

## Death Registration: History, Methods, and Legal Issues

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**ABSTRACT:** This article includes a brief discussion of the evolution death registration as it changed from records of church burial ceremonies to the recording of vital events by government in defined registration areas; today's death registration system in the United States; classification and coding procedures; limitations of data derived from death registration; educational materials; legal issues involving death certificates; and the re-engineering of the death registration process.

**KEYWORDS:** forensic science, forensic pathology, death registration, death certificates, vital records

Meetings are being held to discuss the re-engineering of the death registration process (1). Because certification of the cause, manner, and circumstances of death is a component of the registration process, the approach to certification may also change in the future. This article includes a review of the current death registration system and its history to provide a basis for better understanding of where our death registration practices are and where they may be headed. Information is also presented about limitations of data derived from death certificates, training, education, and legal issues.

### Evolution of Death Investigation and Registration

Historians tell us that "modern" death investigation involving coroners originated with the Articles of Eyre in 1194 England (2). The Articles provided for election in each county of three knights and a clerk to serve as "custos placitorum coronae"—keepers of the pleas of the crown (i.e., "crowners")—and protectors of the Crown's financial interests when a death occurred (3–7). The word "coroner" seems to have been derived from "crown" (3).

In England, justices of the peace had assumed the coroner's fiscal duties by the late 1400s. By 1538, the clergy in all parishes were required to keep a weekly record of christenings, marriages, and burials. Thus, "graves registration" was originally a responsibility of the clergy (most burials occurred at churches) and marked the origin of death and burial records for human bodies (8,9). Prompted by concern about concealment of homicide and grave robbing, a births and deaths registration act and an act to provide medical witnesses at coroner's inquests were both passed in 1836, the net results being a requirement for a certificate for burial, a doctor's attendance at an inquest, and ability of the coroner to order an autopsy (1). These events led to the Coroners Act of 1887 which improved coroner-related laws (6).

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North American colonists brought the idea of coroners with them, and they followed the European custom of graves registration. In 1632, the Grand Assembly of Virginia passed a law requiring a minister or warden from every church parish to appear annually at court and present a register of christenings, marriages, and burials for the year (9). Thus, in America too, registration was originally within the responsibilities of the church. In 1639, Massachusetts Bay Colony required the courts to record all judgments and inventory every marriage, birth, and death, marking two important developments—transfer of registration from the church to government officers, and the recording of vital events rather than church ceremonies (9).

As the U.S. Constitution required separation of church and state, death registration continued to fall from the clergy's domain and into the hands of local and state government because the U.S. government was federal and lacked centralized registration. In the 19th Century, epidemics of infectious disease had caused the formation of urban health departments and boards of health, which created an infrastructure upon which death registration could be based, at least in urban areas (8,9). It is said that the development of death registration was hastened by fears of cholera and "the need to know the location and number of the enemy to be fought (9)." Death records have been collected in Baltimore since 1797—lists of deaths there by cause are available since 1817, and a state registration law was adopted in 1842 (9).

By 1851, seven states had enacted death registration laws and a method was devised as an outgrowth of the Shattuck Report for the 1850 Federal Census to count deaths. However, registration worked well in only a few cities and two states (9). By 1880, resolutions of the American Medical Association and efforts of the American Public Health Association, National Board of Health, and Superintendent of the Census resulted in a registration area concept that was supported by a resolution of Congress. [As an aside, it was about this same time that the first medical examiner systems emerged in Boston in 1870 and in Baltimore in 1890]. Prior to 1900, the United States lagged behind other Western countries in developing a centralized death registration system, but by 1900 had drafted a model vital statistics law that could lead to a centralized system of death registration.

By 1910, a standard model death certificate had been developed. Until 1933 when the last state existing at the time was accepted as a registration area, registration areas had been continually defined and refined. In 1946, federal registration functions were removed from the U.S. Bureau of the Census and assigned to a National Office of Vital Statistics within the Public Health Service. The National Office of Vital Statistics merged in 1960 with the National Health Survey (established by the Public Health Service in 1956 as a source of information on illness and disability among Americans) to form the National Center for Health Statistics

(NCHS), which then became a Center within the Centers for Disease Control and Prevention in 1987 (10). Today, our death-certificate-based, national mortality data is collected and managed by NCHS (as are birth and marriage data), administratively within the Atlanta-based CDC, but physically located in Hyattsville, Maryland with a major data processing center located in Research Triangle, North Carolina. A more thorough history of death registration and vital statistics may be found in the "History and Organization of the Vital Statistics System (9)."

### Today's Death Registration System

The current version of the Model Vital Statistics Act was issued in 1992, and the current U.S. Standard Certificate of Death is a 1989 revision (11,12). Today, each state constitutes a registration area and has adapted modifications of the Model Vital Statistics Act and U.S. Standard Certificate of Death to meet its own needs. A state may or may not alter its vital statistics laws or death certificates when the U.S. Models or Standards are changed. Although many similarities exist among states in regard to death registration procedures and death certificate forms, there are differences among states as well, including the fact that no two states use exactly the same death certificate form (13). There may even be differences within states. New York City has a different death certificate than New York State, for example, and some states have one death certificate form for medical examiners (or coroners) and a different form for deaths that are certified by hospital or private physicians. Although all states register deaths on the state level, some jurisdictions have their deaths registered first on the local or county level. It is advisable to be thoroughly familiar with laws, procedures, regulations, and forms used locally (13).

Despite local variations in procedures, laws, and forms, some generalizations can be offered regarding death certificates. The cause-of-death section is quite similar in each of the 50 states. Death certificate information is passed from the local level to the state, and then to the national level. By and large, much of the policy and procedure regarding death registration at all levels is driven by procedures of the World Health Organization (WHO) and government economics (13). As a signatory of the WHO, the United States is obliged to follow WHO procedures which include methods for documenting and coding causes of death. The cause of death section of the U.S. Standard Death Certificate and the coding system (International Classification of Diseases, ICD) are both based on WHO guidelines and recommendations. As national custodian of mortality data, the National Center for Health Statistics purchases death certificate information from the states. For a state to be paid for the data by NCHS, the state's data must adhere to certain parameters defined by NCHS, which, in turn, are based on WHO guidelines. Thus, the WHO recommendations and inter-agency government economics substantially drive the death registration process.

In general, the funeral director is responsible for ensuring that the death certificate is completed by the responsible parties. Over the years, such a system has worked well because the funeral director has incentives (including financial ones) to finalize death-related paperwork. The physician, medical examiner, or coroner usually completes the cause and circumstances of death section of the certificate, and the funeral director usually completes the other portions containing demographic and burial/disposition information. The extent of completion by each party and who first completes their part of the certificate depend on local needs, laws, regulations, and practices.

The certifier of death is the physician, coroner, or medical examiner who signs the certificate attesting that, "to the best of the certifier's knowledge," the person named on the certificate died at the date and time and of the cause(s) and circumstances indicated on the certificate. The completed death certificate is filed by the funeral director with a records custodian referred to as a registrar who may be a local, county, or state official, usually within a branch or division of the health department. Regardless of the initial point of filing, a hard copy of the death certificate is maintained at the state level. A trained nosologist classifies and codes cause and circumstance of death information using the latest version of the ICD (currently ICD-9). State data are eventually submitted to the National Center for Health Statistics, in ICD code format or literal text. The most current, annual national mortality data usually lag about two years behind the current calendar year.

Some information is lost during the data coding and transmission to the national level. For example, personal identifiers and specific addresses may not be passed to the national level, and the original death certificate may be the only source for some information. Further, some information items are combined during coding (14). For example, there is not a specific, separate code for manner of death (i.e., whether death is a result of homicide, suicide, accidental, or natural causes)—the code for manner of death is integrated with the code for the cause and circumstances of death. This fact may create some problems when trying to compare different data sources or when trying to analyze very broad categories of death.

In the past, national mortality data were not generally available. Now, however, some data base items are accessible to the public through electronic media such as CDC-WONDER.

### *The Death Certificate*

The death certificate serves three basic purposes: (a) it documents the fact of death (that the named person has died, i.e., the registration process), (b) provides an opinion regarding the cause, circumstances, and manner of death (i.e., the certification process), and (c) provides information that may be used for ante mortem: Post mortem correlations (such as correlating cause of death with occupational exposures), and for statistical and research purposes (8). At the local, state, or national level, death certificate information may be used by government and other agencies to monitor morbidity and mortality as well as for scientific study, the planning of public health strategies and programs, legislative change, and research and funding prioritization. The importance of accurate and complete death certificate information cannot be overstated.

### Classification and Coding Procedures

The cause and circumstances of death may be classified and coded in several ways. The most common is for ICD coding to be done manually by a nosologist at the state level (15). ICD codes are designed to reflect varying degrees of specificity in the cause of death, and are typically a three-digit whole number with one or more decimal points attached. For example, ICD code E862 is "accidental; poisoning by petroleum products" and E862.2 is "accidental poisoning by petroleum products, lubricating oils." It should be obvious that specific wording within the cause of death on the death certificate can facilitate more specific ICD coding.

At NCHS, causes of death are stored in two basic formats. One is termed "single cause" mortality and contains only the most important or underlying cause of death (the one that started the

train of fatal events) in ICD code format. The other format, "multiple cause" mortality data, contains ICD codes for multiple conditions if more than one is cited within the cause of death. When multiple conditions are listed by the certifier and the nosologist assigns more than one ICD code, a computer application named Automated Classification of Medical Entities (ACME) may be used by NCHS to select one of the conditions as the underlying cause of death. ACME, however, only deals with ICD code numbers—it does not use literal text. Computer software that has been under development since 1983—Mortality Indexing, Classification, and Retrieval (MICAR)—is capable of converting literal causes of death to ICD codes, and has the advantage that cause of death wording is electronically stored (15). MICAR does not accept unlimited phraseology, however, and some formatting of cause of death word entries must be made to make them match predefined lists of cause-of-death wording. SUPERMICAR is being developed that will accept more diverse wording and convert the certifier's original cause-of-death wording (without preformatting) to standardized phrases and ICD codes. Only a limited number of states currently have the ability to submit the cause of death information to NCHS electronically as literal text, however—most still submit ICD codes. In view of the way in which cause-of-death information is processed, the need for nosologists to be meticulous and for certifiers to supply complete and accurate cause of death information is apparent.

To facilitate electronic printing and automation of death certificates, some commercial vendors have developed word processing software packages for use by funeral directors, and NCHS is developing Electronic Death Certificate (EDC) software for use by the certifier when completing the cause of death. The EDC software is programmed so that some conditions are not accepted as a cause of death, and, when multiple causes are listed, the software can also determine if the causes are listed in an illogical sequence (16).

#### *Limitations of Death Certificate Data*

Some general problems have been described regarding the death certificate including inconsistencies and weaknesses in existing guidelines and instructions for completing the cause-of-death section (17). Numerous items of information on the death certificate have been studied for completeness and/or accuracy—some studies involve cause of death information and others involve demographic or other non cause-related data. For example, studies have suggested under reporting of alcohol-related mortality and cocaine-related deaths (18–20). Discrepancies have been documented between race as it appears on the birth and death certificates (21). Recent emphasis has been placed on the fact that death certificates may not adequately reflect potentially modifiable risk factors and behaviors (such as tobacco smoking, obesity, or sexual promiscuity) that may be viewed conceptually as the "actual cause of death (22)." Causes of death have been shown to be reported in a nonspecific or incomplete way (23) and even a yes/no question on the death certificate (i.e., "was an autopsy performed?") was shown to be inaccurately reported in 26% of cases in one institution (24).

Regarding the quality of death certificate data, in 1982, NCHS published an annotated bibliography of death certificate cause-of-death validation studies performed between 1958 and 1980 (25). The bibliography contains commentary for 128 articles that met the criteria of dealing with cause-of-death validity, being written in English or having an English translation available, having been written after 1957, and being data-based rather than opinion-based. As might be expected, the validity and reporting rate of certain

conditions varied depending on the specific condition being analyzed—for example, deaths from cancer of the uterus were under reported on death certificates but cardiovascular deaths of children were mentioned on 90% of the certificates for the study population known to have died from such conditions (26,27). Unfortunately, for most causes of death that were studied, the articles summarized in the bibliography showed that death certificates had limitations—and they were sometimes major ones.

The bibliography has been updated somewhat since 1980, and appropriate references are included in the Report of the Workshop on Improving Cause-of-death Statistics (28). Reports of studies similar to those in the annotated bibliography continue to be published. For example, one study showed that death certificate data derived from a medical examiner's office were very good for surveillance of deaths due to injury but not for surveillance of deaths due to natural causes (29). A study in another geographic area showed that many injury deaths had not been reported to the medical examiner—particularly deaths involving injuries in the elderly or deaths occurring in a delayed fashion from medical complications of injury (30). The annotated bibliography, the referenced studies, and the many more recent studies not referenced in this article tell us several things: (a) death certificate data must be viewed with caution and the people using the data must be aware of potential problems with validity; (b) the validity of death certificate data varies according to geographic location, cause of death, and the nature of the certifier; (c) certifiers of death should be aware of the need to state causes of death as accurately and completely as possible.

#### *Education, Training, and Instructional Materials*

The need for instructional materials has been addressed by federal agencies, professional organizations, and state or local agencies. NCHS has published written materials (including handbooks), audio, and video instructions for completing the death certificate, but the guidelines are lacking in certain detail (31,32). NCHS has also distributed abbreviated guidelines and instructions that are printed on laminated sheets the size of standard paper—a blue version for natural deaths and a red version for medical examiners and coroners (33,34). The College of American Pathologists has recently published a manual with instructions for writing cause of death statements for natural deaths and is developing instructions geared at writing cause-of-death statements for specific types of death such those due to dementia, injury events, and other causes (13). On the local level, New York State and California professional societies have published materials geared at improving death certification (35,36). Journals of general medical interest such as JAMA have also carried articles relating to cause-of-death and death certification (23,24,37,38).

Despite instructional materials, problems continue to occur with the accuracy and completeness of cause of death statements on death certificates. One problem may relate to the fact that most physicians who certify death complete few death certificates, making it difficult to gain experience (28). Another problem is that few medical schools or postgraduate training programs include formal instruction on how to complete the death certificate (28). Experienced hospital staff physicians may delegate the responsibility to inexperienced interns and residents whose first knowledge of a death certificate comes with the first patient death they encounter. In general, physicians do not get paid for completing a death certificate, a disincentive for learning about and completing the death certificate. The demands of clinical practice may give death-related issues a lower priority

than other educational and patient-related activities. The variation in regulations and procedures in each state creates some problems in trying to teach a standard approach to, or develop a standard system of, death certification (13). These and other problems have prompted federal authorities to conduct workshops on improving cause-of-death statistics, and, in 1994, to convene a steering committee to re-engineer the death registration process. The committee's deliberations continue (1,28).

### Legal Issues Involving Death Certificates

The cause of death stated on the death certificate is the opinion of the certifier and is made "to the best of the certifier's knowledge" based on information available at the time of certification. The certifier is not legally accountable for the accuracy of the stated cause of death so long as the opinion has a factual basis with reasonable medical probability.

In general, the death certificate is *prima facie* evidence of the fact of death (i.e., that death occurred) and is admissible in court to prove that a person is dead. Whether or not the cause of death is admissible has depended on the stated cause of death, precedent case decisions, the laws of the state, the criminal or civil nature of the case, and the type of civil issue. In insurance law, for example, death certificates have been held as admissible as to the cause of death, but not necessarily to show how an injury occurred, and other courts have refused to admit death certificates to prove the cause of death (39). A ruling in a Louisiana case required that no weight be given to the cause or manner expressed on a coroner's death certificate, and that the certificate was only valid as proof of death (*Ray v. Federated Guar. Life Ins. Co.*, La.App. 1980, 381 So.2d 847). In another case, the U.S. Court of Appeals in Philadelphia concluded that the cause of death should be excluded because it was "descriptive. . . of facts not in dispute" and "does not refer to any medical condition which could be construed as the cause of death" (*McSparran v. City of Philadelphia*, 433 F.2d 976, 1970). The manner of death has been deemed "not admissible for limited purpose of negating insurer's bad faith in refusing payment" (*Security Life Ins. Co. of Georgia v. Blitch*, 1980 270 S.E.2d 349, 155 Ga.App. 167). In another life insurance proceeding, the death certificate was allowed to be admitted by the insurer as evidence that a beneficiary may have had intent in a case involving homicide (*McClain v. All States Life Ins. Co.*, 1948, 80 N.E.2d 815, 82 Ohio App. 354).

Regarding the death certificate's stating of how an injury occurred, in one life insurance claim case, the death certificate information (certified by a coroner) was allowed to be admitted as evidence of facts concerning how an injury occurred, but the coroner's opinion was not binding on the trier of fact (*Smith v. John Hancock Mut. Life Ins. Co.*, D.C. Pa 1966 254 F.Supp.622). In some other cases, such evidence has been excluded (39). An amendment to a death certificate that originally showed no cause of death [the cause was presumably "pending" on the original certificate] was not allowed as evidence because it was not part of the death certificate itself and was not certified as being such a part (*Cown v. Allamakee County Benevolent Soc.*, 1943, 8 N.W.2d 433, 232 Iowa 1387).

Other questions arise in reference to death certificates. The general question of whether death certificates are public record and generally available to the public varies by state. The issue of specifying AIDS on the death certificate has reportedly resulted in the cause of death section being officially obscured on death certificate copies in at least one jurisdiction, and the court has

sealed a death certificate from public disclosure (40). Arguments for omitting AIDS from the death certificate have included an alleged need to circumvent the "surviving spouse syndrome" and to protect the privacy of family and friends, and the belief that the death certificate should only reflect the complications from which AIDS patients die (such as pneumonia). In contrast, other persons such as funeral directors have favored citing AIDS on the death certificate and have claimed that the death certificate may be the only way to learn of a potential occupational infectious hazard (47). Another issue is whether a death certificate may be filed for someone who is absent or missing, but whose remains have not been located. Most states have addressed this issue—in Louisiana, for example, the statute empowers the state registrar to issue a "presumptive death certificate (41)."

Court cases have also occurred involving issues of whether the death certificate contains information that is simply hearsay, and whether or not a death certificate can be admitted under the business records exception to the hearsay rule (42). In general, it seems as though admissibility of death certificate information has been heavily dependent on the particular facts of the case in question.

It is ironic that legal action may be taken against a physician certifier of death for the opinions expressed about the cause, manner, or circumstances of death when undertakers, constables, and justices of the peace have been allowed to testify as to cause of death (43). Although such lawsuits have arisen, the cases seem few in number, and most worrisome cases seem to die during the period of threatened suit. Some states have some form of review process or administrative remedy that can assist the certifier and address complaints about death certification when they occur.

### *Re-Engineering the Death Registration Process*

The complexities and problems of death registration have resulted in recognition that the death registration process might be improved, and in meetings to effect such improvement (1). There is little doubt that death registration will evolve away from paper-based records toward electronic ones, as is occurring on a trial basis now in the state of New Hampshire. There is discussion of "attaching" additional information such as medical record diagnoses to the cause of death. Alternatives to the funeral industry are being explored for accepting the responsibility of ensuring that death certificates are completed and filed. Possible incentives for institutions and certifiers are being explored. Regionalized death registration centers have been discussed, as has a user-pay concept. Changes in the format for reporting the causes and circumstances of death have been offered, including the notion that cause-of-death information may be registered separately from fact of death information. Greater emphasis may be placed on the importance of education about the writing of cause-of-death statements and on death certification and registration methods. Alternatives to the WHO-based guidelines, ICD coding, and other historical practices have also been suggested. Immediate electronic access to fact-of-death information is being advocated by some. Where we are headed is not yet known, but it is almost certain that whatever transition occurs, like traditional changes in the US Standard Certificate of Death, will be slow and deliberate. Regarding changes that will be visible to certifiers of death, little seems likely to happen before the next revision of the US Standard Certificate of Death in 1998.

### *For the Future*

Regardless of the ultimate death registration system, certifiers should keep something in mind—the fact that the registration

system has provided a fairly simple and workable vehicle for reporting causes of death, but that certifiers of death (who are physicians for the most part) have not done a good job at following the rules and recommendations for that system (13). The success of any system in the future will depend on a greater commitment from certifiers of death than has been displayed by them in the past.

Further information on ICD coding and classification methods, the querying of death certificates, and lawsuits about cause and manner of death statements may be found in the referenced publications (44–47). A tutorial for writing causes of death can be assessed on the World Wide Web at [www.TheNAME.org](http://www.TheNAME.org).

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