and perhaps become even more critical during the remainder of the twentieth century.
Distribution of Hospitals

To most people, the hospital and the medical care resources associated with it represent the pinnacle of available medical care. Physically as well as symbolically, today’s hospitals contain personnel and facilities at the forefront of modern scientific medicine. Most people turn to hospitals in the belief that they offer the best chance of recovery from serious illness or accident. As recently as 1955, however, the statement was made, “Within living memory an age-old institution has been transformed from a hostal for the sick poor into a medical center for everyone.” During most of the nineteenth century, the large majority of hospitals were charitable institutions which treated only poor unfortunates who were unable to afford treatment in their homes. As late as 1877 in the United States, it was suggested that hospital care be limited to individuals who had no homes and to the poor who could afford home health care.

Indeed, it is instructive to note that, until 1836, patients admitted to St. Bartholomew Hospital in London were required to deposit or give security in the amount of 17s. 6d. to cover burial expenses in the event of death. Such a practice certainly did not inspire confidence among the general populace and particularly not among potential patients. Today in the United States opinions about hospitals continue to evolve. Some critics decry the “medicalization of society” and criticize the hospital as the purveyor and controller of medical care.

The Early Hospital Experience

The first general hospital in the American colonies was Pennsylvania Hospital of Philadelphia, chartered in 1751. This was followed by New York Hospital, which was chartered in 1773 but, due to the Revolution, not opened until 1791. Massachusetts General Hospital in Boston admitted its first patients in 1821. Each of these hospitals was located on a “healthyful,” open, airy, and elevated site, away from the center of the nearby city. These locations were chosen in part to ensure the health of patients through the “enjoyment of fresh and salubrious breezes” but also because hospitals were considered noxious and disagreeable places which no one would want to live near.

Hospital Growth in the United States

While asylums for the mentally ill proliferated during the early and middle parts of the nineteenth century, the building of general hospitals in the United States during the period appears to have been quite limited. A clear assessment of the situation is difficult to achieve because of the lack of aggregate data on hospitals of the period. The first “complete” census of hospitals was accomplished in 1909. At that time the nation
had 4,359 hospitals with a total bed capacity of 421,000. By 1920, however, the number of general and specialty hospitals had declined to 4,013 and the number of beds to just over 311,000. This averages out to about 2.9 hospital beds per every 1,000 persons in the United States. Twenty years later, in 1940, there were 4,165 nonfederal general hospitals with a total of some 401,200 beds, an average of about 4.7 beds per 1,000 population. It is obvious that the increase in hospital beds outpaced population growth during this period. This pattern shifted somewhat over the next 20 years, and in 1960 there were about 3.7 general hospital beds per 1,000 people. Presently there are about 5,500 nonfederal general short-stay hospitals with approximately 333,000 beds, an average of 3.7 beds per 1,000 persons in the United States. Thus the average number of hospital beds per 1,000 persons in the United States appears to have stabilized. It has been suggested that the hospital beds-to-population ratio may decrease with the closing of many rural community hospitals. The actual current availability of beds is believed to be considerably greater than in the past because of the decreasing average length of stay of patients which has occurred over the past 20 years.

Geographic Patterns in Hospital Bed Distribution

While the national average hospital beds-to-population ratio of approximately 3.7:1,000 is a bit lower than the recommended level of 4:0:1,000 people, it is important to remember, as an analogue, that it would be possible for a person to drown in a stream which had an average depth of 3 feet. That is, while the national average provides a gross measure of availability, the state patterns are more useful as indicators of geographic availability. Historically there has been, and there continues to be today, considerable geographic variation in the distribution of hospital beds across the United States.

1920. In 1920 the number of hospital beds per 1,000 population at the state level ranged from a low of 0.3 in Mississippi to a high of 7.5 in Nevada. The national distribution of hospital beds per 1,000 population in 1920 reflected a pattern of considerable deficit, which was especially noticeable in the southeastern states and extending westward (Figure 14.1). In addition to Mississippi, other southern states were substantially "underbedded" with respect to the availability of general hospitals. Georgia, Florida, Arkansas, North Carolina, South Carolina, Tennessee, and Kentucky all had fewer than 2.0 beds per 1,000 population in 1920. Texas and Oklahoma also fell into this lowest category.

This unfortunate deficit in hospital beds in southern states may reflect the presence of large numbers of blacks, for whom provision of hospital services in 1920 was separate and very unequal in terms of both quality and quantity of care. Generally, there were few hospitals devoted to the care of the black population and few general hospitals that were integrated. In most southern states, the extant hospitals were reserved for exclusive use by the white population.

All the states outside the southeastern and near southwestern states of Arkansas, Texas, and Oklahoma had hospital beds-to-population ratios higher than did the low-rate states discussed above, though some provided fewer than 2.5 beds per 1,000 population. These states were widely distributed and included Delaware, Idaho, Indiana, Iowa, Kansas, Louisiana, Michigan, Utah, Vermont, Virginia, and West Virginia.

Other states with low ratios of hospital beds per 1,000 population, that is from 2.5 to 2.7:1,000, were found across the United States from coast to coast in 1920. Maine and New Hampshire fell into this category in the Northeast, as did a contiguous cluster of states stretching from Virginia northwestern to Michigan; the four plains states of Iowa, Missouri, Nebraska, and Kansas; and Idaho and Utah in the mountain area. In 1920, a total of 26 states had ratios below the national average of 2.8:1,000.

With the exception of New York state which had the highest ratio (8.4:1,000), the states with the highest hospital beds-to-population ratios were in the West. These included Wyoming (7.4:1,000), Colorado (5.1:1,000), Arizona (5.2:1,000), and California (4.8:1,000).

As with the distribution of physicians discussed in Chapter 12, the most prominent feature of the distribution of hospital beds in the early part of the century appears to have been the substantial position of most southeastern states as well as of the states extending westward through Texas. Similarly, the western states were among those with the highest ratios.

1930. In 1930, the adequacy of hospital beds for two groups was addressed, specifically farmers and blacks. Of particular concern for farmers was the distance to the nearest hospital. It was estimated that over one-third of the rural population had to travel at least 20 miles to the nearest hospital, and 30 percent spent at least 1 hour in such travel under the most favorable conditions (that is, in summer). Thus, the condition of rural roads was especially important. In winter the average travel time to the nearest hospital was an hour and a half; 15 percent of rural residents reported travel times of 3 or more hours.

The number of hospital beds available to Black people was determined to be far less than their actual
of hospital beds-to-population ratios appears to have taken place between 1960 and 1989.

**Conclusion**

Patterns of hospital provision, while appearing to be relatively stable in the short run, have actually significantly been altered through the addition and deletion of facilities, shifts in population, and government intervention with funding and building programs. This has obviously been true for the United States during the twentieth century. As attitudes toward hospital care changed, and as insurance plans for subsidizing hospital care costs developed among the middle and lower socioeconomic classes, demands for hospital facilities increased. Though broad southeastern sections of the country began the twentieth century with well below average levels of hospital bed provision, in part due to a legacy of racial discrimination, it appears that most states had adequate levels of hospital beds by 1989. On the other hand, perhaps related to more recent trends in migration, states in the far West and the Southwest had very low hospital beds-to-population ratios. Overall, however, the gap in hospital beds per 1,000 population between the highest-ratio and the lowest-ratio states decreased significantly, from 6.3 in 1970 to only 3.0 in 1989. Thus it appeared that, with the reduction in the difference between the highest and lowest hospital beds-to-population ratios, the states were moving toward a common ratio, despite the complexity of underlying factors related to the provision of hospital beds across the nation. It will be interesting to see whether this trend continues in the near future.