

FACTUAL DATA

ON

MEDICAL ECONOMICS

REVISED 1940

*BUREAU OF MEDICAL ECONOMICS, AMERICAN MEDICAL ASSOCIATION
CHICAGO*

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Revised 1940

BUREAU OF MEDICAL ECONOMICS,
American Medical Association
Chicago

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FACTUAL DATA ON MEDICAL ECONOMICS

Introduction

Demography is the science of human generation, growth, decay and death as studied by statistical methods. The elements of this science are composed of the vital facts of human life, such as birth, physical growth, marriage, sex, nationality, sickness and death. These basic facts are essential to a sympathetic understanding of and an orderly progress in social, educational, economic, religious, political and medical affairs.

The data included in this publication deal directly with current medical problems. The treatment of each subject is not intended to be exhaustive but additional material on these and related subjects will be added when reliable data becomes available. Some of these data are collected periodically for the entire population. Others are statistical compilations from birth and death certificates filed by physicians on forms prepared by the Bureau of the Census.

Two factors enter into the reliability and usefulness of statistical data: first, the accuracy and completeness of the original record and, second, the method of compilation and analysis. The reader is referred to such publications as "Vital Statistics" by Whipple, "Principles of Medical Statistics" by Bradford Hill, "Graphic Methods for Presenting Facts" and "Graphic Presentation" both by Brinton, "An Introduction to Statistical Analysis" by Richardson, "Principles and Methods of Statistics" by Chaddock, "Applied General Statistics" by Croxton and Cowden and "Statistical Methods for Research Workers" by Fisher for detailed discussions of the principles and procedures used in this field.

Two tables contain data for more than one chart. Table 1 is the basis for Charts I and II; table 22 is the basis for Charts XX, XXII, XXV and XXVIII.

CHART I
 INCREASE IN NUMBER OF PHYSICIANS AND
 POPULATION OF THE UNITED STATES

PHYSICIANS ——— POPULATION ———

SOURCE: POLK'S AND AMERICAN MEDICAL DIRECTORIES; STATISTICAL ABSTRACT OF THE UNITED STATES DEPARTMENT OF COMMERCE, 1937

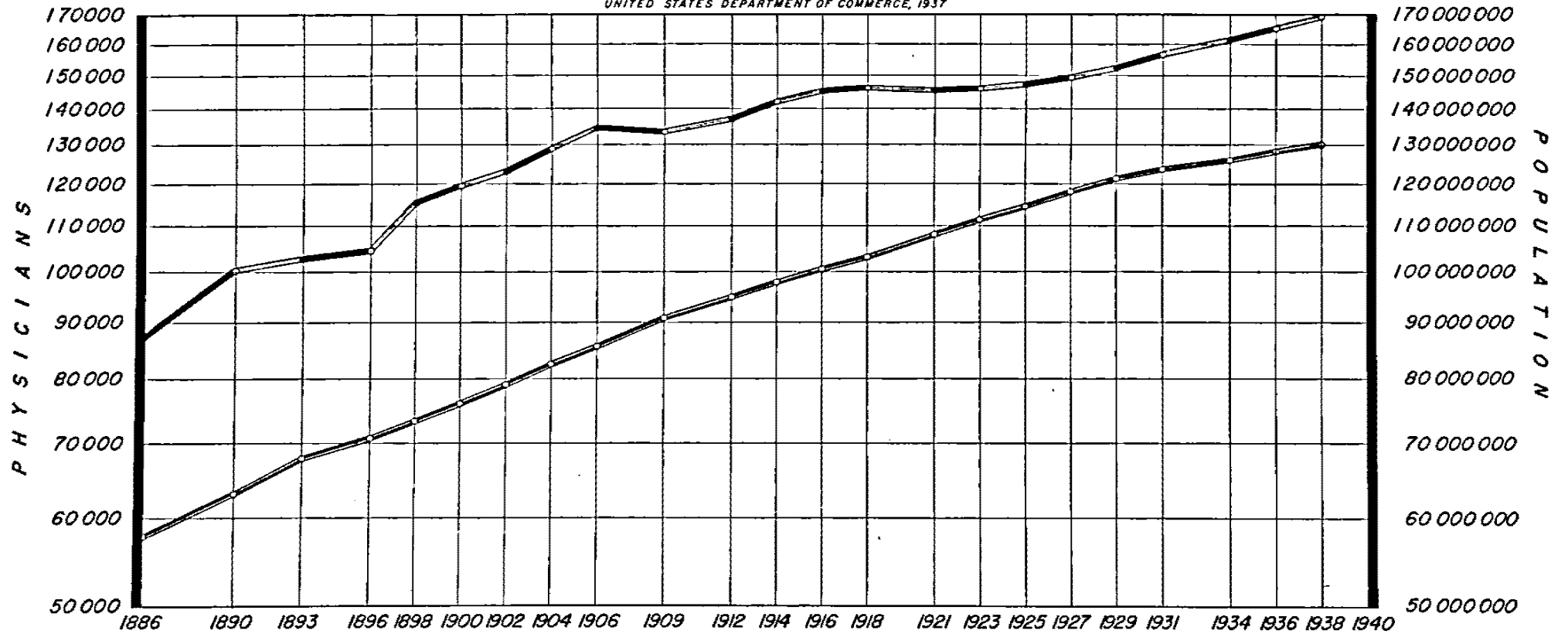


Table 1.—Number of Physicians in the United States and Relation to Population Based on Medical Directories

Directory	Population*	Number of Physicians	Population per Physician
1886 Polk.....	57,937,540	87,521	662
1890 Polk.....	63,056,438	100,180	629
1893 Polk.....	66,970,496	103,090	650
1896 Polk.....	70,884,554	104,554	678
1898 Polk.....	73,493,926	115,524	639
1900 Polk.....	76,129,408	119,749	636
1902 Polk.....	79,365,396	123,190	644
1904 Polk.....	82,601,384	128,050	641
1906 Polk.....	85,837,372	134,088	637
1909 A.M.A.....	90,691,354	133,487	679
1912 A.M.A.....	95,097,298	137,199	693
1914 A.M.A.....	97,927,516	142,332	688
1916 A.M.A.....	100,757,735	145,241	694
1918 A.M.A.....	103,587,955	146,174	709
1921 A.M.A.....	108,207,853	145,404	744
1923 A.M.A.....	111,537,497	145,966	764
1925 A.M.A.....	114,867,141	147,010	781
1927 A.M.A.....	118,196,785	149,521	791
1929 A.M.A.....	121,526,429	152,503	797
1931 A.M.A.....	124,113,000	156,339	794
1934 A.M.A.....	126,626,000	161,359	785
1936 A.M.A.....	128,429,000	165,193	778
1938 A.M.A.....	130,215,000	169,628	767

* Annual Midyear Estimates for Continental United States, U. S. Dept. of Commerce, Statistical Abstract of the United States.

Number of Physicians in Relation to Population

The basic element in the provision of good medical service is a supply of well-trained physicians. Table 1 and the chart opposite show that the supply of physicians in the United States has maintained a fairly uniform relation to a steadily increasing population during the last fifty-two years. In the period 1916 to 1929 the number of physicians did not increase as rapidly as the population, but since 1929 the supply of physicians has increased more rapidly than the population.

While the population per physician is greater today than in the period prior to 1900, a larger number of persons can now be effectively served by a physician because of improved methods of transportation and means of communication. The mere number of physicians is not the only test of the availability of good medical service. The training and equipment of these physicians, together with such auxiliary personnel and facilities as nurses, dentists, technicians, hospitals, and laboratories to assist the physician in furnishing medi-

cal care, are also important. In all these elements the United States occupies a leading position in the world. The rapid increase in these auxiliary personnel and facilities as well as improvements in transportation and communication make it possible for the physician of today to give good service to a larger number of persons than was possible during the last century.

The number of physicians in the United States is greater by approximately 19,000 than the combined number of physicians in Great Britain, Germany, Austria (now a part of Germany), France, Poland, Denmark, Sweden, Norway, Switzerland, Belgium, and Holland despite the fact that the combined population in these eleven countries exceeds the population of the United States by 90,000,000. This situation is particularly significant in view of the fact that these older countries have longer established medical schools, institutions, and professions, and also have systems of sickness insurance.

CHART II
 POPULATION PER PHYSICIAN
 IN THE UNITED STATES

SOURCE: POLK'S AND AMERICAN MEDICAL DIRECTORIES

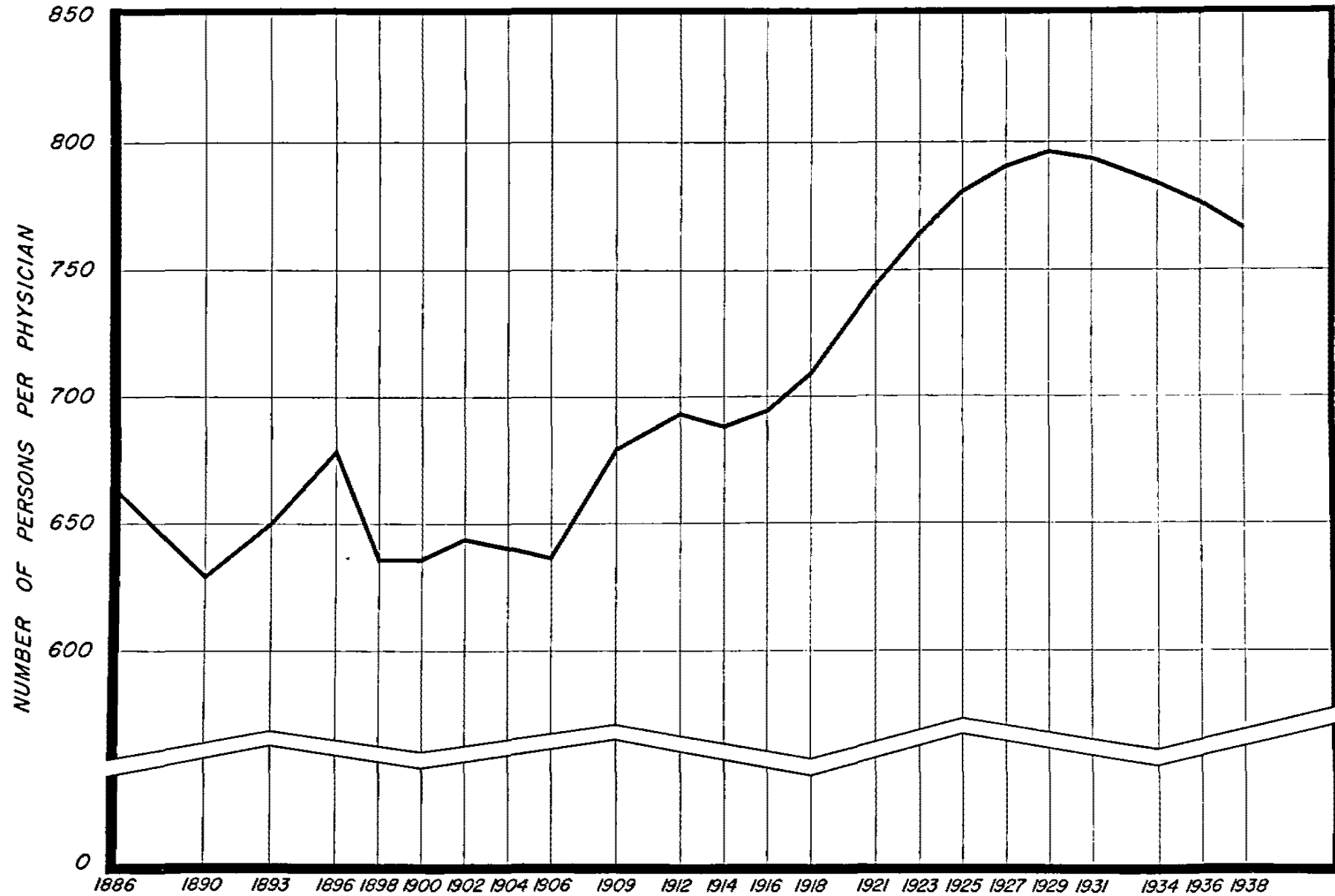


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1896 Polk.....	70,884,554	104,554	678
1898 Polk.....	73,493,026	115,524	636
1900 Polk.....	76,120,408	119,749	636
1902 Polk.....	79,365,896	123,196	644
1904 Polk.....	82,601,384	128,950	641
1906 Polk.....	85,837,372	134,688	637
1909 A.M.A.....	90,691,354	133,487	679
1912 A.M.A.....	95,097,298	137,199	693
1914 A.M.A.....	97,927,516	142,832	688
1916 A.M.A.....	100,757,735	145,241	694
1918 A.M.A.....	103,587,955	146,174	709
1921 A.M.A.....	106,207,853	145,404	744
1923 A.M.A.....	111,537,497	145,968	764
1925 A.M.A.....	114,867,141	147,010	781
1927 A.M.A.....	118,196,785	149,521	791
1929 A.M.A.....	121,526,429	152,563	797
1931 A.M.A.....	124,113,000	156,339	794
1934 A.M.A.....	126,626,000	161,339	785
1936 A.M.A.....	128,429,000	165,163	778
1938 A.M.A.....	130,215,000	169,628	767

* Annual Midyear Estimates for Continental United States, U. S. Dept. of Commerce, Statistical Abstract of the United States.

Population per Physician in the United States

During the little more than half a century for which records are available, the number of persons per physician in the United States has varied between 629 and 797. No other country is as well supplied with physicians. European authorities have stated that one physician for every 2,000 persons is sufficient. Sweden, often cited as having a model medical service, has one physician for about every 2,600 persons.

There appears to have been a somewhat cyclic movement in the growth of the medical profession in the United States. The entire period since 1886, which includes all the years for which approximately accurate figures are available, is still too short to warrant any final conclusions. Because of this seemingly cyclic movement it is difficult to conclude precisely whether at present there is a movement toward a larger number of persons per physician or in the reverse direction. This cyclic movement appears more evident from an examination of table 1, which shows significant decreases in the number of persons per physician for the periods 1886-1890, 1896-1900, 1902-1906, 1912-1914, and 1929-1938, with almost as significant increases of population per physician for most of the intervening periods.

The period of 1906-1929 covers the years during which there was a steady decrease in the number of physicians in relation to population and likewise represents the period of greatest reduction in the number of medical schools and the elevation of standards of medical education.

Quality is more important than quantity in judging the medical care furnished by physicians. Prior to the present century, standards of medical education in the United States were extremely unsatisfactory. During the last thirty years the Council on Medical Education and Hospitals of the American Medical Association has earnestly devoted a large amount of its energy to the elevation of the standards of medical education, both in the medical colleges and in the hospitals where intern training is given.

There is frequent complaint that physicians in the United States are not as widely distributed as they should be and that some rural districts are lacking in physicians. In 1936 there were only 241 counties in the United States that had more than 2,000 persons per physician. This is a more equitable distribution of physicians than is to be found in any of the older and more thickly settled countries of Europe.

CHART III

*MEDICAL SCHOOLS AND GRADUATES
IN THE UNITED STATES*

*SOURCE: ANNUAL REPORTS OF THE COUNCIL ON
MEDICAL EDUCATION AND HOSPITALS OF THE A.M.A.*

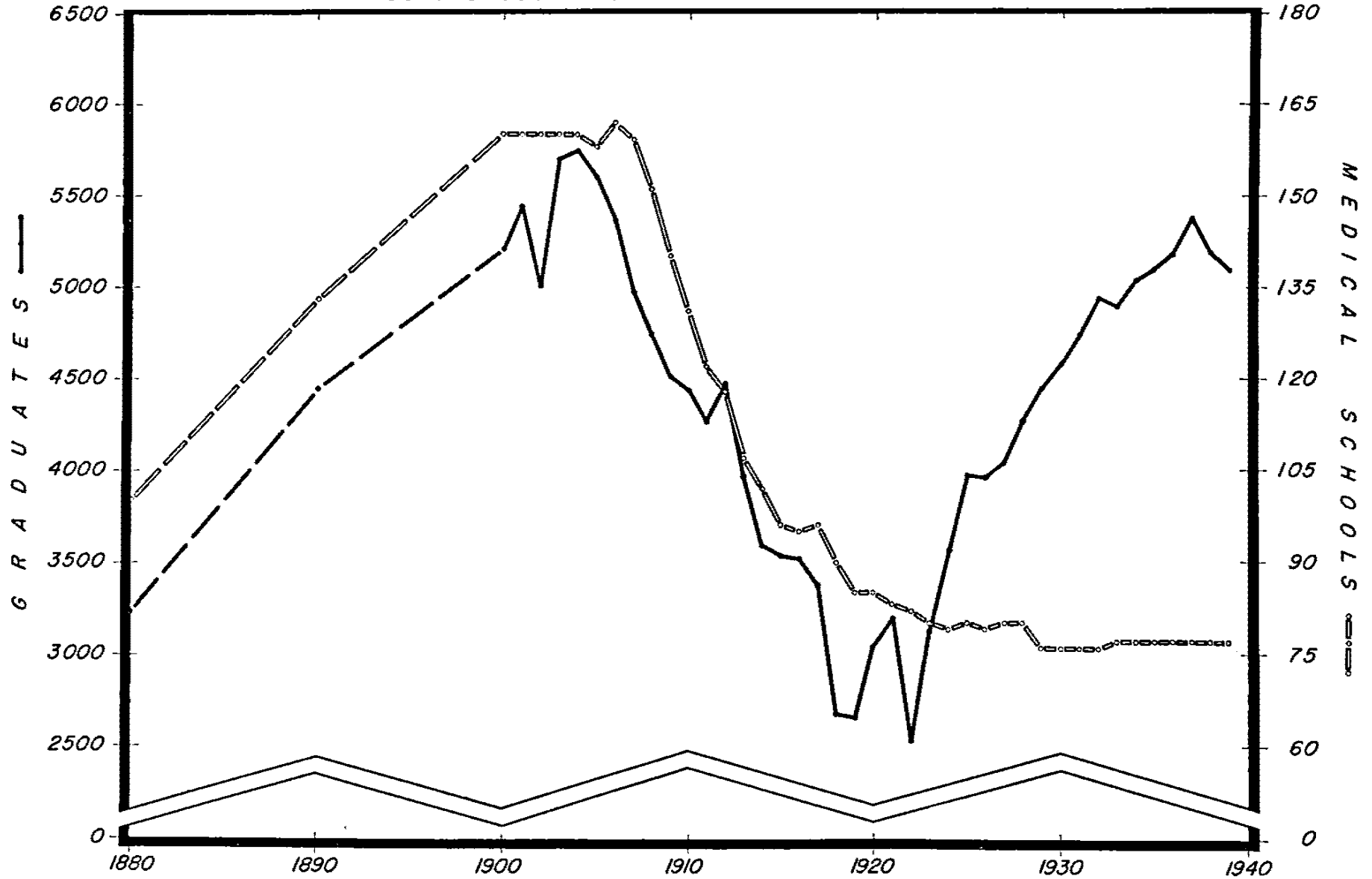


Table 2.—Number of Medical Schools and Graduates 1880-1939 *

Year	Number of Medical Schools	Number of Graduates
1880.....	100	3,241
1890.....	133	4,454
1900.....	160	5,214
1901.....	160	5,444
1902.....	160	5,009
1903.....	160	5,608
1904.....	160	5,747
1905.....	160	5,600
1906.....	162	5,364
1907.....	159	4,980
1908.....	151	4,741
1909.....	140	4,515
1910.....	131	4,440
1911.....	122	4,273
1912.....	118	4,483
1913.....	107	3,981
1914.....	102	3,594
1915.....	96	3,530
1916.....	95	3,518
1917.....	90	3,379
1918.....	90	2,670
1919.....	85	2,656
1920.....	85	3,047
1921.....	83	3,186
1922.....	81	2,520
1923.....	80	3,130
1924.....	79	3,562
1925.....	80	3,174
1926.....	79	3,162
1927.....	80	4,035
1928.....	80	4,262
1929.....	76	4,446
1930.....	76	4,565
1931.....	76	4,735
1932.....	76	4,930
1933.....	77	4,895
1934.....	77	5,185
1935.....	77	5,101
1936.....	77	5,183
1937.....	77	5,377
1938.....	77	5,194
1939.....	77	5,089

* Based on annual reports of the Council on Medical Education and Hospitals of the American Medical Association, "Hospital Service in the United States."

Number of Medical Schools and Graduates

The decline in the number of medical schools in the United States during the present century represents a sorting out and elimination of low grade schools. In the first few years of this century many medical schools were little more than diploma mills. They had low standards for admission and for graduation. During the early years of this century the Council on Medical Education and Hospitals of the American Medical Association began its survey of medical schools and its listing according to standards of admission, education and graduation. The results of the Council's efforts are seen in the reduction of the number of inferior medical schools.

All approved medical schools now require at least two years of college education and many of them demand a bachelor's degree for admission. Graduation requires a full four-year course of training in a school with an adequate faculty and equipment to ensure high standards of education.

The reduction in the number of medical schools at first resulted in a decline in the total number of graduates, but at the present time there are almost as many graduates from the 77 approved medical schools as were graduated from the 160 medical schools that existed

in 1900. The reduction in the number of low grade medical schools through the efforts of the American Medical Association, the increase in entrance requirements, the World War, the lengthening of the medical curriculum and the introduction of a period of intern training seem to have been the most prominent causes of the fluctuations in the number of medical graduates.

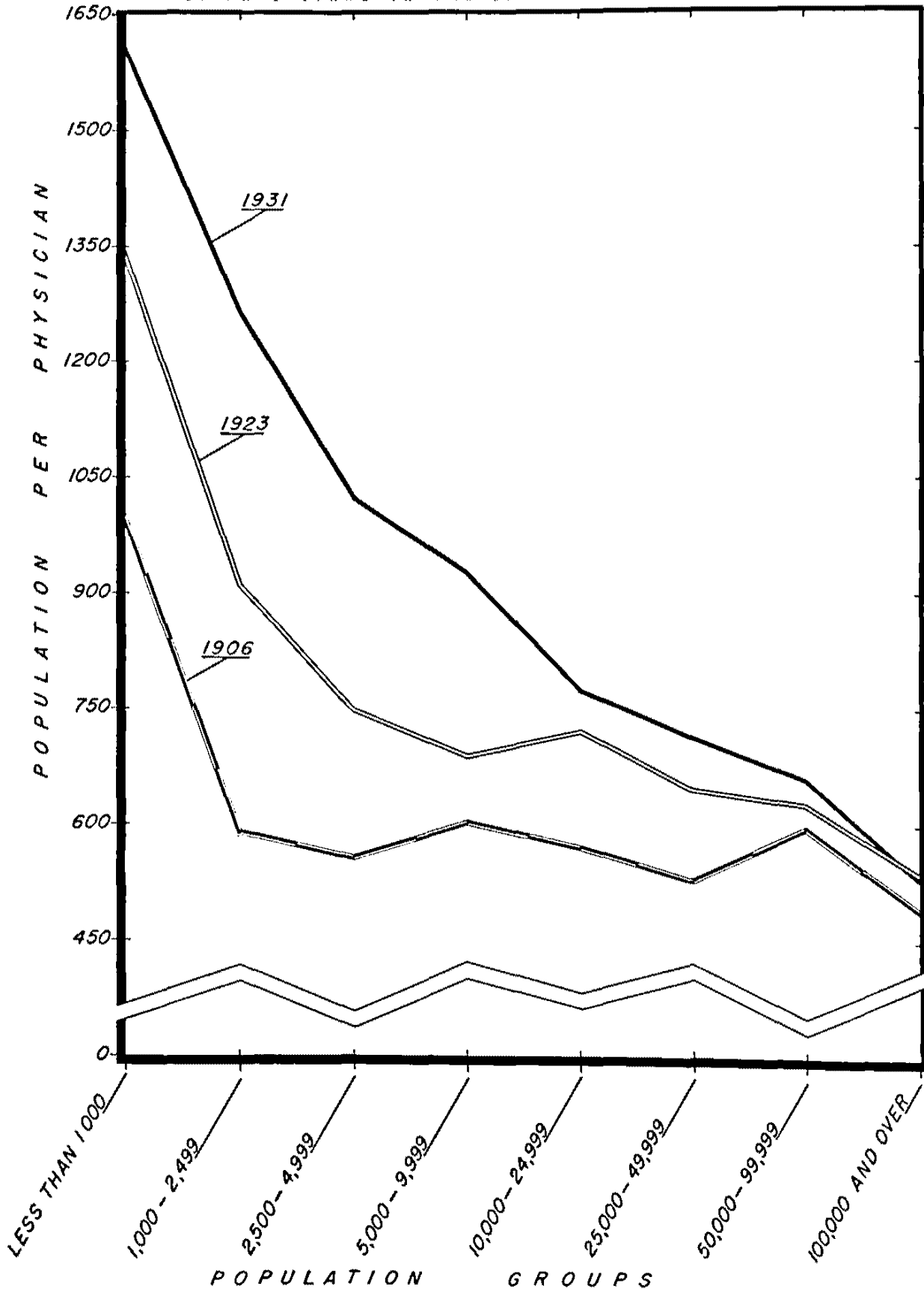
The elevation of the standards of medical education tends to protect the public of the United States against treatment by physicians who are inadequately prepared. It also gives reasonable assurance that the person who chooses any licensed physician will receive the services of a physician who has been given the highest type of medical training available anywhere in the world. There are, of course, some physicians still in practice who graduated from medical schools before present-day standards of medical education were in force. These older physicians, as well as the more recent graduates, have had opportunity to keep themselves abreast of the advances in medicine through medical society meetings, medical journals, programs of postgraduate education for the practicing physician and visits to centers of medical teaching and research.

CHART IV

POPULATION PER PHYSICIAN
FOR SPECIFIED SIZE
OF COMMUNITIES

SHOWING THE DRIFT OF PHYSICIANS
TO THE LARGER COMMUNITIES

SOURCE: MAYERS AND HARRISON (1906 & 1923); DISTRIBUTION
OF PHYSICIANS IN THE UNITED STATES (1931), A.M.A.



**Table 3.—Population per Physician in the United States *
According to Size of Community for the
Years 1906, 1923, 1931**

Size of Community	Population per Physician		
	1906	1923	1931
Less than 1,000.....	997	1,318	1,602
1,000- 2,499.....	890	910	1,205
2,500- 4,999.....	557	749	1,023
5,000- 9,999.....	604	688	927
10,000-24,999.....	571	721	774
25,000-49,999.....	530	647	714
50,000-99,999.....	597	628	661
100,000 and over.....	492	536	630
United States*.....	675	763	823

* Excluding New England states.
Data for 1906 and 1923 from Mayers and Harrison: *The Distribution of Physicians in the United States*; data for 1931 from *Distribution of Physicians in the United States*, Bureau of Medical Economics, A. M. A.

Population per Physician According to Size of Community

In all countries and as long as there has been any recorded history, the number of physicians and medical facilities in general, as well as educational, recreational and most other cultural elements, have always been fewer in relation to population in the smaller cities and rural communities. It could not well be different. Medical schools, hospitals, research institutions, and most of the large group clinics and laboratories require metropolitan conditions for their support and operation. Such institutions are necessary to the national development of a high grade of medical service. They serve not simply their immediate neighborhood but often an entire country or even the world. Anything that would disrupt such institutions and disperse their medical staffs would retard the progress of medical science.

Specialism in medicine cannot develop in sparsely settled localities. The number of people suffering illnesses requiring specialist treatment is relatively too small. In a small community there are too few demands for special services to justify the years of study and expensive equipment required of the specialist.

The amount of medical care received is by no means accurately measured by the ratio of physicians to population. Trains, bus lines, airplanes and automobiles today can bring patients a hundred or even a thousand

miles to specialists and modern equipment more easily than the patient of a generation ago could be carried in a horse-drawn equipage over dirt roads to a physician ten miles away. Residents of towns, villages, and rural districts are no longer dependent solely on local physicians for specialist services and hospital care. Their family physicians can and do give them the best service provided by any body of general practitioners in the world, and they also know when and how to obtain the special care required for the cases that are beyond their competence.

The supply of physicians in rural districts is far better in the United States than in any country with sickness insurance or some other type of state managed medicine. This was made evident at a conference of representatives of medical and other professional groups of all of the principal European nations held in Geneva a few years ago. Medical associations in the United States are, however, always seeking to improve medical practice. For more than half a century the question of encouraging physicians to settle more freely in rural districts has been brought repeatedly before the meetings of the American Medical Association and the various state medical societies, and has been discussed by the administrators of medical colleges.

CHART V

PERCENTAGE OF PHYSICIANS
IN GENERAL PRACTICE AND LIMITED SPECIALTIES
BY GEOGRAPHIC DIVISIONS

GENERAL PRACTICE  LIMITED SPECIALTIES 

SOURCE: AMERICAN MEDICAL DIRECTORY, 1938

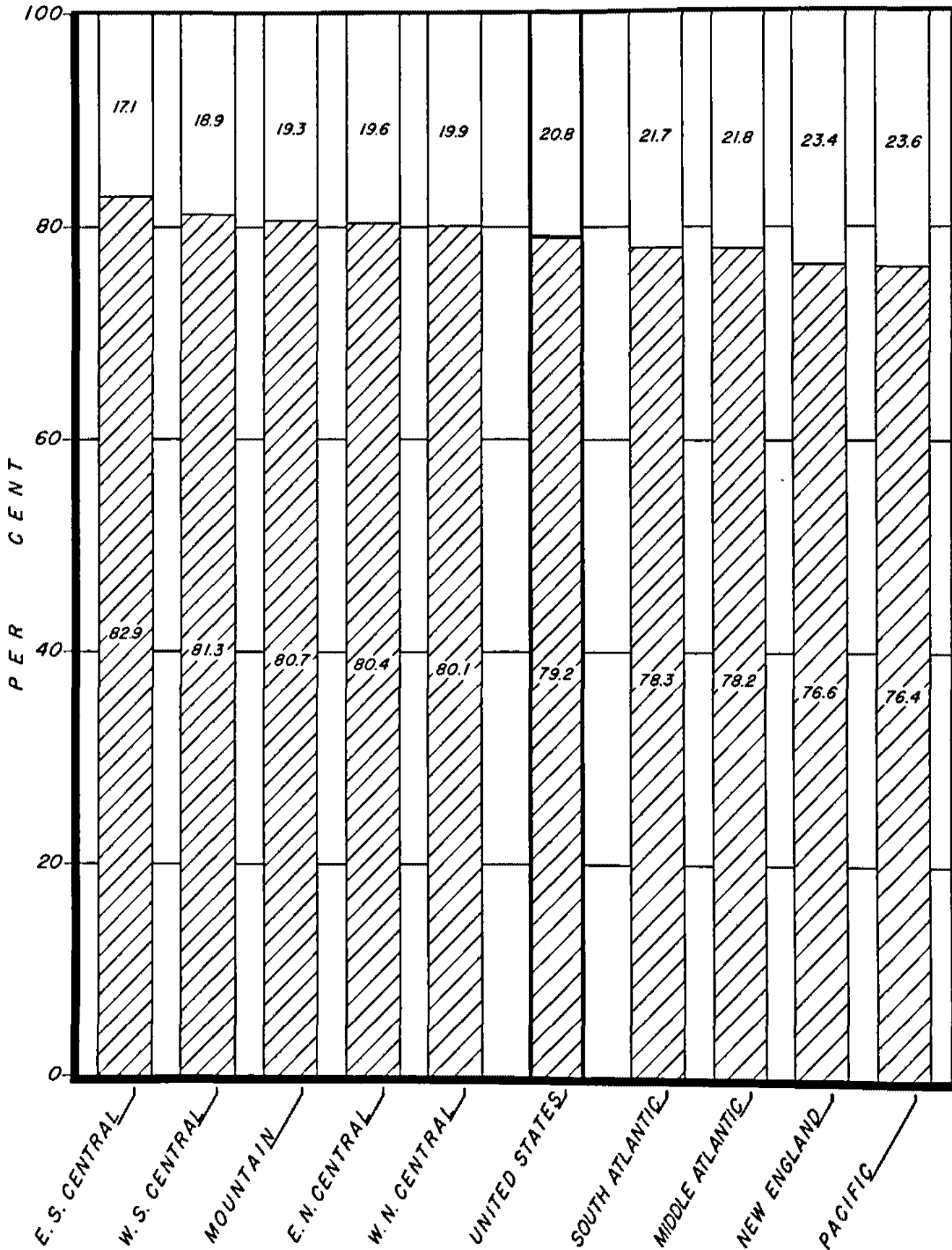


Table 4.—Percentage of Physicians in General Practice and Limited Specialties by Geographic Divisions *

Geographic Divisions	Total Number of Physicians	Number Retired and Not in Practice	Number of Physicians in Active Practice	Physicians Classified as General Practice and Special Attention		Physicians Classified as Specialists	
				Number	Per Cent	Number	Per Cent
United States.....	169,623	8,277	161,351	127,733	79.2	31,618	20.8
New England.....	13,073	704	12,369	9,470	76.0	2,899	23.4
Middle Atlantic.....	44,251	1,587	42,664	33,375	78.2	9,289	21.8
East North Central.....	34,718	1,308	33,410	26,970	80.4	6,441	19.6
West North Central.....	16,739	713	16,026	12,831	80.1	3,195	19.9
South Atlantic.....	18,774	1,145	17,629	13,903	78.9	3,826	21.7
East South Central.....	9,246	451	8,795	7,291	82.9	1,504	17.1
West South Central.....	13,209	614	12,595	10,237	81.3	2,358	18.7
Mountain.....	4,831	203	4,628	3,664	80.7	874	19.3
Pacific.....	14,787	1,462	13,325	10,186	76.4	3,139	23.6

* American Medical Directory 1938.

Percentage of the Physicians in General Practice and in Specialties

What percentage of the medical profession should be specialists? What standard qualifications should be required for recognition as specialists? These are two questions that have engaged the attention of the medical profession and, to a lesser extent, the general public in most Western nations.

The bulk of medical knowledge is today far too great to be mastered by any individual. If medical service to the public is to include an appropriate application of the entire field of medical knowledge, then there must be available the services of a certain number of physicians who are skilled in particular fields of medicine. To a considerable extent the growth of medical science is dependent on specialization. Such growth is always most rapid on the frontiers of any science, which are largely the fields for specialists.

In the practice of medicine, it has often been estimated that about 80 per cent of illnesses can be treated satisfactorily by general practitioners. The remaining approximately 20 per cent are apt to require the services of one or more specialists. A hospital building, no matter how well equipped mechanically, is of little value without a competent staff, including specialists in several of the important fields of medicine.

At the present time, specialists comprise a smaller percentage of the medical profession in the United

States than in most foreign countries for which information is available. Whether this indicates a proper percentage of specialists in this or in other countries is a question that cannot be answered categorically.

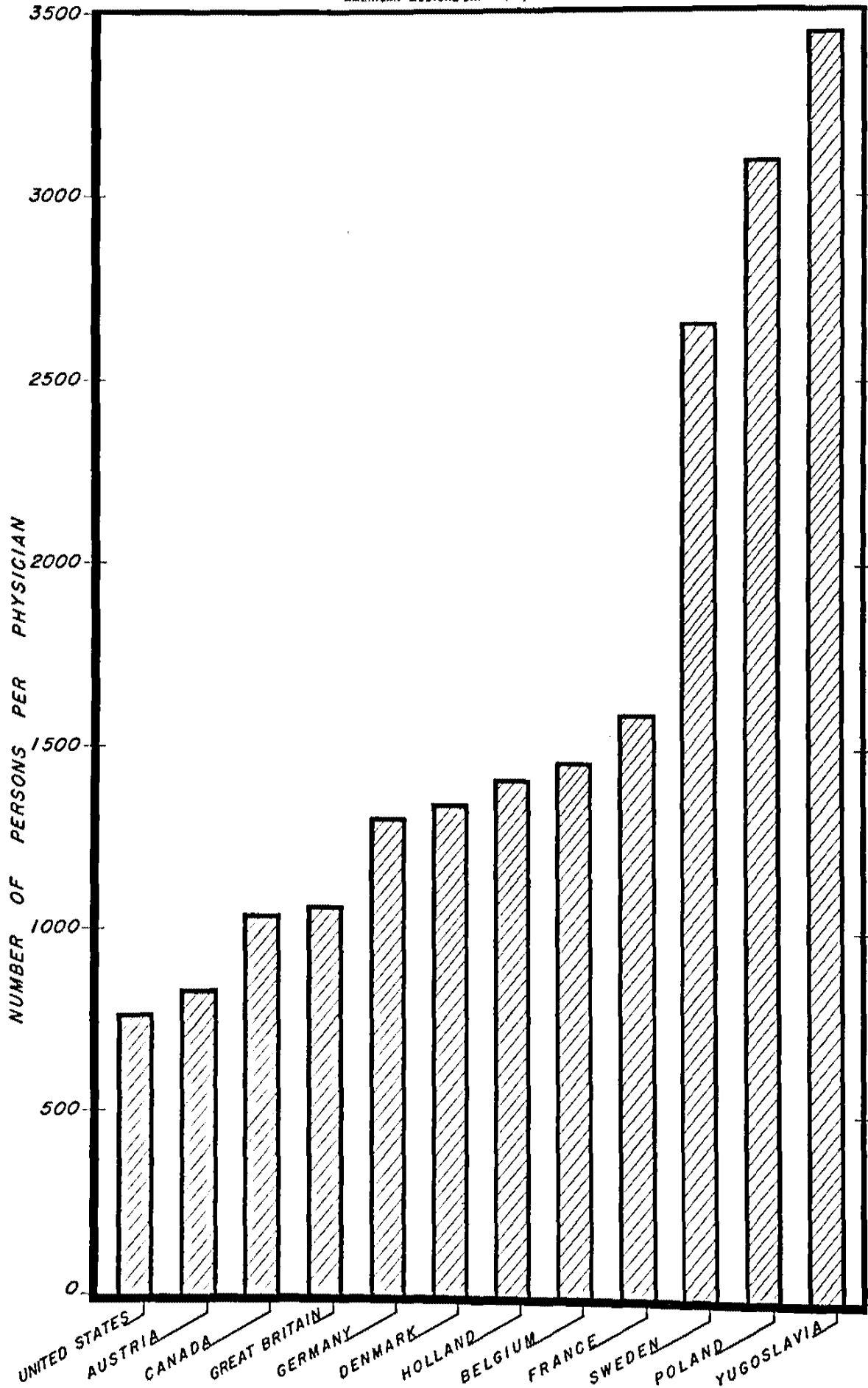
Until recent years there were few definite standards which a physician was required to meet before he was entitled to present himself to the public as a specialist. Specialty boards for 14 of the special branches of medical practice are now organized and have been approved. These boards have established standards of medical education and experience, and conduct examinations to determine the qualifications of candidates for recognition as specialists by the profession and the public. As a usual thing, some years of general practice, followed by specialized education and experience in institutions which are qualified to give training in specialties, are required before a physician is entitled to be recognized as a specialist.

The medical profession recommends that contact of the patient with the specialist should be made through a general practitioner, who acts as the patient's family doctor, and not directly with the specialist. It is believed that the general practitioner should be given the opportunity to determine both when the services of a specialist are needed and which of the available specialists are best qualified to serve the patient.

CHART VI

POPULATION PER PHYSICIAN
IN CERTAIN COUNTRIES

SOURCE: REV. INTERNAT. DE MÉD. PROFESS. ET SOCIALE 5:109 (MAY) 1932;
AMERICAN MEDICAL DIRECTORY, 1938



*Table 5.—Population per Physician
in Certain Countries **

Country	Population per Physician
United States†.....	767
Austria.....	837
Canada.....	1,045
Great Britain.....	1,069
Germany.....	1,307
Denmark.....	1,340
Holland.....	1,417
Belgium.....	1,460
France.....	1,591
Sweden.....	2,000
Poland.....	3,100
Yugoslavia.....	3,450

* *Rev. Internat. de méd. profess. et sociale* 5: 109 (May) 1932.
† American Medical Directory 1933.

Population per Physician in Certain Countries

How many physicians are required for the population of any country? There is no final answer to this question. The number required depends primarily on the quality of the physicians. It has been said that one good physician twenty miles away is better than a dozen quacks in the next block.

The accompanying table shows that there are fewer persons per physician in the United States than in any other country in the world. It is also true that physicians in the United States are, as a body, as well and probably better trained and equipped than the physicians in any other countries. Due chiefly to the activities of state and county medical societies, a larger percentage of the general practitioners in the United States are given postgraduate training than in foreign countries.

The figures for the various European nations were collected by the International Medical Association. Although most of the countries reported twice as large a population per physician as exists in the United States, practically every one declared that there was a surplus of physicians. All of these countries with the exception of Canada, the United States and Sweden have systems of compulsory sickness insurance. In many foreign countries each insurance physician is expected to give medical care to between 1,000 and 2,000 persons. In many of these countries the demand on the physi-

cian's time is too great to permit him to keep up with scientific progress and to supply a character of medical service such as is demanded of physicians in private practice in the United States. If he is to obtain a satisfactory living, he must undertake the care of such a large number of patients that it is either difficult or impossible for him to give good service.

In many European countries the percentage of specialists and governmental or salaried physicians is larger than in the United States. The general practitioners, who really supply medical care to the mass of the population, are therefore much fewer in number in proportion to the population served than the table or chart indicate. The system of private practice in the United States has encouraged a larger number of individuals in relation to the population to enter the medical profession than the systems of sickness insurance and state medicine that prevail in other countries. Free choice of physician makes it possible for a physician in the United States to be judged by his patients and to increase his practice according to his ability and his willingness to serve. These conditions have given the United States a system of medical practice that, as is shown by other charts in this series, has gone further in the conquest of disease and the postponement of death than the systems in other countries that have, to a large extent, abandoned private practice.

CHART VII

HOSPITALS AND HOSPITAL BEDS IN THE UNITED STATES

SOURCE: ANNUAL REPORTS OF THE COUNCIL ON MEDICAL
EDUCATION AND HOSPITALS OF THE A. M. A.

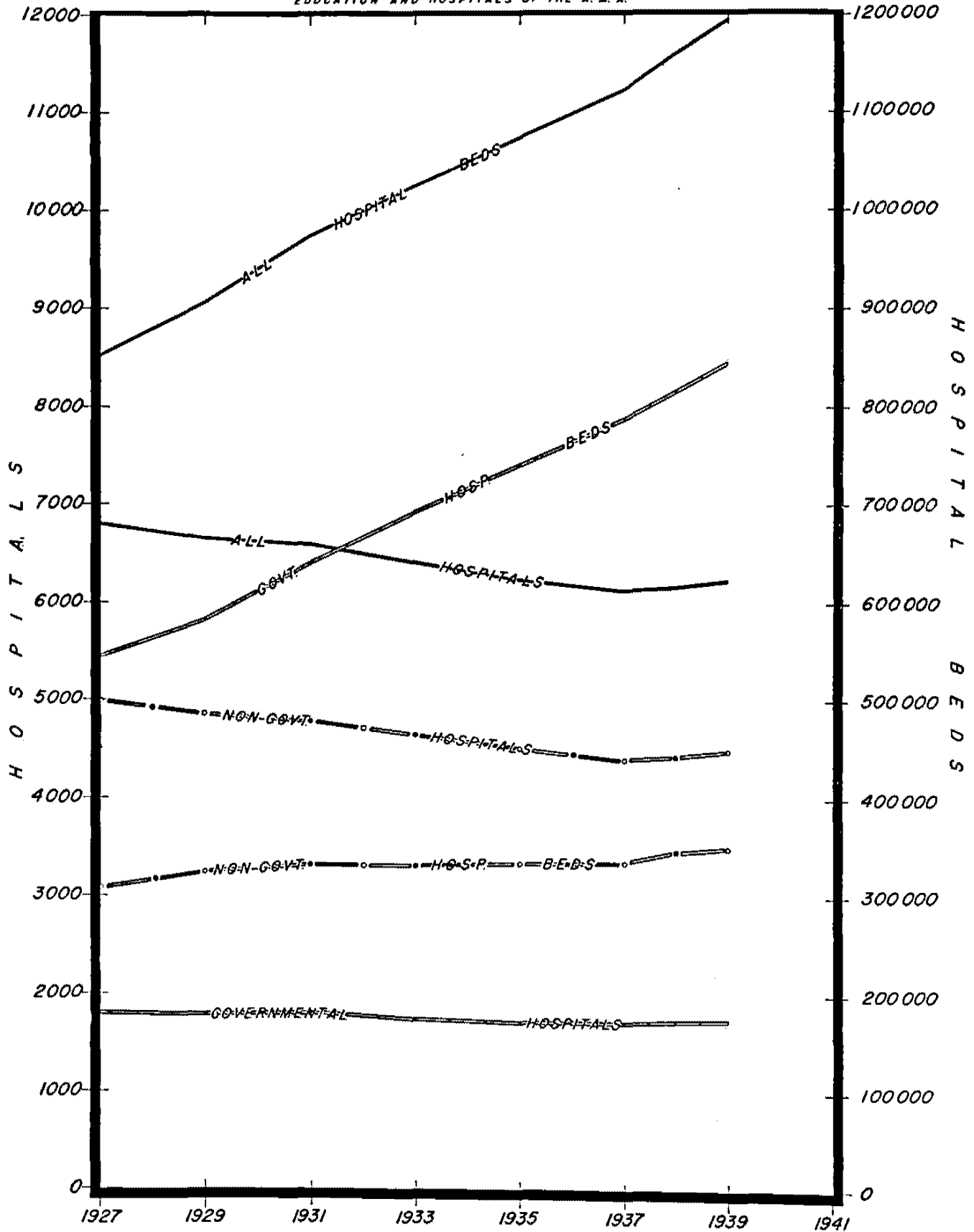


Table 6.—Hospitals and Hospital Beds in the United States*

	All Hospitals		Non-Governmental		Governmental	
	Hospitals	Beds	Hospitals	Beds	Hospitals	Beds
1927	6,807	853,318	4,998	308,149	1,809	545,169
1929	6,665	907,133	4,870	324,506	1,795	582,627
1931	6,613	974,116	4,797	332,501	1,816	641,615
1933	6,437	1,027,046	4,661	332,573	1,776	694,473
1935	6,246	1,075,189	4,522	333,427	1,724	741,762
1937	6,128	1,124,543	4,406	335,709	1,722	788,834
1938	6,166	1,161,380	4,438	340,244	1,728	821,136
1939	6,226	1,195,026	4,486	349,880	1,740	845,146

* Annual Reports of the Council on Medical Education and Hospitals of the American Medical Association, "Hospital Service in the United States."

Hospitals and Hospital Beds in the United States

In measuring the adequacy of medical care and in planning programs to improve that care, it is important to know the conditions which require medical care and the existing facilities to meet these requirements. The top line of this chart shows that the number of hospital beds in the United States is steadily increasing and that there was no slowing up in this increase during depression years. The rate of increase is as important as the number of beds at any given period.

Although the number of beds in both governmental and nongovernmental hospitals has steadily increased during recent years, the rate of increase has been much more rapid in governmental institutions. One of the reasons for this is the expansion of hospitals for nervous and mental diseases. Such hospitals, being partially custodial in character, are very nearly all built and maintained—and quite properly so—by governments.

In spite of the quite rapid increase of beds in such hospitals, overcrowding and consequent harmful conditions are often more prevalent in mental and nervous disease hospitals than in any other type.

While there has been an increase in the number of beds in nearly all types of hospitals, the number of hospitals, as indicated by the line "All Hospitals," has steadily declined until very recently. The conclusion, while not positive, is at least suggested that this evolution indicates that the smaller hospitals are not finding favor with the public to a sufficient extent to render them financially able to survive. Again, the tentative conclusion might be drawn that there has been an excessive amount of building of small hospitals in localities where hospital care was not sufficiently needed, appreciated, or desired to provide supporting patronage. These suggestions should be considered before undertaking any extensive program of small hospital construction in localities where it is doubtful that a proper staff could be obtained or a sufficient demand for their services exists to permit their maintenance.

The comparatively slow growth in the number of hospital beds in nongovernmental institutions may also be a reflection of the fact that a large per cent of the beds in general hospitals are still vacant.

CHART VIII

GENERAL HOSPITAL BEDS
NUMBER AND OCCUPANCY FOR
THE YEARS 1928 TO 1938

SOURCE: ANNUAL REPORTS OF THE COUNCIL ON
MEDICAL EDUCATION AND HOSPITALS OF THE A. M. A.

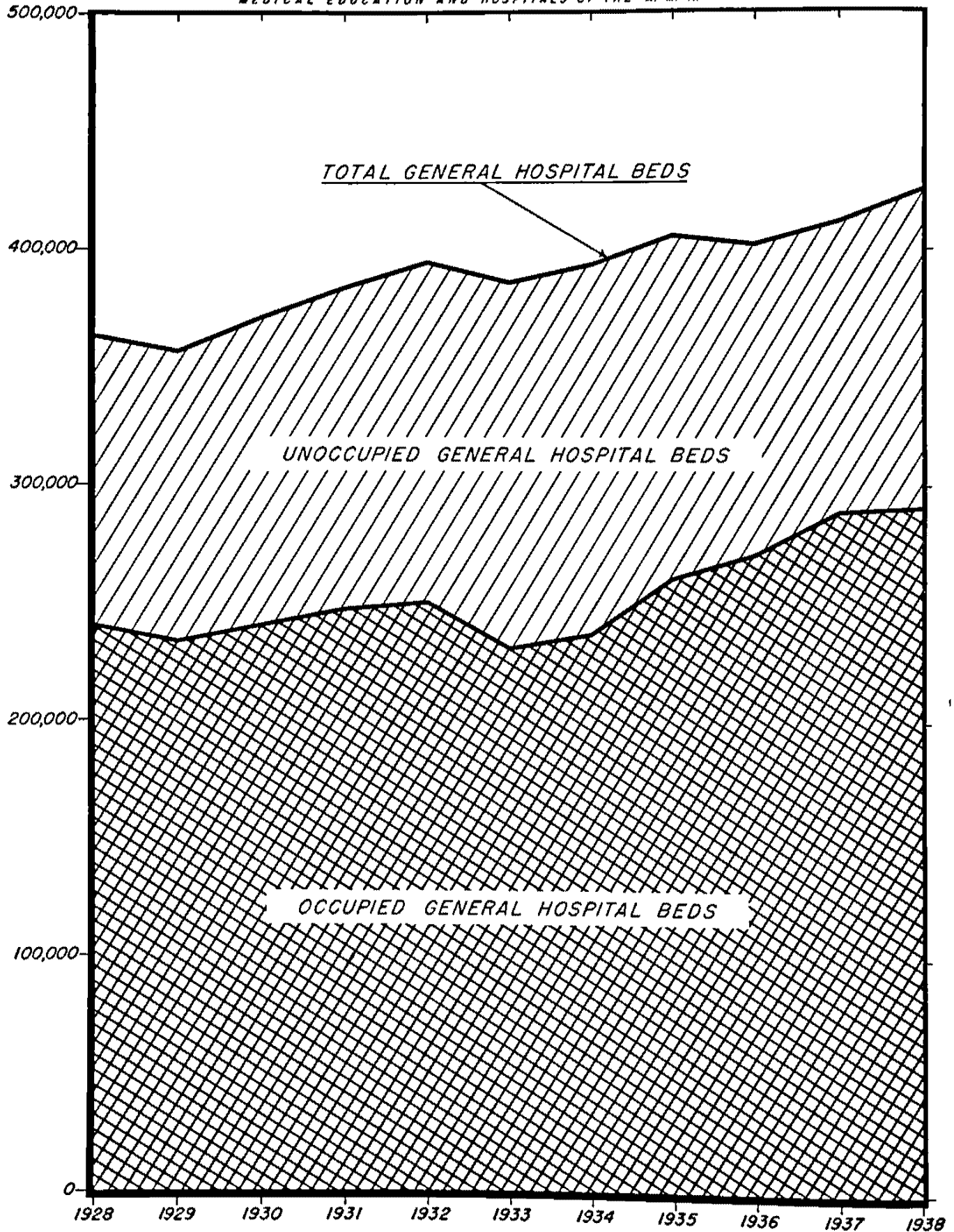


Table 7.—General Hospital Beds—Number and Occupancy for the Years 1928 to 1939 *

Bed Capacity					
Year	Total Number of Beds		Net Increase or Decrease Over Preceding Year	Per Cent Increase or Decrease Over Preceding Year	
1928	363,337	....	17,973	5.2	
1929	357,064	....	- 6,303	-1.7	
1930	371,609	....	14,575	4.1	
1931	384,333	....	12,724	3.4	
1932	395,543	....	11,210	2.9	
1933	386,713	....	- 8,830	-2.2	
1934	393,425	....	6,712	1.7	
1935	406,174	....	12,749	3.2	
1936	402,665	....	- 3,509	-0.9	
1937	412,661	....	9,996	2.4	
1938	425,324	....	12,663	3.0	
1939†	444,947	....	19,623	4.6	
1928-1939	.....	....	81,610	22.5	

Beds Occupied					
Year	Number of Beds Occupied	Per Cent of Beds Occupied	Net Increase or Decrease Over Preceding Year	Per Cent Increase or Decrease Over Preceding Year	
1928	239,802†	66.0	11,718	5.1	
1929	234,009	65.5	- 5,793	-2.4	
1930	240,354	64.7	6,375	2.7	
1931	247,560	64.4	7,170	3.0	
1932	250,495	63.3	2,935	1.2	
1933	231,692	59.9	-18,803	-7.5	
1934	237,395	60.3	5,703	2.5	
1935	261,294	64.3	23,899	10.1	
1936	271,658	67.5	10,364	4.0	
1937	288,280	70.0	16,622	6.1	
1938	292,870	68.9	4,590	1.6	
1939‡	307,991	69.2	15,121	5.2	
1928-1939	.....	....	68,189	28.4	

Beds Unoccupied					
Year	Number of Beds Unoccupied	Per Cent of Beds Unoccupied	Net Increase or Decrease Over Preceding Year	Per Cent Increase or Decrease Over Preceding Year	
1928	123,535	34.0	6,255	5.3	
1929	123,025	33.5	- 510	-0.4	
1930	131,225	35.3	8,200	6.7	
1931	136,773	35.6	5,548	4.2	
1932	145,048	36.7	8,275	6.1	
1933	155,021	40.1	9,973	6.9	
1934	156,030	39.7	1,009	0.7	
1935	144,880	35.7	-11,150	-7.1	
1936	130,947	32.5	-13,933	-9.6	
1937	123,811	30.0	- 7,136	-5.4	
1938	132,454	31.1	8,643	7.0	
1939‡	136,956	30.8	4,502	3.4	
1928-1939	.....	....	13,421	10.0	

* Annual Reports of the Council on Medical Education and Hospitals of the American Medical Association, "Hospital Service in the United States."

† Estimated.

‡ 1939 figures not included on chart.

General Hospital Beds

The picture of hospital bed occupancy presented in the accompanying table should help to show the extent to which the general hospital facilities in the United States were utilized in the years 1928 to 1939. The 1939 data is not included on the chart.

There has been an increase of 81,610 beds in the twelve years shown, but in the same period the number of unoccupied beds has also increased by 13,421. In 1939 there was an average daily census of 136,956 empty beds in general hospitals, which are the institutions on which the public must depend for ordinary hospital care.

A sufficient supply of hospital beds is an important factor in the provision of proper medical services. The number of hospital beds in the United States is sufficient for the most frequent needs of patients. More than 91 per cent of all patients admitted to hospitals each year require the use of general hospital beds. Chart VIII and table 7 show that the existing supply of general hospital beds is greater than the number of beds occupied.

While in some localities there may be a need for additional general hospital beds, in a large number of localities the supply of hospital beds more than exceeds the demand. A study of the distribution of hospitals shows that less than 3,000,000 persons throughout the vast area of the United States are farther than 30 miles

from a hospital registered by the American Medical Association. In addition there are more than 2,000 small institutions with facilities for bed care, nursing and medical services which are not yet included in the list of registered hospitals.

Is it better to build new hospitals or help to fill present empty beds? The House of Delegates of the American Medical Association at the Special Session in 1938 expressed itself as follows:

Your committee favors the expansion of general hospital facilities where need exists. The hospital situation would indicate that there is at present greater need for the use of existing hospital facilities than for additional hospitals.

Your committee heartily recommends the approval of the recommendation of the technical committee stressing the use of existing hospital facilities. The stability and efficiency of many existing church and voluntary hospitals could be assured by the payment to them of the costs of the necessary hospitalization of the medically indigent.

While these figures give the number of available beds and the bed occupancy in general hospitals for the whole nation, the available hospital beds and bed occupancy in any specific county, community or section is a particular problem which should be studied in relation to the needs and demands for such services.

CHART IX

TREND OF GENERAL HOSPITAL BED CONSTRUCTION
AND BED OCCUPANCY 1927-1939

SOURCE: ANNUAL REPORTS OF THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE A. M. A

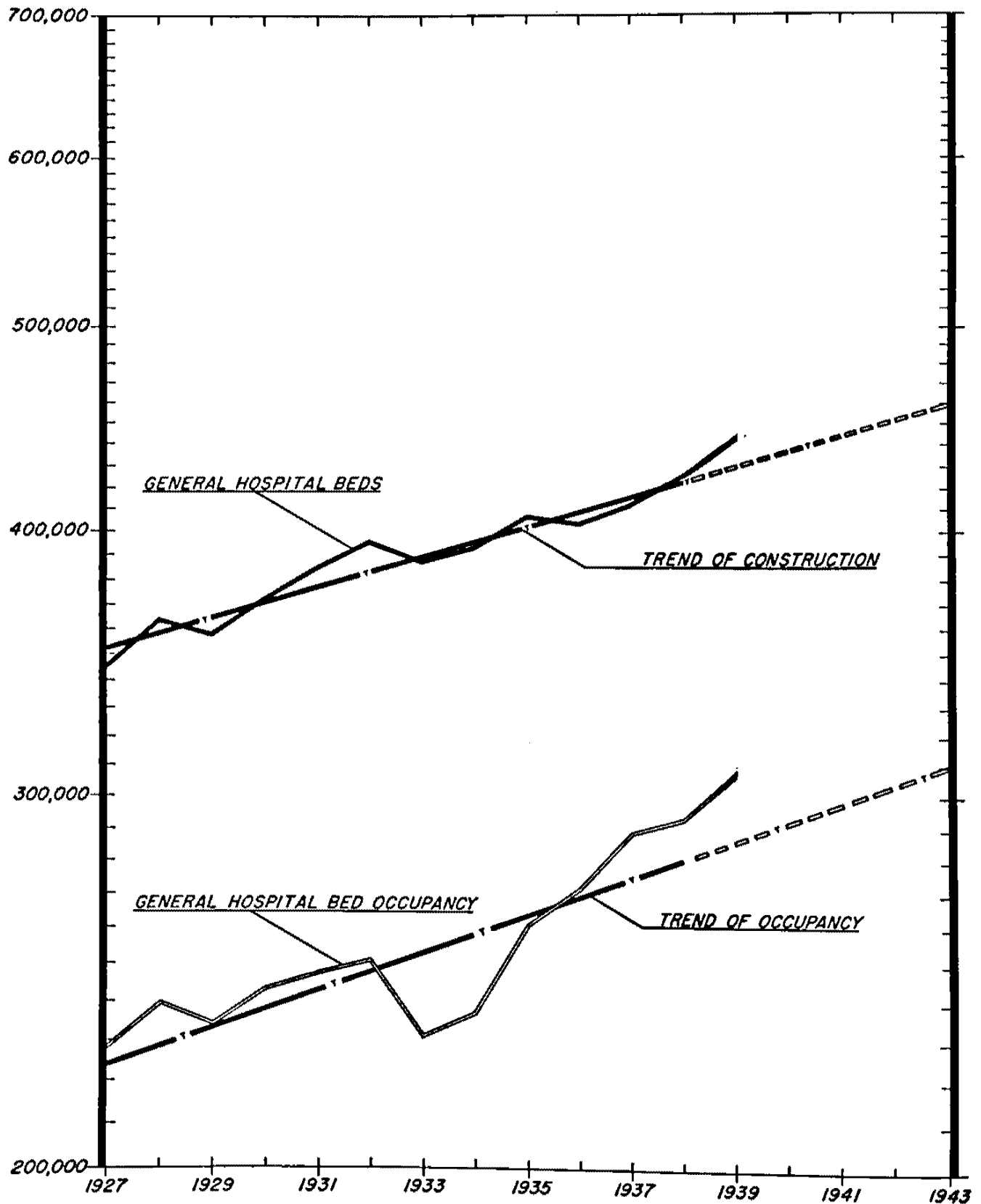


Table 8.—Trend of General Hospital Bed Construction and Bed Occupancy 1927-1939

Year	Total General Hospital Beds*	Trend†	General Hospital Bed Occu- pancy*	Trend‡
1927	345,364	351,796	228,084	228,734
1928	363,337	368,190	239,802	238,808
1929	357,034	364,584	234,000	233,038
1930	371,600	370,978	240,384	239,130
1931	384,333	377,372	247,360	244,262
1932	395,543	383,766	250,495	249,394
1933	386,718	390,160	231,092	254,526
1934	393,425	396,554	237,395	259,658
1935	406,174	402,948	231,294	264,790
1936	402,605	409,342	271,053	269,922
1937	412,091	415,736	258,280	275,054
1938	425,324	422,130	292,870	280,186
1939	444,947	428,524	307,991	285,318
1940	.....	434,918	.....	290,450
1941	.....	441,312	.....	295,582
1942	.....	447,706	.....	300,714

* Hospital Service in the United States, J. A. M. A. 112:108 (March 11) 1939.

† Secular trend fitted by the method of least squares according to data for 1927-1938. Totals for beds and bed occupancy for 1939 added to the respective curves on the opposite chart but not included in derivation of the trend lines.

‡ Estimated.

Trend of General Hospital Bed Construction and Bed Occupancy

Are the general hospital facilities of the United States sufficient to meet the present demand for hospitalization?

What is the trend of general hospital bed construction and bed occupancy?

What would be the effect of increasing the rate of general hospital bed construction?

Two answers should be supplied for each of these questions—one which describes the general hospital situation for the United States as a whole, the other a description of the specific general hospital situation and problems which pertain to individual communities.

Statistics are available to provide a statement pertaining to the entire United States, but more than ordinary statistics is needed to form a judgment as to the general hospital situation in each individual community throughout all the States.

During the last thirteen years general hospital beds have increased in number from 345,364 in 1927 to 444,947 in 1939. In this same period general hospital bed occupancy has increased from 228,084 beds in 1927 to 307,991 beds in 1939. If the same trend of general hospital bed construction which prevailed from 1927 to 1938 (the 1939 figures for beds and bed occupancy are not used in determining the trend lines) were to continue until 1942 there would be at that time more

than 447,000 beds in general hospitals in the United States. Likewise, if the 1927-1938 trend of general hospital bed occupancy were to continue, there would be in 1942 more than 300,000 beds occupied. In 1939 the average daily census showed about 137,000 beds in general hospitals vacant each day. If the construction and occupancy trends were to continue there would be in 1942 some 147,000 beds vacant.

If, however, the construction program is augmented by proposals now before the Congress, the total number of beds in general hospitals will be increased considerably above the trend line. It is impossible to estimate with any degree of accuracy what effect such an increase in the number of general hospital beds would have on bed occupancy. However, unless new measures are contemplated to permit more frequent or extended hospitalization, it is not unlikely that the number of unoccupied general hospital beds would increase proportionately with the increase in new bed construction.

The final answer to the problem of general hospital bed facilities must come from a careful and detailed study of the needs and demand for such facilities in each individual community. These communities should determine their own needs and should direct their own hospital program.

CHART X

GENERAL HOSPITAL BEDS PER THOUSAND
POPULATION AND BED OCCUPANCY, 1925-1939

SOURCE: STATISTICAL ABSTRACT OF THE UNITED STATES BUREAU OF THE CENSUS,
ANNUAL REPORTS OF THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS, A.M.A.

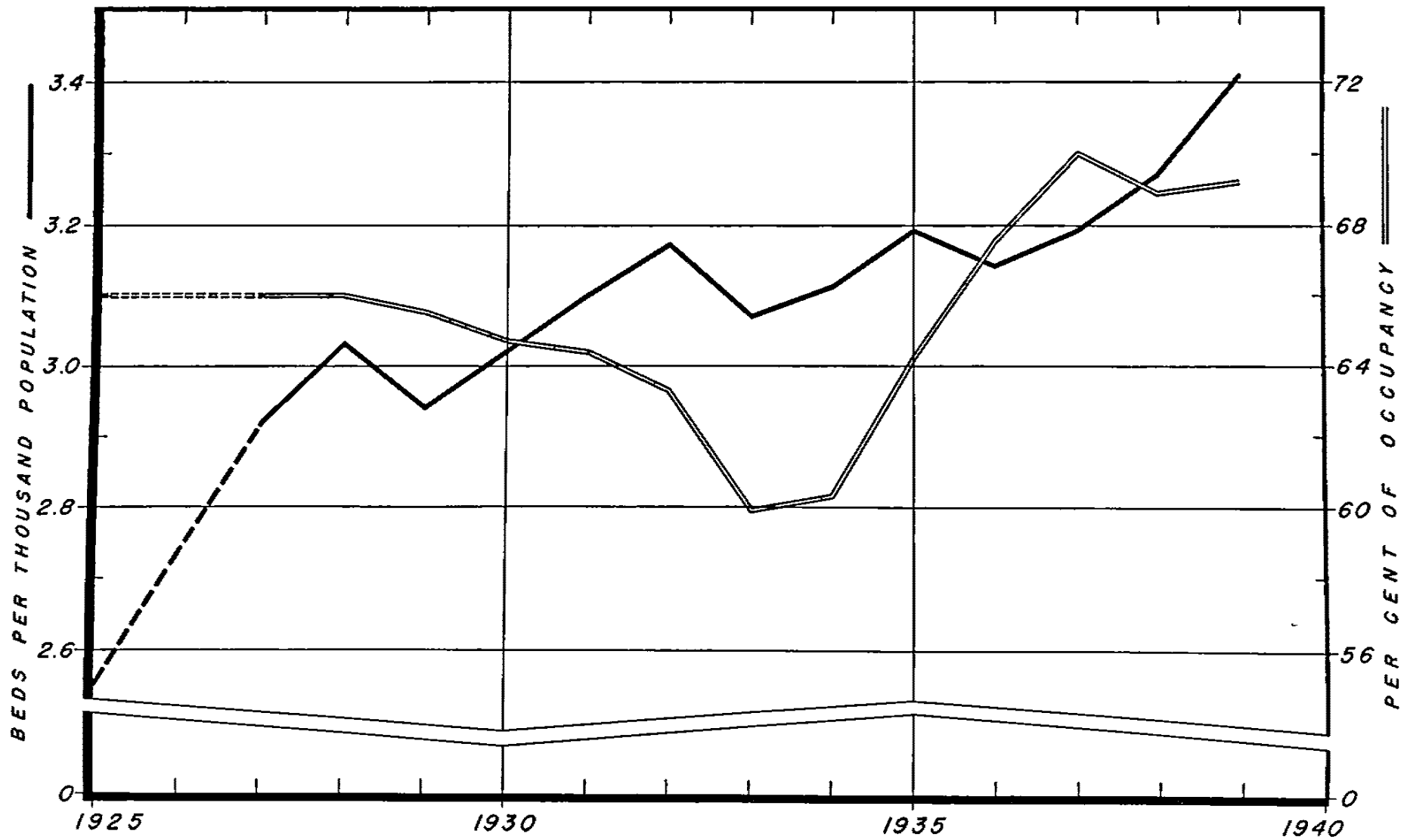


Table 9.—General Hospital Beds per Thousand Population and Bed Occupancy, 1925-1939

Year	Population*	Total Beds†	Beds per Thousand Population	Bed Occupancy‡
1925	114,867,000	294,301	2.55	66.0
1927	118,106,000	345,304	2.92	66.0
1928	119,861,000	363,337	3.03	66.0
1929	121,526,000	357,614	2.94	67.5
1930	123,191,000	371,609	3.02	64.7
1931	124,113,000	384,333	3.10	64.4
1932	124,974,000	385,543	3.17	61.3
1933	125,770,000	386,713	3.07	59.9
1934	126,626,000	393,425	3.11	60.3
1935	127,521,000	401,174	3.19	64.3
1936	128,429,000	402,605	3.14	67.5
1937	129,257,000	412,691	3.19	70.0
1938	130,215,000	425,324	3.27	68.9
1939	130,215,000	444,947	3.41	69.2

* Statistical Abstract of the United States Bureau of the Census, 1931, table 6, page 3, for 1920-1930. Annual mid-year statistics, Bureau of the Census, Nov. 16, 1933.

† Annual Reports of the Council on Medical Education and Hospitals of the American Medical Association, "Hospital Service in the United States."

General Hospital Beds Per Thousand Population and Bed Occupancy, 1925—1939

The question has often been raised as to whether the increase of general hospital beds has kept pace with the increase of population of the United States. The chart on the opposite page shows a comparison between the number of beds per thousand population and the percentage of beds occupied. Over the period of fourteen years shown on the chart, there has been an increase of about 33.7 per cent in the number of beds per thousand population.

Many factors may influence the periodic increase in hospital facilities. Prominent among these factors is a sufficient appreciation of hospital care on the part of the people in individual communities to provide the funds necessary for capital investment and maintenance. Closely associated with this appreciation of the value

of a hospital in times of serious illness is the economic ability of those who live in the vicinity of one or more hospitals to pay for hospital care when they need and desire it.

It is not possible, from statistical records alone, to determine all the factors which have operated at different times to increase or to decrease the number of beds and bed occupancy in general hospitals. It seems clear, however, that the rate at which general hospital beds have been provided for use has shown less sharp fluctuations than the use which the people have made of the beds available. The depression in the occupancy curve which occurred between the years of 1932 to 1935 may have more than an accidental coincidence with the general economic conditions of those years.

TABLE 10.
**DISTRIBUTION OF CERTAIN MEDICAL FACILITIES
 AND PERCENTAGE OF POPULATION FILING
 INCOME TAX RETURNS**

SOURCE: ANNUAL REPORTS, COUNCIL ON MEDICAL EDUCATION
 AND HOSPITALS; AMERICAN MEDICAL DIRECTORY AND THE
 STATISTICAL ABSTRACT OF THE UNITED STATES,
 U. S. DEPARTMENT OF COMMERCE, 1936

	ESTIMATED POPULATION 1934	PHYSICIANS IN ACTIVE PRACTICE 1934	NUMBER OF BEDS IN GENERAL HOSPITALS 1934	AVERAGE NUMBER PATIENTS PER DAY 1934	PERCENT OF POPULATION FILING INCOME TAX RETURNS 1933	PER PHYSICIAN IN ACTIVE PRACTICE 1934	AVERAGE POP. PER PHYSICIAN IN ACTIVE PRACTICE FOR QUARTER GROUPS 1934	POPULA- TION PER BED FOR QUARTER GROUPS	PER CENT OF BEDS OCCUPIED	PERCENT OF BEDS OCCUPIED FOR QUARTER GROUPS
MASSACHUSETTS	4 326 000	6 743	19 593	13 762	5.38	642	683	221	70.23	65.52
NEW YORK	12 846 000	22 207	52 541	36 893	5.17	578		244	70.21	
CONNECTICUT	1 700 000	2 197	6 214	4 225	4.97	774		274	67.99	
NEW JERSEY	4 249 000	4 720	12 445	8 268	4.82	900		341	66.43	
CALIFORNIA	5 937 000	9 644	29 550	18 718	4.73	616		201	63.34	
MARYLAND	1 664 000	2 515	6 131	4 068	4.59	662		271	66.35	
RHODE ISLAND	681 000	861	3 080	2 144	4.20	791		221	69.61	
DELAWARE	253 000	292	744	436	4.11	866		340	58.60	
NEVADA	98 000	131	533	184	3.97	748		184	34.52	
ILLINOIS	7 790 000	11 139	27 799	16 381	3.61	699		280	58.92	
PENNSYLVANIA	10 000 000	12 242	31 290	19 501	3.31	817	320	62.32		
NEW HAMPSHIRE	496 000	545	1 950	1 146	3.30	910	254	58.76		
WASHINGTON	1 623 000	1 915	6 784	3 604	3.29	848	239	53.12		
WISCONSIN	2 908 000	3 218	11 286	6 005	3.00	904	258	53.20		
WYOMING	231 000	227	862	433	2.86	1 018	268	50.23		
OREGON	999 000	1 230	3 721	2 198	2.80	812	268	59.07		
COLORADO	1 058 000	1 766	4 981	2 869	2.73	599	212	57.59		
OHIO	6 701 000	8 466	18 226	11 077	2.67	792	368	60.77		
VERMONT	374 000	488	1 139	704	2.60	766	328	61.80		
MISSOURI	3 868 000	5 364	10 050	6 276	2.54	721	385	62.44		
MAINE	837 000	933	2 877	1 695	2.42	897	291	58.91		
MINNESOTA	2 619 000	3 067	10 197	6 020	2.31	854	257	59.03		
MICHIGAN	4 680 000	5 495	14 554	7 963	2.22	852	322	54.71		
MONTANA	531 000	470	2 877	1 481	2.14	1 130	185	51.47		
UTAH	514 000	510	1 629	904	2.09	1 008	316	55.49		
ARIZONA	406 000	422	1 789	1 095	1.90	962	227	61.20		
INDIANA	3 400 000	3 895	7 598	3 728	1.87	873	447	49.06		
FLORIDA	1 587 000	1 605	4 256	2 200	1.85	989	373	51.69		
NEBRASKA	1 364 000	1 721	4 364	2 274	1.79	793	313	52.10		
VIRGINIA	2 604 000	2 543	6 428	3 676	1.76	1 024	405	57.18		
TEXAS	6 038 000	6 387	12 594	5 862	1.76	945	479	46.54		
KANSAS	1 870 000	2 064	6 027	3 008	1.62	906	310	49.90		
IOWA	2 525 000	3 030	6 905	3 688	1.62	833	366	53.41		
LOUISIANA	2 118 000	2 073	5 657	4 450	1.54	1 022	374	78.66		
WEST VIRGINIA	1 802 000	1 737	4 302	2 123	1.46	1 037	419	49.34		
IDAHO	473 000	367	1 616	802	1.36	1 289	293	49.62		
OKLAHOMA	2 491 000	2 316	4 910	2 573	1.35	1 076	507	52.40		
NEW MEXICO	422 000	364	1 532	756	1.29	1 159	275	49.34		
TENNESSEE	2 785 000	2 854	5 270	3 080	1.26	976	528	58.44		
NORTH DAKOTA	697 000	502	2 161	1 233	1.22	1 388	323	57.05		
KENTUCKY	2 810 000	2 718	4 617	2 272	1.22	1 034	609	49.20		
GEORGIA	3 011 000	2 732	5 030	2 710	1.11	1 102	598	53.82		
SOUTH DAKOTA	692 000	565	2 288	1 146	1.08	1 225	302	50.08		
NORTH CAROLINA	3 378 000	2 379	5 356	2 883	.90	1 420	631	53.82		
ALABAMA	2 805 000	2 055	5 273	2 852	.74	1 365	532	54.08		
SOUTH CAROLINA	1 821 000	1 275	3 053	1 733	.73	1 428	596	56.76		
ARKANSAS	1 976 000	1 821	2 942	1 293	.61	1 085	672	43.94		
MISSISSIPPI	2 008 000	1 454	2 940	1 071	.53	1 381	683	36.42		
DISTRICT OF COLUMBIA	560 000	1 725	5 459	3 932	14.13	325	103	72.03		
UNITED STATES	126 626 000	154 989	393 425	237 395	2.95	817	322	60.34		

Distribution of Certain Medical Facilities and Percentage of Population Filing Income Tax Returns

This table presents some of the most significant, yet frequently overlooked, facts necessary for an understanding of many of the problems of medical care in the United States. The states are arranged according to the per cent of the population which filed income tax returns in 1933. This is a rough measure of the per cent having an annual spendable income of about \$2000 or more.

The number of physicians and hospital beds in relation to population declines at about the same rate as the number of income tax payers. What is even more significant is that there is the same trend of decline in the per cent of hospital beds occupied. Building more hospitals in areas where income is insufficient to maintain them will not be likely to increase the number of persons who can utilize hospital facilities.

Physicians have long pointed out that the only way in which a uniform standard of medical service can be given to a population with uneven incomes is through the use of the "sliding scale of medical fees" which enables persons with low incomes or those who are indigent to receive medical services at reduced fees or for no charge at all. This is true on both a neighborhood and a national scale. An even more important fact is that the causes of greater morbidity and mortality in the states where the population has lower incomes is due far less to a shortage of physicians, hospitals or any type of medical care than to deficiencies of food, clothing and housing. It is not solely nor even

principally due to the lack of medical care that more malaria, hookworm and pellagra are found in one section of the United States than in another. The increased incidence of these diseases is due largely to the lack of health education, proper food, decent homes, toilet facilities and shoes. These factors operate to spread the infestation of the people by hookworm faster than medical care can remove it. It is lack of proper food, shelter and clothing far more than a lack of physicians and hospitals that sends up the disease and death rates in areas with low incomes.

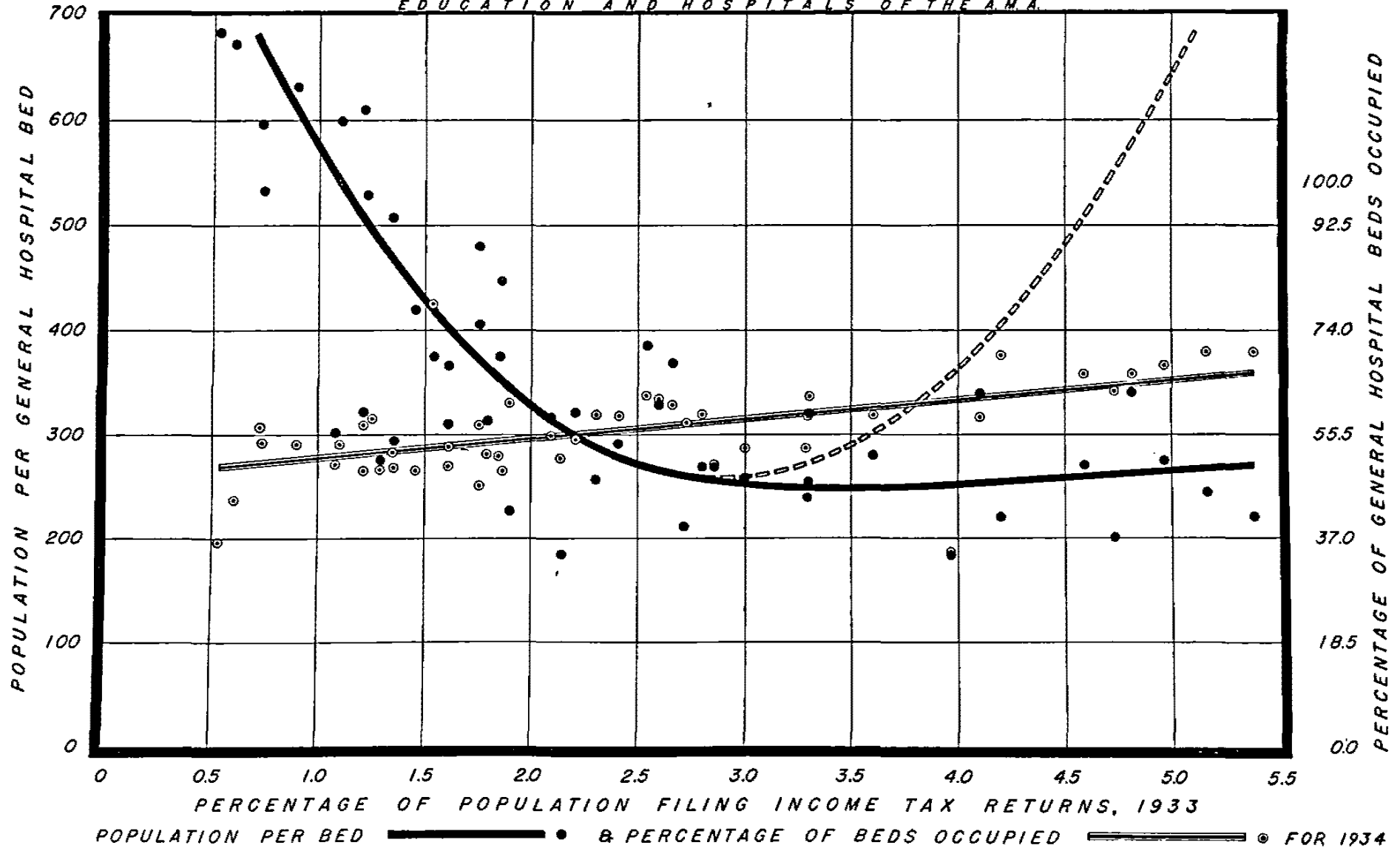
Physicians would be the last to underestimate the importance of medical care, but their scientific training and professional honor prevent them from making any claim that their services are more important in the control of disease and the postponement of death than decent standards of living. Building more hospitals and sending more physicians into states listed in the lower quartile of this table—unless such action were accompanied by increased income—would no more improve health than the building of more grocery and clothing stores and the importation of carpenters would furnish more food, clothing and homes.

This table seems to reveal the existence of a health problem in the United States, but it is more of an economic than a medical problem, and attempts to approach it exclusively from the medical point of view can only lead to confusion of issues and disappointment as to results.

CHART XI

HOSPITAL BEDS AND BED OCCUPANCY IN GENERAL HOSPITALS

SOURCE: STATISTICAL ABSTRACT OF THE UNITED STATES, 1936;
ANNUAL REPORTS OF THE COUNCIL ON MEDICAL
EDUCATION AND HOSPITALS OF THE A.M.A.



Hospital Beds and Bed Occupancy in General Hospitals

A comparison of the two trends, the curve and the straight line, on the accompanying chart, seems to show, in general, that those states having the largest population per general hospital bed also experience the lowest percentage of bed occupancy. A further comparison seems to indicate that those states having the most hospital beds in relation to population do not necessarily have the highest percentage of bed occupancy. An apparent conclusion is that the utilization of hospital beds does not depend so much on the number of beds available as on the percentage of population possessing incomes above the taxable limits.

As shown by the curve, when a ratio of about 250 persons to a hospital bed is reached there is not a continued increase in the number of hospital beds in relation to population despite an increase in the percentage of incomes above the taxable limits or an increase in bed occupancy. Other factors, such as morbidity, education, physical accessibility of hospitals, philanthropy and the incomes of the entire population also affect the distribution and utilization of hospital facilities.

The data for this chart is given in table 10, page 26.

CHART XII
SUPPLY AND UTILIZATION OF BEDS
IN GENERAL HOSPITALS, 1938-1939

1938 ——— ○ ——— 1939 ——— ● ———
SOURCE: ANNUAL REPORTS OF THE COUNCIL ON MEDICAL
EDUCATION AND HOSPITALS, A.M.A.

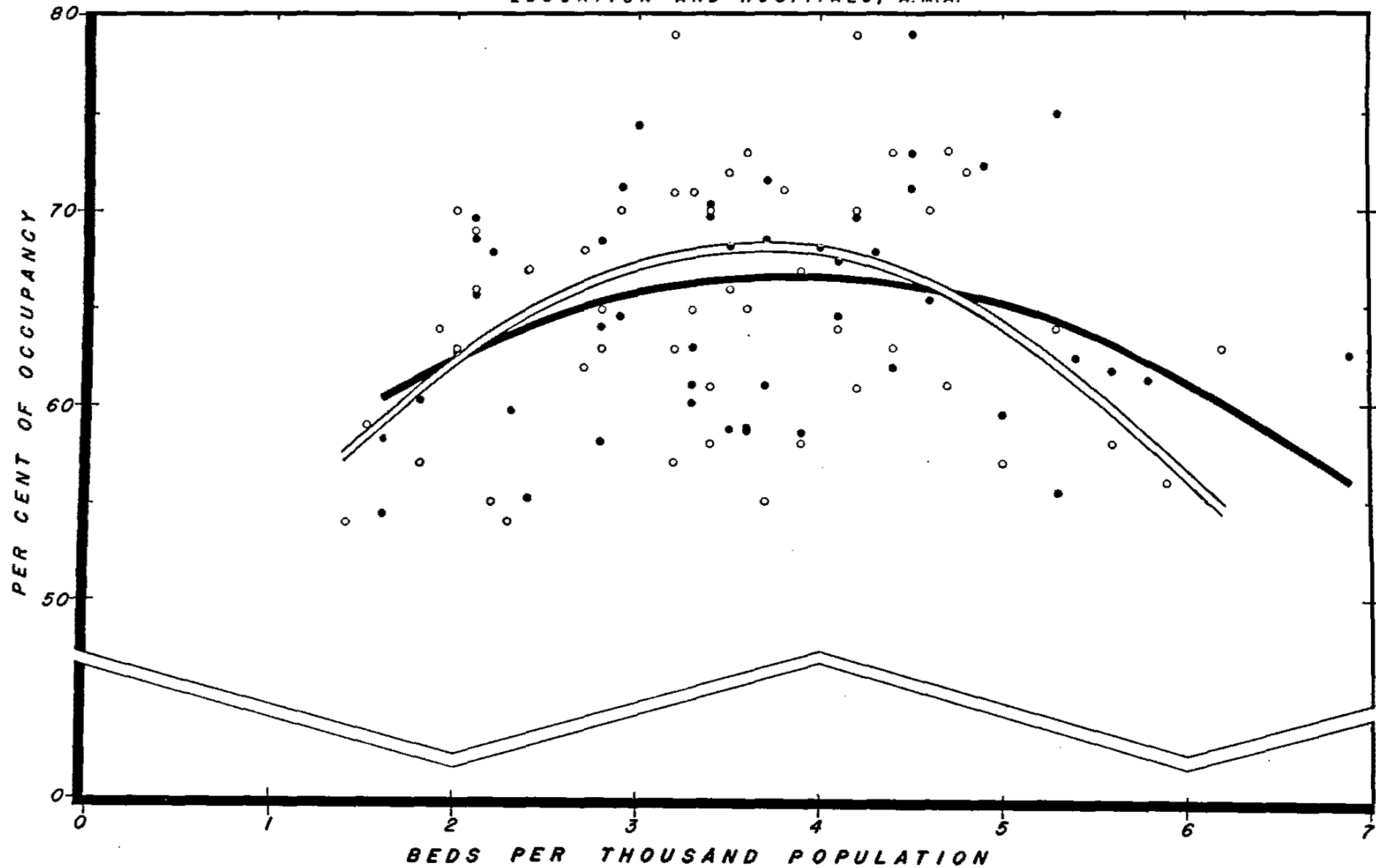


Table 11.—Supply and Utilization of Beds in General Hospitals *

States	Population per Square Mile	Beds per Thousand Population; 1938	Group Average 1938	Beds per Thousand Population 1939	Group Average 1939	Per Cent of Bed Occupancy 1938	Group Average 1938	Per Cent of Bed Occupancy 1939	Group Average 1939
Mississippi.....	43.4	1.4		1.6		53.6		54.4	
Arkansas.....	35.3	1.5		1.6		58.6		58.3	
Kentucky.....	65.1	1.8		1.8		57.9		60.3	
Georgia.....	49.5	1.9		2.0		61.7		62.8	
North Carolina.....	65.0	2.0		2.1		61.3		63.8	
Tennessee.....	62.8	2.0		2.1		70.0		68.6	
South Carolina.....	57.0	2.1		2.1		68.8		69.7	
Alabama.....	51.6	2.1		2.2		65.8		67.0	
Texas.....	22.2	2.2	2.2	2.1	2.3	54.0	62.0	55.2	61.5
Oklahoma.....	34.5	2.3		2.3		54.1		59.7	
Indiana.....	89.8	2.4		2.4		67.1		67.0	
West Virginia.....	72.0	2.7		2.8		62.0		68.1	
Missouri.....	52.8	2.7		2.8		68.4		68.6	
Iowa.....	44.5	2.8		2.8		63.1		64.1	
Virginia.....	60.2	2.8		2.9		65.5		64.7	
Ohio.....	163.1	2.9		2.9		60.8		71.2	
New Jersey.....	537.8	3.2		3.0		71.0		74.3	
Kansas.....	23.0	3.2		3.3		62.9		63.1	
Louisiana.....	46.3	3.2		4.0		78.9		68.2	
Florida.....	26.8	3.2		3.5		56.8		68.8	
Idaho.....	5.3	3.3		3.3		64.6		61.2	
Pennsylvania.....	214.8	3.3		3.4		71.1		69.8	
Nebraska.....	17.9	3.4		3.3		58.2		60.2	
Maine.....	26.7	3.4		3.4		70.5		70.2	
North Dakota.....	9.7	3.4		3.6		61.0		68.7	
Connecticut.....	333.4	3.5		3.7		72.3		71.5	
Illinois.....	136.2	3.5		3.5		66.2		68.2	
Michigan.....	84.2	3.6		4.5		73.3		71.2	
Utah.....	6.2	3.6		3.7		65.3		61.2	
South Dakota.....	9.0	3.7	3.5	3.6	3.0	54.9	67.0	58.8	60.6
Oregon.....	10.0	3.8		4.1		70.9		67.4	
Vermont.....	39.4	3.9		3.7		67.2		68.6	
Delaware.....	121.3	3.9		3.9		67.7		68.5	
Wisconsin.....	53.2	4.1		4.1		63.0		64.7	
New Hampshire.....	51.5	4.2		4.4		61.4		62.0	
Minnesota.....	31.7	4.2		4.2		69.5		69.8	
New York.....	264.2	4.2		4.5		70.3		70.0	
Washington.....	23.4	4.4		4.3		63.3		67.0	
Maryland.....	164.1	4.4		4.5		72.5		73.0	
Rhode Island.....	644.3	4.6		4.6		60.8		65.6	
California §.....	36.5	4.7		5.3		72.9		75.0	
Wyoming §.....	2.3	4.7		5.0		60.7		69.6	
Massachusetts.....	523.6	4.8		4.9		72.4		72.3	
New Mexico.....	3.5	5.0		5.3		57.0		63.6	
Colorado.....	10.0	5.3		5.4		64.2		62.5	
Arizona.....	3.8	5.6	5.6	5.8	5.6	58.4	59.6	62.4	62.8
Montana.....	3.7	5.9		5.8		56.4		61.8	
Nevada.....	0.3	6.2		6.0		62.5		62.6	
District of Columbia**....	7,852.7	8.6		9.7		80.2*		70.1	

* Annual Reports of the Council on Medical Education and Hospitals of the American Medical Association, "Hospital Service in the United States."

† Population estimates, July 1, 1937, Bureau of the Census.

‡ Abstract of Fifteenth Census of the United States, 1930, table 20.

§ The 1939 figures for beds per thousand population and per cent of bed occupancy of California and Wyoming are included in the group coverage of the third group instead of the second.

** The District of Columbia data do not appear on the chart and were not used in deriving the equations for either of the curves.

Supply and Utilization of Beds in General Hospitals

Is there any relation between general hospital bed occupancy and the number of general hospital beds throughout the United States?

The accompanying table and chart show by states the number of beds per thousand population and the per cent of bed occupancy in general hospitals for the years 1938 and 1939.

The location and direction of the parabolic curves represent the relation between the two factors—beds per thousand population and per cent of bed occupancy. It will be observed that as the beds per thousand population increases to about four, the bed occupancy tends gradually to increase. If this trend continued according

to the formula of the parabolic curve after four beds per thousand it would show a gradually decreasing bed occupancy. The trend of general hospital bed occupancy for 1939 was higher than for 1938. No prediction can be made on the course that would be followed by bed occupancy if the number of beds per thousand population were to be increased to 10 or more.

These data seem to show both in this chart and in the chart on page 28 that the maximum occupancy of general hospital beds occurs at some point between four and five beds per thousand population. Small areas may show variations from these state data.

Percentage of Deaths in General Hospitals

Table 12.—Per Cent of Deaths in General Hospitals by States

State	Jan. 1, 1936 Estimate of Population**	Total Gen- Hosp.†	Beds per Thou- sand Popu- lation†	Bed Occu- pancy in Gen. Hosp.†	Total Deaths*‡	Per Cent of Total Deaths in Gen. Hosp.‡
District of Columbia...	608,000	5,263	8.7	80.1	9,094	49.8
California.....	6,031,000	27,054	4.5	70.4	76,094	38.6
New York.....	12,915,000	52,982	4.1	75.0	153,545	38.2
Connecticut.....	1,726,000	6,925	3.5	71.5	17,858	37.0
Nevada.....	100,000	500	3.0	73.1	1,430	35.6
Illinois.....	7,832,000	28,580	3.6	63.9	92,866	34.2
Minnesota.....	2,631,000	10,232	3.9	68.3	28,630	34.2
New Jersey.....	4,310,000	12,840	3.6	71.4	44,059	33.9
Washington.....	1,630,000	6,892	4.2	61.7	19,336	33.6
Colorado.....	1,064,000	5,335	5.0	61.3	13,674	33.1
Massachusetts.....	4,403,000	19,763	4.5	71.9	52,052	32.2
North Dakota.....	792,000	2,282	3.3	66.5	5,654	31.8
Maryland.....	1,672,000	7,269	4.3	71.7	21,960	31.5
Utah.....	518,000	1,764	3.4	64.0	5,126	31.1
Michigan.....	4,760,000	16,963	3.5	69.4	54,781	30.8
Wisconsin.....	2,608,000	11,406	3.9	62.1	33,242	30.5
Montana.....	531,000	2,929	5.5	58.7	6,255	29.7
Rhode Island.....	681,000	3,026	4.4	74.8	8,126	29.5
Oregon.....	1,013,000	3,856	3.8	69.7	12,367	29.1
Louisiana.....	2,121,000	6,370	3.0	91.3	25,074	28.5
Delaware.....	258,000	718	2.8	66.9	3,317	28.2
Pennsylvania.....	10,105,000	31,304	3.1	68.6	112,711	27.2
Ohio.....	6,710,000	18,880	2.8	67.0	60,941	27.0
Arizona.....	406,000	2,049	5.0	65.3	6,551	26.8
New Hampshire.....	505,000	1,954	3.9	62.5	6,438	25.2
Missouri.....	3,938,000	9,972	2.5	70.9	48,767	24.9
Idaho.....	482,000	1,629	3.4	59.7	5,014	24.7
Florida.....	1,630,000	4,543	2.8	58.0	20,063	24.3
Kansas.....	1,882,000	5,922	3.7	60.0	21,674	22.8
South Dakota.....	692,000	2,819	4.1	58.5	6,157	22.5
Indiana.....	2,446,000	7,683	2.2	63.5	42,470	22.2
Iowa.....	2,539,000	6,906	2.4	61.3	28,432	22.0
Nebraska.....	1,364,000	4,333	3.2	63.6	15,752	21.0
Maine.....	849,000	2,957	3.5	66.9	11,325	19.4
Vermont.....	379,000	1,283	3.4	64.2	4,957	19.3
West Virginia.....	1,824,000	4,603	2.5	58.5	19,908	19.3
Texas.....	6,099,000	12,615	2.1	55.7	65,803	19.2
Virginia.....	2,656,000	6,433	2.4	64.3	32,202	17.8
Tennessee.....	2,846,000	5,536	1.9	64.4	32,522	17.7
North Carolina.....	3,439,000	5,586	1.6	64.3	35,630	16.4
Oklahoma.....	2,320,000	5,183	2.1	62.3	23,250	14.9
Alabama.....	2,851,000	5,561	2.0	64.6	31,153	14.6
Georgia.....	3,049,000	5,470	1.8	61.6	37,263	14.6
South Carolina.....	1,831,000	3,234	1.7	66.5	21,426	13.4
New Mexico.....	422,000	2,105	5.0	59.3	6,248	13.2
Kentucky.....	2,860,000	4,695	1.7	55.3	32,378	12.8
Mississippi.....	2,008,000	2,888	1.4	45.4	24,128	9.7
Arkansas.....	2,012,000	2,892	1.4	52.8	18,465	8.1
Wyoming.....	233,000	990	4.2	59.0	2,401	1.0
Total.....	128,021,000	402,605	3.7	67.5	1,479,228	27.0

* Vital Statistics—Special Reports, June 14, 1939, Vol. 7, No. 43, pp. 243-313, Bureau of the Census.

** Department of Commerce, Bureau of the Census, Estimated Population of States, 1936.

† Annual Report of the Council on Medical Education and Hospitals of the American Medical Association, "Hospital Service in the United States."

‡ The District of Columbia data do not appear on the charts and were not used in deriving the equations for the curves.

Table 13.—Per Cent of Deaths from Selected Causes in General Hospitals

Cause	Total Deaths*	Deaths in All Insti- tutions*	Per Cent of Total Deaths in All Insti- tutions*	Per Cent of Total Deaths in General Hospitals*
Appendicitis.....	16,480	13,861	84.1	76.5
Locomotor ataxia, general paral- ysis of insane.....	5,453	4,191	76.9	19.1
Cerebrospinal meningitis.....	3,920	2,231	56.9	59.6
Hernia.....	13,433	9,519	70.9	63.7
Biliary calculi.....	8,663	6,248	70.5	65.0
Puerperal septicemia.....	4,606	3,191	69.3	63.4
Ulcer of stomach.....	8,566	5,659	66.1	60.6
Syphilis.....	12,612	7,788	61.8	43.2
Other puerperal causes.....	4,792	2,747	57.3	51.0
Tuberculosis (other).....	6,484	3,670	56.6	44.3
Puerperal albuminuria.....	2,784	1,555	55.9	50.7
Automobile accidents (primary)...	35,761	19,850	55.5	50.6
Erysipelas.....	2,006	1,040	51.8	33.4
Tuberculosis of the respiratory system.....	65,043	30,638	47.1	21.5
Congenital malformations.....	12,093	5,482	45.3	38.2
All other causes.....	196,023	85,283	43.5	36.1
Other accidents.....	71,963	30,168	41.9	36.2
Diabetes mellitus.....	30,406	12,330	40.6	35.6
Other motor vehicle accidents.....	2,328	938	40.3	36.4
Pneumonia.....	119,378	47,960	40.2	32.8
Cancer (other).....	40,833	16,257	39.8	31.9
Homicide.....	10,232	4,050	39.6	35.7
Cirrhosis of liver.....	10,587	4,193	39.6	34.9
Polioomyelitis.....	780	296	37.9	27.9
Cancer of digestive tract.....	68,230	25,151	36.9	31.0
Typhoid fever.....	3,182	1,160	36.5	31.0
All causes.....	1,479,228	519,120	35.1	27.0
Scarlet fever.....	2,493	859	34.5	22.7
Arteriosclerosis.....	23,893	8,146	34.1	12.8
Measles.....	1,267	430	33.9	23.1
Alcoholism.....	3,714	1,260	33.9	26.0
Diphtheria.....	3,065	1,020	33.3	24.2
Acute rheumatic fever.....	2,175	725	33.3	29.7
Cancer of female organs.....	19,833	6,255	31.5	25.0
Whooping cough.....	2,666	830	31.1	22.0
Diarrhea (under 2 years).....	15,612	4,788	30.0	24.7
Dysentery.....	3,122	935	29.9	23.1
Diarrhea (over 2 years).....	5,339	1,490	27.9	21.1
Cancer of breast.....	13,708	3,806	26.3	19.4
Pellagra.....	3,740	963	25.7	12.7
Nephritis.....	106,865	26,067	24.4	18.3
Diseases of heart.....	341,350	80,030	23.4	16.0
Cerebral hemorrhage.....	116,562	25,091	22.0	15.6
Suicide.....	18,294	3,942	21.5	17.1
Chronic rheumatism.....	1,829	378	20.7	10.7
Influenza.....	33,811	5,899	17.4	14.1
Malaria.....	3,943	450	11.4	9.7

* Vital Statistics—Special Reports, June 14, 1939, Vol. 7, No. 43, pp. 243-313, Bureau of the Census.

Percentage of Deaths in Hospitals

Of the total of 1,479,228 deaths in the United States during the year 1936, 519,120 or 35.1 per cent occurred in hospitals and institutions. General hospitals recorded 399,097 or 27.0 per cent of the total number of deaths. The percentage of deaths for all causes in hospitals and institutions ranges from 51.9 per cent in California to 13.1 per cent in Mississippi. (The District of Columbia, which is very largely urban, and Wyoming, which reported institutional data for 1936 incompletely, were not included in the comparisons between individual states.) When tabulated by cause of death, the percentage of deaths attributed to hospitals and institutions ranges from 84.1 per cent for appendicitis to 11.4 per cent for malaria. These variations may be due to any one of a number of conditions.

The *fatality incidence* of certain diseases or other death-causing conditions varies greatly. In a given hospital the number of deaths from pneumonia and those from measles might be equal, yet the number of cases treated would probably be unequal.

The *average distances* traveled by persons to reach hospitals are appreciably greater in some areas than in others, which tends to prevent them from going to hospitals except in more serious cases. Also, greater distances may delay needed medical and surgical care in acute diseases and in accidents.

Low incomes and standards of living in some areas may restrict hospital admittance to the more serious cases and may delay admittance even in those cases.

Sections showing a large number of hospital beds per thousand population have a relatively greater percentage of deaths in hospitals even though the per cent of beds occupied may be about the same.

The *age composition* of the population of a city or county may affect the proportion of high-fatality cases admitted to hospitals. Younger persons are more susceptible to acute diseases and have a different fatality-incidence than older persons with degenerative diseases.

Differences in the *sex ratios* of different areas or in cases admitted to hospitals may affect the relative numbers of male and female deaths in hospitals. Males may be more frequently involved in accidents and certain frequently hospitalized diseases, such as advanced syphilis and tuberculosis, which have high fatality rates.

The proportion of high-fatality cases admitted to hospitals may differ for *white and other races*. For various reasons, people of certain races may go to hospitals only when injured, or when suffering from serious diseases.

Outstanding hospitals with modern and complete equipment and staffed with specialists, may attract a higher proportion of serious or high-fatality cases.

The *quality of hospital care* undoubtedly varies for different hospitals. Thus, the proportion of serious cases admitted to two hospitals might be approximately equal, but the number of deaths might differ significantly.

The *ratio of serious cases* of a certain disease or condition to all cases involving that disease or condition is probably higher in hospital cases than in nonhospital cases. Hence, a higher percentage of fatalities might be expected among persons admitted to hospitals than among persons with similar diseases or conditions who do not enter hospitals.

Death registration is more complete in hospitals than outside of hospitals. Such a difference automatically raises the proportion of deaths in institutions.

Cause-of-death certification is more complete and more accurate in hospital cases than in the nonhospital cases partly because of superior diagnostic facilities and medical services.

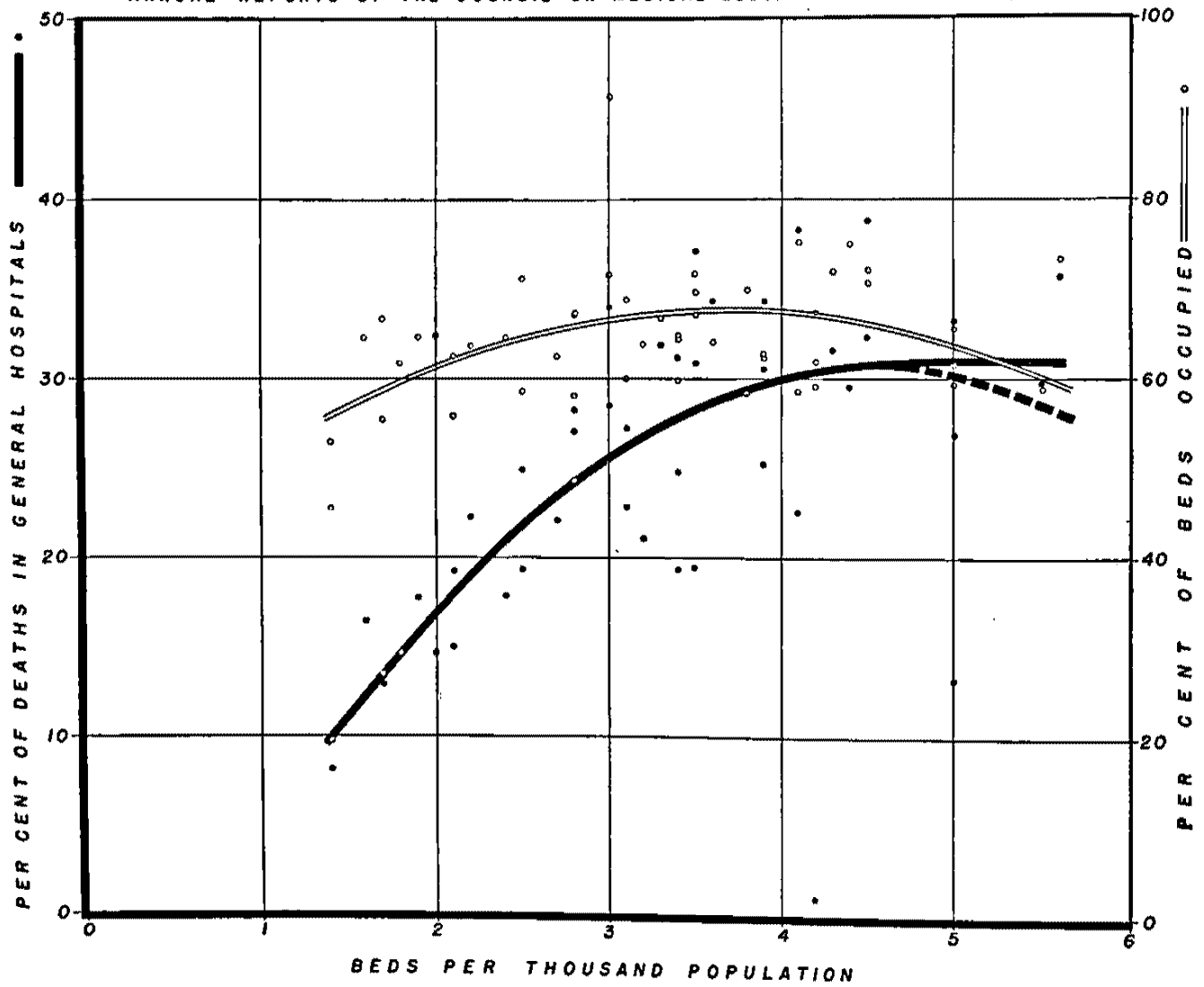
Many persons do not die in the place of treatment. Persons who die because of childbirth, appendicitis, and accidents, may be treated outside the hospital and then, when complications develop, be taken to the hospital too late for medical assistance to effect recovery; yet the death is reported as occurring in the hospital. Particularly in such diseases as tuberculosis, cancer, diabetes, and diseases of the heart, persons may have undergone prolonged treatment in hospitals, but may have returned home before death; yet in these instances the deaths are reported as occurring outside the hospitals.

Therefore, it should be emphasized that similar proportions of deaths in hospitals in two areas do not necessarily mean that the relative quantity and quality of hospital services are similar in these areas, and before any final conclusions are drawn, the aforementioned conditions must be carefully considered.

CHART XIII

BED OCCUPANCY AND DEATHS
IN GENERAL HOSPITALS . 1936

SOURCE: VITAL STATISTICS, SPECIAL REPORTS, BUREAU OF THE CENSUS;
ANNUAL REPORTS OF THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS, A.M.A.



Percentage of Deaths in General Hospitals

The accompanying chart on the opposite page and tables on page 32 show by states the number of beds per thousand population, the per cent of bed occupancy in general hospitals, and the per cent of the total number of deaths in each state that occurred in general hospitals during 1936.

An examination of the chart on the opposite page seems to show that those states having a low percentage of bed occupancy also have a low percentage of deaths occurring in general hospitals. By following the two trend curves on the chart, it would also seem that as the percentage of beds occupied increases, the percentage of deaths that occur in general hospitals also increases. It appears that this same condition continues until the bed occupancy has reached its maximum, at about four beds per thousand population. At this point, the percentage of deaths in general hospitals begins to level off. No prediction can be made as to what would happen if the beds per thousand population were

increased to numbers per thousand population above the data shown. It seems reasonable to assume that if the beds per thousand population were increased to a point at which all people desirous of general hospital care would go to hospitals, the bed occupancy would reach the maximum. Of this total maximum number of patients who would enter general hospitals, a certain number would die in the hospitals. This number would represent the maximum percentage of the total deaths in the state which would occur in general hospitals.

Therefore, on the assumption that at the maximum point of bed occupancy all people who need and desire general hospital care would be entering hospitals, any increase in the number of beds per thousand population beyond this point would not result in any further increase in the percentage of the total deaths in general hospitals, but would result in a lower bed occupancy.

CHART XIV

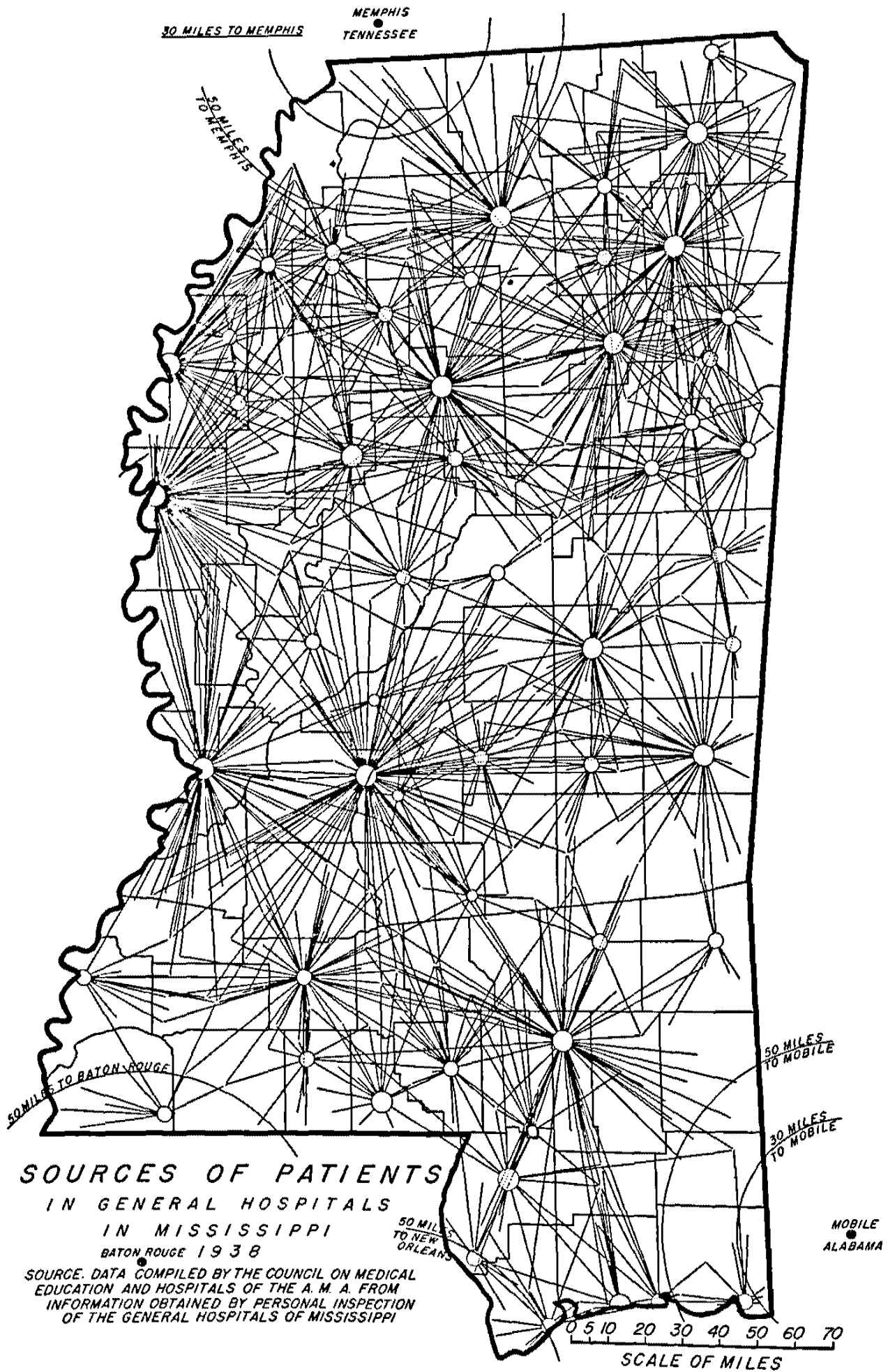


Table 14.—Mississippi Hospital Facilities 1931-1938 *

Year	Hospitals		Beds		Bassinets		Patients Admitted		Average Census	
	Total	General	Total	General	Total	General	Total	General	Total	General
1931.....	77	65	8,007	2,976	325	309	54,061	49,749	5,967	1,283
1932.....	75	64	8,121	2,794	320	308	57,367	53,224	5,967	1,148
1933.....	75	65	8,119	2,823	315	309	50,243	47,166	5,637	961
1934.....	76	66	7,834	2,940	304	298	49,692	46,045	5,717	1,071
1935.....	77	67	8,040	2,961	306	304	55,530	53,007	5,789	1,206
1936.....	73	64	8,512	2,888	323	323	65,079	61,228	6,102	1,312
1937.....	74	63	8,870	2,818	339	339	74,823	70,557	6,678	1,411
1938.....	100	88	9,337	3,118	402	402	76,647	72,442	7,139	1,685

* Council on Medical Education and Hospitals: Hospitals and Medical Care in Mississippi, J. A. M. A. 112:2317 (June 3) 1939.

Table 15.—Percentage of Beds Occupied in Mississippi *

	1934	1936	1937	1938
According to Ownership or Control:				
Federal.....	85.0	90.5	81.6	95.5
State.....	88.6	82.5	85.8	87.2
County.....	36.0	32.0	48.0	51.6
City.....	13.6	13.6	....	35.0
City-county.....	28.6	20.0	51.1	57.3
Total governmental.....	86.9	82.4	84.6	87.1
Church.....	63.8	46.8	58.4	55.4
Fraternal.....	41.7	....	....	....
Associations and restricted corporations.....	28.9	41.4	45.2	50.7
Total nonprofit.....	34.9	42.6	47.4	51.4
Individual and partnership.....	32.2	36.2	37.1	40.9
Corporations (unrestricted as to profit).....	30.3	43.8	40.6	38.1
Total proprietary.....	31.6	37.8	37.7	40.6
Total nongovernmental.....	33.0	40.2	42.7	46.4
According to Type of Service:				
General.....	36.4	45.4	50.1	53.2
Nervous and mental.....	99.0	88.5	88.7	91.9
Tuberculosis.....	64.5	62.9	60.6	57.3
Industrial.....	20.0	....	....	....
Hospital departments of institutions.....	36.4	44.6	36.4	42.1
Total for all hospitals.....	72.1	71.7	74.1	76.6

* Council on Medical Education and Hospitals: Hospitals and Medical Care in Mississippi, J. A. M. A. 112:2317 (June 3) 1939.

Utilization of General Hospital Beds in Mississippi in 1938

The Council on Medical Education and Hospitals of the American Medical Association in 1939 undertook a complete study of hospitalization and facilities for medical care in the State of Mississippi. The procedure involved personal visits of inspection to all of the 117 registered and unregistered hospitals in the state.

It was found that during the last four years, there had been a steady increase in the number of hospital beds in Mississippi. Facilities for Negroes increased less rapidly than those for the Whites, while the population is approximately equally divided. The number of general hospital beds for Negroes was 0.7 per thousand as compared with 2.4 per thousand for the Whites.

Admissions to general hospitals increased 45.6 per cent in the last seven years, while the general hospital beds increased 4.6 per cent. The occupancy in general hospitals is increasing even more rapidly than the number of beds, and yet only 53.2 per cent of the general hospital beds were occupied in 1938. Although the general hospitals admitted 94.5 per cent of the admissions to all hospitals for 1938, the number of patient-days in general hospitals represented only 23.2 per cent of the total patient-days in all hospitals.

The geographical location of general hospital facilities in Mississippi as shown by the chart on the opposite page seems fairly well distributed excepting possibly in the extreme northwest and the extreme southeast, but these areas are partially served by hospitals in neighboring states. Distance and transportation offer no serious difficulties in hospitalization since only about 25 per cent of the patients admitted to general hospitals in 1938 came from a distance of 30 miles or more.

Based on the data collected, the Council arrived at the following conclusions:

More qualified radiologists and pathologists are needed in the State. Clinical laboratory facilities do not provide a sufficiently wide scope of service in most hospitals. Obstetrical delivery rooms and nurseries are needed in many general hospitals offering this service; thirty-seven have no delivery rooms and forty-three have no nurseries.

The tuberculosis program is in need of more adequate financial support in order to utilize the present facilities and to increase the number of beds about 100 per cent.

The development of nursing education in Mississippi has not kept pace with the advances in other parts of the country, and this may be partially ascribed to present economic conditions. Mississippi has no hospitals approved for intern or residency training. Several have made application and are now in the process of conforming to the requirements.

The number of beds for nervous and mental patients is apparently adequate for the needs of the state.

All available information clearly points to the fact that the existing general hospital beds are sufficient for the white population, while additional beds are needed for Negroes.

Extensive inquiry among all classes of the population, including physicians, health officers, nurses and workers, elicited the almost uniform response that there is practically no one in Mississippi who cannot secure medical care regardless of his ability to pay.

CHART XV

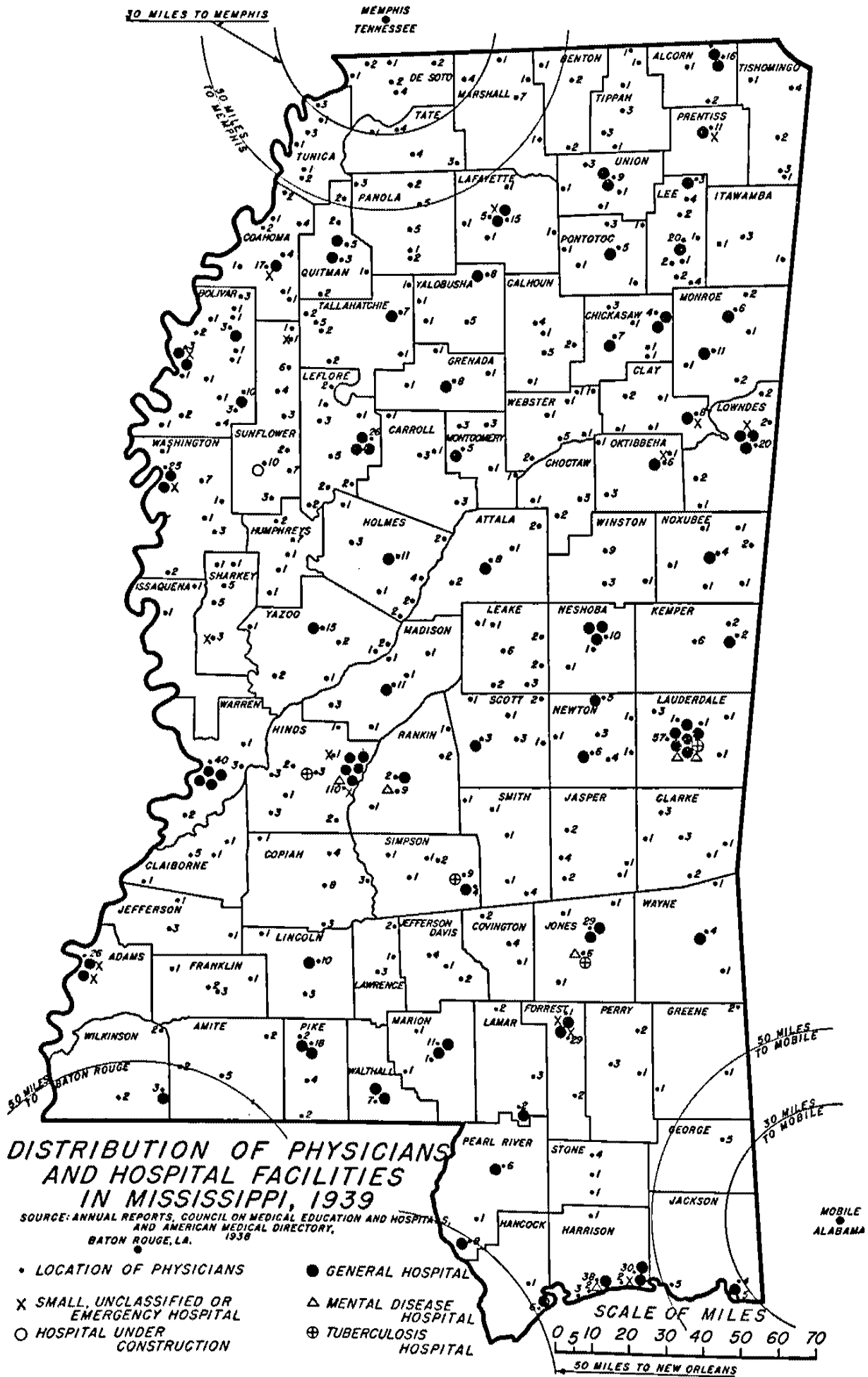


Table 16.—Number of Physicians in Mississippi
(1886-1938)*

Year	Popula- tion †	Number of Physi- cians	Popula- tion per Physician (Miss.)	Popula- tion per Physician (U. S.)
1886 Polk.....		1,682	673	662
1890.....	1,289,600	1,606	803	629
1893.....		1,465	880	630
1896.....		1,367	943	678
1896.....		1,550	832	636
1900.....	1,551,270	1,510	1,027	630
1902.....		1,555	998	644
1904.....		1,696	915	641
1906.....		1,749	887	637
1909 American Medical Directory.....		2,054	755	679
1912.....	1,797,114	2,009	895	693
1914.....		2,047	878	688
1916.....		2,048	877	691
1918.....		1,975	910	709
1921.....	1,790,618	1,761	1,017	744
1923.....		1,792	999	764
1925.....		1,702	1,032	781
1927.....		1,680	1,066	791
1929.....		1,633	1,097	797
1931.....	2,009,821	1,567	1,283	794
1934.....		1,525	1,310	784
1936.....		1,515	1,329	778
1938.....	2,023,000	1,495	1,353	767

* Council on Medical Education and Hospitals: Hospitals and Medical Care in Mississippi. J. A. M. A. 112:2317 (June 3) 1939.

† Population figures are from census enumerations except for 1938 which is a census estimate. Statistical Abstract of the United States, 1938, table No. 6, pp. 4 and 5, 1938, estimate from Public Health Reports, Bureau of the Census, vol. 54, No. 5, pp. 180-185.

Distribution of Physicians and Hospital Facilities in Mississippi, 1938

The population in Mississippi increased approximately 79 per cent in the period 1886 to 1938, while during this same period the number of physicians decreased from 1,682 to 1,495, a decline of about 11 per cent.

Besides Mississippi, other southern states, such as Alabama, Arkansas, Georgia, Kentucky and Tennessee have shown an increase of population while the number of physicians has decreased. However, it does not necessarily follow that because of the changes in the population per physician in these states the medical services are more inaccessible or of a lower quality than in previous years. Many factors such as advances in medical education, improvement in roads, transportation and communication facilities would seem to indicate that the reverse may be true.

In appraising medical service in this state, it must be remembered that over 50 per cent of the population is Negro, and the demand for medical service among this group may fall below that of the white population, although the need for medical services among Negroes may often be greater than for the white population.

The heaviest concentration of medical personnel occurs in counties where the larger cities are located, and where hospital facilities are readily available. Thus, in 1938, 325 physicians were located in towns of less than 500 population, 222 in places of 500—999, while 422 were in towns of 1,000—4,999, and 526 in cities over 5,000.

In proportion to Negro population, Mississippi has the smallest number of Negro physicians of any state in the Union. On the basis of the 1930 census, and the

number of physicians listed in 1932 by the National Medical Association, the average ratio of Negroes to Negro physicians for the entire country was 2,984 to 1, while in Mississippi, with a total of 1,009,718 Negroes and 52 Negro physicians (1938 American Medical Directory), the ratio was 19,417 to 1.

Apparently there is an insufficient number of young physicians locating in Mississippi to maintain the average age distribution as shown by a study of the age of physicians in 16 states and the District of Columbia made in 1931.* The 1938 directory lists 253, or 16.9 per cent, of the physicians in Mississippi as having reached the age of 65. This is in marked contrast to the 8.9 per cent in 1923 when only 159 physicians in the state were classified as 65 years and older. The percentage of physicians in 16 states and the District of Columbia who had attained the ages of 65 to 69 in 1931 was 5.49.

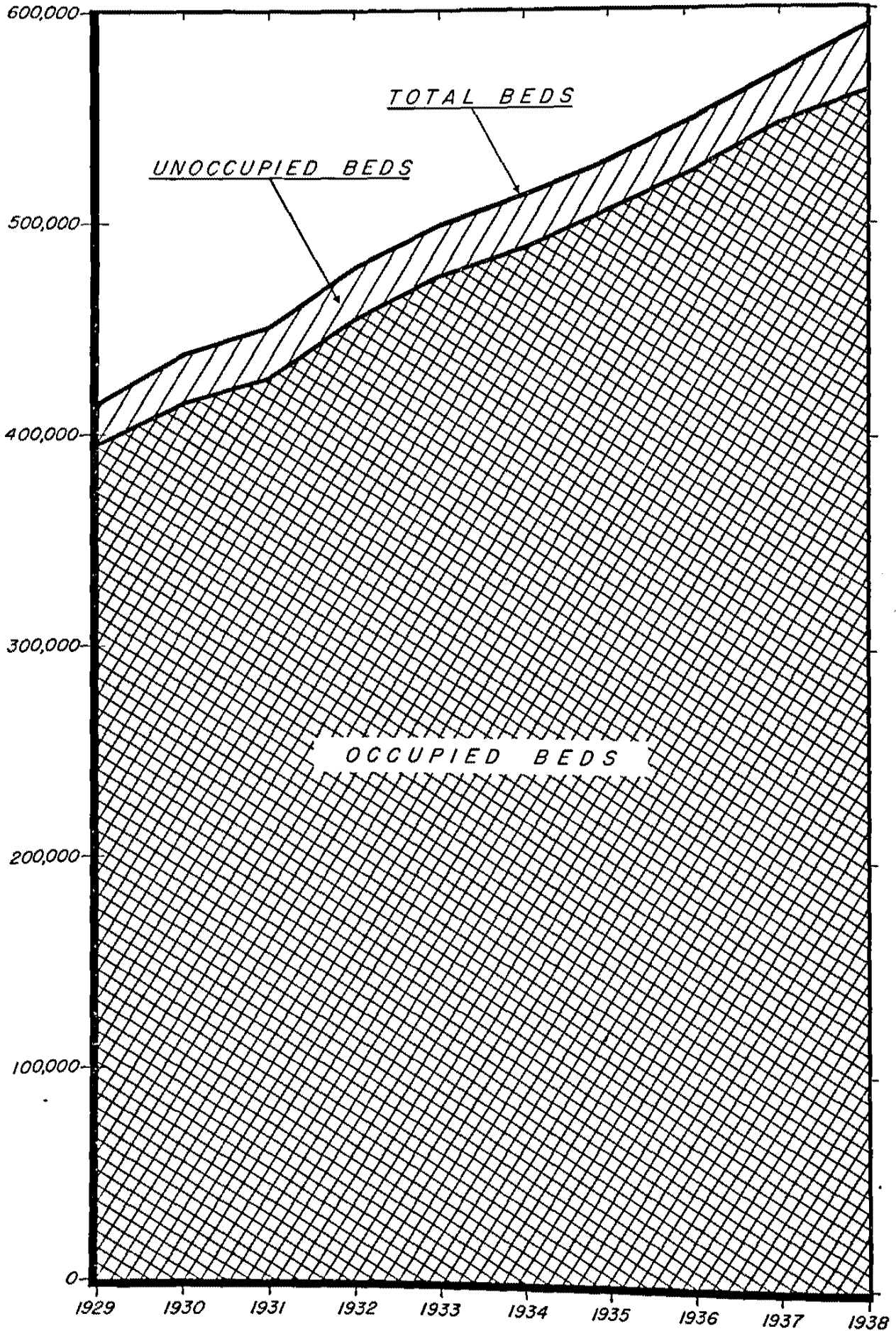
It appears that the distribution of physicians in Mississippi has followed the general trend away from rural areas, but this single factor of location does not necessarily mean a serious lack of sufficient or available medical service. With increased hospital facilities and modern methods of transportation and communication, it is possible for physicians to serve larger areas. The economic factor is no doubt of considerable importance in the distribution of physicians. Physicians, just as other citizens, must have a sufficient amount of income with which to meet their current expenses.

* Leland, R. G.: Distribution of Physicians, American Medical Association, 1936, p. 63.

CHART XVI

NERVOUS AND MENTAL DISEASE
HOSPITAL BEDS AND BED OCCUPANCY

SOURCE: ANNUAL REPORTS OF THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE A. M. A.



*Table 17.—Nervous and Mental Disease Hospital Beds and Bed Occupancy 1929-1939 **

	Nervous and Mental Disease Hospitals		All Other Special Hospitals	
	Beds	Average Census	Beds	Average Census
1929.....	414,386	395,407	135,713	97,350
1930.....	437,919	415,042	146,341	107,056
1931.....	451,245	427,135	138,537	100,701
1932.....	479,548	453,473	139,263	101,477
1933.....	498,935	474,787	141,378	103,792
1934.....	513,845	488,481	140,831	104,232
1935.....	529,311	507,369	139,654	106,947
1936.....	548,952	524,993	145,164	111,865
1937.....	570,616	546,906	141,841	109,250
1938.....	591,822	562,337	144,234	110,409
1939.....	606,234	577,103	143,705	111,339

* Annual Reports of the Council on Medical Education and Hospitals of the American Medical Association, "Hospital Service in the United States." The 1939 data for nervous and mental disease hospitals do not appear on the opposite chart.

Nervous and Mental Disease Hospital Beds and Bed Occupancy

Mental and nervous disease hospitals have shown continuously the highest percentage of beds occupied in any group of hospitals arranged according to type of service. In 1938 the number of patients admitted to nervous and mental disease hospitals constituted only 2.1 per cent of the patients admitted to all hospitals. Mental and nervous diseases require a much longer period of treatment than most other diseases and therefore the hospital beds occupied remain occupied for a much longer time. It follows that a given number of beds for nervous and mental diseases can serve less than $\frac{1}{60}$ as many patients as the same number of general hospital beds.

The number of beds in mental and nervous disease hospitals now (1939) exceeds, by more than 161,000 beds, the bed facilities in general hospitals. Yet the nervous and mental disease hospital bed occupancy was about 95.2 per cent whereas the general hospital bed occupancy was 69.2 per cent.

It may be possible to utilize a higher percentage of available beds in nervous and mental disease hospitals than in general hospitals, but 5 per cent of unoccupied beds seems too narrow a margin to be consistent with satisfactory operation of these hospitals.

Many complaints have been made concerning the crowding of some mental and nervous disease hospitals and attention has been called to the lists of patients awaiting admission.

It should be noted that new methods of treatment may make it possible to shorten the length of time that some of these patients will need to stay in mental and nervous disease hospitals. Thus the turnover in bed occupancy may be somewhat more rapid in the future if these advances in therapy effect satisfactory and lasting improvements in the patients treated. The supply of nervous and mental disease hospital beds depends, therefore, on state requirements and the advances in medical science.

CHART XVII

BIRTH RATES PER 1000 POPULATION
FOR SPECIFIED COUNTRIES, 1920 — 1936.

(EXCLUSIVE OF STILLBIRTHS)

SOURCE: VITAL STATISTICS, SPECIAL REPORTS, BUREAU OF THE CENSUS.

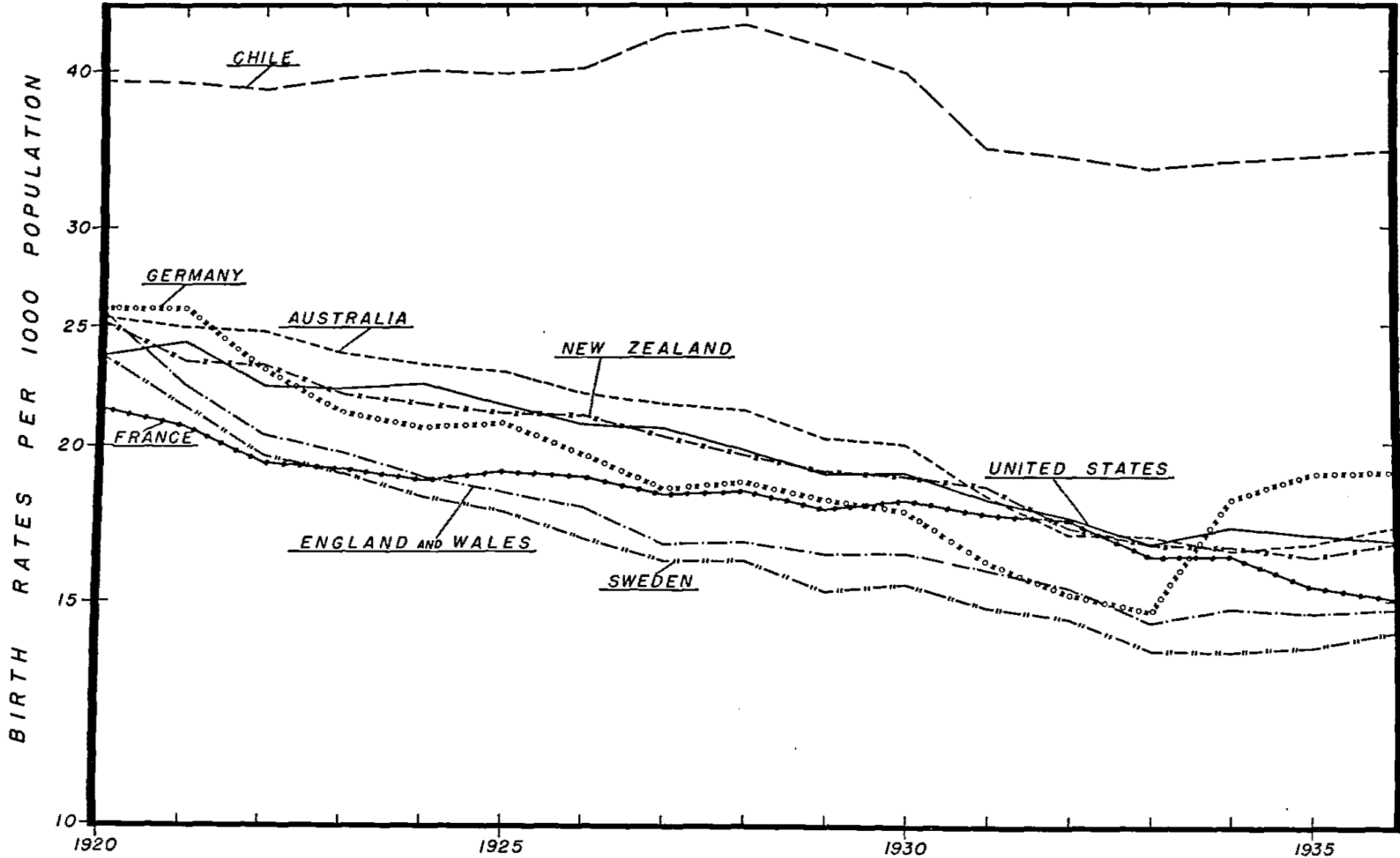


Table 18.—Populations (in Thousands) of Specified Countries, 1921-1936 *

Year	United States	Chile	Germany ^a	England and Wales	France	Sweden	Australia ^b	New Zealand ^c
1921	108,208	3,774	.....	37,887 [§]	39,240	5,929	5,458	1,223
1922	109,873	3,801	82,035	38,158	39,420	5,971	5,571	1,251
1923	111,537	3,847	82,450	38,403	39,880	5,997	5,694	1,273
1924	113,202	3,874	82,846	38,746	40,310	6,021	5,814	1,297
1925	114,867	3,929	83,177	38,890	40,610	6,045	5,941	1,328
1926	116,532	3,977	83,646	39,067	40,870	6,064	6,059	1,352
1927	118,197	4,034	84,023	39,290	40,940	6,081	6,185	1,374
1928	119,862	4,118	84,393	39,432	41,050	6,097	6,304	1,399
1929	121,528	4,199	84,739	39,607	41,230	6,113	6,395	1,405
1930	123,091	4,261	85,084	39,806	41,610	6,131	6,466	1,423
1931	124,113	4,322	85,429	39,988	41,660	6,152	6,527	1,442
1932	124,974	4,375	85,719	40,201	41,860	6,176	6,578	1,453
1933	125,770	4,420	86,027	40,350	41,890	6,201	6,630	1,464
1934	126,626	4,447	86,409	40,467	41,950	6,222	6,678	1,473
1935	127,521	4,466	86,871	40,646	41,940	6,242	6,726	1,482
1936	128,429	4,529	87,349	40,839	41,907	6,259	6,778	1,492
Density of population per square kilometer, 1936	16.7	6.1	143.1	270.3	76.1	15.3	0.9	5.6

* Vital Statistics—Special Reports, Vol. 9, No. 36, pages 345-461, May 2, 1940. Derived from Aperçu de la Démographie des Divers Pays du Monde, 1929-1936, Office Permanent de l'Institut International de Statistique, La Haye, 1939, p. 34, ff.

§ Date of census.

^a Territory of 1936.

^b Natives not included, with a total of 77,195 on June 30, 1936.

^c Natives not included, with a total of 82,326 according to the census of 1936.

Note.—The density per square kilometer is computed according to the area not including water; or, if this figure is incorrect, according to the geographical area.

Table 19.—Birth Rates per 1,000 Population (Exclusive of Stillbirths) for Specified Countries, 1920-1936 *

Year	United States ^a	Chile	Germany ^b	England and Wales	France ^c	Sweden	Australia	New Zealand ^d
1920	23.7	39.4	25.8	25.5	21.4	28.6	25.4	25.1
1921	24.2	39.2	25.8	25.4	20.7	21.5	24.9	23.4
1922	21.3	38.7	25.0	20.4	19.3	19.6	24.7	23.2
1923	22.2	39.5	21.2	19.7	19.1	18.9	23.7	22.0
1924	22.4	40.0	20.0	18.8	18.7	18.1	23.2	21.6
1925	21.5	39.8	20.8	18.3	19.0	17.0	22.9	21.9
1926	20.7	40.1	19.6	17.8	18.8	16.8	22.0	21.1
1927	20.6	42.8	18.4	16.6	18.2	16.1	21.6	20.3
1928	19.8	43.6	18.6	16.7	18.3	16.1	21.3	19.6
1929	18.9	41.9	18.0	16.3	17.7	15.2	20.2	19.0
1930	18.0	29.8	17.6	16.3	18.0	15.4	19.9	18.8
1931	18.0	34.6	16.0	15.8	17.5	14.8	18.2	18.4
1932	17.4	34.2	15.1	15.3	17.3	14.5	16.9	17.1
1933	16.6	33.4	14.7	14.4	16.2	13.7	16.8	16.6
1934	17.1	33.8	18.0	14.8	16.2	13.7	16.4	16.5
1935	16.9	34.1	18.9	14.7	15.3	13.8	16.6	16.2
1936 ^e	16.7	34.6	19.0	14.8	15.0	14.2	17.1	16.0
Decrease	29.5%	12.2%	26.4%	42.0%	29.9%	30.8%	32.7%	33.9%

* Vital Statistics—Special Reports, Vol. 9, No. 36, pages 345-461, May 2, 1940. Derived from League of Nations Annual Epidemiological Reports for the years 1935 (p. 68, f.) and 1936 (p. 66, f.).

^a Birth Registration Area (69.8% of total population in 1920, 94.7% in 1931, and 100% since 1933).

^b From 1921, the rates relate to the present area.

^c Up to 1913, 87 departments; since 1920, 60 departments.

^d Exclusive of Maoris.

^e Preliminary figures.

Birth Rates for Specified Countries

Birth rates declined greatly in most countries during the 17 year period for which statistics are shown. (Only eight of the 50 countries for which rates are available are shown here.) Only the countries of Asia and a few nations in other continents showed increased or almost stationary rates. In some countries, the apparent increase in birth rates may be due to an improvement in birth registration.

When listed in order of rank from the lowest to the highest birth rates for 1936, Austria was lowest with a birth rate of 13.1 per 1,000 population, and Palestine was highest with a birth rate of 44.9 per 1,000 population. The United States was eleventh from the lowest with a birth rate of 16.7.

When listed in order of the per cent increase or decrease in birth rates, Norway is lowest with a decrease of 43.3 per cent in its birth rate from 1920 to 1936 and Strait Settlements was highest with an increase of 49.7 per cent in its birth rate over the same period. The United States, which is eighteenth

from the lowest, showed a decrease of 29.5 per cent in its birth rate during this period.

It is claimed that there is a positive relation between the percentage of decrease in a country's birth rate and the level of its industrial progress and standard of living. There are exceptions, however, to this generalization.

The most striking changes in birth rates are the increase for Chile in 1927, 1928 and 1929 and the sharp rise in Germany's birth rate in 1934, 1935 and 1936. This change coincides closely with the early period of the National Socialist control in that country.

It is interesting to note that, in general, the decline in birth rates during the 17 year period was more rapid in countries with the lowest rates in 1936. If decreasing birth rates are to continue over a long period, the effect of this decrease on the average age of the population will become apparent in the relative increase in the mortality rates for the degenerative diseases of middle life and the declining years.

CHART XVIII

PER CENT OF POPULATION WITHIN UNITED STATES
D.R.A. AND DEATH RATES THEREIN 1804-1938

PER
1000
POP.
50

PER CENT OF POPULATION WITHIN D.R.A. ----- DEATH RATES THEREIN BY YEARS ———

SOURCE: U.S. BUREAU OF THE CENSUS

PER
CENT
100

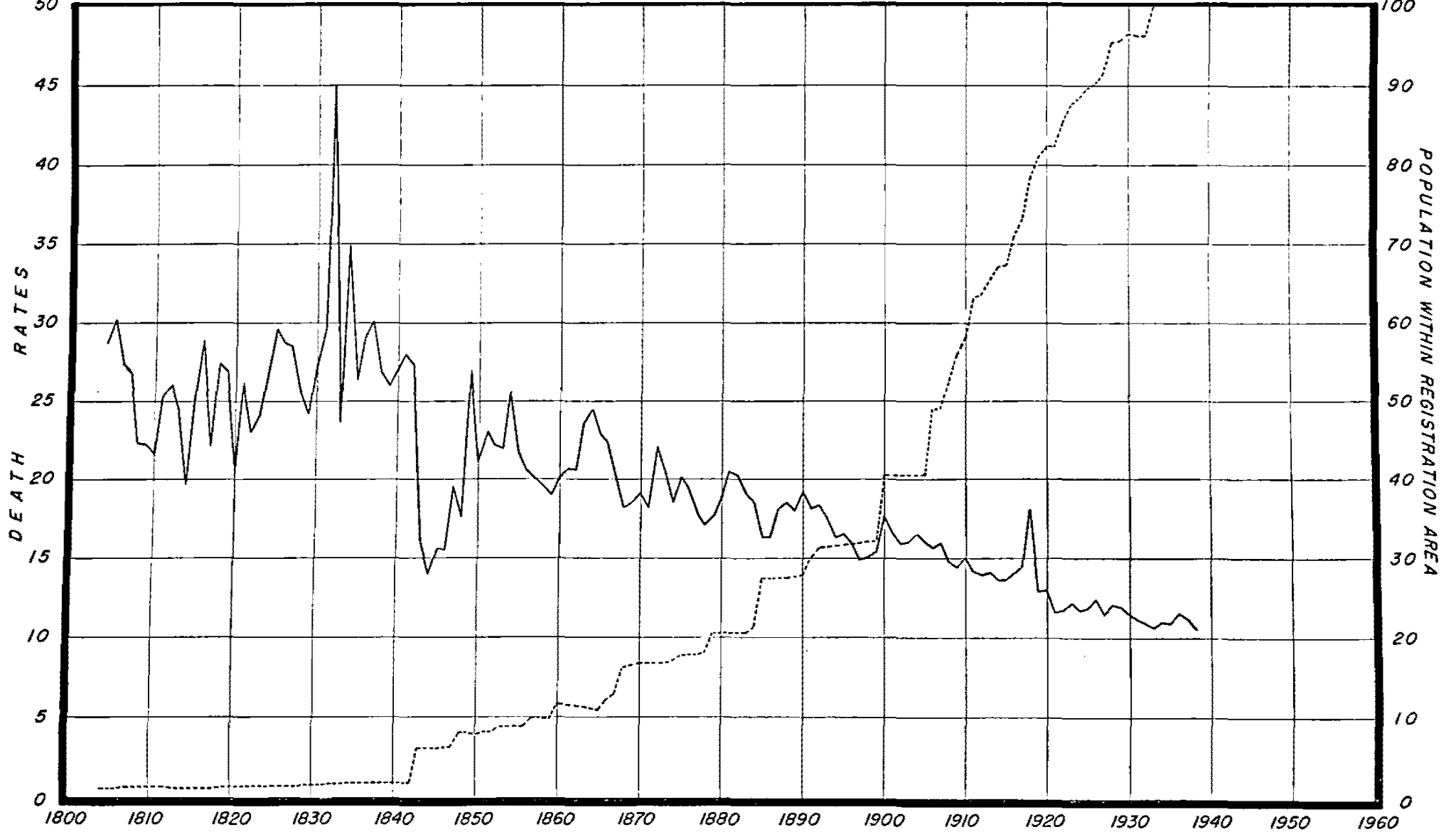


Table 20.—Per Cent of Population Within United States Death Registration Area and Death Rates Therein 1804-1938 *

Year	Per Cent of Population in Registration Area	Death Rate	Districts in Registration Area	Year	Per Cent of Population in Registration Area	Death Rate	Districts in Registration Area
1804	1.2	28.7	Old New York City	1871	16.7	18.2	Washington, D. C. Baltimore
1805	1.2	30.2		1872	16.7	22.1	
1806	1.2	27.3		1873	16.7	20.5	
1807	1.3	26.8		1874	17.0	18.5	
1808	1.3	22.3		1875	17.7	20.1	
1809	1.3	22.2		1876	17.8	19.3	
1810	1.3	21.6		1877	17.8	17.8	
1811	1.3	25.3		1878	18.0	17.1	
1812	1.3	26.1		1879	20.4	17.6	
1813	1.2	24.4		1880	20.4	18.8	
1814	1.2	19.7		1881	20.5	20.5	
1815	1.2	25.1		1882	20.5	20.2	
1816	1.2	28.6		1883	20.5	19.1	
1817	1.2	22.2		1884	21.3	18.5	
1818	1.2	27.4		1885	27.4	16.3	
1819	1.3	26.9		1886	27.4	16.3	
1820	1.3	20.5		1887	27.5	18.1	
1821	1.3	26.2		1888	27.5	18.5	
1822	1.4	23.1	1889	27.7	18.0		
1823	1.4	24.1	1890	27.9	19.2		
1824	1.4	27.0	1891	30.0	18.2		
1825	1.5	29.6	1892	31.3	18.3		
1826	1.5	28.7	1893	31.4	17.6		
1827	1.5	28.5	1894	31.5	16.3		
1828	1.5	25.8	1895	31.7	16.5		
1829	1.6	24.2	1896	31.8	16.0		
1830	1.6	27.1	1897	32.0	14.9		
1831	1.6	29.5	1898	32.1	16.1		
1832	1.7	45.0	1899†	32.2	15.4		
1833	1.7	23.6	1900	40.5	17.6		
1834	1.8	34.9	1901	40.3	16.5		
1835	1.8	26.3	1902	40.4	15.9		
1836	1.8	29.0	1903	40.4	16.0		
1837	1.8	30.1	1904	40.4	16.5		
1838	1.8	26.8	1905	40.4	16.0		
1839	1.8	26.0	1906	48.9	15.7		
1840	1.8	27.0	1907	49.2	16.0		
1841	1.8	28.0	1908	52.5	14.8		
1842	1.8	27.3	1909	56.1	14.4		
1843	6.2	16.1	1910	58.3	15.0		
1844	6.2	18.9	1911	63.2	14.2		
1845	6.2	15.6	1912	63.5	13.9		
1846	6.3	15.5	1913	65.5	14.1		
1847	6.3	19.5	1914	67.2	13.6		
1848	8.1	17.6	1915	67.5	13.4		
1849	8.1	27.0	1916	70.8	14.0		
1850	7.9	21.2	1917	73.4	14.3		
1851	8.2	23.0	1918	78.5	18.1		
1852	8.2	22.2	1919	81.1	12.9		
1853	8.8	21.9	1920	82.3	13.0		
1854	8.8	25.6	1921	82.3	11.6		
1855	8.8	21.7	1922	85.4	11.7		
1856	8.8	20.6	1923	87.7	12.2		
1857	9.9	20.1	1924	88.4	11.7		
1858	9.9	19.7	1925	89.6	11.8		
1859	9.8	19.0	1926	90.1	12.3		
1860	11.6	20.1	1927	91.5	11.4		
1861	11.5	20.7	1928	95.3	12.1		
1862	11.3	20.6	1929	95.7	11.9		
1863	11.2	23.6	1930	96.6	11.3		
1864	11.0	24.4	1931‡	96.3	11.1		
1865	10.9	22.8	1932	96.3	10.9		
1866	12.1	22.3	1933	100.0	10.7		
1867	12.9	20.2	1934	100.0	11.0		
1868	16.1	18.2	1935	100.0	10.9		
1869	16.4	18.5	1936	100.0	11.5		
1870	16.7	19.1	1937	100.0	11.2		
			1938§	100.0	10.6		

* Introduction to the Vital Statistics of the United States, 1900 to 1930.
† Population and deaths 1900-1930 are of the d.r.a. of the Bureau of the Census, which includes many registration cities not mentioned in the last column.

‡ Mortality Statistics, 1936, Bureau of the Census.
§ Vital Statistics—Special Reports, Bureau of the Census, Dec. 29, 1939, Vol. 9, No. 7, page 15.

Death Rates in the Death Registration Area

The expansion of the Death Registration Area began in 1843 when Massachusetts and Chicago were added to the Old New York City registration area. Although there has been a continuous downward trend in the death rates for the entire Death Registration Area, the addition of new states has often caused a temporary increase in the recorded death rate prior to their inclusion. The 1938 general death rate for the Death Registration Area was 63 per cent below the 1804 rate for Old New York City and 39 per cent below the general death rate for the Death Registration Area in 1900.

Evidence that this decline in the general death rate has not been confined to a favored group in the population is shown by the records of the Metropolitan Life Insurance Company for its 17,700,000 Industrial policyholders "who are largely representative of the lower income brackets of the urban population." These records, which will be presented in other charts and tables in this series, report a decline of more than 35 per cent in the death rate for this vast body of wage earners during the past 25 years. Such data seem to show that medical services have been utilized by all groups of the population.

CHART XIX

GENERAL DEATH RATES OF THE UNITED STATES REGISTRATION AREA AND CERTAIN FOREIGN COUNTRIES FOR EACH OF THE YEARS FROM 1911 TO 1935

SOURCE: MORTALITY STATISTICS, U.S. BUREAU OF THE CENSUS

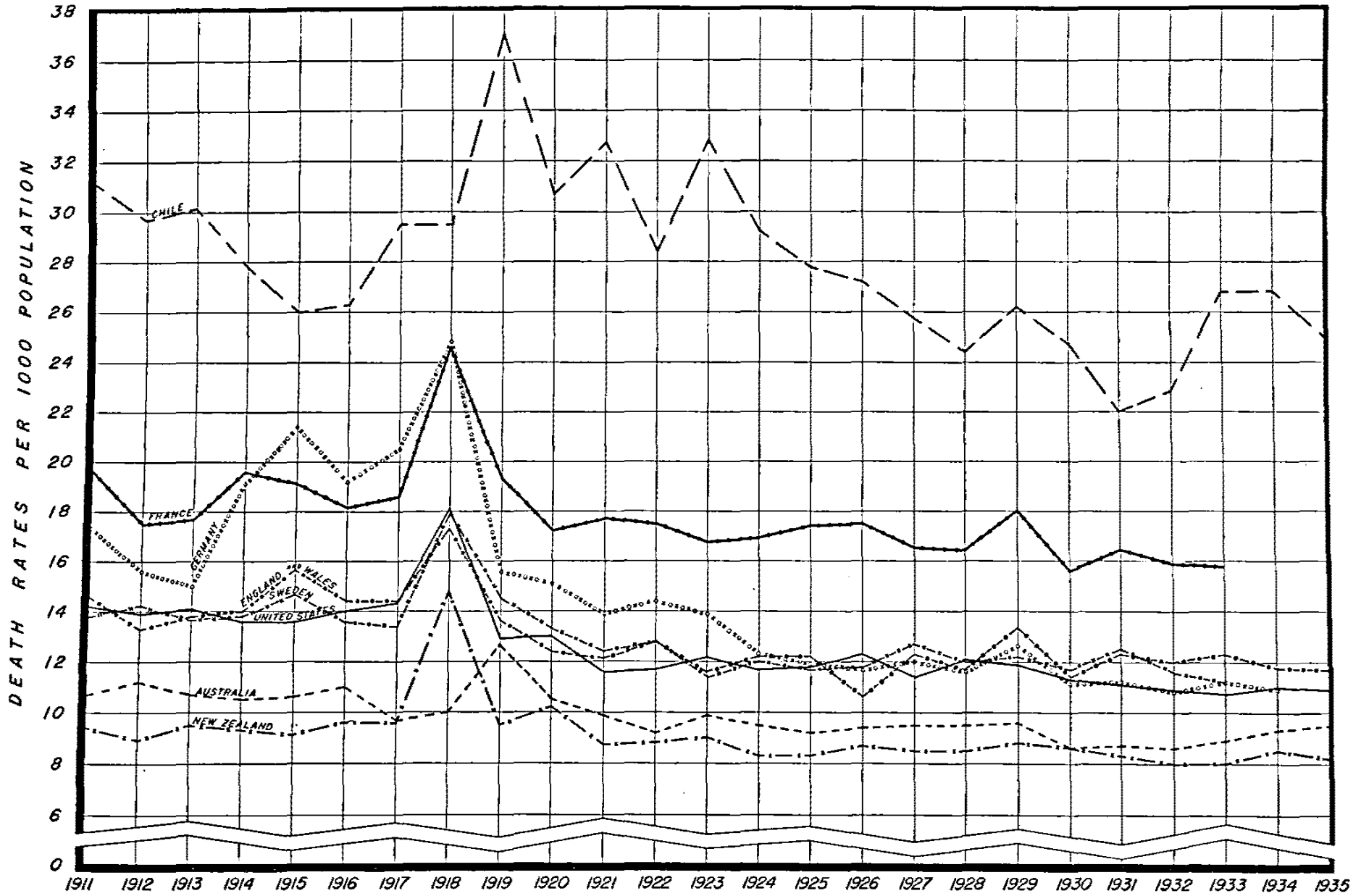


Table 21.—General Death Rates of the United States
Registration Area and Certain Foreign Countries
for Each of the Years from 1911 to 1935 *

Year	Death Rates per 1,000 Population							
	United States Registra- tion Area	Aus- tralia	Chile	England and Wales	France	Ger- many	New Zealand	Sweden
1911	14.2	10.7	31.1	14.6	19.6	17.3	9.4	13.3
1912	13.9	11.2	29.7	13.3	17.5	15.6	8.9	14.2
1913	14.1	10.7	30.1	13.8	17.7	15.0	9.5	13.7
1914	13.6	10.5	27.8	14.0	19.6†	19.1	9.3	13.8
1915	13.6	10.6	26.0	15.7‡	21.0†	21.4	9.1	14.7
1916	14.0	11.0	26.3	14.3†	19.8†	19.2	9.6	13.6
1917	14.3	9.7	29.5	14.2†	20.2†	20.6	9.6	13.4
1918	15.1	10.0	29.5	17.3†	24.6†	24.8	14.9	18.0
1919	12.9	12.7	37.0	14.0†	19.3†	15.6	9.5	14.5
1920	13.0	10.5	30.7	12.4‡	17.2	15.1	10.2	13.8
1921	11.6	9.9	32.7	12.1	17.7	13.9	8.7	12.4
1922	11.7	9.2	28.4	12.8	17.5	14.4	8.8	12.8
1923	12.2	9.9	32.8	11.6	16.7	13.9	9.0	11.4
1924	11.7	9.5	29.2	12.2	16.9	12.3	8.3	12.0
1925	11.8	9.2	27.8	12.2	17.4	11.9	8.8	11.7
1926	12.3	9.4	27.2	11.6	17.5	11.7	8.7	11.9
1927	11.4	9.5	25.8	12.3	16.5	12.0	8.5	12.7
1928	12.1	9.5	24.4	11.7	16.4	11.6	8.5	12.0
1929	11.9	9.6	26.2	13.4	18.0	12.6	8.8	12.2
1930	11.3	8.6	24.7	11.4	15.8	11.1	8.6	11.7
1931	11.1	8.7	22.0	12.3	16.4	11.2	8.3	12.5
1932	10.9	8.6	22.8	12.0	15.9	10.8	8.0	11.6
1933	10.7	8.9	26.8	12.3	16.8	11.2	8.0	11.2
1934	11.0	9.3	26.8	11.8	15.1‡	10.0	8.5	11.2‡
1935	10.9	9.5	25.0	11.7	15.7‡	11.2‡	8.2	11.7‡

* 1911-1914 Mortality Statistics, Bureau of the Census, 1921, p. 22.
1915-1921 Mortality Statistics, Bureau of the Census, 1933, p. 5.
1922-1935 Mortality Statistics, Bureau of the Census, 1936, p. 4.
† Figures relate to 77 "departements," not invaded.
‡ Based on civilian deaths and estimated civilian population.
§ The figures are provisional.

General Death Rates of the United States Registration Area and Certain Foreign Countries

Three countries for which mortality rates are shown in the chart have no system of sickness insurance—United States, Australia, and New Zealand; all the others have such systems. In Germany and England these systems have been in existence during the entire period covered by the table and the chart on the opposite page.

It is not claimed that the present lower death rate and its more rapid decline, in countries that have retained the private practice of medicine with the opportunity of the patient to choose his own physician, are wholly due to this difference in the organization of medical service. Other factors have had an important influence on all vital statistics. About one tenth of the population of the United States is Negro, which in some localities has a death rate about twice that of the white population. This not only constitutes one of the most important economic and medical problems of this country, but also places the United States at a disadvantage in any comparison of mortality rates with countries having an almost exclusively white population.

It appears that these statistics demonstrate that the institution of sickness insurance has not reduced the death rate in any insurance country more rapidly than it has been reduced in noninsurance countries. Morbidity and mortality statistics provide one vital, significant test of the effective application of medical knowledge. When a new drug is introduced in the United States, its acceptance in the Pharmacopeia depends on the

results of tests to determine its value in making possible the more rapid recovery from disease and the postponement of death. The introduction of new appliances, methods of diagnosis or treatment, or organization of medical services is intended to achieve greater efficacy in the control of disease. Judged by this test, sickness insurance has failed to justify itself.

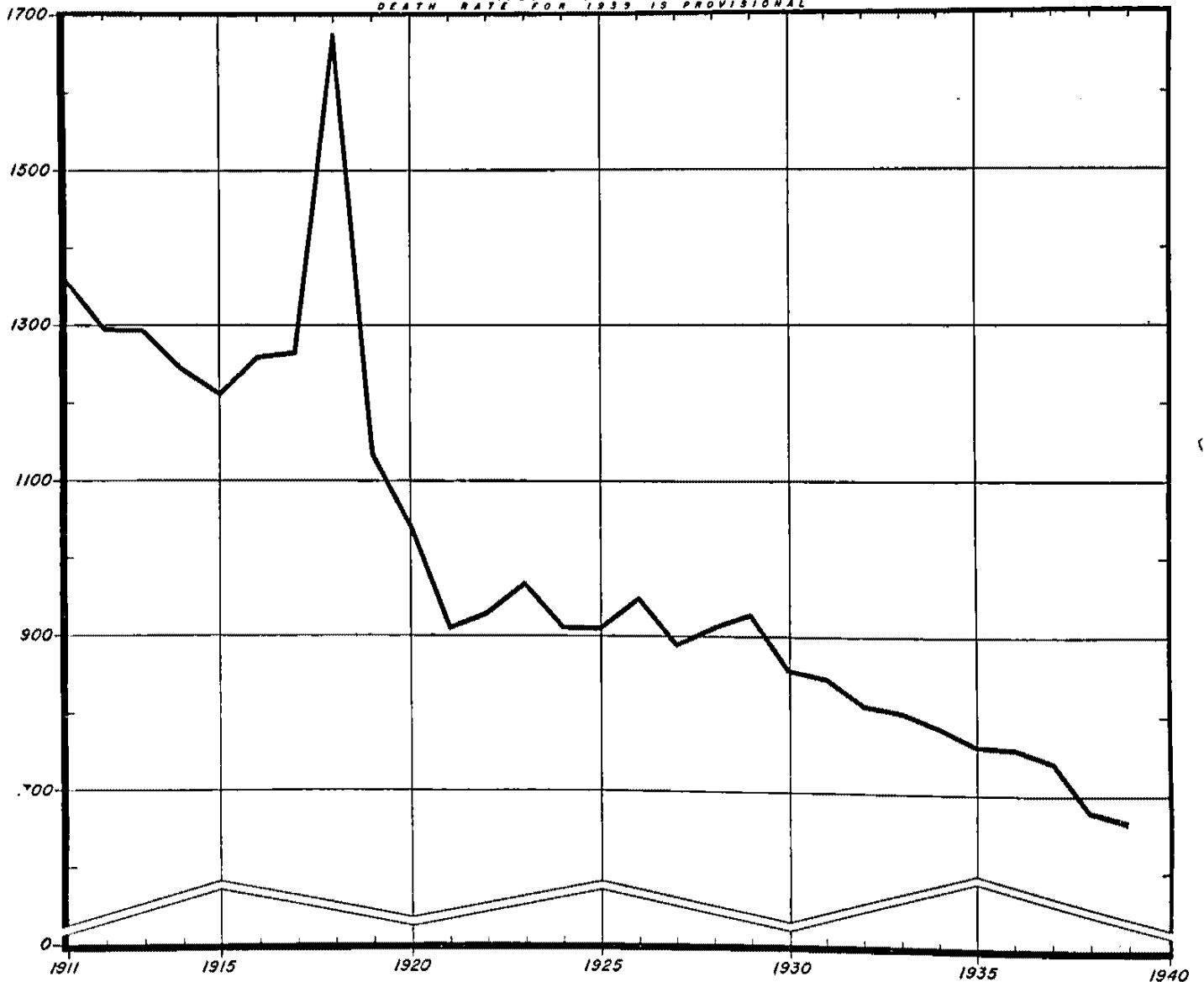
Australia and New Zealand for many years have had the lowest mortality rates in the world not only for the entire population but for mothers and infants. Nevertheless, those who sought to obtain political power and financial advantages from sickness insurance have never relaxed their efforts to secure its introduction in these countries. In Australia a law providing for the establishment of sickness insurance was enacted in 1938, against the opposition of the medical profession, and extensive preparations were made to introduce the system in spite of resistance. Although nearly five million dollars had been expended by the government and other organizations in preparation for its introduction, as the day approached when the law was to go into effect even its governmental defenders finally became convinced of its undesirable nature and in the early months of 1939 the government finally withdrew its support and decided not to put the law into force. The United States and Canada, also without sickness insurance, have shown steadily lowering mortality rates although somewhat higher in both these countries than in Australia and New Zealand.

CHART XX

STANDARDIZED ANNUAL DEATH RATES
PER 100,000 FOR ALL CAUSES
AGES 1-74 YEARS

METROPOLITAN LIFE INSURANCE COMPANY,
INDUSTRIAL DEPARTMENT, 1911 TO 1939

SOURCE: TWENTY-FIVE YEARS OF LIFE CONSERVATION,
AND STATISTICAL BULLETINS, METROPOLITAN LIFE
INSURANCE COMPANY
DEATH RATE FOR 1935 IS PROVISIONAL



**Table 22.—Standardized Annual Death Rates
per 100,000 for Specified Causes**

Total Persons, Ages 1 to 74 Years. Metropolitan Life Insurance
Company, Industrial Department, 1911 to 1939

Year	All Causes of Death	Typhoid Fever	Diph- theria	Tubercu- losis All Forms	Cancer All Forms	Diabetes
1911	1,354.9	22.1	25.6	211.6	75.8	15.1
1912	1,276.0	18.6	22.6	220.7	77.5	16.2
1913	1,291.0	18.0	25.2	221.4	78.4	16.3
1914	1,243.0	15.7	23.7	219.4	77.9	16.7
1915	1,210.9	12.6	19.7	210.6	79.0	16.6
1916	1,258.2	12.8	18.9	204.3	79.2	17.5
1917	1,264.5	12.0	21.7	202.2	80.7	17.1
1918	1,670.5	11.1	17.1	201.5	76.8	15.8
1919	1,133.8	7.1	18.5	165.3	75.8	15.1
1920	1,041.4	6.6	20.5	148.3	78.5	15.6
1921	909.7	6.6	21.7	120.6	79.7	16.7
1922	928.6	5.7	16.7	119.1	79.3	18.3
1923	967.3	5.0	14.2	115.1	81.6	17.8
1924	910.3	4.4	11.3	107.8	80.6	16.5
1925	909.6	4.5	8.9	101.5	81.3	16.8
1926	947.1	4.1	8.4	101.0	84.3	18.3
1927	888.3	4.6	9.0	94.7	83.7	18.1
1928	910.4	2.6	8.5	91.8	83.8	18.5
1929	927.4	2.4	7.9	88.0	84.0	18.9
1930	856.0	2.4	5.4	82.0	82.1	18.3
1931	846.4	2.3	4.2	77.7	84.8	19.9
1932	812.9	1.8	3.8	71.9	87.1	20.7
1933	803.1	1.6	2.6	67.0	88.1	20.8
1934	786.6	1.5	2.2	60.9	84.2	20.7
1935	762.6	1.1	2.3	56.4	86.8	20.5
1936	759.4	1.0	1.8	54.6	84.6	20.6
1937	742.9	0.9	2.1	52.0	80.5	21.0
1938	674.7	1.0	1.8	46.8	86.5	19.7
1939*	659.1	0.7	1.3	43.7	86.8	21.2

* All death rates for 1939 are provisional.

Standardized Annual Death Rates for Specified Causes

The term "Standardized Death Rates" is used to describe the result obtained when general death rates are adjusted to a standard population. The "Standardized Death Rate or Mortality Rate" is the death rate at all ages, computed for comparative purposes to allow for the color, sex, and age composition of the population involved.

The standard population used for computing the standardized death rates in the accompanying table was the "Standard Million" of England and Wales based on the actual age and sex distribution of the total population of those countries in 1901.

The death rates in table 22 are the standardized death rates for the entire group of more than 17,000,000 insured persons included in the rapidly growing num-

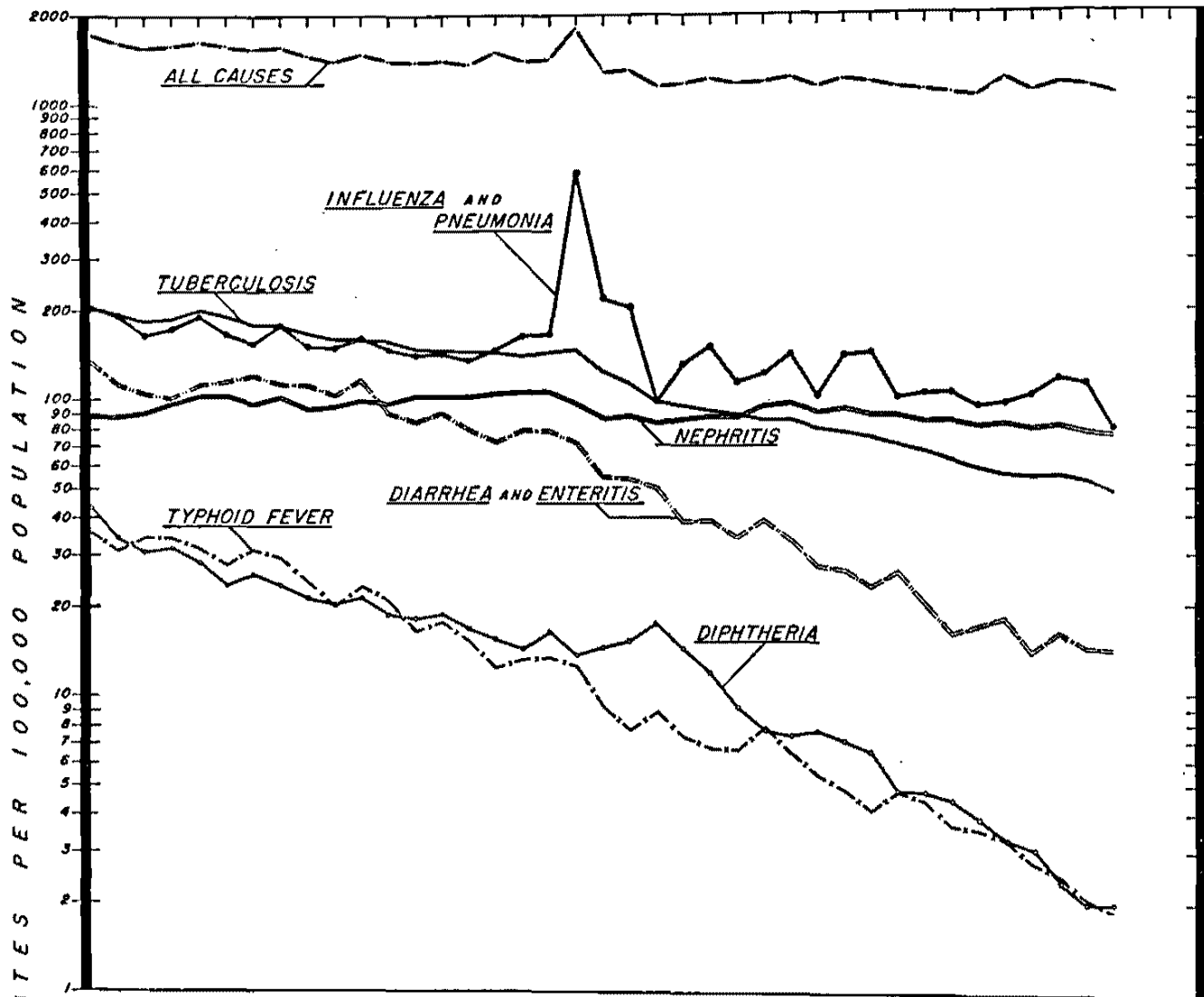
bers of weekly premium-paying Industrial policyholders of the Metropolitan Life Insurance Company. These persons are not wealthy; indeed, they are not even in the class that is commonly described as well-to-do but are wage earners employed in a variety of occupations. These wage earners and their families are exposed to about the same habits of life, environment and health experiences of the American people as a whole. Chart XX shows graphically the mortality trend as recorded for this group of wage earners. The death rates for this group of persons in the low-income group show that the rates of decline or increase compare favorably with the death rates of the entire population as shown in other charts and tables in this series.

CHART XXI

MORTALITY TRENDS IN THE UNITED STATES
FOR SPECIFIED CAUSES OF DEATH
1900 TO 1938

EXPANDING DEATH REGISTRATION AREA
SOURCE: VITAL STATISTICS, SPECIAL REPORTS, BUREAU OF THE CENSUS

GENERALLY DECREASING TRENDS



GENERALLY INCREASING TRENDS

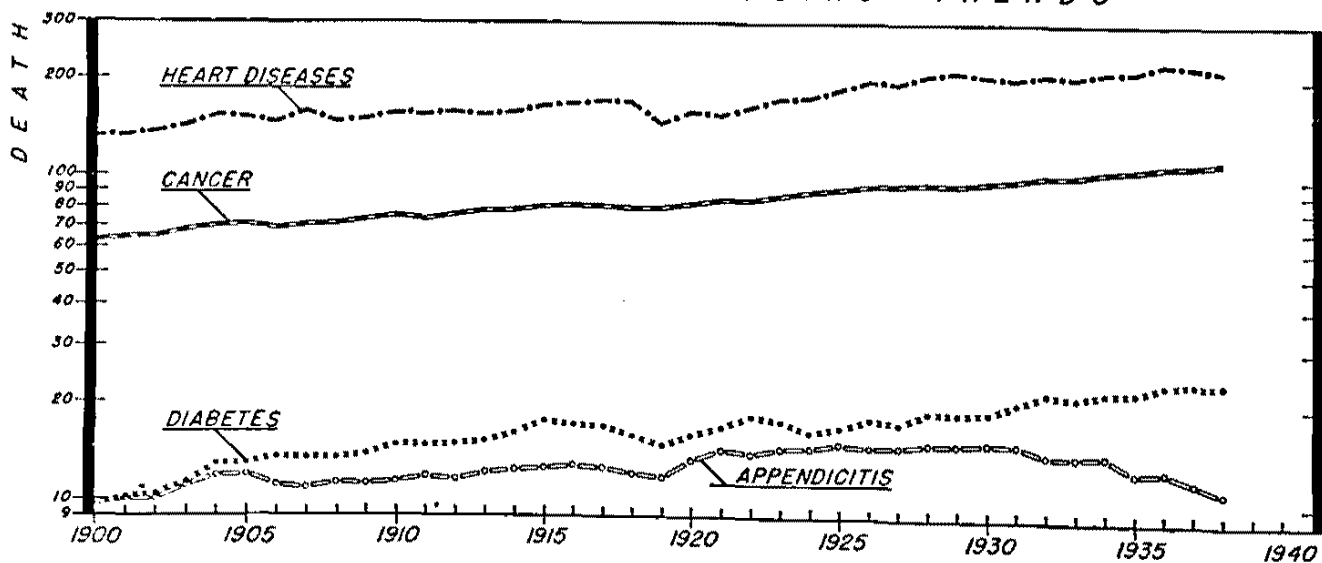


Table 23.—Mortality Trends in the United States.* Death Rates per 100,000 Population, 1900-1938 (United States Registration Area)

Year	Increasing					Decreasing							Total All Causes		
	Heart Diseases ¹	Cancer ²	Accidents ³	Appendicitis	Diabetes Mellitus	Cerebral Hemorrhage ⁴	Typhoid Fever	Diphtheria	Diarrhea, Enteritis ⁵	Influenza, Pneumonia ⁶	Tuberculosis ⁷	Nephritis		Congenital Malformations and Diseases of Early Infancy	Other Causes ⁸
1900	182.1	63.0	79.0	0.7	9.7	71.5	35.9	43.3	183.2	203.4	201.9	89.0	91.8	501.5	1,755.0
1901	132.6	64.3	88.1	10.0	10.2	72.2	32.3	34.0	113.5	193.6	196.9	89.3	80.7	634.2	1,631.9
1902	137.7	65.1	78.1	10.0	10.3	72.0	34.3	30.8	105.0	165.8	184.5	90.9	82.9	620.6	1,588.0
1903	143.0	68.3	87.2	11.0	11.3	72.0	34.1	31.7	101.0	173.6	188.5	97.3	86.2	608.5	1,603.7
1904	153.4	70.2	86.7	11.8	12.3	75.2	31.7	28.3	110.6	191.6	200.7	103.1	90.8	480.6	1,633.5
1905	152.2	71.4	84.0	11.9	12.9	74.7	27.8	28.6	115.7	167.7	192.3	103.4	89.3	475.1	1,602.0
1906	148.4	69.1	93.4	11.1	12.7	73.1	31.3	25.7	120.0	155.8	180.2	97.5	91.7	457.5	1,567.5
1907	159.7	70.9	94.4	10.9	13.5	76.1	29.5	23.6	113.3	179.9	178.5	102.4	92.7	451.7	1,567.1
1908	148.8	71.5	82.0	11.3	13.4	71.7	24.3	21.5	111.6	152.2	167.0	93.7	90.4	418.0	1,478.0
1909	151.4	73.8	81.4	11.3	13.8	73.9	21.1	20.4	103.2	150.7	161.1	95.2	87.5	396.2	1,440.0
1910	158.8	76.2	84.4	11.4	14.0	75.7	23.5	21.4	117.4	162.1	160.3	90.1	88.1	402.9	1,406.2
1911	157.1	74.4	84.6	11.7	14.9	76.5	21.0	18.9	91.2	149.6	159.2	97.7	93.2	388.1	1,418.1
1912	159.9	77.1	82.4	11.6	15.0	77.5	16.5	18.2	84.1	142.7	149.7	103.2	95.4	355.5	1,388.8
1913	155.8	79.0	85.5	12.1	15.3	76.5	17.9	18.9	90.3	144.8	147.8	103.0	98.5	394.2	1,409.0
1914	159.7	79.6	78.7	12.3	16.2	79.6	15.5	17.9	79.6	136.4	147.2	102.0	93.5	343.8	1,364.6
1915	165.7	81.4	76.6	12.5	17.5	81.2	12.4	15.7	72.1	149.1	146.3	105.1	92.1	327.8	1,355.0
1916	168.7	82.1	84.2	12.8	17.1	82.9	13.3	14.5	70.5	142.1	145.3	105.6	94.0	343.2	1,404.8
1917	171.7	82.0	88.2	12.6	17.0	84.5	18.5	16.6	70.3	167.8	147.1	107.9	91.9	346.4	1,455.5
1918	170.1	80.3	82.3	12.2	15.9	81.2	12.6	13.9	72.7	167.0	150.0	97.0	92.8	341.0	1,509.1
1919	146.7	80.5	71.9	11.8	14.9	76.6	9.2	14.7	55.2	222.3	125.6	88.1	79.9	288.0	1,287.4
1920	159.1	83.2	71.3	13.4	16.0	81.7	7.8	15.3	54.3	208.0	114.0	89.2	84.7	305.8	1,303.8
1921	156.3	85.6	68.8	14.4	16.8	80.6	9.0	17.0	51.4	193.3	98.9	85.0	81.9	291.1	1,288.2
1922	164.6	86.2	69.5	14.1	18.3	82.9	7.4	14.6	39.3	132.0	96.4	87.9	77.7	282.4	1,173.9
1923	173.8	88.7	75.8	14.7	17.7	86.9	6.8	12.0	39.6	152.4	92.8	89.3	77.3	291.9	1,219.7
1924	176.5	91.1	75.7	14.8	18.4	88.9	6.7	9.3	34.5	116.7	89.7	88.8	77.6	286.3	1,173.0
1925	185.7	92.8	78.5	15.2	16.9	81.0	8.0	7.8	39.4	123.4	86.7	90.5	74.0	278.2	1,184.1
1926	196.5	95.1	78.8	15.0	18.0	82.8	6.5	7.5	33.6	143.5	87.8	98.5	71.7	287.0	1,216.4
1927	196.0	95.7	78.5	15.0	17.5	80.4	5.3	7.8	27.6	163.2	80.9	92.6	67.8	274.9	1,143.4
1928	208.2	96.1	79.4	15.3	19.0	83.4	4.9	7.2	29.9	143.5	79.3	95.2	65.8	282.4	1,280.6
1929	210.8	95.9	80.9	15.2	18.8	82.1	4.2	6.6	23.5	147.2	76.0	91.2	62.4	277.1	1,191.9
1930	205.7	97.3	80.6	15.3	19.0	81.0	4.8	4.9	26.3	102.7	71.5	90.8	61.0	273.0	1,133.0
1931	201.8	96.9	78.5	15.2	20.4	79.0	4.5	4.8	20.7	107.7	68.1	87.1	56.4	263.9	1,107.0
1932	208.9	102.0	71.4	14.2	21.9	79.3	3.7	4.5	16.3	107.7	62.8	87.1	53.1	254.9	1,087.8
1933	205.8	102.2	72.4	14.1	21.3	75.8	3.6	3.9	17.2	95.5	59.5	82.9	50.5	262.4	1,067.1
1934	212.9	108.2	79.9	14.3	22.1	77.3	3.3	3.3	18.3	96.7	56.6	84.2	52.9	275.2	1,103.2
1935	213.1	107.9	78.3	12.7	22.2	76.8	2.8	3.1	14.1	104.0	55.0	81.2	49.4	271.8	1,062.2
1936	227.9	111.0	85.8	12.8	23.7	81.2	2.5	2.4	16.3	119.8	55.0	83.2	49.7	280.4	1,151.8
1937	222.3	112.0	81.4	11.9	23.7	77.0	2.1	2.0	14.6	114.5	53.6	79.0	49.0	278.4	1,122.1
1938	216.9	114.6	72.1	11.0	23.8	76.2	1.9	2.0	14.2	80.2	49.0	77.2	48.5	273.8	1,060.9

* Vital Statistics, Special Reports, Feb. 23, 1940, Vol. 9, No. 23, pages 152-156. Department of Commerce, Bureau of the Census.

1. Excludes diseases of the coronary arteries.
2. Includes all malignant tumors.
3. All external causes including automobile accidents of all types.
4. Includes softening.
5. From 1900-1920 includes ulcer of the duodenum.
6. Includes capillary bronchitis.
7. All forms.
8. Includes deaths from all causes not otherwise indicated.

Mortality Trends

The purpose of vital statistics is to ascertain and classify facts concerning human beings and to prepare the way for investigating the causes of conditions affecting health.

The vital statistics which show the death rates for a population afford an opportunity to measure the progress made in medical care and public health. In table 23 the recorded mortality rates for a number of important causes of death in the United States are grouped according to those causes that, for the most part, have been increasing and those that have been decreasing since 1900. The fluctuations in several important causes of death are shown graphically in the accompanying chart. Of particular significance is the greater number of decreasing trends in certain specific causes of death which has resulted in a decrease in the total death rate for all causes from 1755.0 to 1060.9 per 100,000 population. This is a decline of more than 39 per cent.

The most significant improvements in death rates have been recorded for such diseases as typhoid fever, diphtheria, diarrhea and enteritis, tuberculosis, and congenital malformations and diseases of early infancy. It will be noted that these are chiefly diseases in the earlier years of life, and the more effective control of these conditions has helped to add more than 12 years to the life expectancy at birth during the period 1900 to 1938, as shown in table 40, page 83. Within this period the decline in the death rate from typhoid fever was 94.7 per cent, from diphtheria 95.3 per cent, from diarrhea and enteritis 89.6 per cent, and from tuberculosis 75.7 per cent.

Heart disease and cancer lead the diseases that have tended to become more prominent as causes of death. In connection with these two diseases it must not be

overlooked that the reductions in mortality of the early years of life have made it possible for a larger number of persons to live to advanced ages where cancer and heart disease take their toll. Another factor to consider in connection with the increasing death rate from heart disease and cancer is the improvement in the diagnosis for each of these diseases. This is reflected in part by the rapid decline in the death rate for all other causes. Formerly, persons died of old age or ill-defined causes, whereas today these conditions are frequently diagnosed as cancer or heart disease.

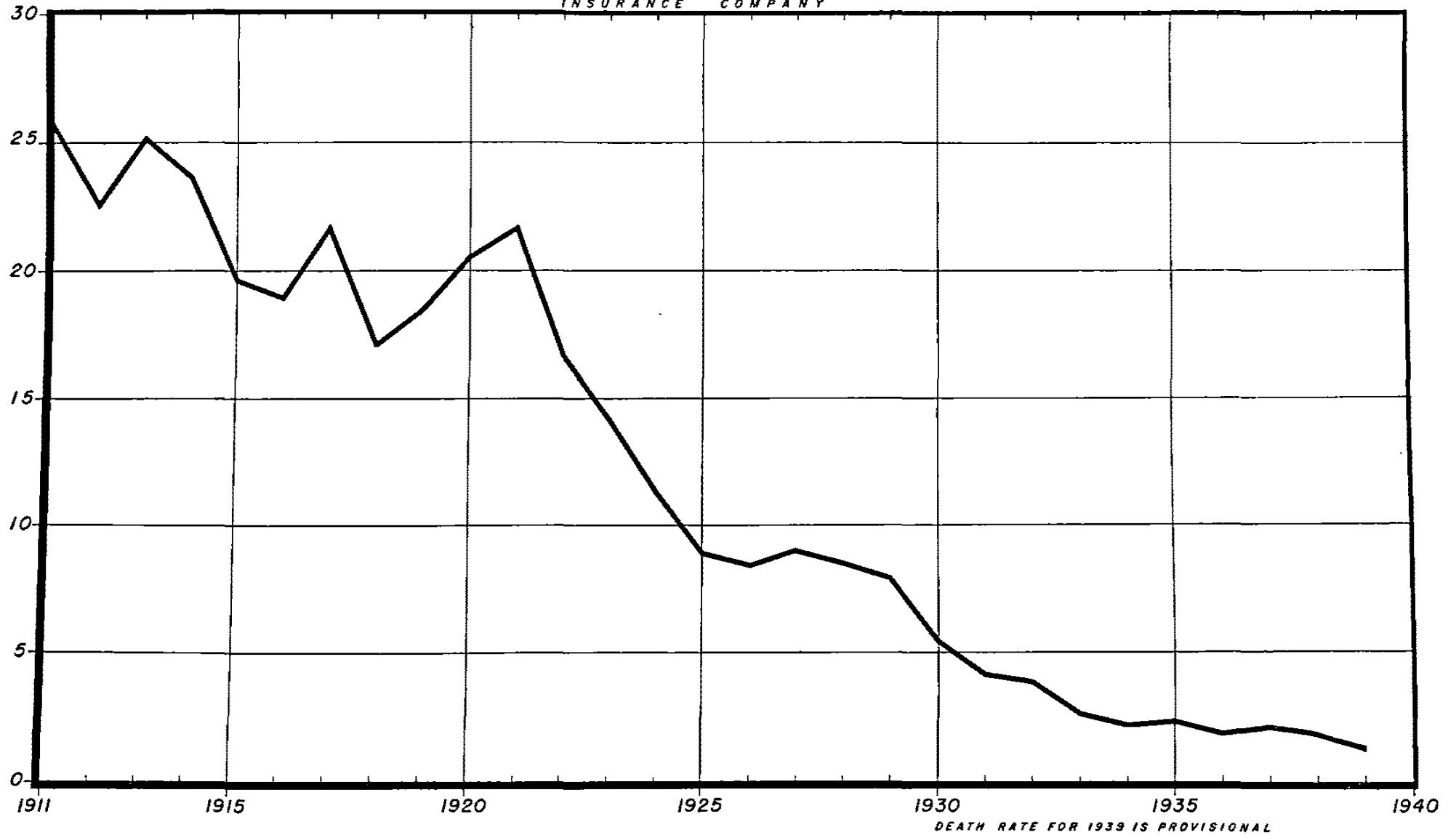
The death rate from diabetes has shown the sharpest increase during the period 1900 to 1938. Again the increase in deaths from diabetes is partly traceable to improvement in diagnosis. Recent treatment has likewise made it possible for diabetic patients to live to advanced ages. Diabetes, as well as heart disease and cancer, which are three of the leading causes of death that have been increasing during the period 1900 to 1938, are degenerative diseases that occur in the later years of life. While the trend of the death rate from appendicitis has increased slightly during the period 1900 to 1938, there has been a downward trend since 1931.

Although significant reductions have not been observed for many diseases for which scientific knowledge is available, this does not necessarily imply that what has been done is of no value. It is impossible to imagine what the situation with respect to these diseases would be had the available medical knowledge not been applied. As information concerning the causes and methods of control has grown, the death rates for many diseases have been definitely reduced. Predictions as to definite future trends cannot be made.

CHART XXII

DIPHTHERIA MORTALITY
STANDARDIZED DEATH RATE PER 100,000
INDUSTRIAL POLICYHOLDERS, AGES 1-74 YEARS

SOURCE: TWENTY-FIVE YEARS OF LIFE CONSERVATION,
AND STATISTICAL BULLETINS, METROPOLITAN LIFE
INSURANCE COMPANY



**Table 22.—Standardized Annual Death Rates
per 100,000 for Specified Causes**

Total Persons, Ages 1 to 74 Years. Metropolitan Life Insurance
Company, Industrial Department, 1911 to 1939

Year	All Causes of Death	Typhoid Fever	Diph- theria	Tubercu- losis All Forms	Cancer All Forms	Diabetes
1911	1,854.0	22.1	25.6	241.6	75.8	15.1
1912	1,226.0	18.6	22.6	226.7	77.5	15.2
1913	1,294.0	18.0	25.2	221.4	78.4	15.3
1914	1,243.0	15.7	23.7	219.4	77.9	15.7
1915	1,210.9	12.6	19.7	210.6	79.0	16.0
1916	1,258.2	12.8	18.9	204.8	79.2	17.5
1917	1,204.5	12.0	21.7	202.2	80.7	17.1
1918	1,670.5	11.1	17.1	201.5	76.8	15.8
1919	1,133.8	7.1	18.5	165.3	75.6	15.1
1920	1,041.4	6.6	20.5	143.3	78.5	15.6
1921	909.7	6.6	21.7	120.6	79.7	16.7
1922	928.0	5.7	16.7	119.1	79.3	18.3
1923	967.3	5.0	14.2	115.1	81.6	17.8
1924	910.3	4.4	11.3	107.8	80.6	16.5
1925	909.6	4.5	8.9	101.5	81.3	16.8
1926	947.1	4.1	8.4	101.9	84.8	18.3
1927	858.3	4.6	9.0	94.7	83.7	18.1
1928	910.4	2.6	8.5	91.8	83.8	18.5
1929	927.4	2.4	7.9	88.0	84.0	18.9
1930	856.0	2.4	5.4	82.0	82.1	18.3
1931	846.4	2.3	4.2	77.7	84.8	19.9
1932	812.9	1.3	3.8	71.9	87.1	20.7
1933	803.1	1.6	2.6	67.0	88.1	20.8
1934	786.6	1.5	2.2	60.9	88.2	20.7
1935	762.6	1.1	2.3	56.4	86.8	20.5
1936	759.4	1.0	1.8	54.6	84.6	20.6
1937	742.9	0.9	2.1	52.0	86.6	21.0
1938	674.7	1.0	1.8	46.8	86.5	19.7
1939*	639.1	0.7	1.3	43.7	86.8	21.2

* All death rates for 1939 are provisional.

Diphtheria Mortality

The decline in diphtheria mortality represents the results of the application of scientific knowledge through the intelligent cooperation of interested individuals and groups of persons with the medical profession.

Prior to the discovery of antitoxin, at least 45 per cent of all diphtheria cases ended fatally. Antitoxin was developed in 1890 but was not put into practical use until 1895. By 1906 the fatality rate had fallen from about 45 per cent to 13 per cent, but the immunity provided by antitoxin was of short duration, and the prevalence of the disease continued to be high.

In 1895-1896 it was discovered that antitoxin could be produced in animals by the introduction of toxin-antitoxin. This information was of little practical use until the Schick test discovered in 1913 made it possible

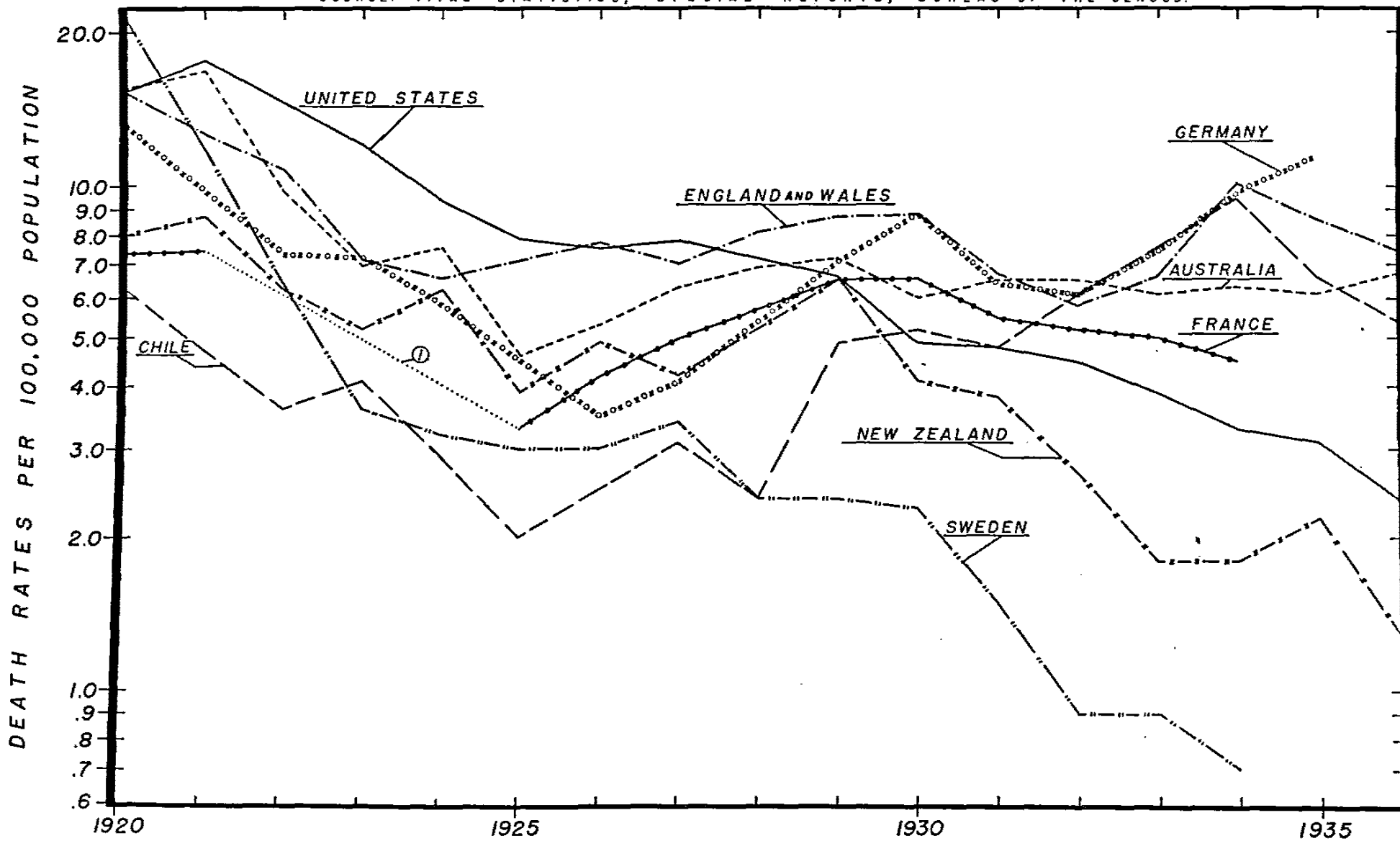
to determine which individuals were naturally immune and the length of time it took to acquire immunity, after receiving the toxin-antitoxin treatment.

During recent years the refinements of the materials and the technique of their use and the gradually increasing acceptance of this proven method of prevention have resulted in a striking decline in general mortality from this disease.

The above table and the chart on the opposite page show the mortality rates among a large group of the wage earning population of the United States as recorded for the Industrial policyholders of the Metropolitan Life Insurance Company. By 1934 the death rate from diphtheria for this group was actually one third below that for the population as a whole.

CHART XXIII
 DIPHTHERIA MORTALITY PER 100,000 POPULATION
 FOR SPECIFIED COUNTRIES, 1920-1936.

SOURCE: VITAL STATISTICS, SPECIAL REPORTS, BUREAU OF THE CENSUS.



① DATA NOT AVAILABLE.

Table 24.—Diphtheria Mortality per 100,000 Population for Specified Countries, 1920-1936 *

Year	United States ^a	Chile	Australia	New Zealand ^b	Germany ^c	England and Wales ^d	France ^e	Sweden
1920.....	15.3	6.2	15.5	8.0	13.1	15.1	7.3	21.2
1921.....	17.6	4.7	16.8	8.7	9.7	12.8	7.4	11.7
1922.....	14.0	3.0	9.7	6.2	7.3	10.7	...	6.4
1923.....	12.0	4.1	6.9	5.2	7.2	7.1	...	3.6
1924.....	9.3	2.9	7.5	6.2	5.8	6.5	...	3.2
1925.....	7.8	2.0	4.6	3.9	4.5	7.1	3.3	3.0
1926.....	7.5	2.5	5.3	4.9	3.5	7.7	4.2	3.0
1927.....	7.8	3.1	6.3	4.2	4.1	7.0	5.0	3.4
1928.....	7.2	2.4	6.9	5.2	5.4	8.1	5.7	2.4
1929.....	6.6	4.9	7.2	6.5	7.1	8.7	6.5	2.4
1930.....	4.9	5.2	6.0	4.1	8.8	8.8	6.5	2.3
1931.....	4.8	4.8	6.5	3.8	6.4	6.7	5.5	1.5
1932.....	4.5	6.1	6.5	2.7	6.1	5.8	5.2	0.9
1933.....	3.9	7.6	6.1	1.8	7.4	6.6	5.0	0.9
1934.....	3.3	9.5	6.3	1.8	9.7	10.1	4.5	0.7 ^f
1935.....	3.1	6.6	6.1	2.2	11.4	8.6	...	...
1936.....	2.4	5.4	6.7	1.3	...	7.5	...	...
Decrease..	84.3%	12.9%	56.8%	83.8%	13.0%	50.3%	38.4%	90.7%

* Vital Statistics—Special Reports, Vol. 9, No. 36, pages 345-401, May 2, 1940. Derived from League of Nations Annual Epidemiological Reports for the years 1935 (p. 72) and 1936 (p. 68, ff.).

^a Figures for the "Death Registration Area," which comprised 63.5% of the total population in 1912, 82.3% in 1920, 96.3% in 1932, and 100% since 1933. (For 1937 and 1938 rates see table 23, p. 61 of this book.)

^b Excluding Maoris.

^c The figures only relate to the whole country (except the Saar) since 1924. Previously, they concerned 98.9% of the population in 1912 and 98.7% in 1920.

^d In 1920, the rates referred to the civil population only.

^e In 1920 and 1921, the rates only related to a variable portion of the territory.

^f Country having a special nomenclature.

Diphtheria Mortality for Specified Countries

The accompanying chart and table show the fluctuations in diphtheria mortality rates of certain selected countries.

Any explanation of these differences would require consideration of much data that are either difficult to evaluate or impossible to obtain. For this reason no explanation is offered here either for the different points at which the chart and table begin or the fluctuations and uneven rates at which the mortality rates change.

Diphtheria is one of the diseases for which prevention has been developed to a high degree of effective-

ness. The focal point in a campaign to reduce incidence and mortality from diphtheria is the immunization of infants. The progress of this program depends on the degree of appreciation of its value and cooperation by parents and public with the medical profession. Details of the methods which will reduce diphtheria mortality necessarily differ in different nations. Responsibility for the reduction of diphtheria mortality among children of the United States must necessarily rest on the citizens of this country.

CHART XXIV

DIPHTHERIA MORTALITY IN CITIES AND TOWNS OF GERMANY, ENGLAND, SCOTLAND AND THE UNITED STATES

SOURCE: ANNUAL EPIDEMIOLOGICAL REPORTS, HEALTH ORGANISATION, LEAGUE OF NATIONS, 1931-1936; SPECIAL ARTICLE, J.A.M.A. 108:2202 (JUNE 26) 1937

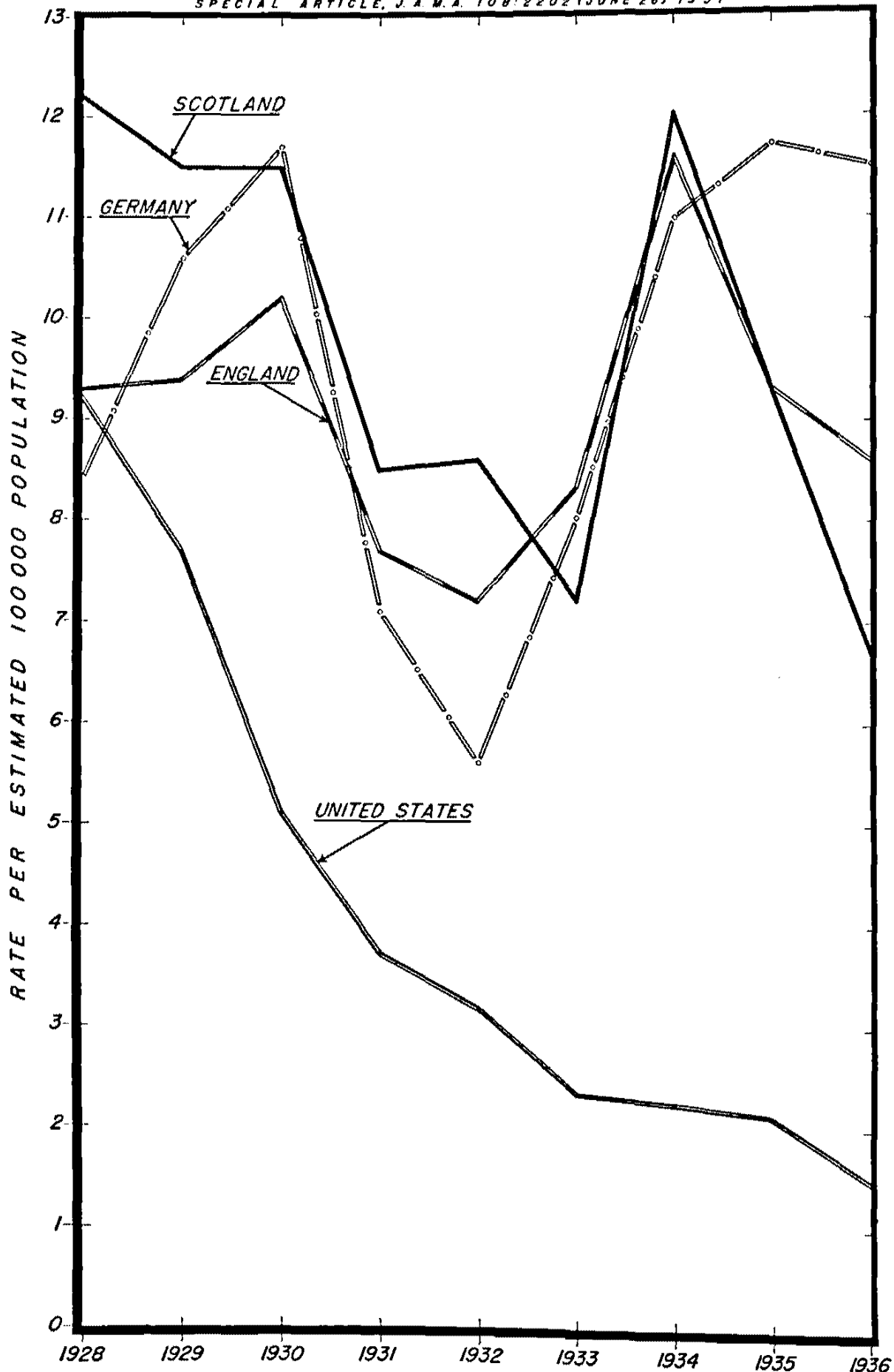


Table 25.—Diphtheria Mortality

Year	Death Rate per Estimated 100,000 Population			
	German Towns*	English Towns†	Scottish Towns‡	United States Cities§
1928.....	8.4	9.8	12.2	9.2
1929.....	10.6	9.4	11.5	7.8
1930.....	11.7	10.2	11.5	5.1
1931.....	7.1	7.7	8.5	3.7
1932.....	5.6	7.2	8.6	3.2
1933.....	8.0	8.3	7.2	2.3
1934.....	11.0	11.6	12.0	2.2
1935.....	11.7	9.3	9.3	2.1
1936.....	11.5	8.6	6.7	1.5

* Figures for 1928 to 1932, inclusive, cover from 50 to 55 towns. From 1933 to 1936, towns with more than 100,000 inhabitants are covered.

† 1928 to 1932, 107 to 121 towns covered. 1933 to 1936, towns with more than 50,000 inhabitants.

‡ 1928 to 1932, 18 towns covered. 1933 to 1936, towns with more than 30,000 inhabitants.

§ 1928: Annual Epidemiological Report, Corrected Statistics of Notifiable Diseases for the year 1931, League of Nations, Geneva, 1933, p. 70.

1929: Annual Epidemiological Report, Corrected Statistics of Notifiable Diseases for the year 1932, League of Nations, Geneva, 1934, Germany and England, p. 96; Scottish, p. 97.

1930: Annual Epidemiological Report, Corrected Statistics of Notifiable Diseases for the year 1933, League of Nations, Geneva, 1935, p. 91.

1931: Annual Epidemiological Report, Corrected Statistics of Notifiable Diseases for the year 1934, League of Nations, Geneva, 1936, Germany and England, p. 97; Scottish, p. 98.

1932: Annual Epidemiological Report, Corrected Statistics of Notifiable Diseases for the year 1935, League of Nations, Geneva, 1937, Germany and England, p. 95; Scottish, p. 96.

1933; 1934; 1935; 1936: Annual Epidemiological Report, Corrected Statistics of Notifiable Diseases for the year 1936, League of Nations, Geneva, 1938, Germany and England, p. 94; Scottish, p. 95.

§ 88 cities in the United States covered (selected cities from each section of the country). J. A. M. A. 108:2202 (June 26) 1937.

Diphtheria Mortality—United States and Certain Foreign Countries

The trend of diphtheria mortality affords an excellent test of the efficiency of medical service in any locality. It is one of the few diseases for which treatment and prevention are almost completely specific. Since toxoid is given as a prophylactic and antitoxin as a temporary emergency protection, the extent of its administration in any community is also a test of the emphasis placed on the preventive side of medicine. Such immunization is an individual protection and therefore differs from the procedures for the control of food, drink, or sewage, and the protection of a community against typhoid fever and other water or food borne diseases. For these reasons it is peculiarly suited to constitute a measure of the extent to which medical practice and public health organizations are efficient in their preventive phases of medicine.

The above table and accompanying chart compare the diphtheria mortality in German, English, and Scottish towns with cities in the United States. It will be noted that while the diphtheria mortality rate in 1928 was slightly lower in German towns, about the same in English towns, and considerably higher in Scottish towns than in the United States, since that time the rate declined steadily in the United States until by 1936 it had dropped to 1.5 deaths per 100,000 population, while it has fluctuated about the original figures in Germany and Great Britain.

Even more significant than the decline in the United States and the continued high rate in insurance coun-

tries, is the fact that the European incidence continues to exhibit the epidemic cycle of 4 to 5 years characteristic of uncontrolled diphtheria, namely a periodic peak with intermediate valleys in the curve. In the United States, the steady decline which cuts across these cycles is a direct result of the successful application of preventive measures, mainly immunization.

It might also be stated that there has been a similar decline in Canada, which has not yet been invaded by sickness insurance. These preventive measures are just as familiar to the physicians of Germany and England as they are to those in the United States, but the method of organization of medical service makes it almost impossible to secure general immunization. In America the cooperation of physicians through their medical associations or individually with health departments and schools has made diphtheria immunization so common that there are many cities in this country in which there has been no diphtheria for several years.

Practically every argument for sickness insurance starts with a claim of its superior preventive qualities. It is argued that the physician under insurance is paid to keep his patients well and that therefore he will devote his energies primarily to the prevention of illness. This argument is practically never heard in countries having sickness insurance, as it is altogether too generally known there that insurance physicians have no time for the practice of preventive medicine, and therefore the argument would be ineffective.

CHART XXV

TUBERCULOSIS DEATH RATE
STANDARDIZED DEATH RATE PER 100,000
INDUSTRIAL POLICYHOLDERS, AGES 1-74 YEARS

SOURCE: TWENTY-FIVE YEARS OF LIFE CONSERVATION,
AND STATISTICAL BULLETINS, METROPOLITAN
LIFE INSURANCE COMPANY

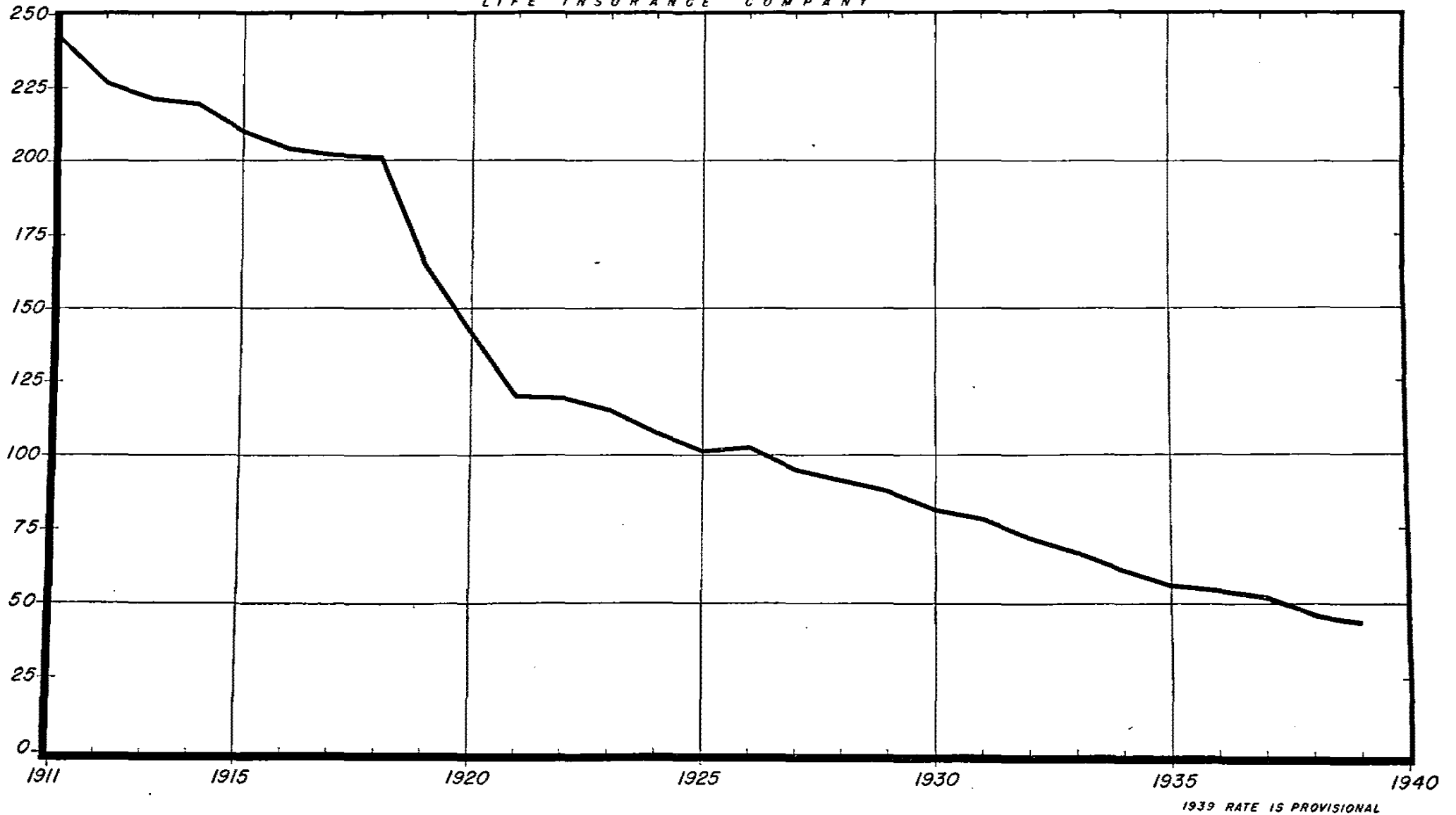


Table 22.—Standardized Annual Death Rates per 100,000 for Specified Causes

Total Persons, Ages 1 to 74 Years. Metropolitan Life Insurance Company, Industrial Department, 1911 to 1939

Year	All Causes of Death	Typhoid Fever	Diphtheria	Tuberculosis All Forms	Cancer All Forms	Diabetes
1911	1,354.9	22.1	25.6	241.6	75.8	15.1
1912	1,295.0	18.6	22.6	226.7	77.5	16.2
1913	1,294.0	18.0	25.2	221.4	78.4	16.3
1914	1,243.0	15.7	23.7	219.4	77.9	15.7
1915	1,210.9	12.6	19.7	210.6	79.0	16.6
1916	1,258.2	12.8	18.9	204.3	79.2	17.5
1917	1,264.5	12.0	21.7	202.2	80.7	17.1
1918	1,670.5	11.1	17.1	201.5	75.8	15.8
1919	1,133.8	7.1	18.5	165.3	75.6	15.1
1920	1,041.4	6.6	20.5	143.3	78.5	15.6
1921	909.7	6.6	21.7	120.6	79.7	16.7
1922	928.6	5.7	16.7	119.1	79.3	18.3
1923	967.3	5.0	14.2	115.1	81.6	17.8
1924	910.3	4.4	11.3	107.8	80.6	16.5
1925	909.6	4.5	8.9	101.5	81.3	16.8
1926	947.1	4.1	8.4	101.9	84.8	18.3
1927	888.8	4.6	9.0	94.7	83.7	18.1
1928	910.4	2.6	8.5	91.8	83.8	18.5
1929	927.4	2.4	7.9	88.0	84.0	18.9
1930	856.0	2.4	5.4	82.0	82.1	18.3
1931	846.4	2.3	4.2	77.7	84.6	19.9
1932	812.9	1.8	3.8	71.9	87.1	20.7
1933	803.1	1.6	2.6	67.0	88.1	20.8
1934	786.6	1.5	2.2	60.9	88.2	20.7
1935	762.6	1.1	2.3	56.4	86.8	20.5
1936	750.4	1.0	1.8	54.6	84.6	20.6
1937	742.9	0.9	2.1	52.0	86.5	21.0
1938	674.4	1.0	1.8	46.8	86.5	19.7
1939*	659.1	0.7	1.3	43.7	86.6	21.2

* All death rates for 1939 are provisional.

Table 26.—Death Rates per 100,000 from Tuberculosis in the United States for Each State in the Periods 1925 to 1927 and 1935 to 1937, Together with the Per Cent Decrease from the First to the Second Period*

State	Death Rates per 100,000		Per Cent Decline from 1925-1927 to 1935-1937
	1925-1927	1935-1937	
Arizona.....	366.0	266.2	27.3
Colorado.....	153.4	73.8	51.9
Tennessee.....	137.3	86.9	36.7
California.....	122.0	74.4	39.0
Kentucky.....	116.3	72.0	38.1
Maryland.....	113.1	63.5	44.2
Virginia.....	110.7	70.2	36.6
Delaware.....	104.3	65.3	37.0
Louisiana.....	100.9	72.1	28.5
Mississippi.....	98.9	61.9	37.4
South Carolina.....	95.1	54.8	42.4
Alabama.....	83.8	61.0	27.7
North Carolina.....	82.5	57.3	30.1
Florida.....	86.0	55.0	35.0
New York.....	84.6	57.9	31.6
Massachusetts.....	82.4	44.2	46.4
Missouri.....	82.4	55.9	32.2
Arkansas.....	80.8	51.6	36.1
Rhode Island.....	80.1	48.5	39.5
Indiana.....	80.0	49.0	38.8
New Jersey.....	78.8	48.0	39.0
West Virginia.....	77.3	45.0	42.8
Pennsylvania.....	77.1	46.0	40.2
Ohio.....	77.0	52.1	32.3
Illinois.....	76.4	51.5	33.0
Washington.....	75.7	49.0	35.3
Connecticut.....	75.6	50.8	33.4
Vermont.....	72.8	44.9	38.3
Montana.....	70.5	44.9	36.3
Maine.....	67.7	39.2	42.5
Michigan.....	66.9	43.0	35.4
New Hampshire.....	66.4	31.5	52.6
Wisconsin.....	64.0	39.5	38.9
Minnesota.....	63.8	35.8	43.9
Oregon.....	61.1	35.4	42.1
North Dakota.....	46.2	25.1	46.7
Idaho.....	41.0	23.9	41.7
Kansas.....	39.8	27.8	30.2
Iowa.....	38.3	23.6	38.4
Wyoming.....	32.7	21.4	34.6
Nebraska.....	32.2	20.3	37.0
Utah.....	31.9	20.3	36.4
United States †.....	65.0	54.7	35.0

* Metropolitan Life Insurance Company Statistical Bulletin, March 1939, page 8.

† Rate for 1925-1927 relates to Death Registration Area; rate for 1935-1937 Continental United States.

‡ Average of death rates for 1926 and 1927.

§ 1927 only.

Data not available for following states which were not in Death Registration Area in 1925-1927: Georgia, New Mexico, Nevada, Oklahoma, South Dakota and Texas.

Tuberculosis Mortality

Tuberculosis is probably as old as civilization itself, but its cause and nature were first clearly recognized only a little more than 50 years ago when Robert Koch succeeded in isolating the tubercle bacillus. Soon after the mode of transmission was disclosed steps were inaugurated to develop methods and campaigns to reduce its incidence.

Many factors have contributed to the present efforts to control tuberculosis. Among these may be mentioned the establishment of tuberculosis sanatoria, visiting nursing services, the campaign of public health education, special examination of school children and

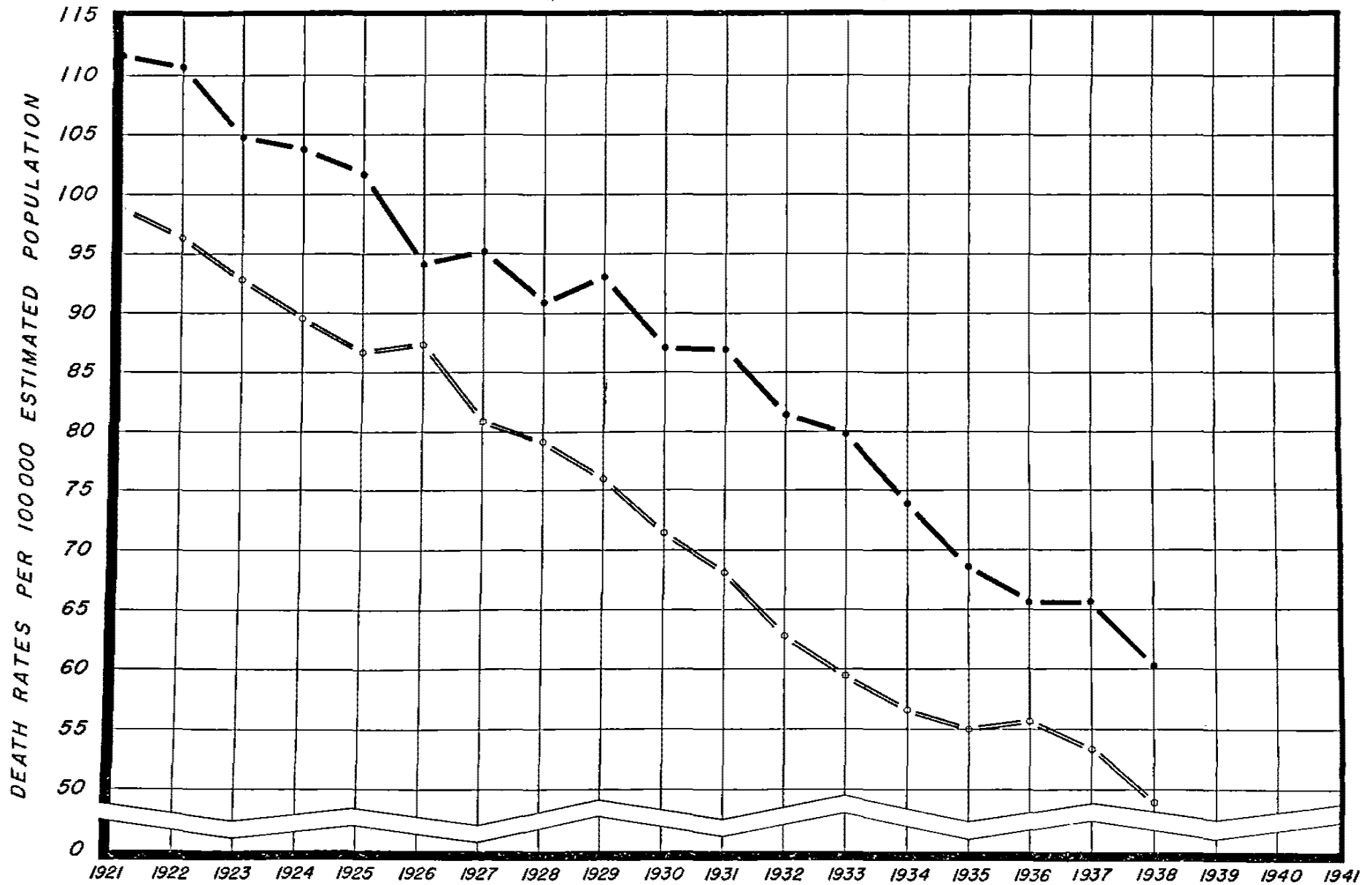
newer methods of treatment. Among the most promising of these more recent methods is the surgical treatment of the disease.

An inspection of Table 22 and Chart XXV shows that the death rate for tuberculosis among the large groups of wage earners who constitute the Industrial policyholders of the Metropolitan Life Insurance Company has declined by nearly 82 per cent during the period 1911 to 1939. This downward trend of tuberculosis deaths for persons in the low income group compares favorably with the decline in the tuberculosis death rate for the entire population. (See page 51.)

CHART XXVI
TUBERCULOSIS MORTALITY

ENGLAND AND WALES •—• UNITED STATES ◊—◊

SOURCE: ANNUAL REPORT, CHIEF MEDICAL OFFICER, MINISTRY OF HEALTH, 1938; BUREAU OF THE CENSUS AND U.S.P.H.S. REPORTS, 1939



**Table 27.—Tuberculosis Mortality in England and Wales,
and the United States 1921 to 1938**

Year	Death Rates per Estimated 100,000 Population	
	United States*	England and Wales†
1921.....	68.9	111.7
1922.....	66.4	110.7
1923.....	62.8	104.0
1924.....	60.7	103.9
1925.....	60.7	101.7
1926.....	67.3	94.2
1927.....	60.9	95.2
1928.....	79.3	90.9
1929.....	76.0	91.2
1930.....	71.5	87.2
1931.....	68.1	86.9
1932.....	62.8	81.5
1933.....	59.5	79.9
1934.....	56.6	74.0
1935.....	55.0	69.7
1936.....	55.7	65.7
1937.....	53.6	65.7
1938.....	49.0	60.7

* Vital Statistics—Special Reports, Bureau of the Census, Dec. 29, 1939, Vol. 9, No. 7, page 15.

† Annual Report of the Chief Medical Officer of the Ministry of Health for the year 1938, p. 203.

Tuberculosis Mortality in England and Wales, and the United States

Many factors pertaining to the characteristics of the population and to methods of collecting vital statistics in different countries make it difficult to compare the death rates of these countries. If it be assumed that in each country the population characteristics and the methods of deriving death rates remain fairly constant over a period of years, then the rate at which the death rates decline or increase may be used for comparison.

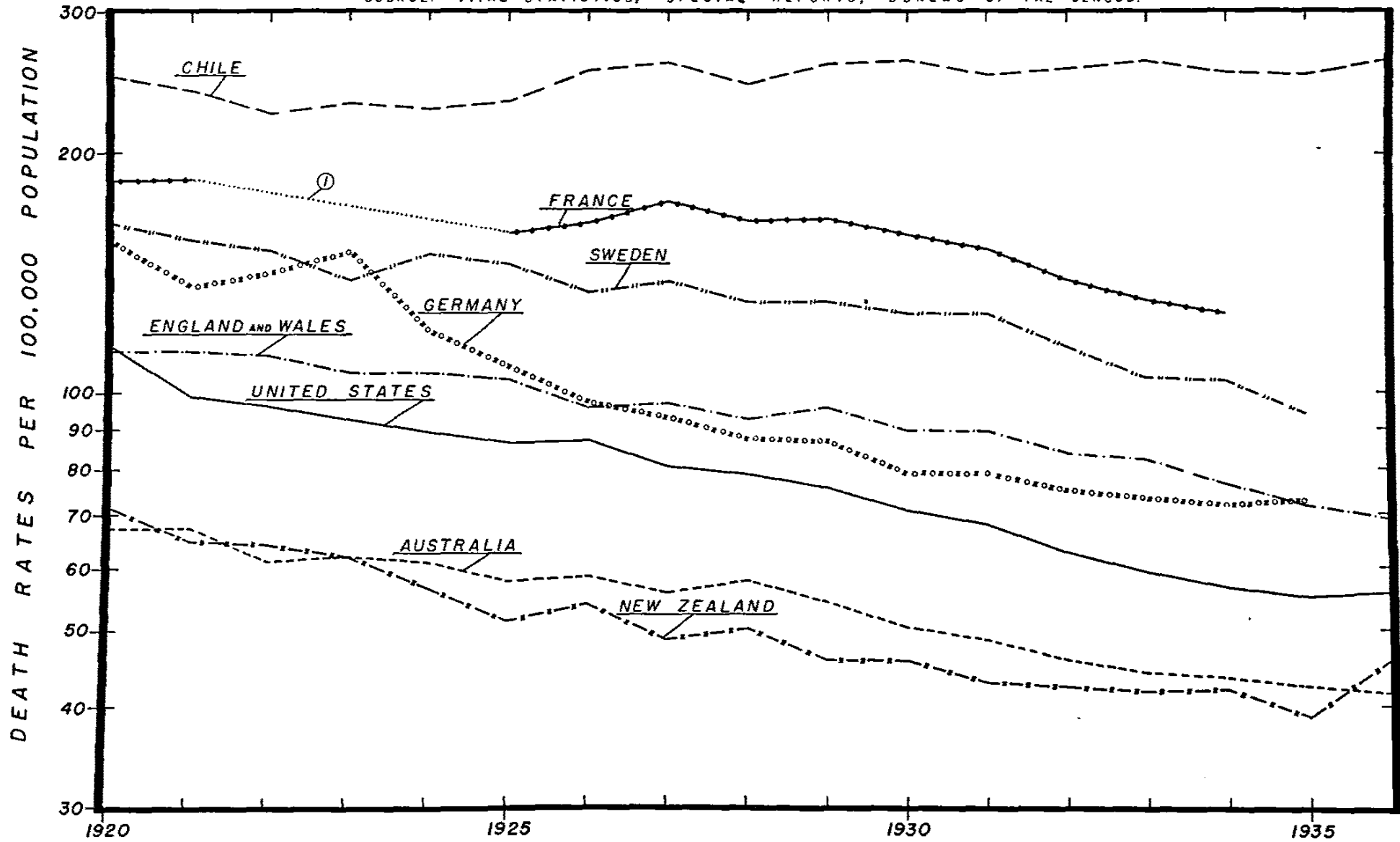
In the period 1921-1938 the death rate from tuberculosis declined 46.1 per cent in England and Wales and

50.5 per cent in the United States. It should also be observed that in 1921 the tuberculosis death rate in England and Wales was considerably higher than in the United States.

Since the rate of decline in England and Wales was slightly less rapid than in the United States it would seem difficult to show that the methods of control in those countries were any more efficient than in the United States.

CHART XXVII
 TUBERCULOSIS MORTALITY PER 100,000 'POPULATION
 FOR SPECIFIED COUNTRIES, 1920 — 1936.

SOURCE: VITAL STATISTICS, SPECIAL REPORTS, BUREAU OF THE CENSUS.



① DATA NOT AVAILABLE.

Table 28.—Tuberculosis Mortality per 100,000 Population for Specified Countries, 1920-1936 *

Year	United States ^a	Chile	Australia	New Zealand ^b	Germany ^c	England and Wales ^d	France ^e	Sweden
1920.....	114.0	249.0	67.3	71.4	154.0	118.0	185.0	163.0
1921.....	98.9	240.0	67.5	64.8	136.0	113.0	186.0	150.0
1922.....	96.4	225.0	61.0	64.1	142.0	112.0	.....	151.0
1923.....	92.8	232.0	62.2	62.2	151.0	106.0	.....	139.0
1924.....	89.7	228.0	61.0	59.7	120.0	101.0	.....	150.0
1925.....	86.7	233.0	57.6	51.4	107.0	104.0	159.0	140.0
1926.....	87.3	254.0	58.5	53.8	97.7	96.1	164.0	134.0
1927.....	80.9	260.0	55.6	48.6	93.3	97.2	174.0	138.0
1928.....	79.3	245.0	57.8	50.2	87.5	92.8	165.0	130.0
1929.....	76.0	259.0	54.2	45.6	86.8	95.9	166.0	130.0
1930.....	71.5	262.0	50.4	45.5	78.8	80.8	164.0	120.0
1931.....	68.2	251.0	48.5	42.7	78.7	80.6	152.0	120.0
1932.....	62.8	255.0	45.7	42.2	75.0	83.7	139.0	114.0
1933.....	59.5	262.0	44.1	41.6	73.1	82.4	131.0	104.0
1934.....	56.6	253.0	43.5	42.0	71.9	79.3	126.2	103.0 ^f
1935.....	55.0	251.0	42.5	38.8	72.8	71.8	.....	94.2
1936.....	55.6	262.2	41.8	45.6	.....	69.2	.....	.....
Decrease.....	51.2%	5.3% [†]	37.9%	36.1%	52.7%	39.8%	31.8%	42.2%

* Vital Statistics—Special Reports, Vol. 9, No. 36, pages 345-461, May 2, 1940. Derived from League of Nations Annual Epidemiological Reports for the years 1935 (p. 74) and 1936 (p. 68, ff.).

† Chile shows a 5.3 per cent increase in death rates for tuberculosis. Figures for the "Death Registration Area," which comprised 63.5% of the total population in 1912, 82.3% in 1920, 96.3% in 1932, and 100% since 1933. (For 1937 and 1938 rates see table 27, p. 61, of this book.)

^b Excluding Maoris.
^c The figures only relate to the whole country (except the Saar) since 1924. Previously, they concerned 93.9% of the population in 1912 and 98.7% in 1920.

^d In 1920, the rates referred to the civil population only.
^e In 1920 and 1921, the rates only related to a variable portion of the territory.

^f Country having a special nomenclature.

Tuberculosis Mortality for Specified Countries

The success achieved in combating tuberculosis has been more consistent than for some of the other causes of death. The degree of reduction of tuberculosis death rates varies with countries from 66 per cent in the Netherlands to 6.8 per cent in Finland. Chile is the only country for which records are available that showed an increase, 5.3 per cent, between the years 1920 and 1936. (All the countries given in the original source table are not shown here.)

Comparisons of general or specific death rates of different countries are always difficult because of the variations in the factors that influence such rates. It is often impossible to enumerate all such factors for com-

parative study but were it possible to place a fair evaluation on many of such factors, there would still be causes and influences in some countries that might be almost wholly absent in others.

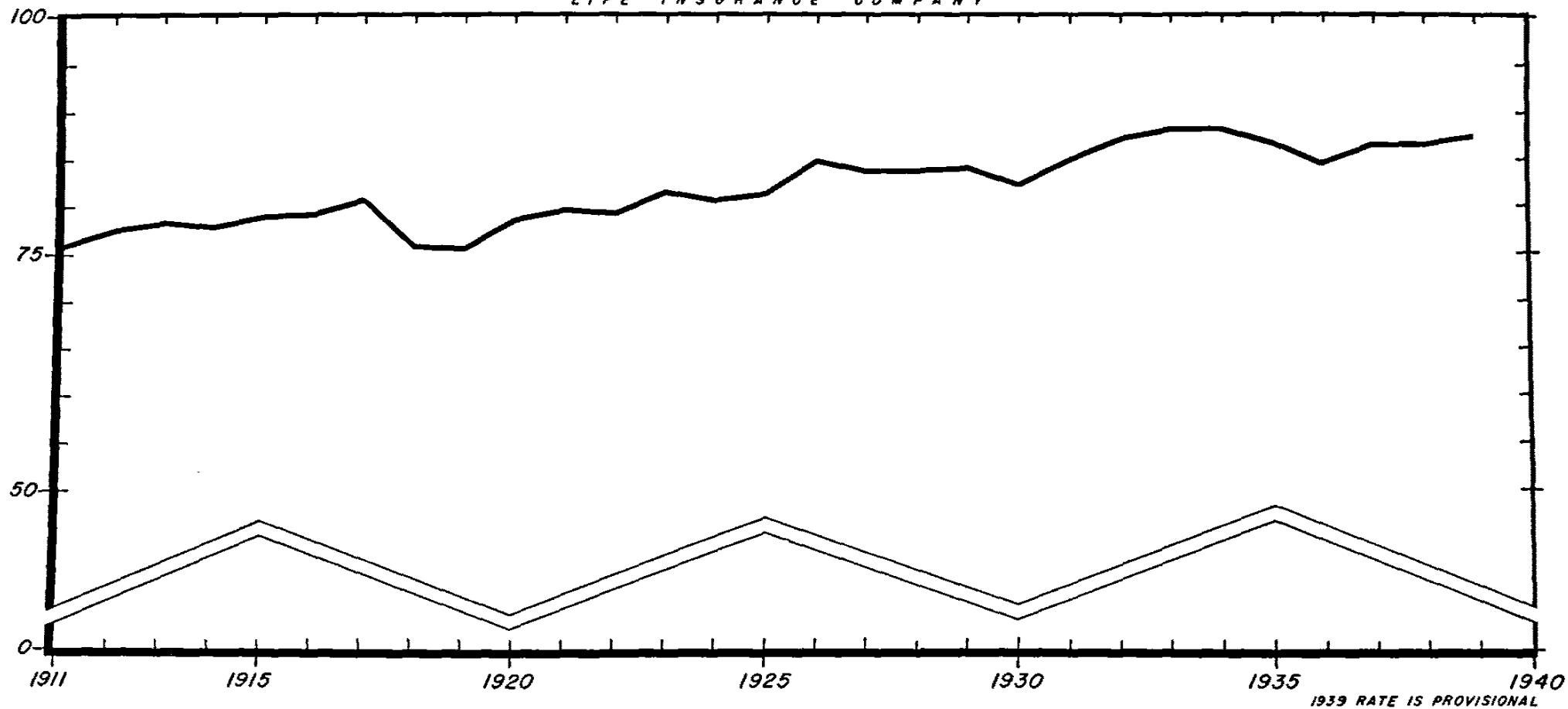
The one fair method of comparison, although general and somewhat limited in its scope, is to contrast the rate of change in the countries under consideration. Such a method omits comparisons of the differing factors which contribute to the mortality rates but enables a comparison of the time results of these factors.

Such a comparison will not provide an explanation of the reasons for greater degree of increase or decrease of death rates in one country than in another.

CHART XXVIII

REPORTED DEATHS FROM CANCER
STANDARDIZED DEATH RATE PER 100,000
INDUSTRIAL POLICYHOLDERS, AGES 1-74 YEARS

SOURCE: TWENTY-FIVE YEARS OF LIFE CONSERVATION,
AND STATISTICAL BULLETINS, METROPOLITAN
LIFE INSURANCE COMPANY



**Table 22.—Standardized Annual Death Rates
per 100,000 for Specified Causes**

Total Persons, Ages 1 to 74 Years. Metropolitan Life Insurance
Company, Industrial Department, 1911 to 1939

Year	All Causes of Death	Typhoid Fever	Diph- theria	Tubercu- losis All Forms	Cancer All Forms	Diabetes
1911	1,354.9	22.1	21.6	241.6	75.8	15.1
1912	1,295.0	18.6	22.6	226.7	77.5	15.2
1913	1,294.0	18.0	23.2	221.4	78.4	15.3
1914	1,243.0	15.7	23.7	219.4	77.9	15.7
1915	1,210.0	12.6	19.7	210.6	79.0	16.6
1916	1,258.2	12.8	18.9	204.3	79.2	17.6
1917	1,264.5	12.0	21.7	202.2	80.7	17.1
1918	1,670.5	11.1	17.1	201.5	75.8	15.8
1919	1,133.8	7.1	18.5	185.3	75.6	15.1
1920	1,041.4	6.6	20.5	143.3	78.6	15.6
1921	909.7	6.6	21.7	120.6	79.7	16.7
1922	928.6	5.7	16.7	119.1	79.3	14.3
1923	907.3	5.0	14.2	115.1	81.6	17.9
1924	910.3	4.4	11.3	107.8	80.6	16.5
1925	909.6	4.5	8.9	101.5	81.3	16.8
1926	947.1	4.1	8.4	101.9	84.8	18.3
1927	888.3	4.6	9.0	94.7	83.7	18.1
1928	910.4	2.6	8.5	91.8	83.8	18.5
1929	927.4	2.4	7.9	88.0	84.0	18.9
1930	856.0	2.4	5.4	82.0	82.1	18.3
1931	846.4	2.3	4.2	77.7	84.8	19.9
1932	812.9	1.8	3.3	71.9	87.1	20.7
1933	803.1	1.6	2.6	67.0	88.1	20.8
1934	786.6	1.5	2.2	60.9	88.2	20.7
1935	762.6	1.1	2.3	60.4	89.6	20.5
1936	759.4	1.0	1.8	54.6	84.6	20.6
1937	742.9	0.9	2.1	52.0	86.5	21.0
1938	674.4	1.0	1.8	46.8	86.5	19.7
1939*	659.1	0.7	1.3	43.7	86.8	21.2

* All death rates for 1939 are provisional.

Mortality from Cancer

Widespread attention has been given to the importance of cancer as a cause of death. During the years 1911 to 1939 cancer advanced from ninth to third place as a leading cause of death for the entire population. Nevertheless, the cancer death rate is not as alarming as it appears from first sight. Vital statisticians have pointed out that the crude death rate for cancer is not a reliable guide of the trend in cancer mortality.

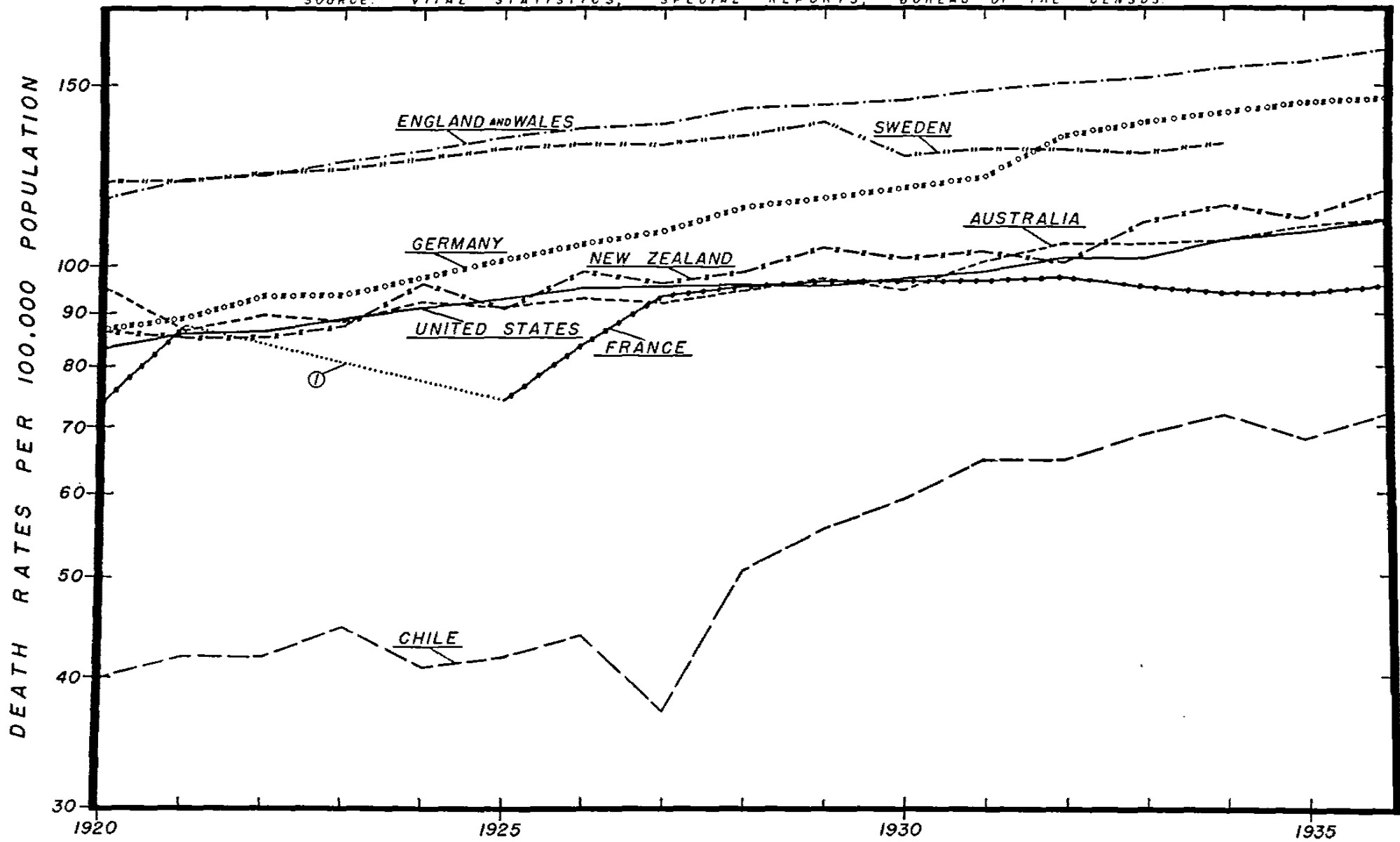
Dublin and Lotka, statisticians of the Metropolitan Life Insurance Company, who are recognized as authorities on vital statistics, stated in their report "Twenty-Five Years of Health Progress" that with declining birth rates and enormous savings in human life, which have been effected in childhood and early adult years, a greater portion of our population has been concentrated

in ages over 45 years where cancer is most prevalent. Ageing of the population is, therefore, an important factor in rising death rates from cancer. In concluding their discussions on cancer they stated: "It is obvious then that the cancer situation in the United States is far from alarming."

The above table and the chart on the opposite page indicate a moderate but upward trend in the recorded mortality of all forms of cancer among a large group of wage earners who constitute the Industrial policyholders of the Metropolitan Life Insurance Company. In the period 1911 to 1935 the standardized annual death rates averaged 81.4 per 100,000, and cancer accounted for 8.2 per cent of the total number of deaths. For this large group of wage earners, cancer ranked seventh among the causes of death in 1911, but in 1935 it was second only to heart disease.

CHART XXIX
 CANCER MORTALITY PER 100,000 POPULATION
 FOR SPECIFIED COUNTRIES, 1920—1936.

SOURCE: VITAL STATISTICS, SPECIAL REPORTS, BUREAU OF THE CENSUS



① DATA NOT AVAILABLE.

Table 29.—Cancer Mortality per 100,000 Population for Specified Countries, 1920-1936 *

Year	United States ^a	Chile	Australia	New Zealand ^b	Germany	England and Wales ^c	France	Sweden
1920.....	83.2	40.0	95.4	86.3	87.0	116.0	74.0	121.0
1921.....	85.6	42.0	86.5	85.3	89.0	121.5	88.0	121.0
1922.....	86.2	42.0	89.7	85.2	93.5	122.0	.....	123.0
1923.....	88.7	45.0	88.2	87.5	94.0	126.7	.....	124.0
1924.....	91.1	41.0	92.3	95.9	97.5	129.7	.....	127.0
1925.....	92.8	42.0	91.4	90.8	101.5	133.0	74.0	130.0
1926.....	95.1	44.0	93.3	99.1	105.0	136.2	84.0	131.0
1927.....	95.7	37.0	92.4	96.3	108.5	137.0	94.0	131.0
1928.....	96.1	51.0	94.8	98.8	114.0	142.5	100.0	134.0
1929.....	95.9	56.0	97.5	104.3	116.5	143.7	97.0	138.0
1930.....	97.3	60.0	95.0	101.9	119.0	145.4	97.0	128.0
1931.....	98.9	64.9	101.0	103.3	122.0	148.4	97.0	130.0
1932.....	102.0	65.0	105.0	101.1	134.0	151.0	98.0	130.0
1933.....	102.2	69.0	105.0	110.7	138.5	152.0	96.0	129.0
1934.....	106.2	72.0	106.0	115.0	141.5	156.3	95.0	132.0
1935.....	107.0	68.0	109.0	111.5	145.0	158.7	94.8	.....
1936.....	111.0	72.0	111.1	118.1	146.5	162.6	96.0	.....
Increase.....	33.4%	80.0%	16.5%	36.8%	68.4%	39.4%	41.0%	0.1%

* Vital Statistics—Special Reports, Vol. 9, No. 36, pages 345-461, May 2, 1940. Figures are taken from (1) the latest official publications in each country, (2) various editions of the Statistisches Jahrbuch für das Deutsche Reich, 1934-1938, and (3) the Aperçu de la Démographie des Divers Pays du Monde, 1929-1936, Office Permanent de l'Institut International de Statistique, La Haye, 1939.

^a Figures for the "Death Registration Area," which comprised 63.5% of the total population in 1912, 82.3% in 1920, 96.3% in 1932, and 100% since 1933. (For 1937 and 1938 rates see table 23, p. 61, of this book.)

^b Excluding Maoris.

^c In 1920, the rates referred to the civil population only.

Cancer Mortality for Specified Countries

From 1920 to 1936 the death rate for cancer has increased in every country for which statistics have been secured. The change in these rates vary from 0.1 per cent in Japan to 80 per cent in Chile. The change in Japan is so small as to cast doubt on the accuracy of reporting cancer as a cause of death.

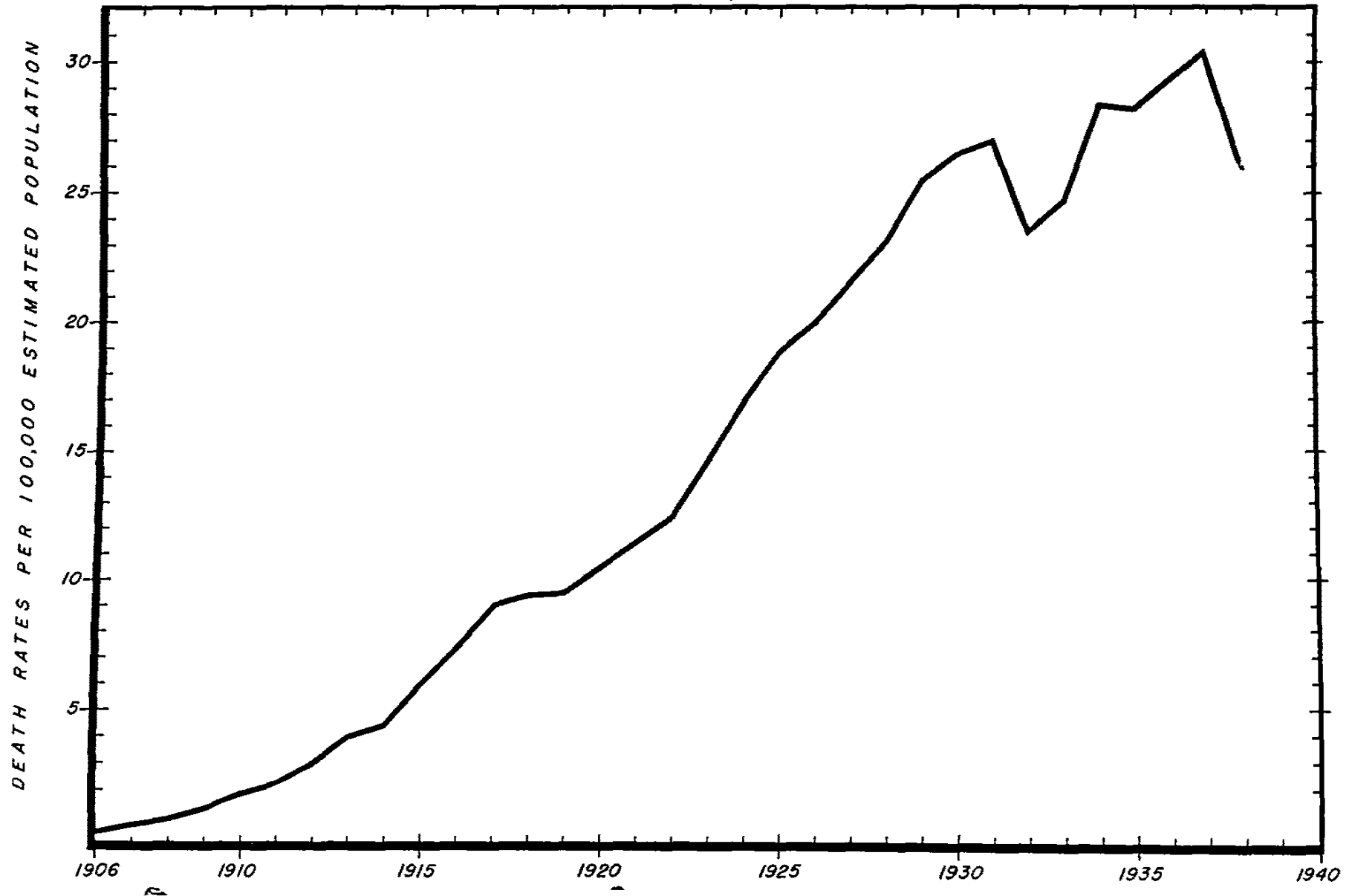
Most of the apparent rise in cancer mortality can be attributed to the older average age of the populations of the countries and to improvements in diagnosis and greater care in the certification of cancer as a cause of death.

During the period 1920 to 1936 much has been added to the medical understanding of cancer and to the

methods of arriving at an early diagnosis. The utilization of this knowledge for the benefit of persons who may have cancer depends to an appreciable degree on the readiness with which such persons seek medical advice. Education of the public has, therefore, been accepted as an important part of the program to control cancer. It is not possible here to evaluate the educational phase of cancer programs in the specified countries. It is believed, however, that a large part of the variations between countries is due to differences in the age composition of the several populations and to the accuracy of the cause-of-death certification in these countries.

CHART XXX

INCREASING MORTALITY FROM AUTOMOBILE ACCIDENTS
FOR THE EXPANDING DEATH REGISTRATION AREA
INCLUDING DEATHS FROM COLLISION WITH RAILROAD AND STREET CARS
SOURCE: VITAL STATISTICS SPECIAL REPORTS, U. S. BUREAU OF THE CENSUS,
FEBRUARY 26, 1940



*Table 30.—Increasing Mortality from Automobile Accidents for the Expanding Death Registration Area Including Death from Collision with Railroad and Street Cars**

Year	Death Rates per 100,000 Estimated Population
1906.....	0.4
1907.....	0.7
1908.....	0.8
1909.....	1.2
1910.....	1.8
1911.....	2.2
1912.....	2.9
1913.....	3.9
1914.....	4.3
1915.....	5.9
1916.....	7.3
1917.....	9.0
1918.....	9.3
1919.....	9.4
1920.....	10.4
1921.....	11.4
1922.....	12.4
1923.....	14.7
1924.....	16.0
1925.....	18.8
1926.....	19.9
1927.....	21.5
1928.....	23.1
1929.....	25.4
1930.....	26.4
1931.....	26.9
1932.....	23.4
1933.....	24.7
1934.....	28.3
1935.....	28.2
1936.....	27.3
1937.....	30.4
1938.....	24.7

* Vital Statistics—Special Reports, U. S. Bureau of the Census, Vol. 9, No. 23, Feb. 26, 1940.

Automobile and Other Accidental Deaths

No country, in proportion to the size of its population, records as many automobile deaths as the United States. A total of 32,218 deaths occurred in 1938 in connection with all forms of automobile accidents, a wholesale slaughter which is unparalleled except during war. The automobile death rate for the United States is twice as high as that for Canada and England; and is more than five times the rate for Italy or Germany. However, the larger number of deaths in the United States from automobile accidents is partly accounted for by the fact that almost three fourths of the automobiles in operation throughout the world are owned in the United States.

The unfavorable death rate from automobile accidents may be traced partly to our national wealth which permits greater use of automobiles and partly to the carelessness or even recklessness with which automo-

biles are operated. Greater speed of travel seems to be one of the chief underlying causes of the rapid increase in automobile accidents.

This scourge of deaths from automobile accidents is not epidemic or endemic—it affects the entire nation and, making proper allowance for the human factor, it presents a problem involving many preventable features.

All accidental deaths, including automobile deaths and deaths from other external causes, constitute about 6.8 per cent of total deaths. These accidental deaths and deaths from homicides and suicides are relatively greater in the United States than in most foreign countries and add appreciably to the general death rate in this country. Although much has been done toward preventing deaths due to accidental causes, homicides, and suicides, the problem of reducing the number of such deaths deserves most careful study.

CHART XXXI

**DECLINE IN MATERNAL MORTALITY
BETWEEN 1921 AND 1935 FOR STATES IN THE
BIRTH REGISTRATION AREA SINCE 1921**

SOURCE: BUREAU OF THE CENSUS; CHILDREN'S BUREAU; AND THE BUREAU OF MEDICAL ECONOMICS, A.M.A.

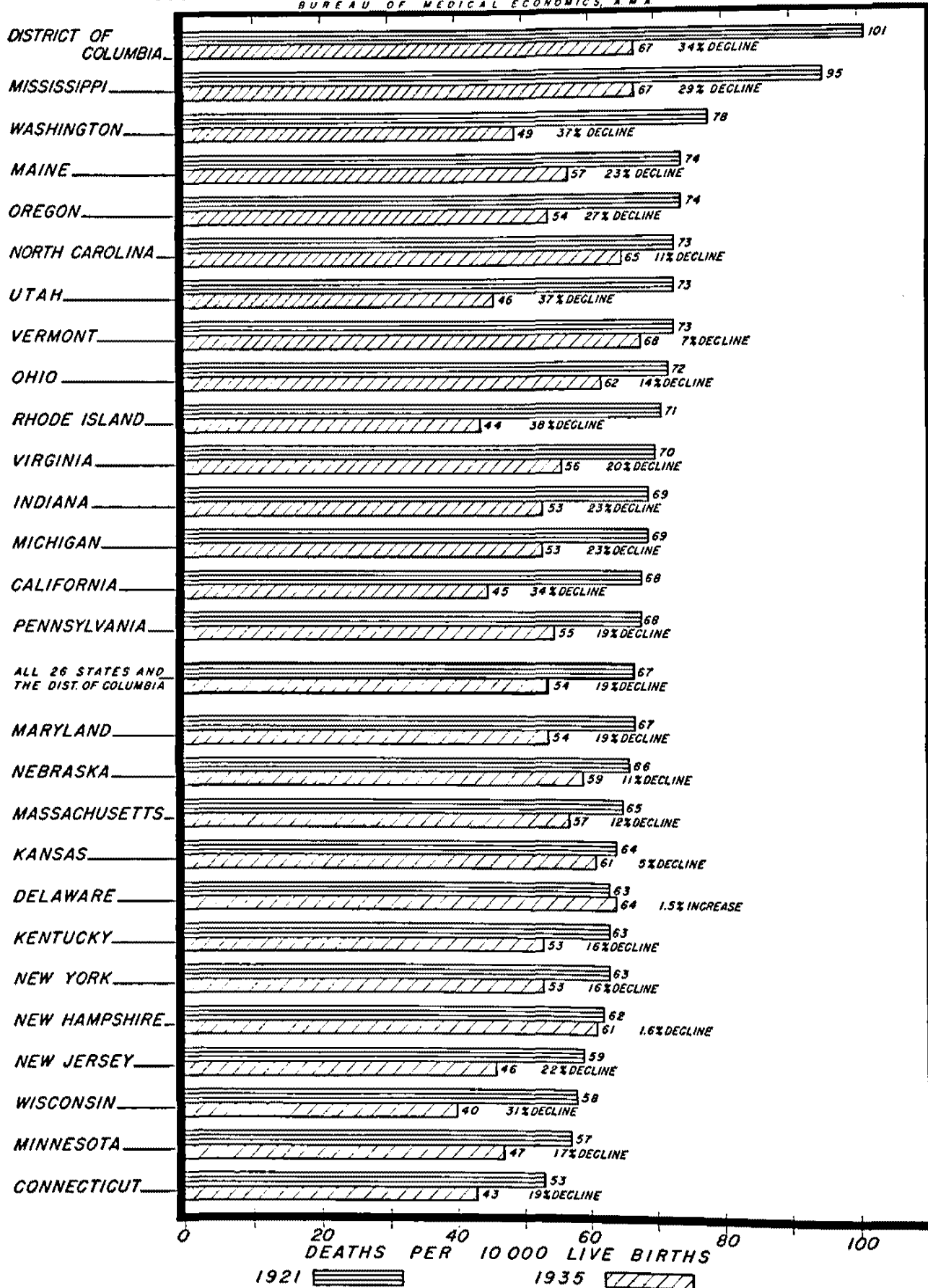


Table 31.—Decline in Maternal Mortality Between 1921 and 1935 for States in the Birth Registration Area Since 1921

State	Deaths per 10,000 Live Births		Per Cent Increase + or Decline -†
	1921*	1935*	
District of Columbia.....	101	67	-33.6
Mississippi.....	95	67	-29.4
Washington.....	79	49	-37.1
Maine.....	74	57	-22.9
Oregon.....	74	54	-27.0
North Carolina.....	73	65	-10.9
Utah.....	73	46	-36.9
Vermont.....	73	68	-6.8
Ohio.....	72	62	-13.9
Rhode Island.....	71	44	-38.0
Virginia.....	70	56	-20.0
Indiana.....	69	53	-23.1
Michigan.....	69	53	-23.1
California.....	68	45	-33.8
Pennsylvania.....	68	56	-19.1
All 26 states and the District of Columbia..	67	54	-19.4
Maryland.....	67	54	-19.4
Nebraska.....	66	59	-10.6
Massachusetts.....	65	57	-12.3
Kansas.....	64	61	-4.6
Delaware.....	63	64	+ 1.5
Kentucky.....	63	53	-15.8
New York.....	63	53	-15.8
New Hampshire.....	62	61	-1.6
New Jersey.....	59	46	-22.0
Wisconsin.....	58	40	-31.0
Minnesota.....	57	47	-17.5
Connecticut.....	53	43	-18.8

* Vital Statistics—Special Reports, Bureau of the Census, July 9, 1938.
† Bureau of Medical Economics, American Medical Association.

Decline in Maternal Mortality

The report on "The Need for a National Health Program" issued by the Technical Committee on Medical Care of the Interdepartmental Committee to Coordinate Health and Welfare Activities on February 27, 1938 says, concerning maternal mortality: "During the 22 years for which records are available, there has been but little decline, with the exception of the last six years during which there has been a slight but significant decrease due to reduction in the deaths from toxemia of pregnancy."

The accompanying table shows the actual rates and percentage of decline or increase in maternal death rates as reported by the Bureau of the Census for the states in the Birth Registration Area since 1921. The maternal death rate is ordinarily reported as the number of maternal deaths per 10,000 live births. Any failure to record births automatically increases the maternal death rate so calculated. Vital statisticians know that in the early years following the establishment of birth registration there were incomplete records of births. This incompleteness of birth reporting tends to produce an incorrect or exaggerated maternal death rate. Statements to the effect that there has been only slight decline in maternal death rates appear to have been based on the reported rates for the expanding Birth Registration Area. The addition of 38 new states to the Birth Registration Area temporarily distorted the rate of decline in maternal mortality. The decline in maternal mortality rates for the states that have been included continuously in the Birth Registration Area since 1921 is much more rapid than the decline in the rate for the expanding Birth Registration Area. Chart XXXI records the fact that maternal mortality has declined very appreciably in practically all states in the Birth Registration Area since 1921. The maternal death rates

for all the states that were in the Registration Area in 1921 are compared with the maternal death rates for these same states for 1935. During this period the average per cent of decline for these twenty-six states and the District of Columbia was 19.4, or an average of more than 1 per cent a year. There are few foreign nations that have shown any greater rate of decline. Students of vital statistics know that this rate of decline is as rapid as has been obtained for any cause of death except where medical discoveries have changed the type of treatment.

Maternal death rates vary not only according to economic conditions but also according to racial and even national differences. The United States, with its large Negro population which has a high maternal death rate and large numbers of immigrants who come from nations having a high maternal mortality, presents problems unknown in many other countries. If only the Northern states having a high percentage of white mothers coming largely from countries with a low maternal mortality rate are considered in a comparison of maternal mortality, it will be found that the rate in those states compares favorably with any European nation.

These facts indicate that a program to reduce maternal mortality has already been in operation for more than a score of years and that this program has been as successful as any other maternal health program operating elsewhere in the world. Furthermore, an examination of the present activities of the medical profession in improving maternal care gives every reason to believe that the greatest progress will be made through the continuation of that program and its progressive improvement under professional auspices.

CHART XXXII

MATERNAL MORTALITY
IN URBAN AND RURAL AREAS
FOR WHITE AND OTHER RACES
UNITED STATES REGISTRATION AREA FOR
THE YEARS 1915 TO 1938

SOURCE: VITAL STATISTICS—SPECIAL REPORTS, BUREAU OF THE CENSUS

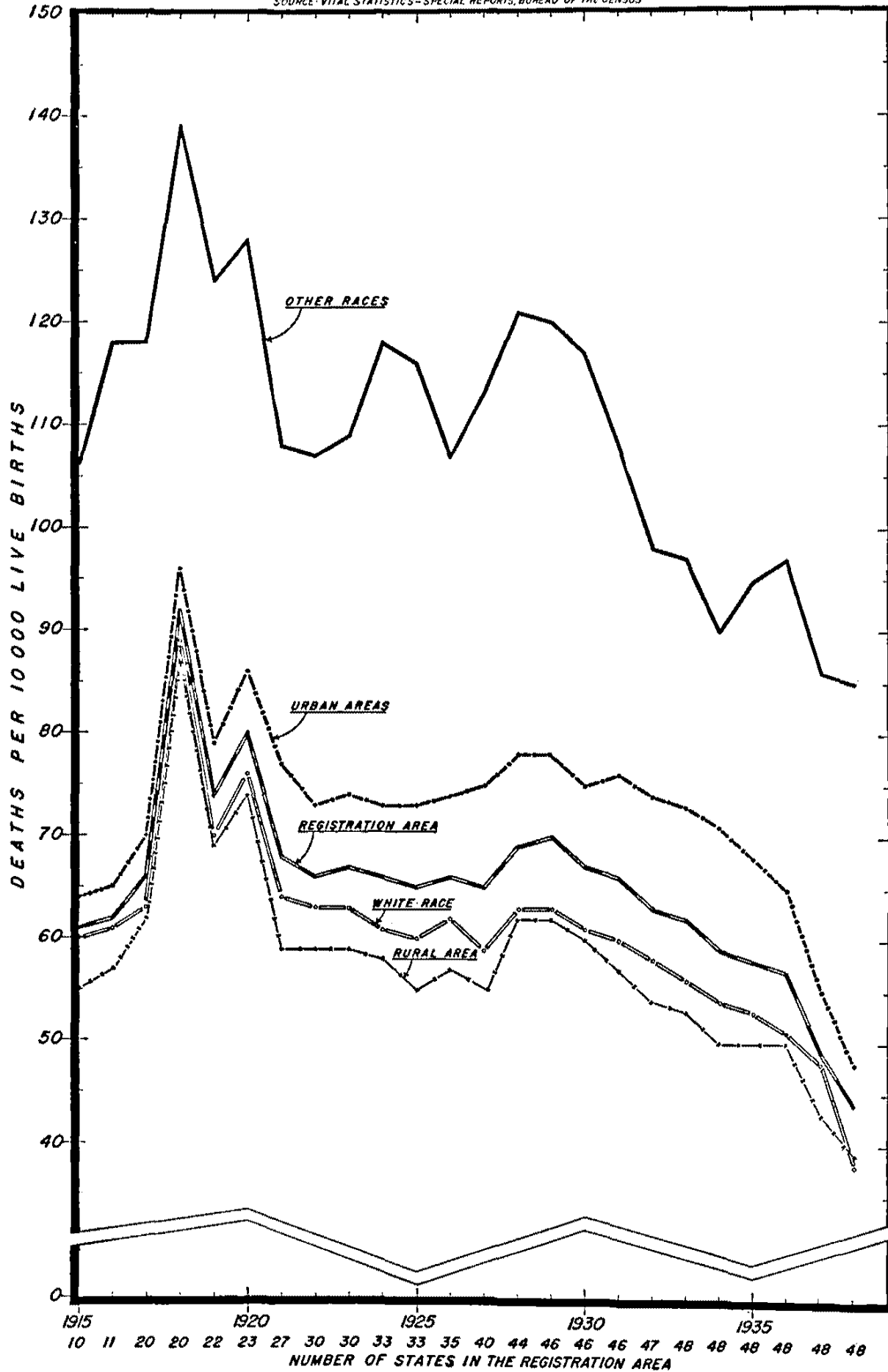


Table 32.—*Maternal Mortality in Urban and Rural Areas for White and Other Races**

Year	Number of States in Registration Area	Deaths per 10,000 Live Births				
		Registration Area	Urban Area	Rural Area	White Race	Other Races
1915	10	61	64	55	60	106
1916	11	62	65	57	61	118
1917	20	66	70	62	63	118
1918	26	92	96	87	89	130
1919	22	74	79	69	70	124
1920	23	80	86	74	76	128
1921	27	68	77	59	64	108
1922	30	66	73	59	63	107
1923	30	67	74	59	63	109
1924	33	66	73	58	61	118
1925	33	65	73	55	60	110
1926	35	66	74	57	62	107
1927	40	65	75	55	59	113
1928	44	69	78	62	64	121
1929	46	70	78	62	63	120
1930	46	67	75	60	61	117
1931	46	66	76	57	60	108
1932	47	63	74	54	58	98
1933	48	62	73	53	56	97
1934	48	59	71	50	54	90
1935	48	58	68	50	53	85
1936	48	57	65	50	51	87
1937	48	49	55	43	44	86
1938	48	44	48	39	39	85

* Vital Statistics—Special Reports, Bureau of the Census, March 18, 1940, Vol. 9, No. 26, pages 177-185.

Maternal Mortality in Urban and Rural Areas for White and Other Races

The maternal mortality rate for the United States is made up of a number of rates for various racial, economic, geographic, and other divisions of the population. One of the most important steps toward formulating conclusions as to the causes of mortality or toward devising steps to reduce such mortality is to determine the death rates for the various elements which compose these rates.

The table on this page and the accompanying chart separate maternal mortality rates according to urban and rural areas and white and other races. It should be noted that the rates given in this table represent the recorded deaths in the expanding Birth Registration Area which included only 10 states and the District of Columbia in 1915 as compared with all states and the District of Columbia after 1933. This changing size of the registration area makes the decline in mortality for the area much less rapid than would result if the area had remained constant in size and population.

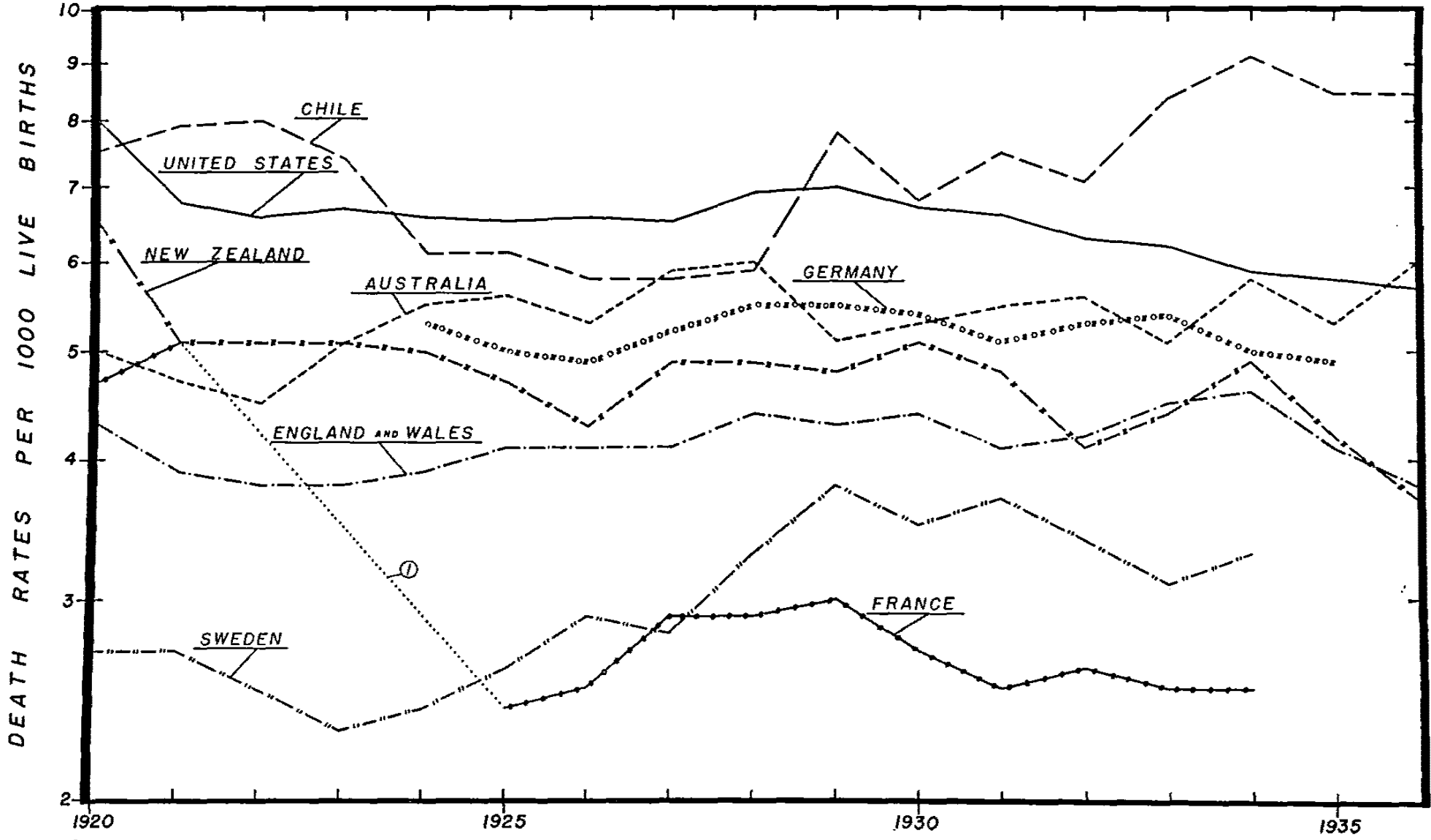
The most significant fact shown by this table is that the maternal death rate is much lower in rural than in urban districts and for white mothers as compared with those of other races. The more favorable showing of

rural over urban areas in regard to maternal mortality would seem to be due partly to economic and social causes. While there are local exceptions, the nutrition of mothers in even the lowest income classes is often better in rural districts than among those with similar incomes in the cities. Recent experiments in England have shown that comparatively minor improvements in the nutrition of expectant mothers has reduced maternal mortality to almost one half that existing among a group of mothers not receiving such additional and necessary food. It is also probable that the "pattern of life" and environment influence the health of mothers more in the rural than in urban districts. Since the maternal mortality rates for urban areas are consistently higher than for rural areas, this difference in rates would seem to depend as much on other factors as on the availability of medical facilities.

The much higher maternal mortality among Negroes, who compose the majority of "other" races, is due to many factors. Among these are racial characteristics, economic and social factors, including racial disadvantages. It is doubtful that these factors would be greatly changed by any alteration in the system of organizing medical care.

CHART XXXIII
 MATERNAL MORTALITY PER 1000 LIVE BIRTHS
 FOR SPECIFIED COUNTRIES, 1920 — 1936.

SOURCE: VITAL STATISTICS, SPECIAL REPORTS, BUREAU OF THE CENSUS.



① DATA NOT AVAILABLE.

Table 33.—Maternal Mortality per 1,000 Live Births for Specified Countries, 1920-1936 *

Year	United States ^a	Chile	Australia	New Zealand ^b	Germany ^c	England and Wales	France ^d	Sweden
1920.....	8.0	7.5	5.0	6.5	...	4.3	4.7	2.7
1921.....	6.8	7.9	4.7	5.1	...	3.9	5.1	2.7
1922.....	6.6	8.0	4.5	5.1	...	3.8	...	2.5
1923.....	6.7	7.4	5.1	5.1	...	3.8	...	2.3
1924.....	6.6	6.1	5.5	5.0	5.3	3.9	...	2.4
1925.....	6.5	6.1	5.6	4.7	5.0	4.1	2.4	2.0
1926.....	6.6	5.8	5.3	4.3	4.9	4.1	2.5	2.9
1927.....	6.5	5.8	5.9	4.9	5.2	4.1	2.9	2.8
1928.....	6.9	5.9	6.0	4.9	5.5	4.4	2.9	3.3
1929.....	7.0	7.8	5.1	4.8	5.5	4.3	3.0	3.8
1930.....	6.7	6.8	5.3	5.1	5.4	4.4	2.7	3.5
1931.....	6.6	7.5	5.5	4.8	5.1	4.1	2.5	3.7
1932.....	6.3	7.1	5.6	4.1	5.3	4.2	2.6	3.4
1933.....	6.2	8.4	5.1	4.4	5.4	4.5	2.5	3.1
1934.....	5.9	9.1	5.8	4.9	5.0	4.6	2.5	3.3*
1935.....	5.8	8.5	5.3	4.2	4.9	4.1	...	...
1936.....	5.7	8.5	6.0	3.7	...	3.8	...	...
Decrease..	28.7%	13.3%†	20.0%†	43.1%	7.5%	11.6%	46.8%	22.2%†

* Vital Statistics—Special Reports, Vol. 9, No. 36, pages 345-461, May 2, 1940. Derived from League of Nations Annual Epidemiological Reports for the years 1935 (p. 75) and 1936 (p. 68, ff.).

† Increase.

^a Figures for the Birth Registration Area which comprised 50.8% of total population in 1920, 94.7% in 1931, and 100% since 1933. (For 1937 and 1938 rates see table 32, p. 73, of this book.)

^b Excluding Maoris.

^c The figures only relate to the whole country (except the Saar) since 1924. Previously they concerned 98.9% of the population in 1912 and 98.7% in 1920.

^d In 1920 and 1921, the rates only related to a variable portion of the territory.

^e Country having a special nomenclature.

Maternal Mortality for Specified Countries

The death rates for all puerperal causes do not show consistent increases or decreases. Comparisons of the maternal mortality rates of different countries has long been difficult, if not quite impossible, because of the variations in the causes of death included under the general statistical category of maternity or the puerperal state.

For all puerperal causes, the changes between 1920 and 1936 range from a decrease of 46.8 per cent for France to an increase of 50 per cent for Finland. (The entire list of countries is not included in the accompanying chart and table.) Eighteen countries reported lower puerperal death rates and twelve countries reported higher rates in 1936 than in 1920.

It seems fair to suggest that completeness of birth registration and in certification of the primary cause of death have probably contributed to these apparent differences.

A comparison of maternal death rates, no less than other death rates, affords no explanations for differences between countries from a study of the statistics alone. An enumeration and discussion of all the factors which might have a bearing on maternal mortality rates in the various countries which file vital statistics reports with the Health Organization of the League of Nations, the International Labor Office or the International Statistical Institute, would require a separate study of considerable magnitude.

CHART XXXIV

I N F A N T M O R T A L I T Y
O R I G I N A L R E G I S T R A T I O N S T A T E S
C O M P A R I S O N O F R A T E S F O R T H E Y E A R S 1 9 1 5 A N D 1 9 3 7

SOURCE: VITAL STATISTICS SPECIAL REPORTS, BUREAU OF THE CENSUS
 (RATES AND PERCENTAGES ROUNDED TO NEAREST WHOLE NUMBER)

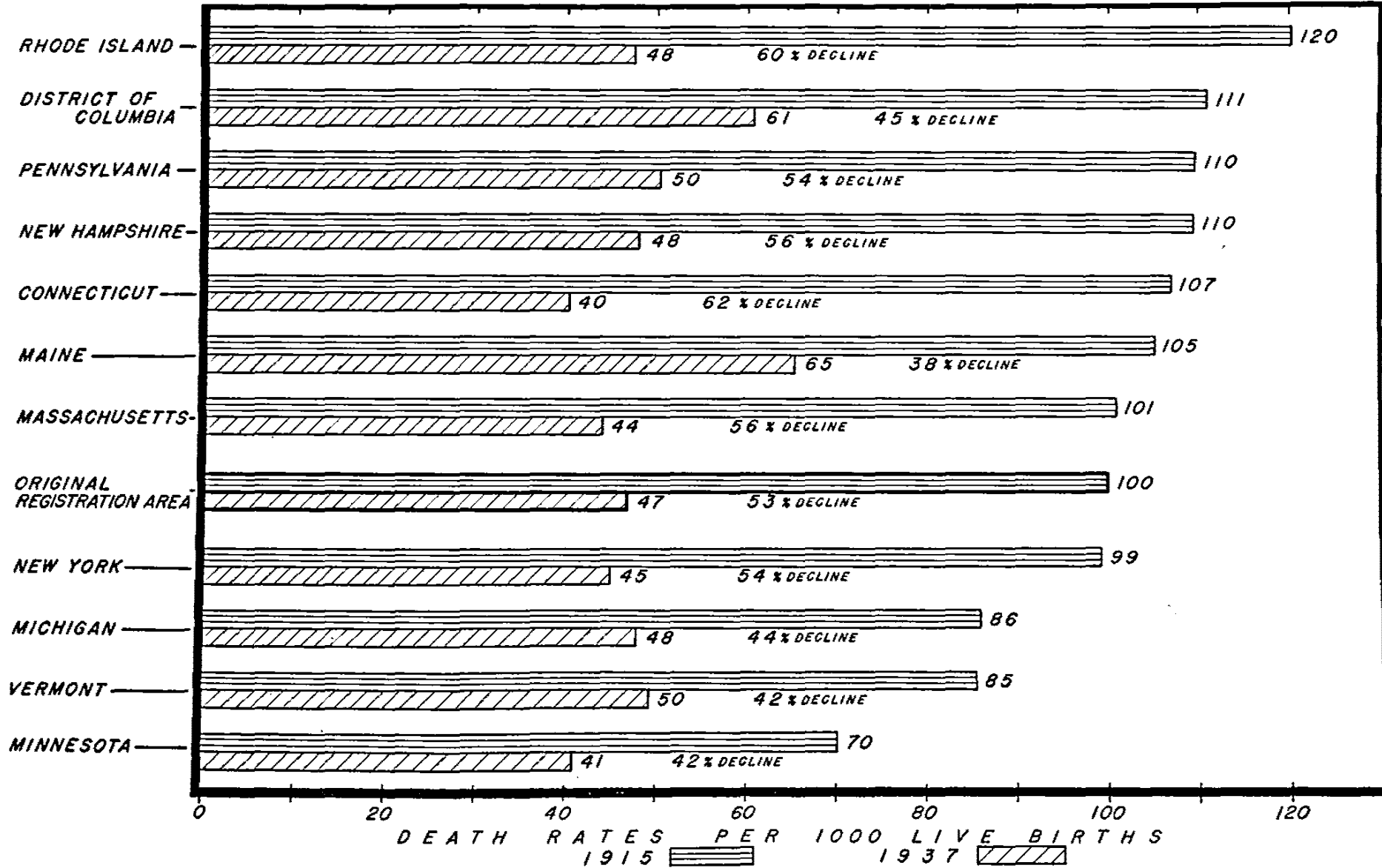


Table 34.—Infant Mortality; Original Registration States; Comparison of Rates for the Years 1915 and 1937

State	Deaths Under 1 Year of Age per 1,000 Live Births		Per Cent Decline
	1915*	1937†	
Rhode Island.....	120.3	47.6	60.4
District of Columbia.....	111.1	60.8	45.2
Pennsylvania.....	109.8	50.5	54.1
New Hampshire.....	109.6	48.1	56.1
Connecticut.....	107.1	40.4	62.2
Maine.....	105.4	63.3	39.0
Massachusetts.....	101.0	44.1	56.3
Registration states.....	100.0	46.0	53.1
New York.....	99.3	45.1	54.5
Michigan.....	86.0	47.9	44.3
Vermont.....	85.5	49.5	42.1
Minnesota.....	70.2	40.8	41.8

* Vital Statistics—Special Reports, Bureau of the Census, March 1, 1938.
† Vital Statistics—Special Reports, Bureau of the Census, Jan. 13, 1939.

Decline in Infant Mortality

The same statistical error of considering a gradually expanding "Registration Area" as a uniformly constant area has constituted the basis for the statements that there has been very little decline in infant mortality during recent years. The accompanying table and chart demonstrate this error by giving the figures for all the states concerning which facts are available for the twenty-two years preceding 1938. In these states the decline was 53.1 per cent from 1915 to 1937.

Some of those whose proposals, if adopted, would disrupt the private practice of medicine and place the medical profession under the control of lay administrators, promise to reduce the present infant death rate by one half. The infant death rate was reduced by nearly one half in the expanding birth registration area since 1915 and by more than one half in the original registration area. The recorded performance of the medical profession, in cooperation with public health agencies, would seem to be better security for a future program than utopian promises. The medical profession in private practice through the present system of health care is not asking for the retention of that system on the basis of promises but on the basis of past performances and present accomplishments.

Far from resting content with this accomplishment, nearly every state and county medical society in the United States is planning for even greater progress in protecting the lives of mothers and infants. Some of the practical phases of the program are: more and better courses in obstetrics and pediatrics in the medical schools and in the postgraduate instruction of practicing physicians; constant research in all phases of medical science applicable to maternal and infant care; more attention to the proper foods for mothers and infants; and constant cooperation with every individual, institution, or organization offering real assistance in furthering a program of protection of children.

This program was started by the medical profession many years ago and has received the sympathetic cooperation of public health agencies. It has been steadily improved as science added knowledge, and extended as resources became available. Its results, as shown in the figures of the above table and by the accompanying chart, indicate that there is no valid reason or excuse to abandon that program or to hand over its management to administrators who may be untrained in the science and art of medicine.

CHART XXXV

INFANT MORTALITY IN THE UNITED STATES
FROM 1915 TO 1939

FOR THE EXPANDING BIRTH REGISTRATION AREA
SOURCE: VITAL STATISTICS SPECIAL REPORTS, BUREAU OF THE CENSUS;
AND THE METROPOLITAN LIFE INSURANCE COMPANY
1939 RATE IS PROVISIONAL

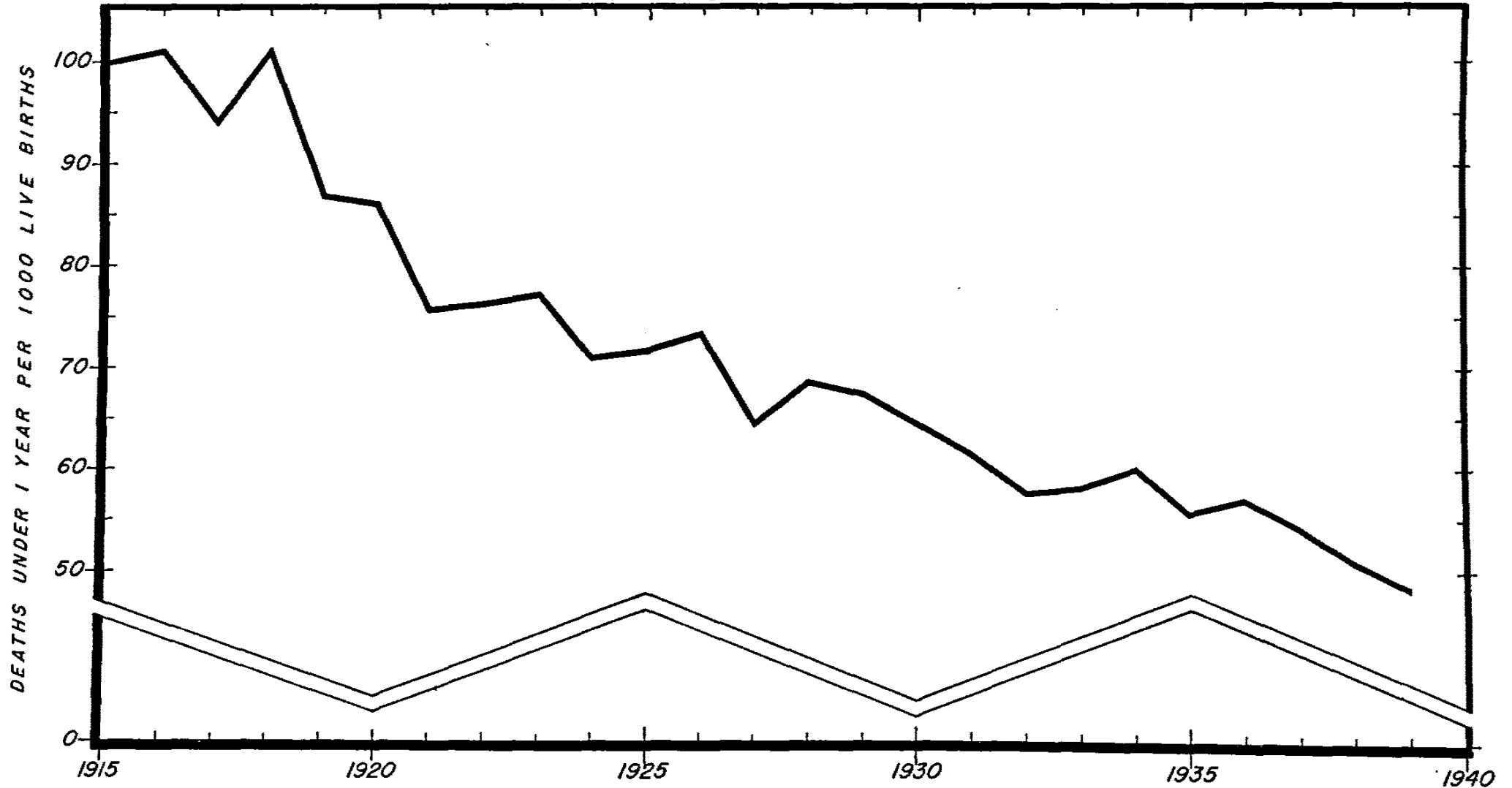


Table 35.—*Infant Mortality in the United States
1915-1939* *

Deaths Under Age One per 1,000 Live Births			
Year	Death Rate†	Year	Death Rate†
1915.....	99.9	1927.....	64.6
1916.....	101.0	1928.....	64.7
1917.....	93.3	1929.....	67.6
1918.....	100.9	1930.....	64.6
1919.....	86.6	1931.....	61.6
1920.....	85.8	1932.....	57.6
1921.....	75.6	1933.....	58.1
1922.....	78.2	1934.....	60.1
1923.....	77.1	1935.....	55.7
1924.....	70.8	1936.....	57.1
1925.....	71.7	1937.....	54.4
1926.....	73.3	1938.....	51.0
		1939†.....	48.2

* Metropolitan Life Insurance Company and Bureau of the Census.
 † Expanding Birth Registration Area.
 ‡ Bureau of the Census—Monthly Statistical Bulletin, Annual Summary for 1939—Feb. 7, 1940, Vol. 2, No. 13, page 1. Rates for 1939 are provisional.

Infant Mortality in the United States

For the period 1915-1938 the recorded infant mortality rates for the United States declined 48.9 per cent. The 1939 mortality rate is provisional and therefore cannot be used for comparison at this time. This decline is for the expanding Birth Registration Area and is somewhat less than the decline shown in the immediately preceding chart and table for the Original Birth Registration States for the same period. The original registration states showed a 53.1 per cent decline from 1915 to 1937.

Birth registration in states newly admitted to the Birth Registration Area was not always as accurate or complete as in the states that had become accustomed to registration. Therefore the incompleteness of birth registration tended temporarily to show a somewhat higher rate for the entire area. Infant mortality is usually stated as the number of deaths under one year of age per 1,000 live births; a correct mortality rate can be derived only from complete and accurate reports of *all* deaths under one year of age and *all* live births throughout the entire Birth Registration Area.

CHART XXXVI
 INFANT MORTALITY RATES PER 1000 LIVE BIRTHS
 FOR SPECIFIED COUNTRIES, 1920-1936.
 (EXCLUSIVE OF STILLBIRTHS)

SOURCE: VITAL STATISTICS, SPECIAL REPORTS, BUREAU OF THE CENSUS.

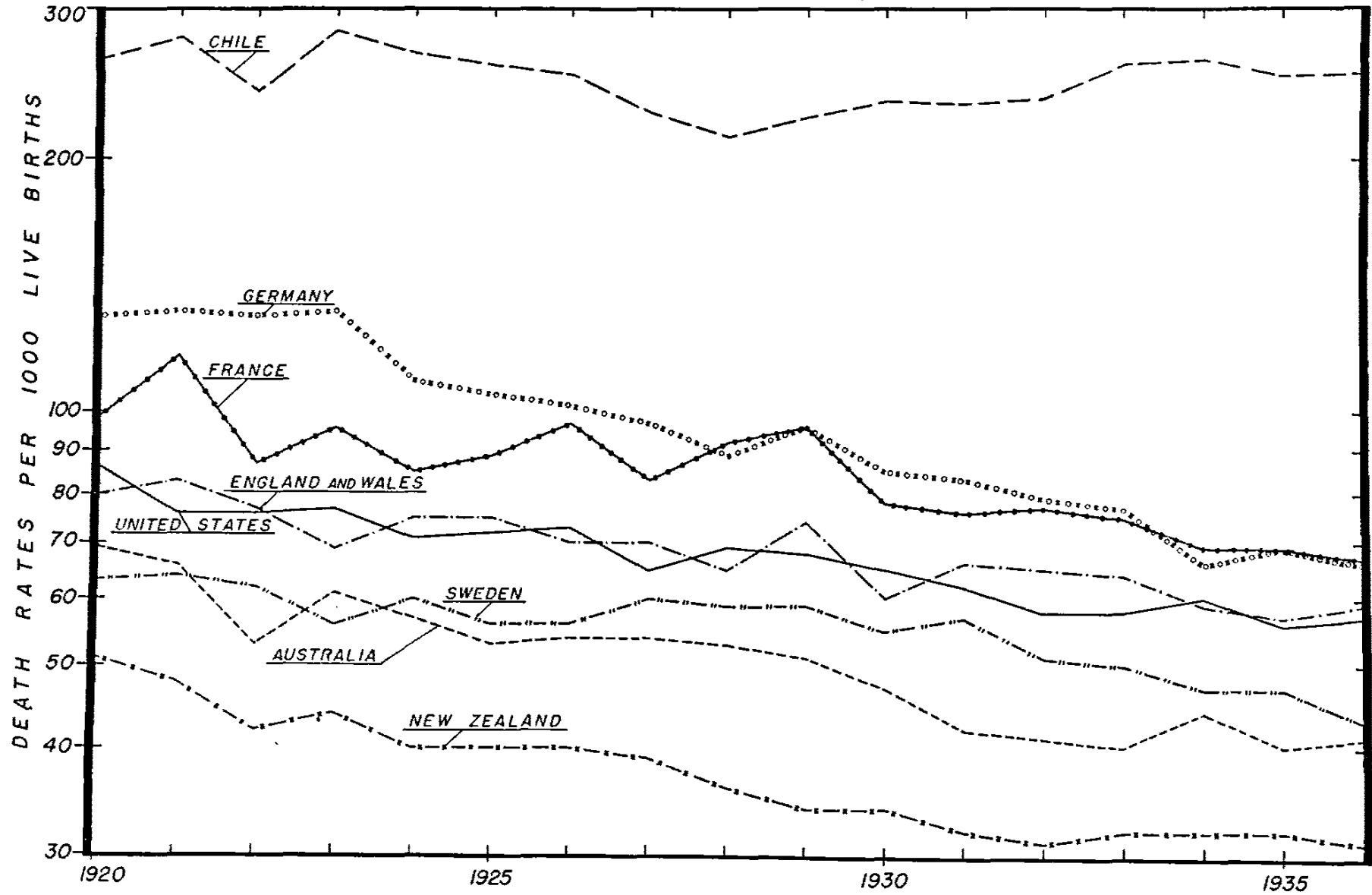


Table 36.—*Infant Mortality Rates per 1,000 Live Births for Specified Countries, 1920-1936**
(Exclusive of Stillbirths)

Year	United States ^a	Chile	England and Wales				Australia	New Zealand ^d
			Germany ^b	France ^c	Sweden	Switzerland		
1920	86	243	130	80	99	63	60	51
1921	76	278	132	83	117	64	61	48
1922	73	240	130	77	87	62	53	42
1923	77	283	132	69	96	56	61	44
1924	71	266	109	75	85	60	57	40
1925	72	258	105	75	89	60	53	40
1926	73	251	102	70	97	60	54	40
1927	65	226	97	70	83	60	54	39
1928	69	212	89	65	92	59	53	36
1929	68	224	90	74	96	59	51	34
1930	65	214	85	60	78	55	47	34
1931	62	232	83	66	70	57	42	32
1932	58	235	79	65	77	51	41	31
1933	58	258	77	64	75	50	40	32
1934	60	262	66	59	69	47	44	32
1935	56	251	69	57	60	47	40	32
1936 ^e	57	252	66	59	67	43	41	31
Decrease since 1920	33.7%	4.2%	49.2%	26.3%	32.3%	31.7%	40.6%	39.2%

* Vital Statistics—Special Reports, Vol. 9, No. 36, pages 345-461, May 2, 1940. Compiled from League of Nations Annual Epidemiological Reports for the years 1935 (p. 67, f.) and 1936 (p. 65, f.).

^a Birth Registration Area which comprised 59.8% of total population in 1920, 64.7% in 1931, and 100% since 1933. (For 1927, 1928 and 1929 rates see table 35, p. 79, of this book.)

^b Present area since 1920, but without the Saar from 1920 to 1934 inclusive.

^c Up to 1913, 87 departments; since 1920, 90 departments.

^d Exclusive of Maoris.

^e Preliminary figures.

Infant Mortality for Specified Countries

Few parts of vital statistics have attracted more attention than the subject of infant mortality. Sir Arthur Newsholme expressed the belief that "infant mortality is the most sensitive index of social welfare and sanitary improvements which we possess." In reality infant mortality is an index of more than the early outlook of the individual for health and life—it is often an accurate measure of adult education, economic status, the disregard or utilization of available modern scientific advances, the manifestation of many traits of human nature and the effect of environment.

Serious difficulties confront the statistician who endeavors to present an accurate account of infant deaths. The first of these difficulties is the uncertainty that all infants born alive have been registered. As communities become more accustomed to birth registration the completeness of registration approaches more nearly 100 per cent but it requires constant alertness on the part of registrars and intelligent cooperation on the part of parents, physicians, hospitals and health departments and registrars to maintain birth registration at the highest possible point.

Many practical problems pertaining to infant mortality should be studied with the aid of statistics. Some of these problems are directly related to density of population, housing, personal and home cleanliness, economic status, health concepts of parents, number in the family, clothing, food, refrigeration and protection against communicable diseases.

The accompanying chart and table show the differences in infant mortality for selected countries for the years 1920 to 1936 inclusive. It would be very difficult to explain all the differences in infant mortality rates shown for these countries since the dissimilar factors of race, government, customs, food supply, appreciation and use of modern medical services and facilities and other important influences make comparisons almost impossible.

It is interesting to note, however, the points at which these rates started in 1920 and the relative rates at which reductions took place during the succeeding sixteen years in the countries shown in the accompanying chart and table.

Table 37.—Expectation of Life by Age and Sex, in Specified Countries *

Country	Period	Male						Female					
		At Birth	At 10 Years	At 20 Years	At 30 Years	At 60 Years	At 80 Years	At Birth	At 10 Years	At 20 Years	At 30 Years	At 60 Years	At 80 Years
Germany.....	1932-1934	59.80	57.28	48.16	39.47	15.11	4.84	62.75	59.01	49.77	40.97	10.00	5.15
Austria.....	1930-1933	54.50	54.10	45.20	36.90	14.20	4.60	58.50	57.00	48.00	39.60	15.40	5.00
Belgium.....	1928-1932	56.02	54.88	46.04	37.78	14.53	4.65	59.79	57.25	48.43	40.17	15.93	5.20
Bulgaria.....	1925-1928	45.92	53.75	45.78	38.45	16.45	7.08	46.04	53.20	45.45	38.97	17.18	7.27
Denmark.....	1931-1935	62.00	59.00	49.80	41.00	16.00	5.20	63.80	59.40	50.00	41.20	16.40	5.40
Estonia.....	1932-1934	53.15	52.02	43.68	35.99	14.36	5.04	59.02	58.08	49.75	41.52	17.44	5.92
Finland.....	1931-1935	53.94	51.41	42.99	35.58	14.35	5.73	58.69	55.65	47.40	39.75	16.22	5.62
France.....	1928-1933	54.30	52.06	43.30	35.42	13.76	4.44	59.02	55.95	47.40	39.54	15.94	5.09
Hungary.....	1930-1931	59.77	50.97	47.63	38.70	13.49	2.85	63.74	59.57	50.31	41.40	15.10	3.61
Ireland.....	1925-1932	57.37	55.20	46.40	38.39	15.75	5.81	57.93	54.92	46.36	38.60	16.36	6.47
Italy.....	1930-1932	53.70	55.46	46.75	38.58	15.16	4.85	50.00	57.15	48.49	40.41	16.13	5.18
Latvia.....	1934-1936	55.39	54.19	45.58	37.47	14.73	5.50	60.93	58.80	50.25	42.10	17.73	6.35
Norway.....	1921-1930	60.98	56.27	47.73	40.39	16.97	5.87	63.84	58.35	49.85	42.14	18.16	6.31
Netherlands.....	1931-1935	65.10	60.10	50.90	41.90	16.30	5.30	66.40	60.50	51.10	42.10	18.70	5.60
Poland.....	1931-1932	48.20	52.20	43.70	36.00	13.70	4.60	51.40	54.00	45.70	38.00	15.10	5.00
England and Wales.....	1930-1932	58.74	55.79	46.81	38.21	14.43	4.74	62.88	58.87	49.88	41.22	16.50	5.46
Scotland.....	1930-1932	56.00	54.90	46.00	37.40	14.10	4.90	59.50	57.20	48.30	39.80	15.90	5.20
Northern Ireland.....	1925-1927	55.42	54.42	45.63	37.40	14.79	5.43	56.11	53.73	45.22	37.42	15.55	6.25
Sweden.....	1931-1935	63.22	58.37	49.44	41.07	16.59	5.37	65.33	59.49	50.56	42.15	17.29	5.62
Switzerland.....	1929-1932	59.25	54.36	45.36	36.97	13.91	4.58	63.05	57.51	48.46	40.01	15.45	4.92
Czechoslovakia.....	1929-1932	51.92	54.04	45.29	37.15	14.35	4.73	55.18	50.10	47.40	39.24	15.35	5.12
U. S. S. R. (Europe).....	1926-1927	41.93	51.65	43.24	35.65	14.85	6.05	46.79	55.72	47.36	39.75	17.07	6.77
R. S. F. S. R.	1926-1927	40.23	50.98	42.48	34.82	14.48	5.87	45.01	55.91	47.48	39.79	17.12	6.75
Ukraine.....	1926-1927	45.42	52.63	44.58	37.25	15.45	6.14	48.63	54.73	46.76	39.34	16.58	6.51
White Russia.....	1926-1927	50.77	54.79	46.22	38.58	16.75	6.93	54.70	57.13	48.61	41.79	18.08	6.61
Egypt.....	1917-1927	.....	38.06	32.92	27.80	13.65	6.05	.....	41.64	35.77	30.04	14.68	6.45
Union of South Africa ¹	1925-1927	57.78	55.17	46.27	37.87	15.31	5.42	61.48	58.33	49.34	40.77	16.76	5.85
Canada.....	1929-1931	59.32	58.23	49.35	40.76	16.53	5.77	61.59	59.03	50.09	41.61	17.32	6.05
United States: White.....	1929-1931	59.12	54.90	46.02	37.54	14.72	5.26	62.67	57.65	48.52	39.99	16.05	5.63
Negro.....	1929-1931	47.55	44.27	35.95	29.45	13.15	5.42	49.51	45.33	37.22	30.67	14.22	6.90
British India.....	1921-1930	26.91	36.38	29.57	23.60	10.25	3.13	20.50	33.61	27.08	22.30	10.81	3.25
Japan.....	1926-1930	44.82	47.93	40.18	33.43	12.23	4.15	46.54	49.18	42.12	35.98	14.69	4.73
U. S. S. R.: Siberia.....	1926-1927	39.18	53.12	44.86	37.29	16.68	7.32	43.20	56.22	47.98	40.50	18.42	7.55
Australia.....	1932-1934	63.48	58.92	48.81	39.90	15.57	5.22	67.14	61.02	51.67	42.77	17.74	6.01
New Zealand.....	1931	65.04	58.75	49.61	40.78	16.22	5.45	67.63	60.07	51.28	42.45	17.30	5.63

* Vital Statistics—Special Reports, Vol. 9, No. 36, pages 345-461, May 2, 1940.
1. European population.

Table 38.—Expectation of Life at Selected Ages for the Total Population of the Original Registration States, 1900-1902, and the Total Population of the United States¹*

Age	Original Registration States, 1900-1902	United States, 1933	Increase	
			Years	Per Cent
0	49.24	61.26	12.02	24.4
1	55.20	63.67	8.47	15.3
2	56.10	63.21	7.11	12.7
3	55.98	62.47	6.49	11.6
4	55.55	61.65	6.10	11.0
5	54.98	60.80	5.82	10.6
10	51.14	56.25	5.14	10.0
15	46.81	51.61	4.80	10.3
20	42.79	47.16	4.37	10.2
25	39.12	42.88	3.76	9.6
30	35.51	38.64	3.13	8.8
35	31.92	34.45	2.53	7.9
40	28.34	30.34	2.00	7.1
45	24.77	26.34	1.57	6.3
50	21.26	22.52	1.26	5.9
55	17.88	18.89	1.01	5.6
60	14.70	15.50	0.74	5.0
65	11.86	12.46	0.60	5.1
70	9.30	9.75	0.45	4.8
75	7.08	7.40	0.41	5.8
80	5.30	5.59	0.29	5.5
85	3.96	4.13	0.17	4.3
90	2.95	3.09	0.14	4.7

* United States Public Health Service, "The Average Length of Life," Reprint No. 1884, December 3, 1937.
 1. Metropolitan Life Insurance Co., Statistical Bulletin, Vol. 17, March 1936.

Table 39.—Hypothetical Life Table Representing the Ultimate Longevity Attainable with Present Knowledge¹*

Age x	Number Attaining Age x Out of 100,000 Born Alive I _x	Mortality Rate 1000 _a *	Per Cent Reduction in Mortality from That Prevailing in 1933	Expectation of Life ² e _x
0	100,000	25.00	53	69.93
1	97,500	3.34	61	70.71
2	97,174	1.97	52	69.05
3	96,983	1.82	38	69.00
4	96,800	1.73	25	68.22
5	96,630	1.50	22	67.34
10	96,144	0.50	53	62.67
15	95,843	0.99	45	57.85
20	95,221	1.61	44	53.21
25	94,560	2.18	39	48.66
30	93,216	2.80	32	44.23
35	91,858	3.69	29	39.83
40	90,438	3.15	50	35.41
45	88,875	4.31	49	30.98
50	86,698	5.80	50	26.63
55	83,670	8.32	48	22.50
60	79,645	13.83	42	18.55
65	73,240	21.05	30	14.94
70	64,508	32.60	28	11.00
75	52,327	50.65	27	8.60
80	39,301	91.15	22	6.38
85	19,914	152.56	12	4.00
90	7,540	212.90	14	3.44

* United States Public Health Service, "The Average Length of Life," Reprint No. 1884, December 3, 1937.

1. From Length of Life (p. 194), Dublin & Lotka.
 2. The expectation of life given in this column is based on the assumed mortality rates in column 2.

Table 40.—Expectation of Life in Years, at Birth, White Persons*

	Male	Female
Massachusetts:		
1850.....	38.3	40.5
1890.....	42.5	44.5
Original Registration States:		
1900-1902.....	48.2	51.1
1909-1911.....	50.2	53.0
1919-1920.....	54.1	56.4
1930.....	59.1	62.0
United States:		
1932.....	60.8	64.4
1935.....	60.7	64.7
1936.....	60.2	64.4
1937.....	60.8	65.1
1938†.....	62.0 total persons	

* United States Public Health Service, April 8, 1940.
 † Estimated.

Expectation of Life in Specified Countries

The expectation of life at birth and at different age intervals is of considerable interest in a comparison of countries, races, standards of living, the level of industrial progress, advancements in the application of medical knowledge, and the changes in mortality rates.

It will be noted that in the United States there has been an increase of 12.02 years or 24.4 per cent in the

expectation of life at birth over the past 30 years. If the life expectancy at birth in Massachusetts is used for comparison, the increase between 1850 and 1937 is 22.5 years for males and 24.6 years for females. It is necessary, however, to use such a comparison with a full understanding that only one state, and that in 1850, is being compared with the entire United States.

CHART XXXVII

GERMAN SICKNESS INSURANCE, 1885 TO 1933
NET REVENUE AND EXPENDITURES PER MEMBER

SOURCE: DIE DEUTSCHE KRANKENVERSICHERUNG 1885-1933,
DEUTSCHES ARZTEBLATT, VOL. 65, NO 18, MAY 4, 1935

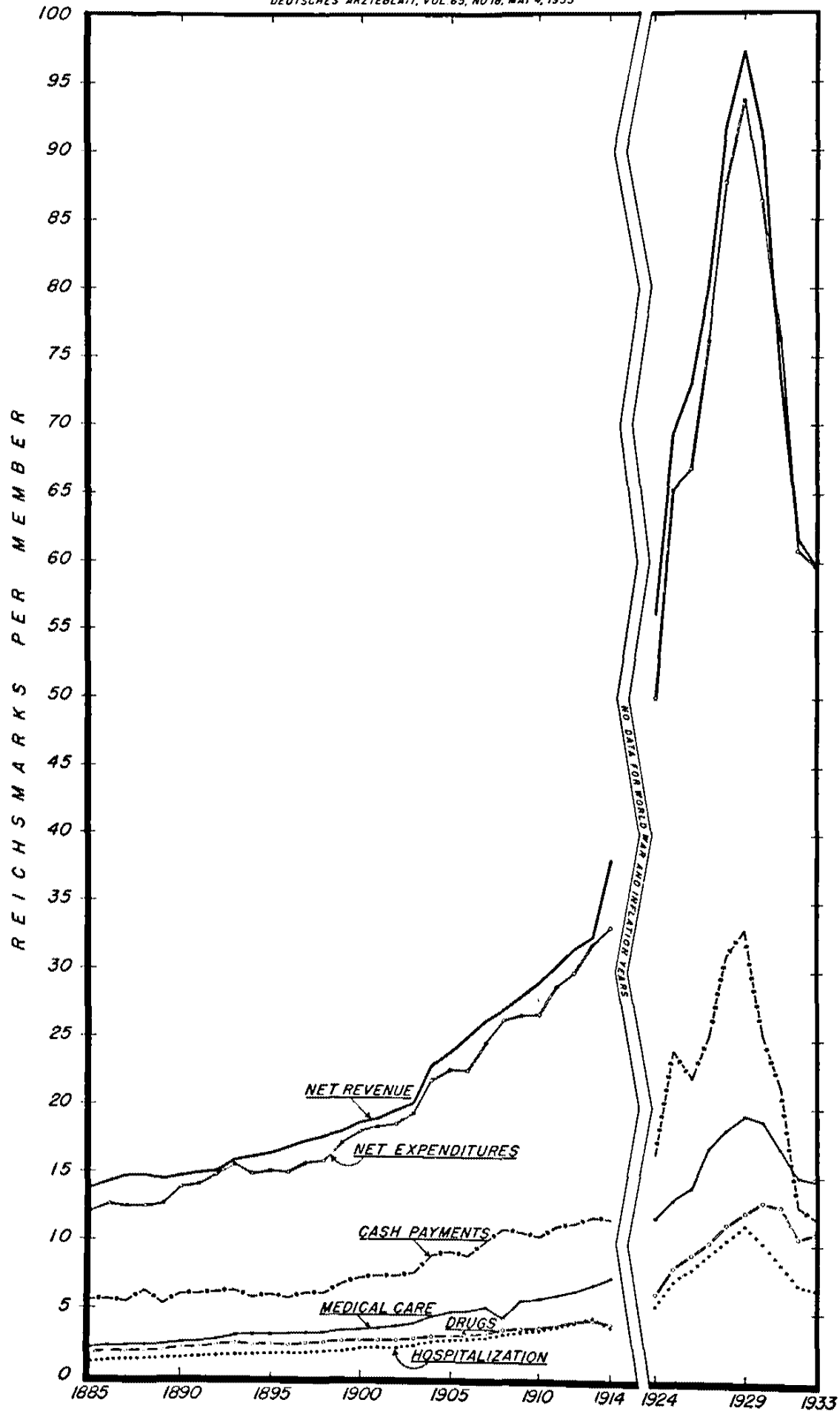


Table 41.—Revenue and Expenditures per Member in German Sickness Insurance
1885—1933
(Amounts corrected to the present value of the Reichsmark)

Year	Net Revenue		Net Expenditures		Cash Payments		Medical Care		Drugs		Hospitalization	
	Total	Per Member	Total	Per Member	Total	Per Member	Total	Per Member	Total	Per Member	Total	Per Member
1885	59,123,754	13.77	52,220,926	12.16	23,958,923	5.58	9,000,945	2.11	7,072,016	1.65	4,400,735	1.04
1886	68,327,105	14.29	57,833,328	12.65	26,064,579	5.70	10,337,524	2.23	8,128,401	1.78	5,339,619	1.17
1887	70,809,363	14.62	60,425,358	12.48	26,570,892	5.49	11,023,119	2.28	8,591,129	1.77	5,702,500	1.20
1888	79,304,810	14.69	67,729,090	12.55	29,002,700	6.37	12,523,435	2.32	9,046,684	1.84	6,050,468	1.23
1889	89,123,354	14.51	77,580,763	12.63	32,860,436	5.35	14,011,608	2.38	11,775,335	1.92	7,021,413	1.29
1890	96,852,742	14.72	91,316,570	13.88	39,883,695	6.06	16,783,473	2.55	14,187,242	2.16	8,801,800	1.35
1891	102,636,700	14.92	96,954,297	14.00	41,859,446	6.08	17,859,712	2.60	14,894,070	2.16	10,051,782	1.46
1892	105,419,745	15.16	102,502,615	14.74	43,956,335	6.22	19,068,892	2.74	16,039,356	2.31	10,425,049	1.50
1893	112,727,967	15.86	110,894,001	15.60	45,775,471	6.44	21,433,859	3.01	17,033,412	2.49	11,568,006	1.63
1894	118,286,828	16.24	108,306,555	14.87	42,599,461	5.85	22,299,891	3.05	17,426,008	2.39	11,898,843	1.63
1895	124,787,989	16.58	113,900,908	15.14	45,856,229	6.03	23,141,102	3.07	18,134,398	2.41	12,004,169	1.67
1896	134,685,534	16.90	119,228,063	15.01	46,462,665	5.85	24,813,242	3.12	18,999,497	2.38	12,675,037	1.71
1897	144,597,717	17.34	130,711,992	15.68	51,730,939	6.20	26,014,241	3.23	20,699,812	2.48	14,804,827	1.78
1898	154,669,821	17.64	139,444,690	15.90	54,390,489	6.20	29,107,843	3.32	22,011,200	2.51	15,822,301	1.81
1899	165,245,151	18.06	157,953,979	17.25	63,558,360	6.94	31,918,163	3.49	24,562,651	2.68	17,883,762	1.95
1900	177,766,351	18.67	171,584,173	18.02	69,955,542	7.35	34,331,368	3.60	25,905,030	2.73	19,007,832	2.06
1901	183,685,628	19.05	178,039,195	18.47	72,052,960	7.57	35,636,010	3.70	26,194,089	2.72	20,041,164	2.14
1902	193,417,667	19.62	183,328,868	18.60	74,383,662	7.55	37,499,311	3.80	26,578,004	2.70	21,342,085	2.17
1903	206,730,399	20.22	199,896,723	19.55	79,113,677	7.74	40,765,690	3.90	28,005,813	2.83	23,626,831	2.31
1904	246,005,055	22.97	234,084,806	21.80	95,783,051	8.94	47,914,471	4.47	32,139,318	3.00	27,004,385	2.69
1905	266,912,173	23.86	253,835,378	22.70	102,816,975	9.19	53,113,137	4.75	34,634,237	3.10	30,585,404	2.73
1906	283,305,180	25.09	264,236,036	22.00	104,050,513	8.90	57,293,689	4.90	36,021,712	3.08	32,670,074	2.79
1907	319,592,187	26.33	299,004,756	24.04	121,416,115	10.00	63,225,782	5.22	40,157,749	3.31	36,167,035	2.94
1908	333,291,351	27.04	325,054,492	26.38	133,542,355	10.84	67,692,047	4.49	43,351,020	3.62	39,147,308	3.18
1909	351,105,331	28.04	334,563,748	26.72	134,486,435	10.74	71,335,248	5.70	44,470,182	3.65	41,700,617	3.33
1910	370,284,406	29.02	350,545,175	26.82	135,052,829	10.40	76,440,495	5.85	48,216,290	3.89	45,270,027	3.46
1911	412,290,611	30.27	392,624,744	28.82	153,582,976	11.28	83,754,224	6.15	53,171,234	4.00	51,357,861	3.77
1912	417,608,075	31.59	395,036,896	29.89	150,399,441	11.38	85,633,295	6.48	54,706,040	4.14	53,553,500	4.06
1913	440,789,418	32.49	432,773,430	31.60	161,541,356	11.21	93,941,390	6.92	60,317,653	4.45	58,933,621	4.34
1914	595,369,246	38.14	562,492,926	32.19	183,600,000	11.76	116,873,974	7.49	68,505,187	3.75	62,005,154	4.08
1924	971,192,000	56.18	864,674,000	50.05	286,660,000	16.59	205,729,000	11.90	92,330,000	5.34	100,000,000	6.32
1925	1,264,382,000	69.34	1,189,964,000	65.26	439,800,000	24.12	241,409,000	13.24	133,538,000	7.32	160,200,000	8.24
1926	1,342,549,000	72.97	1,230,023,000	66.84	406,800,000	22.21	258,135,000	14.03	149,238,000	8.11	169,000,000	9.21
1927	1,554,028,000	81.07	1,459,772,000	76.15	486,500,000	25.38	329,047,000	17.06	177,012,000	9.33	193,200,000	10.09
1928	1,823,731,000	91.74	1,743,230,000	87.69	620,500,000	31.21	366,973,000	18.40	205,093,000	10.32	221,600,000	11.44
1929	1,961,758,000	97.24	1,888,961,000	93.64	668,700,000	33.15	392,527,000	19.40	230,083,000	11.41	249,700,000	12.39
1930	1,788,893,000	91.28	1,691,047,000	86.29	497,700,000	25.40	375,085,000	19.14	199,691,000	10.19	257,000,000	13.11
1931	1,340,312,744	73.34	1,394,976,000	76.33	357,400,000	19.54	312,308,000	17.09	156,450,000	8.56	234,000,000	12.44
1932	1,015,420,000	61.73	1,000,560,000	60.82	210,000,000	12.82	240,732,000	15.00	117,048,000	7.15	172,000,000	10.51
1933	975,381,000	59.91	971,714,000	59.89	195,300,000	12.00	240,125,000	14.75	109,223,000	6.71	177,800,000	10.89
	*20,478,331,450		*19,438,444,420		*6,524,947,313		*4,222,315,577		*3,383,740,974		*2,664,113,119	

German Sickness Insurance 1885-1933, by Dr. Hadrich, Deutsches Aerzteblatt 65: 430-439 (May 4) 1935.

* There appear to be some omissions from these columns, which result in totals that are less than the totals given.

German Sickness Insurance—Revenue and Expenditures

The above table and the chart on the opposite page show the revenue and expenditures, including cash payments, medical care, drugs, and hospitalization, under the German Sickness Insurance from 1885 to 1933. The data for this review of German Sickness Insurance are taken from official sources as reported by Dr. Hadrich in an article in the *Deutsches Aerzteblatt* for May, 1935.

During this period the revenue collected from each member increased from a low of 13.77 to a high of 97.24 reichsmarks. In this same period the expenditure per member increased from a low of 12.16 to a high of 93.64 reichsmarks.

Concerning these developments in German Sickness Insurance, Dr. Hadrich states that, "The causes for this increase in expenditures are found in the liberalization of benefits for hospitalization of dependents and for confinement help, in an increase in the number of benefit cases, and in the higher cost for each benefit. An explanation of the increase from year to year in the morbidity of the insured population can be found in the increased industrialization and urbanization, the entrance of women into industrial employment, and the psychological effect on the insured members."

Dr. Hadrich also suggests that the decline in income and expenditures since 1929 is due largely to adminis-

trative regulations and changes in employment. For example, costs for drugs reached a high point of 11.41 reichsmarks per person in 1929 but dropped to 6.71 reichsmarks per person because of regulations requiring a small payment (25 reichspfennig) from the member for prescriptions. While these regulations were instituted in 1924 they were extended in 1930 and 1933. Dr. Hadrich also points out that the rapidly increasing costs for hospitalization will become more and more the responsibility of the physician to avoid unnecessary demands. The fluctuations in cash benefits and in other benefits are also traceable in part to employment conditions.

Complete data concerning administrative costs under German Sickness Insurance are not available because of the numerous agencies involved. The administrative costs for only the sickness insurance funds under federal regulations (Reichsversicherungsordnung Krankenkassen) amounted to 6.12 reichsmarks (approximately \$1.50) per member in 1933, or a total of about 100,000,000 reichsmarks (approximately \$25,000,000).

Including dependents and members of all sickness insurance funds, about two-thirds of the German people are included under sickness insurance.

CHART XXXVIII

DURATION OF ILLNESS WITH INCAPACITY
FOR WORK—GERMAN SICKNESS INSURANCE
1885-1934

SOURCE: GOLDMAN AND GROTJAHN, 1928; DEUTSCHES ARZTEBLATT, 1933;
GERMAN FOREIGN LETTER, NOVEMBER 23, 1926, JAMA JANUARY 16, 1937

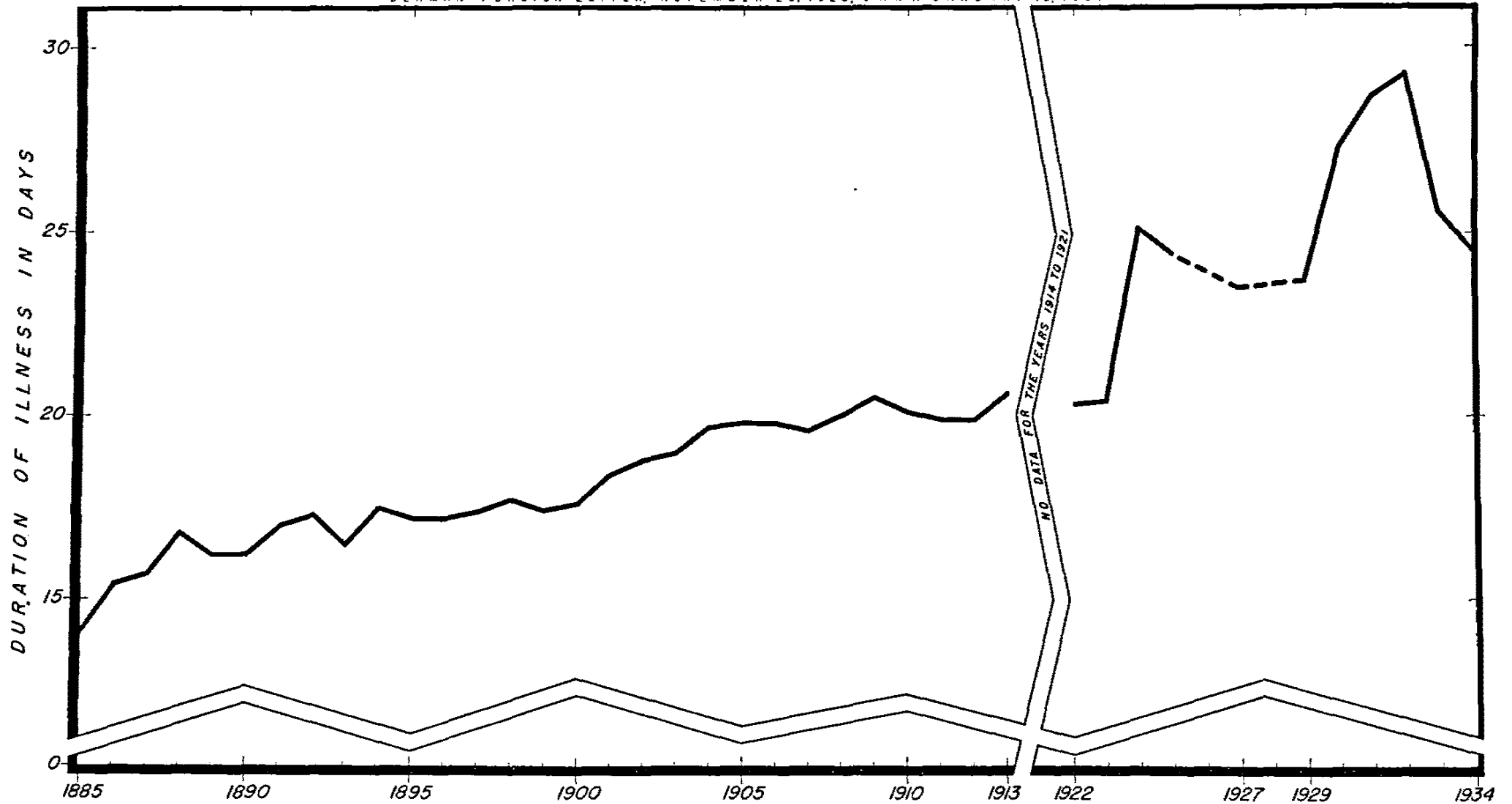


Table 42.—Duration of Illness with Incapacity for Work
German Sickness Insurance 1885-1934

Year*	Duration of Illness in Days	Year*	Duration of Illness in Days
1885.....	14.1	1900.....	19.8
1886.....	15.4	1905.....	19.0
1887.....	15.6	1908.....	20.0
1888.....	16.8	1909.....	20.5
1889.....	16.2	1910.....	20.1
1890.....	16.2	1911.....	19.9
1891.....	17.0	1912.....	19.9
1892.....	17.3	1913.....	20.6
1893.....	16.5	No figures for 1914-1921	
1894.....	17.5	1922.....	20.3
1895.....	17.2	1923.....	20.4
1896.....	17.2	1924.....	25.1
1897.....	17.4	1925.....	24.4
1898.....	17.7	1927.....	23.5
1899.....	17.4	1929.....	23.7
1900.....	17.6	1930.....	27.3
1901.....	18.4	1931.....	28.7
1902.....	18.8	1932.....	29.3
1903.....	19.0	1933.....	25.6
1904.....	19.7	1934.....	24.6
1905.....	19.8		

* 1885-1925: Benefits of German Sickness Insurance, Goldman and Grot-jahn, 1928, p. 61.

1927-1931: Deutsches Arzteblatt, 63: 81-83, July 15, 1933.

1932-1934: Berlin Foreign Letter, Nov. 23, 1926, J. A. M. A. 108: 218 (Jan. 16) 1937.

Duration of Incapacitating Illness—German Sickness Insurance

Advocates of sickness insurance claim that it ensures early diagnosis and continuous treatment and therefore shortens the average period of illness. The experience of fifty years with German sickness insurance, as presented in the accompanying table and chart, seems to prove the exact reverse to be true.

The number of days between the onset of illness and the date of recovery, among German insurance patients, has increased almost continuously from 1885 to 1934, until today the period is almost twice as great as it was when the insurance system was established. Yet, during this time Germany has had the opportunity to share in the general improvement made possible through public health measures and in the world-wide advance in the science and art of medicine. None of the numerous explanations offered for this phenomenon of increasing duration of illness, which has greatly troubled German observers, has been of much comfort to the advocates of insurance.

Some have said that the increase was due to malingering or neuroses caused by the desire to extend the period during which cash benefits were paid. Certainly a sys-

tem which makes a large percentage of its population dishonest or neurotic is not desirable because of such effects. Many German physicians have charged that delay in recovery is due to the superficial and therefore inaccurate diagnosis and inadequate or inappropriate treatment which are compelled by insurance regulations.

This phenomenon is not peculiar to the German system. There has been a similar increase under the British health insurance system, and similar explanations or excuses have been offered. These figures might well be studied by those who urge the adoption of sickness insurance in the United States as a means of reducing the duration of illnesses in the general population.

It is difficult, if not quite impossible, to make detailed comparisons of all the features of medical services and the benefits which result from dissimilar methods of administration in different countries. However, the rate at which general health improves or certain mortality rates decline and the rate of increase or decrease of the average duration of illness appear to be significant indexes of the efficiency of the different systems.

Table 43.—Principal Provisions of National Sickness Insurance Systems *

Date of Enactment of Law	Qualifications For		Population	Number Insured and Beneficiaries						Physicians		
				Number Insured				Total Beneficiaries Including Families		Total In Country	Engaged in Insurance	
				Compulsory		Voluntary					Number	Per Cent
				Number	Per Cent	Number	Per Cent	Number	Per Cent			
BELGIUM 1844; 1851; 1884; 1894; 1931	Compulsory for sea- men. Subsidized benefit schemes for employees of rail- way, telegraph, and telephone companies	Open to all persons	8,331,000	163,400	1.24	1,289,000	15.5	3,000,000	36.0	5,500	.....	.....
BULGARIA 1918; 1924; 1929; 1931; 1937	All wage-earning and salaried employees	Former compulsorily insured; public offi- cials; independent handicraft workers, merchants, farmers, members of liberal professions (limit, \$400)	6,319,000	251,000	4.0	2,000 to 3,000	0.04	Does not include family	....	2,300	1,100	47.8
CZECHOSLOVAKIA† 1888; 1907; 1919; 1920; 1924	All wage-workers; all salaried employees engaged in pri- vate undertak- ings; miners; postal, telegraph, and tele- phone employees; em- ployees and officials of state railway department	.....	15,239,000	2,700,000	17.7	50,000	0.37	10,000,000	65.6	8,000	6,400	80.0
DENMARK† 1892; 1915; 1921-27; 1933	Compulsory, \$600 to \$900	.....	3,749,000	2,309,000	61.6	111,000	3.0	.....	....	2,600	Great majority	
ESTHONIA 1912; 1917; 1920; 1923	All industrial workers; subsidized benefit scheme for state and public service employees	.....	1,131,000	60,000	5.3	.....	....	90,000	8.0	893	.....	....
FRANCE 1894; 1928; 1930; 1931; 1935	All industrial and commercial workers, domestic servants, and agricultural workers (income limit, 30,000 fr.)	.....	41,950,000	8,700,000	20.7	144,000	0.34	.....	....	27,000	18,000	66.7
GERMANY 1883; 1885; 1886; 1892; 1911; 1914; 1923; revised repeatedly by decrees under Nazis	All employed persons earning less than 2,700 M. (1931) annually; apprentices	Former compulsorily insured; small em- ployers 2,700 M. maximum; families of insured	68,072,000	19,800,000	29.1	8,000,000	11.8	45,000,000	66.1	50,000	30,000	60.0
GREAT BRITAIN 1911; 1924; 1929; 1929; 1932	All manual workers; all nonmanual work- ers receiving less than £250	Former compulsorily insured; nonmanual workers earning more than £250	47,288,000	18,520,000	39.2	650,000	1.37	.....	....	36,000	19,000	52.8
HOLLAND 1918; 1929; 1930; 1935	All wage workers whose annual wage does not exceed 3,000 Fl.	Former compulsorily insured. Persons of small means	8,651,000	1,227,500	14.2	1,160,000	13.4	Does not include family	....	4,450	3,700	83.1
HUNGARY 1891; 1907; 1927; 1931- 33; 1935	All persons employed in industry and com- merce, and domestic servants. (Excludes nonmanual workers earning more than 3,600 pengo a year)	.....	9,035,000	672,627	7.4	.....	....	.....	....	.....	.....	....
LATVIA 1912; 1922; 1930; 1938	All employed persons receiving a remuneration	.....	1,971,000	145,000	7.4	.....	....	240,000	12.2	1,062	600	56.5
LUXEMBURG 1901; 1925; 1933	All employed persons, and apprentices. (Ex- cludes private salaried employees earning more than 10,000 fr. ann.; public officials and salaried employees; members of liberal professions, etc.)	Any person over 18 years of age may join a mutual aid society	299,000	47,000	15.7	18,000	6.3	110,000	36.7	180	165	91.6
NORWAY† 1909; 1911; 1915; 1930; 1932-37	All workers earning less than 6,000 Kr.; domestic servants; apprentices	Any person between ages 15 and 70. (Max. income limit of man and wife, 6,000 Kr.); persons 15 to 23 years not in paid employ- ment	2,008,000	755,000	26.0	141,000	4.8	1,500,000	51.5	1,800	Nearly all	
PALESTINE	No compulsory insur- ance	All members of labor organizations	1,060,000	.....	....	75,000	4.5	140,000	8.4	600	70	11.7
POLAND† 1883; 1885; 1886; 1888- 89; 1920; 1933; 1934	All paid employees (excludes agricultural workers and wageworkers earning more than 725 zloty monthly); domestic servants; and home workers	.....	34,534,000	2,000,000	5.8	.....	....	6,000,000	17.4	7,500	2,700	36.0
SWEDEN 1910; 1931	.....	Open to all persons aged 15 to 40 years, with a taxable income of less than 8,000 kr. annually. (Voluntary, partially state-subsid- ized sickness insur- ance system)	6,235,000	.....	....	1,272,000	20.2	3,628,000	57.7	2,300	Nearly all	
SWITZERLAND 1911	Not compulsory ex- cept in certain cantons	Open to all persons. Voluntary unless ruled compulsory by the au- thorities of a canton	4,183,000	.....	....	1,541,896†	44.0†	.....	....	3,350	2,700	80.6
YUGOSLAVIA 1888; 1907; 1909; 1922	All paid workers (ex- cept agricultural workers and domestic servants)	.....	15,400,000	670,000	4.4	.....	....	1,900,000	12.3	3,700	1,300	35.1

* Compiled from replies to questionnaires by International Medical Association, publications of the International Labour Office, governmental reports, and other material from the various nations; corrected from all available information to March 1939. No attempt has been made to indicate all the modifications that have been made in these systems.

† Before 1938.

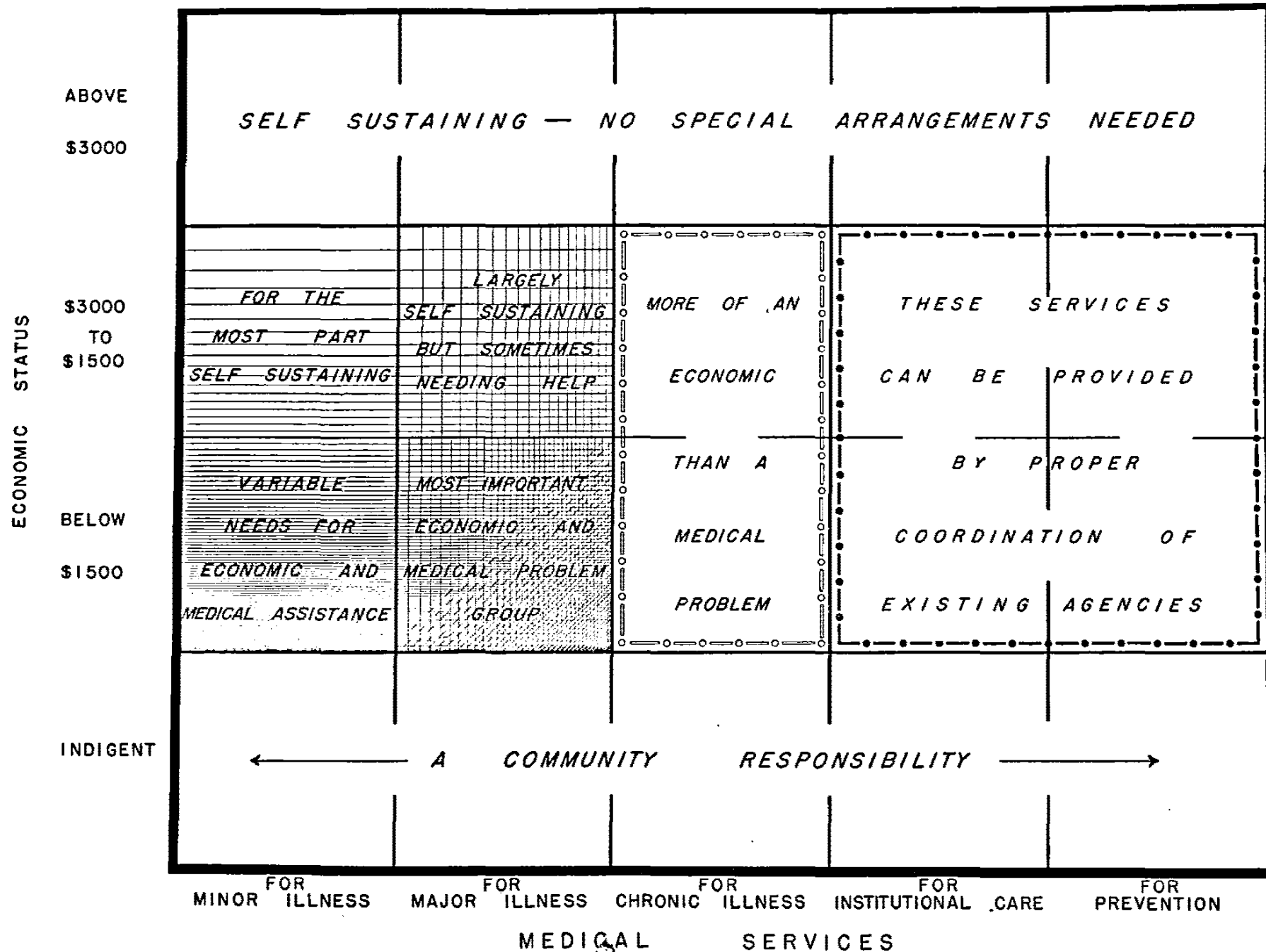
‡ Statistics include total number of insured, no distinction being made between cantons in which sickness insurance is compulsory and those in which it is voluntary.

Principal Provisions of National Sickness Insurance Systems

While all available sources have been used to insure accuracy, the alterations in sickness insurance systems are so frequent that it is almost impossible to keep abreast with them. Many of the systems that have been introduced in the smaller nations since the World War have been so heavily handicapped by economic conditions that it is probable that many of the provisions in the laws have never actually gone into effect. In nearly all systems the actual carriers of insurance are private or mutual organizations. In many countries these organizations are actively engaged in politics. In Germany they have been transformed into instruments of the National Socialist government.

In no system is there any actual provision for the indigent, but the income limit is so low that the majority of the insured would, in the United States, be looked upon as "medically indigent." The benefits of sickness insurance, in most countries, are supplements to the wage earner's actual money income; the wage earner's actual income plus the value of the medical services would be considered less than a living wage in the United States. In no system is there any provision for preventive services in any way comparable in extent to the preventive services provided by health departments and the medical profession in most sections of the United States.

CHART XXXIX
 MEDICAL SERVICES AND ECONOMIC STATUS



Medical Services and Economic Status

The diagram on the opposite page is designed to show, in general, the relation between medical problems and economic status. The income limits used are illustrative only and should be raised or lowered somewhat according to the cost of living in the community under consideration, the number in the family and other economic and social factors.

The diagram indicates the type of medical needs and the economic status which, combined, are responsible for individual or family medical problems. The diagram also suggests the organization of medical services that might be required by different economic conditions, and the limits within which any changes in present conditions might be considered desirable.

Tobacco Stalks, Hemp Hurds, and Sorghum
and Bagasse as Sources of Cellulose for
Making High-Quality Paper

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