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## THE PREVALENCE OF INFLUENZA

*United States.*—Reports from State health officers for the week ended March 7, 1931, showed a decrease in the prevalence of influenza in the United States generally. For that week 7,811 cases of influenza were reported, as compared with 10,950 cases for the preceding week. (See pp. 663 and 664.)

All of the groups of States except the West South Central, Mountain, and Pacific reported decreased prevalence of influenza for the week ended March 7, 1931.

*Europe.*—During the week ended February 21, 1931, 509 deaths from influenza were registered in 107 great towns of England and Wales, as compared with 456 influenza deaths for the preceding week and 84 for the corresponding week of last year. In London about half of the persons who died from influenza were over 60 years of age. In Liverpool the epidemic appears to be about over.

For the week ended February 21, influenza was reported in all the military stations in Northern Ireland.

In the 16 principal towns of Scotland 29 influenza deaths were reported for the week ended February 21, 1931. During the preceding week there were 11 influenza deaths in these towns. The general death rate in the 16 towns was below the average for the corresponding weeks of the last five years.

Reports from Switzerland indicated that the epidemic was nearing its end.

In three large cities of the Netherlands (population 1,700,000) 23 deaths from influenza and the same number from pneumonia were registered for the week ended February 14, 1931.

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## CURRENT PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES<sup>1</sup>

February 1-28, 1931

The prevalence of certain important communicable diseases, as indicated by weekly telegraphic reports from State health departments to the Public Health Service, is summarized below. The

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<sup>1</sup> From the Office of Statistical Investigations, U. S. Public Health Service. The numbers of States included for various diseases are as follows: Typhoid fever, 46; poliomyelitis, 47; meningococcus meningitis, 47; smallpox, 47; measles, 44; diphtheria, 46; scarlet fever, 46; influenza, 38.

underlying statistical data are published weekly in the PUBLIC HEALTH REPORTS under the section entitled "Prevalence of Disease."

*Influenza.*—For the United States as a whole, the influenza wave appears to have been on a decline since the week ended February 14, but in specific regions the pictures are divergent in several respects.

TABLE 1.—Number of influenza cases reported in different geographic sections during recent weeks of the winter of 1930-31 and during the corresponding weeks of the winter of 1929-30

| Region                 | Week ended—  |               |               |               |              |               |               |               |               |              |               |               |               |              |
|------------------------|--------------|---------------|---------------|---------------|--------------|---------------|---------------|---------------|---------------|--------------|---------------|---------------|---------------|--------------|
|                        | Dec. 6, 1930 | Dec. 13, 1930 | Dec. 20, 1930 | Dec. 27, 1930 | Jan. 3, 1931 | Jan. 10, 1931 | Jan. 17, 1931 | Jan. 24, 1931 | Jan. 31, 1931 | Feb. 7, 1931 | Feb. 14, 1931 | Feb. 21, 1931 | Feb. 28, 1931 | Mar. 7, 1931 |
| N. E. and Mid. Atl.:   |              |               |               |               |              |               |               |               |               |              |               |               |               |              |
| 1930-31                | 27           | 40            | 51            | 62            | 102          | 540           | 1,390         | 2,156         | 2,153         | 1,243        | 1,127         | 649           | 475           | 273          |
| 1929-30                | 59           | 68            | 120           | 54            | 87           | 104           | 71            | 87            | 93            | 86           | 101           | 100           | 94            | 105          |
| E. N. Central:         |              |               |               |               |              |               |               |               |               |              |               |               |               |              |
| 1930-31                | 52           | 76            | 49            | 62            | 59           | 89            | 118           | 354           | 670           | 558          | 1,045         | 784           | 1,581         | 662          |
| 1929-30                | 60           | 91            | 78            | 104           | 90           | 163           | 190           | 151           | 111           | 91           | 153           | 82            | 131           | 90           |
| W. N. Central:         |              |               |               |               |              |               |               |               |               |              |               |               |               |              |
| 1930-31                | 8            | 9             | 13            | 9             | 31           | 27            | 24            | 122           | 119           | 101          | 201           | 324           | 476           | 137          |
| 1929-30                | 16           | 20            | 16            | 20            | 26           | 61            | 80            | 61            | 83            | 41           | 70            | 24            | 22            | 38           |
| S. Atlantic:           |              |               |               |               |              |               |               |               |               |              |               |               |               |              |
| 1930-31                | 760          | 769           | 633           | 661           | 868          | 1,184         | 1,408         | 3,682         | 6,697         | 6,071        | 7,122         | 6,841         | 5,624         | 4,324        |
| 1929-30                | 1,127        | 1,144         | 786           | 1,093         | 1,466        | 1,366         | 1,239         | 1,269         | 1,232         | 1,466        | 1,365         | 1,145         | 1,204         | 1,325        |
| E. and W. S. Central:  |              |               |               |               |              |               |               |               |               |              |               |               |               |              |
| 1930-31                | 214          | 239           | 322           | 189           | 265          | 626           | 679           | 831           | 1,087         | 1,184        | 1,419         | 1,460         | 1,290         | 1,319        |
| 1929-30                | 429          | 541           | 470           | 415           | 724          | 757           | 561           | 886           | 977           | 1,127        | 755           | 838           | 596           | 561          |
| Mount. and Pac.:       |              |               |               |               |              |               |               |               |               |              |               |               |               |              |
| 1930-31                | 111          | 86            | 121           | 106           | 85           | 157           | 129           | 173           | 261           | 294          | 464           | 568           | 642           | 812          |
| 1929-30                | 109          | 125           | 96            | 78            | 139          | 162           | 199           | 185           | 189           | 169          | 195           | 134           | 137           | 168          |
| Total (all regions): * |              |               |               |               |              |               |               |               |               |              |               |               |               |              |
| 1930-31                | 1,172        | 1,219         | 1,189         | 1,080         | 1,520        | 2,623         | 3,748         | 7,318         | 10,996        | 9,451        | 11,378        | 10,631        | 10,088        | 7,527        |
| 1929-30                | 1,800        | 1,989         | 1,566         | 1,764         | 2,532        | 2,613         | 2,340         | 2,639         | 2,685         | 2,980        | 2,639         | 2,323         | 2,274         | 2,287        |

\* 38 States and the District of Columbia included.

From Table 1 it is evident that the epidemic movement has, in general, been from east to west. It reached its crest in the North Atlantic region during the week ended January 24, in the South Atlantic about two weeks later, and in the Central groups toward the last week of February. It is not yet possible to state whether the latest data from the far West (week ended March 7) represent the peak incidence for that region.

*Poliomyelitis.*—The reported incidence of poliomyelitis showed a sharp decline from 194 cases during the preceding 4-week period to 96 cases during the current period. There were 79 reported cases during the corresponding period of last year. In other words, the current incidence is 1.21 times that of last year. During the preceding period this ratio stood at 2.52. All sections participated in the decline.

*Diphtheria.*—The incidence of diphtheria continued at a very satisfactory level, the reported cases numbered 4,542, i.e., about 80 per cent of the cases recorded for the corresponding period of last year. All regions participated in the low record except the West North

Central and East and West South Central groups. Even in those groups only slight increases occurred.

*Meningococcus meningitis*.—There was a further recession from the high level of the last two years. There were reported during the current period 588 cases, or 58 per cent of the cases of the corresponding period of last year. Last month this ratio stood at 63 per cent. A decline in this index occurred in all regions except the North Atlantic sections, where an increase occurred.

*Typhoid fever*.—The number of reported cases of typhoid fever (580) has undergone a decline from that of the preceding 4-week period (623), which was somewhat greater than would be expected on seasonal grounds alone. Last year 650 cases were reported for the period. There has, therefore, been a slight decline from the higher levels of last year.

*Smallpox*.—The incidence of smallpox during the current period (4,137 cases) was about 62 per cent of last year's figure and slightly in excess of the 1929 incidence for the corresponding period. The few exceptions to the lowered incidence have been in some of the Central States, especially Kansas, Oklahoma, and Texas.

*Scarlet fever*.—The reported incidence (23,563 cases) continues to be about 13 per cent in excess of last year. The current figure is even more (about 25 per cent) in excess of the 1929 incidence. This rising tendency is characteristic of all regions except the far West.

*Measles*.—The number of cases of measles reported was 47,590, an increase of approximately 18,000 over the preceding 4-week period. All the regions contributed to the increase except the West North Central. In that group a decrease of 800 cases was shown. In general, the incidence during the current period was about 27 per cent in excess of the corresponding period in 1930 and 45 per cent above that of 1929.

*Mortality, all causes*.—The mortality from all causes in cities reporting to the Bureau of the Census averaged 14.2 per thousand population (annual basis) for the current period, as compared with 13.7 last year and 15.6 in 1929.

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## THE FUNDAMENTALS OF PUBLIC HEALTH LAW<sup>1</sup>

By JAMES E. BAUMAN, Assistant Director of Health, Ohio State Department of Health, Member of the Columbus (Ohio) Bar

In the complexities of modern life we are likely to forget or overlook the fundamentals which form the basis of administrative practice and procedure. This is as true, but not more so, in public health work as in other kinds of public service. However, in the field in

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<sup>1</sup> Read before the 10th Annual Public Health Conference at Lansing, Mich., Jan. 8, 1931.

which I am most interested, public health law, the task is not as difficult as in other and newer branches of public health work, because there are definite principles and precedents to follow. These principles of law may be readily applied to the new developments as other phases of work are added to the curriculum of the public-health official.

The effort to promote and preserve public health by the pronouncement of edicts by or under authority of sovereign power is of ancient origin. "The ten commands of God respecting moral and civil obligations, written on tablets of stone and given by Moses to the children of Israel, are not older in time than that code of sanitary regulations for the preservation of the health and safety of the people, minute and particular in every detail, wherein God, through Moses, commanded his people to observe frequent purifications and cleansings; to isolate those suffering from communicable diseases; to disinfect houses where the plague had prevailed; to destroy infected articles; to avoid the use of unwholesome foods; and to protect the roofs of their houses by battlements, 'that thou bring not blood upon thine house if any man fall from thence.'" (Public Health and Safety, by Parker and Worthington. Albany, N. Y., 1892, Matthew Bender. P. 37.)

The necessity for sanitary regulations was recognized as soon as people came together in community life; and history tells us of disastrous consequences brought about because of neglect in the observance of such simple procedures as were laid down for the guidance of the Israelites. Where this necessity was recognized and sanitary regulations for the preservation of the public health were enacted and enforced, we find the greatest freedom from pestilential diseases and the greatest advances in civilization. Such knowledge as was had by the ancients would not have been sufficient at any time to have entirely prevented or controlled the epidemics which at various times decimated the populations of European and Asiatic countries; but, had such methods of right living been followed as were known in Biblical days, plagues would not have been so severe as those history records.

Public health law is that body of statutes, regulations, and precedents that have for their purposes the protection and promotion of individual and community health. You will note that this definition includes statutes, regulations, and precedents.

In the term "statutes" we include the constitutions, Federal and State, and the acts of the law-making bodies, such as Congress and the legislatures of the various States. The casual observer of Government might assume that the law of the land is the statutory law. This is theory and not practice. Legislatures are provided to make laws necessary for our Government and the collection of legislative

acts is referred to as "statutes" or statutory law. A person need not be a student of law to reach the conclusion that statutory law constitutes but a very small part of the body of the law. It has been estimated that this proportion is not more than 2 per cent. The work of the lawyer would be very circumscribed if we had no law except legislative enactments. There would be no "science of law" and no legal profession, as law would be in a chaotic state. This may be illustrated by the experience of a candidate for the bar. During his examination it was evident that his knowledge of legal principles was very deficient and he was asked if there was any subject in which he was proficient. His answer was that he was "good on statutes." The wise examiner told him: "That is not enough knowledge for a lawyer, as some fool legislature can come along and repeal all you know."

Regulations, and with these we include municipal ordinances, are those rules of conduct and procedure which emanate from such bodies as boards of health, boards of education, municipal councils, etc., which depend for their authority upon a grant of power by the legislature under sanction of a constitution.

Properly to understand this statement it is necessary to recall the history of the foundation of our State and Federal governments. We know that originally sovereignty was vested in the several States and that the Federal Government was formed by the relinquishment of certain rights by the States and by the delegation of certain powers and functions, and that these are expressed in the Federal Constitution. All powers not relinquished or delegated remained in the States, to be exercised or not as the individual State might elect. All State, county, and municipal administrative boards and officers get their authority to exist and function by delegation of powers coming from the State constitution and State legislature, and from no other source. These are the powers that were not surrendered to the Federal Government.

Precedents form the great bulk of our law, and for this the courts are responsible. These precedents are to be found in the decisions rendered on points of law and the principles thereby established. The building up of this type of law has been going on from time immemorial. It is to be found in thousands of volumes of court reports and analyses of law as given us by writers on law.

From a legal point of view, public health law owes its origin and effectiveness to the inherent right of sovereignty known as police power. Police power has been variously defined, but for our purpose the following definition is sufficient: "Police power is that inherent sovereignty which the Government exercises whenever regulations are demanded by public policy for the benefit of society at large in order to guard its morals, safety, health, order, and the like, in ac-

cordance with the needs of civilization." (Miami County v. Dayton, 92 O. S. 215.)

Speaking generally, police power is limited in its exercise to the enforcement of the maxim that "each individual must so conduct himself, so pursue his calling, and so use his property as not to injure or unnecessarily annoy others." In other words, the rights of each individual are conditioned on the equal rights of all other persons to the extent that may be necessary to secure the largest measure of freedom for all. (Public Health and Safety, Sec. 251).

Police powers have their origin in the law of necessity. Before the existence of constitutions or statutory laws it was a well-settled principle of common law that in cases of actual necessity, as in preventing the spread of fire, the ravages of pestilence, or any other great calamity, the private property of the individual might be lawfully taken, used, or destroyed for the relief, protection, or safety of the many. This is recognized as "The law of overruling necessity"—the rights of the individual as against another individual or of the public. In other words, the subject is to be considered as government for the defense of society or of the people whose peace is invaded by any violence.

With the adoption of constitutions and the delegation of legislative authority to the legislative branch of the Government, police power was developed by statutory enactment, with the effect that we now look to the statutes for the authority to exercise police power. The subjects for the exercise of police power are being constantly increased, so that it is not possible to forecast the extent to which this power may be exercised.

Considering the definition of police power as heretofore given, it is seen that the nature of police power is to be determined by its relation to the general welfare and that such power is to be applied by making and enforcing such laws as are necessary to preserve and promote the public health and public safety. Without such laws civil society could not exist. They are justified by necessity and sanctioned by the right of self-preservation.

The power to enact and enforce regulations under police power is lodged by the people with the government of the State qualified only by such conditions as to the manner of its exercise as are necessary to secure the individual citizen against unjust and arbitrary interference.

The State can not divest itself of its obligations under the police power, and the authority of each of the States is supreme and exclusive. In the delegation of powers to the Federal Government, reservation was made to each State of sovereign control over its own internal affairs.

"The police power is so clearly essential to the well-being of the State that the legislature can not by any act or contract, whatever, divest itself of the power nor fetter its discretion in the exercise of the power. The discretion can no more be bargained away than the power itself. In other words, the right to exercise police power can not be alienated, surrendered, or abridged by a State legislature by any act, grant, charter, contract, or delegation, whatsoever, because, it is said it is a governmental function without which the legislature would be powerless to protect those rights which it was especially designed to secure. So that the legislature can not, even by charter granted to a corporation, confer any irrepealable right to continue the exercise of franchises in a way that may become injurious to the public." (Public Health and Safety, Sec. 9.)

The extent to which police power may be exercised is undetermined. The legislative branch of the Government is vested with large discretion, and may determine, primarily, the necessity or expediency of legislation in respect to any particular matter, and as to the means which shall be adopted to accomplish any legitimate object.

This authority in the legislative branch of Government is subject to some control by the judiciary. In any particular case the judiciary has a supervisory function to decide, when properly called upon to do so, whether an act passed for an ostensible or declared purpose is a reasonable exercise of legislative power; that is, whether it is properly related to and appropriate to accomplish the purpose sought to be accomplished.

The judiciary is without authority to determine the expediency of such legislation. This principle is expressed in the following quotation: "Making of laws is committed to the general assembly; it is the judge of the wisdom and policy of all its enactments and no court has the right to overrule its judgment, even as to the extent of its own powers, unless it is clearly and beyond doubt exceeding the legislative functions with which it is vested by the constitution." (Adler v. Whitbeck, 44 O. S. 539.) This is so generally recognized as true as to be regarded as axiomatic upon questions as to the power of a legislature to enact a given law.

As stated, a law under the police power must not only not be unreasonable or arbitrary, but it must also confine itself to the protection, preservation, or promotion of the public health or public safety. Under the guise of a police regulation, any law which deviates from the above purpose will be invalid.

Some limitations on the exercise of police power are to be found in the Federal Constitution and some in the constitutions of the various States. These provisions are designed to secure the rights of persons and property against arbitrary and unjust governmental interference.

The constitutional inhibition of State laws impairing the obligation of contracts can have no application to laws which are in their nature legitimate police regulations. Such regulations do not violate the sanctity of contract obligations, since all such engagements are made and entered into subject to the right of the State at any time to enact such laws as the public interest may require.

The police power of the State is superior to any engagements entered into by the State; and all rights, franchises, and privileges, however derived or secured, are held subject thereto. This is the answer to many claims that the exercise of police power is a violation of Amendments V and XIV to the Federal Constitution, and similar provisions in State constitutions.

The fourteenth amendment reads in part: "No state shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States; nor shall any State deprive any person of life, liberty, or property, without due process of law; nor deny to any person within its jurisdiction the equal protection of the law."

The United States Supreme Court has held in a number of cases that it is a settled doctrine that this amendment was not designed to interfere with or in any degree abridge or impair the exercise of the police powers of the States. It does prohibit personal enactment favoring some to the impairment of the rights of others. As stated by Justice Field (111 U. S. 746): "The principal, if not the sole, purpose of its prohibitions is to prevent any arbitrary invasions by State authority of the rights of persons and property, and to secure to everyone the right to pursue his happiness unrestrained, except by just, equal, and impartial laws."

The Ohio Supreme Court has this to say regarding the fourteenth amendment to the Federal Constitution: "There is perhaps no provision of the Federal Constitution that is more overworked than the fourteenth amendment. Counsel generally are apparently unanimous in thinking that any judgment or finding as against their client denies such client the equal protection of the laws, or is without due process of law. It has been so many times decided that the fourteenth amendment does not limit the States in the proper exercise of police power, that citation of authorities seems needless. The right of the State through the exercise of police power to subject persons and property to reasonable and proper restraints in order to secure the general comfort, health, and prosperity of the State is no longer open to question." (Ex parte Company, 106 O. S. 50.)

There is a definite prohibition against the States, in the matter of regulating interstate commerce, by the provisions of the Federal Constitution which places this subject exclusively within the jurisdiction of the Federal Government. This, however, does not limit the States in matters of intrastate commerce or in the protection of the individual State by necessary quarantine regulations. The limita-



tions of police power are generally in favor of the States as against the Federal Government.

No provision of the Federal Constitution deprives a State of the right to preserve order within its limits, to pass laws against crimes and punish offenders, to regulate relations between individuals, to control for the public good the use of private property, to protect the health, life, and safety of the people, and, to that end, not only to enact suitable legislation, but to destroy private property that is dangerous to the well-being of the State. In the exercise of this power regard must be paid to the fundamental principles of civil liberty and to processes that are adapted to preserve and secure civil rights; persons can not arbitrarily be deprived of equal protection of the laws or of life, liberty, or property because the State purports to be exercising the police power.

The due process of law that must be observed is necessarily different under different circumstances. Sometimes summary proceedings are sufficient. The summary abatement of nuisances without judicial process or proceedings was well known to the common law prior to the adoption of the Constitution, and it can not be supposed that its provisions were intended to prevent such action. The exercise of this power to secure the destruction of property prejudicial to health, morals, or safety, or to prohibit the use of property in a particular way, is very different from taking property for public use.

However, we are more interested in the administration of public health laws than in discussing questions of constitutional law. Under this topic will be considered the rights and functions of Federal, State, and municipal governments in the exercise of police power.

The authority of the Federal Government to act must be found in the provisions of the Constitution, or in such implied powers as are necessary to carry into effect its express provisions. In like manner, the constitution of the State is a delegation of powers inherent in the people for the purpose of promotion of government. Municipal corporations and other political subdivisions get their authority to exist and their form of government from the constitution of the State and from legislative acts.

The delegation of authority to the Federal Government makes plain the fact that the Constitution of the United States, the acts of Congress, and treaties made by authority of the Constitution are the supreme law of the land. The constitution of the State and the laws enacted by its legislative body come next in authority. Then come the regulations adopted under authority of legislative sanction by State governmental agencies created by the State constitution or by legislative enactment, and, finally, the ordinances, rules, and regulations adopted by the legislative body of a municipal corporation, or by other local agencies. No political subdivision or governmental

agency created by the Constitution or by legislative enactment has any authority except such as is specifically granted.

There must be an understanding of the relations existing between the Federal Government and the State, and the State and the lesser political subdivisions and governmental agencies in order that the relative powers of each be understood.

As has been indicated, the Federal Government must look to the Constitution for its authority in the exercise of police power. Unless such powers are expressly given, or may be implied in order to make effective some express grant of power, the right to exercise such power by the Federal Government does not exist. It is not possible to give in detail the subject matter upon which the Federal Government may legitimately exercise police power. This can best be indicated by a review of the subjects in which the Federal Government has acted, to the exclusion of the right of the State to act, or of the cases where a concurrent power exists, that is, authority in both the Federal Government and in the State to act where there is no conflict.

The constitution of the State may be said to be a declaration of general authority with few prohibitions against legislative enactment. While in the national administration it may be said that police powers are limited, in the States such powers extend and progress in every direction with no well-defined bounds, subject principally to the wisdom of the legislature and the will of the people as they find expression in the constitution and the laws.

The principle of law that all legislation must be general and not special applies under the police power; therefore, every such law must avoid the taint of class legislation and must apply with equal effect in the jurisdiction of the law-making body. This principle applies to national, State, and municipal legislation.

In matters concerning the public health, certain powers have been delegated to State departments of health, and frequently health functions have been assigned to other State agencies. These governmental agencies have been given the authority to adopt and enforce sanitary regulations that come within the police power, and in so far as they are applicable they take precedence over legislation adopted by municipal corporations or by other minor political subdivisions.

The authority of the legislature to delegate rule-making power to an administrative body has been many times disputed, but in only one case that I know of has the power been denied to a State or local board of health. That is a Wisconsin case (*State v. Burdge* 95 Wis. 390). In this case it was held that the State board of health was a purely administrative body and had no regulatory power, and that none could constitutionally be delegated to it. The matter has been more or less definitely settled by the United States Supreme Court in the case of *Zucht v. King* (43 S. C. Rep. 24), in which it is held

"(1) That a State may, consistently with the Federal Constitution, delegate to a municipality authority to determine under what conditions health regulations shall become operative. (2) That the municipality may vest in its officials broad discretion in matters affecting the application and enforcement of a health law. (3) That in the exercise of the police power reasonable classification may be freely applied, and that regulation is not violative of the equal protection clause merely because it is not all embracing."

The Ohio Supreme Court more definitely says: "That the legislature in the exercise of its constitutional authority may lawfully confer on boards of health the power to enact sanitary ordinances having the force of law within the districts over which their jurisdiction extends, is not an open question." (Ex parte Company, 106 O. S., 50.)

We have in the Ohio constitution (article XVIII, section 3,) the following provision: "Municipalities shall have authority to exercise all powers of local self-government and to adopt and enforce within their limits such police, sanitary, and other similar regulations as are not in conflict with general laws." As the valid enactment of sanitary regulations by the State department of health gives to such regulations the force and effect of general laws such regulations take precedence over the provisions of a municipal ordinance or a sanitary regulation adopted by a municipal board of health.

In matters concerning the public health, a municipal corporation can act only where there is specific authority for such action, and the ordinances adopted by the legislative body of the municipal corporation must not only be limited in subject matter to the powers delegated, but they must not conflict with, or attempt to set aside, any provision of the constitution, of State law, or other sanitary regulation of the State.

The same rule applies to the sanitary regulations adopted by a local board of health. These regulations can apply only where the subject matter has by law been placed under the jurisdiction of the board of health, and, in addition to the limitations placed upon a municipal ordinance, these regulations must not be in conflict with the provisions of an existing ordinance. Where there is concurrent jurisdiction, a sanitary regulation adopted by the board of health would stand until the municipal legislative body had acted on the same subject matter. There may be an exception to this rule if the authority given to the board of health is in specific terms and that given to the municipal council is in general terms. The valid enactment of a sanitary regulation gives to it the same force and effect as is given to a municipal ordinance.

Where police powers have been delegated to State or local agencies, there is a responsibility to use the power and an accountability for

the manner in which it is used. When the means for performance are placed at his disposal, a public officer may be compelled to exercise the police power committed to him when the public interests demand such action. Though action may be demanded, the means or manner of enforcement, if left to the discretion of the officer, can not be determined for him. In other words, unless the statutes prescribe the method of procedure, the officer may select his own method. The above is the rule in cases where the public health and safety are involved. A ministerial officer is not liable to an individual for damage caused by an alleged nonfeasance except upon proof showing an omission on his part to perform a plain duty required of him by law. In the exercise of discretionary and legislative powers there is no liability. A body given power to enact laws or regulations can not be compelled to enact certain legislation.

State quarantine laws have been held to be within the powers reserved to the States and not conferred upon the Federal Government. The national quarantine differs from a State and local quarantine in that it can only apply to immigrants and importations and transit and traffic between States.

There can be no conflict between the Federal and State authorities in matters of quarantine as they affect persons afflicted with contagious diseases or of articles unwholesome or unfit for food or dangerous from infection. Such persons and articles are not proper subjects of commerce and are beyond the ordinary rules of its regulation.

The same rule applies to sanitary regulations as applies to State or Federal laws in matters coming under police power. Such regulations can not be arbitrary; they must be uniform in application to all classes to which they may apply; they must not be unreasonable; and they must be appropriate to accomplish the purpose for which they are intended.

The present status of public health law in the United States is well stated in decisions of the Ohio Supreme Court, and similar decisions will be found in the law reports of nearly all States of the Union: "The general assembly, in the exercise of the legislative power conferred by the constitution, has authority to enact general laws prescribing health, sanitary, and similar regulations, effective throughout the State, and to provide such reasonable classification therein as may be deemed necessary to accomplish the object sought. The peace, morals, health and safety of the people are a matter of concern to the State." (State ex rel. v. Zangerle, 103 O. S. 566.)

"The measure of the police power of the State is the measure of the public need, limited only by the State and Federal Constitutions. Public health is one of the most vital subjects for the exercise of that power. Primarily, the State legislature is the judge of that need,

and in the exercise of that judgment must be given wide discretion. The legislative judgment in this behalf will not be nullified except when it clearly appears that there has been a gross abuse of such discretion, in undoubted violation of some State or Federal constitutional provision." (*Williams v. Scudder*, 102 O. S. 305.)

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## PHOSPHORUS, TOTAL CALCIUM, AND DIFFUSIBLE CALCIUM CONTENT OF THE BLOOD SERA OF LEPERS AND THEIR RELATION TO BONE CHANGES

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Bone atrophy and absorption have frequently led investigators to look for changes in serum and blood calcium. Underhill, Hoenig, and Bogert (1) investigated the calcium equilibrium in two lepers and reported an apparent retention in the more advanced case. Boulay and Leger (2) examined three lepers and reported a marked retention of calcium in the less advanced and a loss of calcium in the far advanced case. Conception and Salcedo (3) examined 37 cases, including three who had been discharged as cured, and reported that the calcium content of the blood of their patients in the various stages and of different forms of leprosy revealed that the values of calcium in all the cases examined, except the three paroled and suspected cases, were within normal limits. Average calcium in cases of less than one year's duration was much less than in those of longer duration. A slight increase in calcium was found in the paroled cases. Lemann, Liles, and Johansen (4) report the results of the analysis of the blood for calcium in 54 lepers and conclude that there is no relationship between calcium content of the blood and bone absorption in lepers. Cruz, Lara, and Paras (5) examined a group of 70 lepers and concluded that the serum calcium in leprosy is usually within normal limits and that type, advancement, duration of the disease, antileprosy treatment, and the presence of bone changes had no influence on the level of serum calcium. They did, however, find low calcium in lepra fever.

Price (6) states, in substance, that the interrelationship between calcium and inorganic phosphorus, the factor which constitutes a yardstick for determining the capability of a blood to deposit calcium for use, is important, and that while either might vary within given ranges, the one should increase if the other decreases, and therefore their ratio is an expression of normality or divergence from it. This ratio, termed calcium-phosphorus balance (serum calcium  $\times$  inorganic phosphorus), is, under ordinary conditions, between 30 and 40 in adults.

Giving consideration to the above hypothesis, 47 patients in this hospital were selected without regard to the duration of leprosy, stage of activity, or type of the disease, and their sera were analyzed for calcium by Clark-Collip modification of the Kramer-Tisdall method (7) and for phosphorus by Benedict-Theis method (8), with the following findings:

TABLE I

| Reg. No. | Ca.  | P.   | Ca.-P.<br>balance | Reg. No.     | Ca.  | P.   | Ca.-P.<br>balance |
|----------|------|------|-------------------|--------------|------|------|-------------------|
| 38.....  | 9.0  | 4.16 | 37.4              | 585.....     | 9.1  | 3.7  | 34.0              |
| 46.....  | 8.9  | 3.6  | 32.0              | 591.....     | 8.9  | 3.4  | 30.2              |
| 73.....  | 9.2  | 3.1  | 28.5              | 579.....     | 9.0  | 3.3  | 29.7              |
| 43.....  | 9.8  | 3.2  | 31.3              | 575.....     | 9.4  | 3.0  | 28.2              |
| 117..... | 10.8 | 3.9  | 42.1              | 571.....     | 9.5  | 2.8  | 28.6              |
| 155..... | 8.8  | 4.0  | 37.2              | 566.....     | 10.0 | 2.5  | 25.0              |
| 207..... | 9.4  | 3.7  | 34.7              | 564.....     | 11.5 | 3.4  | 40.1              |
| 234..... | 10.7 | 3.7  | 39.5              | 593.....     | 9.1  | 4.16 | 37.8              |
| 256..... | 10.5 | 3.4  | 35.7              | 578.....     | 10.2 | 3.7  | 37.7              |
| 276..... | 10.0 | 3.2  | 32.0              | 584.....     | 9.1  | 3.1  | 28.2              |
| 307..... | 9.1  | 3.4  | 30.9              | 586.....     | 10.0 | 3.1  | 31.0              |
| 333..... | 10.9 | 3.16 | 33.7              | 589.....     | 9.1  | 3.4  | 30.9              |
| 332..... | 9.5  | 4.4  | 41.8              | 595.....     | 9.1  | 3.7  | 33.6              |
| 391..... | 9.0  | 2.9  | 27.1              | 594.....     | 11.0 | 2.9  | 31.9              |
| 436..... | 9.0  | 3.1  | 27.9              | 592.....     | 10.0 | 3.0  | 30.0              |
| 450..... | 10.0 | 3.0  | 30.0              | 600.....     | 9.6  | 3.9  | 37.4              |
| 466..... | 9.2  | 3.1  | 28.5              | 601.....     | 9.9  | 3.8  | 37.6              |
| 485..... | 9.8  | 4.18 | 40.9              | 621.....     | 9.3  | 3.4  | 31.6              |
| 511..... | 10.6 | 3.12 | 33.0              | 618.....     | 9.8  | 3.4  | 33.2              |
| 520..... | 8.9  | 3.5  | 31.1              | 609.....     | 10.4 | 2.9  | 30.1              |
| 533..... | 9.9  | 3.7  | 36.6              | 619.....     | 8.9  | 3.4  | 30.2              |
| 529..... | 11.0 | 3.1  | 34.1              | 604.....     | 9.2  | 3.6  | 33.1              |
| 526..... | 9.8  | 3.75 | 36.7              |              |      |      |                   |
| 528..... | 10.0 | 3.7  | 37.0              |              |      |      |                   |
| 570..... | 9.8  | 2.3  | 22.5              | Average..... | 9.9  | 3.42 | 33.1              |

From 3 to 4 mgm. of inorganic phosphorus per 100 c. c. of blood serum in an adult is usually considered normal. Our average findings of 3.42 mgm., therefore, are well within the normal range. In this series only six patients had less than 3 mgm. present; of these, three were determined as 2.9 mgm.; one as 2.8; one as 2.5; and one as 2.3 mgm. Only two of these six showed a compensatory rise of serum calcium. Case No. 594 had calcium 11 mgm. and phosphorus 2.9 mgm., and case No. 609 had calcium 10.4 mgm. and phosphorus 2.9 mgm.

The average total calcium in these sera was 9.9 mgm. per 100 c. c. Only five were found to be below 9 mgm. Four of these were 8.9, and one 8.8 mgm.

Ten patients had a calcium-phosphorus balance ratio of less than 30, the lowest of which was 22.5, while the others ranged from 25 to 29.7.

Having concluded from our own observations, which confirmed the findings of others, that bone changes in leprosy are not dependent on total calcium, and the evident failure of calcium-phosphorus balance ratio to explain the bone deficiencies, we determined to investigate the diffusible or dializable calcium content of leprous blood.

Calcium is said to exist in the blood in three forms—the first an ionized form, and the second a nonionized form; of these, both are diffusible or dializable through an animal membrane; while the third, an un-ionized form, is combined with protein, is in a colloidal state, and is not diffusible. The first two forms can be separated from the colloidal combination by processes of ultrafiltration, compensation dialysis, or negative pressure filtration through a collodion membrane which keeps back the proteins.

Sera from 53 lepers were analysed for phosphorus, total calcium, and diffusible calcium; the per cent of diffusible calcium, the calcium-phosphorus balance ratio, and the diffusible calcium-phosphorus ratio were calculated. These 53 patients represented the following types and stages of progression:

|                                  | Nodular | Mixed | Anesthetic | Arrested | Total |
|----------------------------------|---------|-------|------------|----------|-------|
| Active, early.....               | 6       | 7     | 1          | -----    | 14    |
| Active, moderately advanced..... | 10      | 14    | 4          | -----    | 28    |
| Active, far advanced.....        | 6       | 2     | 1          | -----    | 9     |
| Apparently arrested.....         | -----   | ----- | 1          | -----    | 1     |
| Arrested.....                    | -----   | ----- | -----      | 1        | 1     |
| Total.....                       | 22      | 23    | 7          | 1        | 53    |

The following nationalities were represented: Americans (white), 26; Americans (negro), 6; Mexican, 7; Greek, 3; Filipino, 3; Chinese, 1; Italian, 2; Portuguese, 2; Jew, 1; British West Indies (white), 1; Hawaiian, 1; 41 were males and 12 females.

Control sera were collected from 15 young men, physicians who had recently passed rigid physical examinations for entrance into the United States Public Health Service, and were analyzed coincidentally with the patients' sera.

#### METHOD

Approximately 15 c. c. of blood was collected from a cubital vein, allowed to clot, was centrifuged, and the serum collected and analyzed for inorganic phosphorus (8), total calcium (7), and diffusible calcium by a method described by Moritz (10), which consists of the separation of the diffusible from the colloidal calcium by placing the serum (2 c. c.) in a collodion sac which is immersed in distilled water and subjected to a negative pressure of 150 mm. of mercury for five hours. The filtrate was then analyzed for diffusible calcium (7) and tested for proteins to determine the possibility of any leakage of colloidal material through the sac.

TABLE II.—Controls

| Name         | Phos-<br>phorus                             | Calcium<br>(total)                          | Diffusible<br>calcium                       | Diffusible<br>calcium | Calcium-<br>phosphorus<br>balance | Diffusible<br>calcium-<br>phosphorus<br>balance |
|--------------|---|---|---|-----------------------|-----------------------------------|---|
|              | <i>Mgms. per<br/>100 c. c. of<br/>serum</i> | <i>Mgms. per<br/>100 c. c. of<br/>serum</i> | <i>Mgms. per<br/>100 c. c. of<br/>serum</i> | <i>Per cent</i>       | <i>Ratio</i>                      | <i>Ratio</i>                                    |
| 1-HGB.....   | 3.07  | 10.0  | 6.0   | 60.0                  | 30.7                              | 18.42   |
| 2-WPG.....   | 3.26  | 9.6   | 5.5   | 58.3                  | 31.2                              | 17.93   |
| 3-RSW.....   | 3.26  | 9.5   | 5.4   | 57.1                  | 30.9                              | 17.60   |
| 4-RLE.....   | 3.12  | 9.8   | 5.6   | 57.1                  | 30.5                              | 17.47   |
| 5-JOD.....   | 3.40  | 9.6   | 5.6   | 58.3                  | 32.6                              | 19.04   |
| 6-WDP.....   | 3.22  | 9.6   | 5.6   | 58.3                  | 30.9                              | 18.03   |
| 7-JWC.....   | 3.26  | 11.5  | 6.0   | 52.1                  | 37.4                              | 19.66   |
| 8-GVG.....   | 2.90  | 10.8  | 6.0   | 55.5                  | 31.3                              | 17.40   |
| 9-JPG.....   | 3.34  | 10.5  | 6.2   | 59.0                  | 35.0                              | 20.70   |
| 10-OFH.....  | 3.34  | 9.6   | 6.2   | 64.5                  | 32.0                              | 20.70   |
| 11-JFJ.....  | 3.40  | 10.0  | 6.1   | 61.0                  | 34.0                              | 20.74   |
| 12-KRN.....  | 3.00  | 10.2  | 5.8   | 56.8                  | 30.6                              | 17.40   |
| 13-JWB.....  | 3.12  | 10.6  | 6.0   | 56.6                  | 33.0                              | 18.72   |
| 14-IWS.....  | 3.40  | 10.0  | 5.6   | 56.0                  | 34.0                              | 19.04   |
| 15-H.....    | 3.10  | 11.2  | 6.5   | 58.9                  | 34.7                              | 20.15   |
| Average..... | 3.21  | 10.1  | 5.8   | 57.8                  | 32.4                              | 18.80   |

The quantity of diffusible calcium that should exist in the serum of a normal adult has not been definitely determined. But it would seem from our series of controls, who, in so far as physical examinations reveal, are in a normal state of health, that 5.5 to 6.5 mgm. per 100 c. c. of serum, representing 55 to 65 per cent of the total calcium, would approximate the normal range.



TABLE III

| No.    | Race     | Sex | Age | Approximate duration of leprosy, years | Type        | Stage of progression <sup>1</sup> | Bone changes; X-ray findings   | Eats freely of—  | Eats sparingly of—                   | Medication, general?   | Phosphorus (mgms. per 100 c. c. serum) | Calcium total (mgms. per 100 c. c. serum) | Diffusible calcium (mgms. per 100 c. c. serum) | Diffusible calcium (per cent) | Calcium - phosphorus balance (ratio) | Diffusible calcium-phosphorus balance (ratio) |
|--------|----------|-----|-----|--|-------------|-----------------------------------|--|--|--------------------------------------|--|--|---|--|-------------------------------|--------------------------------------|---|
| 38698° | White... | M   | 47  | 17                                     | Anesthetic. | AFA                               | General rarefaction, both feet, with spindle deformity and absorption in phalanges.  | Cereals and fruit...                                     | Meat, vegetables, eggs, and milk...  | Cod-liver oil irregularly, ultra-violet light to hands 16 months. C. O.* | 3.2                                    | 9.8                                       | 4.6  | 46.9                          | 31.3                                 | 14.7  |
| 136    | Negro... | M   | 22  | 8                                      | Nodular...  | AMA                               |  | Cereals, milk, fruit, vegetables...                      | Meat...                              |  | 3.56                                   | 10.5                                      | 4.9  | 46.6                          | 37.3                                 | 17.4  |
| 174    | Mexican. | M   | 34  | 11                                     | ...do...    | AMA                               | Spindle deformity in phalanges of feet. Slight rarefaction in metacarpals and osteoporitis in proximal phalanges.                                      | Cereals, milk, fruit, vegetables, milk, eggs, meat, etc. |                                      | Olive oil; C. O. 15 minims.  | 3.25                                   | 10.8                                      | 4.8  | 44.4                          | 35.1                                 | 15.6  |
| 241    | White... | M   | 32  | 12                                     | Mixed...    | AMA                               |  | Cooked vegetables, cereals, milk.                        | Spinach, lettuce, beans, eggs, meat. | C. O.*; cod-liver oil emulsion daily.                                    | 4.3                                    | 10.2                                      | 4.1  | 40.1                          | 43.8                                 | 17.6  |
| 275    | Greek... | M   | 39  | 11                                     | ...do...    | AMA                               | Rarefaction of medio- and metatarsals with spindle deformity of proximal phalanges. Rarefaction of metacarpals and osteoporitis in proximal phalanges. | All kinds...   |                                      | C. O.*; olive oil daily.   | 3.34                                   | 12.0                                      | 6.2  | 51.6                          | 40.0                                 | 20.7  |
| 276    | White... | M   | 25  | 20                                     | Nodular...  | AFA                               | Marked rarefaction of bones of hands and feet.   | Vegetables, fruits, cereals, eggs, bread.                | Meat...                              | Cod-liver oil and olive oil occasionally. C. O.*                         | 3.12                                   | 10.0                                      | 5.4  | 54.0                          | 31.2                                 | 15.8  |
| 332    | ...do... | F   | 39  | 8                                      | Mixed...    | AMA                               | Moderate atrophy of bones of feet; marked in hands with absorption in distal phalanges of both third fingers.  | Vegetables, cereals, fruit, milk.                        | Meat, eggs...                        | C. O.*; C. O. 225 minims.  | 4.16                                   | 9.7                                       | 5.5  | 55.7                          | 40.3                                 | 22.6  |
| 335    | ...do... | M   | 28  | 9                                      | ...do...    | AFA                               |  | Cereal, milk, eggs, bread.                               | Meat, spinach, carrots, vegetables.  | C. O.*; olive oil daily; cod-liver oil irregularly.                      | 4.5                                    | 8.6                                       | 3.8  | 44.1                          | 38.7                                 | 17.1  |

<sup>1</sup> AFA—Active, far advanced; AMA—Active, moderately advanced; AE—Active, early; Arrested—Paroled; Ap. Ar.—Apparently arrested but not on parole.  
 \* C. O.—Benzocaine-chaulmoogra oil, 5 c. c. intramuscularly semitweekly; C. O.—Chaulmoogra oil, daily oral dose.

TABLE III—Continued

| No. | Race      | Sex | Age | Approximate duration of leprosy, years | Type        | Stage of progression | Bone changes; X-ray findings  | Eats freely of—                                     | Eats sparingly of—                  | Medication, general  | Phosphorus (mgms. per 100 c. c. serum) | Calcium total (mgms. per 100 c. c. serum) | Diffusible calcium (mgms. per 100 c. c. serum) | Diffusible calcium (per cent) | Calcium - phosphorus balance (ratio) | Diffusible calcium-phosphorus balance (ratio) |
|-----|-----------|-----|-----|--|-------------|----------------------|---|---|-------------------------------------|--|--|---|--|-------------------------------|--------------------------------------|---|
|     |           |     |     |  |             |                      |   | Food  |                                     |  |  |   |  |                               |                                      |   |
| 370 | White...  | M   | 26  | 8                                      | Mixed....   | AMA                  | Atrophy throughout metacarpals and metatarsals, with spindle deformity in phalanges.  | Vegetables, milk, spinach, carrots, fruit, cereals. | Meat.....                           | C. O.*; cod-liver oil irregularly; ultra-violet to feet 22 months. | 3.4                                    | 9.8                                       | 4.2  | 42.8                          | 33.3                                 | 14.2  |
| 401 | Greek.... | M   | 39  | 12                                     | do.....     | AMA                  | Rarefaction throughout hands, with absorption in distal phalanges of first and fifth fingers, both hands.                       | Milk, eggs, vegetables, peas, beans.                | Meat, spinach.....                  | C. O.*   | 3.2                                    | 11.0                                      | 5.8  | 52.7                          | 35.2                                 | 18.5  |
| 462 | White.... | M   | 31  | 4                                      | Nodular..   | AMA                  | Spindle deformity in phalanges of feet; slight atrophy throughout hands.  | Milk, vegetables, fruit, cereals.                   | Meat.....                           | C. O. 75 minims....  | 3.7                                    | 11.2                                      | 5.1  | 45.5                          | 41.4                                 | 18.6  |
| 485 | Negro.... | M   | 30  | 13                                     | Mixed....   | AE                   | Spindle deformity in phalanges second, third, fourth, and fifth toes; proliferation in first toe, with rarefaction throughout.  | Vegetables, fruit, spinach, milk, eggs.             | Meat, carrots.....                  | C. O. 200 minims..   | 3.9                                    | 9.9                                       | 5.0  | 50.0                          | 38.7                                 | 19.5  |
| 504 | White.... | M   | 29  | 11                                     | Nodular..   | AFA                  | General rarefaction throughout, also showing proliferative osteitis of proximal phalanges of second, third, and fourth fingers. | Cereals, eggs, potatoes.                            | Spinach, fish, meat, milk, carrots. | C. O.*; cod-liver oil irregularly.                                 | 3.4                                    | 9.1                                       | 5.0  | 54.8                          | 30.9                                 | 17.0  |
| 514 | do.....   | M   | 27  | 13                                     | Mixed....   | AMA                  | Moderate rarefaction in bones of hands and feet. Absorption and spindle deformity in feet.                                      | All kinds.....                                      | .....                               | C. O.*; ultra-violet to feet.                                      | 3.4                                    | 10.2                                      | 4.4  | 43.5                          | 34.6                                 | 14.9  |
| 518 | Negro.... | M   | 33  | 10                                     | Nodular..   | AFA                  | Marked atrophy throughout both hands, with hypertrophic changes in all interphalangeal joints.                                  | Vegetables, meat, milk, eggs.                       | Spinach, carrots, fruit cereals.    | None.....  | 3.4                                    | 9.0                                       | 4.4  | 45.8                          | 30.6                                 | 14.9  |
| 522 | Jew.....  | M   | 55  | 7                                      | Anesthetic. | AMA                  | Moderate atrophy of bones of hands and feet.  | Cereal, milk, eggs, vegetables, fruit, bread.       | Meat.....                           | C. O.*   | 3.0                                    | 9.6                                       | 4.6  | 47.8                          | 28.8                                 | 13.8  |
| 523 | White.... | M   | 15  | 4                                      | Mixed....   | AMA                  | Moderate atrophy of bones of hands and feet.  | Vegetables, fruit, cereals.                         | Milk.....                           | C. O.*   | 3.7                                    | 9.0                                       | 4.3  | 47.7                          | 33.3                                 | 15.9  |

|     |           |      |    |             |          |   |                                    |                           |   |      |      |     |      |      |      |
|-----|-----------|------|----|-------------|----------|---|------------------------------------|---------------------------|---|------|------|-----|------|------|------|
| 525 | Negro...  | M 34 | 11 | Nodular...  | AFA      | Atrophy throughout bones of feet, with absorption at interphalangeal joints, both great toes. Spindling deformity of phalanges of other toes. Atrophy throughout hands. | All kinds.....                     | -----                     | C. O.*; C. O. 125 minims.   | 3.75 | 9.4  | 4.6 | 48.9 | 35.2 | 17.3 |
| 527 | White...  | M 33 | 11 | Mixed....   | AE       | Proliferative ostitis in middle phalanges of fifth fingers. No atrophy in hands. Marked spindle deformity of proximal phalanges of all toes.                            | Fruit, cereals, milk, eggs.        | Vegetables, meat.....     | C. O.*; C. O. 25 minims.  | 3.75 | 10.0 | 5.1 | 51.0 | 37.5 | 19.1 |
| 528 | do.....   | M 40 | 6  | Nodular...  | AMA      | Rarefying ostitis of second, third, fourth, and fifth phalanges of both feet, with some rarefaction in base of all metatarsals. Rarefaction throughout hands.           | Milk, cereal, bread, fruit.        | Vegetables, meat, butter. | C. O.*; ultra-violet 8 months.  | 2.88 | 9.4  | 4.9 | 52.0 | 27.0 | 14.3 |
| 535 | Filipino. | M 23 | 4  | Mixed....   | AMA      | Slight atrophy in bones of hands.   | Vegetables, fruit, milk.           | Meat, eggs.....           | C. O.*; C. O. 45 minims; ultra-violet hands and feet 6 months.          | 3.75 | 10.3 | 5.2 | 50.4 | 38.6 | 19.5 |
| 536 | do.....   | M 30 | 5  | Anesthetic. | Arrested | Rarefaction of medio- and base of metatarsal, with spindle deformity of metatarsal and phalanges. Some rarefaction in bones of lower legs.                              | All kinds.....                     | -----                     | C. O. 30 minims; ultra-violet to arms, hands, legs, and feet 11 months. | 1.9  | 9.6  | 3.8 | 39.5 | 18.2 | 7.3  |
| 537 | Chinese.  | M 27 | 2  | Mixed....   | AE       | Marked rarefaction in bones of hands and feet.  | do.....                            | -----                     | C. O.*; C. O. 300 minims; ultra-violet to hands 12 months.              | 3.07 | 10.4 | 3.1 | 29.8 | 31.1 | 9.5  |
| 540 | Greek...  | F 25 | 1½ | Nodular...  | AE       | Atrophy throughout feet. Proliferative ostitis of proximal phalanges of fingers.  | Milk, fruit, cereal.               | Vegetables, meat.....     | C. O.*; C. O. 225 minims; olive oil daily.                              | 3.0  | 10.0 | 4.8 | 48.0 | 30.0 | 14.4 |
| 543 | White...  | F 20 | 3  | Mixed....   | AE       | Some atrophy throughout hands and feet.   | All kinds.....                     | -----                     | C. O.*; ultra-violet to thigh.  | 3.3  | 10.6 | 5.4 | 50.9 | 34.9 | 17.8 |
| 545 | do.....   | M 45 | 2  | Nodular...  | AE       | Moderate atrophy in metatarsal bone. Partial absorption of distal phalanges of fifth toes.  | Cereals, milk, bread, eggs, fruit. | Meat, vegetables.....     | C. O.*; C. O. 60 minims; cod-liver oil irregularly.                     | 2.7  | 11.2 | 3.9 | 34.8 | 30.2 | 14.4 |

TABLE III—Continued

| No. | Race        | Sex | Age | Approximate duration of leprosy, years | Type       | Stage of progression | Bone changes; X-ray findings   | Eats freely of—                                | Eats sparingly of— | Medication, general                | Phosphorus (mgms. per 100 c. c. serum) | Calcium total (mgms. per 100 c. c. serum) | Diffusible calcium (mgms. per 100 c. c. serum) | Diffusible calcium (per cent) | Calcium - phosphorus balance (ratio) | Diffusible calcium-phosphorus balance (ratio) |
|-----|-------------|-----|-----|--|------------|----------------------|--|--|--------------------|------------------------------------|--|---|--|-------------------------------|--------------------------------------|---|
|     |             |     |     |  |            |                      |  |  | Food               |                                    |  |   |  |                               |                                      |   |
| 549 | White...    | M   | 28  | 20                                     | Anesthetic | AMA                  | Marked atrophy throughout, with spindle deformity of metatarsal and phalanges; necrosis of first and second metatarsals, right foot. Left foot amputated because of bone absorption, necrosis, and ulceration. General atrophy throughout hands. | All kinds.....                                 | .....              | C. O.*; C. O. 20 minims.           | 3.0                                    | 10.4                                      | 3.9  | 37.4                          | 31.2                                 | 11.7  |
| 552 | do.....     | F   | 55  | 19                                     | Nodular... | AFA                  | Marked atrophy with spindle deformity in bones of feet. Marked atrophy in bones of hands.  | Cereals, milk, eggs, vegetables, spinach, etc. | Meat.....          | C. O.*; C. O. 30 minims.           | 2.5                                    | 9.5                                       | 4.6  | 48.4                          | 23.7                                 | 11.5  |
| 553 | do.....     | M   | 61  | 4                                      | Mixed....  | AMA                  | Moderate atrophy throughout hands; absorption in distal phalanges of second, third, and fourth fingers, left.  | Cereals, eggs, vegetables, bread, fruit.       | do.....            | Ethyl esters C. O. 2 c. c. weekly. | 2.7                                    | 10.3                                      | 5.3  | 51.4                          | 27.8                                 | 14.0  |
| 557 | Negro...    | F   | 31  | 21                                     | Anesthetic | AMA                  | Absorption in distal phalanges; rarefaction all phalanges of hands and all bones of feet. Spindle deformity in feet.   | All kinds.....                                 | .....              | C. O.*.....                        | 3.25                                   | 10.2                                      | 3.2  | 31.3                          | 33.1                                 | 10.4  |
| 558 | White...    | M   | 25  | 7                                      | Mixed....  | AMA                  | Marked rarefaction in bones of hands and feet. Spindle deformity in first phalanges of feet.   | do.....  | .....              | C. O.*; C. O. 30 minims.           | 3.4                                    | 9.6                                       | 3.4  | 35.4                          | 31.6                                 | 11.5  |
| 559 | Portuguese. | M   | 25  | 3                                      | Nodular... | AE                   | Practically normal hands and feet.   | do.....  | .....              | C. O.*; C. O. 100 minims.          | 2.22                                   | 11.5                                      | 4.9  | 42.5                          | 25.5                                 | 10.8  |

|     |                  |   |    |    |                  |            |  |   |  |                           |      |      |      |      |      |      |
|-----|------------------|---|----|----|------------------|------------|--|---|--|---------------------------|------|------|------|------|------|------|
| 590 | Italian...       | M | 34 | 6  | do.....          | AMA        | Marked atrophy of tarsals and metatarsals, with slight spindle deformity of phalanges of feet. Rarefying osteitis of phalanges of fingers. Proliferative changes in proximal phalanges. Atrophy throughout hands. Proliferative changes in middle phalanges of both middle fingers. Atrophy throughout feet. | do.....                                 | Meat.....                                      | C. O.*; C. O. 375 minims. | 3.7  | 11.9 | 5.6  | 47.0 | 44.0 | 20.5 |
| 595 | Negro....        | M | 16 | 6  | do.....          | AMA        | Atrophy throughout hands. Proliferative changes in middle phalanges of both middle fingers. Atrophy throughout feet.   | Milk, cereals, eggs, vegetables, fruit. | C. O.*; C. O. 20 minims.                       | 7.5                       | 9.6  | 5.0  | 52.0 | 72.0 | 37.5 |      |
| 599 | White....        | M | 20 | 11 | do.....          | AFA        | Marked atrophy throughout with absorption of all distal phalanges. Rarefaction and spindle deformity of all bones of feet. Absorption of distal phalanges.   | do.....                                 | C. O.*   | 3.56                      | 10.5 | 5.1  | 48.5 | 37.3 | 18.1 |      |
| 598 | Mexican          | F | 45 | 15 | Mixed....        | AFA        | General atrophy throughout hands and feet.   | All kinds.....                          | C. O.*; C. O. 50 minims.                       | 3.7                       | 11.0 | 4.5  | 40.9 | 40.7 | 16.6 |      |
| 491 | Italian..        | M | 42 | 5  | Nodular ..       | AMA        | Rarefaction of hands and feet. Spindle deformity in feet.  | Eggs, fruit, bread.                     | C.O.400-525 minims                             | 4.10                      | 11.4 | 5.2  | 45.7 | 47.3 | 21.6 |      |
| 602 | Mexican          | M | 37 | 3  | Mixed....        | AMA        | Rarefaction of medio and base of metatarsals.  | Cereals, milk, eggs, fruit, bread.      | C. O.*; C. O. 300 minims.                      | 3.11                      | 11.2 | 5.1  | 45.5 | 34.7 | 15.8 |      |
| 605 | do.....          | M | 36 | 2  | Nodular ..       | AE         | Negative for rarefaction, hands and feet. Spindle deformity of metacarpals.  | All kinds.....                          | C. O.*; C. O. 75 minims.                       | 3.0                       | 11.2 | 5.3  | 47.3 | 33.6 | 15.9 |      |
| 606 | Portu-<br>guese. | M | 48 | 19 | Mixed....        | AMA        | General atrophy throughout bones of feet with spindle deformity of metatarsals and phalanges. Atrophy throughout hands, with spindle deformity of metacarpals.   | do.....                                 | C. O.*; C. O. 50 minims; ultra-violet to arms. | 3.02                      | 10.0 | 3.8  | 38.0 | 30.2 | 11.4 |      |
| 615 | Mexican          | M | 40 | 11 | Anesthe-<br>tic. | Ap.<br>Ar. | Rarefaction through medio- and base of metatarsals. Absorption and destruction of interphalangeal joints of first and fourth toes, both feet. Moderate rarefaction throughout metacarpals and phalanges of both hands.   | do.....                                 | C. O.*; C. O. 50 minims.                       | 2.8                       | 10.0 | 5.5  | 55.0 | 28.0 | 15.4 |      |

TABLE III—Continued

| No.        | Race             | Sex    | Age      | Approximate duration of leprosy, years | Type             | State of progression | Bone changes; X-ray findings  | Eats freely of—                           | Eats sparingly of— | Medication general                  | Phosphorus (mgms. per 100 c. c. serum) | Calcium total (mgms. per 100 c. c. serum) | Diffusible calcium (mgms. per 100 c. c.) | Diffusible calcium (per cent) | Calcium - phosphorus balance (ratio) | Diffusible calcium - phosphorus balance (ratio) |
|------------|------------------|--------|----------|--|------------------|----------------------|---|---|--------------------|-------------------------------------|--|---|--|-------------------------------|--------------------------------------|---|
|            |                  |        |          |  |                  |                      |   | Food                                      |                    |                                     |  |   |  |                               |                                      |   |
| 616        | White...         | M      | 32       | 12                                     | Mixed....        | AMA                  | Hands and feet normal....   | Cereals, eggs, milk, vegetables, fruit.   | Meat.....          | C. O.*; C. O. 100 minims.           | 3.5                                    | 10.0                                      | 5.8                                      | 58.0                          | 35.0                                 | 20.3  |
| 618        | Jamaican.        | F      | 35       | 3                                      | Nodular...       | AMA                  | Moderate degree of rarefaction throughout hands and feet.   | Spinach, carrots, celery, lettuce, fruit. | do.....            | C. O.*; C. O. 25 minims.            | 3.2                                    | 9.8                                       | 5.0                                      | 51.0                          | 31.3                                 | 16.5  |
| 625        | Mexican.         | M      | 28       | 1                                      | do.....          | AE                   | Slight rarefaction hands and feet; early absorption distal and second phalanges, both feet.   | Meat, milk, eggs, vegetables, fruit.      | Cereals.....       | C. O.*; C. O. 75 minims.            | 3.6                                    | 10.5                                      | 4.3                                      | 45.7                          | 37.8                                 | 17.2  |
| 626<br>627 | White<br>do..... | M<br>F | 52<br>62 | 1<br>½                                 | do.<br>Mixed.... | AMA<br>AE            | Marked rarefaction bones of feet, with spindle deformity of proximal phalanges. Rarefying osteitis throughout all phalanges of hands and some rarefaction of other bones. | Vegetables, fruit bread.                  | Meat, spinach...   | C. O.*;<br>C. O.*; C. O. 25 minims. | 3.26<br>4.16                           | 10.0<br>10.9                              | 5.5<br>4.2                               | 55.0<br>38.5                  | 32.6<br>45.6                         | 17.1<br>17.4                                    |
| 628        | do.....          | F      | 27       | 2½                                     | do.....          | AE                   | General atrophy throughout feet, with marked spindle deformity of metacarpals and phalanges. Hands normal.  | Vegetables, fruit, milk, eggs.            | Meat.....          | None.....                           | 2.6                                    | 10.2                                      | 4.5                                      | 44.1                          | 26.5                                 | 11.7  |
| 630        | do.....          | M      | 55       | 1                                      | Nodular...       | AMA                  | Atrophy and spindle deformity in phalanges of feet; atrophy throughout hands.   | All kinds.....                            | do.....            | do.....                             | 3.12                                   | 10.2                                      | 5.0                                      | 49.0                          | 31.8                                 | 15.6  |
| 631        | do.....          | F      | 27       | 20                                     | Mixed....        | AMA                  | Moderate atrophy hands and feet. Spindle deformity and some absorption in phalanges of feet.  | Meat, milk, vegetables, fruit.            | Eggs, cereals...   | do.....                             | 2.88                                   | 9.2                                       | 4.6                                      | 50.0                          | 26.4                                 | 12.8  |

| 632 | ...do....      | M | 55 | 5     | Anesthet-<br>ic. | AMA | Small amount of atrophy<br>in bones of hands and<br>feet.<br>Hands normal.<br>Practically no changes.             | Fruit, vegetables,<br>spinach, bread.<br>All kinds.<br>Vegetables, eggs,<br>milk, bread.<br>Vegetables, fruit<br>bread. | Cereals, meat..... | C. O. 30 minims..... | 3.12 | 9.5  | 4.5  | 47.3 | 22.6 | 14.0 |
|-----|----------------|---|----|-------|------------------|-----|---|---|--------------------|----------------------|------|------|------|------|------|------|
| 634 | Filipino.      | M | 23 | 1 1/2 | do.....          | AE  | Small amount of atrophy<br>in bones of hands and<br>feet.   |   |                    |                      |      |      |      |      |      |      |
| 636 | Mexi-<br>can.  | F | 42 | 1 1/2 | Nodular..        | AE  | Practically no changes.   |   |                    |                      |      |      |      |      |      |      |
| 637 | Hawai-<br>ian. | F | 23 | 1 1/2 | Mixed....        | AE  | Rarefaction throughout<br>feet with spindle de-<br>formity of proximal<br>phalanges. Atrophy<br>throughout hands. |   |                    |                      |      |      |      |      |      |      |
|     |                |   |    |       |                  |     | Average.....  |   |                    |                      |      |      |      |      |      |      |
|     |                |   |    |       |                  |     |   |   |                    |                      | 3.38 | 10.1 | 4.75 | 46.8 | 34.1 | 13.0 |

In the above series the average findings of inorganic phosphorus, total calcium, and consequently the calcium-phosphorus balance ratio, were practically the same in the sera of the leprosy patients as in the control sera and were well within the normal range. The average findings of diffusible calcium, however, were considerably lower in the patients than in the controls, the patients averaging 4.75 mgm. per 100 c. c. of serum to controls 5.8 mgm.; thus the per cent of calcium that was diffusible in the patients was 46.8, against 57.8 in the controls. The diffusible calcium-phosphorus balance ratio (diffusible calcium  $\times$  inorganic phosphorus) averaged 16 in the patients, as compared to 18.8 in the controls. A very wide range of diffusible calcium was found in the patients' sera; the largest quantity was 6.2 mgm., while the smallest was 3.1 mgm. per 100 c. c. of serum. The per cent of calcium that was diffusible ranged between 61 and 29.8. In the controls the quantity of diffusible calcium ranged between 6.5 mgm. and 5.4 mgm. per 100 c. c. of serum, and the per cent of calcium that was diffusible was between 64.5 and 52.1.

Fourteen patients were taking 75 or more minims of chaulmoogra oil daily by mouth over a long period of time; one of these, taking 100 minims daily, had 5.8 mgm. of diffusible calcium in the serum, representing 58 per cent of the total calcium, while another, taking 300 minims, had 3.1 mgm., representing 29.8 per cent, showing that chaulmoogra oil probably does not have any influence on the diffusible calcium.

The food served to these patients represented the best that could be purchased and was served in excellent variety. An investigation was made of the varieties that were eaten freely and those eaten sparingly, and it was concluded that the food had no influence on the chemical findings in the serum of this series.

Bones of the hands and feet of 48 of the 53 patients were examined by X ray, and it was found that 44 had atrophy either in the form of decalcification or bone absorption to some degree. Twenty-one of these 48 patients had marked bone atrophy, 10 had atrophy in a moderate degree, 6 had slight atrophy and 4 were practically normal, while 10 showed atrophy in varying degrees, with evidence of proliferation or regenerative changes.

The diffusible calcium of the 21 patients showing marked bone atrophy (Table IV) averaged 4.5 mgm. per 100 c. c. of serum; only 2 of these patients had diffusible calcium within the normal range. Patient No. 275 had 6.2 mgm. and No. 401 had 5.8., while 15 of these patients had less than 5 mgm. per 100 c. c. of serum, the lowest of which was 3.1 mgm. Of the 10 patients showing moderate bone atrophy (Table V), an average of 4.8 mgm. was found. Two of these patients had diffusible calcium barely within normal limits, 5.5 mgm.,



while five patients had less than 5.0 mgm. per 100 c. c. of serum. Of six patients showing slight bone atrophy (Table VI), the average findings were 5.0 mgm., and for the four patients having practically normal bones (Table VII) the average findings were 5.1 mgm. per 100 c. c. of serum. Of the seven patients showing evidence of proliferative changes and bone atrophy (Table VIII), the average findings were 5.0 mgm. per 100 c. c. of serum.

TABLE IV.—*Patients showing marked bone atrophy*

| Reg. No.     | Phosphorus                       | Calcium (total)                  | Diffusible calcium               | Diffusible calcium | Calcium-phosphorus balance | Diffusible calcium-phosphorus balance |
|--------------|----------------------------------|----------------------------------|----------------------------------|--------------------|----------------------------|---------------------------------------|
|              | <i>Mgms. per 100 c. c. serum</i> | <i>Mgms. per 100 c. c. serum</i> | <i>Mgms. per 100 c. c. serum</i> | <i>Per cent</i>    | <i>Ratio</i>               | <i>Ratio</i>                          |
| 43.....      | 3.2                              | 9.8                              | 4.6                              | 46.9               | 31.3                       | 14.7                                  |
| 275.....     | 3.34                             | 12.0                             | 6.2                              | 51.6               | 40.0                       | 20.7                                  |
| 276.....     | 3.12                             | 10.0                             | 5.4                              | 54.0               | 31.2                       | 16.8                                  |
| 370.....     | 3.4                              | 9.8                              | 4.2                              | 42.8               | 33.3                       | 14.2                                  |
| 401.....     | 3.2                              | 11.0                             | 5.8                              | 52.7               | 35.2                       | 18.5                                  |
| 525.....     | 3.75                             | 9.4                              | 4.6                              | 48.9               | 35.2                       | 17.2                                  |
| 528.....     | 2.88                             | 9.4                              | 4.9                              | 52.0               | 27.0                       | 14.3                                  |
| 536.....     | 1.9                              | 9.6                              | 3.8                              | 39.5               | 18.2                       | 7.2                                   |
| 537.....     | 3.07                             | 10.4                             | 3.1                              | 29.8               | 31.1                       | 9.5                                   |
| 549.....     | 3.0                              | 10.4                             | 3.9                              | 37.4               | 31.2                       | 11.7                                  |
| 552.....     | 2.5                              | 9.5                              | 4.6                              | 48.4               | 23.7                       | 11.5                                  |
| 557.....     | 3.25                             | 10.2                             | 3.2                              | 31.3               | 33.1                       | 10.4                                  |
| 558.....     | 3.4                              | 9.6                              | 3.4                              | 35.4               | 31.6                       | 11.5                                  |
| 590.....     | 3.56                             | 10.5                             | 5.1                              | 43.5               | 37.3                       | 18.1                                  |
| 598.....     | 3.7                              | 11.0                             | 4.5                              | 40.9               | 40.7                       | 16.6                                  |
| 491.....     | 4.16                             | 11.4                             | 5.2                              | 45.7               | 47.3                       | 21.6                                  |
| 606.....     | 3.02                             | 10.0                             | 3.8                              | 38.0               | 30.2                       | 11.4                                  |
| 627.....     | 4.16                             | 10.9                             | 4.2                              | 38.5               | 45.6                       | 17.4                                  |
| 628.....     | 2.6                              | 10.2                             | 4.5                              | 44.1               | 26.5                       | 11.7                                  |
| 630.....     | 3.12                             | 10.2                             | 5.0                              | 49.0               | 31.8                       | 15.6                                  |
| 637.....     | 3.0                              | 9.8                              | 4.8                              | 48.9               | 29.7                       | 14.7                                  |
| Average..... | 3.2                              | 10.2                             | 4.5                              | 44.0               | 32.9                       | 14.5                                  |

TABLE V.—*Patients showing moderate bone atrophy*

| Reg. No.     | Phosphorus                       | Calcium (total)                  | Diffusible calcium               | Diffusible calcium | Calcium-phosphorus balance | Diffusible calcium-phosphorus balance |
|--------------|----------------------------------|----------------------------------|----------------------------------|--------------------|----------------------------|---------------------------------------|
|              | <i>Mgms. per 100 c. c. serum</i> | <i>Mgms. per 100 c. c. serum</i> | <i>Mgms. per 100 c. c. serum</i> | <i>Per cent</i>    | <i>Ratio</i>               | <i>Ratio</i>                          |
| 174.....     | 3.25                             | 10.8                             | 4.8                              | 44.4               | 35.1                       | 15.6                                  |
| 332.....     | 4.16                             | 9.7                              | 5.5                              | 56.7               | 40.3                       | 22.6                                  |
| 452.....     | 3.7                              | 11.2                             | 5.1                              | 45.5               | 41.4                       | 18.6                                  |
| 514.....     | 3.4                              | 10.2                             | 4.4                              | 43.5               | 34.6                       | 14.9                                  |
| 523.....     | 3.7                              | 9.0                              | 4.3                              | 47.7               | 33.3                       | 15.9                                  |
| 545.....     | 2.7                              | 11.2                             | 3.9                              | 34.8               | 30.2                       | 14.4                                  |
| 553.....     | 2.7                              | 10.3                             | 5.3                              | 51.4               | 27.8                       | 14.0                                  |
| 615.....     | 2.8                              | 10.0                             | 5.5                              | 55.0               | 28.0                       | 15.4                                  |
| 618.....     | 3.2                              | 9.8                              | 5.0                              | 51.0               | 31.3                       | 16.5                                  |
| 631.....     | 2.88                             | 9.2                              | 4.6                              | 50.0               | 26.4                       | 13.3                                  |
| Average..... | 3.24                             | 10.1                             | 4.8                              | 48.0               | 32.8                       | 16.1                                  |

TABLE VI.—*Patients showing slight bone atrophy*

| Reg. No.     | Phosphorus                       | Calcium (total)                  | Diffusible calcium               | Diffusible calcium | Calcium-phosphorus balance | Diffusible calcium-phosphorus balance |
|--------------|----------------------------------|----------------------------------|----------------------------------|--------------------|----------------------------|---------------------------------------|
|              | <i>Mgms. per 100 c. c. serum</i> | <i>Mgms. per 100 c. c. serum</i> | <i>Mgms. per 100 c. c. serum</i> | <i>Per cent</i>    | <i>Ratio</i>               | <i>Ratio</i>                          |
| 535.....     | 3.75                             | 10.3                             | 5.2                              | 50.4               | 38.6                       | 19.5                                  |
| 543.....     | 3.3                              | 10.6                             | 5.4                              | 50.9               | 34.9                       | 17.8                                  |
| 602.....     | 3.11                             | 11.2                             | 5.1                              | 45.5               | 34.7                       | 15.8                                  |
| 605.....     | 3.0                              | 11.2                             | 5.3                              | 47.3               | 33.6                       | 15.9                                  |
| 625.....     | 3.6                              | 10.5                             | 4.8                              | 45.7               | 37.8                       | 17.2                                  |
| 632.....     | 3.12                             | 9.5                              | 4.5                              | 47.3               | 29.6                       | 14.1                                  |
| Average..... | 3.31                             | 10.5                             | 5.0                              | 47.8               | 34.8                       | 16.7                                  |

TABLE VII.—*Patients having practically no bone changes*

| Reg. No.     | Phosphorus                       | Calcium (total)                  | Diffusible calcium               | Diffusible calcium | Calcium-phosphorus balance | Diffusible calcium-phosphorus balance |
|--------------|----------------------------------|----------------------------------|----------------------------------|--------------------|----------------------------|---------------------------------------|
|              | <i>Mgms. per 100 c. c. serum</i> | <i>Mgms. per 100 c. c. serum</i> | <i>Mgms. per 100 c. c. serum</i> | <i>Per cent</i>    | <i>Ratio</i>               | <i>Ratio</i>                          |
| 559.....     | 2.22                             | 11.5                             | 4.9                              | 42.5               | 25.5                       | 10.8                                  |
| 616.....     | 3.5                              | 10.0                             | 5.8                              | 58.0               | 35.0                       | 20.3                                  |
| 634.....     | 2.8                              | 9.2                              | 4.0                              | 43.4               | 25.7                       | 11.2                                  |
| 636.....     | 2.8                              | 9.5                              | 5.8                              | 61.0               | 26.6                       | 16.2                                  |
| Average..... | 2.83                             | 10.0                             | 5.1                              | 51.2               | 28.2                       | 14.5                                  |

TABLE VIII.—*Patients showing bone atrophy and proliferative changes*

| Reg. No.     | Phosphorus                       | Calcium (total)                  | Diffusible calcium               | Diffusible calcium | Calcium-phosphorus balance | Diffusible calcium-phosphorus balance |
|--------------|----------------------------------|----------------------------------|----------------------------------|--------------------|----------------------------|---------------------------------------|
|              | <i>Mgms. per 100 c. c. serum</i> | <i>Mgms. per 100 c. c. serum</i> | <i>Mgms. per 100 c. c. serum</i> | <i>Per cent</i>    | <i>Ratio</i>               | <i>Ratio</i>                          |
| 485.....     | 3.9                              | 9.9                              | 5.0                              | 50.0               | 38.7                       | 19.5                                  |
| 504.....     | 3.4                              | 9.1                              | 5.0                              | 54.8               | 30.9                       | 17.0                                  |
| 522.....     | 3.0                              | 9.6                              | 4.6                              | 47.8               | 28.8                       | 13.8                                  |
| 527.....     | 3.75                             | 10.0                             | 5.1                              | 51.0               | 37.5                       | 19.1                                  |
| 540.....     | 3.0                              | 10.0                             | 4.8                              | 48.0               | 30.0                       | 14.4                                  |
| 560.....     | 3.7                              | 11.9                             | 5.6                              | 47.0               | 44.0                       | 20.5                                  |
| 565.....     | 7.5                              | 9.6                              | 5.0                              | 52.0               | 72.0                       | 37.5                                  |
| Average..... | 4.03                             | 10.0                             | 5.0                              | 50.0               | 40.3                       | 20.2                                  |

A study of the patients' sera in the various types and stages of progression of leprosy was made, and the diffusible calcium was found to average lower in the mixed and anesthetic types than in the nodular type of the disease and lower in the far advanced stage than in the early or moderately advanced. (Tables IX, X, XI, and XII.) The per cent of diffusible calcium was slightly lower in the early stage than in the moderately advanced stage of progression.

TABLE IX.—*Stage of progression: Active far advanced leprosy*

## NODULAR TYPE

| Reg. No.     | Duration (years) | X-ray findings                       | Phosphorus                | Calcium (total)           | Diffusible calcium        | Diffusible calcium | Calcium-phosphorus balance | Diffusible calcium-phosphorus balance |
|--------------|------------------|--------------------------------------|---------------------------|---------------------------|---------------------------|--------------------|----------------------------|---------------------------------------|
|              |                  |                                      | Mgms. per 100 c. c. serum | Mgms. per 100 c. c. serum | Mgms. per 100 c. c. serum | Per cent           | Ratio                      | Ratio                                 |
| 276.....     | 20               | Marked bone atrophy.....             | 3.12                      | 10.0                      | 5.4                       | 54.0               | 31.2                       | 16.8                                  |
| 504.....     | 11               | Bone atrophy with proliferation..... | 3.4                       | 9.1                       | 5.0                       | 54.8               | 31.9                       | 17.0                                  |
| 518.....     | 10               | .....                                | 3.4                       | 9.0                       | 4.4                       | 48.8               | 30.6                       | 14.9                                  |
| 525.....     | 11               | Marked bone atrophy.....             | 3.75                      | 9.4                       | 4.6                       | 48.9               | 35.2                       | 17.2                                  |
| 552.....     | 19               | do.....                              | 2.5                       | 9.5                       | 4.6                       | 48.4               | 23.7                       | 11.5                                  |
| 590.....     | 11               | do.....                              | 3.56                      | 10.5                      | 5.1                       | 48.5               | 37.3                       | 18.1                                  |
| Average..... |                  |                                      | 3.28                      | 9.5                       | 4.8                       | 50.5               | 31.6                       | 15.9                                  |

## ANESTHETIC TYPE

|         |    |                          |     |     |     |      |      |      |
|---------|----|--------------------------|-----|-----|-----|------|------|------|
| 43..... | 17 | Marked bone atrophy..... | 3.2 | 9.8 | 4.6 | 46.9 | 31.3 | 14.7 |
|---------|----|--------------------------|-----|-----|-----|------|------|------|

## MIXED TYPE

|              |    |                          |     |      |     |      |      |      |
|--------------|----|--------------------------|-----|------|-----|------|------|------|
| 335.....     | 9  | .....                    | 4.5 | 8.6  | 3.8 | 44.1 | 38.7 | 17.1 |
| 598.....     | 15 | Marked bone atrophy..... | 3.7 | 11.0 | 4.5 | 40.9 | 40.7 | 16.6 |
| Average..... |    |                          | 4.1 | 9.8  | 4.1 | 42.5 | 42.7 | 16.8 |

TABLE X.—*Stage of progression: Active moderately advanced leprosy*

## NODULAR TYPE

| Reg. No.     | Duration (years) | X-ray findings                       | Phosphorus                | Calcium (total)           | Diffusible calcium        | Diffusible calcium | Calcium-phosphorus balance | Diffusible calcium-phosphorus balance |
|--------------|------------------|--------------------------------------|---------------------------|---------------------------|---------------------------|--------------------|----------------------------|---------------------------------------|
|              |                  |                                      | Mgms. per 100 c. c. serum | Mgms. per 100 c. c. serum | Mgms. per 100 c. c. serum | Per cent           | Ratio                      | Ratio                                 |
| 174.....     | 11               | Moderate bone atrophy.....           | 3.25                      | 10.8                      | 4.8                       | 44.4               | 35.1                       | 15.6                                  |
| 136.....     | 8                | .....                                | 3.56                      | 10.5                      | 4.9                       | 46.6               | 37.3                       | 17.4                                  |
| 452.....     | 4                | Moderate bone atrophy.....           | 3.7                       | 11.2                      | 5.1                       | 45.5               | 41.4                       | 18.6                                  |
| 528.....     | 6                | Marked bone atrophy.....             | 2.88                      | 9.4                       | 4.9                       | 52.0               | 27.0                       | 14.3                                  |
| 560.....     | 6                | Bone atrophy with proliferation..... | 3.7                       | 11.9                      | 5.6                       | 47.0               | 44.0                       | 20.5                                  |
| 565.....     | 6                | do.....                              | 7.5                       | 9.6                       | 5.0                       | 52.0               | 72.0                       | 37.5                                  |
| 401.....     | 5                | Marked bone atrophy.....             | 4.16                      | 11.4                      | 5.2                       | 45.7               | 47.3                       | 21.6                                  |
| 618.....     | 3                | Moderate bone atrophy.....           | 3.2                       | 9.8                       | 5.0                       | 51.0               | 31.3                       | 16.5                                  |
| 626.....     | 1                | .....                                | 3.26                      | 10.0                      | 5.5                       | 55.0               | 32.6                       | 17.0                                  |
| 630.....     | 1                | Marked bone atrophy.....             | 3.12                      | 10.2                      | 5.0                       | 49.0               | 31.8                       | 15.6                                  |
| Average..... |                  |                                      | 3.83                      | 10.4                      | 5.1                       | 48.8               | 39.8                       | 19.4                                  |

## ANESTHETIC TYPE

|              |    |                                      |      |      |     |      |      |      |
|--------------|----|--------------------------------------|------|------|-----|------|------|------|
| 522.....     | 7  | Bone atrophy with proliferation..... | 3.0  | 9.6  | 4.6 | 47.8 | 28.8 | 13.8 |
| 549.....     | 20 | Marked bone atrophy.....             | 3.0  | 10.4 | 3.9 | 37.4 | 31.2 | 11.7 |
| 557.....     | 21 | do.....                              | 3.25 | 10.2 | 3.2 | 31.3 | 33.1 | 10.4 |
| 632.....     | 5  | Slight bone atrophy.....             | 3.12 | 9.5  | 4.5 | 47.3 | 29.6 | 14.1 |
| Average..... |    |                                      | 3.09 | 9.9  | 4.0 | 40.9 | 30.7 | 12.5 |

TABLE X.—*Stage of progression: Active moderately advanced leprosy—Continued*

## MIXED TYPE

| Reg. No.     | Duration (years) | X-ray findings             | Phosphorus                | Calcium (total)           | Diffusible calcium        | Diffusible calcium | Calcium-phosphorus balance | Diffusible calcium-phosphorus balance |
|--------------|------------------|----------------------------|---------------------------|---------------------------|---------------------------|--------------------|----------------------------|---------------------------------------|
|              |                  |                            | Mgms. per 100 c. c. serum | Mgms. per 100 c. c. serum | Mgms. per 100 c. c. serum | Per cent           | Ratio                      | Ratio                                 |
| 241.....     | 12               | .....                      | 4.3                       | 10.2                      | 4.1                       | 40.1               | 43.8                       | 17.6                                  |
| 275.....     | 11               | Marked bone atrophy.....   | 3.34                      | 12.0                      | 6.2                       | 51.6               | 40.0                       | 20.7                                  |
| 332.....     | 8                | Moderate bone atrophy..... | 4.16                      | 9.7                       | 5.5                       | 56.7               | 40.3                       | 22.6                                  |
| 370.....     | 8                | Marked bone atrophy.....   | 3.4                       | 9.8                       | 4.2                       | 42.8               | 33.3                       | 14.2                                  |
| 401.....     | 12               | do.....                    | 3.2                       | 11.0                      | 5.8                       | 52.7               | 35.2                       | 18.5                                  |
| 514.....     | 13               | Moderate bone atrophy..... | 3.4                       | 10.2                      | 4.4                       | 43.5               | 34.6                       | 14.9                                  |
| 523.....     | 4                | do.....                    | 3.7                       | 9.0                       | 4.3                       | 47.7               | 33.3                       | 15.9                                  |
| 535.....     | 4                | Slight bone atrophy.....   | 3.75                      | 10.3                      | 5.2                       | 50.4               | 38.6                       | 19.5                                  |
| 553.....     | 4                | Moderate bone atrophy..... | 2.7                       | 10.3                      | 5.3                       | 51.4               | 27.8                       | 14.0                                  |
| 558.....     | 7                | Marked bone atrophy.....   | 3.4                       | 9.6                       | 3.4                       | 35.4               | 31.6                       | 11.5                                  |
| 602.....     | 3                | Slight bone atrophy.....   | 3.11                      | 11.2                      | 5.1                       | 45.5               | 34.7                       | 15.8                                  |
| 606.....     | 19               | Marked bone atrophy.....   | 3.02                      | 10.0                      | 3.8                       | 38.0               | 30.2                       | 11.4                                  |
| 616.....     | 12               | Normal bones.....          | 3.5                       | 10.0                      | 5.8                       | 58.0               | 35.0                       | 20.3                                  |
| 631.....     | 20               | Moderate bone atrophy..... | 2.88                      | 9.2                       | 4.6                       | 50.0               | 26.4                       | 13.3                                  |
| Average..... |                  |                            | 3.41                      | 10.1                      | 4.8                       | 47.4               | 34.5                       | 16.5                                  |

TABLE XI.—*Stage of progression: Active early leprosy*

## NODULAR TYPE

| Reg. No.     | Duration (years) | X-ray findings                       | Phosphorus                | Calcium (total)           | Diffusible calcium        | Diffusible calcium | Calcium-phosphorus balance | Diffusible calcium-phosphorus balance |
|--------------|------------------|--------------------------------------|---------------------------|---------------------------|---------------------------|--------------------|----------------------------|---------------------------------------|
|              |                  |                                      | Mgms. per 100 c. c. serum | Mgms. per 100 c. c. serum | Mgms. per 100 c. c. serum | Per cent           | Ratio                      | Ratio                                 |
| 540.....     | 1½               | Bone atrophy with proliferation..... | 3.0                       | 10.0                      | 4.8                       | 48.0               | 30.0                       | 14.4                                  |
| 545.....     | 2                | Moderate bone atrophy.....           | 2.7                       | 11.2                      | 3.9                       | 34.8               | 30.2                       | 14.4                                  |
| 559.....     | 3                | Normal bones.....                    | 2.22                      | 11.5                      | 4.9                       | 42.5               | 25.5                       | 10.8                                  |
| 605.....     | 2                | Slight bone atrophy.....             | 3.0                       | 11.2                      | 5.3                       | 47.3               | 33.6                       | 15.9                                  |
| 625.....     | 1                | do.....                              | 3.6                       | 10.5                      | 4.8                       | 45.7               | 37.8                       | 17.2                                  |
| 636.....     | ½                | Normal bones.....                    | 2.8                       | 9.5                       | 5.8                       | 61.0               | 26.6                       | 16.2                                  |
| Average..... |                  |                                      | 2.88                      | 10.6                      | 4.9                       | 46.5               | 30.6                       | 14.8                                  |

## ANESTHETIC TYPE

|          |   |                   |     |     |     |      |      |      |
|----------|---|-------------------|-----|-----|-----|------|------|------|
| 634..... | ½ | Normal bones..... | 2.8 | 9.2 | 4.0 | 43.4 | 25.7 | 11.2 |
|----------|---|-------------------|-----|-----|-----|------|------|------|

## MIXED TYPE

|              |    |                                      |      |      |     |      |      |      |
|--------------|----|--------------------------------------|------|------|-----|------|------|------|
| 485.....     | 13 | Bone atrophy with proliferation..... | 3.9  | 9.9  | 5.0 | 50.0 | 38.7 | 19.5 |
| 527.....     | 11 | do.....                              | 3.75 | 10.0 | 5.1 | 51.0 | 37.5 | 19.1 |
| 537.....     | 2  | Marked bone atrophy.....             | 3.07 | 10.4 | 3.1 | 29.8 | 31.1 | 9.5  |
| 543.....     | 3  | Slight bone atrophy.....             | 3.3  | 10.6 | 5.4 | 50.9 | 34.9 | 17.8 |
| 627.....     | ½  | Marked bone atrophy.....             | 4.16 | 10.9 | 4.2 | 38.5 | 45.6 | 17.4 |
| 628.....     | 2½ | do.....                              | 2.6  | 10.2 | 4.5 | 44.1 | 26.5 | 11.7 |
| 637.....     | ½  | do.....                              | 3.0  | 9.8  | 4.8 | 48.9 | 29.7 | 14.7 |
| Average..... |    |                                      | 3.39 | 10.2 | 4.5 | 44.7 | 34.8 | 15.6 |

TABLE XII.—*Stage of progression*

## ARRESTED

| Reg. No. | Duration,<br>(years) | X-ray findings           | Phosphorus                         | Calcium<br>(total)                 | Diffusible calcium                 | Diffusible calcium | Calcium phosphorus<br>balance | Diffusible calcium-phosphorus<br>balance |
|----------|----------------------|--------------------------|------------------------------------|------------------------------------|------------------------------------|--------------------|-------------------------------|--|
|          |                      |                          | Mgms.<br>per 100<br>c. c.<br>serum | Mgms.<br>per 100<br>c. c.<br>serum | Mgms.<br>per 100<br>c. c.<br>serum | Per cent           | Ratio                         | Ratio                                    |
| 536..... | 5                    | Marked bone atrophy..... | 1.9                                | 9.6                                | 3.8                                | 39.5               | 18.2                          | 7.2                                      |

## APPARENTLY ARRESTED: ANESTHETIC TYPE

|          |    |                            |     |      |     |      |      |      |
|----------|----|----------------------------|-----|------|-----|------|------|------|
| 615..... | 11 | Moderate bone atrophy..... | 2.8 | 10.0 | 5.5 | 55.0 | 28.0 | 15.4 |
|----------|----|----------------------------|-----|------|-----|------|------|------|

The diffusible calcium-phosphorus balance ratio (diffusible calcium  $\times$  inorganic phosphorus in the serum) was calculated, and it was found that this factor was lower in the patients having marked and moderate bone atrophy than in those having slight atrophy and atrophy with proliferation due to the lower amounts of diffusible calcium. Patients having practically no bone changes also had a low balance ratio, due to low inorganic phosphorus content, though the diffusible calcium was relatively high. The diffusible calcium-phosphorus balance ratio in the sera of the controls averaged higher than in the patients'.

## SUMMARY

Sera from 47 lepers were analyzed for calcium and inorganic phosphorus; the results were found to be within the range usually considered normal.

Sera from 15 normal, healthy young men were examined for inorganic phosphorus, total calcium, diffusible calcium; the per cent of calcium that was diffusible, the calcium phosphorus, and the diffusible calcium-phosphorus balance ratios were determined. Sera from 53 lepers, representing the various types and stages of progression of the disease, were similarly examined.

The diffusible calcium and the per cent of total calcium that was diffusible averaged considerably lower in the lepers than in the normal young men, and in only a few instances did the diffusible calcium in the lepers approximate the level found in the controls.

Radiographic studies of the bones of the hands and feet of 48 of these lepers showed bone atrophy in 44 (91.0 per cent), the condition manifesting itself either as decalcification or absorption.

The writers appreciate that the records here submitted do not include a sufficient number of cases, observed over a sufficiently long period, to warrant the drawing of conclusions; it is thought,

however, that deviation from the presumed normal has been marked enough to justify continuation of the investigation.

#### ACKNOWLEDGMENTS

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#### REFERENCES

- (1) Underhill, E. P., Hoenig, J. A., and Bogert, L. G. Calcium and Magnesium Metabolism in Leprosy. Jour. Exper. Med. 32: 41. 1920.
- (2) Boulay, A., and Leger, M. Bull. Soc. Path. exot. Paris, 15: 1002. Oct. 21, 1921.
- (3) Conception, I., and Salcedo, J. The Calcium Content of Blood in Leprosy. Jour. Philippine Isls. M. A. 6: 154-157. May, 1926.
- (4) Lemann, I. I., Liles, R. T., and Johansen, F. A. Blood Serum Calcium in Leprosy. Amer. Jour. of Trop. Med. 7: 61-70. January, 1927.
- (5) Cruz, M. C., Lara, C. B., and Paras, E. M. Blood Calcium in Leprosy. Jour. Philippine Isls. M. A. May, 1928.
- (6) Price, Weston A. Jour. Am. Dental Ass. 16, No. 3: 456-480. March, 1929.
- (7) Clark and Collip. Jour. Biol. Chem. 63: 461. 1925.
- (8) Benedict and Theis. Jour. Biol. Chem. 61: 63. 1924.
- (9) Morse, W. Applied Biochemistry, 2d edition, p. 404.
- (10) Moritz, Alan R. The Effect of Ultra-violet Irradiation on the State of the Serum Calcium. Jour. Biol. Chem. 64: 81-89. 1925.

### DEATHS FROM INFLUENZA AND PNEUMONIA IN LARGE CITIES

*Deaths from influenza and pneumonia (all forms) in certain large cities of the United States during the three weeks ended February 28, 1931—a continuation of the table appearing on page 483 of the Public Health Reports dated February 27, 1931. (From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce)*

| City            | Influenza   |         |         | Pneumonia   |         |         |
|-----------------|-------------|---------|---------|-------------|---------|---------|
|                 | Week ended— |         |         | Week ended— |         |         |
|                 | Feb. 28     | Feb. 21 | Feb. 14 | Feb. 28     | Feb. 21 | Feb. 14 |
| Total.....      | 316         | 352     | 341     | 1,409       | 1,484   | 1,485   |
| Akron.....      | 1           | 3       | 0       | 8           | 5       | 4       |
| Albany.....     | 1           | 1       | 2       | 9           | 9       | 14      |
| Atlanta.....    | 16          | 14      | 10      | 18          | 15      | 11      |
| Baltimore.....  | 7           | 13      | 17      | 42          | 55      | 62      |
| Birmingham..... | 3           | 7       | 1       | 8           | 12      | 8       |
| Boston.....     | 3           | 7       | 7       | 35          | 48      | 66      |
| Bridgeport..... | 2           | 3       | 1       | 5           | 6       | 5       |
| Buffalo.....    | 0           | 4       | 2       | 50          | 43      | 33      |
| Cambridge.....  | 1           | 0       | 0       | 6           | 3       | 8       |
| Camden.....     | 1           | 5       | 4       | 5           | 11      | 7       |
| Canton.....     | 0           | 0       | 0       | 4           | 3       | 2       |
| Chicago.....    | 18          | 26      | 54      | 88          | 104     | 130     |
| Cincinnati..... | 15          | 11      | 3       | 24          | 23      | 11      |
| Cleveland.....  | 15          | 20      | 8       | 33          | 44      | 29      |
| Columbus.....   | 4           | 1       | 4       | 7           | 10      | 11      |

*Deaths from influenza and pneumonia (all forms) in certain large cities of the United States during the three weeks ended February 28, 1931—a continuation of the table appearing on page 483 of the Public Health Reports dated February 27, 1931. (From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce)—Continued*

| City                   | Influenza   |         |         | Pneumonia   |         |         |
|------------------------|-------------|---------|---------|-------------|---------|---------|
|                        | Week ended— |         |         | Week ended— |         |         |
|                        | Feb. 28     | Feb. 21 | Feb. 14 | Feb. 28     | Feb. 21 | Feb. 14 |
| Dallas.....            | 5           | 5       | 0       | 6           | 10      | 7       |
| Dayton.....            | 1           | 2       | 1       | 7           | 8       | 8       |
| Denver.....            | 4           | 7       | 6       | 21          | 12      | 12      |
| Des Moines.....        | 0           | 0       | 0       | 5           | 2       | 8       |
| Detroit.....           | 21          | 27      | 11      | 56          | 64      | 52      |
| Duluth.....            | 5           | 2       | 0       | 2           | 4       | 1       |
| El Paso.....           | 1           | 1       | 1       | 5           | 8       | 4       |
| Erie.....              | 0           | 2       | 2       | 0           | 7       | 5       |
| Fall River.....        | 1           | 1       | 0       | 5           | 3       | 4       |
| Flint.....             | 3           | 1       | 1       | 6           | 2       | 3       |
| Fort Worth.....        | 2           | 4       | 1       | 3           | 1       | 4       |
| Grand Rapids.....      | 1           | 2       | 0       | 2           | 0       | 2       |
| Houston.....           | 0           | 1       | 5       | 12          | 13      | 5       |
| Indianapolis.....      | 3           | 1       | 5       | 38          | 27      | 24      |
| Jersey City.....       | 1           | 1       | 2       | 18          | 18      | 21      |
| Kansas City, Kans..... | 0           | 0       | 1       | 10          | 6       | 5       |
| Kansas City, Mo.....   | 2           | 1       | 3       | 23          | 21      | 21      |
| Knoxville.....         | 3           | 1       | 4       | 4           | 8       | 3       |
| Long Beach.....        | 1           | 0       | 0       | 3           | 3       | 0       |
| Los Angeles.....       | 6           | 5       | 1       | 23          | 20      | 14      |
| Louisville.....        | 4           | 1       | 1       | 18          | 18      | 14      |
| Lowell.....            | 0           | 0       | 2       | 3           | 1       | 7       |
| Lynn.....              | 0           | 0       | 0       | 3           | 7       | 3       |
| Memphis.....           | 4           | 7       | 2       | 10          | 11      | 8       |
| Miami.....             | 1           | 1       | 3       | 3           | 2       | 0       |
| Milwaukee.....         | 14          | 8       | 7       | 19          | 14      | 18      |
| Minneapolis.....       | 8           | 3       | 2       | 18          | 10      | 13      |
| Nashville.....         | 6           | 6       | 2       | 14          | 14      | 6       |
| New Bedford.....       | 0           | 0       | 0       | 3           | 8       | 11      |
| New Haven.....         | 1           | 2       | 0       | 8           | 5       | 5       |
| New Orleans.....       | 5           | 14      | 16      | 22          | 19      | 16      |
| New York.....          | 32          | 30      | 49      | 265         | 277     | 308     |
| Newark, N. J.....      | 0           | 3       | 2       | 13          | 19      | 21      |
| Oakland.....           | 2           | 2       | 1       | 4           | 4       | 2       |
| Oklahoma City.....     | 0           | 1       | 0       | 8           | 15      | 3       |
| Omaha.....             | 0           | 4       | 0       | 16          | 8       | 1       |
| Paterson.....          | 2           | 1       | 0       | 7           | 3       | 6       |
| Philadelphia.....      | 16          | 27      | 35      | 66          | 75      | 89      |
| Pittsburgh.....        | 26          | 21      | 15      | 61          | 70      | 85      |
| Portland, Oreg.....    | 1           | 0       | 0       | 3           | 5       | 6       |
| Providence.....        | 1           | 0       | 5       | 15          | 21      | 16      |
| Richmond.....          | 3           | 9       | 3       | 5           | 9       | 9       |
| Rochester.....         | 5           | 2       | 0       | 13          | 15      | 11      |
| St. Louis.....         | 0           | 0       | 9       | 61          | 68      | 70      |
| St. Paul.....          | 2           | 0       | 0       | 8           | 6       | 2       |
| Salt Lake City.....    | 0           | 0       | 0       | 3           | 4       | 2       |
| San Antonio.....       | 3           | 7       | 2       | 13          | 9       | 11      |
| San Diego.....         | 0           | 1       | 0       | 0           | 2       | 1       |
| San Francisco.....     | 8           | 4       | 4       | 18          | 15      | 15      |
| Schenectady.....       | 1           | 1       | 1       | 3           | 1       | 2       |
| Seattle.....           | 0           | 1       | 1       | 6           | 4       | 4       |
| Somerville.....        | 0           | 0       | 1       | 9           | 5       | 9       |
| South Bend.....        | 1           | 1       | 0       | 5           | 3       | 3       |
| Spokane.....           | 0           | 1       | 0       | 2           | 0       | 1       |
| Springfield, Mass..... | 2           | 0       | 2       | 5           | 9       | 14      |
| Syracuse.....          | 4           | 0       | 0       | 2           | 4       | 2       |
| Tacoma.....            | 1           | 0       | 1       | 4           | 3       | 1       |
| Toledo.....            | 6           | 5       | 1       | 19          | 15      | 10      |
| Trenton.....           | 1           | 1       | 2       | 6           | 10      | 3       |
| Utica.....             | 0           | 1       | 1       | 4           | 9       | 7       |
| Washington, D. C.....  | 3           | 4       | 8       | 29          | 35      | 23      |
| Waterbury.....         | 1           | 1       | 3       | 1           | 4       | 7       |
| Wilmington, Del.....   | 2           | 0       | 2       | 5           | 3       | 12      |
| Worcester.....         | 0           | 2       | 1       | 5           | 3       | 6       |
| Yonkers.....           | 0           | 0       | 0       | 5           | 5       | 4       |
| Youngstown.....        | 3           | 1       | 0       | 3           | 9       | 6       |

## DEATHS DURING WEEK ENDED FEBRUARY 28, 1931

Summary of information received by telegraph from industrial insurance companies for the week ended February 28, 1931, and corresponding week of 1930. (From the Weekly Health Index issued by the Bureau of the Census, Department of Commerce)

|  | Week ended<br>February 28,<br>1931 | Corresponding<br>week, 1930 |
|--|------------------------------------|-----------------------------|
| Policies in force.....                                     | 75, 133, 150                       | 75, 508, 041                |
| Number of death claims.....                                | 16, 973                            | 16, 741                     |
| Death claims per 1,000 policies in force, annual rate..... | 11. 8                              | 11. 6                       |

Deaths<sup>1</sup> from all causes in certain large cities of the United States during the week ended February 28, 1931, infant mortality, annual death rate, and comparison with corresponding week of 1930. (From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce)

[The rates published in this summary are based upon mid-year population estimates derived from the 1930 census]

| City                          | Week ended Feb. 28, 1931 |                         |                     |                                    | Corresponding week, 1930 |                     | Death rate <sup>2</sup> for first 9 weeks |                  |
|-------------------------------|--------------------------|-------------------------|---------------------|------------------------------------|--------------------------|---------------------|---|------------------|
|                               | Total deaths             | Death rate <sup>2</sup> | Deaths under 1 year | Infant mortality rate <sup>3</sup> | Death rate <sup>2</sup>  | Deaths under 1 year | 1931                                      | 1930             |
| Total (81 cities).....        | 9, 569                   | 14. 0                   | 920                 | 4 73                               | 14. 1                    | 890                 | 14. 2                                     | 13. 4            |
| Akron.....                    | 42                       | 8. 5                    | 3                   | 30                                 | 7. 3                     | 3                   | 8. 4                                      | 8. 7             |
| Albany <sup>5</sup> .....     | 43                       | 17. 4                   | 2                   | 40                                 | 20. 0                    | 5                   | 15. 5                                     | 16. 9            |
| Atlanta.....                  | 86                       | 16. 2                   | 6                   | 61                                 | 21. 5                    | 9                   | 16. 7                                     | 17. 6            |
| White.....                    | 47                       | ( <sup>6</sup> )        | 2                   | 32                                 | ( <sup>6</sup> )         | 2                   | ( <sup>6</sup> )                          | ( <sup>6</sup> ) |
| Colored.....                  | 39                       | ( <sup>6</sup> )        | 4                   | 115                                | ( <sup>6</sup> )         | 7                   | ( <sup>6</sup> )                          | ( <sup>6</sup> ) |
| Baltimore <sup>5</sup> .....  | 257                      | 16. 5                   | 26                  | 88                                 | 14. 9                    | 23                  | 17. 6                                     | 15. 4            |
| White.....                    | 193                      | ( <sup>6</sup> )        | 21                  | 91                                 | ( <sup>6</sup> )         | 18                  | ( <sup>6</sup> )                          | ( <sup>6</sup> ) |
| Colored.....                  | 64                       | ( <sup>6</sup> )        | 5                   | 78                                 | ( <sup>6</sup> )         | 5                   | ( <sup>6</sup> )                          | ( <sup>6</sup> ) |
| Birmingham.....               | 78                       | 15. 1                   | 9                   | 91                                 | 16. 7                    | 11                  | 15. 0                                     | 14. 5            |
| White.....                    | 42                       | ( <sup>6</sup> )        | 4                   | 69                                 | ( <sup>6</sup> )         | 5                   | ( <sup>6</sup> )                          | ( <sup>6</sup> ) |
| Colored.....                  | 36                       | ( <sup>6</sup> )        | 5                   | 122                                | ( <sup>6</sup> )         | 6                   | ( <sup>6</sup> )                          | ( <sup>6</sup> ) |
| Boston.....                   | 239                      | 15. 9                   | 21                  | 60                                 | 16. 3                    | 31                  | 17. 7                                     | 15. 9            |
| Bridgeport.....               | 40                       | 14. 2                   | 3                   | 50                                 | 14. 2                    | 4                   | 14. 1                                     | 14. 2            |
| Buffalo.....                  | 207                      | 18. 6                   | 26                  | 106                                | 17. 9                    | 22                  | 15. 3                                     | 14. 5            |
| Cambridge.....                | 28                       | 12. 8                   | 5                   | 101                                | 16. 5                    | 1                   | 14. 4                                     | 13. 9            |
| Camden.....                   | 41                       | 18. 0                   | 8                   | 139                                | 14. 1                    | 11                  | 19. 2                                     | 14. 5            |
| Canton.....                   | 32                       | 15. 6                   | 1                   | 23                                 | 16. 8                    | 4                   | 11. 2                                     | 12. 4            |
| Chicago <sup>5</sup> .....    | 787                      | 11. 9                   | 97                  | 86                                 | 12. 8                    | 78                  | 12. 4                                     | 11. 8            |
| Cincinnati.....               | 192                      | 21. 9                   | 16                  | 96                                 | 19. 8                    | 18                  | 18. 2                                     | 17. 7            |
| Cleveland.....                | 233                      | 13. 3                   | 16                  | 47                                 | 12. 6                    | 28                  | 12. 0                                     | 12. 3            |
| Columbus.....                 | 87                       | 15. 4                   | 8                   | 78                                 | 20. 7                    | 7                   | 14. 6                                     | 15. 4            |
| Dallas.....                   | 72                       | 13. 8                   | 8                   | —                                  | 11. 3                    | 11                  | 12. 7                                     | 13. 7            |
| White.....                    | 51                       | ( <sup>6</sup> )        | 6                   | —                                  | ( <sup>6</sup> )         | 10                  | ( <sup>6</sup> )                          | ( <sup>6</sup> ) |
| Colored.....                  | 21                       | ( <sup>6</sup> )        | 2                   | —                                  | ( <sup>6</sup> )         | 1                   | ( <sup>6</sup> )                          | ( <sup>6</sup> ) |
| Dayton.....                   | 65                       | 16. 4                   | 8                   | 112                                | 11. 6                    | 3                   | 13. 8                                     | 10. 8            |
| Denver.....                   | 85                       | 15. 2                   | 11                  | 106                                | 15. 0                    | 9                   | 16. 1                                     | 15. 6            |
| Des Moines.....               | 33                       | 11. 9                   | 1                   | 18                                 | 7. 3                     | 1                   | 12. 4                                     | 12. 8            |
| Detroit.....                  | 362                      | 11. 4                   | 70                  | 112                                | 11. 6                    | 57                  | 9. 6                                      | 10. 7            |
| Duluth.....                   | 29                       | 14. 9                   | 3                   | 74                                 | 9. 2                     | 2                   | 12. 4                                     | 11. 5            |
| El Paso.....                  | 30                       | 14. 9                   | 3                   | —                                  | 13. 2                    | 5                   | 20. 4                                     | 19. 2            |
| Erie.....                     | 28                       | 12. 4                   | 1                   | 19                                 | 9. 9                     | 3                   | 11. 6                                     | 11. 4            |
| Fall River <sup>5</sup> ..... | 30                       | 13. 6                   | 4                   | 91                                 | 14. 9                    | 0                   | 13. 5                                     | 14. 1            |
| Flint.....                    | 32                       | 10. 2                   | 8                   | 102                                | 13. 9                    | 13                  | 7. 7                                      | 10. 1            |
| Fort Worth.....               | 29                       | 9. 0                    | 0                   | —                                  | 13. 3                    | 2                   | 11. 4                                     | 13. 1            |
| White.....                    | 24                       | ( <sup>6</sup> )        | 0                   | —                                  | ( <sup>6</sup> )         | 1                   | ( <sup>6</sup> )                          | ( <sup>6</sup> ) |
| Colored.....                  | 5                        | ( <sup>6</sup> )        | 0                   | —                                  | ( <sup>6</sup> )         | 1                   | ( <sup>6</sup> )                          | ( <sup>6</sup> ) |
| Grand Rapids.....             | 31                       | 9. 4                    | 5                   | 74                                 | 12. 9                    | 5                   | 9. 4                                      | 11. 1            |
| Houston.....                  | 74                       | 12. 4                   | 9                   | —                                  | 15. 0                    | 5                   | 12. 2                                     | 13. 7            |
| White.....                    | 55                       | ( <sup>6</sup> )        | 6                   | —                                  | ( <sup>6</sup> )         | 5                   | ( <sup>6</sup> )                          | ( <sup>6</sup> ) |
| Colored.....                  | 19                       | ( <sup>6</sup> )        | 3                   | —                                  | ( <sup>6</sup> )         | 0                   | ( <sup>6</sup> )                          | ( <sup>6</sup> ) |
| Indianapolis.....             | 122                      | 17. 2                   | 10                  | 82                                 | 14. 3                    | 8                   | 15. 6                                     | 16. 8            |
| White.....                    | 109                      | ( <sup>6</sup> )        | 10                  | 94                                 | ( <sup>6</sup> )         | 8                   | ( <sup>6</sup> )                          | ( <sup>6</sup> ) |
| Colored.....                  | 13                       | ( <sup>6</sup> )        | 0                   | 0                                  | ( <sup>6</sup> )         | 0                   | ( <sup>6</sup> )                          | ( <sup>6</sup> ) |
| Jersey City.....              | 76                       | 12. 4                   | 7                   | 62                                 | 10. 7                    | 13                  | 14. 2                                     | 12. 8            |

Footnotes at end of table.



*Deaths from all causes in certain large cities of the United States during the week ended February 28, 1931, infant mortality, annual death rate, and comparison with corresponding week of 1930. (From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce)—Continued*

| City                        | Week ended Feb. 28, 1931 |                         |                     |                                    | Corresponding week, 1930 |                     | Death rate <sup>1</sup> for first 6 weeks |                  |
|-----------------------------|--------------------------|-------------------------|---------------------|------------------------------------|--------------------------|---------------------|---|------------------|
|                             | Total deaths             | Death rate <sup>1</sup> | Deaths under 1 year | Infant mortality rate <sup>2</sup> | Death rate <sup>2</sup>  | Deaths under 1 year | 1931                                      | 1930             |
| Kansas City, Kans.          | 51                       | 21.6                    | 5                   | 103                                | 13.2                     | 1                   | 17.1                                      | 13.3             |
| White                       | 39                       |                         | 5                   | 123                                |                          | 0                   |   |                  |
| Colored                     | 12                       | ( <sup>9</sup> )        | 0                   | 0                                  | ( <sup>9</sup> )         | 1                   | ( <sup>9</sup> )                          | ( <sup>9</sup> ) |
| Kansas City, Mo.            | 136                      | 17.3                    | 13                  | 99                                 | 15.3                     | 5                   | 15.5                                      | 14.5             |
| Knoxville                   | 34                       | 16.2                    | 6                   | 128                                | 16.6                     | 1                   | 14.5                                      | 15.0             |
| White                       | 23                       |                         | 4                   | 95                                 |                          | 1                   |   |                  |
| Colored                     | 11                       | ( <sup>9</sup> )        | 2                   | 407                                | ( <sup>9</sup> )         | 0                   | ( <sup>9</sup> )                          | ( <sup>9</sup> ) |
| Long Beach                  | 28                       | 9.6                     | 2                   | 48                                 | 8.7                      | 1                   | 10.9                                      | 10.2             |
| Los Angeles                 | 330                      | 13.1                    | 34                  | 99                                 | 12.1                     | 27                  | 12.4                                      | 12.5             |
| Louisville                  | 97                       | 16.4                    | 6                   | 51                                 | 12.5                     | 3                   | 17.0                                      | 14.8             |
| White                       | 78                       |                         | 6                   | 59                                 |                          | 3                   |   |                  |
| Colored                     | 19                       | ( <sup>9</sup> )        | 0                   | 0                                  | ( <sup>9</sup> )         | 0                   | ( <sup>9</sup> )                          | ( <sup>9</sup> ) |
| Lowell <sup>3</sup>         | 27                       | 14.0                    | 4                   | 102                                | 20.7                     | 4                   | 14.6                                      | 15.5             |
| Lynn                        | 20                       | 10.2                    | 2                   | 52                                 | 17.3                     | 2                   | 12.9                                      | 13.0             |
| Memphis                     | 98                       | 19.7                    | 9                   | 95                                 | 17.9                     | 8                   | 17.6                                      | 17.2             |
| White                       | 49                       |                         | 4                   | 67                                 |                          | 6                   |   |                  |
| Colored                     | 49                       | ( <sup>9</sup> )        | 5                   | 145                                | ( <sup>9</sup> )         | 2                   | ( <sup>9</sup> )                          | ( <sup>9</sup> ) |
| Miami                       | 38                       | 17.6                    | 3                   | 76                                 | 12.7                     | 2                   | 14.5                                      | 13.1             |
| White                       | 25                       |                         | 0                   | 0                                  |                          | 1                   |   |                  |
| Colored                     | 13                       | ( <sup>9</sup> )        | 3                   | 265                                | ( <sup>9</sup> )         | 1                   | ( <sup>9</sup> )                          | ( <sup>9</sup> ) |
| Milwaukee                   | 117                      | 10.3                    | 12                  | 52                                 | 11.8                     | 20                  | 10.7                                      | 10.9             |
| Minneapolis                 | 114                      | 12.5                    | 7                   | 45                                 | 14.5                     | 9                   | 12.6                                      | 11.9             |
| Nashville                   | 77                       | 25.8                    | 8                   | 119                                | 13.9                     | 3                   | 18.1                                      | 16.8             |
| White                       | 50                       |                         | 5                   | 100                                |                          | 1                   |   |                  |
| Colored                     | 27                       | ( <sup>9</sup> )        | 3                   | 177                                | ( <sup>9</sup> )         | 2                   | ( <sup>9</sup> )                          | ( <sup>9</sup> ) |
| New Bedford <sup>4</sup>    | 35                       | 16.2                    | 2                   | 53                                 | 17.6                     | 2                   | 14.2                                      | 12.2             |
| New Haven                   | 46                       | 14.7                    | 2                   | 38                                 | 14.4                     | 4                   | 13.4                                      | 15.3             |
| New Orleans                 | 176                      | 19.6                    | 12                  | 66                                 | 18.6                     | 15                  | 20.8                                      | 20.1             |
| White                       | 98                       |                         | 6                   | 50                                 |                          | 10                  |   |                  |
| Colored                     | 78                       | ( <sup>9</sup> )        | 6                   | 98                                 | ( <sup>9</sup> )         | 5                   | ( <sup>9</sup> )                          | ( <sup>9</sup> ) |
| New York                    | 1,676                    | 12.3                    | 159                 | 66                                 | 13.0                     | 174                 | 14.1                                      | 12.1             |
| Bronx Borough               | 241                      | 9.4                     | 22                  | 50                                 | 9.7                      | 19                  | 10.2                                      | 8.6              |
| Brooklyn Borough            | 543                      | 10.8                    | 65                  | 69                                 | 12.3                     | 75                  | 13.1                                      | 11.2             |
| Manhattan Borough           | 689                      | 19.8                    | 49                  | 83                                 | 18.5                     | 62                  | 21.3                                      | 17.9             |
| Queens Borough              | 164                      | 7.4                     | 18                  | 49                                 | 7.5                      | 11                  | 9.3                                       | 7.8              |
| Richmond Borough            | 39                       | 12.4                    | 5                   | 90                                 | 22.9                     | 7                   | 14.4                                      | 15.4             |
| Newark, N. J.               | 101                      | 11.8                    | 6                   | 31                                 | 16.2                     | 10                  | 14.4                                      | 14.7             |
| Oakland                     | 59                       | 10.5                    | 2                   | 26                                 | 13.0                     | 1                   | 12.0                                      | 12.4             |
| Oklahoma City               | 42                       | 11.1                    | 3                   | 41                                 | 12.2                     | 5                   | 11.5                                      | 10.7             |
| Omaha                       | 77                       | 18.5                    | 8                   | 90                                 | 17.5                     | 2                   | 15.5                                      | 14.7             |
| Paterson                    | 59                       | 22.2                    | 3                   | 52                                 | 19.6                     | 4                   | 15.8                                      | 13.7             |
| Philadelphia                | 553                      | 14.7                    | 51                  | 74                                 | 14.7                     | 54                  | 16.5                                      | 13.9             |
| Pittsburgh                  | 241                      | 18.6                    | 18                  | 62                                 | 16.2                     | 16                  | 18.1                                      | 15.6             |
| Portland, Oreg.             | 75                       | 12.7                    | 3                   | 36                                 | 12.1                     | 3                   | 13.0                                      | 14.2             |
| Providence                  | 84                       | 17.2                    | 8                   | 74                                 | 14.2                     | 13                  | 16.0                                      | 15.5             |
| Richmond                    | 61                       | 17.3                    | 4                   | 58                                 | 17.4                     | 5                   | 18.2                                      | 16.7             |
| White                       | 38                       |                         | 2                   | 44                                 |                          | 2                   |   |                  |
| Colored                     | 23                       | ( <sup>9</sup> )        | 2                   | 87                                 | ( <sup>9</sup> )         | 3                   | ( <sup>9</sup> )                          | ( <sup>9</sup> ) |
| Rochester                   | 110                      | 17.3                    | 7                   | 64                                 | 13.6                     | 4                   | 14.2                                      | 12.7             |
| St. Louis                   | 324                      | 20.4                    | 17                  | 57                                 | 15.1                     | 8                   | 18.8                                      | 15.2             |
| St. Paul                    | 50                       | 9.4                     | 6                   | 62                                 | 12.4                     | 3                   | 10.8                                      | 11.6             |
| Salt Lake City <sup>5</sup> | 35                       | 12.8                    | 3                   | 45                                 | 15.6                     | 3                   | 12.9                                      | 14.7             |
| San Antonio                 | 67                       | 14.6                    | 14                  | 16.5                               | 13                       | 15.4                | 19.4                                      |                  |
| San Diego                   | 42                       | 14.0                    | 1                   | 20                                 | 12.9                     | 2                   | 16.4                                      | 16.2             |
| San Francisco               | 171                      | 13.7                    | 7                   | 46                                 | 16.4                     | 8                   | 14.8                                      | 14.5             |
| Schenectady                 | 25                       | 13.6                    | 5                   | 147                                | 9.3                      | 0                   | 11.6                                      | 10.5             |
| Seattle                     | 93                       | 13.0                    | 8                   | 76                                 | 14.1                     | 3                   | 12.6                                      | 11.9             |
| Somerville                  | 30                       | 14.9                    | 4                   | 149                                | 14.0                     | 3                   | 12.3                                      | 13.1             |
| South Bend                  | 25                       | 12.1                    | 1                   | 25                                 | 12.4                     | 1                   | 8.8                                       | 10.2             |
| Spokane                     | 30                       | 13.4                    | 1                   | 26                                 | 14.9                     | 1                   | 13.1                                      | 13.6             |
| Springfield, Mass.          | 49                       | 16.8                    | 3                   | 46                                 | 14.9                     | 6                   | 14.3                                      | 14.8             |
| Syracuse                    | 53                       | 13.0                    | 3                   | 36                                 | 15.4                     | 3                   | 13.5                                      | 13.4             |
| Tacoma                      | 28                       | 13.5                    | 3                   | 77                                 | 14.1                     | 0                   | 14.9                                      | 12.5             |
| Toledo                      | 87                       | 15.4                    | 10                  | 92                                 | 15.4                     | 4                   | 13.2                                      | 14.4             |
| Trenton                     | 43                       | 18.1                    | 4                   | 70                                 | 27.5                     | 9                   | 19.6                                      | 19.1             |
| Utica                       | 29                       | 14.8                    | 0                   | 0                                  | 16.9                     | 3                   | 16.2                                      | 15.4             |

Footnotes at end of table.

*Deaths from all causes in certain large cities of the United States during the week ended February 28, 1931, infant mortality, annual death rate, and comparison with corresponding week of 1930. (From the weekly Health Index, issued by the Bureau of the Census, Department of Commerce)—Continued.*

| City                  | Week ended Feb. 28, 1931 |                         |                     |                                    | Corresponding week, 1930 |                     | Death rate <sup>2</sup> for first 9 weeks |                  |
|-----------------------|--------------------------|-------------------------|---------------------|------------------------------------|--------------------------|---------------------|---|------------------|
|                       | Total deaths             | Death rate <sup>1</sup> | Deaths under 1 year | Infant mortality rate <sup>1</sup> | Death rate <sup>1</sup>  | Deaths under 1 year | 1931                                      | 1930             |
| Washington, D. C..... | 185                      | 19.6                    | 19                  | 105                                | 14.7                     | 7                   | 19.0                                      | 16.2             |
| White.....            | 114                      |                         | 4                   | 33                                 |                          | 4                   |   |                  |
| Colored.....          | 71                       | ( <sup>3</sup> )        | 15                  | 258                                | ( <sup>3</sup> )         | 3                   | ( <sup>3</sup> )                          | ( <sup>3</sup> ) |
| Waterbury.....        | 16                       | 8.3                     | 3                   | 90                                 | 8.9                      | 1                   | 11.3                                      | 10.6             |
| Wilmington, Del.....  | 28                       | 13.7                    | 1                   | 22                                 | 16.1                     | 4                   | 16.5                                      | 16.0             |
| Worcester.....        | 52                       | 13.7                    | 3                   | 41                                 | 17.6                     | 9                   | 15.4                                      | 15.4             |
| Yonkers.....          | 26                       | 9.8                     | 4                   | 105                                | 12.3                     | 6                   | 11.1                                      | 9.3              |
| Youngstown.....       | 29                       | 8.7                     | 6                   | 84                                 | 12.8                     | 3                   | 11.4                                      | .0               |
|                       |                          |                         |                     |                                    |                          |                     |   | 11               |

<sup>1</sup> Deaths of nonresidents are included. Stillbirths are excluded.

<sup>2</sup> These rates represent annual rates per 1,000 population, as estimated for 1931 and 1930 by the arithmetical method.

<sup>3</sup> Deaths under 1 year of age per 1,000 live births. Cities left blank are not in the registration area for births.

<sup>4</sup> Date for 76 cities.

<sup>5</sup> Deaths for week ended Friday.

<sup>6</sup> For the cities for which deaths are shown by color, the percentage of colored population in 1920 was as follows: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Louisville, 17; Memphis, 38; Miami, 31; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

<sup>7</sup> Population Apr. 1, 1930; decreased 1920 to 1930; no estimate made.

# PREVALENCE OF DISEASE

*No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring*

## UNITED STATES

### CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended March 7, 1931, and March 8, 1930

*Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended March 7, 1931, and March 8, 1930*

| Division and State          | Diphtheria              |                         | Influenza               |                         | Measles                 |                         | Meningococcus meningitis |                         |
|-----------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|--------------------------|-------------------------|
|                             | Week ended Mar. 7, 1931 | Week ended Mar. 8, 1930 | Week ended Mar. 7, 1931 | Week ended Mar. 8, 1930 | Week ended Mar. 7, 1931 | Week ended Mar. 8, 1930 | Week ended Mar. 7, 1931  | Week ended Mar. 8, 1930 |
| New England States:         |                         |                         |                         |                         |                         |                         |                          |                         |
| Maine.....                  | 2                       | 3                       | 116                     | 27                      | 31                      | 82                      | 1                        | 0                       |
| New Hampshire.....          |                         | 5                       | 12                      |                         | 18                      | 13                      | 0                        | 1                       |
| Vermont.....                | 1                       | 1                       | 3                       |                         | 1                       | 2                       | 0                        | 0                       |
| Massachusetts.....          | 44                      | 62                      | 30                      | 7                       | 524                     | 680                     | 3                        | 3                       |
| Rhode Island.....           | 10                      | 13                      | 3                       |                         |                         | 4                       | 1                        | 0                       |
| Connecticut.....            | 6                       | 22                      | 13                      | 20                      | 503                     | 39                      | 2                        | 0                       |
| Middle Atlantic States:     |                         |                         |                         |                         |                         |                         |                          |                         |
| New York.....               | 123                     | 132                     | 149                     | 124                     | 1,427                   | 761                     | 20                       | 25                      |
| New Jersey.....             | 69                      | 130                     | 50                      | 27                      | 728                     | 659                     | 5                        | 6                       |
| Pennsylvania.....           | 100                     | 138                     |                         |                         | 2,884                   | 915                     | 24                       | 5                       |
| East North Central States:  |                         |                         |                         |                         |                         |                         |                          |                         |
| Ohio.....                   | 48                      | 56                      | 167                     | 33                      | 615                     | 747                     | 1                        | 10                      |
| Indiana.....                | 39                      | 21                      | 95                      |                         | 767                     | 135                     | 9                        | 23                      |
| Illinois.....               | 187                     | 145                     | 90                      | 13                      | 1,496                   | 578                     | 19                       | 13                      |
| Michigan.....               | 25                      | 64                      | 209                     | 10                      | 141                     | 603                     | 23                       | 37                      |
| Wisconsin.....              | 9                       | 12                      | 196                     | 34                      | 337                     | 979                     | 1                        | 2                       |
| West North Central States:  |                         |                         |                         |                         |                         |                         |                          |                         |
| Minnesota.....              | 12                      | 6                       | 1                       |                         | 58                      | 284                     | 4                        | 6                       |
| Iowa.....                   | 13                      | 11                      | 1                       |                         | 16                      | 690                     | 3                        | 1                       |
| Missouri.....               | 33                      | 48                      | 56                      | 15                      | 397                     | 80                      | 6                        | 20                      |
| North Dakota.....           | 2                       | 4                       |                         |                         | 17                      | 36                      | 0                        | 3                       |
| South Dakota.....           | 8                       | 3                       |                         |                         | 27                      | 225                     | 0                        | 1                       |
| Nebraska.....               | 14                      | 25                      | 10                      | 22                      | 15                      | 541                     | 0                        | 2                       |
| Kansas.....                 | 7                       | 16                      | 70                      | 1                       | 21                      | 365                     | 1                        | 3                       |
| South Atlantic States:      |                         |                         |                         |                         |                         |                         |                          |                         |
| Delaware.....               | 2                       | 3                       | 33                      | 1                       | 46                      | 3                       | 0                        | 0                       |
| Maryland <sup>1</sup> ..... | 19                      | 26                      | 228                     | 48                      | 891                     | 27                      | 2                        | 2                       |
| District of Columbia.....   | 30                      | 13                      | 4                       | 4                       | 154                     | 11                      | 2                        | 0                       |
| West Virginia.....          | 11                      | 25                      | 229                     | 42                      | 40                      | 96                      | 1                        | 2                       |
| North Carolina.....         | 24                      | 31                      | 185                     | 21                      | 574                     | 50                      | 5                        | 5                       |
| South Carolina.....         | 17                      | 9                       | 2,652                   | 1,072                   | 99                      |                         | 3                        | 6                       |
| Georgia.....                | 9                       | 10                      | 956                     | 154                     | 167                     | 285                     | 1                        | 5                       |
| Florida.....                | 9                       | 13                      | 222                     | 4                       | 127                     | 275                     | 0                        | 0                       |

<sup>1</sup> New York City only.

<sup>2</sup> Week ended Friday.

*Cases of certain communicable diseases reported by telegraph by State health officers  
for weeks ended March 7, 1931, and March 8, 1930—Continued*

| Division and State.         | Diphtheria              |                         | Influenza               |                         | Measles                 |                         | Meningococcus meningitis |                         |
|-----------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|--------------------------|-------------------------|
|                             | Week ended Mar. 7, 1931 | Week ended Mar. 8, 1930 | Week ended Mar. 7, 1931 | Week ended Mar. 8, 1930 | Week ended Mar. 7, 1931 | Week ended Mar. 8, 1930 | Week ended Mar. 7, 1931  | Week ended Mar. 8, 1930 |
| East South Central States:  |                         |                         |                         |                         |                         |                         |                          |                         |
| Kentucky.....               |                         |                         |                         |                         | 294                     | 114                     | 0                        | 3                       |
| Tennessee.....              | 10                      | 13                      | 312                     | 82                      | 157                     | 289                     | 4                        | 54                      |
| Alabama.....                | 26                      | 11                      | 442                     | 153                     | 641                     | 242                     | 8                        | 3                       |
| Mississippi.....            | 9                       | 16                      |                         |                         |                         |                         | 3                        | 25                      |
| West South Central States:  |                         |                         |                         |                         |                         |                         |                          |                         |
| Arkansas.....               | 4                       | 20                      | 319                     | 118                     | 35                      | 8                       | 0                        | 4                       |
| Louisiana.....              | 30                      | 25                      | 49                      | 51                      | 26                      | 69                      | 2                        | 5                       |
| Oklahoma <sup>1</sup> ..... | 7                       | 19                      | 138                     | 82                      | 23                      | 359                     | 2                        | 4                       |
| Texas.....                  | 31                      | 51                      | 59                      | 77                      | 92                      | 192                     | 1                        | 2                       |
| Mountain States:            |                         |                         |                         |                         |                         |                         |                          |                         |
| Montana.....                | 4                       | 2                       |                         |                         | 5                       | 31                      | 1                        | 0                       |
| Idaho.....                  |                         | 1                       |                         |                         | 2                       | 38                      | 1                        | 0                       |
| Wyoming.....                |                         | 3                       |                         |                         | 1                       | 12                      | 0                        | 2                       |
| Colorado.....               | 9                       | 13                      |                         |                         | 346                     | 256                     | 0                        | 5                       |
| New Mexico.....             | 5                       | 4                       | 18                      | 2                       | 47                      | 101                     | 3                        | 2                       |
| Arizona.....                | 6                       | 5                       | 11                      | 48                      | 180                     | 5                       | 1                        | 7                       |
| Utah.....                   |                         | 3                       | 19                      | 4                       | 5                       | 139                     | 0                        | 5                       |
| Pacific States:             |                         |                         |                         |                         |                         |                         |                          |                         |
| Washington.....             | 9                       | 5                       | 1                       | 2                       | 44                      | 243                     | 0                        | 2                       |
| Oregon.....                 | 3                       | 1                       | 161                     | 60                      | 58                      | 57                      | 1                        | 2                       |
| California.....             | 70                      | 52                      | 602                     | 52                      | 1,205                   | 1,514                   | 6                        | 5                       |

| Division and State          | Poliomyelitis           |                         | Scarlet fever           |                         | Smallpox                |                         | Typhoid fever           |                         |
|-----------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
|                             | Week ended Mar. 7, 1931 | Week ended Mar. 8, 1930 | Week ended Mar. 7, 1931 | Week ended Mar. 8, 1930 | Week ended Mar. 7, 1931 | Week ended Mar. 8, 1930 | Week ended Mar. 7, 1931 | Week ended Mar. 8, 1930 |
| New England States:         |                         |                         |                         |                         |                         |                         |                         |                         |
| Maine.....                  | 0                       | 0                       | 33                      | 37                      | 0                       | 0                       | 3                       | 0                       |
| New Hampshire.....          | 0                       | 0                       | 2                       | 13                      | 0                       | 0                       | 0                       | 0                       |
| Vermont.....                | 0                       | 0                       | 5                       | 5                       | 0                       | 5                       | 0                       | 0                       |
| Massachusetts.....          | 0                       | 0                       | 318                     | 284                     | 0                       | 0                       | 2                       | 2                       |
| Rhode Island.....           | 0                       | 0                       | 55                      | 26                      | 0                       | 0                       | 0                       | 0                       |
| Connecticut.....            | 0                       | 0                       | 62                      | 163                     | 0                       | 0                       | 1                       | 0                       |
| Middle Atlantic States:     |                         |                         |                         |                         |                         |                         |                         |                         |
| New York.....               | 1                       | 1                       | 870                     | 559                     | 11                      | 1                       | 10                      | 9                       |
| New Jersey.....             | 0                       | 1                       | 291                     | 290                     | 0                       | 0                       | 2                       | 3                       |
| Pennsylvania.....           | 0                       | 2                       | 643                     | 537                     | 0                       | 2                       | 24                      | 17                      |
| East North Central States:  |                         |                         |                         |                         |                         |                         |                         |                         |
| Ohio.....                   | 2                       | 2                       | 508                     | 328                     | 51                      | 240                     | 3                       | 11                      |
| Indiana.....                | 0                       | 0                       | 400                     | 212                     | 149                     | 160                     | 2                       | 4                       |
| Illinois.....               | 2                       | 3                       | 677                     | 612                     | 36                      | 97                      | 2                       | 2                       |
| Michigan.....               | 0                       | 0                       | 366                     | 363                     | 19                      | 63                      | 10                      | 0                       |
| Wisconsin.....              | 3                       | 0                       | 178                     | 208                     | 8                       | 31                      | 7                       | 0                       |
| West North Central States:  |                         |                         |                         |                         |                         |                         |                         |                         |
| Minnesota.....              | 0                       | 0                       | 141                     | 145                     | 4                       | 15                      | 3                       | 6                       |
| Iowa.....                   | 0                       | 0                       | 127                     | 87                      | 75                      | 66                      | 1                       | 3                       |
| Missouri.....               | 0                       | 1                       | 261                     | 106                     | 40                      | 51                      | 4                       | 4                       |
| North Dakota.....           | 0                       | 0                       | 8                       | 42                      | 8                       | 12                      | 3                       | 1                       |
| South Dakota.....           | 0                       | 0                       | 19                      | 15                      | 19                      | 63                      | 0                       | 0                       |
| Nebraska.....               | 1                       | 0                       | 50                      | 71                      | 60                      | 35                      | 0                       | 0                       |
| Kansas.....                 | 1                       | 0                       | 59                      | 113                     | 75                      | 68                      | 3                       | 1                       |
| South Atlantic States:      |                         |                         |                         |                         |                         |                         |                         |                         |
| Delaware.....               | 0                       | 0                       | 30                      | 15                      | 0                       | 0                       | 0                       | 0                       |
| Maryland <sup>2</sup> ..... | 0                       | 0                       | 104                     | 82                      | 0                       | 0                       | 2                       | 4                       |
| District of Columbia.....   | 0                       | 0                       | 25                      | 11                      | 0                       | 0                       | 0                       | 0                       |
| West Virginia.....          | 2                       | 0                       | 17                      | 39                      | 14                      | 26                      | 0                       | 45                      |
| North Carolina.....         | 0                       | 0                       | 50                      | 52                      | 2                       | 20                      | 1                       | 2                       |
| South Carolina.....         | 2                       | 0                       | 7                       | 12                      | 0                       | 1                       | 1                       | 6                       |
| Georgia.....                | 0                       | 0                       | 89                      | 18                      | 0                       | 0                       | 3                       | 7                       |
| Florida.....                | 0                       | 2                       | 11                      | 6                       | 2                       | 0                       | 2                       | 3                       |

<sup>2</sup> Week ended Friday.

<sup>1</sup> Figures for 1931 are exclusive of Oklahoma City and Tulsa.

<sup>2</sup> Typhus fever, 1931: 2 cases in Texas.

*Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended March 7, 1931, and March 8, 1930—Continued*

| Division and State                | Polliomyelitis          |                         | Scarlet fever           |                         | Smallpox                |                         | Typhoid fever           |                         |
|-----------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
|                                   | Week ended Mar. 7, 1931 | Week ended Mar. 8, 1930 | Week ended Mar. 7, 1931 | Week ended Mar. 8, 1930 | Week ended Mar. 7, 1931 | Week ended Mar. 8, 1930 | Week ended Mar. 7, 1931 | Week ended Mar. 8, 1930 |
| <b>East South Central States:</b> |                         |                         |                         |                         |                         |                         |                         |                         |
| Kentucky.....                     | 0                       | 0                       | 76                      | 70                      | 8                       | 87                      | 4                       | 1                       |
| Tennessee.....                    | 0                       | 0                       | 68                      | 127                     | 1                       | 67                      | 1                       | 4                       |
| Alabama.....                      | 1                       | 0                       | 36                      | 28                      | 8                       | 8                       | 3                       | 7                       |
| Mississippi.....                  | 0                       | 0                       | 25                      | 20                      | 27                      | 1                       | 3                       | 6                       |
| <b>West South Central States:</b> |                         |                         |                         |                         |                         |                         |                         |                         |
| Arkansas.....                     | 0                       | 0                       | 24                      | 37                      | 41                      | 15                      | 3                       | 1                       |
| Louisiana.....                    | 0                       | 0                       | 20                      | 18                      | 23                      | 3                       | 3                       | 17                      |
| Oklahoma <sup>1</sup> .....       | 0                       | 0                       | 37                      | 48                      | 66                      | 103                     | 0                       | 17                      |
| Texas <sup>1</sup> .....          | 5                       | 2                       | 42                      | 104                     | 55                      | 350                     | 9                       | 9                       |
| <b>Mountain States:</b>           |                         |                         |                         |                         |                         |                         |                         |                         |
| Montana.....                      | 0                       | 0                       | 44                      | 40                      | 4                       | 20                      | 5                       | 4                       |
| Idaho.....                        | 0                       | 0                       | 5                       | 5                       | 5                       | 9                       | 1                       | 0                       |
| Wyoming.....                      | 0                       | 0                       | 21                      | 11                      | 2                       | 10                      | 0                       | 0                       |
| Colorado.....                     | 1                       | 0                       | 41                      | 20                      | 11                      | 26                      | 0                       | 3                       |
| New Mexico.....                   | 0                       | 0                       | 14                      | 4                       | 7                       | 1                       | 0                       | 0                       |
| Arizona.....                      | 0                       | 1                       | 1                       | 20                      | 0                       | 29                      | 0                       | 0                       |
| Utah <sup>2</sup> .....           | 0                       | 0                       | 17                      | 7                       | 2                       | 0                       | 0                       | 0                       |
| <b>Pacific States:</b>            |                         |                         |                         |                         |                         |                         |                         |                         |
| Washington.....                   | 1                       | 0                       | 49                      | 70                      | 25                      | 74                      | 1                       | 0                       |
| Oregon.....                       | 0                       | 1                       | 37                      | 40                      | 33                      | 20                      | 1                       | 1                       |
| California.....                   | 12                      | 3                       | 150                     | 207                     | 71                      | 53                      | 6                       | 7                       |

<sup>1</sup> Week ended Friday.

<sup>2</sup> Figures for 1931 are exclusive of Oklahoma City and Tulsa.

<sup>3</sup> Typhus fever, 1931: 2 cases in Texas.

## SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

| State                 | Menin-<br>gococ-<br>cus<br>menin-<br>gitis | Diph-<br>theria | Infla-<br>enza | Ma-<br>laria | Mea-<br>sles | Pel-<br>lagra | Polio-<br>mye-<br>litis | Scarlet<br>fever | Small-<br>pox | Ty-<br>phoid<br>fever |
|-----------------------|--|-----------------|----------------|--------------|--------------|---------------|-------------------------|------------------|---------------|-----------------------|
| <b>January, 1931</b>  |  |                 |                |              |              |               |                         |                  |               |                       |
| Arkansas.....         | 6  | 36              | 522            | 32           | 17           | 105           | 1                       | 77               | 91            | 22                    |
| California.....       | 31   | 267             | 443            | 3            | 1,840        | 1             | 32                      | 567              | 453           | 33                    |
| Idaho.....            | 11   | 24              | 33             | -----        | -----        | -----         | 1                       | 89               | -----         | 12                    |
| Kansas.....           | 8  | 76              | 32             | -----        | 141          | -----         | 4                       | 260              | 507           | 8                     |
| Wisconsin.....        | 11   | 114             | 433            | -----        | 1,208        | -----         | 6                       | 695              | 34            | 10                    |
| <b>February, 1931</b> |  |                 |                |              |              |               |                         |                  |               |                       |
| Arizona.....          | 14   | 24              | 45             | -----        | 760          | -----         | 0                       | 2                | 7             | -----                 |
| New Mexico.....       | 4  | 19              | 88             | 1            | 148          | -----         | 0                       | 30               | 11            | 2                     |

### January, 1931

|                             | Cases | Hookworm disease:       | Cases |
|-----------------------------|-------|-------------------------|-------|
| Chicken pox:                |       | Arkansas.....           | 1     |
| Arkansas.....               | 121   | California.....         | 1     |
| California.....             | 2,224 | Leprosy:                |       |
| Kansas.....                 | 804   | California.....         | 2     |
| Wisconsin.....              | 2,452 | Lethargic encephalitis: |       |
| Dysentery:                  |       | California.....         | 5     |
| California (amebic).....    | 1     | Kansas.....             | 2     |
| California (bacillary)..... | 8     | Wisconsin.....          | 1     |
| German measles:             |       | Mumps:                  |       |
| California.....             | 51    | Arkansas.....           | 34    |
| Kansas.....                 | 8     | California.....         | 1,097 |
| Granuloma, coccidioides:    |       | Kansas.....             | 199   |
| California.....             | 2     | Wisconsin.....          | 2,000 |

| Paratyphoid fever:  | Cases | Whooping cough—Continued. | Cases |
|---------------------|-------|---------------------------|-------|
| California.....     | 8     | Kansas.....               | 126   |
| Kansas.....         | 1     | Wisconsin.....            | 667   |
| Rabies in animals:  |       |                           |       |
| California.....     | 82    |                           |       |
| Scabies:            |       | February, 1931            |       |
| Kansas.....         | 2     | Chicken pox:              |       |
| Septic sore throat: |       | Arizona.....              | 78    |
| Kansas.....         | 2     | New Mexico.....           | 70    |
| Tetanus:            |       | Conjunctivitis:           |       |
| California.....     | 3     | New Mexico.....           | 3     |
| Trachoma:           |       | Dysentery:                |       |
| Arkansas.....       | 5     | Arizona.....              | 1     |
| California.....     | 4     | German measles:           |       |
| Trench mouth:       |       | Arizona.....              | 3     |
| Kansas.....         | 1     | New Mexico.....           | 2     |
| Trichinosis:        |       | Mumps:                    |       |
| California.....     | 3     | Arizona.....              | 27    |
| Tularaemia:         |       | New Mexico.....           | 79    |
| California.....     | 1     | Puerperal septicaemia:    |       |
| Wisconsin.....      | 1     | New Mexico.....           | 1     |
| Undulant fever:     |       | Trachoma:                 |       |
| California.....     | 8     | Arizona.....              | 8     |
| Kansas.....         | 8     | New Mexico.....           | 1     |
| Vincent's angina:   |       | Vincent's angina:         |       |
| Kansas.....         | 7     | New Mexico.....           | 1     |
| Whooping cough:     |       | Whooping cough:           |       |
| Arkansas.....       | 11    | Arizona.....              | 16    |
| California.....     | 687   | New Mexico.....           | 12    |

## GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 95 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 32,765,000. The estimated population of the 88 cities reporting deaths is more than 31,220,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

*Weeks ended February 28, 1931, and March 1, 1930*

|                           | 1931   | 1930   | Estimated expectancy |
|---------------------------|--------|--------|----------------------|
| <i>Cases reported</i>     |        |        |                      |
| Diphtheria:               |        |        |                      |
| 46 States.....            | 1,071  | 1,419  |                      |
| 95 cities.....            | 439    | 649    | 854                  |
| Measles:                  |        |        |                      |
| 45 States.....            | 13,853 | 13,374 |                      |
| 95 cities.....            | 4,390  | 3,329  |                      |
| Meningococcus meningitis: |        |        |                      |
| 46 States.....            | 167    | 365    |                      |
| 95 cities.....            | 92     | 151    |                      |
| Poliomyelitis:            |        |        |                      |
| 46 States.....            | 22     | 20     |                      |
| Scarlet fever:            |        |        |                      |
| 46 States.....            | 6,229  | 5,910  |                      |
| 95 cities.....            | 2,358  | 2,204  | 1,554                |
| Smallpox:                 |        |        |                      |
| 46 States.....            | 950    | 1,715  |                      |
| 95 cities.....            | 129    | 191    | 59                   |
| Typhoid fever:            |        |        |                      |
| 46 States.....            | 145    | 174    |                      |
| 95 cities.....            | 45     | 50     | 28                   |
| <i>Deaths reported</i>    |        |        |                      |
| Influenza and pneumonia:  |        |        |                      |
| 88 cities.....            | 1,566  | 1,247  |                      |
| Smallpox:                 |        |        |                      |
| 88 cities.....            | 0      | 0      |                      |

## City reports for week ended February 28, 1931

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence the number of cases of the disease under consideration that may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding weeks of the preceeding years. When the reports include several epidemics, or when for other reasons the median is unsatisfactory, the epidemic periods are excluded, and the estimated expectancy is the mean number of cases reported for the week during nonepidemic years.

If the reports have not been received for the full nine years, data are used for as many years as possible, but no year earlier than 1922 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviation from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

| Division, State, and city | Chicken<br>pox, cases<br>reported | Diphtheria                             |                   | Influenza         |                    | Measles,<br>cases re-<br>ported | Mumps,<br>cases re-<br>ported | Pneu-<br>monia,<br>deaths<br>reported |
|---------------------------|-----------------------------------|--|-------------------|-------------------|--------------------|---------------------------------|-------------------------------|---------------------------------------|
|                           |                                   | Cases,<br>estimated<br>expect-<br>ancy | Cases<br>reported | Cases<br>reported | Deaths<br>reported |                                 |                               |                                       |
| NEW ENGLAND               |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Maine:                    |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Portland                  | 4                                 | 1                                      | 0                 | 4                 | 0                  | 0                               | 10                            | 7                                     |
| New Hampshire:            |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Concord                   | 0                                 | 0                                      | 0                 |                   | 0                  | 0                               | 0                             | 2                                     |
| Vermont:                  |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Barre                     |                                   | 0                                      |                   |                   |                    |                                 |                               |                                       |
| Massachusetts:            |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Boston                    | 69                                | 38                                     | 19                | 12                | 3                  | 94                              | 14                            | 35                                    |
| Fall River                | 3                                 | 4                                      | 1                 | 1                 | 1                  | 1                               | 11                            | 5                                     |
| Springfield               | 2                                 | 4                                      | 5                 | 1                 | 2                  | 0                               | 4                             | 3                                     |
| Worcester                 | 11                                | 2                                      | 1                 | 4                 | 0                  | 3                               | 8                             | 5                                     |
| Rhode Island:             |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Pawtucket                 | 3                                 | 1                                      | 3                 |                   | 0                  | 0                               | 1                             | 6                                     |
| Providence                | 8                                 | 8                                      | 5                 |                   | 1                  | 0                               | 0                             | 15                                    |
| Connecticut:              |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Bridgeport                | 6                                 | 6                                      | 0                 | 5                 | 2                  | 1                               | 3                             | 3                                     |
| Hartford                  | 13                                | 5                                      | 2                 | 12                | 0                  | 20                              | 0                             | 9                                     |
| New Haven                 | 34                                | 1                                      | 1                 | 1                 | 1                  | 144                             | 10                            | 8                                     |
| MIDDLE ATLANTIC           |                                   |  |                   |                   |                    |                                 |                               |                                       |
| New York:                 |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Buffalo                   | 22                                | 13                                     | 7                 | 10                | 3                  | 156                             | 75                            | 50                                    |
| New York                  | 313                               | 206                                    | 83                | 92                | 32                 | 687                             | 43                            | 265                                   |
| Rochester                 | 6                                 | 6                                      | 2                 | 8                 | 5                  | 1                               | 4                             | 13                                    |
| Syracuse                  | 10                                | 3                                      | 0                 |                   | 4                  | 11                              | 1                             | 2                                     |
| New Jersey:               |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Camden                    | 2                                 | 6                                      | 2                 | 2                 | 1                  | 78                              | 2                             | 5                                     |
| Newark                    | 118                               | 16                                     | 7                 | 25                | 1                  | 4                               | 10                            | 12                                    |
| Trenton                   | 7                                 | 2                                      | 3                 | 11                | 1                  | 3                               | 1                             | 6                                     |
| Pennsylvania:             |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Philadelphia              | 207                               | 68                                     | 11                | 30                | 16                 | 322                             | 50                            | 66                                    |
| Pittsburgh                | 124                               | 20                                     | 10                | 26                | 26                 | 71                              | 28                            | 61                                    |
| Reading                   | 11                                | 1                                      | 0                 |                   | 0                  | 110                             | 34                            | 6                                     |
| EAST NORTH CENTRAL        |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Ohio:                     |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Cincinnati                | 14                                | 8                                      | 2                 | 20                | 15                 | 78                              | 26                            | 24                                    |
| Cleveland                 | 167                               | 30                                     | 12                | 139               | 15                 | 11                              | 105                           | 38                                    |
| Columbus                  | 37                                | 3                                      | 2                 | 230               | 4                  | 3                               | 3                             | 7                                     |
| Toledo                    | 54                                | 5                                      | 6                 | 6                 | 6                  | 3                               | 12                            | 19                                    |
| Indiana:                  |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Fort Wayne                | 3                                 | 2                                      | 7                 |                   | 1                  | 34                              | 0                             | 8                                     |
| Indianapolis              | 68                                | 6                                      | 1                 |                   | 3                  | 100                             | 13                            | 39                                    |
| South Bend                | 3                                 | 1                                      | 0                 |                   | 2                  | 1                               | 0                             | 6                                     |
| Terre Haute               | 0                                 | 0                                      | 3                 |                   | 1                  | 1                               | 0                             | 5                                     |
| Illinois:                 |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Chicago                   | 106                               | 96                                     | 87                | 32                | 18                 | 79                              | 60                            | 88                                    |
| Springfield               | 5                                 | 1                                      | 1                 | 8                 | 1                  | 144                             | 1                             | 6                                     |
| Michigan:                 |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Detroit                   | 90                                | 47                                     | 12                | 101               | 23                 | 8                               | 22                            | 64                                    |
| Flint                     | 20                                | 2                                      | 1                 | 149               | 3                  | 0                               | 8                             | 6                                     |
| Grand Rapids              | 10                                | 0                                      | 0                 | 1                 | 1                  | 0                               | 0                             | 2                                     |
| Wisconsin:                |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Kenosha                   | 24                                | 1                                      | 0                 | 4                 | 0                  | 1                               | 48                            | 2                                     |
| Madison                   | 38                                | 0                                      | 0                 |                   |                    | 1                               | 48                            |                                       |
| Milwaukee                 | 132                               | 16                                     | 1                 | 16                | 14                 | 31                              | 309                           | 19                                    |
| Racine                    | 8                                 | 2                                      | 0                 | 3                 | 0                  | 3                               | 3                             | 1                                     |
| Superior                  | 26                                | 0                                      | 0                 |                   | 0                  | 0                               | 0                             | 3                                     |

## City reports for week ended February 28, 1931—Continued

| Division, State, and city | Chicken<br>pox, cases<br>reported | Diphtheria                             |                   | Influenza         |                    | Measles,<br>cases re-<br>ported | Mumps,<br>cases re-<br>ported | Pneu-<br>monia,<br>deaths<br>reported |
|---------------------------|-----------------------------------|--|-------------------|-------------------|--------------------|---------------------------------|-------------------------------|---------------------------------------|
|                           |                                   | Cases,<br>estimated<br>expect-<br>ancy | Cases<br>reported | Cases<br>reported | Deaths<br>reported |                                 |                               |                                       |
| WEST NORTH CENTRAL        |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Minnesota:                |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Duluth.....               | 7                                 | 0                                      | 0                 |                   | 5                  | 0                               | 10                            | 2                                     |
| Minneapolis.....          | 68                                | 15                                     | 1                 | 1                 | 8                  | 53                              | 63                            | 18                                    |
| St. Paul.....             | 62                                | 7                                      | 0                 |                   | 2                  | 1                               | 0                             | 8                                     |
| Iowa:                     |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Davenport.....            | 1                                 | 1                                      | 0                 |                   |                    | 0                               | 0                             |                                       |
| Des Moines.....           | 2                                 | 2                                      | 0                 |                   |                    | 1                               | 3                             |                                       |
| Sioux City.....           | 9                                 | 0                                      | 0                 |                   |                    | 1                               | 7                             |                                       |
| Waterloo.....             | 2                                 | 1                                      | 0                 |                   |                    | 0                               | 0                             |                                       |
| Missouri:                 |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Kansas City.....          |                                   | 5                                      |                   |                   |                    |                                 |                               |                                       |
| St. Joseph.....           | 14                                | 0                                      | 6                 |                   | 0                  | 0                               | 0                             | 4                                     |
| St. Louis.....            | 23                                | 42                                     | 14                | 21                | 7                  | 291                             | 16                            |                                       |
| North Dakota:             |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Fargo.....                | 2                                 | 0                                      | 0                 |                   | 0                  | 0                               | 10                            | 0                                     |
| Grand Forks.....          | 1                                 | 0                                      | 2                 |                   |                    | 0                               | 0                             |                                       |
| South Dakota:             |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Aberdeen.....             | 4                                 | 0                                      | 0                 |                   |                    | 0                               | 0                             |                                       |
| Sioux Falls.....          | 0                                 | 0                                      | 0                 |                   |                    | 0                               | 0                             |                                       |
| Nebraska:                 |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Omaha.....                | 16                                | 5                                      | 6                 |                   | 0                  | 1                               | 7                             | 16                                    |
| Kansas:                   |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Topeka.....               | 16                                | 1                                      | 0                 | 1                 | 1                  | 1                               | 11                            | 1                                     |
| Wichita.....              | 16                                | 2                                      | 0                 |                   | 0                  | 1                               | 3                             | 2                                     |
| SOUTH ATLANTIC            |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Delaware:                 |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Wilmington.....           | 1                                 | 2                                      | 0                 |                   | 0                  | 9                               | 3                             | 5                                     |
| Maryland:                 |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Baltimore.....            | 173                               | 24                                     | 9                 | 67                | 7                  | 575                             | 39                            | 42                                    |
| Cumberland.....           | 0                                 | 0                                      | 0                 | 4                 | 0                  | 0                               | 0                             | 4                                     |
| Frederick.....            | 1                                 | 0                                      | 0                 | 3                 | 0                  | 2                               | 1                             | 0                                     |
| District of Columbia:     |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Washington.....           | 44                                | 16                                     | 23                | 8                 | 3                  | 91                              | 0                             | 29                                    |
| Virginia:                 |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Lynchburg.....            | 17                                | 0                                      | 0                 |                   | 0                  | 2                               | 1                             | 5                                     |
| Norfolk.....              | 10                                | 1                                      | 0                 |                   | 0                  | 7                               | 3                             | 5                                     |
| Richmond.....             | 1                                 | 3                                      | 0                 |                   | 2                  | 460                             | 0                             | 5                                     |
| Roanoke.....              | 4                                 | 1                                      | 1                 |                   | 1                  | 0                               | 0                             | 3                                     |
| West Virginia:            |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Charleston.....           | 1                                 | 0                                      | 0                 |                   | 0                  | 0                               | 1                             | 3                                     |
| Wheeling.....             | 10                                | 1                                      | 0                 | 2                 | 3                  | 0                               | 0                             | 2                                     |
| North Carolina:           |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Raleigh.....              | 10                                | 0                                      | 0                 |                   | 0                  | 12                              | 0                             | 0                                     |
| Wilmington.....           | 17                                | 0                                      | 0                 |                   | 0                  | 6                               | 0                             | 3                                     |
| Winston-Salem.....        | 3                                 | 1                                      | 0                 | 17                | 1                  | 0                               | 2                             | 5                                     |
| South Carolina:           |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Charleston.....           | 4                                 | 0                                      | 0                 | 179               | 1                  | 74                              | 5                             | 12                                    |
| Columbia.....             | 7                                 | 1                                      | 1                 |                   | 0                  | 1                               | 5                             | 14                                    |
| Greenville.....           | 1                                 | 0                                      | 0                 |                   | 0                  | 0                               | 0                             | 0                                     |
| Georgia:                  |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Atlanta.....              | 3                                 | 4                                      | 5                 | 417               | 16                 | 58                              | 1                             | 18                                    |
| Brunswick.....            | 0                                 | 0                                      | 0                 |                   | 0                  | 0                               | 10                            | 0                                     |
| Savannah.....             | 3                                 | 1                                      | 0                 | 282               | 2                  | 0                               | 20                            | 7                                     |
| Florida:                  |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Miami.....                | 14                                | 2                                      | 1                 | 3                 | 0                  | 3                               | 2                             | 4                                     |
| St. Petersburg.....       |                                   | 0                                      |                   |                   | 0                  |                                 |                               | 3                                     |
| Tampa.....                | 1                                 | 2                                      | 0                 | 6                 | 4                  | 98                              | 0                             | 1                                     |
| EAST SOUTH CENTRAL        |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Kentucky:                 |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Covington.....            | 1                                 | 0                                      | 2                 | 1                 | 2                  | 6                               | 0                             | 10                                    |
| Tennessee:                |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Memphis.....              | 48                                | 3                                      | 1                 |                   | 4                  | 32                              | 0                             | 10                                    |
| Nashville.....            | 0                                 | 1                                      | 0                 |                   | 0                  | 27                              | 1                             | 14                                    |
| Alabama:                  |                                   |  |                   |                   |                    |                                 |                               |                                       |
| Birmingham.....           | 13                                | 2                                      | 6                 | 38                | 3                  | 113                             | 1                             | 8                                     |
| Mobile.....               | 0                                 | 1                                      | 0                 | 11                | 3                  | 0                               | 0                             | 1                                     |
| Montgomery.....           | 43                                | 1                                      | 1                 | 20                |                    | 1                               | 0                             |                                       |



## City reports for week ended February 28, 1931—Continued

| Division, State, and city | Chicken pox, cases reported | Diphtheria                  |                | Influenza      |                 | Measles, cases reported | Mumps, cases reported | Pneumonia, deaths reported |
|---------------------------|-----------------------------|-----------------------------|----------------|----------------|-----------------|-------------------------|-----------------------|----------------------------|
|                           |                             | Cases, estimated expectancy | Cases reported | Cases reported | Deaths reported |                         |                       |                            |
| WEST SOUTH CENTRAL        |                             |                             |                |                |                 |                         |                       |                            |
| Arkansas:                 |                             |                             |                |                |                 |                         |                       |                            |
| Fort Smith.....           | 4                           | 0                           | 0              | -----          | -----           | 1                       | 0                     | -----                      |
| Little Rock.....          | 1                           | 1                           | 0              | -----          | 0               | 0                       | 2                     | 3                          |
| Louisiana:                |                             |                             |                |                |                 |                         |                       |                            |
| New Orleans.....          | 4                           | 14                          | 15             | 6              | 5               | 0                       | 0                     | 22                         |
| Shreveport.....           | 7                           | 0                           | 3              | -----          | 0               | 0                       | 0                     | 5                          |
| Oklahoma:                 |                             |                             |                |                |                 |                         |                       |                            |
| Muskogee.....             | 4                           | 1                           | 0              | 6              | -----           | 0                       | 2                     | -----                      |
| Tulsa.....                | 20                          | 1                           | 1              | -----          | -----           | 3                       | 0                     | -----                      |
| Texas:                    |                             |                             |                |                |                 |                         |                       |                            |
| Dallas.....               | 55                          | 6                           | 11             | 6              | 5               | 0                       | 34                    | 6                          |
| Fort Worth.....           | 27                          | 4                           | 3              | -----          | 2               | 0                       | 0                     | 3                          |
| Galveston.....            | 0                           | 1                           | 1              | -----          | 0               | 0                       | 0                     | 3                          |
| Houston.....              | 8                           | 5                           | 3              | -----          | 0               | 1                       | 0                     | 12                         |
| San Antonio.....          | 4                           | 3                           | 6              | -----          | 3               | 5                       | 2                     | 13                         |
| MOUNTAIN                  |                             |                             |                |                |                 |                         |                       |                            |
| Montana:                  |                             |                             |                |                |                 |                         |                       |                            |
| Billings.....             | 10                          | 0                           | 0              | -----          | 0               | 0                       | 0                     | 0                          |
| Great Falls.....          | 6                           | 0                           | 0              | -----          | 0               | 1                       | 0                     | 0                          |
| Helena.....               | 0                           | 0                           | 0              | -----          | 0               | 0                       | 0                     | 0                          |
| Missoula.....             | 0                           | 0                           | 0              | -----          | 0               | 0                       | 0                     | 0                          |
| Idaho:                    |                             |                             |                |                |                 |                         |                       |                            |
| Boise.....                | 0                           | 0                           | 0              | -----          | 0               | 1                       | 0                     | 1                          |
| Colorado:                 |                             |                             |                |                |                 |                         |                       |                            |
| Denver.....               | -----                       | 9                           | -----          | -----          | -----           | -----                   | -----                 | -----                      |
| Pueblo.....               | 2                           | 1                           | 0              | -----          | 0               | 121                     | 2                     | 2                          |
| New Mexico:               |                             |                             |                |                |                 |                         |                       |                            |
| Albuquerque.....          | 2                           | 1                           | 0              | -----          | 0               | 0                       | 3                     | 2                          |
| Arizona:                  |                             |                             |                |                |                 |                         |                       |                            |
| Phoenix.....              | 3                           | 0                           | 0              | -----          | 0               | 3                       | 0                     | 2                          |
| Utah:                     |                             |                             |                |                |                 |                         |                       |                            |
| Salt Lake City.....       | 12                          | 2                           | 2              | -----          | 0               | 0                       | 6                     | 3                          |
| Nevada:                   |                             |                             |                |                |                 |                         |                       |                            |
| Reno.....                 | 0                           | 0                           | 2              | 1              | 0               | 0                       | 0                     | 0                          |
| PACIFIC                   |                             |                             |                |                |                 |                         |                       |                            |
| Washington:               |                             |                             |                |                |                 |                         |                       |                            |
| Seattle.....              | 17                          | 5                           | 2              | -----          | -----           | 1                       | 24                    | -----                      |
| Spokane.....              | 13                          | 2                           | 0              | -----          | -----           | 9                       | 0                     | -----                      |
| Tacoma.....               | 10                          | 2                           | 2              | -----          | 1               | 0                       | 0                     | 4                          |
| Oregon:                   |                             |                             |                |                |                 |                         |                       |                            |
| Portland.....             | 15                          | 7                           | 1              | 25             | 1               | 31                      | 13                    | 3                          |
| Salem.....                | 1                           | 0                           | 1              | -----          | -----           | 4                       | 17                    | -----                      |
| California:               |                             |                             |                |                |                 |                         |                       |                            |
| Los Angeles.....          | 92                          | 35                          | 23             | 122            | 6               | 89                      | 25                    | 23                         |
| Sacramento.....           | 21                          | 1                           | 1              | 41             | 2               | 4                       | 6                     | 4                          |
| San Francisco.....        | 62                          | 15                          | 1              | 286            | 8               | 11                      | 1                     | 7                          |

| Division, State,<br>and city   | Scarlet fever                               |                        | Smallpox                                    |                        |                         | Tuber-<br>culosis,<br>deaths<br>reported | Typhoid fever                               |                        |                         | Whoop-<br>ing<br>cough,<br>cases<br>reported | Deaths,<br>all<br>causes |
|--------------------------------|---|------------------------|---|------------------------|-------------------------|--|---|------------------------|-------------------------|--|--------------------------|
|                                | Cases,<br>esti-<br>mated<br>expect-<br>ancy | Cases<br>re-<br>ported | Cases,<br>esti-<br>mated<br>expect-<br>ancy | Cases<br>re-<br>ported | Deaths<br>re-<br>ported |  | Cases,<br>esti-<br>mated<br>expect-<br>ancy | Cases<br>re-<br>ported | Deaths<br>re-<br>ported |  |                          |
| NEW ENGLAND                    |   |                        |   |                        |                         |  |   |                        |                         |  |                          |
| Maine:<br>Portland-----        | 4   | 11                     | 0   | 0                      | 0                       | 1  | 0   | 0                      | 0                       | 23   | 23                       |
| New Hampshire:<br>Concord----- | 1   | 1                      | 0   | 0                      | 0                       | 0  | 0   | 0                      | 0                       | 0  | 6                        |
| Vermont:<br>Barre-----         | 0   | -----                  | 0   | -----                  | -----                   | -----                                    | 0   | -----                  | -----                   | -----  | -----                    |

## City reports for week ended February 28, 1931—Continued

| Division, State,<br>and city | Scarlet fever                               |                        | Smallpox                                    |                        |                         | Tuber-<br>culosis,<br>deaths<br>reported | Typhoid fever                               |                        |                         | Whoop-<br>ing<br>cough,<br>cases<br>reported | Deaths,<br>all<br>causes |
|------------------------------|---|------------------------|---|------------------------|-------------------------|--|---|------------------------|-------------------------|--|--------------------------|
|                              | Cases,<br>esti-<br>mated<br>expect-<br>ancy | Cases<br>re-<br>ported | Cases,<br>esti-<br>mated<br>expect-<br>ancy | Cases<br>re-<br>ported | Deaths<br>re-<br>ported |  | Cases,<br>esti-<br>mated<br>expect-<br>ancy | Cases<br>re-<br>ported | Deaths<br>re-<br>ported |  |                          |
| NEW ENGLAND—<br>continued    |   |                        |   |                        |                         |  |   |                        |                         |  |                          |
| Massachusetts:               |   |                        |   |                        |                         |  |   |                        |                         |  |                          |
| Boston.....                  | 84  | 126                    | 0   | 0                      | 0                       | 14                                       | 1   | 1                      | 0                       | 51   | 239                      |
| Fall River.....              | 3   | 18                     | 0   | 0                      | 0                       | 4  | 0   | 0                      | 0                       | 0  | 30                       |
| Springfield.....             | 10  | 3                      | 0   | 0                      | 0                       | 1  | 1   | 0                      | 0                       | 0  | 48                       |
| Worcester.....               | 10  | 22                     | 0   | 0                      | 0                       | 0  | 0   | 0                      | 0                       | 8  | 52                       |
| Rhode Island:                |   |                        |   |                        |                         |  |   |                        |                         |  |                          |
| Pawtucket.....               | 2   | 22                     | 0   | 0                      | 0                       | 0  | 0   | 0                      | 0                       | 3  | 22                       |
| Providence.....              | 13  | 35                     | 0   | 0                      | 0                       | 4  | 0   | 0                      | 0                       | 5  | 84                       |
| Connecticut:                 |   |                        |   |                        |                         |  |   |                        |                         |  |                          |
| Bridgeport.....              | 13  | 3                      | 0   | 0                      | 0                       | 0  | 0   | 1                      | 0                       | 4  | 40                       |
| Hartford.....                | 7   | 10                     | 0   | 0                      | 0                       | 4  | 0   | 0                      | 0                       | 0  | 62                       |
| New Haven.....               | 10  | 1                      | 0   | 0                      | 0                       | 3  | 1   | 0                      | 0                       | 1  | 46                       |
| MIDDLE ATLANTIC              |   |                        |   |                        |                         |  |   |                        |                         |  |                          |
| New York:                    |   |                        |   |                        |                         |  |   |                        |                         |  |                          |
| Buffalo.....                 | 30  | 40                     | 0   | 0                      | 0                       | 12                                       | 0   | 0                      | 0                       | 27   | 203                      |
| New York.....                | 302   | 404                    | 0   | 0                      | 0                       | 96                                       | 6   | 13                     | 2                       | 175  | 1,676                    |
| Rochester.....               | 9   | 102                    | 0   | 0                      | 0                       | 2  | 0   | 0                      | 0                       | 21   | 103                      |
| Syracuse.....                | 15  | 13                     | 0   | 0                      | 0                       | 1  | 0   | 0                      | 0                       | 19   | 53                       |
| New Jersey:                  |   |                        |   |                        |                         |  |   |                        |                         |  |                          |
| Camden.....                  | 6   | 5                      | 0   | 0                      | 0                       | 3  | 0   | 0                      | 0                       | 0  | 41                       |
| Newark.....                  | 43  | 41                     | 0   | 0                      | 0                       | 9  | 0   | 0                      | 0                       | 47   | 105                      |
| Trenton.....                 | 5   | 9                      | 0   | 0                      | 0                       | 1  | 0   | 0                      | 0                       | 6  | 43                       |
| Pennsylvania:                |   |                        |   |                        |                         |  |   |                        |                         |  |                          |
| Philadelphia.....            | 104   | 205                    | 0   | 0                      | 0                       | 29                                       | 2   | 0                      | 0                       | 48   | 553                      |
| Pittsburgh.....              | 33  | 34                     | 0   | 0                      | 0                       | 10                                       | 0   | 1                      | 0                       | 13   | 241                      |
| Reading.....                 | 6   | 0                      | 0   | 0                      | 0                       | 0  | 0   | 0                      | 0                       | 0  | 26                       |
| EAST NORTH<br>CENTRAL        |   |                        |   |                        |                         |  |   |                        |                         |  |                          |
| Ohio:                        |   |                        |   |                        |                         |  |   |                        |                         |  |                          |
| Cincinnati.....              | 21  | 42                     | 1   | 0                      | 0                       | 13                                       | 0   | 1                      | 0                       | 9  | 192                      |
| Cleveland.....               | 59  | 69                     | 0   | 0                      | 0                       | 18                                       | 0   | 0                      | 0                       | 24   | —                        |
| Columbus.....                | 11  | 7                      | 1   | 0                      | 0                       | 2  | 1   | 0                      | 0                       | 3  | 87                       |
| Toledo.....                  | 13  | 7                      | 1   | 3                      | 0                       | 2  | 0   | 0                      | 1                       | 5  | 87                       |
| Indiana:                     |   |                        |   |                        |                         |  |   |                        |                         |  |                          |
| Fort Wayne.....              | 4   | 6                      | 1   | 4                      | 0                       | 2  | 0   | 0                      | 0                       | 0  | 35                       |
| Indianapolis.....            | 13  | 80                     | 8   | 9                      | 0                       | 3  | 0   | 1                      | 0                       | 21   | —                        |
| South Bend.....              | 4   | 1                      | 0   | 3                      | 0                       | 2  | 0   | 0                      | 0                       | 4  | 26                       |
| Terre Haute.....             | 2   | 2                      | 0   | 0                      | 0                       | 0  | 0   | 0                      | 0                       | 0  | 19                       |
| Illinois:                    |   |                        |   |                        |                         |  |   |                        |                         |  |                          |
| Chicago.....                 | 140   | 237                    | 2   | 0                      | 0                       | 54                                       | 2   | 2                      | 0                       | 47   | 787                      |
| Springfield.....             | 3   | 3                      | 0   | 0                      | 0                       | 0  | 0   | 0                      | 0                       | 1  | 28                       |
| Michigan:                    |   |                        |   |                        |                         |  |   |                        |                         |  |                          |
| Detroit.....                 | 121   | 96                     | 2   | 2                      | 0                       | 32                                       | 0   | 1                      | 0                       | 64   | 362                      |
| Flint.....                   | 16  | 10                     | 1   | 0                      | 0                       | 2  | 0   | 0                      | 0                       | 5  | 32                       |
| Grand Rapids.....            | 13  | 16                     | 1   | 0                      | 0                       | 0  | 1   | 0                      | 0                       | 10   | 31                       |
| Wisconsin:                   |   |                        |   |                        |                         |  |   |                        |                         |  |                          |
| Kenosha.....                 | 3   | 2                      | 0   | 0                      | 0                       | 0  | 0   | 0                      | 0                       | 0  | 7                        |
| Madison.....                 | 5   | 3                      | 0   | 0                      | —                       | —  | 0   | 1                      | —                       | 2  | —                        |
| Milwaukee.....               | 35  | 18                     | 0   | 0                      | 0                       | 4  | 0   | 0                      | 0                       | 16   | 117                      |
| Racine.....                  | 4   | 10                     | 0   | 0                      | 0                       | 1  | 0   | 0                      | 0                       | 5  | 16                       |
| Superior.....                | 3   | 1                      | 0   | 0                      | 0                       | 1  | 0   | 0                      | 0                       | 2  | 7                        |
| WEST NORTH.CEN-<br>TRAL      |   |                        |   |                        |                         |  |   |                        |                         |  |                          |
| Minnesota:                   |   |                        |   |                        |                         |  |   |                        |                         |  |                          |
| Duluth.....                  | 10  | 1                      | 0   | 0                      | 0                       | 1  | 1   | 0                      | 0                       | 3  | 29                       |
| Minneapolis.....             | 53  | 25                     | 1   | 0                      | 0                       | 6  | 0   | 0                      | 0                       | 21   | 114                      |
| St. Paul.....                | 35  | 13                     | 2   | 0                      | 0                       | 4  | 0   | 6                      | 0                       | 18   | 54                       |
| Iowa:                        |   |                        |   |                        |                         |  |   |                        |                         |  |                          |
| Davenport.....               | 1   | 2                      | 1   | 8                      | —                       | —  | 0   | 0                      | —                       | 0  | —                        |
| Des Moines.....              | 12  | 3                      | 1   | 9                      | —                       | —  | 0   | 0                      | —                       | 0  | 33                       |
| Sioux City.....              | 1   | 14                     | 1   | 3                      | —                       | —  | 0   | 0                      | —                       | 1  | —                        |
| Waterloo.....                | 2   | 0                      | 0   | 0                      | —                       | —  | 0   | 0                      | —                       | 9  | —                        |
| Missouri:                    |   |                        |   |                        |                         |  |   |                        |                         |  |                          |
| Kansas City.....             | 23  | —                      | 0   | —                      | —                       | —  | 0   | —                      | —                       | —  | —                        |
| St. Joseph.....              | 3   | 1                      | 0   | 0                      | 0                       | 1  | 0   | 0                      | 0                       | 0  | 26                       |
| St. Louis.....               | 39  | 187                    | 2   | 0                      | 0                       | 13                                       | 0   | 0                      | 1                       | 14   | 324                      |

## City reports for week ended February 28, 1931—Continued

| Division, State,<br>and city | Scarlet fever                               |                        | Smallpox                                    |                        |                         | Tuber-<br>culo-<br>sis,<br>deaths<br>re-<br>ported | Typhoid fever                               |                        |                         | Whoop-<br>ing<br>cough,<br>cases<br>re-<br>ported | Deaths,<br>all<br>causes |
|------------------------------|---|------------------------|---|------------------------|-------------------------|--|---|------------------------|-------------------------|---|--------------------------|
|                              | Cases,<br>esti-<br>mated<br>expect-<br>ancy | Cases<br>re-<br>ported | Cases,<br>esti-<br>mated<br>expect-<br>ancy | Cases<br>re-<br>ported | Deaths<br>re-<br>ported |  | Cases,<br>esti-<br>mated<br>expect-<br>ancy | Cases<br>re-<br>ported | Deaths<br>re-<br>ported |   |                          |
| WEST NORTH CENTRAL—CON.      |   |                        |   |                        |                         |  |   |                        |                         |   |                          |
| North Dakota:                |   |                        |   |                        |                         |  |   |                        |                         |   |                          |
| Fargo.....                   | 3   | 2                      | 0   | 0                      | 0                       | 0  | 0   | 0                      | 0                       | 1   | 9                        |
| Grand Forks.....             | 1   | 1                      | 1   | 0                      |                         | 0  | 0   | 0                      |                         | 2   |                          |
| South Dakota:                |   |                        |   |                        |                         |  |   |                        |                         |   |                          |
| Aberdeen.....                | 0   | 0                      | 0   | 1                      |                         |  | 0   | 0                      |                         | 0   |                          |
| Sioux Falls.....             | 2   | 1                      | 0   | 5                      |                         |  | 0   | 0                      |                         | 0   | 4                        |
| Nebraska:                    |   |                        |   |                        |                         |  |   |                        |                         |   |                          |
| Omaha.....                   | 5   | 9                      | 2   | 20                     | 0                       | 2  | 0   | 0                      | 0                       | 7   | 77                       |
| Kansas:                      |   |                        |   |                        |                         |  |   |                        |                         |   |                          |
| Topeka.....                  | 1   | 2                      | 0   | 0                      | 0                       | 1  | 0   | 0                      | 0                       | 0   | 16                       |
| Wichita.....                 | 3   | 1                      | 1   | 44                     | 0                       | 0  | 0   | 0                      | 0                       | 11  | 24                       |
| SOUTH ATLANTIC               |   |                        |   |                        |                         |  |   |                        |                         |   |                          |
| Delaware:                    |   |                        |   |                        |                         |  |   |                        |                         |   |                          |
| Wilmington.....              | 5   | 11                     | 0   | 0                      | 0                       | 1  | 0   | 0                      | 0                       | 0   | 28                       |
| Maryland:                    |   |                        |   |                        |                         |  |   |                        |                         |   |                          |
| Baltimore.....               | 41  | 78                     | 0   | 0                      | 0                       | 20   | 1   | 1                      | 0                       | 14  | 257                      |
| Cumberland.....              | 1   | 2                      | 0   | 0                      | 0                       | 0  | 0   | 0                      | 0                       | 0   | 16                       |
| Frederick.....               | 1   | 0                      | 0   | 0                      | 0                       | 0  | 0   | 0                      | 0                       | 0   | 6                        |
| District of Col.:            |   |                        |   |                        |                         |  |   |                        |                         |   |                          |
| Washington.....              | 26  | 18                     | 0   | 0                      | 0                       | 12   | 0   | 0                      | 0                       | 5   | 185                      |
| Virginia:                    |   |                        |   |                        |                         |  |   |                        |                         |   |                          |
| Lynchburg.....               | 0   | 0                      | 0   | 0                      | 0                       | 1  | 0   | 0                      | 0                       | 0   | 18                       |
| Norfolk.....                 | 2   | 3                      | 0   | 0                      | 0                       | 2  |   | 0                      | 0                       | 3   |                          |
| Richmond.....                | 4   | 3                      | 0   | 0                      | 0                       | 4  | 0   | 0                      | 0                       | 0   | 52                       |
| Roanoke.....                 | 1   | 5                      | 0   | 0                      | 0                       | 1  | 0   | 0                      | 0                       | 2   | 19                       |
| West Virginia:               |   |                        |   |                        |                         |  |   |                        |                         |   |                          |
| Charleston.....              | 1   | 3                      | 0   | 0                      | 0                       | 1  | 1   | 0                      | 0                       | 0   | 24                       |
| Wheeling.....                | 2   | 1                      | 0   | 0                      | 0                       | 1  | 0   | 0                      | 0                       | 0   | 22                       |
| North Carolina:              |   |                        |   |                        |                         |  |   |                        |                         |   |                          |
| Raleigh.....                 | 0   | 3                      | 0   | 0                      | 0                       | 0  | 0   | 0                      | 0                       | 12  | 10                       |
| Wilmington.....              | 0   | 2                      | 0   | 0                      | 0                       | 1  | 0   | 0                      | 0                       | 6   | 10                       |
| Winston-Salem.....           | 1   | 0                      | 0   | 0                      | 0                       | 0  | 0   | 0                      | 0                       | 6   | 12                       |
| South Carolina:              |   |                        |   |                        |                         |  |   |                        |                         |   |                          |
| Charleston.....              | 0   | 0                      | 0   | 0                      | 0                       | 2  | 0   | 0                      | 0                       | 2   | 34                       |
| Columbia.....                | 0   | 1                      | 0   | 0                      | 0                       | 7  | 0   | 0                      | 0                       | 0   | 40                       |
| Greenville.....              | 0   | 0                      | 0   | 0                      | 0                       | 0  | 0   | 0                      | 0                       | 0   |                          |
| Georgia:                     |   |                        |   |                        |                         |  |   |                        |                         |   |                          |
| Atlanta.....                 | 6   | 57                     | 2   | 0                      | 0                       | 5  | 0   | 7                      | 0                       | 1   | 86                       |
| Brunswick.....               | 0   | 0                      | 0   | 0                      | 0                       | 0  | 0   | 0                      | 0                       | 0   | 1                        |
| Savannah.....                | 1   | 0                      | 0   | 0                      | 0                       | 2  | 0   | 1                      | 0                       | 1   | 35                       |
| Florida:                     |   |                        |   |                        |                         |  |   |                        |                         |   |                          |
| Miami.....                   | 1   | 1                      | 0   | 0                      | 0                       | 1  | 0   | 1                      | 0                       | 0   | 38                       |
| St. Petersburg.....          | 0   |                        | 0   |                        | 0                       | 0  | 0   |                        | 1                       |   | 34                       |
| Tampa.....                   | 1   | 0                      | 0   | 0                      | 0                       | 0  | 1   | 2                      | 1                       | 0   | 34                       |
| EAST SOUTH CENTRAL           |   |                        |   |                        |                         |  |   |                        |                         |   |                          |
| Kentucky:                    |   |                        |   |                        |                         |  |   |                        |                         |   |                          |
| Covington.....               | 1   | 21                     | 0   | 0                      | 0                       | 0  | 0   | 0                      | 0                       | 0   | 20                       |
| Tennessee:                   |   |                        |   |                        |                         |  |   |                        |                         |   |                          |
| Memphis.....                 | 8   | 51                     | 1   | 4                      | 0                       | 10   | 1   | 0                      | 0                       | 2   | 96                       |
| Nashville.....               | 3   | 10                     | 1   | 0                      | 0                       | 2  | 0   | 0                      | 0                       | 1   | 77                       |
| Alabama:                     |   |                        |   |                        |                         |  |   |                        |                         |   |                          |
| Birmingham.....              | 3   | 8                      | 1   | 0                      | 0                       | 4  | 0   | 0                      | 0                       | 4   | 78                       |
| Mobile.....                  | 1   | 5                      | 0   | 0                      | 0                       | 0  | 1   | 1                      | 0                       | 0   | 19                       |
| Montgomery.....              | 0   | 0                      | 0   | 0                      |                         |  | 0   | 0                      |                         | 3   |                          |
| WEST SOUTH CENTRAL           |   |                        |   |                        |                         |  |   |                        |                         |   |                          |
| Arkansas:                    |   |                        |   |                        |                         |  |   |                        |                         |   |                          |
| Fort Smith.....              | 1   | 1                      | 0   | 0                      |                         |  | 0   | 0                      |                         | 3   |                          |
| Little Rock.....             | 1   | 1                      | 0   | 1                      | 0                       | 1  | 0   | 1                      | 0                       | 0   |                          |
| Louisiana:                   |   |                        |   |                        |                         |  |   |                        |                         |   |                          |
| New Orleans.....             | 8   | 18                     | 0   | 7                      | 0                       | 24   | 2   | 1                      | 2                       | 0   | 176                      |
| Shreveport.....              | 2   | 0                      | 1   | 1                      | 0                       | 1  | 0   | 0                      | 0                       | 0   | 19                       |
| Oklahoma:                    |   |                        |   |                        |                         |  |   |                        |                         |   |                          |
| Muskogee.....                | 1   | 0                      | 2   | 2                      |                         |  | 0   | 0                      |                         | 0   |                          |
| Tulsa.....                   | 2   | 10                     | 0   | 0                      | 0                       |  | 1   | 0                      |                         | 0   | 1                        |

## City reports for week ended February 28, 1931—Continued

| Division, State,<br>and city | Scarlet fever                               |                        | Smallpox                                    |                        |                    | Tuber-<br>culosis,<br>deaths<br>reported | Typhoid fever                               |                        |                    | Whoop-<br>ing<br>cough,<br>cases<br>reported | Deaths,<br>all<br>causes |
|------------------------------|---|------------------------|---|------------------------|--------------------|--|---|------------------------|--------------------|--|--------------------------|
|                              | Cases,<br>esti-<br>mated<br>expect-<br>ancy | Cases<br>re-<br>ported | Cases,<br>esti-<br>mated<br>expect-<br>ancy | Cases<br>re-<br>ported | Deaths<br>reported |  | Cases,<br>esti-<br>mated<br>expect-<br>ancy | Cases<br>re-<br>ported | Deaths<br>reported |  |                          |
| WEST SOUTH CEN-<br>TRAL—con. |   |                        |   |                        |                    |  |   |                        |                    |  |                          |
| Texas:                       |   |                        |   |                        |                    |  |   |                        |                    |  |                          |
| Dallas.....                  | 5   | 7                      | 4   | 2                      | 0                  | 3  | 1   | 1                      | 1                  | 11   | 72                       |
| Fort Worth.....              | 4   | 4                      | 2   | 3                      | 0                  | 2  | 0   | 0                      | 0                  | 0  | 29                       |
| Galveston.....               | 0   | 0                      | 0   | 0                      | 0                  | 0  | 1   | 1                      | 0                  | 0  | 18                       |
| Houston.....                 | 2   | 9                      | 4   | 8                      | 0                  | 4  | 0   | 0                      | 0                  | 0  | 73                       |
| San Antonio.....             | 1   | 1                      | 0   | 0                      | 0                  | 9  | 0   | 0                      | 0                  | 0  | 67                       |
| MOUNTAIN                     |   |                        |   |                        |                    |  |   |                        |                    |  |                          |
| Montana:                     |   |                        |   |                        |                    |  |   |                        |                    |  |                          |
| Billings.....                | 1   | 0                      | 0   | 0                      | 0                  | 0  | 0   | 0                      | 0                  | 3  | 2                        |
| Great Falls.....             | 3   | 5                      | 1   | 0                      | 0                  | 0  | 0   | 0                      | 0                  | 15   | 7                        |
| Helena.....                  | 0   | 0                      | 0   | 0                      | 0                  | 0  | 0   | 0                      | 0                  | 0  | 6                        |
| Missoula.....                | 0   | 0                      | 0   | 0                      | 0                  | 0  | 0   | 0                      | 0                  | 11   | 4                        |
| Idaho:                       |   |                        |   |                        |                    |  |   |                        |                    |  |                          |
| Boise.....                   | 0   | 0                      | 0   | 1                      | 0                  | 0  | 0   | 0                      | 0                  | 0  | 7                        |
| Colorado:                    |   |                        |   |                        |                    |  |   |                        |                    |  |                          |
| Denver.....                  | 14  |                        | 1   |                        |                    |  | 1   |                        |                    |  |                          |
| Pueblo.....                  | 0   | 0                      | 0   | 0                      | 0                  | 0  | 0   | 0                      | 0                  | 7  | 5                        |
| New Mexico:                  |   |                        |   |                        |                    |  |   |                        |                    |  |                          |
| Albuquerque.....             | 0   | 0                      | 0   | 0                      | 0                  | 2  | 0   | 0                      | 0                  | 1  | 14                       |
| Arizona:                     |   |                        |   |                        |                    |  |   |                        |                    |  |                          |
| Phoenix.....                 | 1   | 1                      | 1   | 0                      | 0                  | 3  | 0   | 0                      | 0                  | 0  |                          |
| Utah:                        |   |                        |   |                        |                    |  |   |                        |                    |  |                          |
| Salt Lake City.....          | 3   | 3                      | 0   | 0                      | 0                  | 0  | 0   | 0                      | 0                  | 26   | 35                       |
| Nevada:                      |   |                        |   |                        |                    |  |   |                        |                    |  |                          |
| Reno.....                    | 0   | 0                      | 0   | 0                      | 0                  |  | 0   | 0                      | 0                  | 0  | 7                        |
| PACIFIC                      |   |                        |   |                        |                    |  |   |                        |                    |  |                          |
| Washington:                  |   |                        |   |                        |                    |  |   |                        |                    |  |                          |
| Seattle.....                 | 11  | 8                      | 3   | 0                      |                    |  | 0   | 0                      |                    | 32   |                          |
| Spokane.....                 | 7   | 10                     | 10  | 8                      |                    |  | 0   | 0                      |                    | 0  |                          |
| Tacoma.....                  | 2   | 5                      | 3   | 0                      | 0                  | 1  | 0   | 0                      | 0                  | 3  | 23                       |
| Oregon:                      |   |                        |   |                        |                    |  |   |                        |                    |  |                          |
| Portland.....                | 5   | 4                      | 17  | 19                     | 0                  | 6  | 1   | 0                      | 0                  | 0  | 75                       |
| Salem.....                   | 1   | 0                      | 1   | 0                      |                    |  | 0   | 0                      |                    | 0  |                          |
| California:                  |   |                        |   |                        |                    |  |   |                        |                    |  |                          |
| Los Angeles.....             | 45  | 43                     | 2   | 10                     | 0                  | 33                                       | 2   | 0                      | 0                  | 22   | 330                      |
| Sacramento.....              | 3   | 0                      | 0   | 0                      | 0                  | 0  | 0   | 1                      | 0                  | 32   | 26                       |
| San Francisco.....           | 27  | 8                      | 1   | 2                      | 0                  | 11                                       | 0   | 1                      | 0                  | 19   | 171                      |

| Division, State, and city | Meningococcus meningitis |        | Lethargic encephalitis |        | Pellagra |        | Poliomyelitis (Infantile paralysis) |       |        |
|---------------------------|--------------------------|--------|------------------------|--------|----------|--------|-------------------------------------|-------|--------|
|                           | Cases                    | Deaths | Cases                  | Deaths | Cases    | Deaths | Cases, estimated expectancy         | Cases | Deaths |
| <b>NEW ENGLAND</b>        |                          |        |                        |        |          |        |                                     |       |        |
| <b>Massachusetts:</b>     |                          |        |                        |        |          |        |                                     |       |        |
| Boston.....               | 3                        | 0      | 0                      | 0      | 0        | 0      | 0                                   | 0     | 0      |
| <b>Connecticut:</b>       |                          |        |                        |        |          |        |                                     |       |        |
| Hartford.....             | 0                        | 1      | 0                      | 0      | 0        | 0      | 0                                   | 0     | 0      |
| <b>MIDDLE ATLANTIC</b>    |                          |        |                        |        |          |        |                                     |       |        |
| <b>New York:</b>          |                          |        |                        |        |          |        |                                     |       |        |
| New York.....             | 12                       | 8      | 1                      | 1      | 0        | 0      | 1                                   | 1     | 1      |
| Rochester.....            | 2                        | 0      | 0                      | 0      | 0        | 0      | 0                                   | 0     | 0      |
| <b>Pennsylvania:</b>      |                          |        |                        |        |          |        |                                     |       |        |
| Philadelphia.....         | 8                        | 4      | 0                      | 1      | 1        | 0      | 0                                   | 0     | 0      |
| Pittsburgh.....           | 1                        | 2      | 0                      | 0      | 0        | 0      | 0                                   | 0     | 0      |

## City reports for week ended February 28, 1931—Continued

| Division, State, and city   | Meningo-<br>cocci meningitis |        | Lethargic en-<br>cephalitis |        | Poliagra |        | Polioomyelitis (infan-<br>tile paralysis)   |       |        |
|-----------------------------|------------------------------|--------|-----------------------------|--------|----------|--------|---|-------|--------|
|                             | Cases                        | Deaths | Cases                       | Deaths | Cases    | Deaths | Cases,<br>esti-<br>mated<br>expect-<br>ancy | Cases | Deaths |
| <b>EAST NORTH CENTRAL</b>   |                              |        |                             |        |          |        |   |       |        |
| Ohio:                       |                              |        |                             |        |          |        |   |       |        |
| Cincinnati.....             | 1                            | 0      | 0                           | 0      | 0        | 0      | 0   | 0     | 0      |
| Cleveland.....              | 2                            | 0      | 1                           | 1      | 0        | 0      | 0   | 0     | 0      |
| Columbus.....               | 1                            | 1      | 0                           | 0      | 0        | 0      | 0   | 0     | 0      |
| Indiana:                    |                              |        |                             |        |          |        |   |       |        |
| Indianapolis.....           | 1                            | 2      | 0                           | 0      | 0        | 0      | 0   | 0     | 0      |
| Illinois:                   |                              |        |                             |        |          |        |   |       |        |
| Chicago.....                | 8                            | 4      | 1                           | 0      | 0        | 0      | 0   | 0     | 0      |
| Michigan:                   |                              |        |                             |        |          |        |   |       |        |
| Detroit.....                | 16                           | 8      | 1                           | 0      | 0        | 0      | 1   | 0     | 0      |
| Flint.....                  | 0                            | 0      | 1                           | 1      | 0        | 0      | 0   | 0     | 0      |
| Wisconsin:                  |                              |        |                             |        |          |        |   |       |        |
| Racine.....                 | 0                            | 0      | 0                           | 1      | 0        | 0      | 0   | 0     | 0      |
| <b>WEST NORTH CENTRAL</b>   |                              |        |                             |        |          |        |   |       |        |
| Minnesota:                  |                              |        |                             |        |          |        |   |       |        |
| Minneapolis.....            | 1                            | 0      | 0                           | 0      | 0        | 0      | 0   | 0     | 0      |
| Iowa:                       |                              |        |                             |        |          |        |   |       |        |
| Sioux City.....             | 1                            | 1      | 0                           | 0      | 0        | 0      | 0   | 0     | 0      |
| Missouri:                   |                              |        |                             |        |          |        |   |       |        |
| St. Louis.....              | 8                            | 5      | 1                           | 1      | 0        | 0      | 0   | 0     | 0      |
| <b>SOUTH ATLANTIC</b>       |                              |        |                             |        |          |        |   |       |        |
| Maryland:                   |                              |        |                             |        |          |        |   |       |        |
| Baltimore.....              | 1                            | 1      | 0                           | 0      | 0        | 0      | 1   | 1     | 0      |
| District of Columbia:       |                              |        |                             |        |          |        |   |       |        |
| Washington.....             | 1                            | 0      | 0                           | 0      | 1        | 1      | 0   | 1     | 1      |
| North Carolina:             |                              |        |                             |        |          |        |   |       |        |
| Raleigh.....                | 0                            | 0      | 0                           | 0      | 1        | 0      | 0   | 0     | 0      |
| Winston-Salem.....          | 0                            | 0      | 0                           | 0      | 1        | 1      | 0   | 0     | 0      |
| South Carolina:             |                              |        |                             |        |          |        |   |       |        |
| Charleston.....             | 0                            | 0      | 0                           | 0      | 2        | 1      | 0   | 0     | 0      |
| Columbia.....               | 0                            | 1      | 0                           | 0      | 0        | 0      | 0   | 0     | 0      |
| Georgia:                    |                              |        |                             |        |          |        |   |       |        |
| Atlanta.....                | 2                            | 0      | 0                           | 0      | 0        | 2      | 0   | 1     | 0      |
| Savannah <sup>1</sup> ..... | 0                            | 0      | 0                           | 0      | 0        | 0      | 0   | 0     | 0      |
| Florida:                    |                              |        |                             |        |          |        |   |       |        |
| Tampa.....                  | 2                            | 0      | 0                           | 0      | 0        | 1      | 0   | 0     | 0      |
| <b>EAST SOUTH CENTRAL</b>   |                              |        |                             |        |          |        |   |       |        |
| Tennessee:                  |                              |        |                             |        |          |        |   |       |        |
| Memphis.....                | 13                           | 7      | 0                           | 0      | 0        | 2      | 0   | 0     | 0      |
| Nashville.....              | 2                            | 2      | 0                           | 0      | 0        | 0      | 0   | 0     | 0      |
| Alabama:                    |                              |        |                             |        |          |        |   |       |        |
| Mobile.....                 | 1                            | 0      | 0                           | 0      | 1        | 0      | 0   | 0     | 0      |
| <b>WEST SOUTH CENTRAL</b>   |                              |        |                             |        |          |        |   |       |        |
| Louisiana:                  |                              |        |                             |        |          |        |   |       |        |
| New Orleans.....            | 4                            | 1      | 0                           | 0      | 0        | 0      | 0   | 0     | 0      |
| Texas:                      |                              |        |                             |        |          |        |   |       |        |
| Dallas.....                 | 0                            | 0      | 0                           | 0      | 2        | 1      | 0   | 0     | 0      |
| Fort Worth.....             | 0                            | 0      | 0                           | 0      | 0        | 1      | 0   | 0     | 0      |
| Houston.....                | 0                            | 0      | 0                           | 1      | 0        | 0      | 0   | 0     | 0      |
| <b>PACIFIC</b>              |                              |        |                             |        |          |        |   |       |        |
| Washington:                 |                              |        |                             |        |          |        |   |       |        |
| Tacoma.....                 | 0                            | 1      | 0                           | 0      | 0        | 0      | 0   | 0     | 0      |
| California:                 |                              |        |                             |        |          |        |   |       |        |
| Los Angeles.....            | 1                            | 1      | 0                           | 0      | 0        | 0      | 0   | 1     | 0      |
| San Francisco.....          | 0                            | 0      | 0                           | 1      | 0        | 0      | 0   | 1     | 0      |

<sup>1</sup> Typhus fever: 1 case at Savannah, Ga.

The following tables give the rates per 100,000 population for 98 cities for the 5-week period ended February 28, 1931, compared with those for a like period ended March 1, 1930. The population figures used in computing the rates are estimated mid-year populations for 1930 and 1931, respectively, derived from the 1930 census. The 98 cities reporting cases have an estimated aggregate population of more than 33,000,000. The 91 cities reporting deaths have more than 31,500,000 estimated population.

*Summary of weekly reports from cities January 25 to February 28, 1931—Annual rates per 100,000 population, compared with rates for the corresponding period of 1930<sup>1</sup>*

## DIPHTHERIA CASE RATES

|                         | Week ended—   |              |              |              |               |               |               |               |               | Mar. 1, 1930 |
|-------------------------|---------------|--------------|--------------|--------------|---------------|---------------|---------------|---------------|---------------|--------------|
|                         | Jan. 31, 1931 | Feb. 1, 1930 | Feb. 7, 1931 | Feb. 8, 1930 | Feb. 14, 1931 | Feb. 15, 1930 | Feb. 21, 1931 | Feb. 22, 1930 | Feb. 28, 1931 |              |
| 98 cities.....          | 2 89          | 112          | 2 78         | 92           | 67            | 95            | 68            | 91            | 1 70          | 104          |
| New England.....        | 106           | 135          | 82           | 119          | 75            | 104           | 70            | 109           | 4 89          | 121          |
| Middle Atlantic.....    | 68            | 98           | 53           | 92           | 53            | 78            | 64            | 83            | 56            | 103          |
| East North Central..... | 111           | 139          | 96           | 102          | 85            | 114           | 66            | 101           | 78            | 122          |
| West North Central..... | 111           | 77           | 99           | 83           | 55            | 107           | 59            | 95            | 1 61          | 120          |
| South Atlantic.....     | 2 73          | 116          | 2 75         | 76           | 59            | 102           | 47            | 120           | 77            | 96           |
| East South Central..... | 70            | 84           | 52           | 72           | 52            | 66            | 58            | 96            | 58            | 54           |
| West South Central..... | 183           | 216          | 156          | 157          | 118           | 136           | 186           | 80            | 132           | 101          |
| Mountain.....           | 70            | 35           | 78           | 70           | 78            | 62            | 35            | 70            | 4 68          | 35           |
| Pacific.....            | 45            | 69           | 69           | 36           | 49            | 75            | 59            | 53            | 57            | 63           |

## MEASLES CASE RATES

| 98 cities.....          | 2 418  | 278   | 2 473  | 317   | 521   | 411   | 668   | 446   | 2 699 | 538   |
|-------------------------|--------|-------|--------|-------|-------|-------|-------|-------|-------|-------|
| New England.....        | 438    | 341   | 502    | 322   | 534   | 472   | 541   | 418   | 4 636 | 506   |
| Middle Atlantic.....    | 306    | 145   | 353    | 176   | 397   | 213   | 652   | 254   | 645   | 346   |
| East North Central..... | 142    | 167   | 151    | 171   | 183   | 251   | 255   | 267   | 300   | 345   |
| West North Central..... | 1 521  | 424   | 1 488  | 610   | 1 314 | 810   | 1 086 | 775   | 1 785 | 939   |
| South Atlantic.....     | 21 032 | 314   | 21 294 | 268   | 1 817 | 334   | 2 202 | 441   | 2 800 | 148   |
| East South Central..... | 908    | 54    | 1 024  | 72    | 896   | 233   | 1 123 | 604   | 1 042 | 753   |
| West South Central..... | 17     | 293   | 3      | 648   | 17    | 693   | 24    | 745   | 24    | 704   |
| Mountain.....           | 496    | 396   | 1 123  | 405   | 688   | 758   | 1 567 | 767   | 2 086 | 1 507 |
| Pacific.....            | 110    | 1 028 | 112    | 1 028 | 168   | 1 243 | 243   | 1 271 | 223   | 1 696 |

## SCARLET FEVER CASE RATES

| 98 cities.....          | 2 337 | 292 | 2 320 | 323 | 348 | 302 | 346 | 294 | 2 375 | 357 |
|-------------------------|-------|-----|-------|-----|-----|-----|-----|-----|-------|-----|
| New England.....        | 519   | 346 | 534   | 530 | 683 | 352 | 589 | 409 | 4 609 | 402 |
| Middle Atlantic.....    | 328   | 239 | 304   | 260 | 321 | 234 | 342 | 242 | 381   | 308 |
| East North Central..... | 378   | 416 | 331   | 427 | 375 | 434 | 353 | 421 | 364   | 510 |
| West North Central..... | 386   | 283 | 480   | 370 | 474 | 331 | 497 | 327 | 1 574 | 341 |
| South Atlantic.....     | 2 312 | 224 | 2 304 | 222 | 320 | 262 | 304 | 236 | 363   | 258 |
| East South Central..... | 512   | 143 | 419   | 191 | 378 | 149 | 529 | 149 | 553   | 173 |
| West South Central..... | 112   | 73  | 86    | 129 | 105 | 108 | 139 | 94  | 125   | 108 |
| Mountain.....           | 323   | 414 | 261   | 361 | 469 | 423 | 296 | 308 | 1 136 | 388 |
| Pacific.....            | 143   | 306 | 145   | 289 | 123 | 269 | 94  | 202 | 145   | 352 |

<sup>1</sup> The figures given in this table are rates per 100,000 population, annual basis, and not the number of cases reported. Populations used are estimates as of July 1, 1931 and 1930, respectively.

<sup>2</sup> Columbia, S. O., not included.

<sup>3</sup> Barre, Vt., Kansas City, Mo., and Denver, Colo., not included.

<sup>4</sup> Barre, Vt., not included.

<sup>5</sup> Kansas City, Mo., not included.

<sup>6</sup> Denver, Colo., not included.

*Summary of weekly reports from cities January 25 to February 28, 1931—Annual rates per 100,000 population, compared with rates for the corresponding period of 1930*

## SMALLPOX CASE RATES

|                         | Week ended—         |                    |                    |                    |                     |                     |                     |                     |                     |                 |
|-------------------------|---------------------|--------------------|--------------------|--------------------|---------------------|---------------------|---------------------|---------------------|---------------------|-----------------|
|                         | Jan.<br>31,<br>1931 | Feb.<br>1,<br>1930 | Feb.<br>7,<br>1931 | Feb.<br>8,<br>1930 | Feb.<br>14,<br>1931 | Feb.<br>15,<br>1930 | Feb.<br>21,<br>1931 | Feb.<br>22,<br>1930 | Feb.<br>28,<br>1931 | Mar. 1,<br>1930 |
| 98 cities.....          | 17                  | 31                 | 23                 | 29                 | 18                  | 26                  | 20                  | 24                  | 21                  | 30              |
| New England.....        | 0                   | 0                  | 0                  | 2                  | 0                   | 7                   | 0                   | 0                   | 0                   | 0               |
| Middle Atlantic.....    | 0                   | 0                  | 2                  | 0                  | 0                   | 0                   | 3                   | 0                   | 0                   | 0               |
| East North Central..... | 25                  | 39                 | 12                 | 34                 | 10                  | 33                  | 13                  | 20                  | 11                  | 40              |
| West North Central..... | 84                  | 48                 | 151                | 60                 | 84                  | 48                  | 128                 | 93                  | 151                 | 91              |
| South Atlantic.....     | 0                   | 6                  | 0                  | 4                  | 0                   | 6                   | 2                   | 2                   | 0                   | 2               |
| East South Central..... | 17                  | 12                 | 29                 | 0                  | 12                  | 24                  | 17                  | 12                  | 23                  | 6               |
| West South Central..... | 51                  | 73                 | 81                 | 94                 | 132                 | 98                  | 51                  | 52                  | 64                  | 111             |
| Mountain.....           | 0                   | 62                 | 44                 | 18                 | 0                   | 35                  | 44                  | 18                  | 17                  | 26              |
| Pacific.....            | 18                  | 152                | 24                 | 126                | 29                  | 89                  | 22                  | 101                 | 39                  | 97              |

## TYPHOID FEVER CASE RATES

|                         |    |    |    |    |    |    |    |    |    |    |
|-------------------------|----|----|----|----|----|----|----|----|----|----|
| 98 cities.....          | 5  | 5  | 4  | 4  | 3  | 6  | 4  | 5  | 7  | 8  |
| New England.....        | 5  | 0  | 2  | 0  | 2  | 2  | 0  | 5  | 5  | 0  |
| Middle Atlantic.....    | 2  | 5  | 1  | 3  | 2  | 6  | 3  | 6  | 6  | 4  |
| East North Central..... | 1  | 3  | 2  | 5  | 1  | 3  | 0  | 1  | 3  | 1  |
| West North Central..... | 13 | 4  | 2  | 2  | 2  | 10 | 4  | 2  | 14 | 6  |
| South Atlantic.....     | 8  | 8  | 18 | 12 | 0  | 8  | 10 | 14 | 22 | 60 |
| East South Central..... | 17 | 6  | 6  | 18 | 29 | 18 | 0  | 6  | 6  | 30 |
| West South Central..... | 14 | 3  | 24 | 7  | 14 | 7  | 7  | 3  | 14 | 0  |
| Mountain.....           | 0  | 9  | 0  | 0  | 0  | 0  | 9  | 9  | 0  | 0  |
| Pacific.....            | 10 | 14 | 0  | 2  | 10 | 4  | 12 | 10 | 4  | 6  |

## INFLUENZA DEATH RATES

|                         |     |    |     |    |     |    |     |    |    |    |
|-------------------------|-----|----|-----|----|-----|----|-----|----|----|----|
| 91 cities.....          | 70  | 16 | 60  | 14 | 59  | 20 | 60  | 19 | 51 | 19 |
| New England.....        | 34  | 2  | 46  | 5  | 46  | 5  | 43  | 17 | 24 | 12 |
| Middle Atlantic.....    | 101 | 14 | 68  | 10 | 49  | 14 | 42  | 15 | 40 | 16 |
| East North Central..... | 36  | 13 | 52  | 12 | 56  | 17 | 61  | 16 | 61 | 16 |
| West North Central..... | 29  | 18 | 21  | 21 | 56  | 12 | 68  | 12 | 88 | 15 |
| South Atlantic.....     | 127 | 12 | 129 | 12 | 118 | 32 | 122 | 22 | 79 | 28 |
| East South Central..... | 76  | 52 | 63  | 32 | 63  | 56 | 139 | 71 | 76 | 52 |
| West South Central..... | 100 | 82 | 73  | 50 | 159 | 68 | 97  | 68 | 45 | 64 |
| Mountain.....           | 52  | 9  | 52  | 44 | 17  | 35 | 61  | 26 | 0  | 18 |
| Pacific.....            | 14  | 2  | 12  | 7  | 14  | 17 | 26  | 2  | 41 | 10 |

## PNEUMONIA DEATH RATES

|                         |     |     |     |     |     |     |     |     |     |     |
|-------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 91 cities.....          | 259 | 164 | 231 | 175 | 220 | 171 | 217 | 177 | 211 | 193 |
| New England.....        | 185 | 193 | 286 | 160 | 291 | 193 | 276 | 242 | 237 | 232 |
| Middle Atlantic.....    | 368 | 158 | 293 | 180 | 254 | 191 | 236 | 190 | 217 | 219 |
| East North Central..... | 176 | 128 | 176 | 138 | 182 | 128 | 187 | 151 | 193 | 179 |
| West North Central..... | 159 | 162 | 135 | 159 | 124 | 111 | 147 | 153 | 195 | 138 |
| South Atlantic.....     | 345 | 238 | 325 | 216 | 373 | 214 | 340 | 222 | 312 | 236 |
| East South Central..... | 227 | 239 | 176 | 207 | 164 | 220 | 265 | 239 | 271 | 175 |
| West South Central..... | 203 | 292 | 214 | 270 | 176 | 256 | 228 | 174 | 221 | 185 |
| Mountain.....           | 200 | 229 | 209 | 379 | 183 | 256 | 200 | 247 | 102 | 247 |
| Pacific.....            | 115 | 92  | 72  | 130 | 72  | 107 | 70  | 67  | 91  | 63  |

<sup>2</sup> Columbia, S. C., not included.

<sup>3</sup> Barre, Vt., Kansas City, Mo., and Denver, Colo., not included.

<sup>4</sup> Barre, Vt., not included.

<sup>5</sup> Kansas City, Mo., not included.

<sup>6</sup> Denver, Colo., not included.

## FOREIGN AND INSULAR

### CANADA

*Provinces—Communicable diseases—Week ended February 28, 1931.*—The Department of Pensions and National Health of Canada reports cases of certain communicable diseases for the week ended February 28, 1931, as follows:

| Province                                | Cerebro-spinal fever | Influenza | Small-pox | Typhoid fever |
|---|----------------------|-----------|-----------|---------------|
| Prince Edward Island <sup>1</sup> ..... |                      |           |           |               |
| Nova Scotia.....                        |                      | 74        |           |               |
| New Brunswick <sup>1</sup> .....        |                      |           |           |               |
| Cu bec.....                             | 2                    | 1         |           | 4             |
| Ontario.....                            | 2                    | 8         | 7         | 1             |
| Manitoba.....                           | 1                    |           | 1         | 1             |
| Saskatchewan.....                       |                      |           | 18        | 1             |
| Alberta <sup>1</sup> .....              |                      |           |           |               |
| British Columbia.....                   | 2                    | 10        | 5         | 4             |
| Total.....                              | 7                    | 93        | 31        | 11            |

<sup>1</sup> No case of any disease included in the table was reported during the week.

*Quebec Province—Communicable diseases—Week ended February 28, 1931.*—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the week ended February 28, 1931, as follows:

| Disease                       | Cases | Disease                   | Cases |
|-------------------------------|-------|---------------------------|-------|
| Cerebrospinal meningitis..... | 2     | Mumps.....                | 15    |
| Chicken pox.....              | 139   | Puerperal septicemia..... | 2     |
| Diphtheria and croup.....     | 26    | Scarlet fever.....        | 86    |
| Erysipelas.....               | 4     | Tuberculosis.....         | 33    |
| German measles.....           | 23    | Typhoid fever.....        | 4     |
| Influenza.....                | 1     | Whooping cough.....       | 51    |
| Measles.....                  | 229   |                           |       |

*Ontario Province—Communicable diseases—Five weeks ended January 31, 1931.*—During the five weeks ended January 31, 1931, and the corresponding period of the year 1930, certain communicable diseases were reported in the Province of Ontario, as follows:



| Disease                       | 5 weeks, 1930 |        | 5 weeks, 1931 |        |
|-------------------------------|---------------|--------|---------------|--------|
|                               | Cases         | Deaths | Cases         | Deaths |
| Actinomycosis.....            |               |        | 1             |        |
| Cerebrospinal meningitis..... | 7             | 4      | 6             | 3      |
| Chancroid.....                | 2             |        |               |        |
| Chicken pox.....              | 1, 183        |        | 1, 827        |        |
| Diphtheria.....               | 269           | 13     | 357           | 14     |
| Dysentery.....                |               |        | 1             | 1      |
| Erysipelas.....               | 2             |        |               |        |
| German measles.....           | 177           |        | 74            |        |
| Gonorrhea.....                | 159           |        | 174           |        |
| Influenza.....                | 20            | 5      | 32            | 9      |
| Lethargic encephalitis.....   |               |        | 1             | 1      |
| Measles.....                  | 627           |        | 159           |        |
| Mumps.....                    | 223           |        | 790           | 1      |
| Paratyphoid fever.....        |               |        | 1             |        |
| Pneumonia.....                |               | 187    |               | 202    |
| Poliomyelitis.....            | 2             | 1      | 2             |        |
| Scarlet fever.....            | 739           | 3      | 1, 029        | 7      |
| Septic sore throat.....       |               |        | 3             | 1      |
| Smallpox <sup>1</sup> .....   | 51            |        | 47            |        |
| Syphilis.....                 | 110           |        | 187           | 1      |
| Tuberculosis.....             | 85            | 55     | 121           | 55     |
| Typhoid fever.....            | 21            | 2      | 34            | 4      |
| Undulant fever.....           |               |        | 15            |        |
| Whooping cough.....           | 311           |        | 266           | 6      |

<sup>1</sup> The cases of smallpox were distributed as follows: Sault Ste. Marie, 17; Kingston, 5; Coniston, 4; Ottawa, 4; Ryerson, 3; Nepean, Wolfe Island, and Sudbury, 2 each, and one case each in Chisholm, Tarentorus, Kingston Tp., Tyendinaga, Humphrey, Essex Border, Hagar, and Frater.

## CUBA

*Habana—Communicable diseases—February, 1931.*—During the month of February, 1931, certain communicable diseases were reported in the city of Habana, Cuba, as follows:

| Disease                       | Cases | Deaths | Disease                          | Cases | Deaths |
|-------------------------------|-------|--------|----------------------------------|-------|--------|
| Cerebrospinal meningitis..... | 1     | 1      | Poliomyelitis <sup>1</sup> ..... | 1     |        |
| Chicken pox.....              | 30    |        | Scarlet fever.....               | 7     |        |
| Diphtheria.....               | 17    | 3      | Tuberculosis.....                | 33    | 5      |
| Malaria <sup>1</sup> .....    | 4     |        | Typhoid fever <sup>1</sup> ..... | 12    | 4      |
| Measles.....                  | 18    |        |                                  |       |        |

<sup>1</sup> Many of these cases are from the island of Cuba outside of Habana.

## ITALY

*Communicable diseases—Four weeks ended November 30, 1930.*—During the four weeks ended November 30, 1930, cases of certain communicable diseases were reported in Italy as follows:

| Disease                       | Nov. 3-9, 1930 |                   | Nov. 10-16, 1930 |                   | Nov. 17-23, 1930 |                   | Nov. 24-30, 1930 |                   |
|-------------------------------|----------------|-------------------|------------------|-------------------|------------------|-------------------|------------------|-------------------|
|                               | Cases          | Communes affected | Cases            | Communes affected | Cases            | Communes affected | Cases            | Communes affected |
| Anthrax.....                  | 25             | 23                | 29               | 28                | 25               | 21                | 23               | 20                |
| Cerebrospinal meningitis..... | 5              | 5                 | 10               | 9                 | 9                | 9                 | 6                | 6                 |
| Chicken pox.....              | 109            | 65                | 104              | 62                | 188              | 91                | 283              | 108               |
| Diphtheria and croup.....     | 854            | 408               | 713              | 345               | 871              | 422               | 898              | 445               |
| Dysentery.....                | 6              | 6                 | 10               | 7                 | 6                | 6                 | 4                | 3                 |
| Lethargic encephalitis.....   | 2              | 2                 | 2                | 2                 | 1                | 1                 | 5                | 5                 |
| Measles.....                  | 1, 061         | 199               | 847              | 161               | 1, 230           | 235               | 1, 507           | 236               |
| Poliomyelitis.....            | 14             | 13                | 13               | 11                | 14               | 12                | 16               | 13                |
| Rabies.....                   |                |                   |                  |                   |                  |                   | 1                | 1                 |
| Scarlet fever.....            | 617            | 228               | 478              | 188               | 553              | 232               | 569              | 231               |
| Typhoid fever.....            | 767            | 411               | 592              | 311               | 592              | 332               | 553              | 292               |

## SPAIN

*Vital statistics—Year 1930.*—According to provisional figures published by the Health Department of Spain, births and deaths occurred in the Kingdom of Spain during the year 1930 as follows:

|                                      |         |  |        |
|--------------------------------------|---------|--|--------|
| Births.....                          | 660,735 | Stillbirths.....                                   | 21,747 |
| Birth rate per 1,000 population..... | 29.03   | Stillbirth rate (per 1,000 births).....            | 31.9   |
| Deaths.....                          | 394,355 | Infant mortality rate (per 1,000 live births)..... | 117    |
| Death rate per 1,000 population..... | 17.33   |  |        |

Death rates per 100,000 population for certain causes of death in Spain for the years 1929 and 1930 are given in the following table:

*Death rates per 100,000 population from certain causes during 1929 and 1930*

| Cause of death                                      | 1929  | 1930  | Cause of death                                | 1929  | 1930  |
|---|-------|-------|---|-------|-------|
| Appendicitis and typhlitis.....                     | 2.9   | 3.3   | Malaria.....                                  | 2.5   | 2.4   |
| Bronchitis, acute.....                              | 80.6  | 74.4  | Measles.....                                  | 16.2  | 23.0  |
| Bronchitis, chronic.....                            | 42.5  | 39.4  | Meningitis.....                               | 49.0  | 44.7  |
| Cancer and other malignant tumors.....              | 70.0  | 72.3  | Nephritis and Bright's disease.....           | 56.9  | 56.9  |
| Cerebral hemorrhage and softening of the brain..... | 124.8 | 125.7 | Organic diseases of the heart.....            | 168.9 | 160.9 |
| Cirrhosis of the liver.....                         | 16.0  | 16.2  | Pneumonia.....                                | 43.0  | 40.1  |
| Congenital debility and malformation.....           | 60.1  | 59.1  | Other diseases of the respiratory system..... | 160.0 | 144.5 |
| Diphtheria.....                                     | 5.4   | 5.6   | Scarlet fever.....                            | 1.0   | 0.8   |
| Diseases of the stomach (excluding cancer).....     | 15.0  | 15.3  | Tuberculosis, pulmonary.....                  | 111.3 | 103.3 |
| Hernia and intestinal obstructions.....             | 12.8  | 11.9  | Tuberculosis of the meninges.....             | 11.1  | 10.5  |
| Influenza.....                                      | 24.3  | 10.6  | Tuberculosis, other forms.....                | 13.9  | 13.1  |
|   |       |       | Typhoid fever.....                            | 17.3  | 16.4  |
|   |       |       | Whooping cough.....                           | 5.1   | 4.9   |

## YUGOSLAVIA

*Communicable diseases—January, 1931.*—During the month of January, 1931, certain communicable diseases were reported in Yugoslavia, as follows:

| Disease                       | Cases | Deaths | Disease                   | Cases | Deaths |
|-------------------------------|-------|--------|---------------------------|-------|--------|
| Anthrax.....                  | 33    | 1      | Puerperal septicemia..... | 11    | 8      |
| Cerebrospinal meningitis..... | 10    | 7      | Rabies.....               | 2     | 2      |
| Diphtheria and croup.....     | 867   | 126    | Scarlet fever.....        | 724   | 104    |
| Dysentery.....                | 16    | 2      | Tetanus.....              | 9     | 4      |
| Erysipelas.....               | 200   | 12     | Typhoid fever.....        | 197   | 29     |
| Measles.....                  | 914   | 24     | Typhus fever.....         | 20    | 2      |
| Poliomyelitis.....            | 1     |        |                           |       |        |

# CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, Pan American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

## CHOLERA

[C indicates cases; D, deaths; P, present]

[illegible]



| Place                                       | July,<br>1930 | August,<br>1930 | Sep-<br>tember,<br>1930 | October, 1930 |       |       | November, 1930 |       |       | December, 1930 |       |       | January, 1931 |       |       |
|---|---------------|-----------------|-------------------------|---------------|-------|-------|----------------|-------|-------|----------------|-------|-------|---------------|-------|-------|
|   |               |                 |                         | 1-10          | 11-20 | 21-31 | 1-10           | 11-20 | 21-30 | 1-10           | 11-20 | 21-31 | 1-10          | 11-20 | 21-31 |
|   |               |                 |                         |               |       |       |                |       |       |                |       |       |               |       |       |
| Indo-China (French) (see also table above): |               |                 |                         |               |       |       |                |       |       |                |       |       |               |       |       |
| Annam <sup>1</sup> .....                    | 1             | 3               |                         |               |       |       |                |       |       |                |       |       |               |       |       |
| Cambodia <sup>2</sup> .....                 | 43            | 59              | 38                      |               |       | 6     |                |       |       |                |       |       |               | 19    | 36    |
| Cochin-China <sup>3</sup> .....             | 46            | 27              | 33                      |               |       | 4     |                |       |       |                | 8     |       |               | 4     | 13    |
| Samar.....                                  | C             | 4               | 7                       | 16            | 8     | 2     | 1              | 12    | 2     |                |       |       |               |       |       |
| Sorsogon.....                               | C             | 2               | 7                       | 12            | 8     | 1     |                | 7     | 1     |                |       |       |               |       |       |
| Surigao.....                                | C             |                 |                         | 4             |       |       |                |       |       |                |       |       |               |       |       |
| Surigao.....                                | C             | 1               | (1)                     |               |       |       |                |       |       |                |       |       |               |       |       |
| Surigao.....                                | C             | 2               |                         |               |       |       |                |       |       |                |       |       |               |       |       |
| Siam.....                                   | C             |                 |                         | 4             | 6     | 2     | 2              | 2     | 2     | 2              | 1     | 1     | 1             |       |       |
| Bangkok.....                                | C             |                 | 1                       | 4             | 6     | 2     | 2              | 2     | 2     | 2              | 1     | 1     | 1             |       |       |
| Bangkok.....                                | C             |                 | 3                       | 3             | 4     | 2     | 1              | 1     | 2     | 2              | 1     | 1     | 1             |       |       |
| Bangkok.....                                | C             |                 | 2                       | 2             | 4     | 2     | 1              | 1     | 1     | 1              | 1     | 1     | 1             |       |       |
| On vessel: S. S. Malwa from Shanghai.....   | D             | 1               |                         |               |       |       |                |       |       |                |       |       |               |       |       |

<sup>1</sup> Figures for cholera in the Philippine Islands are subject to correction.

<sup>2</sup> During the period from Aug. 24 to Sept. 26, 1930, 26 cases of cholera with 17 deaths were reported in Manitung, Surigao Province, P. I.

<sup>3</sup> Reports incomplete.

U indicates cases; D, deaths; P, present)

[illegible]

[illegible]

## CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

**PLAGUE--Continued**

[C indicates cases; D, deaths; P, present]

| Place   | Week ended—                      |                           |                                 |                                 |               |    |    |   |                |    |    |  |                    |
|---|----------------------------------|---------------------------|---------------------------------|---------------------------------|---------------|----|----|---|----------------|----|----|--|--------------------|
|   | December, 1930                   |                           |                                 |                                 | January, 1931 |    |    |   | February, 1931 |    |    |  | Mar.<br>7,<br>1931 |
|   | 20                               | 27                        | 3                               | 10                              | 17            | 24 | 31 | 7 | 14             | 21 | 28 |  |                    |
|   | Aug.<br>24-<br>Sept.<br>20, 1930 | Sept.<br>Oct.<br>18, 1930 | Oct.<br>19-<br>Nov.<br>15, 1930 | Nov.<br>16-<br>Dec.<br>13, 1930 |               |    |    |   |                |    |    |  |                    |
| Tunisia: Tunis.....   |                                  |                           |                                 | 1                               | P             |    |    |   |                |    |    |  |                    |
| Union of Socialist Soviet Republics: Transcaucasia—Karakah. |                                  |                           |                                 |                                 |               |    |    |   |                |    |    |  |                    |
| Union of South Africa:                                      |                                  |                           |                                 |                                 |               |    |    |   |                |    |    |  |                    |
| Cape Province.....  |                                  |                           |                                 | 1                               | P             |    |    |   |                |    |    |  |                    |
| Orange Free State.....                                      |                                  |                           |                                 |                                 |               |    |    |   |                |    |    |  |                    |
| On vessel: S. S. Marlonga de Thermotis at Avonmouth.....    |                                  |                           |                                 |                                 |               |    |    |   |                |    |    |  |                    |

| Place                                       | July,<br>1930 | Aug.,<br>1930 | Sept.,<br>1930 | Oct.,<br>1930 | Nov.,<br>1930 | Dec.,<br>1930 | Plac.           | July,<br>1930 | Aug.,<br>1930 | Sept.,<br>1930 | Oct.,<br>1930 | Nov.,<br>1930 | Dec.,<br>1930 |
|---|---------------|---------------|----------------|---------------|---------------|---------------|-----------------|---------------|---------------|----------------|---------------|---------------|---------------|
| British East Africa (see also table above): |               |               |                |               |               |               |                 |               |               |                |               |               |               |
| Kenya.....                                  | 97            | 87            | 53             | 48            | 62            | 50            | Peru.....       | 8             | 21            | 10             | 42            | 24            | 8             |
| Greece (see also table above).....          |               |               |                | 2             | 5             | 1             | Senegal:        |               |               |                |               |               |               |
| Indo-China (see also table above).....      | 1             | 2             | 5              | 2             |               |               | Baoi.....       | 62            | 79            | 48             | 53            |               |               |
| Madagascar (see also table above):          |               |               |                |               |               |               | Dakar.....      | 48            | 20            | 23             | 35            | 4             |               |
| Amboisira Province.....                     |               |               |                | 4             | 44            |               | Louga.....      | 140           | 108           | 3              |               |               |               |
| Antsirabe Province.....                     | 24            | 11            | 21             | 3             | 18            |               | Thies.....      | 122           | 90            | 8              |               |               |               |
| Marinarivo Province.....                    | 24            | 11            | 21             | 3             | 18            |               | Tlivaouans..... | 138           | 76            | 61             | 37            | 10            |               |
| Moramanga Province.....                     | 1             | 2             | 7              | 18            | 12            |               |                 | 103           | 83            | 30             | 25            | 2             |               |
| Tananarive Province.....                    | 1             | 2             | 7              | 18            | 12            |               |                 | 54            | 34            | 12             | 24            | 27            |               |
|   |               | 27            | 18             | 20            | 19            |               |                 | 30            | 20            | 4              | 15            | 23            |               |
|   | 28            | 39            | 79             | 125           | 170           |               |                 | 119           | 110           | 20             | 53            | 31            |               |
|   | 28            | 38            | 79             | 116           | 164           |               |                 | 70            | 54            | 14             | 31            | 25            |               |

<sup>1</sup> Reports incomplete.





## CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER AND YELLOW FEVER—Continued

## SMALLPOX—Continued

[C Indicates cases; D, deaths; P, present]

| Place                                | Aug. 24-<br>Sept. 20,<br>1930 | Sept.<br>21-Oct. 18,<br>1930 | Oct. 19-<br>Nov. 15,<br>1930 | Nov.<br>16-Dec.<br>13, 1930 | Week ended—       |       |               |       |     |     |     |     |                |    |    | Mar.<br>7, 1931 |
|--------------------------------------|-------------------------------|------------------------------|------------------------------|-----------------------------|-------------------|-------|---------------|-------|-----|-----|-----|-----|----------------|----|----|-----------------|
|                                      |                               |                              |                              |                             | December,<br>1930 |       | January, 1931 |       |     |     |     |     | February, 1931 |    |    |                 |
|                                      |                               |                              |                              |                             | 20                | 27    | 3             | 10    | 17  | 24  | 31  | 7   | 14             | 21 | 28 |                 |
| China—Continued.                     |                               |                              |                              |                             |                   |       |               |       |     |     |     |     |                |    |    |                 |
| Shanghai—                            |                               |                              |                              |                             |                   |       |               |       |     |     |     |     |                |    |    |                 |
| Foreigners only.....                 | 18                            | 1                            | 2                            | 8                           | 4                 | 2     | 6             | 2     | 1   | 1   | 6   | 4   | 4              | 7  |    |                 |
| Including natives.....               | 2                             |                              | 1                            | 4                           | 5                 | 1     | 1             | 1     | 4   | 2   | 4   | 3   | 5              | 2  |    |                 |
| Swatow.....                          | 2                             | 4                            | 3                            | 3                           |                   | 2     | 1             | 2     | 1   | 1   | 3   | 2   |                |    |    |                 |
| Tientsin.....                        |                               | 1                            | 1                            | 2                           |                   |       |               |       |     |     |     |     |                |    |    |                 |
| Chosen (see table below).            |                               |                              |                              |                             |                   |       |               |       |     |     |     |     |                |    |    |                 |
| Colombia: Cali.....                  |                               |                              |                              |                             |                   |       |               |       |     |     |     |     |                |    |    |                 |
| Dutch East Indies:                   |                               |                              |                              |                             |                   |       |               |       |     |     |     |     |                |    |    |                 |
| Java—Batavia and West Java.....      |                               | 2                            |                              | 1                           |                   |       |               |       |     |     |     |     |                |    |    |                 |
| Sangi Islands.....                   |                               |                              |                              |                             |                   |       |               |       |     |     |     |     |                |    |    |                 |
| France (see table below).            | 11                            | 14                           | 26                           | 6                           | 2                 |       | 2             |       |     |     |     |     | 1              |    |    |                 |
| Greece (see table below).            | 4                             | 4                            | 4                            | 2                           |                   | 1     |               |       |     |     |     |     | 1              |    |    |                 |
| Great Britain:                       | 14                            |                              | 29                           |                             |                   |       |               |       |     |     |     |     |                |    |    |                 |
| England and Wales.....               | 3                             |                              | 3                            |                             |                   |       |               |       |     |     |     |     |                |    |    |                 |
| Bradford.....                        | 341                           | 325                          | 372                          | 508                         | 138               | 135   | 164           | 228   | 187 | 272 | 286 | 213 | 221            |    |    |                 |
| Cardiff.....                         | 3                             | 1                            | 1                            | 1                           |                   |       | 1             |       |     | 1   |     | 3   |                |    |    |                 |
| Leeds.....                           |                               |                              |                              |                             |                   |       | 2             |       |     |     |     |     |                |    |    |                 |
| London.....                          | 120                           | 29                           | 172                          | 184                         | 27                | 38    | 48            | 48    | 45  | 47  | 33  | 24  | 23             |    |    |                 |
| London and Great Towns.....          | 223                           | 52                           | 296                          | 433                         | 105               | 131   | 162           | 162   | 154 | 198 | 194 | 147 | 150            |    |    |                 |
| Sheffield.....                       | 1                             |                              | 1                            | 1                           |                   |       |               |       |     |     |     |     |                |    |    |                 |
| Stoke-on-Trent.....                  |                               |                              | 1                            |                             |                   |       |               |       |     | 1   | 1   | 1   |                |    |    |                 |
| Honduras:                            |                               |                              |                              |                             |                   |       |               |       |     |     |     |     |                |    |    |                 |
| Amapala.....                         |                               |                              |                              |                             |                   |       |               |       |     |     |     |     |                |    |    | 1               |
| Naco.....                            | 6                             |                              |                              |                             |                   |       |               |       |     |     |     |     |                |    |    |                 |
| Ocotopque and Gracias Districts..... |                               |                              |                              |                             |                   |       |               |       |     |     |     |     |                |    |    |                 |
| Puerto Castilla.....                 |                               |                              |                              |                             |                   |       |               |       |     |     |     |     |                |    |    |                 |
| India.....                           | 3,131                         | 2,322                        | 2,412                        | 3,627                       | 942               | 1,169 | 1,278         | 2,234 | 4   | 7   | 1   | 3   | 3              |    |    |                 |
| Bombay.....                          | 680                           | 572                          | 606                          | 874                         | 262               | 281   | 327           | 510   |     |     |     |     |                |    |    |                 |
|                                      | 6                             | 1                            |                              | 1                           |                   |       | 1             | 1     | 1   | 2   | 2   | 1   | 1              |    |    |                 |
|                                      |                               |                              |                              |                             |                   |       |               |       |     |     |     |     |                |    |    |                 |



## CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

## SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

| Place  | Week ended—                   |                              |                              |                             |                   |    |               |    |    |    |    |                |    |    | Mar.<br>7, 1931 |    |    |
|--|-------------------------------|------------------------------|------------------------------|-----------------------------|-------------------|----|---------------|----|----|----|----|----------------|----|----|-----------------|----|----|
|  | Aug. 24-<br>Sept. 20,<br>1930 | Sept.<br>21-Oct. 18,<br>1930 | Oct. 19-<br>Nov. 16,<br>1930 | Nov.<br>17-Dec.<br>13, 1930 | December,<br>1930 |    | January, 1931 |    |    |    |    | February, 1931 |    |    |                 |    |    |
|  |                               |                              |                              |                             | 20                | 27 | 3             | 10 | 17 | 24 | 31 | 7              | 14 | 21 |                 | 28 |    |
| Sudan (French) (see table below).                    |                               |                              |                              |                             |                   |    |               |    |    |    |    |                |    |    |                 |    |    |
| Switzerland: Berne Canton.....                       | C                             |                              | 1                            |                             |                   |    |               |    |    |    |    |                |    |    |                 |    |    |
| Syria (see table below).                             | C                             |                              | 2                            |                             |                   |    |               | 13 | 4  | 6  | 1  | 1              |    |    |                 |    |    |
| Tunisia: Tunis.....                                  | C                             |                              |                              |                             |                   |    |               |    |    |    |    |                |    |    |                 |    |    |
| Turkey (see table below).                            |                               |                              |                              |                             |                   |    |               |    |    |    |    |                |    |    |                 |    |    |
| Union of South Africa:                               |                               |                              |                              |                             |                   |    |               |    |    |    |    |                |    |    |                 |    |    |
| Cape Province.....                                   | C                             | P                            | P                            | P                           | P                 | P  | P             | P  | P  |    |    |                |    |    |                 |    |    |
| Orange Free State.....                               | C                             | P                            | P                            | P                           | P                 | P  | P             | P  | P  |    |    |                |    |    |                 |    |    |
| Transvaal.....                                       | C                             | P                            | P                            | P                           | P                 | P  | P             | P  | P  |    |    |                |    |    |                 |    |    |
| Upper Volta.....                                     | D                             |                              |                              | 6                           |                   |    |               |    | 4  |    |    |                |    |    |                 | 8  |    |
| On vessel:   |                               |                              |                              |                             |                   |    |               |    | 2  |    |    |                |    |    |                 |    |    |
| S. S. Clan Macgortag at Suez.....                    | C                             |                              |                              |                             |                   |    |               |    |    |    |    |                |    |    |                 | 2  |    |
| S. S. Muncester Castle at Manila from Hong Kong..... | C                             |                              |                              |                             |                   | 1  |               |    |    |    |    |                |    |    |                 |    |    |
| S. S. Matheran at Suez from Calcutta.....            | C                             |                              |                              |                             |                   |    |               |    |    |    | 1  |                |    |    |                 |    |    |
| S. S. Clan Buchanan at Suez.....                     | C                             |                              |                              |                             |                   |    |               |    |    |    |    |                |    |    |                 | 2  |    |
| Indo-China (see also table above).....               | C                             | 93                           | 192                          | 288                         |                   |    |               |    |    |    |    |                |    |    |                 |    |    |
| Ivory Coast.....                                     | C                             |                              |                              | 86                          |                   |    |               | 38 | 9  | 14 |    |                |    |    |                 |    | 46 |
| Sudan (French).....                                  | C                             | 39                           | P                            | 2                           |                   |    |               | 9  |    |    |    |                |    |    |                 |    |    |
| D  |                               | 3                            |                              |                             |                   |    |               | 16 |    | 96 |    |                |    |    |                 |    |    |
| C  |                               | 1                            |                              |                             |                   |    |               | 4  |    | 4  |    |                |    |    |                 |    |    |
| Syria: Beirut.....                                   | C                             |                              |                              |                             |                   |    |               |    |    |    |    | 1              |    |    |                 |    |    |



**Week ended—**

[illegible]

|                                  |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |
|----------------------------------|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|
| Palestine.....                   | C | 3  | 3  | 1  | 6  | 21 | 9  | 1  | 1  | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 3 |
| Poland.....                      | C | 23 | 22 | 37 | 12 | 1  | 3  | 3  | 3  | 11 | 19 | 21 | 16 | 60 | 49 | 41 | 3 |
| Portugal: Oporto.....            | D | 1  | 2  | 4  | 1  | 2  | 2  | 3  | 3  | 2  | 2  | 2  | 4  | 1  | 1  | 1  | 3 |
| Rumania.....                     | C | 4  | 14 | 41 | 19 | 2  | 15 | 20 | 34 | 89 | 54 | 43 | 1  | 1  | 1  | 1  | 1 |
| Spain.....                       | D | 1  | 2  | 2  | 1  | 2  | 2  | 1  | 2  | 2  | 1  | 7  | 1  | 1  | 1  | 1  | 1 |
| Tunisia.....                     | D | 1  | 1  | 4  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1 |
| Turkey (see table below).        | C | 6  | 12 | 5  | 6  | 23 | 1  | 1  | 1  | 1  | 1  | 1  | 4  | 5  | 1  | 1  | 1 |
| Union of South Africa:           |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |
| Cape Province.....               | C | P  | P  | P  | P  | P  | P  | P  | P  | P  | P  | P  | 1  | 1  | 1  | 1  | 1 |
| Municipality of East London..... | C | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1 |
| Natal.....                       | C | P  | 2  | P  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1 |
| Orange Free State.....           | C | P  | P  | P  | P  | P  | P  | P  | P  | P  | P  | P  | P  | P  | P  | P  | P |
| Transvaal.....                   | C | P  | P  | P  | P  | P  | P  | P  | P  | P  | P  | P  | P  | P  | P  | P  | P |
| Yugoslavia (see table below).    | C | P  | P  | P  | P  | P  | P  | P  | P  | P  | P  | P  | P  | P  | P  | P  | P |

| Place                                     | Aug., 1930 | Sept., 1930 | Oct., 1930 | Nov., 1930 | Dec., 1930 | Jan., 1931 | Place                              | Aug., 1930 | Sept., 1930 | Oct., 1930 | Nov., 1930 | Dec., 1930 | Jan., 1931 |
|---|------------|-------------|------------|------------|------------|------------|------------------------------------|------------|-------------|------------|------------|------------|------------|
| China: Harbin (see also table above)..... | 5          | 1           | 3          | 3          | 1          | 1          | Lithuania.....                     | 7          | 24          | 1          | 5          | 6          | 26         |
| Chosen: Seoul.....                        | 2          | 1           | 7          | 1          | 1          | 1          | Mexico (see also table above)..... | 1          | 2           | 2          | 1          | 3          | 3          |
| Czechoslovakia.....                       | 1          | 1           | 1          | 16         | 16         | 28         | Turkey.....                        | 26         | 47          | 47         | 1          | 3          | 3          |
| Greece: Athens.....                       | 6          | 4           | 4          | 4          | 10         | 11         | Yugoslavia.....                    | 11         | 11          | 28         | 3          | 2          | 20         |
| Latvia.....                               | 1          | 2           | 1          | 1          | 1          | 1          |                                    | 2          | 2           | 2          | 2          | 2          | 2          |

## YELLOW FEVER

| Place  | Aug., 1930 | Sept., 1930 | Oct., 1930 | Nov., 1930 | Dec., 1930 | Jan., 1931 | Cases | Deaths |
|--|------------|-------------|------------|------------|------------|------------|-------|--------|
| Brazil:  |            |             |            |            |            |            |       |        |
| Barbaha.....   |            |             |            |            |            |            |       |        |
| Para, July 29, 1930.....   |            |             |            |            |            |            | 1     | 1      |
| Rio de Janeiro State—  |            |             |            |            |            |            |       |        |
| Camucuy.....   |            |             |            |            |            |            |       |        |
| Jan. 25, 1931.....   |            |             |            |            |            |            | 3     | 3      |
| Feb. 1-7, 1931.....  |            |             |            |            |            |            | 1     | 1      |
| Friburgo (imported), Jan. 25-30, 1931.....                         |            |             |            |            |            |            | 1     | 1      |
| Gold Coast:  |            |             |            |            |            |            |       |        |
| July 10, 1930.....   |            |             |            |            |            |            |       |        |
| Alibosso, Aug. 4, 1930.....  |            |             |            |            |            |            |       |        |
| Nigeria: Lagos, July 12, 1930 (probably laboratory infection)..... |            |             |            |            |            |            | 1     | 1      |

! The Director General of Public Health of Guatemala reports an unusual outbreak of typhus fever in a small village in Guatemala.