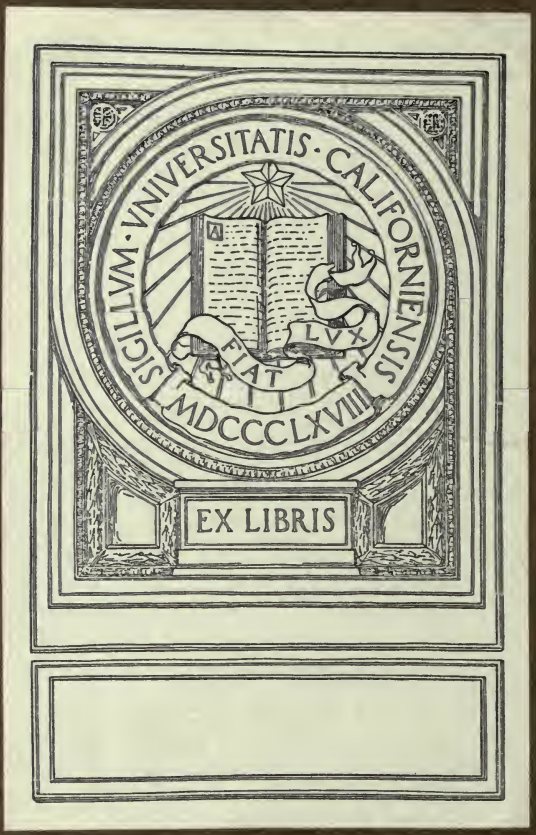
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BUREAU OF THE CENSUS
S. N. D. NORTH, DIRECTOR

Modes of Statement of Cause of Death and Duration of Illness upon Certificates of Death

COMPARISON OF FORMS NOW IN USE IN THE UNITED STATES AND CERTAIN OTHER COUNTRIES AND SUGGESTION OF A MODIFICATION OF THE STANDARD CERTIFICATE OF DEATH IN ORDER TO SECURE UNIFORM AND DEFINITE STATEMENTS OF CAUSES OF DEATH ❧ ❧ ❧ ❧ ❧ ❧ ❧ ❧ ❧ ❧ CHECK LIST OF REGISTRATION OFFICIALS, REPORTS AND BULLETINS

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Department of Commerce and Labor

8—1292
V. S. No. 107.

CENSUS PUBLICATIONS ON MORTALITY STATISTICS SINCE 1900.

TWELFTH CENSUS.

Vital Statistics, Part I—Analysis and Ratio Tables.
Vital Statistics, Part II—Statistics of Deaths.
Bulletin No. 15. A discussion of the Vital Statistics of the Twelfth Census.

[The last of the series of decennial reports. The data are for the census year ending May 31, 1900, and are based upon enumerators' returns from the nonregistration area and upon transcripts of deaths from the registration records, chiefly, for the registration area. Succeeding reports are for the calendar years and relate to the registration area only.]

PERMANENT CENSUS.

Mortality Statistics, 1900 to 1904. Five years in one volume.
Mortality Statistics, 1905. Sixth Annual Report.
Mortality Statistics, 1906. Seventh Annual Report. In preparation.

PAMPHLETS.

No. 71. (Circular) Registration of Deaths.
No. 100. Legislative Requirements for Registration of Vital Statistics. [Out of print. See Nos. 71 and 104.]
No. 101. Practical Registration Methods.
No. 102. Relation of Physicians to Mortality Statistics.
No. 103. Medical Education in Vital Statistics. [Out of print.]
No. 104. Registration of Births and Deaths.
No. 105. Statistical Treatment of Causes of Death.
No. 106. Extension of the Registration Area for Births and Deaths.
No. 107. Modes of Statement of Cause of Death and Duration of Illness upon Certificates of Death.

Manual of International Classification of Causes of Death.

NOTE.—Any publications now in print may be obtained upon application to the Director of the Census.

CONTENTS.

INTRODUCTORY.

This pamphlet has been prepared by the Bureau of the Census for presentation to the registration officials of the United States at the initial session of their national organization, which will be formed as a Section of the American Public Health Association at its meeting to be held at Atlantic City, N. J., from September 30 to October 4, 1907.[1]

The cooperation of the American Public Health Association and the Bureau of the Census has already been fruitful of practical results—among them the formulating of the essential requirements of an effective law for the registration of deaths, since carried into successful operation in many states,[2] and the preparation of a standard certificate of death—and has received the express approval of the Congress of the United States by a joint resolution approved February 11, 1903, the concluding portion of which is as follows:

> Whereas the American Public Health Association and the United States Census Office are now cooperating in an effort to extend the benefits of registration and to promote its efficiency by indicating the essential requirements of legislative enactments designed to secure the proper registration of all deaths and births and the collection of accurate vital statistics, to be presented to the attention of the legislative authorities in nonregistration states, with the suggestion that such legislation be adopted: Now, therefore,
>
> *Resolved by the Senate and House of Representatives of the United States of America in Congress assembled,* That the Senate and House of Representatives of the United States hereby expresses approval of this movement, and requests the favorable consideration and action of the state authorities, to the end that the United States may attain a complete and uniform system of registration.

The organization of a special Section of the Association, devoted entirely to vital statistics, and embracing in its membership, as it is hoped, the entire registration service of the United States, should greatly facilitate the continuance of this cooperation, and should enable effective concerted action to be taken upon many practical questions affecting the collection and presentation of vital statistics, which are now in a chaotic and exceedingly unsatisfactory condition.

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[1] See Circular of Announcement, Appendix A.

[2] See Census circular No. 71 containing paper of the Committee of the American Public Health Association on Demography and Statistics in their Sanitary Relations, entitled "The Essential Requirements of a Law for the Registration of Deaths and the Collection of Mortality Statistics;" Census pamphlet No. 104, Registration of Births and Deaths—Drafts of Laws and Forms of Certificates; and Census pamphlet No. 106, Extension of the Registration Area for Births and Deaths—A Practical Example of Cooperative Census Methods as applied to the State of Pennsylvania. These will be sent by the Director of the Census upon request.

IMPORTANT SUBJECTS REQUIRING UNITED ACTION.

Some of the important subjects requiring agreement and upon which action may well be taken by the representative organization of American registrars, are as follows:

1. Legislation for the improvement of vital statistics, (*a*) Federal, (*b*) state, and (*c*) municipal. The "Essential Requirements" for the registration of deaths, which have stood the test of actual experience for some six years, should be revised, if any revision be necessary, and reaffirmed. State laws enacted during recent years should be compared in connection with the essential requirements, and the conditions of their failure or success pointed out. Similar criteria should be framed for the registration of births. No state or city has yet been accepted by the Bureau of the Census as having the minimum standard of completeness (only 90 per cent) of birth registration; it is believed that a beginning may be made at an early date and a "registration area for births" be constituted. The drafts of laws recommended by the Bureau of the Census should be remodeled, simplified as much as possible, and effective alternative plans suited to special conditions in the West and South be arranged. For cities in the nonregistration states a model city ordinance for the registration of births and deaths should be prepared, so that a beginning of registration can be made without waiting for the sometimes tardy coming of general state legislation. The formation of a Section of municipal health officers at the present meeting of the Association should be of important service in this connection, and a special committee might well be appointed by it to cooperate with the committee of the Section of vital statistics.

2. Administrative methods should be compared, and a higher standard of general efficiency in collecting and handling registration returns be attained. There should be absolute agreement as to what constitutes a birth, a stillbirth, and a death, for registration purposes, in the entire country.[1] At present there is great lack of uniformity in this respect. Some registrars include stillbirths in deaths; some exclude them. Some registrars include stillbirths in births; some exclude them. The term "stillbirth" is undefined, and means one thing in one place and another in another; yet upon its precise definition depends uniformity in the statement of births and deaths. Sometimes deaths in institutions or deaths of transients or nonresidents are included in total deaths, and sometimes they are excluded; sometimes deaths in institutions located without a city are included in its statistics. When it comes to the classification of causes of death, even when the International Classification is in use, there is chaos indeed; the same deaths compiled in two or three separate offices, as sometimes happens, may

[1] Resolutions containing definitions of these elements of vital statistics will be presented.

show quite different results, largely due to the lack of an accepted uniform method for the disposition of joint causes and an identical form of statement by physicians and coroners upon their certificates. Imperfect data are not uniformly corrected, and no general system of checks or tests is in operation whereby a registrar may be assured of the substantial completeness of his results. All of these unfortunate conditions can be remedied by the cooperation of the registrars themselves, if once organized into a coherent body, and there is no other way, under our system of government, by which they can be materially improved.

3. Uniform blanks should be employed for the collection of the fundamental data upon which the vital statistics are based. In 1900 only two states in the Union employed the same form of certificate of death.

States in which the standard certificate of death has been adopted (or recommended in nonregistration states) by the state authorities: 1907.

As a result of the movement begun by the Association a standard blank was prepared and recommended by the Bureau of the Census for general adoption. It is now in use in many states and cities, including all of the registration states except a few of the older ones that already possessed forms containing all of the essential items, and which they were reluctant to abandon for the reason that their filing cabinets or methods of clerical work were especially adapted to the old forms in use. Only two states, both included in the nonregistration area, have blanks recommended by their state authorities that do not include all of the information required for the annual reports on Mortality Statistics prepared by the Bureau of the Census, and it is hoped that with the adoption of effective laws in those states the standard blank will be introduced. Many cities, however, continue to use very defective

forms, and it would be desirable for them, where the matter is entirely under local control, to adopt the standard certificate.

Even with the standard blank, however, there is beginning to be a diversity of arrangement and mode of statement of certain items, so that the condition of actual uniformity may be lost. It would be well for a general agreement to be reached as to the desirability of any modification of it, and then that the standard blank should be adopted and maintained in use in the standard form so far as all of the essential items are concerned. There is, of course, provision for special additional data required by the laws of certain states.

The most important items concerning which the form of statement may perhaps be altered with advantage are the following:

(*a*) *Occupation.*—While this item should afford some of the most practically useful information derived from mortality statistics, it does not do so at present. A complete study of the subject by an authorized committee, and with the aid of all who are interested in statistics of the mortality of occupations, should be made and an improved schedule formulated, if one not too cumbrous can be devised, that will enable a beginning to be made in the collection of satisfactory material.[1]

(*b*) *Cause of death.*—This is even more fundamental than occupation, and this pamphlet has been especially devoted to this subject as the most urgently important of any that can come before the organized association of registration officials, and also one that they are quite able to radically reform.

4. Uniform methods of presentation of data relating to vital statistics should be adopted. Registration reports and bulletins of states and cities should be readily comparable with each other and with the annual Mortality Reports of the Bureau of the Census. Each class of report or bulletin has its own field of usefulness and may go into greater or less detail in certain directions, as may be necessary for its own specific purpose, but when the results come together they must harmonize. Otherwise our statistics, as a nation, will become discredited and the old gibe that "One can prove anything by statistics" will seem to be true.

5. Standard tables showing the most important results for each year of registration should be prepared for each state and city. The past results of registration in the United States should be made available for convenient reference, no matter how imperfect. The figures should be critically examined, and explanatory notes made of changes of methods of collection or compilation of data, probable degree of completeness of registration, etc., so that users of statistics may know

[1] A form will be submitted merely as a basis of discussion and so that definitive action *may* be taken in 1908 without waiting another year for the report of the special committee in charge of the subject. It is desirable that all changes in the standard blank be made at the same time. In the meantime it is urged that special attention be given to the subject by statisticians. A symposium on "Occupations" is planned in the American Statistical Association, in which the requirements of the schedule and instructions on occupations may be discussed from the several points of view of population, industrial (manufactures), and vital statistics.

just what the sources of information are and the actual value of the published figures. As a basis, the items contained in the international tables published by the French government (*Statistique générale de la France*, Tome XXXII, 1902) may be taken, namely, population at each census since the beginning of registration and estimated populations for intercensal years, number of marriages, living births, stillbirths, and deaths (exclusive of stillbirths) for each year, with rates per 1,000 enumerated or estimated population. The French tables contain data for only five American states, Connecticut (1848–1900), Massachusetts (1849–1900), Maine (1892–1898), Michigan (1868–1899), and Rhode Island (1874–1892). Even in these, however, as also in the standard tables published by certain states, errors occur, so that at present it is necessary to go back to the original annual reports of each state for assurance of correctness; and very possibly in so doing one will be confronted by differing statements of total deaths or other items in various tables of the same report, or perhaps find that the method of treating stillbirths changed from year to year, so that it is absolutely impossible to know in a given instance whether they were or were not included in the total number of births or deaths.

Such standard tables are equally necessary for cities, as shown by the valuable series published by Mr. Hoffman[1] and the summaries prepared by Doctor Chapin for the city of Providence.[2] In the latter case it was necessary to go back to the original returns and ascertain the true number of stillbirths ("dead at birth"), so that the figures for total living births and total deaths (exclusive of stillbirths) might be comparable. The method of compiling deaths of children who had lived less than a week after birth as stillbirths had been followed up to 1889, contrary to the present practice of the office. Standard tables for individual causes of death are especially important, but present great difficulties owing to the changes in methods of classification. The work can best be done by those having access to the original returns and familiar with office rules.

UNIFORM MODE OF STATEMENT OF CAUSE OF DEATH INDISPENSABLE.

Identical schedules are necessary to secure comparable results in statistics. One of the most important statements made upon the certificate of death—perhaps the *most important* for the uses of the data for sanitary purposes—is the statement of cause of death. In deaths from disease this statement is usually made by the attending physician, and in deaths of sudden occurrence, under suspicious circumstances, or from violence, by the coroner or medical examiner. In order to obtain a definite and satisfactory statement for statistical purposes, the physician or coroner should clearly understand just

[1] The General Death Rate of Large American Cities, 1871–1904, by Frederick L. Hoffman. Publications of the American Statistical Association, March, 1906.

[2] Fifty-first Annual Report upon the Births, Marriages, and Deaths in the City of Providence for the year 1905, including Tables for Fifty Years. By Charles V. Chapin, M. D., city registrar.

what kind of information is desired, and how the cause or causes of death should be stated so that the mortality statistics can be correctly compiled. If a sequence or certain order of statement of the causes of death, such as "primary," "secondary," etc., be necessary, it should be plainly and unmistakably provided for on the blank, and the exact meaning and relation of the qualifying terms should be understood by all concerned.

From the point of view of the Bureau of the Census this is especially important for two reasons:

1. All transcripts of deaths received from the states and cities constituting the registration area of the United States are made upon blanks of the standard form. When copied from original certificates made out upon other forms of blanks, or perhaps upon materially altered standard blanks, the character of the returns may be considerably changed and quite different relations be shown for the causes reported than those originally indicated by the physicians or coroners.

2. It is quite impossible for the Bureau of the Census to cooperate with state and city offices in instructing physicians and coroners as to how they shall return causes of death so as to be most serviceable for the compilation of mortality statistics unless the blanks in use contain a uniform method of statement.

MODIFICATION OF THE STANDARD BLANK PROPOSED.

While the standard certificate of death has proved very satisfactory in practical use during the time since its adoption, it has not proved to be wholly free from uncertainty, as understood by physicians. It also possesses the fault, in common with every other blank used in this country and many of those used abroad, that it does not properly provide for the statement of causes of death due to violence. Primarily prepared for the return of deaths from disease, the form does not suggest the statement of the most essential particular required for the classification of deaths from violent causes, namely, whether the means of death was of an accidental, suicidal, or homicidal character. An explicit statement in this respect is contained in the form proposed, where every physician or coroner can read it while filling out the certificate of death, and if generally adopted a marked improvement should result in the precision of this very important class of statistics.

The new form is presented for the criticism of all interested, and with the express request that it be not adopted by any local office, except in a merely experimental way, until it has been thoroughly considered, reported upon through the proper channels, and officially recommended by the organized registration officials of the United States. Upon the possibility of deliberate action upon such a question as this, followed by *actual compliance* with the decisions made, depends the outlook for improvement in American vital statistics. Unless registration officials can agree upon the adoption of some uniform methods,

and then let them stay adopted and in force until regularly and consistently modified by general agreement, it is quite impossible to expect a homogeneous body of national statistics. Without such agreement in practice the form proposed would only add one more to the already too numerous list, and would demonstrate that it is quite impossible to build a uniform and effective statistical administration upon the sand of shifting individual preferences.

PERSONNEL OF AMERICAN REGISTRATION SERVICE.

Whatever success is reached will be due to the intelligent action of American registrars of vital statistics. Without organization nothing can be accomplished, and the coming together of state and municipal officials for the express purpose of forming a national association devoted to the improvement of registration methods and results is full of promise for better things. Much is accomplished by personal acquaintance, and by the knowledge that fellow-workers in different parts of the country are watching one's progress. Every health officer who brings the sanitary condition of his city to the attention of the people by means of reports or bulletins containing causes of deaths is helping, or hindering, the progress of American vital statistics. It has seemed desirable to list the state and city registration officials,[1] including all places having a population of 8,000 or over at the time of the last Federal Census, and also to show, as far as the information is available, some particulars in regard to whether they are acting under state laws or city ordinances, or both, and also as to the issue of reports and bulletins containing vital statistics.

EXTENSION OF THE REGISTRATION AREA.

The extension of the registration area by the inclusion of new registration states is proceeding apace. There were ten registration states in 1900—Connecticut, Indiana, Maine, Massachusetts, Michigan, New Hampshire, New Jersey, New York, Rhode Island, and Vermont—besides the District of Columbia (city of Washington). Of these, two—Maine and Michigan—were added during the previous decade, while Delaware was dropped. In 1906 five additional states were included—California, Colorado, Maryland, Pennsylvania, and South Dakota. Complete laws were enacted in 1907 which should bring Minnesota, Montana, North Dakota, Wisconsin, and perhaps other states, into the list. Earnest efforts will be made by the state authorities in Kentucky, Ohio, and Virginia to secure adequate legislation in 1908, and Illinois, Kansas, and other states will endeavor to secure it in 1909. But since 1900 no registration cities in nonregistration states have been added, although it is entirely practicable for many cities in states which are not likely to secure effective state registration for some years to come to pass at once local ordinances for this

[1] See Appendix B.

purpose, and so execute them as to obtain complete registration of deaths. As soon as this is done and the results tested, the cities can at once be admitted into the registration area. The attention of city authorities whose cities are not included in the list of cities having effective registration[1] is called to this fact, and suitable action is suggested, provided that the cities are free to act independently unhampered by defective state laws. It would be well also if state boards of health in nonregistration states in which the prospect of the enactment of a general state law seems remote would at once use their influence to promote municipal registration under uniform local ordinances and by means of the standard blanks containing all of the essential statistical items.

It is, indeed, not necessary to wait until the limit of 8,000 population is reached, although this governs the admission of separate registration cities. For local sanitary uses and for legal, historical, and genealogical purposes, registration may yield excellent results in much smaller places. Every American citizen should take pride in having his personal and family history properly recorded, and in future years the official registers of births and deaths will be regarded as an invaluable possession. As an example, the city of Keene, N. H., not long ago published a volume[2] containing the early records of births (1742–1877), marriages (1753–1854), and deaths (1742–1881), concerning which it is said: "These records are of invaluable service to historians and genealogists and ought never to be allowed to perish. Once in print the record of these facts will be indestructible. After the publication of the vital statistics it would be comparatively safe to send all the old and badly worn town records to be cleansed, rebound and covered, page by page, with overlays of transparent silk, as is done in such cases, thus permanently preserving the old volumes." The first state law for the registration of vital statistics in New Hampshire was enacted in 1849, at which time Keene, although having only about 3,000 inhabitants, had had local registration for over a century. The tender care taken of these old returns shows the estimation placed upon them by the descendants of the men whose vital statistics are there recorded, and reveals the duty to the future owed by the generation of to-day.

In conclusion, thanks are due to American and foreign registrars for samples of blanks and information concerning their use, and suggestions and criticisms in regard to the conclusions reached will be warmly welcomed both from registration officials and experts and from physicians and coroners, upon whose statements of causes of death, primarily, is founded the whole edifice of mortality statistics.

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[1] Appendix B.

[2] Vital Statistics of the Town of Keene, N. H., compiled from the Town Records, First Church and Family Records, the Original Fisher Record, and the Newspapers. By Frank H. Whitcomb, City Clerk. Authorized by vote of the City Council, June 1, 1905.

MODES OF STATEMENT OF CAUSE OF DEATH AND DURATION OF ILLNESS UPON CERTIFICATES OF DEATH.

The wording and arrangement of the form provided on the certificate of death for the statement of cause of death by the attending physician or coroner is one of the most important features of the blank. The information to be thus obtained is very valuable, and the tables of causes of death contain perhaps the most useful and characteristic data of mortality statistics. Their value is largely dependent upon a full understanding by those who originally report the causes of death of just what should be properly understood by that term—what is essential and what is not essential to state concerning the causes of a death. Many of the imperfections of mortality statistics at the present time arise from the fact that complete statements of cause of death in a form best adapted to statistical compilation are not obtained.

To some extent this unsatisfactory condition is due to a lack of definite agreement as to just what is wanted from the physician. Physicians in active practice can not be expected to take interest in the minutiae of nosological classifications, or to specify the relations of several causes of death so that the compiler's task will be clear and easy, unless the questions addressed to them are entirely definite and unambiguous. Apparently slight variations in framing the schedules in this respect may be responsible for serious differences in the character of the replies, and even the order of the replies, if order be taken as a basis of classification, may affect the statistical results.

Attempts have been made to secure precise information by the use of various qualifying words or expressions in the blanks, or by the use of explanatory notes or instructions. Among the words commonly found modifying the return of cause of death are the following: "Primary," "secondary," "chief," "determining," "consecutive," "contributory," "immediate," "remote," etc. It is certain that some of these terms are understood in very different senses by various physicians, as well as by the registration officials who compile the certificates of death in which they appear.

The statement or omission of the statement of duration of illness is also very important as affecting the compilation of the data. In England, according to the "Rules as to Classification of Causes of Death,"

published by a committee of The Incorporated Society of Medical Officers of Health in 1901, of which committee the distinguished vital statistician Doctor Arthur Newsholme was chairman, the element of duration is adopted as the basis of the first and most important general rule for the compilation of joint causes of death:

> With the following exceptions, the general rule should be to select from several diseases mentioned in the certificate *the disease of the longest duration* [italics in original]. In the event of no duration being specified, the disease standing first in order should be assumed to be the disease of longest duration.

On the other hand, general European practice, as shown by the rules published by the Imperial Board of Health of Germany (1905), and by Doctor Bertillon (Paris classification, 1890, 1898; International classification, 1900, 1903), lays little direct stress upon the element of duration in regulating the preference of causes jointly returned, and the certificates of death in use do not usually contain this item of information. In the United States practice is unsettled. So far as the rules for jointly returned causes published in connection with the International classification have been followed it is probable that the duration of illness has been ignored. Many registrars, however, decide as to the "acute" or "chronic" character of certain diseases by the duration stated, or, in the absence of a statement of duration, by the period of medical attendance. In the Mortality Statistics of the Seventh Census of the United States, 1850, may be found tables showing the "Duration of sickness" in connection with the causes of death compiled, but the item was omitted from the mortality schedules of subsequent censuses, and was not restored until the adoption of the standard certificate. In the instructions issued for the return of deaths for the calendar year 1906 upon the standard blanks for transcripts of certificates of death, it is requested that the duration of illness be given in all cases in which it appears upon the original returns. It is desirable that registrars should endeavor to secure a proper statement of duration of illness for all deaths registered with them.

In order to supply a basis for specific recommendations as to these items, it will be of service to examine the forms of statement now in use in this country (samples collected in July, 1906), and to compare them with some forms used abroad.

UNITED STATES.

A. *Standard certificate of death.*—The standard certificate of death, in the precise form adopted by the United States Bureau of the Census as a result of cooperation with the American Public Health Association, has the following arrangement for the statement of cause of death and duration of illness:

[1] U. S. Bureau of the Census; many states and cities. × 1.[1]

The CAUSE OF DEATH was as follows:

---(DURATION)---DAYS

Contributory ---

---(DURATION)---DAYS

Following is a list of states and a partial list of cities using the strictly standard form of certificate of death, so far as it relates to the items under consideration:

STATES.

California	Nebraska	South Dakota
Iowa	Oregon	Washington
Michigan	Pennsylvania	

CITIES.

Bellaire, Ohio	Houston, Tex.	Newport News, Va.
Buffalo, N. Y.	Lancaster, Ohio	Portsmouth, Ohio
Canton, Ohio	Manchester, Va.	St. Louis, Mo.
Charleston, S. C.	Memphis, Tenn.	Shreveport, La.
Columbus, Ohio	Minneapolis, Minn.	Toledo, Ohio
Findlay, Ohio	Nashville, Tenn.	Wichita, Kans.
Fort Smith, Ark.	Newport, Ky.	Yonkers, N. Y.

It should be understood that cities in registration states, e. g., Detroit, Mich., Philadelphia, Pa., and San Francisco, Cal., use the standard form prescribed by the state authorities, and that the cities listed above are chiefly registration cities in nonregistration states. Two exceptions are Buffalo, N. Y., and Yonkers, N. Y., which use the exact form of the standard certificate, while the state blank, as shown in the next section (form [7]), contains a slight modification.

[1] Indicates that blank is reproduced in same size, approximately, as original; ×½ indicates reduction to about one-half size, etc. In some cases the printer has not uniformly reduced, but merely narrowed the blanks, as in forms [30], [41], etc. In such cases it should be understood that additional blank space exists on the originals.

B. *Modified standard certificate of death.*—Some of the variations that have already developed since the adoption of the standard certificate in 1902 may be seen in the following examples:

[2] Colorado; Utah. × 1.

The CAUSE OF DEATH was as follows:

Chief Cause ----------

Where Contracted ---------- **Duration** ---------- **Days**

Contributory (if any) ----------

Where Contracted ---------- **Duration** ---------- **Days**

The Colorado blank has the same general arrangement as the Utah form shown above, but contains an additional leader line for "Chief Cause" and omits the word "Days" after the word "Duration."

The instructions to physicians on the back of the Utah certificate ask them to state the "primary and contributory causes of death, with the duration of each," and, if from peritonitis or septicemia, to "give the contributing cause, especially for females of child-bearing age."

[3] Indiana (1906). × 1.

. . . the cause of death was as follows:

Chief Cause_____

_____ Duration _____

Immediate Cause _____

_____ Duration _____

Instructions: "*Write the name of the disease which caused the death.* If the patient had pulmonary tuberculosis and died from hemorrhage of the lungs, write pulmonary tuberculosis as the disease causing death and pulmonary hemorrhage as the immediate cause."

The above form was in use in July, 1906, when the general collection of specimens was made. At present a new form is in use:

[4] Indiana (1907). × 1.

The IMMEDIATE CAUSE OF DEATH was as follows:

---(*duration*) ---*days*

Contributory---

---(*duration*) ---*days*

Instructions: "Write the name of the disease which caused the death. If the patient had pulmonary tuberculosis and died from hemorrhage of the lungs, write pulmonary tuberculosis as the disease causing death and pulmonary hemorrhage as the contributory cause."

[5] Florida; Middletown, Ohio; Wheeling, W. Va. × 1.

. . . the cause of death was as follows:

CAUSE OF DEATH.

_____

_____

_____

_____

_____

Duration_____

The first appearance of the standard certificate of death in Census Circular No. 71, from which the Middletown, Ohio, blank shown above was derived, was somewhat different from the present familiar form.

[6] Massachusetts; Leavenworth, Kans. × 1.

. . . the CAUSE OF DEATH was as follows:

Primary: ---

---(DURATION)---DAYS

Contributory: ---

---(DURATION)---DAYS

The regular state form is given above. Boston does not use the standard blank; see form [31].

[7] New York. × 1.

. . . **the cause of death was as follows:**

CHIEF CAUSE

---(DURATION)---DAYS

CONTRIBUTORY---

---(DURATION)---DAYS

The form employed by the State Department of Health is shown above. Albany still uses the old New York state blank [29]. Buffalo and Yonkers employ the standard form. So did Greater New York until recently, so far as cause of death and duration are concerned. Lately the matter indicated by brackets in the form below has been stricken out, leaving it entirely without suggestion as to mode of stating the cause of death and with no provision for the statement of duration of illness.

[8] New York, N. Y. × ½.

. . . *the cause of*---*death was as follows:*

---[(*Duration*)---*Yrs.*---*Mos.*---*Days.*]

[*Contributory*---(*Duration*)---*Yrs.*---*Mos.*---*Days.*]

[9] Vermont. × 1.

. . . the cause of death was as follows:

CAUSE OF DEATH.

[See instructions on back.]

Chief _____

Contributing_____

_____

_____

_____

Duration _____

In this the duration is given for only the "Contributing" cause of death.

[10] Baltimore, Md. × 1.

CAUSE OF DEATH (Secondary or Immediate).

---- (DURATION) ---- DAYS

Contributory (Primary) ----

---- (DURATION) ---- DAYS

This form is of interest because it reverses the usual order of statement, placing the secondary or immediate cause first in order, and identifies the primary with the contributory cause.

C. *Old forms used by Census.*—In Schedule 3 of the Seventh Census, 1850, the first United States Census that included the subject of mortality, two of the eleven items related to cause of death:

[11] U. S. Census (1850).

10. Disease or cause of death.
11. Number of days ill.

The instructions on the latter item are: "In column 11 state the number of days' sickness. If of long duration, insert 'C.' for chronic."

The same questions were employed in the census of 1860, but only the first ("Disease or cause of death") in the censuses of 1870, 1880, 1890, and 1900. The instructions to enumerators of the censuses of 1880, 1890, and 1900 were practically identical:

[12.] U. S. Censuses (1880, 1890, 1900).

The most important point in this schedule is the question in column 12 [1900] headed "Disease or cause of death." Especial pains must be taken in this column to make the answer full and exact, and to this end attention is called to the following points:

Enter the name of the primary disease in all cases, and where the immediate cause of death has been a complication or consequence of the primary disease, enter that also. For instance, enter all cases of death resulting either immediately or remotely from *measles, scarlet fever, typhoid fever, remittent fever, smallpox*, etc., under the names of those diseases, but add also *dropsy, hemorrhage from the bowels, pneumonia*, etc., if these occurred as complications and were the most immediate cause of death.

* * * * * * *

Distinguish between acute and chronic bronchitis, acute and chronic dysentery or diarrhea, acute and chronic rheumatism.

In 1880 and 1890, in addition to the deaths returned upon the regular schedules, an effort was made to collect voluntary returns from physicians, for which purpose they were provided with a special register of deaths. As shown on page xi, Mortality and Vital Statistics, Part I, Tenth Census (1880), the form was as follows:

[13] U. S. Censuses (1880, 1890).

Cause or Causes of Death:†

_____

_____

_____

Was a post-mortem held? _____

Name of Physician:

_____

†Under "cause or causes of death" insert remote, immediate, and concurring causes. For instance, insert "measles and pneumonia," or "difficult labor, peritonitis, and septicemia," or "scarlet fever, nephritis, dropsy, and coma," in cases representing these phenomena.

☞If the true cause of death *is not certainly known*, insert names of symptoms with a cross, thus: "Convulsions and coma ×; paralysis of the heart, ×," etc.

In the introductory remarks of the Report on Vital and Social Statistics of the Eleventh Census (1890), Part I, page 8, may be found a form recommended, after study of the various types at that time in use, in which the sole question is as follows:

[14] U. S. Census (1890).

Disease, or cause of death, _____

Subsequently, in connection with the preparations for the Twelfth Census (1900), the following form was recommended, and may still be found in use to some extent:

[15] U. S. Census (1899); Minnesota[1]; various cities. × ½.

12. Disease or Cause of Death:

	DURATION.
CHIEF CAUSE	
CONTRIBUTING CAUSE	

PLACE WHERE DISEASE WAS CONTRACTED, if other than place of death:

_____

[1] Under old law; superseded by act of 1907.

This blank was in use in 1906 in the following cities:

Akron, Ohio	Hamilton, Ohio	Paducah, Ky.
Columbus, Ga.	Ironton, Ohio	Salem, Ohio
Dayton, Ohio	Kansas City, Mo.	Springfield, Ohio
East Liverpool, Ohio	Lincoln, Nebr.	Tiffin, Ohio
Fort Worth, Tex.	Louisville, Ky.	Youngstown, Ohio
Fremont, Ohio	Lynchburg, Va.	Zanesville, Ohio
Greenville, Ohio	Marion, Ohio	

Also, similar in general arrangement, but with different wording, are:

[16] Washington, D. C. × ½.

13. Cause of Death	DURATION
PRIMARY	
IMMEDIATE	

[17] Atlanta, Ga.; Augusta, Ga. × ½.

12. DISEASE OR CAUSE OF DEATH.	Duration
Immediate Cause	
Primary or Contributing Cause	

D. *Miscellaneous forms.*—Despite the efforts at uniformity shown in the preceding groups of blanks, there is still a considerable variety of forms in use in the United States, most of which are employed only in the states or cities in which they have originated. The following state forms give both a differential statement with reference to cause and a statement of duration: Connecticut, Illinois, Kansas, Maryland, New Hampshire, Texas, and Wisconsin. Alabama and Maine make no distinction on this point and do not provide for duration. The Rhode Island blank suggests a statement of causes of death "in order of occurrence," but offers no prescribed form of statement, while the New Jersey form asks for only a single cause, but requires statement of duration. In Alabama, Illinois, Kansas, Maryland, Texas, and Wisconsin, all of which states with the exception of Maryland are part of the nonregistration area, the state forms are not used exclusively, but certain cities—e. g., Mobile, Ala., Chicago, Ill., Topeka, Kans., Baltimore, Md., Galveston, Tex., and Milwaukee, Wis.—prepare their own forms.

STATES.

Following are the state forms of this group:

[18] Alabama. × 1.

Cause of death _____ _____ _____

[19] Connecticut. × ½.

2. Primary cause of death..... 3. Duration of disease.....days
4. Secondary or contributory..... 5. Duration of .....days

[20] Illinois. × ⅔.[1]

CAUSE OF DEATH	Duration			
	Years	Months	Days	Hours
Immediate Cause				
Contributory Cause or Complication				

Instructions: "In the settlement of life insurance and for many other purposes the *duration* of the immediate *proximate* or *chief* and *determining* cause of death is required to be stated, as also the character and duration of *contributory* causes or complications."

[21] Kansas. × 1.

7. Cause of death .....
8. Occupation .....
9. Nationality .....
10. Place of death .....
11. Duration of disease .....
12. Complication .....
13. Duration of complication .....

[22] Maine. × 1.

Cause of Death, ...

.....

.....

[23] Maryland. × ⅔.

CAUSES OF DEATH	
Primary	How long
Immediate	How long

[1] Various sizes are used in different counties.

[24] New Hampshire. × 1.

Cause of Death, _____

_____ Duration, _____

Contributing Cause, _____

_____ Duration, _____

[25] New Jersey. × ½.

. . . *the cause of death was*_____

_____*Length of sickness*_____

[26] Rhode Island. × ⅔.

PHYSICIAN'S CERTIFICATE.

Please state different causes of death in order of occurrence as **FULLY** as possible, particularly in **DOUBTFUL** cases.

Date of Death_____190 Hour_____M.

Name_____

Causes of Death_____

_____

_____

_____

As an addition to the regular form, the blank used in the city of Providence has a line for the "Duration of Diseases," and also the following special request to the reporting physician:

TO THE PHYSICIAN. If more than one cause of death is given please underline that which you consider the most important.

Concerning this request Doctor Chapin writes (August 8, 1907): "I am sorry to say that it is only occasionally that our physicians underline the cause of death which they consider the most important. Sometimes when they do so indicate a cause it is evident that they mistake my intention, for they sometimes indicate the immediate, rather than the most important cause of death; yet in the aggregate during the year there are quite a number of certificates brought in on which this indication by the physician of the proper cause for tabulation is of value. I shall probably continue to make the request, as heretofore."

[27] Texas. × ½.

CAUSE OF DEATH	DURATION			
	YEARS	MONTHS	DAYS	HOURS
Immediate Cause				
Contributory Cause				

[28] Wisconsin. × ½.

20. *Cause of death* { *Primary* ..... / *Secondary* .....

21. *Duration of disease* .....

The standard certificate is required by the new registration law of 1907.

CITIES.

Among the cities of this group making provision on their certificates for a compound statement of cause and also for duration are: Albany, N. Y.; Boston, Mass.; Chicago, Ill.; Chillicothe, Ohio; Cincinnati, Ohio; Cleveland, Ohio; Fredericksburg, Va.; Galveston, Tex.; Milwaukee, Wis.; and Topeka, Kans. Some give only a simple statement of cause and no statement of duration: Alliance, Ohio; Americus, Ga.; Bessemer, Ala.; Biloxi, Miss.; Chattanooga, Tenn.; Greensboro, N. C.; Jacksonville, Fla.; Key West, Fla.; Lexington, Ky.; Martinsburg, W. Va.; Newbern, N. C.; New Orleans, La.; and Parkersburg, W. Va. Others give a single cause, with duration, as Defiance, Ohio; Mobile, Ala.; St. Paul, Minn.; and others give a double statement of cause, with no duration, as Cheyenne, Wyo.; Knoxville, Tenn.; and St. Joseph, Mo.

Some of the forms follow:

[29] Albany, N. Y. × ½.

. . . *the Cause of h____ death was as hereunder written:*

	Duration of Disease in Years, Months, Days or Hours. †
Chief and Determining	
Consecutive and Contributing	

† The duration of each Disease, when given, is reckoned from its commencement until Death.

*Sanitary observations*_____

This is the old and original form of the New York state blank, which is shown on page 111 of the Third Annual Report of the State Board of Health (1883).

[30] Boise, Idaho; Covington, Ky.; and other cities. × ½.

18.—Cause of death, { Remote or Predisposing _____
Immediate _____

19.—Duration of last illness _____

The following cities employ this form, in some cases without statement of duration:

Boise, Idaho,	Chillicothe, Ohio,	Sidney, Ohio,
Bucyrus, Ohio,	Covington, Ky.,	Troy, Ohio.
Cambridge, Ohio,	Elyria, Ohio,	
Canal Dover, Ohio,	Fostoria, Ohio,	

[31] Boston, Mass. × ½.

Disease { *Chief cause,*_____
*Contributing cause,*_____

Duration { *Chief Cause,*_____
*Contributing cause,*_____

[32] Chicago, Ill. ×½.

Cause or Causes of Death.	Duration of Causes.			
	Years.	Months.	Days.	Hours.
Immediate and Determining				
Contributing Cause or Complication				

On the reverse side: "In the settlement of life insurance and for many other purposes the *duration* of the *proximate* or *immediate* and *determining* cause of death is required to be stated, as also the character and duration of *contributing cause or complication.* * * * Albuminuria, emphysema, jaundice, or dropsy—the primary cause should be given."

[33] Cincinnati, Ohio; Norwalk, Ohio. ×½.

. . . *the cause of death was as hereunder written:*	Duration of each cause.
*Disease Causing Death**	
Immediate Cause of Death	
Contributory Causes or Complications, if any	
Post-mortem — Place where Disease causing Death was contracted, if other than place of Death.	

*In case of a **Violent Death,** state (1) mode of injury, and whether accidental, suicidal or homicidal; (2) what was the nature of the injury and the immediate cause of death; (3) contributory causes or conditions, *e. g.*, septicemia. Also, whether operation was performed, etc.
In deaths from tuberculosis, cancer, etc., always specify what organ or part of the body was affected. In septicemia, give cause, especially puerperal.

This form is identical with the original Michigan blank (1897), except that it is of greater size. Milwaukee, Wis., also uses the same form of statement as regards cause, except that the item relative to *post-mortem* is omitted.

[34] Cleveland, Ohio. ×½.

Cause of Death: *Chief* ..... *Duration* ..... *Days,*
Contributing ..... *Duration* ..... *Days.*

[35] Galveston, Tex. ×½.

Disease, Injury or other Efficient and Remote Cause of Death .....

.....

Disease, Injury or other Efficient and Immediate Cause of Death .....

.....

[36] Knoxville, Tenn. ×1.

Cause of Death, _____
Give immediate cause of Death.

Name of Disease, _____
Give remote cause of Death.

If Stillborn, state Supposed Cause of Death, _____

[37] Macon, Ga. ×1.

CAUSE OF DEATH.

Immediate _____

Contributing _____

Remote _____

[38] Massillon, Ohio. × ½.

Cause of Death: { Chief or Primary _____
Contributory or Immediate _____

[39] Spartanburg, S. C. × ½.

. . . the Cause of _____ death was:

First (Primary), _____

Second (Immediate), _____

[40] Topeka, Kans. ×1.

Cause of Death,	
Contributing Cause,	**Duration.**

[41] Worcester, Mass. × ½.

Disease or Cause of Death. { First or Primary, _____ Duration of _____
Secondary, . . _____ Duration of _____

FOREIGN COUNTRIES.

1. *France.*—Heretofore individual returns have not been made to the central statistical office of France, numerical statements having been prepared by the communal administrations, these totalized by prefectures for each department, and the department totals transmitted to the office of the *Statistique générale de la France.* Beginning January 1, 1907, however, this system has been changed, and colored slips representing individual living births (rose), deaths (green), stillbirths (chamois), marriages (blue), divorces (yellow), legitimations (orange), transcriptions or corrections (violet), together with a *bordereau*, or statement slip of transmission (white), giving the first and last registered numbers and the total number of each class, are sent in on the eighth days of January and July for the preceding half years. The system is much like that employed in many states, and recommended by the Bureau of the Census, for the monthly transmission of returns. As France possesses a deserved reputation for perfection in statistical detail, it will be of interest to present a reduced *facsimile* of the *Bulletin de Décès* (the reference imprint thereon gives exact details of the color, size, and weight of paper), together with a translation of the question concerning cause of death.

[42] France. × $\frac{2}{3}$.

DÉPARTEMENT d _____

ARRONDISSEMENT d _____

Commune d _____

RÉPUBLIQUE FRANÇAISE.

BULLETIN DE DÉCÈS.

ANNÉE 19____

N° de l'acte: _____

N° d'ordre du décès: _____

Décès survenu le _____ *du mois d* _____ *19*____ *à* _____ *heures du* _____ (matin ou soir.)

1. **Sexe:** masculin _____ féminin _____

2. **Date et lieu de naissance.** Né le _____ du mois d _____ 19 _____ (n'indiquer les mois d'âge que pour les enfants ayant moins de 5 ans.) à _____ département d _____

S'il s'agit d'un adulte:

3. **État civil.** Célibataire _____ / Marié _____ / Veuf _____ / Divorcé ____ — Depuis combien d'années? _____

4. **Si le décédé était marié.** Âge au mariage _____ / Nombre d'enfants vivants ou morts issus du mariage (morts-nés non compris) _____ / Nombre d'enfants survivants ____ / Âge de l'époux survivant _____

S'il s'agit d'un enfant de moins de cinq ans:

Était-il . . légitime? _____ / illégitime? _____ / premier né? _____

Si l'enfant a moins d'un an:

Mode d'alimentation. Au sein _____ / Au biberon _____ / Par allaitement mixte _____

5. **Profession du décédé** (1) _____ Patron (2) _____ Employé (2) _____ Ouvrier (2) _____

Profession de l'époux survivant (1) _____ Patron (2) _____ Employé (2) _____ Ouvrier (2) _____

6. **Si le décédé est un enfant:** _____

Profession du père (1) _____ Patron (2) _____ Employé (2) _____ Ouvrier (2) _____

Profession de la mère (1) _____ Patronne (2) ____ Employée (2) ____ Ouvrière (2) ____

7. **Maladie ou accident cause de mort** _____ aiguë _____ / chronique _____

8. **Le décès a-t-il été constaté par un médecin?** _____

_____, *le* _____ *19*____.

Le Déclarant, — *Le Maire ou le Préposé de l'état civil,* — Vu: *Le Médecin de l'état civil,*

(1) Préciser le plus possible la profession.
(2) Oui *ou* non.

[Translation of question 7.]

7. Disease or accident cause of death _____ acute _____ / chronic _____

7-117-1906. [8870] Papier vert, format o^m,24 × o^m,15; poids: 5 grammes.

2. *Germany.*—The following form is in use in Germany:

[43] Germany. ×1.

C. 190 (Vierteljahr).

Sterbefall (einschließlich der Totgeborenen).

Standesamts-Bezirk ..... } Kreis:
Stadtgemeinde ..... } .....
Landgemeinde ..... } .....
Gutsbezirk ..... } .....

Zutreffendes ist zu unterstreichen!

1. Nummer im Sterberegister: .....
2. Vor- und Zuname des Verstorbenen: .....
   oder ob totgeboren oder unbenannt verstorben?
3. Geschlecht: männlich oder weiblich?
4. Zeit des Sterbefalls? Monat: ..... Tag: .....
   Stunde: ..... Vormittags, Nachmittags.
5. Geburtsjahr und Tag des Verstorbenen: .....
6. Familienstand des Verstorbenen:
   a) bei Totgeb. u. Kindern unter 1 Jahre: ehelich oder unehelich geboren?
   b) bei allen übrigen Personen: ledig, verheiratet, verwitwet, geschieden?
   bei Verheirateten: Dauer der durch diesen Todesfall gelösten Ehe: ..... Jahre.
7. Religionsbekenntnis: .....
   bei Totgeborenen des Vaters: ....., der Mutter: .....
8. a) Stand, Hauptberuf, Gewerbe:
   bei Personen über 15 Jahre alt des Verstorbenen selbst: .....
   .....
   Berufsstellung (ob selbständig, Gehilfe, Arbeiter usw.): .....
   b) Stand, Hauptberuf, Gewerbe:
   bei Totgeborenen und nicht erwerbtätigen Kindern unter 15 Jahren:
   des Vaters: .....
   wenn vaterlos: der Mutter: .....
   Berufsstellung des Vaters bezw. der Mutter: .....
9. Todesursache (bei Verunglückung Art derselben): .....
   .....
   .....
10. Bemerkungen, z. B.: ob aufgefundene unbekannte Leiche, ob auf deutschen Schiffen auf See, oder ob in einer Anstalt verstorben?
    in welcher Anstalt? .....
    .....

[Translation of question 9.]

9. Cause of death (Nature of accident): .....

3. *Great Britain and Colonies.*—The forms supplied by the Registrars-General of England and Wales and Ireland are identical in the arrangement and wording of this part of the blank:

[44] England and Wales; Ireland. × ⅓.

. . . *the Cause of h_____ death was as hereunder written.*

Cause of Death.	Duration† of Disease in			
	Years.	Calendar Months.	Days.	Hours.
Primary *Enteric Fever*			*21*	
Secondary *Broncho-Pneumonia*			*3*	

†The duration of each form of Disease or Symptom is reckoned from its commencement until death occurs.

The example of primary and secondary causes is that officially given by the Registrar-General of England and Wales in the book of forms supplied to physicians.

[45] Scotland; South Australia. × ½.

. . . *the Cause of Death and Duration of Disease were as undernoted:—*

	Cause of Death.	Duration of Disease.		
		Years.	Months.	Days.
Primary Disease ... ... (*a*)				
Secondary Diseases (*if any*) ... (*b*)				
... (*c*)				
... (*d*)				

[46] New South Wales. × ⅔.

. . . the cause of h____ death was as hereunder written.

‡Cause of Death.	Duration of Disease in Years, Months, Days, or Hours. †
(*a*) Primary (Actual)	
(*b*) Secondary (Contributing)	

†The duration of each form of Disease or Symptom is reckoned from its commencement until death occurs.

‡N. B.—If the Deceased was a State child, boarded out, the Children's Protection Act of 1902 (sec. 10) requires that the medical attendant, in giving the cause of death, should also certify whether such cause was accelerated by neglect or ill-treatment. The addition of "*neglect*" or "*no neglect*," under the cause of death, will comply with this requirement.

[47] New Zealand. × 1.

. . . the cause of h ___ death was, —

	Cause of Death.	Time from attack till Death.
(*a*) First		†
(*b*) Second		†

† Each form of disease, or symptom, is reckoned from its commencement *till* death.

[48] Queensland. × 1.

The cause of h death was as specified at foot hereof.

Cause of Death. (Disease or Injury.*)	Duration of Illness.
1. Primary	
2. Secondary	
3. Final	

*In case of a Death resulting from fractures, contusions, wounds of any kind, poison, or drowning, the Registrar-General particularly requests medical men to state specifically THE NATURE OF THE INJURY, and whether the Cause of Death was ACCIDENTAL, SUICIDAL, or HOMICIDAL.

[49] Tasmania. × ½.

Cause of Death—1st 2nd

[50] Victoria. × 1.

. . . *the cause of h death was—*

	Cause of Death.	Duration of Diseases.
(*a*) First:		
(*b*) Second:		

4. *Italy.*—Individual returns to the central bureau of the government have long been employed in Italy. Unfortunately a copy of the Italian blank is not at hand, but a translation of the reproduction given by Doctor Bertillon (*Cours élémentaire de statistique administrative*, 1895, p. 277), so far as it relates to form of statement of cause of death, with instructions, may be given:

[51] Italy. × 1.

Natural death	Primary disease [*Maladie primitive*]	
	Complications of the disease or terminal condition [*Accident terminal*]	
Violent death[1]	Accidental[2]	
	Suicide[3]	
	Homicide	

[1] If unable to certify whether a death from violence is due to homicide, suicide or accident, indicate the supposed cause.
[2] In accidental death state whether caused by fall, crushing, burning, drowning, poisoning, etc.
[3] In suicides indicate the means employed—firearms, cutting instruments, poisoning, precipitation from height, drowning, hanging, crushing under train, etc.

5. *Japan.*—A reduced *facsimile* of the certificate of death employed in Japan, and also a translation of the complete instructions issued to physicians in connection with its use, which were kindly supplied by Hon. N. Hanabusa, Director of the Bureau of General Statistics, Imperial Cabinet of Japan, are given below:

[52] Japan. × ½.

死亡診斷書

内務省認可

死亡者ノ氏名		
死亡者男女ノ別		
死亡者ノ生レタル日		年　月　日
職業	死亡者ノ職業	
	家計ノ主ナル職業	
死亡ノ原因	病死	病名
	自殺	手段
	自殺以外ノ變死、中毒	種類
發病ノ日	明治　年　月　日	
死亡ノ時	明治　年　月　日　午　後前　時	
死亡ノ場所		

右證明候也

明治　年　月　日

9159—07——3

INSTRUCTIONS TO PHYSICIANS.

The certificate of death to be made by a physician should be as follows:

CERTIFICATE OF DEATH.

1. Name of the deceased----------
2. Sex ----------
3. Date of birth----------
4. Occupation:
   (a) Occupation of the deceased----------
   (b) Occupation of the head of household----------
5. Whether death by disease, suicide, other violence, or poison----------
6. Name of disease, means of suicide or kinds of other violence or poison----------
7. Date of beginning of disease (if death by suicide, other violence, etc., this clause omitted) ----------
8. Date of death----------
9. Place of death----------

I certify the above mentioned.

Dated---------- ----------,

Physician.

For 1, write the name written on the family register book. When the name is not evident, as in the case of suicide, other violent death, etc., write it as unknown.

For 2, when the sex is not distinct on account of a time-worn corpse, write it as unknown.

For 3, when the date of birth is not evident on account of suicide, other violent death, etc., write a conjectured age; and if it could not be conjectured, write it as unknown.

For 4, when the deceased is the head of household, write the occupation of the deceased only; when the deceased has no definite occupation on account of being young, old, female, etc., write it as "has not," and write the occupation of the head of the household. When the deceased has a definite occupation and is not the head of household, write collaterally the occupations of the deceased and of the head of household. The nomenclature of occupation should not be limited to the use of simple broad terms, as a "merchant" or "manufacturer," but be written in detail as to what [kind of a] merchant, what [kind of a] manufacturer, etc. When the occupation is not certain on account of the case being suicide, other violent death, etc., write it as unknown.

For 5, write the distinction of whether the death is by disease, suicide, other violence, or poison.

For 6, when the death is by disease, do not write any other matter than the name of disease. When death is caused by two or more diseases, and if one is primary and the others are secondary or after-diseases, write the primary disease only. If each disease is an independent one, write the disease that became chiefly the cause of death. If the distinction is found impossible, write collaterally all the diseases. When the disease as cause of death can not be determined, write it as unknown. As for suicide, write the means of it, as, for instance, by hanging or strangulation, by drowning, or by cutting instruments. As for other violence and poison, write the kinds of them, as, for instance, by accidental drowning, crushing, burns, murder, poison of Fugu (a kind of tetrodon), poison of alcohol, etc.

For 7, as for death by disease, write the date of beginning of it; if it is not evident, write conjectural date, and if it is impossible to conjecture, write it as unknown.

For 8, no matter whether the death is by disease, suicide, other violence, or poison, write the date of death. If the date of death is not evident, as in the case of suicide or other violence, write conjectural date, prefixing the word "conjectural."

6. *Sweden.*—Physicians are supplied with a copy of the classification of causes of death and an alphabetical list of diseases referred to the proper classification number. On the first line of the following form, which is part of the certificate of death, there is to be written the principal cause of death (hufvuddödsorsak) and its classification number, while the following lines are for the contributory causes (bidragande dödsorsaker).

[53] Sweden. × 1.

Hufvuddödsorsak: Nomenkl. n:o _____
_____
Bidragande dödsorsaker:
_____
_____

7. *Switzerland.*—The methods employed by the Federal Bureau of Statistics of Switzerland deserve special consideration on account of the great pains taken to frame the interrogations as to cause of death, the very explicit instructions, and the provision for a confidential report by the attending physician. A slightly reduced copy of the blank is presented herewith, together with a translation of that part of the blank relating to statement of cause of death and including the suggestions to the physician as found upon the reverse side:

[54] Switzerland. × ⅔.

Nom du décédé: .....

.....

La notice pour les officiers de l'état civil se trouve au verso.

☞ Le **médecin** est prié de bien vouloir: 1° répondre le plus tôt possible aux questions 8 à 10, en tenant compte des **observations inscrites au verso,** mais seulement après l'autopsie, si celle-ci a lieu; 2° contrôler les réponses données aux questions 1 à 7 par l'officier de l'état civil et, cas échéant, les compléter; 3° après avoir enlevé le présent coupon, mettre le bulletin dans l'enveloppe ci-jointe, fermer cette dernière et la mettre **sans retard** à la poste.

.....

Masculin.

Arrond^{t} d'état civil: .....

Registre des décès 190.... District: .....

No. .....

1. Décédé le ..... à ..... heures {matin* / soir*}
2. Lieu du décès (Commune): .....

(Quart., etc.; hôp., établ., etc.) .....

Pour les non domiciliés au lieu du décès, durée du séjour: .....

3. Profession du décédé: .....

Position dans l'entreprise: .....

Nature de l'entreprise: .....

Si le défunt a moins de 15 ans, **profession du père*** ou **de la mère***: } .....

4. Etat civil: célibataire* — marié* — veuf* — divorcé*.

P^{r} les enfants au-dessous de 5 ans: légit.* — illég.* — mis en pension*.

5. Commune d'origine: ..... (canton, Etat.) .....
6. Commune de domicile: .....
7. Né le ..... 1.....

8. **Déclaration médicale de la cause du décès:**

a. Maladie primitive ou cause primaire. (*En cas de mort violente, indiquer le genre et la cause, date de l'accident, du suicide, etc*) } .....

.....

b. Maladie conséc. et cause immédiate de la mort } .....

.....

c. Maladies concomit. ou circonst. dignes d'être mentionnées } .....

.....

9. Autopsie: Oui* — Non*.
10. Observations: .....

(Condit. sanit. de l'habitation, etc.—Voir au verso.) .....

Le médecin traitant*—appelé après la mort*:

(*Sig.*) ..... à .....

☞ ***Souligner** les mots qui se rapportent à la personne.

8. **Medical statement of the cause of death.**

a. Primitive disease or primary cause. ----------
(*In violent deaths, state kind and cause, date of accident, of suicide, etc.*) ----------

b. Consecutive disease and immediate cause of death. ----------
----

c. Concomitant or circumstantial diseases worthy of being mentioned. ----------
----

9. Autopsy: Yes* — No.*

10. Observations: ----------

(Sanitary condition of habitation, etc.—See other side.) ----------

The physician attending * — called after death *:

(Signed) ---------- of ----------

☞ ***Underscore** the words which apply to the case.

DIRECTIONS FOR USE OF SWISS BLANK.

According to the directions given on the detachable part above the perforated line, the physician is requested (1) to fill out questions 8 to 10, having regard to the "*Observations pour le médecin*" or special suggestions printed on the back of the blank, and waiting until after the post-mortem, if any be held, before entering the cause of death; (2) to check the replies to questions 1 to 7, correcting them when necessary; and (3) to detach the coupon and mail the certificate, with statement of cause of death, to the local registrar (l'officier de l'état civil) in a *sealed envelope* especially supplied for this purpose. [This is a "penalty envelope," which goes post free in the mails; it bears the inscription "Statistique de décès" in the upper right-hand corner in lieu of a stamp, and in the left corner above, the words "Contrôle: No. —— of the Register of Deaths," with the physician's signature in the corner below. This enables the local registrar to identify the return of cause of death as being made, without opening the envelope, which he is forbidden to do. He sends it intact to the Federal Bureau of Statistics at Berne at the end of each month, where it is used solely for statistical purposes, and thus the confidential statement of the physician as to the cause of death is absolutely guarded.]

SUGGESTIONS TO THE PHYSICIAN.

Question 8. Please distinguish with care the *primary* or *causal disease* (8a) and the *consecutive* or *secondary disease* (8b).

Question 8a is important from the viewpoint of hygiene and sanitation, but it is often difficult to answer; sometimes a reply is uncertain or *impossible* to give. In the latter case indicate by dash after the question 8a, and, if the answer is uncertain, add a question mark.

In violent deaths it is necessary to state exactly the nature, the cause, and the date, and to also indicate whether the death was due to suicide (motive: mental disease, alcoholism, etc.), to homicide or to accident.

It is generally easier to reply to *question 8b*, because it most frequently relates to what the physician has been able to observe during life or after death (autopsy? question 9). There should be inserted here the *results of accidents*, e. g., the nature

and the seat of the lesions, fractures, dislocations, cerebral affections, secondary inflammations, etc.

Question 8c. Here indicate the pathological processes which accompanied the principal disease and which have influenced its course and result, as, for example, curvature of the spine in diseases of the lungs or heart, alcoholism with the acute diseases, mental diseases, etc.

[The remainder of the suggestions relate to sanitary observations, and show how the confidential communication between the physician and the central bureau of public health may be utilized to convey much information of value to the sanitary service of the state not ordinarily obtainable from mortality returns.]

NOMENCLATURE OF CAUSES OF DEATH.

As an indispensable aid in securing brief and precise statements of cause of death Swiss physicians are supplied with a "Nomenclature of the Causes of Death," similar to those issued by the governments of Sweden, Holland, Germany, and other countries, and to the pamphlet, "Relation of Physicians to Mortality Statistics," distributed by the United States Bureau of the Census some years ago to every physician in the United States. In this list are indicated by single asterisk (*) diseases frequently *secondary*, and by double asterisks (**) diseases usually or exclusively *secondary*, so that the Swiss physician has a practical guide to aid him in filling out the form correctly. Here are some examples:

Acute bronchitis and broncho-pneumonia.*
Bronchial asthma.*
Putrid bronchitis.**
Gangrene of lungs.**
Pleurisy.*
Empyema.**
Acute pericarditis:
a. Simple.*
b. Purulent.**
Endocarditis.*
Acquired valvular disease.**
Aneurism.**
Meningeal apoplexy.*
Cerebral hemorrhage.*
Abscess of brain.**
Convulsions.**
Acute parenchymatous nephritis.*
Acute nephritis of pregnancy.
Chronic parenchymatous nephritis.*
Chronic interstitial nephritis.*
Suppurative nephritis.**
Etc.

CORRECTION OF UNSATISFACTORY STATEMENT OF CAUSE OF DEATH.

Not only is there a very precise blank provided for the statement of cause of death by the Swiss physician, together with explicit instructions, a detailed nomenclature showing the relations of individual diseases, and a system of post-free confidential communication assured against violations of secrecy and professional confidence, but the central office also carries out a "follow-up system," which assures that the occasional cases of ignorance or neglect of the proper form of statement are promptly corrected. Here is the form:

FEDERAL BUREAU OF STATISTICS,
Berne, _____, *190*___.

Dr. _____

_____

DEAR DOCTOR: You have delivered a certificate of death for a person of male female sex, occupation _____, born _____, died _____, at _____, St. _____, No. _____, from:

_____

The disease indicated as a cause of death being regarded as a secondary affection, I will ask you to kindly inform me of the *primary cause* of the death, which it is important to know from the point of view of statistics, as well as from the point of view of public and private hygiene of the sanitary administration.

Thanking you in advance, I remain,

Very respectfully,

The Director,
Federal Bureau of Statistics:
Dr. GUILLAUME.

[On the opposite page are the questions.]

What are the sanitary conditions of the habitation?
(Question 10 of the card report of the death.)

Hereditary predisposition?

Mode of infection?

Accident, suicide, homicide?

In what way did the accident occur?

Probable or certain motive for suicide?

TERMINOLOGY AND ARRANGEMENT OF TERMS EMPLOYED UPON CERTIFICATES OF DEATH TO DENOTE CAUSES OF DEATH.

Casual examination of the various forms of certificates of death will show that a great variety of expressions has been employed for the purpose of securing a statement of cause of death. These may be brought together for comparison in the following tabular list:

First term.	Second term. (Subsequent terms, if any.)
The CAUSE OF DEATH	Contributory.
Chief	Contributory (if any).
Chief	Immediate.
Immediate	Contributory.
Cause of death	[No second term.]
Primary	Contributory.
Chief	Contributing.
Cause of death (secondary or immediate)	Contributory (primary).
Disease or cause of death	[No second term.]
Primary[1]	Immediate (when a complication or consequence of the primary).[1]
[1] Remote[1]	[2] Immediate.[1] [3] Concurring.[1]
Immediate	Primary or contributing.
True cause of death[1]	Symptoms (when true cause *is not certainly known*).[1]
Primary	Secondary or contributory.
Immediate	Contributory causes or complications.
Cause of death	Complication.
Primary	Immediate.
Primary	Secondary.
Causes of death [in order of occurrence].	
Causes of death [in order of occurrence—physician is requested to underline that which he considers the most important].	
Immediate and determining	Contributing cause or complication.
Immediate, proximate, or chief and determining[1]	Contributory causes or complications.[1]
Chief and determining	Consecutive and contributing.
[1] Disease causing death	[2] Immediate cause of death. [3] Contributory causes or complications. [4] Post-mortem.
[1] Mode of injury; accidental, suicidal, or homicidal.[1]	[2] Nature of injury and immediate cause of death.[1] [3] Contributory causes or conditions.[1] [4] Post-mortem.
Remote or predisposing	Immediate.
Disease, injury, or other efficient and remote cause of death.	Disease, injury, or other efficient and immediate cause of death.
[1] Immediate	[2] Contributing. [3] Remote.
Cause of death (immediate)	Name of disease (remote).
Chief or primary	Contributory or immediate.
First (primary)	Second (immediate).
First or primary	Secondary.
Primary disease.....(a)	Secondary diseases (if any).....(b). Secondary diseases (if any).....(c). Secondary diseases (if any).....(d).
Primary (actual)	Secondary (contributing).
First	Second.
1. Primary	2. Secondary 3. Final.
Disease or accident causing death	Acute. Chronic.
Primary disease	Complications of the disease or terminal condition.
Primary disease	Secondary or after disease.
Principal cause	Contributory cause.
[1] Primitive disease or primary cause	[2] Consecutive disease and immediate cause of death. [3] Concomitant or circumstantial diseases worthy of note. [4] Autopsy: Yes ——; No ——.
[1] Nature and cause of accident, suicide, etc	[2] Results of accidents.

[1] From instructions or alternative modification of regular form.

What a conglomeration!

Are all of these terms and their relations definitely understood by the physicians and registrars who employ them?

It may be well, with the aid of certain authorities available for reference, to analyze them, and to see just what meanings may be attached to the more important ones.

Some of the terms are those of ordinary language, so that reference to a general dictionary should be sufficient. Others are used in a more or less technical sense, so that medical dictionaries would seem likely to be more useful. For convenience the more important ones will be listed in alphabetical order, without regard to their usual occurrence as first or second terms, and the definitions given in three dictionaries in common use in the United States will be compared: (*a*) Dorland: American Illustrated Medical Dictionary; (*b*) Gould: Illustrated Dictionary of Medicine, Biology, and Allied Sciences; and Dictionary of New Medical Terms; (*c*) Webster's International Dictionary of the English Language. Omission of a reference shows that the word or term is not defined in the work in question.

DEFINITIONS OF MORE IMPORTANT TERMS.

Chief.—(*c*) 1. Highest in office or rank; principal; head. 2. Principal or most eminent in any quality or action; most distinguished; having most influence; taking the lead; most important. *Syn.*—Principal; head; leading; main; paramount; supreme; prime; vital; especial; great; grand; eminent; master. [Note that *primary* is not given as a synonym.]

Chief cause.—[Not specially defined in any medical or general dictionary. This term was probably employed upon certificates of death as an approximate equivalent or substitute for primary cause, but without retaining the idea of necessary priority in time of development and causal relation to other causes. Some modes of use upon certificates of death are as follows:

First term.	Second term.
Chief	Contributory.
Chief	Immediate.
Chief and determining	Consecutive and contributing.
Immediate proximate or chief and determining	Contributory causes or complications.
Chief or primary	Contributory or immediate.

The transition of meaning may be seen in these groupings. The term is ambiguous, meaning either (1) *most important* (for what?), or (2) *primary* (original). Thus, in a death from typhoid fever followed by bronchopneumonia (complication), the "chief cause of death" might, in the opinion of the attending physician, be either typhoid fever or bronchopneumonia, in the latter case the secondary disease or condition being regarded as the immediate or determining factor, and hence the most important as directly bringing about the death, which might not have occurred except for such complication.]

Complication.—(*a*) 1. A disease or diseases concurrent with another disease. 2. The occurrence of two or more diseases in the same patient.

(*b*) A disease or process secondary to or more or less dependent upon some primary disease.

(*c*) (*Med.*) A disease or diseases, or adventitious circumstances or conditions, coexistent with and modifying a primary disease, but not necessarily connected with it.

[This term is always used in a subordinate relation:

First term.	Second term.
Primary	Immediate (when a complication or consequence of the primary).
Immediate	Contributory causes or complications.
Cause of death	Complication.
Immediate and determining	Contributing cause or complication.
Primary disease	Complications of the disease or terminal conditions.

Complications frequently include mere symptoms, and the term is apt to lead to the statement of inconsequential details upon the certificate of death. Complications are frequently understood to be necessarily secondary in character to the primary disease, but they may equally well include independent intercurrent diseases.]

Contributory (or *contributing*).—(*c*) Contributing to the same stock or purpose; promoting the same end; bringing assistance to the same joint design, or increase to some common stock.

Contributory cause (or *contributing cause*).—[This term is not given in medical or general dictionaries, although it is very extensively employed in the United States. It is found upon the standard certificate of death, prepared by the cooperation of the Census and the American Public Health Association, which is used for the transcripts of all deaths (over 650,000 yearly) returned to the Bureau of the Census, as well as by many states and cities upon their individual blanks, whether of standard or other form. In the standard certificate, the term is subordinate to the "Cause of Death." It is generally secondary in character, if the diseases are related as to cause and effect; if not so related, it may connote any independent disease *aiding* the principal cause of death. It should not include mere symptoms or trivial complications which do not materially contribute to the fatal result. In modifications of the standard certificate used in different states and cities the term is employed in various connections, and has even been taken as the primary cause, although always coming second in the order of statement. Among the arrangements found are the following:

First term.	Second term.
Cause of death	Contributory.
Chief	Contributory.
Immediate	Contributory.
Primary	Contributory.
Cause of death (secondary or immediate)	Contributory (primary).
Immediate	Primary or contributing.
Primary	Secondary or contributory.
Immediate and determining	Contributing cause or complication.
Chief and determining	Consecutive and contributing.
Chief or primary	Contributory or immediate.
Primary (actual)	Secondary (contributing).

There is evidently great confusion in the practical use of this term, due, perhaps, to the fact that all causes of death aiding to produce the fatal result in any case are "contributory" to the death. The term does not mark with clearness the distinction between primary and secondary or concurrent causes, and for this reason the Bureau of the Census, and it is believed also the various offices using the standard blank, will welcome any change of form conducive to greater precision of statement.]

Determining.

Determining cause.—(*b*) A cause that precipitates the action of another or other causes.

[Only a single definition of "determining cause" is found in the three authorities consulted. For "determining," reference may, of course, be made to the various meanings of the verb *determine*, as found in any general dictionary; but which precise signification of this word is applicable does not seem certain. The term "determining cause" is extensively used relative to the causation of disease, and considerably, but to a less extent, upon death certificates. Another medical dictionary[1] thus defines it: "A cause that gives efficiency to other causes, precipitating their action." Both of these definitions seem to make determining causes of merely subsidiary importance, as hastening or helping the action of other (efficient) causes. Dr. Lewellys F. Barker[2], in a passage which may be quoted in full for the purpose of showing the relation of various other terms, makes it equivalent to the efficient, proximate, immediate, or direct cause.

"All pathologists are now agreed that by far the majority of pathologic conditions are the result of external causes; i. e., are due to inimical environmental influences. These are divisible into (1) *efficient* causes and (2) *predisposing* and *accessory causes* of disease.

"The *efficient causes* of disease (*causæ proximæ sive determinantes*) are the immediate or direct causes. Thus the cholera-spirillum is the efficient cause of cholera, the micrococcus lanceolatus is the efficient cause of acute lobar pneumonia, the heat of the sun's rays of insolation, lead-poisoning of wrist-drop.

"The *predisposing* and *accessory causes* of disease (*causæ predisponantes sive remotæ*) include those which render the body more susceptible to the efficient cause. Thus, external agents which render the contents of the stomach alkaline are believed to predispose to infection with the comma-bacillus of cholera; exposure to cold and wet predispose to lobar pneumonia; alcoholism predisposes to insolation; and certain occupations make lead-poisoning possible, and in a sense may therefore be regarded as remote causes of lead paralysis. That an efficient cause of one disease may be a predisposing cause of another disease, and *vice versa*, is obvious."

Stengel[3] says, "The causes of disease may be classified as *predisposing* and *determining*. The former prepare the system or part by rendering it weaker and less resistant; the latter are the immediate or specific causes of disease," and, under "Determining causes," he says: "Among the immediate or determining causes of disease are those which originate outside the body and those which are generated within the body. Among the former are included traumatism, heat, cold, and living organisms, including bacteria and various animal parasites." As the *determining* (=efficient=proximate=immediate=direct) cause of a disease, e. g., typhoid fever, is the bacillus typhosus, so the disease itself (the pathologic entity called typhoid fever, with all its complications and sequelae) is sometimes taken as the *determining* (=efficient=proximate=immediate=direct) cause of death. As found upon death certificates, the term occurs always in combination, and in the first place:

First term.	Second term.
Immediate and determining	Contributing cause or complication.
Immediate proximate or chief and determining	Contributory causes or complications.
Chief and determining	Consecutive and contributing.

[1] Foster: An Encyclopedic Medical Dictionary.
[2] Introduction, American Textbook of Pathology.
[3] A Text Book of Pathology, third edition, page 18.

However useful the word may be in connection with causes of disease, its employment in connection with causes of death is vague and indefinite.]

Immediate.—(*a*) Direct; with nothing intervening.

(*b*) Direct; without anything intervening.

(*c*) 1. Not separated with respect to place by anything intervening; proximate; close. 2. Not deferred by an interval of time; present; instant. 3. Acting with nothing interposed or between, or without the intervention of another object as a cause, means, or agency; acting, perceived, or produced, directly; as an *immediate* cause.

Immediate cause.—(*a*) An exciting cause that is not remote or secondary; any cause which is operative at the beginning of an attack.

(*b*) See C., Proximate; and, making the reference, we find that primary and proximate causes are thus defined: "C., Primary, C., Proximate, that one of several causes which takes effect last and acts with rapidity."

[Another medical dictionary (Dunglison) refers the term to "essential or proximate cause," an essential cause being defined as "one that produces the effect without regard to other causes." See identity with efficient, proximate, determining, and direct causes of disease, as used by writers on pathology, under "Determining cause," *supra*. The term is very frequently and most confusingly employed upon certificates of death in this country:

First term.	Second term.
Chief	Immediate.
Immediate	Contributory.
Cause of death (secondary or immediate)	Contributory (primary).
Primary	Immediate (complication or consequence of the primary).
[1] Remote	[2] Immediate. [3] Concurring.
Immediate	Primary or contributing.
Immediate	Contributory causes or complications.
Primary	Immediate.
Immediate and determining	Contributing cause or complication.
[1] Disease causing death	[2] Immediate cause of death. [3] Contributory causes or complications.
Remote or predisposing	Immediate.
[1] Immediate	[2] Contributing. [3] Remote.
Primitive disease or primary cause of death	Consecutive disease and immediate cause of death.

In its practical use upon certificates of death it has at least three distinct meanings: (1) As a term subordinate to the principal term ("Chief cause," "Primary cause," "Remote cause," "Disease causing death," etc.), and indicating the special pathological process, condition, or complication through which the disease itself, or primary cause, brings about the fatal result. Thus, in a case of typhoid fever the *immediate* cause of death might be a secondary pneumonia, perforation of the intestine, peritonitis, or hemorrhage of the bowels, all consequences and properly a part of the original disease. In the only foreign blank in which this term occurs, that of Switzerland, it appears to be used in this way. (2) In a very different manner, the term is employed to indicate the principal or even primary cause of death, being followed by subordinate terms, such as "Contributory cause," "Primary or contributing cause," "Contributory causes or complications," etc. (3) In common with the synonymous term, proximate cause, it is frequently understood by physicians as merely indicating the *mode of death*, e. g., asphyxia, "heart failure" or syncope, coma, etc. Thus Quain's Dictionary of Medicine, under "Death, modes of," says, "The proximate causes of death, whether resulting from natural decay, disease, or violence, may be reduced in ultimate analysis to two, namely, first, cessation of the circulation; and, second, cessation of respiration." "Shock," "debility," "exhaustion," and also terms representing terminal conditions, such as "hypostatic pneumo-

nia," "uremic convulsions," and the like, are frequently reported as the immediate causes of death.]

Primary.—(*a*) First in order; principal.

(*b*) First in time or in importance.

(*c*) 1. First in order of time or development or intention; primitive; fundamental; original. 2. First in order as being preparatory to something higher. 3. First in dignity or importance, as chief, principal.

[There are other significations of the word "primary" as employed to qualify names of diseases or causes of death, as indicated by the definition in the New Sydenham Society's Lexicon: "Primary. (L. *primarius*, of the first rank.) A term used in a variety of senses in medicine; e. g., to denote the original site of a disease (primary seat of a new growth), or its earliest manifestations (primary syphilis); often used in opposition to secondary, in cases in which the morbid condition so indicated is viewed as the main disease, and not as a secondary effect, e. g., primary lateral sclerosis = idiopathic lateral sclerosis."]

Primary cause.—(*a*) The principal or original cause of an attack.

(*b*) C., Proximate, that one of several causes which takes effect last and acts with rapidity.

[See also another medical dictionary (Foster): "Primary cause, proximate cause. That one of two or more causes that comes into play last and produces its effect with comparative rapidity." The last two definitions seem at variance with the first, and explain how, the immediate (proximate) and primary causes of disease being considered the same,[1] so likewise the immediate and primary causes of death come to be treated as identical. In England, at least in its official use for registration purposes, the term has been uniformly employed to show precedence in time or causal relation. In the First Annual Report of the Registrar-General (1837), Doctor Farr stated: "When after hooping cough it was stated that the patient died of pneumonia, the case has been referred to the primary disease; and the same principle has been adhered to in similar instances." And in the Thirteenth Annual Report: "It has been the general rule, in the classification, to refer the secondary affections that supervene in the course of measles, scarlatina, phthisis, and other diseases, to the primary diseases by which they are caused or modified, and the diseases that are the direct result of external causes to those causes." The certificates of death supplied to physicians as early as 1845 provided for the statement of primary and secondary causes, as do those in use at the present time in Great Britain and many of the British colonies. Up to a recent date the "Suggestions to Medical Practitioners respecting Certificates of the Cause of Death"[2] contained the following paragraph: "Write the causes of death, when there are more than one, under each other, *in the order of their appearance*, and not in the presumed order of their importance." The accepted English arrangement (primary, secondary) is of very infrequent occurrence in this country, the term primary cause being usually opposed by some other term, as contributory cause, immediate cause, etc., as shown by the following comparison:

First term.	Second term.
Primary	Contributory.
Cause of death (secondary or immediate)	Contributory (primary).
Primary	Immediate.
Immediate	Primary or contributing.
Primary	Secondary or contributory.
Primary	Secondary.
Chief or primary	Contributory or immediate.
First (primary)	Second (immediate).

[1] Cf. Barton-Wells, Thesaurus of Medical Words and Phrases: "Immediate cause of disease—Essential, proximate, or primary cause," and "Predisposing cause of disease—Antecedent, procatarctic remote, or secondary cause."

[2] See Newsholme's Vital Statistics, third edition, page 72.

Even in England, after over sixty years of continuous use of the terms "primary" and "secondary" upon the official blanks, there is confusion as to their proper significance in the minds of many medical practitioners. Following are the conclusions of the Select Committee on Death Certification of the House of Commons (1893) on this subject, together with the testimony upon which they were based:

Hicks, 1325. Tatham, 2010. Vallance, 2267. Grimshaw, 775. Sykes, 450.

(C.) It appears that there is some confusion in the minds of medical men as to the meaning to be attached to the words "primary" and "secondary," in the space provided in the form for setting forth the cause of death. The words are interpreted by some as meaning the "primary cause chronologically, and by others as the primary cause physically of death." The forms are filled up in accordance with these different interpretations.

Sykes, 450. Wells, 691.

The result of this is that in many instances the certificate does not give correct information as to the cause of death, and it is difficult for a person from mere inspection of the certificate, and without having seen the patient, to say what was the immediate cause of death.

Your committee are of opinion that it is desirable that the words "primary" and "secondary" should either be omitted from the form as leading to confusion in stating the cause of death, or that they should be defined in a footnote as meaning the order of the development of the diseases as they occurred. In the event of the entire omission of the words, some other terms should be substituted so as to secure the declaration in all cases of associated diseases or associated traumatic conditions.

[Testimony.]

450. [Mr. J. F. J. Sykes, M. B.] Will you tell the committee now, as briefly as you can, the directions in which you think the present system of certification is defective as regards the causes of death?—The difficulty arises when those who have to extract these causes of death and classify them, find either a number of terms not used in the ordinary form of classification, or else a multitude of terms without any guide as to which of the several terms the death should be classified under, and it is extremely difficult for persons seeing only the certificate, and not the patient, to know the real cause, the true cause from which the patient died, and under which the death should be classified. The certificate of the Registrar-General contains under the "Cause of death," the words "primary" and "secondary." In my opinion those are more misleading than useful, for this reason: that they are interpreted by some as being the primary cause chronologically, and by others as the primary cause physically of death; so that the two interpretations that they are open to do not coincide. And as far as chronological order is concerned, they are unnecessary, inasmuch as at the other end of the line under the "cause of death" there is a space for stating the duration of each cause in years, months, days, or hours. I would suggest that the words "primary" and "secondary" should be omitted altogether from the certificate, and that it should be made compulsory to state the duration of the complaint or the approximate duration, so as to form some sort of guide as near as possible.

451. You think those terms lead to confusion?—I think those terms lead to confusion.

691. [Sir Spencer Wells, M. D., F. R. C. S.] And in what way; would you give us an illustration of that insufficiency?—That the registered cause of death was not sufficiently precise; that one could not tell from the terms exactly what were the alleged causes of death; that they were inaccurate and insufficient; that you want full information as to the cause of death.

692. And you believe that fuller and more detailed information of the cause of death would lead to a greater value being given to the statistics of the Registrar-General, and secondarily (and this is a most important point) to an improvement in the national health?—Distinctly.

775. [Thomas W. Grimshaw, M. D., Registrar-General for Ireland.] With regard to that we have had evidence given here that the division of the causes of death into primary and secondary is undesirable. What is your opinion upon that subject?—It would not be undesirable if

properly used, but there is a great deal of confusion in the minds of medical men as to what is primary and what is secondary.

776. Would you suggest the omission of those words or the substitution of others?—I do not know really any way in which we could amend the certificate so as to get rid of that ambiguity, because it is in the mind of the man who certifies, it is not in the form of the certificate. If we could get a specific cause mentioned and then get the medical man to add a descriptive note as to how this state of things was arrived at which caused the man to die, it might be of very great value; but I do not think we could succeed in doing that. If we were to ask him to voluntarily give us any other information that threw light upon the case, he might do so, but he might become a very great nuisance; some would write a great deal too much.

1325. [Mr. A. B. Hicks, coroner, London.] Do you want the words "primary" and "secondary" altered?—I wish to put in the primary cause with the duration of the illness, and the secondary cause also, and then, if there is one, the immediate cause of death.

1326. Then you would still retain the words "primary" and "secondary"?—They are somewhat misleading, I think. I do not say I would insist myself upon them, but at any rate there should be some words which may really lead to the cause of the decease, if the doctor knows it, and how it runs its course, with the symptoms; that it is essential to get, and then the immediate cause of death, if he knows it. Then I should suggest a note at the bottom of the certificate, which he should fill up, if he can: "Facts which may be known to the medical man which may bear upon the cause of death, and which he considers desirable to state."

2010. [Mr. John Tatham, M. A., M. D., then medical officer of health for Manchester, now statistical superintendent of the department of the Registrar-General of England and Wales.] If you would kindly make such remarks as you think fit.—I think in the first place that the space left for the cause of death should be enlarged. I think it should also be explained what is the real meaning of the terms "primary" and "secondary"—whether they refer to time or to the relative importance of the causes of death. That is a point upon which certificates are frequently indefinite. As I have said before, I think the certificates should be delivered to the registrar direct, and I attach very great importance to that.

2267. [Mr. William Vallance, superintendent registrar, Whitechapel district.] You say that you have reason to believe that there is a good deal of lax certification both as regards the mode of filling up the cause of death and the circumstances under which the certificate is given. Will you illustrate that point?—I consider that the words "During the last illness" require some explanation as to what is to constitute the attendance during the last illness, and, therefore, appended to the certificate it appears to me there needs to be an instruction to the medical practitioner. And next, with regard to the cause of death, the words "primary" and "secondary" are somewhat misleading, or, at all events, they are differently interpreted; so that if statistical results are recorded from one or the other they may be fallacious in their results. I would much prefer myself—I think it would be much more simple—if the actual disease which is the immediate cause of death were recorded in the column headed "Cause of death," with the duration of the disease, and an observation column appended, not for registration but for transmission to the statistical authority.

The committee did not, however, suggest the "other terms" which should satisfactorily replace those in use.

Secondary.—(*a*) Second or inferior in order of time, place, or importance.

(*b*) Following, succeeding to a first. Subordinate in order of time or development.

(*c*) Succeeding next in order to the first; of second place, origin, rank, etc.; subordinate; not of the first order or rate; not primary. (*Med.*) *a.* Dependent or consequent upon another disease; as, Bright's disease is often *secondary* to scarlet fever. *b.* Occurring in the second stage of a disease; as, the *secondary* symptoms of syphilis.

Secondary cause.—(*a*) One which helps to bring on an attack of disease. [Another dictionary (Dunglison) refers "remote or secondary cause" to "predisponent cause; one which renders the body liable to disease." It is evident that these definitions relate to the secondary cause of disease and that they are quite the opposite, in time relation, to the sense in which the term is used as applying to causes of death. Although the proper associate of primary cause (q. v.), the term is quite rarely used in this country upon certificates of death, and when used is probably frequently understood in the sense of *minor* rather than according to the original statistical usage of *consecutive and resulting* from the primary cause. Some examples of use are as follows]:

First term.	Second term.
Primary	Secondary or contributory.
Primary	Secondary.
Primary (actual)	Secondary (contributing).
Cause of death (secondary or immediate)	Contributory (primary).

Only the more important terms that actually occur upon certificates of death are considered in the preceding examination of definitions. These are: "Chief cause," "complication," "contributory (or contributing) cause," "determining cause," "immediate cause," "primary cause," and "secondary cause." Other terms occurring less frequently, or used chiefly in instructions, are: "Concurrent (or concurring) cause," "consecutive cause," "consequence," "efficient cause," "final cause," "predisposing (predisponent) cause," "remote cause," "sequela," "symptom," and "terminal cause." Among these the following are defined:

DEFINITIONS OF LESS IMPORTANT TERMS.

Concurrent.—(*c*) 1. Acting in conjunction; agreeing in the same act or opinion; contributing to the same event or effect; cooperating. 2. Conjoined; associate; concomitant; existing or happening at the same time.

["Concurrent cause" or "concurrent disease" is not found in the authorities cited, but "intercurrent disease" appears as follows: (*a*) "A disease occurring during the course of another disease with which it has no connection." (*b*) "A disease occurring during the progress of another of which it is independent," and also, elsewhere, "A term loosely applied to diseases occurring sporadically during a period of prevailing endemic or epidemic diseases. Also applied to a disease arising or progressing during the existence of another disease in the same person."]

Efficient cause.—(*c*) The agent or force that produces a change or result.

Final cause.—(*c*) The end, design, or object for which anything is done.

[Not used in this sense upon certificates where it means a terminal cause, i. e., symptoms or conditions attending the fatal termination of the disease.]

Predisposing (or *predisponent*) *cause.*—(*a*) Anything which renders a person liable to an attack of disease without actually producing it.

(*b*) That which tends to the development of a condition.

(*c*) (*Med.*) Causes which render the body liable to disease.

Proximate cause.—(*a*) That which immediately precedes and produces a disease.

(*b*) The immediate cause of any change.

(*c*) A cause which immediately precedes and produces the effect, as distinguished from the remote, mediate, or predisposing causes.

[Usually equivalent to immediate cause. The new Sydenham Society's Lexicon thus defines it: "The term is used by some in the sense of the disease itself; by others as meaning those morbid processes which the exciting cause induces; by others as denoting the morbific cause itself." The same causes may be either "proximate" or "ultimate," according to the previous direction of thought: (Quain's Dictionary of Medicine; "Death, modes of.") "The proximate causes of death, whether resulting from natural decay, disease, or violence, may be reduced in ultimate analysis to two, namely, first, cessation of the circulation; and, second, cessation of respiration." (Flint's Encyclopedia of Medicine and Surgery; Death, modes of.) "Failure of the heart or of the respiratory mechanism is always the ultimate cause of death."]

Remote cause.—(*a*) Any cause which is not immediate in its effect; a predisposing, secondary, or ultimate cause.

Sequela.—(*a*) Any lesion or affection following and caused by an attack of disease.

(*b*) The consequence or abnormal condition following an injury or the abatement of a disease; any diseased or abnormal condition that follows an attack of disease or an injury.

(*c*) (*Med.*) A morbid phenomenon left as the result of a disease; a disease resulting from another.

Symptom.—(*a*) Any evidence of disease or of a patient's condition; a change in a patient's condition indicative of some bodily or mental state.

(*b*) That change or phase which occurs synchronously with a disease and serves to point out its nature and location.

(*c*) Any affection which accompanies disease; a perceptible change in the body or its functions, which indicates disease, or the kind or phases of disease.

Terminal cause.—[Not defined. But see "Final cause" above.]

Ultimate cause.—(*a*) One which may be considered the original cause in point of time; the most remote cause.

(*b*) One which eventually comes into play aided by a proximate cause.

To these definitions might be added two others which are frequently to be considered in vital statistics, although not expressly stated:

Hidden cause.—An undiscoverable cause.

Obscure cause.—(L. *obscurus*, dark.) A cause not definitely known.

APPLICATION OF TERMS IN CERTIFYING CAUSES OF DEATH.

It is evident in comparing the definitions of various causes as found in medical and general dictionaries and works of reference, and which the physician would ordinarily consult in attempting to understand the requirements of the official blanks, that they relate almost exclusively to *causes of disease* and do not apply to *causes of death* except by implication or transference of meaning. It is not surprising, therefore, that their use in the latter connection is not well defined. Thus, the Bacillus typhosus is the efficient, proximate, immediate, determining, or direct cause of the disease known as typhoid fever; it has also been termed the primary cause, in which case all antecedent causes would be termed secondary. Typhoid fever itself, the disease resulting from an invasion of the typhoid bacillus, is the primary cause of death in a fatal case of typhoid fever; it may also be reported as the immediate, determining, or direct cause of death. The disease-entity known as

typhoid fever properly includes all of the secondary pathological conditions and processes resulting from the development of the specific infection, such as ulceration of the intestinal lymph-follicles, perforation of the intestine and resulting peritonitis, intestinal hemorrhage, bronchopneumonia or lobar pneumonia due to the typhoid bacillus (but not independent intercurrent pneumonia due to Pneumococcus), terminal phenomena such as hypostatic pneumonia from impairment of circulation, and modes of dying—"heart failure," exhaustion, debility, coma, and the like. Any of the secondary affections, or even terminal conditions and modes of dying, is likely to be entered upon the certificate of death as the proximate, immediate, direct, or determining cause of death; or even, when the form of the blank facilitates it, as the primary or chief cause of death, leaving the disease itself in the position of a secondary, contributory, or remote cause, if reported at all.

In considering the application of various terms to the certification of deaths, the broad and fundamental distinction necessary in vital statistics must be borne in mind. All deaths are divided into two great classes, namely, (1) deaths from disease, and (2) deaths from violence. A third subdivision, due solely to imperfections in the returns or impossibility of securing exact information to make the distinction, would include deaths the causes of which are absolutely "unknown." It should not include deaths from ill-defined diseases or from violence whose exact character is not certain. Such deaths should at least be distinguished as due to diseases of unknown or unspecified nature, or as due to traumatism or some unknown form of violence. It may be mentioned that the term "violence" is an entirely general one and includes all deaths not due to disease; poisons (not autointoxications proper), effects of weather agencies, as sunstroke, etc., are included as well as the usual forms of violence due to accident or negligence, suicide, homicide, war, and execution.

(1) *Deaths from disease.*

As an illustration of the complexity of the relations involved and of the necessity for a precise understanding of the terminology to be employed in reporting causes of death, a not unusually complicated fatal case of typhoid fever may be selected.

Causation, course, and fatal termination of case of typhoid fever.

Phenomena.	Cause of *disease*.	Cause of *death*.
A. CAUSATION OF DISEASE.		
(1) A previous case	Ultimate; remote; antecedent.	[All causes of disease are, of course, more or less remote causes of resulting deaths. They do not enter into the formal statement of *cause of death*.]
(2) Dejecta containing typhoid bacilli, not disinfected.	Remote; antecedent	
(3) A young man,	Age and sex are predisposing causes.	
(4) whose "vital resistance" ("opsonic index"?) may be lowered by insanitary conditions, e. g., filth, crowding, bad air, adulterated or insufficient food,	Accessory; predisposing; remote; contributory.	
(5) drinks infected water or milk which contains—	Accidental; occasional; remote.	
(6) Bacillus typhosus (the "typhoid germ").	Specific; efficient; proximate; determining; immediate; direct. [Also called primary, in which case all antecedent causes become secondary.] [Causation of *disease* ends.]	
B. COURSE OF DISEASE.	*Disease processes or conditions.*	[Causation of *death* begins.]
(7) After the usual period of incubation the disease TYPHOID FEVER is recognized, a general infection.	The disease itself. [Also called the proximate cause.]	Disease causing death; cause of death; primary, first, chief, actual, principal, or original cause of death or disease. [Also reported as immediate, proximate, determining, remote, predisposing, and contributory causes of death.]
(8) It is characterized by ulceration of the lymph-follicles of the intestines.	Pathologic process	Sometimes reported as cause of death.
(9) Perforation of bowel may result.	Complication	Secondary; contributory; immediate.
(10) Peritonitis may follow	Complication	Secondary; contributory; immediate.
(11) A pneumonic process may exist from the start (primary "pneumo-typhus") or develop in the course of the disease (secondary), due to invasion of typhoid bacilli.	Complication; pneumonic type of disease.	Secondary; contributory; immediate.
(12) An independent (primary) acute lobar pneumonia may occur, due to Pneumococcus infection.	Complicating disease; complication; concurrent or intercurrent disease.	Contributory; immediate; secondary (in time); concurrent; intercurrent.
C. PROCESS OF DYING.		
(13) Hypostatic pneumonia may result from failure of circulation.	Terminal condition; complication.	[Frequently returned as secondary, contributory, or immediate cause of death. Not a proper cause of death.]
(14) Death finally results (Bichat) from interference with the functions of the brain (coma), heart ("heart failure," syncope), or lungs (apnea, asphyxia); or from asthenia, collapse, debility, exhaustion, etc.	Terminal symptoms; modes of death or, rather, modes of dying.	[Modes of death should not be returned as causes of death when the latter can be ascertained.]
D. POST-MORTEM APPEARANCES.		
(15) The disease itself, or its complications, may cause certain lesions evident on post-mortem examination, as typhoid ulcers, necrosis and perforation of the bowel, etc.	Pathologic findings; lesions	[Post-mortem findings, as such, should not be given as the cause of death, but the disease should be named from which they result.]

In such an instance, what should the attending physician report upon the certificate as the cause of death?

The question may be simplified by first considering what he should *not* report, namely, any of the items coming under the subdivisions (A) Causation of disease, (C) Process of dying, and (D) Post-mortem appearances. All of the information desired pertains to (B) Course of disease. It should be understood that this limitation pertains to the formal statement of cause of death upon certificates of death as at present generally employed.

The causation of disease is antecedent to the actual existence of the disease in the given case. Much of the information under this head is of a very important practical character, but relates rather to morbidity than to mortality reports. A special place might be given for such data, as upon the back of the Swiss return, but many of the replies would be merely conjectural, and it has usually been necessary to limit the statements to what should be definite facts concerning the cause of death, not the cause of disease leading to the death. Various important predisposing causes of disease can also be obtained from other parts of the certificate, as, for example, age, sex, nativity, occupation, residence, etc.

The process of dying need not be described upon a certificate of death. Terms descriptive of mere terminal conditions or symptoms and of the *modes of death* should uniformly be omitted, provided, a statement of the disease leading to the final appearance of such conditions or symptoms and ultimate death can be given. The inclusion of such terms upon certificates of death is responsible, to a very considerable degree, for the indefinite and unsatisfactory character of the returns. Deaths from asthenia, collapse, coma, debility, exhaustion, "heart failure," etc., are compiled under ill-defined causes, unless they are reported in connection with some definite cause of death, in which case the terminal conditions are neglected, and the death compiled under the proper cause. But a death from hypostatic pneumonia, for example, occurring as a terminal state of chronic Bright's disease, is quite likely to be reported as "pneumonia," leading to possible inclusion with deaths from lobar pneumonia, and thus invalidating the mortality statistics.

A complete schedule of post-mortem findings is not necessary or desirable upon a certificate of death. What is wanted is the exact statement of the disease causing death. (The relation of the post-mortem examination to deaths from violence will be considered a little later.) An autopsy may be indispensable for ascertaining the nature of this disease, and the agreement of the pathologic findings with the clinical diagnosis may be of the highest importance, e. g., in a death reported from yellow fever at the beginning of an epidemic, as giving assurance that the true cause of death has been registered. Negative findings may be of value, as making it certain that the disease reported as a cause of death was not confounded with some other having definite pathological lesions. A certificate

of death should, preferably, provide a space for a brief statement of the results of the post-mortem examination (see form [33]), or at least, as in the Swiss blank [54], should state whether an autopsy was held or not; and if an autopsy was held, then the statement of the disease causing death should be based upon the results of the autopsy *and* the clinical diagnosis, *and not solely upon the clinical diagnosis*. It has happened, and undoubtedly is constantly happening at the present time, that certificates of death are filed with local registrars containing the clinical diagnoses of diseases causing death; permits are duly issued, and the certificates accepted as the basis of the mortality statistics of the city, state, and United States Bureau of the Census—the last on the authority of transcripts of the original certificates of death returned by the state or city authorities. But after the filing of the original certificates, or even before, post-mortem examinations may be held which reveal entirely different causes of death. The results of such examinations and the pathological diagnoses are not used to correct the erroneous certificates. It is desirable that such discrepancies should be prevented, and the use of a special blank for this purpose, as required for deaths in hospitals and other institutions in Greater New York, may be heartily commended.

[55] New York, N. Y. (Institutions). $\times \frac{1}{2}$.

15 H—1906

THE CITY OF NEW YORK.

STATE OF NEW YORK. No. of Certificate, _____

CERTIFICATE AND RECORD OF DEATH

OF

MARGIN RESERVED FOR BINDING. NO MUTILATED CERTIFICATE WILL BE RECEIVED.

Sex		Color	Place of Death
Age	_____ Yrs. _____ Mos. _____ Days		Character of premises, whether tenement, private, etc. If hotel, hospital or other institution, state full title
Single, married, widowed or divorced			
Occupation			Father's Name
Birthplace			Father's Birthplace
How long in U. S. If foreign born			Mother's Maiden Name
How long resident in City of New York			Mother's Birthplace

I hereby certify that deceased was admitted to this institution on _____ *190*__, *that I last saw h*__ *alive on the* __ *day of* _____ *190*__, *that he died on the* __ *day of* _____ *190*__, *about* _____ *o'clock A. M., or P. M., and that I am unable to state definitely the cause of death; the diagnosis during h*__ *last illness was:*

_____

_____

Witness my hand this _____ *day of* _____ *190*

SPECIAL INFORMATION.

Former Residence, _____

How long Resident at Place of Death, _____

Signature, _____

_____ *M.D.*

House _____

I hereby certify that I have this _____ *day of* _____ *190*__, *performed an autopsy upon the body of said deceased, and that the cause of h*__ *death was as follows:*

_____

_____

_____

Signature, _____

_____ *M.D.*

Pathologist _____ *Hospital*

On such a blank considerable pathological detail may be expected, but it should not be allowed to obscure the statement of the *disease causing death* and primarily responsible for the lesions shown, provided the evidence is sufficient to warrant a definite statement. Otherwise the return may be of very little service for statistical compilation, although the case may excite the wonder of the general public as in an instance quoted from a newspaper dispatch:

Had Ten Diseases; Fate of One Man; Physicians at Hospital Call for Help to Perform the Post-Mortem. Physicians of the ——— Hospital reported to the coroner's office to-day that ——— had died and that they were unable to determine the cause of his death. Coroner ——— instructed the physician, Dr. ———, to perform an autopsy and the hospital physicians watched Dr. ——— with interest when he found that ——— had died of a complication of diseases, which were: Abscess of the pancreas, laceration of the brain, hemorrhage of the brain, dilatation of the heart, pericarditis, chronic diffuse nephritis, pleurisy with intense adhesion of both lungs, gastritis, dilatation of stomach and alcoholism. And then he issued a death certificate.

The transcript of this death certificate that reached the Bureau of the Census contained simply this statement: "The cause of death was as follows: Abscess of pancreas, pericarditis." This may suggest that sometimes the statement of unnecessary details may lead to the omission of essential facts. On this subject, the relation of the pathological findings to the statement of cause of death, and with special reference to the death from typhoid fever under consideration, Delafield and Prudden[1] may be quoted.

Great care is necessary in endeavoring to ascertain the cause of death when the clinical history is imperfect or unknown. Mechanical injuries, which destroy life by abolishing the function of one of the important viscera, are relatively infrequent. Most of the lesions found after death are rather the marks of disease than the cause of death. We do not know, for example, how great a degree of meningitis, or of pneumonia, or of endocarditis, or of cirrhosis, or of nephritis necessarily leads to death. On the contrary, one patient may recover with an extent of lesion which is sufficient to destroy the life of another. So with accidents; there is often no evident reason why fracture of the skull or of the pelvis should destroy life, yet they usually do. *In some of the infectious diseases, such as typhoid fever, the visible lesions can not be called the cause of death.* Sudden deaths of persons apparently in good health are often particularly obscure. In many of them we have to acknowledge that we can find no sufficient cause for the death. This is of course due to our imperfect knowledge, but it is much better in such cases to avow ignorance than to attribute the death to some trifling lesion. The brain and the heart are the organs which are especially capable of giving symptoms during life without corresponding lesions after death. Very well marked cardiac or cerebral symptoms may continue for days or months, and apparently destroy life, and yet after death we find no corresponding anatomical changes.

Coming finally to the items which should be included in a statement of cause of death, and which are all embraced in group B, Course of disease, as given in the tabular arrangement on page 51, it may be

[1] Pathological Anatomy, 6th edition, page 3.

said that it is not necessary or desirable to include *all* symptoms or complications attending the course of the disease. In fact, it is not necessary to name any of them if only the name of the *disease causing death* and responsible for the secondary affections be stated. Mere symptoms should not be stated at all; ordinary minor complications are of no consequence; and other diseases, unless they play a distinct part in the causation of the death, should not be mentioned. A case-history of the decedent's last illness or previous illness is not wanted. Such a return as the following, which was received at the Bureau of the Census during the present year (1907) and which is easily first in multiplicity of terms among the several millions of transcripts received upon the standard blank, is merely ridiculous:

The CAUSE OF DEATH was as follows:

Diphtheria, Antitoxin, Septicaemia, Erythema, Urticaria,
Dermatitis, Lymphangitis, Multiple dermal ulcer, Abscesses,
Rheumatic Fever, Hepatitis, Jaundice, Duodenitis (DURATION) *4½ Mos.*
Contributory *Nephritis, Pneumonia, Erysipelas, La Grippe,*
Cerebro Spinal Meningitis, Peritonitis, Convulsions, Death
(DURATION) *96 Hrs.*

In the assumed case of a death from typhoid fever, with the various complications indicated, the certificate of death might be filled out, according to some of the various forms in use, as follows:

CAUSE OF DEATH	*Typhoid fever.*
Disease causing death	
Primary cause of death	
Chief cause of death	
Chief and determining cause of death	

The additional statement, of entirely subsidiary importance, may be given:

Secondary cause of death	*Bronchopneumonia, perforation of intestine, etc.*
Contributory cause of death	
Immediate cause of death	
Complication	
Consecutive and contributing cause of death	

It may be of very considerable medical interest to know just what complications are the most frequent immediate causes of death from typhoid fever. Doctor Osler estimates[1] that of the 35,379 deaths compiled from typhoid fever by the United States Census as occurring in the United States during the census year 1899–1900 between 9,000 and 12,000 were due to intestinal perforation. The returns are not sufficiently complete, however, to show the true relations of secondary affections to primary causes, and it is more important

[1] Principles and Practice of Medicine, sixth edition, page 81.

that all of the primary causes should be reported and that no deaths be erroneously classified through failure to report the principal disease. This is especially liable to occur where blanks require the immediate cause to be stated first and the true cause of death (primary disease) is given as the remote or contributory cause, if at all.

The most complete form of statement employed in this country, which is quite comparable in this respect with the Swiss form—the most complete among the European samples—is that originally employed in Michigan[1] and now in use in the cities of Cincinnati, Ohio, and Norwalk, Ohio [33]. It was originally suggested by Dr. Henry B. Baker, former secretary of the State Board of Health of Michigan, and is incorporated in the Michigan law of 1897, whose first draft (1895) provided chiefly for the statement of "immediate cause." A death registered in this form might show:

DISEASE CAUSING DEATH ..... *Typhoid fever.*

Immediate cause of death ..... *Perforation, hemorrhage of intestine.*

Contributory causes or complications, if any ..... *Bronchopneumonia.*

Post-mortem ..... *confirmed statements above.*

In this blank the immediate cause has its proper subordinate place, and also serves to catch statements of modes of death, such as "heart failure," coma, etc., which might otherwise be reported as the main cause of death. Also a careful physician is less likely to report "old age" as the *disease* causing death than he is to report it simply as "cause of death," especially when a place is provided for its insertion as a contributory cause.

The whole subject of mortality statistics, as does medicine in general, labors under the disadvantage of lack of precision and definiteness in the terms employed. No definition can be found for the much used term *cause of death.* As employed in vital statistics, this term may be held to signify either (1) a disease, or (2) a form of violence from which, either wholly or partly, the death of an individual results. But the word *disease* is equally ill defined:

DISEASE: (*a*) Any departure from a state of health; an illness; more frequently the genus or kind of disturbance of health to which any particular case of sickness may be assigned.

(*b*) A condition of the body marked by inharmonious action of one or more of the various organs, owing to abnormal condition or structural change.

The latter part of the first definition more closely represents the conception of diseases as returned and tabulated as causes of death;

[1] See facsimile in Reference Handbook of the Medical Sciences, article by the late Doctor Samuel W. Abbott on "Certification of Deaths;" also reproduced by Doctor Chapin in his work on Municipal Sanitation in the United States, page 855.

but it is difficult to give explicit directions for the proper statement of diseases when almost any condition of "departure from a state of health" may be included in the category. Of the conditions included under section B, page 51, only typhoid fever and the intercurrent acute lobar pneumonia are entitled to the designation of diseases; the others are secondary affections which should not be returned or classified as individual causes of death. "Dropsy" is certainly a "condition of the body marked by inharmonious action of one or more of the various organs;" nevertheless it should not be reported as a disease causing death, but the *disease* of the heart, liver, kidneys, etc., which caused it should be named. That this fact is already recognized, even among the laity, is shown by the following quotation:[1] "Dropsy is not a disease in itself, but is a symptom associated with a number of different diseases, chiefly of the heart and kidneys."

What names of diseases shall be employed by the physician in reporting causes of death? The practical compilation of returns of deaths is greatly embarrassed by the large number of more or less synonymous expressions employed to designate the same disease.[2] The commonly accepted English name of the disease should be invariably used, as, in the United States, *typhoid fever* for the disease taken as an example. (The accepted term in England is *enteric fever;* this is one of the few cases in which the usage of the two countries differs.) Unfortunately we have in the United States no generally accepted standard of nomenclature for the naming of diseases. In England the "Nomenclature of Diseases drawn up by a Joint Committee appointed by the Royal College of Physicians of London," of which the third revision has recently been published (1906), furnishes an authoritative guide of the greatest service to physicians in reporting causes of death. At the last meeting of the American Medical Association, held at Atlantic City, N. J., it was voted, on June 4, 1907, that the president of the association appoint a committee of five on nomenclature and classification of diseases, as a result of whose labors this need of the medical profession of the United States may be met. In the meantime, and in the absence of any other guide, it would be well if the Nomenclature of the Royal College of Physicians could be followed in this country and physicians employ only the terms authorized therein. It should be remembered that a nomenclature of diseases is not a statistical classification, and this recommendation does not affect in any way the adherence to the International Classification of Causes of Death, which is the accepted standard in the United States. It rather aids its usefulness, because a satisfactory nomenclature of diseases is a fundamental requisite for an effective statistical classification of causes of death.

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[1] Youth's Companion, August 1, 1907.

[2] See Manual of International Classification of Causes of Death, published by the Bureau of the Census in 1902, and containing terms actually employed upon certificates of death.

(2) *Deaths from violence.*

The facts required on a certificate of death from violence are of quite a different character from those required on a certificate of death from disease, and a complete statement can not well be expected unless special provision is made in the arrangement of the blank or special instructions be given to the physician, health officer, or coroner making the report. The transcripts received by the Bureau of the Census are especially unsatisfactory in this respect,[1] and although efforts have been made to secure more complete statements by correspondence with the local registrars sending indefinite returns the improvement is comparatively slight. Success can not be obtained in this way, but only by seeing that the certificates contain all of the data required when originally filed with the local registrar.

The kind of facts desired may be seen from the general classification of violent deaths, whether from (1) accident and negligence, (2) suicide, (3) murder, or (4) manslaughter, as employed by the Registrar-General of England and Wales:

Cause or character of accident; method of suicide, murder, or manslaughter.

1. Mines, quarries, etc.
2. Vehicles and horses.
3. Ships, boats, docks, etc. (excluding drowning).
4. Building operations.
5. Machinery.
6. Weapons and implements.
7. Conflagrations, burns, scalds, explosions (not in mines, ships, etc.).
8. Poisons and poisonous vapors.
9. Drowning.
10. Suffocation.
11. Falls.
12. Weather agencies.
13. Otherwise or not stated.

And, more minutely, under 2 (a), for example, Injuries on railways, there is an exact specification of the mode in which the injury occurred, as, "run over on line," "collision," "locomotive machinery," "striking against bridge," etc. The kinds of mines are specified and always the special means of injury or agent by which the casualty occurred.

[1] See Mortality Statistics, 1900 to 1904, page lv: "In the statistical treatment of this class of deaths they naturally fall into four primary groups—(1) suicide, (2) homicide, (3) accidental violence, (4) other external causes; but the information upon which the classification must be made is too incomplete to permit the accurate separation of the deaths even by these general groups, and all general statistics of deaths from suicide, homicide, and various special forms of accident, derived from registration records, are incorrect and absolutely misleading. It would seem that in this class of deaths more than any other there should be no difficulty whatever in securing a proper classification, to the extent specified at least, since it is the only class in which there are practically universal provisions for an official inquiry into the circumstances attending each death, by a coroner, medical examiner, or other official, for the precise purpose of determining whether the death was due to homicide or suicide or to purely accidental causes; but instead of this being true the returns in this class of cases are the most unsatisfactory."

The International Classification of Causes of Death does not make clear-cut distinctions in this respect, but admits such a title as "Fractures," a term merely expressive of the nature of the injury (lesion) and not of the nature of the violence, and one which the Registrar-General considers indefinite and places, in the absence of other information, under "13. Otherwise or not stated."

As an example of the factors to be considered in violent deaths, the following illustrative cases may be presented:

Class of fact.	Case 1.	Case 2.	Case 3.
1. CHARACTER OF VIOLENCE	Accidental	Suicidal	Homicidal.
2. MEANS OF VIOLENCE	Toy pistol	River	Revolver.
3. Nature of injury (lesion); immediate cause of death.	Wound of hand	Drowning (asphyxia).	Wound of abdomen, perforation of intestine.
4. Secondary effects of injury, including infection of wound (sepsis, tetanus).	Tetanus		Peritonitis.
5. Contributory disease or condition		Acute mania	Alcoholism.

In the above cases, and, in fact, in all deaths from violent causes, there are two items that are absolutely essential for statistical purposes; these are, (1) the *character of the violence*, and (2) the *means of violence*.

The character of the violence, as accidental, suicidal, homicidal,[1] forms the primary basis of classification. A place should be provided for its statement on every certificate of death, and no case of violent death should be left unqualified in this respect. "Probably accidental" may be written in a doubtful case, or "Unknown" if absolutely impossible to determine; but in many cases the character is left unstated when it is perfectly easy to give it. In case of a railway collision it is not necessary to await the verdict of the coroner's jury before reporting any death resulting therefrom as *accidental;* a verdict to the effect that the collision resulted from criminal negligence would not change the statistical character of the death return, however it might alter its legal aspect. No fine distinctions as to murder, manslaughter, or justifiable homicide apply to a statement of *homicidal* violence; it is sufficient that one person kills another and not by accident.

The second essential feature of a return of a death from violence is the means or agency causing the death. A specific statement should be made of the special cause of the injury, as by fall of elevator, struck by trolley car, fell from building, carbolic acid (names of poisons should always be stated), etc.

Frequently a satisfactory statement of both items 1 and 2 can be given in a single expression; as, lightning, sunstroke, boiler explosion,

[1] Legal execution, war, and catastrophes such as earthquakes, volcanic eruptions, tidal waves, etc.; should be made special subdivisions when necessary, the latter group because it includes various modes of violent death, as ordinarily classified, but all due to one common cause.

collision on railway, etc. But if there be any shadow of doubt as to the event being entirely free from possibility of interpretation as suicidal or homicidal, its accidental character should be stated.

The remaining items, 3 to 5, are not essential for statistical purposes, but may be very important otherwise, and should be specified as completely as possible. Tetanus resulting from a wound should always be mentioned. It may be noted that while the injury itself—that is, the lesion resulting from the violence, as a fractured skull, a wound inflicted by a firearm, or the burn resulting from a conflagration—may be considered the primary cause of death in the same sense that the disease itself (e. g., typhoid fever) is considered the primary cause of death in a death from disease, in the first case the statement of the primary cause is *not* necessary and in the second case it *is* necessary for statistical purposes. Fractures, wounds, and burns are indefinite terms, and we desire to know, for the purposes of statistical classification, what caused the fracture, whether the wound was caused by a firearm, or the burn by a conflagration. In other words, we wish to know the proximate cause of the injury, corresponding to the Bacillus typhosus as a cause of typhoid fever, together with the directive influence determining that cause (suicide, homicide), or a statement that there was no directive or purposive element (accident, negligence, effect of weather agencies). The element of purpose is entirely absent, as a rule, from deaths from disease.[1] The dissimilar character of the information required in deaths from disease and in deaths from violence is chiefly responsible for the imperfect returns of the latter and for the absence of proper forms of statement on nearly all of the forms employed for certificates of death.

[1] A case of self-infection by typhoid fever with suicidal intent, cited by Schultze in his article on "Autopsies," Reference Handbook of the Medical Sciences, might be considered suicide by disease, and wilful persistence in providing a contaminated water supply verges on homicide, but practically all deaths from disease are considered "accidental" in the sense of absence of purpose in their incidence.

DURATION OF ILLNESS.

The blanks used in the United States provide, as a rule, for a fairly satisfactory statement of duration of illness. The standard blank is not as excellent in this respect as the English form, with its columns for "Years," "Calendar months," "Days," and "Hours." Not infrequently transcripts are received showing duration of a few days from such diseases as chronic Bright's disease. This may mean either that the terminal symptoms are referred to only, or that the physician or transcriber forgot to cross out the word "Days" and write "Months" or "Years" as the case might be. It is difficult to suggest a remedy with the present form of the blank, although it would possibly be better not to have any word on the form that is not always applicable; let the physician write "3 *mos.*," "3 *days*," etc. Another objection is that by specifying "days," the physician may state no duration if it is less than one day; this is especially objectionable in the case of children dying soon after birth, who may thus come to be included among still-births. "Acute" and "chronic," employed upon the French blanks, are serviceable for precision under certain titles of the International Classification (acute and chronic bronchitis, rheumatism, nephritis), but are very indefinite terms, and should be considered in connection with a correct statement of duration. The physician and registrar should always note the relative duration of related terms; the primary cause or disease causing death can not have a less duration than one of its secondary affections or consequences.

CONCLUSIONS AND RECOMMENDATIONS.

As a result of the examination of present conditions, it seems proper to submit to the registrars of the United States, soon to be organized as a national body and constituting a Section of the American Public Health Association, some propositions looking to the improvement of the registration of causes of death, and especially to the adoption of more uniform methods for the United States as a whole. Whatever is done must depend upon harmonious individual action of the registration states and cities. The Census has no authority except to suggest the desirability of certain measures, but its work is for the benefit of all, and if there should be a general agreement as to the expediency of action in any direction, it is hoped that mere individual preference, however well founded, will yield for the greater good to the whole United States that can come only from concerted action. Such action should be well considered before it is taken. The recommendations, together with any others affecting statistical practice, should be laid before the annual meeting, referred to the proper committee for report at the succeeding one, printed in the proceedings and distributed to every registrar of vital statistics in the United States for his consideration.[1] If necessary a referendum should be taken to the individual offices. The report of the committee and the expressions of the state and city offices should be thoroughly digested, and when a final decision has been made, by a majority or two-thirds ballot, that action should stand as the action of all of the registrars of the United States and should be carried out by them faithfully in accordance with the general desire. There can be no real progress in the upbuilding of a National System of Vital Statistics—something in which this country is at present behind all of the civilized nations of the world—until some definite basis of agreement can be reached *and maintained* relative to the collection of the basic material. It is worse than useless to attempt a local change or improvement here and there, which has no chance of general adoption, and which only serves to cause still greater confusion and complication of methods. By the plan proposed ample notice will be given of any change, so that no loss of blanks already printed will result—the form proposed would not become effective at the earliest before January 1, 1909—and the satisfaction of feeling that each office, large or small,

[1] This pamphlet has been sent to the registration officials of all states and places of 8,000 inhabitants or more (Census of 1900).

is employing standard methods and contributing fully comparable data to the vital statistics of the United States should amply compensate for the slight trouble of making any change.

It is therefore recommended, subject to the consideration and approval of the American Association of Registrars of Vital Statistics [1] organized as a Section of the American Public Health Association, that certain resolutions be adopted:

Proposed Resolution No. 1.—That a uniform mode of statement of causes of death upon certificates of death shall be adopted by all registration offices in the United States which shall provide, First, in the case of a death from disease, for the name of the ***disease causing death,*** *and in the case of a death from violence, for the* ***means of death, and whether accidental, suicidal, or homicidal;*** *together with such subsidiary information, if any, as may be necessary, under the head of "resulting in" or "aided by."*

As an example of how such data might be provided for with but slight modification of the standard blank, the following form is submitted:

[56] Proposed form of statement.

MEDICAL CERTIFICATE OF DEATH

DATE OF DEATH

_____ 19___
(Month) (Day) (Year)

I attended deceased from _____ 19___

to _____ 19___, I last saw h___ alive on

_____ 19___, and I HEREBY CERTIFY

that death occurred on the date above at _____ M. The DISEASE

CAUSING DEATH [*or* *MEANS OF DEATH** (Deaths from violence)] was: | Duration in Years, Months, Days, or Hours.

_____ | _____

_____ | _____

_____ | _____

_____ | _____

Resulting in:
or Aided by: _____ | _____

_____ | _____

(Signed) _____ M. D.

_____ 190___ (Address) _____

* State how injury occurred and whether {Accidental? Suicidal? Homicidal?}

[1] Or whatever name the Section may adopt.

The proposed form will concentrate the attention of the certifying physician or coroner upon the fact that it is necessary to name the *disease* that caused the death, or the *means* from which a violent death resulted, with complete absence of the very uncertain meanings sometimes embraced under the term "cause of death." It will be comparatively easy to give definite instructions as to just what is, and just what is not, a "disease" for the purposes of registration; and to explain the use of the word "means" so that precisely the class of information necessary for classifying violent deaths can be obtained. The expression "cause of death" is an ill-defined or undefined term, of complex significance even when employed in the strict sense understood in vital statistics, and also includes other conceptions, such as terminal condition, mode of dying, and cause of disease, that serve only to perplex reporting physicians and to vitiate the mortality statistics. Its entire disuse upon certificates of death, at least in the most important position, is therefore advised; its use in registration reports and bulletins, as a convenient general term, is quite another matter, as it is seldom improperly employed therein.

The term "disease *causing* death" may be criticised upon the ground that, at the time of the making out of the certificate, the disease is no longer a continuing cause, and that it would be better to speak of the "disease that caused death." Either term will serve, but it is an objection to the latter that a disease that very remotely caused death may not be actually present at the time of death, and hence, under the accepted method of classification, should not be entered as the cause of death. A child may have rheumatic fever with endocarditis and recover from the rheumatic fever. Years afterward the individual may die from valvular heart disease remotely due to the rheumatic infection. Under the International Classification, and probably in practical agreement with most methods in use, it is expressly provided that deaths from rheumatic fever shall not include deaths from organic diseases of rheumatic origin; the organic heart affection is taken as the primary cause of death. This rule may be subject to criticism, but while it is practically accepted, only a disease actually present at time of death should be reported as the disease *causing* death.

The word "means," as used only in connection with the statement of deaths from violence, is fairly definite, in the sense of "instrument" and "necessary condition or coagent." When the instrument is a deadly weapon, its use is implied by the mere name, and the statement of the character of the act as accidental, suicidal, or homicidal. When the instrument is not a deadly weapon, the statement of *means* may properly include the necessary condition of action, although even here the mere naming of the instrument is usually sufficient for the main purpose of classification; thus, "elevator," "horse," or

"bicycle," would be sufficient, although a little more detail, as "fall of elevator," "kicked by horse," "fell from bicycle," would usually be given. Properly understood, the exclusive use of this term would prevent the mere statement of the lesion, such as "fracture of skull," "hemorrhage," etc., without giving, in the first place, the instrumentality or *means* by which it was caused, and which is primarily necessary for statistical compilation.

The subsidiary information is less important, providing we can assure a correct statement of the *disease causing death*, or the *means of death* in accidents, suicides, and homicides. Possibly some of the old terms could be chosen, such as "secondary," "immediate," "concurrent," and after settling upon their exact definitions and educating all concerned in their definite use, the purpose would be answered, which is chiefly that the true cause of death be picked up in the subsidiary statement when the physician or coroner does not properly enter it in the principal one. The main relations of importance would be clearly shown by the arrangement suggested, which has the advantage of breaking away from the hackneyed terms employed for this purpose, the most definite of them being widely misunderstood. It is possible for the physician to indicate, by crossing out the term that does not particularly apply, just how he wishes the minor cause to be understood. "Resulting in" would always mark a secondary affection, while "Aided by," alone, would show that it was an independent disease or injury. The plan of stating duration is merely suggested; the present form [1] can be retained if desired.

I roposed Resolution No. 2.—That a continuous and systematic effort be made, through the conjoined action of the local, state, and Government authorities, to secure the cooperation of physicians and coroners in the more definite and satisfactory statement of causes of death; and that for this purpose each certificate of death bear a certain minimum amount of suggestions in regard to the statement of cause of death, which shall be uniform throughout the United States, in addition to any special instructions or regulations required for local use.

As a basis for discussion in regard to what this minimum amount shall be, the following draft of suggestions, which can readily be inserted upon the reverse side of any certificate or printed on the inside of the cover of the booklet of blanks supplied to physicians and coroners, has been prepared:

(DRAFT OF) SUGGESTIONS TO PHYSICIANS AND CORONERS RELATIVE TO THE STATEMENT OF CAUSE OF DEATH.

(Adopted by the American Public Health Association and recommended by the United States Bureau of the Census for the purpose of securing uniformity in returns of deaths throughout the United States.[1] *Please read carefully.*)

[1] Provided, of course, that any definite instructions can be generally agreed upon.

A. *Deaths from disease.*

1. Name, first, the DISEASE CAUSING DEATH. What is wanted is the name of the *disease* (or malformation) itself responsible for the death; *not* a mere secondary, consecutive, contributory, or immediate cause, complication, symptom, terminal condition, or mode of death. Never report a death from such "causes" as asphyxia, asthenia, collapse, coma, convulsions, debility, dropsy, exhaustion, heart failure, hypostatic pneumonia, inanition, marasmus, old age, shock, syncope, or weakness, if a definite disease causing the condition can be named. WAS IT PUERPERAL? Always qualify, as *puerperal* convulsions, *puerperal* peritonitis, *puerperal* septicemia, etc., all deaths resulting from childbirth or miscarriage.

2. *Important* secondary affections or independent (concurrent) diseases actually contributing to the death may be named.

Example: Measles (disease causing death); bronchopneumonia (secondary affection).

B. *Deaths from violence.*

1. Name, first, the MEANS OF DEATH, and whether ACCIDENTAL, SUICIDAL, or HOMICIDAL; as, *accidental drowning; suicide—carbolic acid; railroad collision.*

NOTE.—In the last example, it is not necessary to write "Accidental," because such cases are *plainly* of that character. A judicial determination of "manslaughter" on account of negligence does not affect the *statistical* character of the return, and a coroner should not delay the filing of the certificate of death on that account.

2. Nature of injury (lesion) or immediate cause of death may be given if not implied under (1).

3. Important *secondary* affections (e. g., erysipelas, septicemia, tetanus) and contributory diseases (e. g., insanity, alcoholism) should always be stated.

Duration.

Enter duration, in years, months, days *or* hours, after each separate cause of death. Duration of a disease is from its commencement until death occurs; do not merely give time of final illness in chronic diseases. Duration in deaths from violence is from the time of injury or appearance of complication until death.

This draft is merely suggestive. Some cities already have more stringent directions and, by the direct communication possible in a city between the reporting physician and the registrar, have eliminated some undesirable classes of returns. For the country as a whole, however, strict compliance with the instructions given above would work a vast improvement in the returns, and it would be especially beneficial if such a guide could appear on all state blanks.

If it be possible to agree upon certain explicit instructions as suggested above, and similar in their purpose to those disseminated by the Registrar-General of England to the physicians of that country, then the Bureau of the Census can cooperate in a very practical manner with the state and local offices by bringing home to the individual attention of every physician in this country, at occasional intervals, the importance of precise and definite statements of causes of death. This may be done by means of a pocket leaflet or small pamphlet of a size such as can readily be carried in a vest pocket or visiting list, and

perhaps containing the scheme of statistical classification (International), with indication of indefinite terms and secondary affections, as in the booklet distributed to physicians in Switzerland. Moreover, with exact directions available for reference, the instruction of newly appointed local registrars would be greatly facilitated, and a uniform method of obtaining corrections of imperfect data would be more readily installed.

Postscript.—*In this pamphlet the bearing of the correct and orderly statement of causes of death upon the statistical compilation of such causes, especially when two or more causes are returned for the same death, has only been casually touched upon. The subject of "joint causes" has been a perplexing one from the very beginning of vital statistics, and irregularities and discrepancies, some of great importance, may be found in mortality reports because no adequate plan has yet been accepted for their treatment. Several plans have been devised, and it is intended to compare them, together with the principles that have been formulated by various authorities for this purpose, in a revised edition of the Manual of International Classification of Causes of Death, which it is hoped to have ready next year in preparation for the approaching Decennial Revision. But it is probable that the true solution of this question will not be reached until physicians and coroners are educated in the proper reporting of causes of death so that their order of statement can be depended upon; and until registration officials shall at once detect any inconsistency or anomaly of statement, and secure prompt correction or interpretation thereof, so that a simple rule of dependence upon the* ***disease causing death*** *as reported by the attending physician and accepted by the local registrar can be followed.*

APPENDIX A.

CIRCULAR OF ANNOUNCEMENT OF ORGANIZATION OF AMERICAN ASSOCIATION OF REGISTRARS OF VITAL STATISTICS.

American Public Health Association

The United States of America
The Dominion of Canada The Republic of Mexico
The Republic of Cuba

Officers 1906-7

President DR. DOMINGO ORVAÑANOS, Mexico City, Mexico
First Vice-President, DR. QUITMAN KOHNKE, Covington, Louisiana
Second Vice-President, DR. ROBERT W. SIMPSON, Winnipeg, Manitoba
Third Vice-President, DR. GARDNER T. SWARTS, Providence, Rhode Island
Secretary, DR. CHARLES O. PROBST, Columbus, Ohio
Treasurer, DR. FRANK W. WRIGHT, New Haven, Connecticut

Meeting in Atlantic City, Sept. 30-Oct. 4, 1907

ORGANIZATION OF SECTION OF VITAL STATISTICS.

At the last meeting of the American Public Health Association, in accordance with the request of many registration officials, the following resolution was adopted:

Resolved, That a committee of five be appointed by the president of the American Public Health Association to report on the organization of a Section of Vital Statistics at the next meeting of the association, and that it be authorized to notify registration officials in the countries represented in the association, particularly inviting their attendance at the next meeting, and to prepare a constitution for approval by the association and adoption by the section at that time.

The committee on organization appointed to carry out the purpose of this resolution met at Washington in May, and formulated a draft of a constitution, the first two sections of which are as follows:

PURPOSE OF THE ORGANIZATION.

1. The purpose of this organization is to bring about a closer official and personal association of the registration officials of the several countries composing the American Public Health Association; to promote the introduction of effective systems of registering vital statistics; to aid the adoption of uniform methods of collecting, preserving, correcting, and compiling registration records and of publishing the statistical data derived therefrom in the most useful form, especially for sanitary purposes; to conduct the active cooperation of the American Public Health Association with the Government agencies of each country and with other organizations interested in

the improvement and use of vital statistics; to report on the actual condition of the International Classification of Causes of Death as employed in vital statistics reports and bulletins, and to formulate recommendations for its decennial revision; to help in the better reporting and classification of the mortality of occupations; to present and discuss papers relating to vital statistics both in the section meetings and in the general sessions of the American Public Health Association; and in general to promote a proper appreciation of the necessity and importance of vital statistics as an absolutely essential basis of modern public health work, and to improve the character and status of registration service.

MEMBERSHIP.

2. Registration officials and other workers in vital statistics who are members of the American Public Health Association shall be eligible to membership in the Vital Statistics Section.

The above extract, which is subject to approval by the association and section, shows the general scope of the movement as understood by the committee on organization. Your attendance is earnestly requested at the *first meeting* of the section, which will be held in connection with the Thirty-fifth Annual Meeting of the American Public Health Association at Atlantic City, N. J., beginning on September 30 and ending October 4, 1907. A circular will be sent by the secretary of the association giving full information in regard to reduced railway fares, accommodations, etc. It is expected that the first section meeting will be held on Monday, September 30, when the preliminary organization will be effected.

In addition to organizing, it is planned to begin the active work of the section at this meeting, and papers, questions, and suggestions on various phases of vital statistics, and especially relating to the practical side of registration work and the sanitary uses of mortality statistics, are requested. They may be sent to Dr. Cressy L. Wilbur, Bureau of the Census, Washington, D. C., who will provisionally act as secretary of the committee.

There is a large field of usefulness for this section, and it should have the enthusiastic support of all registration officials and users of vital statistics. If you can not be personally present at this first meeting, or send a paper or suggestions, please let us know that you are interested in the movement and will, at least, be with us in spirit.

Sincerely,

J. N. Hurty, *Chairman*,
Cressy L. Wilbur,
John S. Fulton,
Jesus E. Monjarás,
Charles A. Hodgetts,
Committee.

APPENDIX B.

CHECK LIST OF REGISTRATION OFFICIALS, AND OF REPORTS AND BULLETINS CONTAINING VITAL STATISTICS, IN THE UNITED STATES.

EXPLANATORY NOTE.—This list of state registrars and local registrars is a provisional one of all places (cities, towns, and boroughs) in the United States whose population was 8,000 or over in 1900. It is based chiefly upon a circular request for information issued July 24, 1907, and asking the following questions in regard to each local office:

1. Are deaths registered?
2. Under state law or city ordinance?
3. Do you publish city reports containing mortality statistics?
4. Annual or biennial? Latest?
5. Do you publish city bulletins showing mortality?
6. Weekly, monthly, quarterly?
7. Name of city registrar?
8. Official title?

Replies were promptly received, as a rule, and the statements as to publications and nature of legislation under which deaths are registered have been accepted on the authority of the local registrars given in the last column of the table. Comparison has been made with reports and bulletins on file, and where no reply was received the probable condition with respect to state or municipal legislation has been entered, subject to future correction. Thus it is known that all places in Massachusetts, Michigan, New York, and Pennsylvania are under state law, supplemented, perhaps, in a few instances, by local regulations. A registration city in a nonregistration state which has no general state law, e. g., Atlanta, Ga., must necessarily have a city ordinance for the registration of deaths. But in nonregistration states with general state laws for the registration of deaths, but which are not usually effective, registration may be conducted under local ordinances, as in Kansas, Ohio, and Texas. In such cases, in the absence of direct statement, "State law" is inserted, but not to the exclusion of possible local ordinances. The circulars were uniformly addressed "City Registrar of Vital Statistics," and in some instances there is no such official, returns being made under the county system.

Publications are indicated as follows: a = annual report; b = biennial report; w = weekly bulletin; m = monthly bulletin; q = quarterly bulletin. *The Bureau of the Census desires to preserve complete files of all official publications containing vital statistics in the United States. It is requested that registration officials noting omission of their publications will kindly correct this list and regularly transmit copies of all reports and bulletins to the Library of the Census; penalty labels will be provided for this purpose upon request.*

Registration states, and registration cities in nonregistration states, *which make returns of deaths directly to this Bureau*, are designated by asterisks (*) before each name. Registration cities in registration states, whose returns are received *through* their respective state offices, are indicated by daggers (†).

STATES AND CITIES. (Reports and bulletins—see explanatory note, p. 71.)	Estimated population, 1906.	State law or city ordinance.	Name and official title of registrar. (Remarks.)
ALABAMA (a)[1]	2,017,877	State law	W. H. Sanders, M. D., State Health Officer, Montgomery.
Anniston	10,919	State law	
Birmingham	45,869	State law	
Huntsville	8,110	State law	"Unclaimed."
*Mobile	42,903	City ordinance.	D. T. Rogers, Secretary Board of Health.
Montgomery	40,808	State law	
Selma (m)	12,047	Both	I. C. Skinner. M. D., Registrar.
ARKANSAS	1,421,574		
Fort Smith	23,505	Both	D. B. Sparks, City Clerk.
Hot Springs	11,157		
Little Rock (a m)[2]	39,959	City ordinance.	F. M. Oliver, City Clerk.
Pine Bluff[3]	13,038		None.
*CALIFORNIA (b m)	1,648,049	State law	N. K. Foster, M. D., Secretary State Board of Health and Registrar of Vital Statistics, Sacramento.
†Alameda (a)	19,644	State law	L. W. Studham, M. D., City Physician.
†Berkeley	19,700	State law	J. J. Benton, M. D., Health Officer.
†Fresno	13,460	State law	T. M. Hayden, M. D., Health Officer.
†Los Angeles (a m)	(4)	State law	L. M. Powers, M. D., Health Officer.
†Oakland (a m)	73,812	State law	E. W. Ewer, M. D., Health Officer.
†Pasadena	14,378	State law[5]	S. P. Black, M. D., Health Officer.
†Sacramento (m)	31,022	State law[6]	H. L. Nichols, M. D., Health Officer.
†San Diego (m)	19,140	State law	F. H. Mead, M. D., Health Officer.
†San Francisco (a m)	(4)	State law	J. T. Watkins, M. D., Health Officer.
†San Jose	23,564	State law	J. C. Corcoran, Assistant Secretary Board of Health.
†Stockton	19,354	State law	
*COLORADO (b m)	615,570	State law	H. L. Taylor, M. D., Secretary State Board of Health, Denver.
†Colorado Springs (m)	29,338	State law	
†Cripple Creek town	10,147	State law	
†Denver (a)	151,920	Both	W. H. Sharpley, M. D., Health Commissioner.
†Leadville	13,697	State law	
†Pueblo (m)	30,824	State law	
*CONNECTICUT (a m)	1,005,716	State law	J. H. Townsend, M. D., Secretary State Board of Health, Hartford.
†Ansonia	14,085	State law	A. P. Kirkham, City Clerk.
†Bridgeport (m)[7]	84,274	State law	J. N. Booth, Town Clerk.
†Danbury	16,537	State law	Town Clerk.
†Hartford (a m)	95,822	State law	C. P. Botsford, M. D., Registrar of Vital Statistics.
†Manchester town (m)	12,029	State law	S. M. Benton, Town Clerk.
†Meriden (a)	25,880	State law	H. Hess, City Clerk.
†Middletown town	9,937	State law	W. C. Howard, Town Clerk.
†Naugatuck borough	13,133	State law	H. Heanes, Town Clerk.
†New Britain	33,722	State law	L. D. Penfield, Town Clerk.
†New Haven (a m)	121,227	State law	J. J. Carr, Registrar of Vital Statistics.
†New London	19,822	State law	F. L. Kenyon, Town Clerk.
†Norwich	19,759	State law	C. S. Holbrook, Town Clerk.
†Stamford	17,599	State law	W. F. Waterbury, Town Clerk.
†Torrington town	10,808	State law	W. W. Bierce, Town Clerk.
†Waterbury	61,903	State law	F. P. Brett, Registrar of Vital Statistics.
†Willimantic	9,111	State law	F. P. Fenton, Town Clerk.
DELAWARE (b)	194,479	State law	A. Lowber, M. D., Secretary State Board of Health, Wilmington.
*Wilmington (a)	85,140	City ordinance.	J. Wigglesworth, Registrar of Vital Statistics.
*DISTRICT OF COLUMBIA[8] (a w).	307,716	(9)	W. C. Woodward, M. D., Health Officer, Washington.
FLORIDA (a m)	629,341	State law	J. Y. Porter, State Health Officer, Jacksonville.
*Jacksonville (m)	36,675	City ordinance.	C. D. Taylor, Clerk Board of Health.
*Key West	21,174	City ordinance.	
Pensacola	22,256	City ordinance.	L. G. Aymard, Clerk Board of Health.
Tampa	24,220	City ordinance.	J. A. Borns, M. D., City Physician.

[1] None issued since 1894.
[2] Reports made by city physician.
[3] No record is kept of deaths. Burials (in city cemeteries) are recorded, showing cause of death, etc.
[4] No estimate.
[5] City ordinance also, but simply supplemental.
[6] And city charter.
[7] Published by Board of Health, E. A. McLellan, M. D., Health Officer.
[8] Coextensive with city of Washington.
[9] Registration is effected under an ordinance of the late board of health, duly legalized by Congress.

STATES AND CITIES. (Reports and bulletins—see explanatory note, p. 71.)	Estimated population, 1906.	State law or city ordinance.	Name and official title of registrar. (Remarks.)
GEORGIA	2,443,719		
Athens	11,211		
*Atlanta (a)	104,984	City ordinance.	L. Thornton, Clerk Board of Health.
Augusta (a)	43,125	City ordinance.	E. C. Goodrich, M. D., Secretary Health Department.
Brunswick (a)	9,453	City ordinance.	J. A. Butts, M. D., Health Officer.
Columbus (a m)	17,800	City ordinance.	M. M. Moore, Secretary Board of Health.
Macon (m)	32,692	City ordinance.	T. L. Massenburg, Secretary Board of Health.
Savannah	68,596	City ordinance.	
ILLINOIS (a m)	5,418,670	State law	J. A. Egan, M. D., Secretary State Board of Health, Springfield.
Alton (m)	16,562	State law	G. Gray, City Clerk.
*Aurora (a)	26,823	State law	C. W. Geyer, M. D., Health Officer.
*Belleville	18,756	City ordinance.	G. H. Beineke, City Clerk.
Bloomington (a m)	25,506	State law	H. E. Rhoads, City Clerk.
Cairo	13,910	State law	
Champaign	11,054	State law	None.
*Chicago (a w)	2,049,185	Both	M. O. Heckard, M. D., Registrar of Vital Statistics.
Danville	21,794	State law	"Name not found in Directory."
*Decatur	24,727	State law	A. Leach, City Clerk.
East St. Louis	40,958	State law	
Elgin	25,199	Both	W. F. Sylla, City Clerk.
Evanston	22,949	State law	
Freeport	15,100	State law	
Galesburg	20,611	State law	None.
*Jacksonville (m)	16,362	City ordinance.	G. E. Baxter, M. D., Health Officer.
Joliet	32,185	State law	M. Beescheid, City Clerk.
Kankakee	16,337	State law	
Kewanee	10,668	State law	
Lasalle	10,800	State law	
Lincoln	10,891	State law	
Mattoon	11,301	City ordinance.	B. B. Cole, City Clerk.
Moline	20,478	State law	A. H. Arp, M. D., Health Commissioner.
*Ottawa	11,188	State law	F. Mendel, City Clerk.
Pekin	9,662	Both	F. C. Gale, M. D., Health Officer.
Peoria (a m)	66,365	State law	J. F. Wolf, Registrar of Vital Statistics.
*Quincy (a)	39,108	City ordinance.	P. W. Reardon, Health Officer.
Rock Island	23,009	State law	
Rockford (m)	36,051	State law	
*Springfield (a m)	38,933	State law	J. E. Smith, City Clerk.
Streator (a)	15,771	State law	W. L. Smith, M. D., President Board of Health.
Waukegan	12,132	State law	
*INDIANA (a m)	2,710,898	State law	J. N. Hurty, M. D., Secretary State Board of Health, Indianapolis.
†Anderson	25,842	State law	
†Columbus	8,976	State law	
†Elkhart	17,501	State law	T. G. Wilkinson, City Clerk.
†Elwood	19,232	State law	
†Evansville (a m)	63,957	State law	J. J. Casey, Chief Sanitary Officer.
†Fort Wayne (a)	50,947	State law	H. O. Brueggeman, M. D., Secretary Board of Public Health.
†Hammond (a)	15,956	State law	J. T. Clark, M. D., Secretary Board of Health.
†Huntington	11,047	State law	None.
†Indianapolis (a)	219,154	State law	E. Buehler, M. D., Health Officer.
†Jeffersonville	10,840	State law	W. H. Sheets, M. D., Secretary Board of Health.
†Kokomo	12,019	State law	
†Lafayette (a m)	19,238	State law	J. D. Hillis, M. D., Secretary Board of Health.
†Logansport	17,932	State law	
†Marion (a)	24,030	State law	O. W. McQuown, M. D., Secretary Board of Health.
†Michigan City	17,292	State law	V. V. Bacon, M. D., Secretary Board of Health.
†Muncie (a)	27,293	State law	H. R. Spickerman, M. D., Health Officer.
†New Albany	20,628	State law	C. C. Funk, M. D., Health Officer.
†Peru	11,648	State law	
†Richmond (a q)	19,602	Both	C. S. Bond, M. D., Secretary Board of Health.
†South Bend (a)	44,605	State law	D. W. McNamara, M. D., Health Officer.
†Terre Haute	52,805	State law	
†Vincennes (a)	11,393	Both	P. H. Caney, M. D., Secretary Department of Public Health.
†Wabash	9,944	State law	N. H. Thompson, M. D., Health Officer.
†Washington	10,045	State law	"Returned."

STATES AND CITIES. (Reports and bulletins—see explanatory note, p. 71.)	Estimated population, 1906.	State law or city ordinance.	Name and official title of registrar. (Remarks.)
IOWA (b m)	2,205,690	State law	L. A. Thomas, M. D., Secretary State Board of Health, Des Moines.
Boone	9,596	State law	
Burlington (a m)	25,741	State law	J. P. Harrell, M. D., Health Officer.
Cedar Rapids	29,380	State law	None.
Clinton	22,768	State law	
Council Bluffs (a m)	25,117	Both	N. J. Rice, M. D., Health Officer.
Davenport	40,706	State law	None.
Des Moines (a)	78,323	State law	
Dubuque (m)[1]	43,070	City ordinance	E. A. Linehan, City Recorder.
Fort Dodge	14,810	State law	
Fort Madison	8,665	State law	
Keokuk (m)	14,597	State law	H. T. Moore, Clerk of Council.
Marshalltown	12,100	State law	
Muscatine (a)	15,290	Both	J. D. Fulliam, M. D., Health Officer.
Oskaloosa	10,288	State law	
Ottumwa (m)	20,548	([2])	J. A. Hull, M. D., Physician to Board of Health.
Sioux City	42,520	State law	G. J. Ross, M. D., City Health Officer.
Waterloo	18,849	State law	
KANSAS (b m)	1,612,471	State law	S. J. Crumbine, M. D., Secretary State Board of Health, Topeka.
Atchison	18,871	State law	
Emporia	9,413	State law	None.
Fort Scott[3]	12,633	City ordinance	J. O. Brown, City Clerk.
Hutchinson	13,024	State law	None.
Kansas City (a)	77,912	City ordinance	E. J. Lutz, M. D., Secretary Board of Health.
Lawrence	12,123	City ordinance	F. D. Brooks, Secretary and Treasurer of Cemeteries.
*Leavenworth (a m)	22,167	Both	J. F. Wallace, M. D., Secretary Board of Health.
Pittsburg	15,964	State law	
Topeka	41,886	City ordinance	M. R. Mitchell, M. D., City Physician.
*Wichita	35,541	Both	R. M. Dorr, City Clerk.
KENTUCKY	2,320,298		
Bowling Green (a)	8,428	City ordinance	W. H. Philips, City Clerk.
*Covington (a)	46,436	City ordinance	
Frankfort	10,447		
Henderson (a)	15,201	Both	B. L. Powell, City Clerk.
Lexington (a)	29,249	City ordinance	J. E. Cassidy, City Clerk.
*Louisville (a)	226,129	City ordinance	G. A. Schneider, Registrar.
*Newport (a w)	30,329	City ordinance	G. W. Brown, M. D., Health Officer.
Owensboro	14,461	None	None.
*Paducah (a)	22,464	City ordinance	N. F. Graves, M. D., Health Officer.
LOUISIANA (b)	1,539,449	State law	W. S. Ingram, M. D., Secretary State Board of Health.
Baton Rouge	11,743	Both	L. J. Granary, City Auditor.
*New Orleans (b m)	314,146	State law	W. F. O'Reilly, M. D., Chairman Board of Health.
Shreveport (a w m)	17,831	State law	L. H. Pirkle, M. D., Secretary Board of Health.
*MAINE (a m)	714,494	State law	A. G. Young, M. D., Secretary State Board of Health and Registrar of Vital Statistics.
†Auburn (a)	13,971	State law	G. W. Bumpus, City Clerk.
†Augusta	12,379	State law	E. E. Newbert, City Clerk.
†Bangor (a)	23,500	State law	V. Brett, City Clerk.
†Bath (a)	11,527	State law	A. J. Grassy, City Clerk.
†Biddeford	17,165	State law	A. O. Marcille, City Clerk.
†Lewiston	24,997	State law	
†Portland (a m)	55,167	State law	F. F. Driscoll, City Clerk.
†Rockland (a)	8,150	State law	A. L. Orne, City Clerk.
†Waterville	10,899	State law	F. W. Clan, City Clerk.
*MARYLAND (a)	1,275,434	State law	M. L. Price, M. D., Secretary State Board of Health, Baltimore.
†Annapolis (m)	9,077	State law	W. S. Welch, M. D., Health Officer.
*Baltimore (a m)	553,669	Both	J. Bosley, M. D., Commissioner of Health and Registrar of Vital Statistics.
†Cumberland	19,768	State law	C. H. Brace, M. D., Secretary Board of Health.
†Frederick (m)	9,956	Both	I. J. McCurdy, M. D., Health Officer.
†Hagerstown	15,673	State law	L. Peterman, City Clerk.

[1] Published by Board of Health, Charles Palew, M. D., Physician to Board.
[2] Resolution of Board of Health.
[3] "Ordinance requires doctors and undertakers to make reports of deaths, but it is almost ignored. Births the same."

STATES AND CITIES. (Reports and bulletins—see explanatory note, p. 71.)	Estimated population, 1906.	State law or city ordinance.	Name and official title of registrar. (Remarks.)
*MASSACHUSETTS (a)	3,043,346	State law	Hon. W. M. Olin, Secretary of State, Boston.
†Adams town	12,756	State law	F. H. B. Memton, Town Clerk.
†Amesbury town	8,713	State law	N. E. Collins, Town Clerk.
†Arlington town (a)	9,881	State law	T. J. Robinson, Town Clerk.
†Attleboro town	12,975	State law	F. I. Babcock, Town Clerk.
†Beverly (a)	15,491	State law	L. S. Herrick, City Clerk.
†Boston (a m) [1]	602,278	State law	E. W. McGlenen, City Registrar.
†Brockton (a m) [2]	49,340	State law	D. C. Packard, City Clerk.
†Brookline town (a)	24,136	State law	E. W. Baker, Town Clerk.
†Cambridge (a)	98,544	State law	E. J. Brandon, City Clerk.
†Chelsea (a)	37,932	State law	C. H. Reed, City Clerk.
†Chicopee (a)	20,396	State law	J. C. Buckley, City Clerk.
†Clinton town (a)	13,217	State law	J. H. Carr, Town Clerk.
†Danvers town (a)	9,167	State law	J. Peale, Town Clerk.
†Everett (a)	30,066	State law	J. H. Cannell, City Clerk.
†Fall River	105,942	State law	A. B. Brayton, City Clerk.
†Fitchburg	33,319	State law	W. A. Davis, City Clerk.
†Framingham town (a)	11,597	State law	F. E. Hemenway, Town Clerk.
†Gardner town	12,252	State law	
†Gloucester (a)	25,989	State law	J. J. Somes, City Clerk.
†Haverhill (a)	37,961	State law	W. W. Roberts, City Clerk.
†Holyoke (a m)	50,778	State law	J. F. Sheehan, City Clerk.
†Hyde Park town	14,763	State law	
†Lawrence (m) [3]	71,548	State law	C. J. Corcoran, City Clerk.
†Leominster town (a)	14,678	State law	R. L. Carter, City Clerk.
†Lowell (a)	95,173	State law	G. P. Dadman, City Clerk.
†Lynn (a)	78,748	State law	J. W. Attwell, City Clerk.
†Malden (a m)	38,912	State law	J. P. Litch, Clerk Board of Health.
†Marlboro (a)	14,106	State law	P. B. Murphy, City Clerk.
†Medford	19,974	State law	A. P. Joyce, City Clerk.
†Melrose (a)	14,562	State law	W. D. Jones, City Clerk.
†Milford town	12,251	State law	
†Natick town (a)	9,633	State law	J. McManus, Town Clerk.
†New Bedford	76,746	State law	D. B. Leonard, City Clerk.
†Newburyport (a)	14,714	State law	J. O. W. Little, City Clerk.
†Newton (a) [4]	37,475	State law	I. F. Kingsbury, City Clerk.
†North Adams (a)	21,740	State law	C. S. Brooker, City Clerk.
†Northampton (a)	20,222	State law	C. D. Chase, City Clerk.
†Peabody town	13,413	State law	E. M. Poor, Town Clerk.
†Pittsfield (a)	25,648	State law	W. R. N. Barker, City Clerk.
†Plymouth town (a)	11,424	State law	E. Le Brugen, Town Clerk.
†Quincy (a)	28,911	State law	H. A. Keith, City Clerk.
†Revere town (a)	13,112	State law	A. J. Brown, Town Clerk.
†Salem	37,961	State law	J. C. Entwisle, Agent Board of Health.
†Somerville (a)	70,798	State law	F. W. Cook, City Clerk.
†Southbridge town	11,195	State law	W. W. Buckley, Town Clerk.
†Springfield (a)	75,836	State law	E. A. Newell, City Clerk.
†Taunton (a)	30,953	State law	E. A. Tetlow, City Clerk.
†Wakefield town (a)	10,464	State law	C. F. Hartshorne, Town Clerk.
†Waltham (a)	26,842	State law	L. N. Hall, City Clerk.
†Ware town (a)	8,660	State law	A. F. Richardson, Town Clerk.
†Watertown town (a)	11,568	State law	F. E. Critchett, Town Clerk.
†Webster town	10,261	State law	L. J. Upham, Town Clerk.
†Westfield town	13,871	State law	
†Weymouth town (a)	11,637	State law	J. A. Raymond, Town Clerk.
†Woburn (a)	14,432	State law	J. H. Finn, City Clerk.
†Worcester (a m) [4]	130,078	State law	E. H. Towne, City Clerk.
*MICHIGAN (a m)	2,584,533	State law	Hon. G. A. Prescott, Secretary of State, Lansing.
†Adrian	11,194	State law	J. Mawdsley, City Clerk.
†Alpena	12,715	State law	
†Ann Arbor (m)	14,645	State law	R. Granger, City Clerk.
†Battle Creek	24,039	State law	T. Thome, City Recorder.
†Bay City	40,587	State law	
†Detroit (a)	353,535	State law	H. T. Renshaw, Registrar.
†Escanaba	11,872	State law	T. J. Burke, City Clerk.

[1] Monthly bulletin published by Health Department, Samuel H. Durgin, M. D., chairman; and weekly and monthly mortality from reports of the Board of Health in Monthly Bulletin of the Statistics Department, published quarterly, by Edward M. Hartwell, Secretary.
[2] Monthly bulletin by Board of Health, J. H. Lawrence, M. D., Health Officer.
[3] By Board of Health.
[4] Monthly bulletin by Board of Health.

STATES AND CITIES. (Reports and bulletins—see explanatory note, p. 71.)	Estimated population, 1906.	State law or city ordinance.	Name and official title of registrar. (Remarks.)
*MICHIGAN—Cont'd.			
†Flint	15,574	State law	D. E. Newcombe, City Clerk.
†Grand Rapids (a m)	99,794	State law	J. Schriver, Secretary Board of Health.
†Iron Mountain	8,257	State law	J. B. Calis, City Clerk.
†Ironwood	10,177	State law	W. D. Snyder, City Clerk.
†Ishpeming	10,807	State law	J. D. West, City Recorder.
†Jackson	25,360	State law	
†Kalamazoo (a)	32,472	State law	J. J. Levy, Health Officer.
†Lansing	22,172	State law	M. F. Gray, City Clerk.
†Manistee	11,932	State law	C. A. Gnewuch, City Clerk.
†Marquette (m)	10,969	State law	H. Siegel, City Recorder.
†Menominee	10,234	State law	B. T. Phillips, M. D., Health Officer.
†Muskegon	20,937	State law	P. P. Misner, City Recorder.
†Owosso	9,369	State law	A. H. Dumond, City Clerk.
†Pontiac	11,942	State law	G. H. Drake, M. D., Health Officer.
†Port Huron (m)	20,464	State law	
†Saginaw	48,742	State law	D. C. Bell, City Clerk.
†Sault Ste. Marie	11,894	State law	
†Traverse City	12,153	State law	T. H. Gillis, City Clerk.
MINNESOTA (a m)	2,025,615	State law[1]	H. M. Bracken, M. D., Secretary State Board of Health, St. Paul.
*Duluth (a m)	67,337	State law	D. D. Murray, M. D., Health Commissioner.
*Mankato (a)	11,075	Both	A. O. Bjelland, M. D., Health Officer.
*Minneapolis (a m)	273,825	State law	A. M. Kriedt, Registrar of Vital Statistics.
St. Cloud	9,574	State law	J. B. Dunn, M. D., City Health Officer.
*St. Paul (a m)	203,815	State law	G. A. Renz, M. D., Commissioner of Health.
Stillwater	12,458	State law	W. H. Pratt, M. D., City Physician.
*Winona (a m)	20,458	State law	D. B. Pritchard, M. D., Health Officer.
MISSISSIPPI	1,708,272		
Meridian	20,503		
Natchez (b m)[2]	13,476	City ordinance	G. T. Eiseli, City Clerk.
Vicksburg	15,710		
MISSOURI	3,363,153		
Carthage	10,280	None	None.
Hannibal	12,780	City ordinance	A. S. Lilleman, City Clerk.
Jefferson	11,416	State law	None.
Joplin	35,671		
*Kansas City	182,376	City ordinance	H. L. Ebert, Secretary Board of Health.
Moberly	8,012	None	None.
*St. Joseph (a)	118,004	City ordinance	W. H. Hartigan, Secretary Health Department.
*St. Louis (a w)	649,320	Both	P. J. Regan, City Register.
Sedalia	15,927		C. E. Baker, City Clerk.
Springfield	24,119		
Webb City	11,897	None	None.
MONTANA (b m)	303,575	State law[1]	T. D. Tuttle, M. D., Secretary State Board of Health, Helena.
Anaconda (a)	12,267	Both	H. W. Stephens, M. D., Health Officer.
Butte (a)	43,624	State law	C. T. Pigot, M. D., Health Officer.
Great Falls	21,500	State law	
Helena	16,770	State law	J. S. Tooker, Secretary Board of Health.
NEBRASKA	1,068,484	State law	G. H. Brash, M. D., Secretary State Board of Health, Beatrice.
*Lincoln (m)	48,232	Both	W. C. Rohde, Health Officer.
*Omaha (a)	124,167	City ordinance	J. Barker, Registrar.
South Omaha	36,765	Both	J. J. Gelley, City Clerk.
*NEW HAMPSHIRE (a)	432,624	State law	I. A. Watson, M. D., Secretary State Board of Health and Registrar of Vital Statistics, Concord.
†Berlin (a)	11,982	State law	P. J. Smyth. City Clerk.
†Concord (a m)	21,210	State law	H. E. Chamberlain, Registrar of Vital Statistics.
†Dover (a)	13,459	Both	F. E. Quimby, City Clerk.
†Keene (a)	10,197	State law	F. H. Whitcomb, City Clerk.
†Laconia (a)	8,042	State law	J. F. Frank, City Clerk.
†Manchester (m)[3]	64,708	State law	E. C. Smith, City Clerk.
†Nashua (a)	26,652	State law	A. L. Cyr, City Clerk.
†Portsmouth	11,123	State law	L. Hilton, City Clerk.
†Rochester (a)	9,108	State law	H. L. Worcester, City Clerk.

[1] New law in effect, 1907.
[2] Semimonthly.
[3] Published by Board of Health.

STATES AND CITIES. (Reports and bulletins—see explanatory note, p. 71.)	Estimated population, 1906.	State law or city ordinance.	Name and official title of registrar. (Remarks.)
*NEW JERSEY (a)	2,196,237	State law	H. Mitchell, M. D., Secretary State Board of Health, Trenton.
†Atlantic City (a)	39,544	State law	A. T. Glenn, Registrar of Vital Statistics.
†Bayonne	44,170	State law	
†Bloomfield town	12,068	State law	W. L. Johnson, Registrar of Vital Statistics.
†Bridgeton	13,682	State law	F. L. Hewitt, City Recorder.
†Camden	84,849	State law	I. V. Bradley, City Clerk.
†East Orange (a)	25,909	State law	L. E. Rowley, City Clerk.
†Elizabeth	62,185	State law	J. F. Kenah, City Clerk.
†Hackensack village (m)	11,429	State law	W. P. Ellery, Assessor.
†Harrison town (a m)	13,268	State law and county ordinance.	C. J. Rooney, Clerk Board of Health and Vital Statistics of Hudson County. *See* Jersey City.
†Hoboken (a)	66,689	State law	J. Tucker, Registrar of Vital Statistics.
†Jersey City (a m)	237,952	State law and county ordinance.	C. J. Rooney, Clerk Board of Health and Vital Statistics of Hudson County.
†Kearny town (m)	14,142	State law	C. Schiller, Registrar of Vital Statistics.
†Long Branch	12,525	State law	E. B. Blaisdell, Secretary Board of Health and Registrar.
†Millville	12,144	State law	L. H. Hogate, City Recorder.
†Montclair town (a)	16,851	Both	C. H. Wells, Health Officer.
†Morristown town (a)	12,322	City ordinance	D. H. Wilday, Registrar of Vital Statistics.
†New Brunswick	23,758	Both	J. A. Morrison, City Clerk.
†Newark (a w)	289,634	State law	J. F. Connelly, City Clerk.
†Orange	26,493	State law	W. B. Gano, City Clerk.
†Passaic (a)	39,799	Both	G. F. Grear, Registrar of Vital Statistics.
†Paterson (a m)	112,801	State law	C. S. Gall, Registrar of Vital Statistics.
†Perth Amboy	27,534	State law	C. M. MacWilliam, City Clerk.
†Phillipsburg town	13,712	State law	
†Plainfield (a)	19,088	State law	Miss H. O. Mattison, Registrar of Vital Statistics.
†Trenton (a)	86,355	State law	T. B. Holmes, c/o Board of Health Office.
†Union town	17,369	State law and county ordinance.	*See* Jersey City.
†West Hoboken town	30,280	State law	
*NEW YORK (a m)	8,226,990	State law	E. H. Porter, M. D., Secretary State Board of Health, Albany.
*Albany (a)	98,537	City ordinance	W. G. Van Zandt, Registrar of Vital Statistics.
†Amsterdam	24,172	State law	S. W. Brumley, Registrar of Vital Statistics.
†Auburn (a m)	32,963	State law	A. H. Brown, M. D., Health Officer.
†Batavia village	10,400	State law	E. J. Hogan, Registrar of Vital Statistics.
†Binghamton (a)	43,785	State law	J. T. Lamm, Secretary Board of Health.
*Buffalo (a)	381,819	Both	F. C. Gram, M. D., Registrar of Vital Statistics.
†Cohoes	24,093	State law	
†Corning	13,913	Both	E. W. Byran, M. D., Health Officer.
†Cortland (a)	11,530	State law	E. S. Dalton, City Clerk.
†Dunkirk (a m)	15,913	Both	L. N. Murray, Registrar of Vital Statistics.
†Elmira	35,734	State law	S. A. Warner, Registrar of Vital Statistics.
†Geneva	12,506	State law	J. M. O'Malley, City Clerk.
†Glens Falls village	15,057	State law	D. I. Howe, Registrar of Vital Statistics.
†Gloversville	18,624	State law	
†Hornellsville (m)	13,390	State law	B. R. Hollands, Registrar of Vital Statistics.
†Hudson	10,531	State law	L. Van Hoesen, M. D., Registrar of Vital Statistics.
†Ithaca	14,768	State law	W. O. Kerr, Secretary Board of Health.
†Jamestown	26,628	State law	C. B. Jones, Registrar of Vital Statistics.
†Johnstown	9,692	State law	F. Bogaskie, City Clerk.
†Kingston (m)	25,585	State law	W. B. Scott, Secretary Board of Health.
†Little Falls	11,169	State law	J. G. Hazlett, Registrar of Vital Statistics.
†Lockport	17,597	State law	J. R. Compton, Registrar.
†Middletown (a m)	15,914	State law	J. G. Gray, Registrar of Vital Statistics.
†Mt. Vernon	25,670	State law	A. T. Banning, M. D., Health Officer.
†New Rochelle	21,520	State law	W. B. Croft, Clerk Board of Health.
*New York (a w q)	4,113,043	Both	W. H. Guilfoy, M. D., Registrar of Records, Department of Health.
Manhattan borough	2,153,495	Both	C. J. Burke, M. D., Assistant Registrar of Records.
Bronx borough	285,809	Both	A. J. O'Leary, M. D., Assistant Registrar of Records.
Brooklyn borough	1,392,811	Both	S. J. Byrne, M. D., Assistant Registrar of Records.
Queens borough	206,806	Both	R. Campbell, M, D., Assistant Registrar of Records.
Richmond borough	74,122	Both	J. W. Wood, M.D., Assistant Registrar of Records.

STATES AND CITIES. (Reports and bulletins—see explanatory note, p. 71.)	Estimated population, 1906.	State law or city ordinance.	Name and official title of registrar. (Remarks.)
*NEW YORK—Con.			
†Newburg (a)	26,593	Both	A. P. Templeton, Registrar of Vital Statistics.
†Niagara Falls (a)	27,827	State law	W. P. Horne, Registrar of Vital Statistics.
†North Tonawanda	10,348	State law	J. H. Tillitson, Registrar of Vital Statistics.
†Ogdensburg (a)	14,842	State law	D. J. Crichton, jr., City Clerk.
†Olean (a)	10,202	State law	T. B. Loughlen, M. D., Registrar of Vital Statistics.
†Oswego (a)	22,419	State law	E. A. Cooke, Clerk Board of Health.
†Peekskill village	13,768	State law	A. Barger, jr., Registrar of Vital Statistics.
†Plattsburg	10,445	State law	T. F. Mannix, City Clerk.
†Port Jervis	9,757	State law	J. F. Cleary, City Clerk.
†Poughkeepsie (a)	25,369	State law	E. Burgess, City Chamberlain.
†Rochester (a m)	185,703	Both	W. F. Hitchcock, Registrar of Vital Statistics.
†Rome (m)	17,726	Both	A. T. Huggins, Registrar of Vital Statistics.
†Saratoga Springs village	13,117	State law	C. I. Leggett, Registrar of Vital Statistics.
†Schenectady (a)	61,919	State law	D. E. Hart, City Clerk.
†Syracuse (a m)	118,880	State law	J. Metz, Registrar of Vital Statistics.
†Troy (m)	76,513	State law	E. Bolton, Registrar of Vital Statistics.
†Utica (a)	65,099	State law	T. W. Fogarty, Registrar.
†Watertown (m)	25,992	State law	F. W. Streeter, City Clerk.
†Watervliet	14,513	State law	F. E. Holahan, City Clerk.
*Yonkers (a m)	64,110	Both	J. J. Hanrahan, Secretary Board of Health.
NORTH CAROLINA (b m)	2,059,326	State law	R. H. Lewis, Secretary State Board of Health, Raleigh.
Asheville	18,414	State law	A. G. Halyburton, City Clerk.
Charlotte (m)	22,009	Both	F. O. Hawley, M. D., Superintendent of Health.
Greensboro (a)	14,067	City ordinance	E. Harrison, M. D., Superintendent of Health.
Newbern	9,840	City ordinance	F. M. Hahn, City Clerk.
*Raleigh (a m)	14,225	City ordinance	T. P. Sale, Clerk Board of Health.
*Wilmington	21,528	City ordinance	C. T. Harper, M. D., City Superintendent of Health.
Winston (m)	11,202	Both	Superintendent of Health.
NORTH DAKOTA (b)	463,784	State law	J. Grassick, M. D., State Superintendent of Health, Grand Forks.
Fargo	13,097	State law	
OHIO (a) [1,2]	4,448,677	State law	Hon. C. A. Thompson, Secretary of State, Columbus.
		State law	C. O. Probst, M. D., Secretary State Board of Health, Columbus.
Akron (m)	50,738	State law	A. A. Kohler, M. D., Health Officer.
Alliance	9,796	State law	None.
*Ashtabula	15,415	State law	None.
*Bellaire (a)	9,912	State law	
Cambridge (a) [3]	10,569	State law	W. T. Ramsey, M. D., Health Officer.
*Canton (a)	38,440	City ordinance	A. V. Smith, M. D., Health Officer.
*Chillicothe	13,990	State law	E. F. Waddle, Health Officer.
*Cincinnati (a w)	345,230	City ordinance	H. M. Millar, Registrar of Vital Statistics.
*Cleveland (a m)	460,327	City ordinance	F. Combes, Secretary Public Health Department.
*Columbus (m)	145,414	State law	E. G. Horton, M. D., Health Officer.
*Dayton (a)	100,799	State law	C. E. Adams, Clerk Department of Health.
East Liverpool	20,078	State law	
Elyria	10,699	State law	None.
*Findlay	17,613	State law	
Fremont (a m)	9,219	State law	A. W. Overmyer, Secretary Board of Health.
*Hamilton	27,670	State law	M. Millikin, M. D., Health Officer.
*Ironton	12,186	State law	
Lancaster	9,855	State law	
*Lima	27,702	State law	A. L. Jones, M. D., Health Officer.
Lorain (a)	22,730	State law	E. V. Hug, M. D., Health Officer.
Mansfield	20,142	City ordinance	J. M. Burns, M. D., City Health Officer.
*Marietta	16,396	State law	
Marion	14,001	State law	None.
*Massillon (a)	13,054	City ordinance	F. C. Miller, Health Officer.
*Middletown (a)	9,305	State law	G. D. Lummis, M. D., Health Officer.
*Newark (m)	20,491	State law	C. B. Hatch, M. D., Health Officer.
Piqua	13,564	State law	Health Officer.
*Portsmouth (a)	20,714	State law	J. W. Bendt, Clerk Board of Health.
Sandusky	20,378	State law	H. C. Shoepfle, M. D., Health Officer.
Springfield	42,069	Both	H. Baldwin, M. D., Health Officer.
Steubenville	14,925	State law	None.
*Tiffin (a)	11,078	State law	H. B. Gibbon, M. D., Health Officer.

[1] In Statistics of Ohio by Secretary of State.
[2] In Report of State Board of Health.
[3] Report to State Board of Health.

STATES AND CITIES. (Reports and bulletins—see explanatory note, p. 71.)	Estimated population, 1906.	State law or city ordinance.	Name and official title of registrar. (Remarks.)
OHIO—Continued.			
*Toledo (a m)	159,980	State law	J. C. Reinhart, M. D., Health Officer.
Warren	10,071	State law	J. H. Jameson, Clerk Board of Health.
Wellston	10,247	State law	None.
Xenia	9,356	State law	
*Youngstown (a)	52,710	City ordinance.	G. C. Steventon, Registrar and City Chemist.
Zanesville (a)	24,856	State law	None.
OKLAHOMA	590,247		
Guthrie	13,808	City ordinance.	E. W. Kinnan, City Clerk.
Oklahoma City	20,990	None	None.
OREGON (b m)	474,738	State law	R. C. Yenney, M. D., Secretary State Board of Health, Portland.
Astoria	9,701	State law	F. V. Mohn, M. D., City Physician.
*Portland (m)	109,884	City ordinance.	E. Moore, Clerk Board of Health.
*PENNSYLVANIA (a)	6,928,515	State law	W. R. Batt, M. D., State Registrar of Vital Statistics, Harrisburg.
† Allegheny (a m)	145,240	State law	H. K. Beatty, M. D., Superintendent Bureau of Health.
† Allentown (a)	41,595	Both	J. A. McCafferty, Secretary Board of Health.
†Altoona (a m)	47,910	State law	S. B. Trees, Secretary Board of Health.
†Beaver Falls borough (m)	10,246	State law	T. G. McPherson, Registrar.
†Braddock borough	19,218	State law	L. L. Todd, Registrar of Vital Statistics.
†Bradford (a)	16,577	Both	J. C. Walker, M. D., Registrar.
†Butler borough (a)	12,125	State law	T. M. Maxwell, M. D., Registrar of Vital Statistics.
†Carbondale (a m)	14,976	Both	F. W. Lewis, Secretary Board of Health.
†Carlisle borough	10,832	State law	A. Wiener, Registrar of Vital Statistics.
†Chambersburg	9,658	State law	
†Chester (a)	38,002	State law	H. Harkson, Registrar.
†Columbia borough (a)	13,423	State law	H. B. Clepper, Secretary Board of Health.
†Danville borough	8,066	State law	
†Dubois borough (a)	11,313	State law	W. J. Smathers, M. D., Registrar.
†Dunmore borough	15,145	State law	
†Duquesne borough	11,634	State law	
†Easton	28,317	State law	
†Erie (a)	59,993	State law	J. W. Wright, M. D., Health Officer.
†Harrisburg	55,735	State law	
†Hazelton (a)	15,771	State law	S. J. Hughes, City Clerk.
†Homestead borough	15,486	State law	C. C. Huff, M. D., Registrar of Vital Statistics.
†Johnstown (a m)	43,250	State law	F. H. Singer, Secretary Board of Health.
†Lancaster (a)	47,129	Both	M. W. Raub, Registrar.
†Lebanon (m)	19,404	State law	E. L. Kreider, Secretary Board of Health.
†McKeesport (a)	45,438	State law	A. J. Richards, Secretary Board of Health.
†Mahanoy City borough (a)	14,836	State law	J. H. Kirchner, Secretary Board of Health.
†Meadville (a)	11,769	State law	
†Mt. Carmel borough	16,137	State law	
†Nanticoke borough (a)	13,358	State law	A. Werth, Health Officer.
†Newcastle (a m)	36,847	State law	C. C. Horner, Registrar of Vital Statistics.
†Norristown borough (a m)	23,747	State law	C. E. White, Registrar.
†Oil City (a)	14,662	State law	J. T. Fahey, Registrar.
†Philadelphia (a w)	1,441,735	State law	G. W. Atherholt, Chief Division of Vital Statistics, Bureau of Health.
†Phoenixville borough	9,604	State law	
†Pittsburg (m w)	375,082	State law	J. F. Edwards, M. D., Superintendent Bureau of Health.
†Pittston	13,906	State law	
†Plymouth borough (a m)	16,235	State law	R. J. Williams, M. D., Secretary Board of Health.
†Pottstown borough	13,942	State law	J. B. Evans, Secretary Board of Health.
†Pottsville borough	16,664	State law	
†Reading (a)	91,141	State law	F. P. Heine, Secretary Board of Health.
†Scranton (m)	118,692	State law	
†Shamokin borough (a)	20,482	Both	T. C. Roberts, Secretary Board of Health.
†Sharon borough	11,909	State law	
†Shenandoah borough	22,949	State law	
†South Bethlehem borough (b).	15,005	State law	S. B. Keener, Secretary Board of Health.
†Steelton borough	13,911	State law	
†Sunbury borough	10,968	State law	B. F. Heckert, Registrar of Vital Statistics.
†Titusville (a)	8,346	Both	W. Varian, M. D., Health Officer.
†Warren borough (a)	10,647	State law	C. W. Schmehl, M. D., Registrar of Vital Statistics.
†West Chester borough (a)	10,424	State law	C. E. Woodward, M. D., Registrar of Vital Statistics.
†Wilkesbarre (m)	60,121	Both	F. H. Gates, City Clerk.

STATES AND CITIES. (Reports and bulletins—see explanatory note, p. 71.)	Estimated population, 1906.	State law or city ordinance.	Name and official title of registrar. (Remarks.)
*PENNSYLVANIA—Con.			
†Wilkinsburg borough	16,949	State law	W. Elder, Registrar.
†Williamsport (a)	29,735	State law	R. B. Staner, Registrar.
†York (a m)	39,168	State law	J. H. Bennett, M. D., Subregistrar of Vital Statistics.
*RHODE ISLAND (a)	490,387	State law	G. T. Swarts, M. D., Secretary State Board of Health, Providence.
†Central Falls	19,702	State law	C. F. Crawford, City Clerk.
†Cranston town	18,415	State law	D. D. Waterman, Town Clerk.
†Cumberland town	9,469	State law	
†East Providence town	14,072	State law	
†Lincoln town	9,279	State law	D. D. Johnston, Town Clerk.
†Newport (w)	25,559	State law	D. Stevens, City Clerk.
†Pawtucket	44,211	State law	J. W. Rowe, City Clerk.
†Providence (a)	203,243	Both	C. V. Chapin, M. D., Superintendent of Health.
†Warwick	25,464	State law	
†Woonsocket (a m)	32,994	State law	W. C. Mason, City Clerk.
SOUTH CAROLINA	1,453,818		
*Charleston (a)	56,317	City ordinance	J. M. Green, M. D., Health Officer.
Columbia	24,564	Both	E. C. McGregor, Secretary Board of Health.
Greenville	13,810		
Spartanburg	14,905	Both	H. E. Heinitsh, jr., Secretary.
*SOUTH DAKOTA (a)	465,908	State law	Hon. Doane Robinson, Superintendent of Vital Statistics, Pierre.
†Sioux Falls	12,681	Both	A. H. Tufts, M. D., Health Officer.
TENNESSEE	2,172,476		
Chattanooga (m)	34,297		
Clarksville	10,337	City ordinance	R. B. Macon, M. D., Health Officer.
Jackson	17,193	None	None.
Knoxville (a)[1]	36,051	City ordinance	W. R. Cochrane, M. D., Secretary Board of Health.
*Memphis (m)	125,018	City ordinance	
*Nashville (a m)	84,703	City ordinance	L. B. Smith, M. D., City Health Officer.
TEXAS (b)	3,536,618	State law	W. Brumby, M. D., State Health Officer, Austin.
Austin	25,290	State law	
Beaumont	13,105	State law	None.
Corsicana	12,275	State law	
Dallas	52,793	State law	
Denison[2]	12,317	State law	J. D. Yocorn, City Secretary.
El Paso	19,248	State law	
Fort Worth (a)	27,096	City ordinance	W. J. Estes, City Secretary.
*Galveston (q)	34,355	City ordinance	C. W. Trueheart, M. D., City Health Physician.
Houston	58,132	State law	
Laredo	14,695	State law	
Palestine	9,773	State law	None.
Paris	10,018	Both	M. A. Walker, M. D., Health Officer.
*San Antonio (m)	62,711	City ordinance	
Sherman	11,989	State law	
Tyler	8,765		D. H. Connally, M. D., Health Officer.
Waco	24,430	State law	
UTAH (m)	316,331	State law	T. B. Beatty, M. D., Secretary State Board of Health, Salt Lake City.
Ogden	17,165	State law	
*Salt Lake City (m w)	61,202	Both	M. R. Stewart, M. D., Health Commissioner.
*VERMONT (b)	350,373	State law	H. D. Holton, M. D., Secretary State Board of Health, Brattleboro.
†Barre (a)	11,028	State law	J. Mackay, City Clerk.
†Burlington (a)	21,070	State law	M. C. Grandy, City Clerk.
†Rutland	11,961	State law	H. B. Whittier, City Clerk.
VIRGINIA	1,973,104		
*Alexandria (a)	14,642	City ordinance	E. F. Price, Auditor.
Danville (a m)	17,972	City ordinance	J. W. Robinson, M. D., Health Officer.
*Lynchburg	22,850	City ordinance	"Not in city."
Manchester (a)	9,997	Both	M. P. Rucker, M. D., President Board of Health.
Newport News	28,749		
*Norfolk (b m)	66,931	Both	A. P. Pannill, Asst. Health Commissioner.
*Petersburg (a m)	21,810	City ordinance	V. L. Weddell, Secretary Board of Health.

[1] Monthly bulletins issued until 1907.
[2] Record kept only of interments in city limits.

STATES AND CITIES. (Reports and bulletins—see explanatory note, p. 71.)	Estimated population, 1906.	State law or city ordinance.	Name and official title of registrar. (Remarks.)
VIRGINIA—Continued.			
Portsmouth (m)	18,627	State law	F. S. Hope, M. D., Health Officer.
*Richmond (a m)	87,246	City ordinance	J. M. Donahoe, Registrar of Vital Statistics.
Roanoke	24,699		
WASHINGTON (b)	614,625	State law	E. E. Heg, M. D., Secretary State Board of Health, Seattle.
*Seattle (m)	104,169	State law	C. Calhoun, M. D., Health Officer.
*Spokane (a m)	47,006	Both	M. B. Grieve, M. D., Health Officer.
*Tacoma (m)	55,392	State law	A. de Y. Green, M. D., Commissioner of Health.
Wallawalla (m)	13,253	Both	A. E. Braden, M. D., Health Officer.
WEST VIRGINIA (b)	1,076,406	State law	H. A. Barbee, M. D., Secretary State Board of Health, Point Pleasant.
Charleston (m)	13,715	City ordinance	J. S. Ross, City Recorder.
Huntington	13,015		
Parkersburg	16,477	City ordinance	C. W. Hudson, M. D., Health Officer.
*Wheeling (a q)	41,494	City ordinance	W. H. McLain, M. D., Health Officer.
WISCONSIN (b)	2,260,930	State law [1]	C. A. Harper, M. D., Secretary State Board of Health, Madison.
*Appleton	17,383	State law	J. V. Canavan, M. D., Health Officer.
Ashland	14,808	State law	
*Beloit (q)	13,339	State law	H. O. Delaney, M. D., Health Officer.
Chippewa Falls	9,192	State law	None.
*Eau Claire	18,981	State law	J. F. Farr, M. D., Health Physician.
Fond du Lac	17,719	State law	None.
*Green Bay	23,688	State law	H. P. Rhode, M. D., Commissioner of Health.
Janesville	13,887	State law	W. D. Merritt, M. D., Health Commissioner.
Kenosha	17,061	State law	None.
La Crosse	29,115	State law	Register of Deeds.
*Madison	25,128	State law	O. S. Norsman, City Clerk.
*Manitowoc	12,922	State law	J. E. Meany, M. D., Health Officer.
*Marinette	15,186	State law	S. P. Jones, M. D., Health Commissioner.
Merrill	9,329	State law	None.
*Milwaukee (a m)	317,903	State law	F. E. Darling, M. D., Registrar of Vital Statistics.
Oshkosh	31,033	Both	A. H. Brocho, M. D., Health Commissioner.
Racine	32,928	Neither	C. Harms, Acting Health Officer.
Sheboygan (q)	24,239	State law	H. C. Reich, M. D., Commissioner of Health.
Stevens Point	8,922	State law	
*Superior (a m)	37,643	Both	——— ———, Health Commissioner.
Watertown	8,659	State law	
Wausau	14,879	State law	
WYOMING	103,673		
Cheyenne	13,570	City ordinance	W. A. Burgess, M. D., Health Officer.
Laramie	7,480	State law	None.

[1] New law in effect, 1907.

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