U.S. Vital Statistics System

Major Activities and Developments, 1950-95

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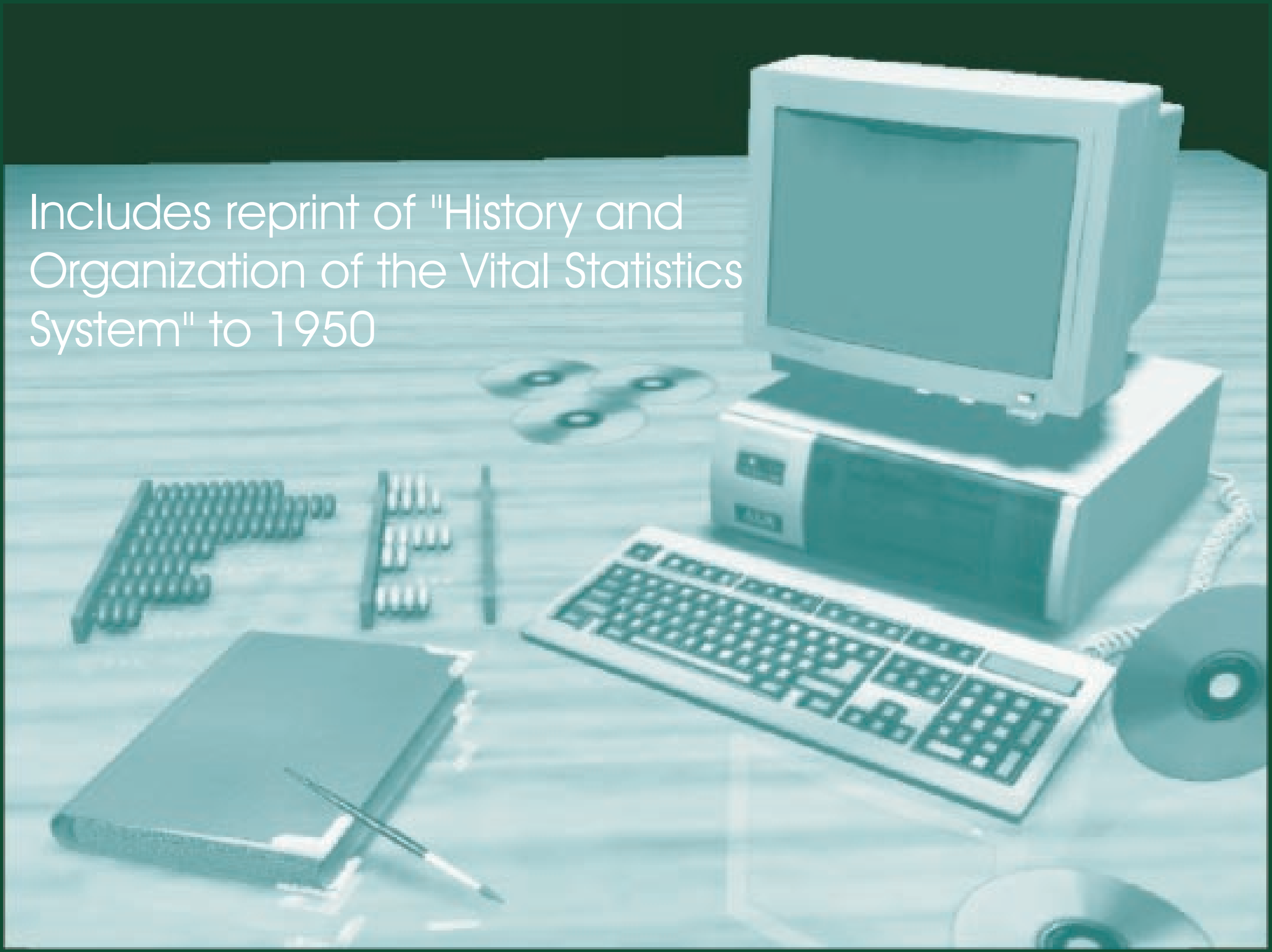

Includes reprint of "History and Organization of the Vital Statistics System" to 1950

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
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Preface

The early history of the vital statistics system was presented in detail in *Vital Statistics of the United States*, Volume I, 1950. This earlier document is reprinted in this publication in appendix II. That report begins with the early collection and preservation of registration records as legal evidence of the occurrence of the event, primarily for use in protecting individual rights. It then describes the era in which death records by cause became recognized as essential for control of epidemics and for other public health interests. The report goes on to cover how welfare legislation of the 1930's and emergency World War II legislation of the 1940's brought about an unprecedented demand by individuals for their birth certificates.

Included in the earlier report is a description of the long, hard-fought, and often discouraging campaign of individuals, associations, and State and Federal agencies to bring about uniform registration laws and reporting forms that could not only serve the increasing needs of individuals for their records but also provide data for statistical analysis at all levels of government. The establishment, development, and completion of the registration areas designed to provide national birth and death statistics and the early efforts that ultimately led to establishment of similar registration areas for providing marriage and divorce data are described. The report traces the Federal function in vital statistics from its origin in the Bureau of the Census to its placement in the National Office of Vital Statistics in the Public Health Service in 1946.

The purpose of this report is to pick up where the 1950 report ended and describe further developments and major activities and accomplishments that occurred from 1950 through 1995. Most of the information included was obtained from or based upon material contained in government reports. Material from the 1950 report is repeated in certain instances to provide an informative context for understanding the more recent developments. Reference is also made to some pre-1950 activities and achievements that were not discussed in the earlier report.

All publications that were reviewed by the author in preparing this report are referred to in the text or cited as sources. Because the publications reviewed are in the public domain, much of the material in them is widely used, appears in numerous publications, and consequently, is likely to appear in publications not cited in this report.

Introduction

Vital statistics for the United States are obtained from the official records of live births, deaths, fetal deaths, marriages, divorces, and annulments. The official recording of these events is the responsibility of the individual States and independent registration areas (District of Columbia, New York City, and territories) in which the event occurs; the Federal Government obtains use of the records for statistical purposes through a cooperative arrangement with the responsible agency in each State.

Since 1950 attention has been focused on improving the quality of vital statistics and making them more useful and widely available. Interest in vital statistics widened when State and Federal agencies, challenged to define needs for and effects of various State and Federal health and welfare programs, began looking for pertinent and reliable statistics on which to base judgments. The registration certificates assumed new importance as they were looked to as a source of credible national vital and health statistics for use by all levels of government, institutions, and the general public.

Demand for this information increased, and research was undertaken to determine the most economical and effective application of the rapidly developing data processing technology. Updating data collecting, recording, and processing techniques to keep abreast of rapidly evolving automation capabilities became an increasingly important part of the vital statistics program.

As health and social issues became more complex, the content of the information collected on the vital records was expanded and measures to improve its quality and usefulness were added. Supplemental data sources were developed to augment and enrich the information obtained from the registration system.

The function of producing national vital statistics was shifted several times from one organizational unit of the Federal Government to another, the most consequential being its merging with the National Health Survey to form the National Center for Health Statistics (NCHS). The following is a discussion of the most prominent milestones in the progress of the national vital statistics program during the last half of the 20th century.

Organizational changes

The act of Congress that made the Bureau of the Census a permanent full-time agency of the Federal Government in 1902 also gave the Bureau statutory authority to establish registration areas to produce nationally comparable vital statistics. This put into motion the development of a system for the annual collection of vital statistics data on a national basis.

Transfer to the Public Health Service

These collection activities continued in the Division of Vital Statistics of the Bureau of the Census until July 1946. At that time the Bureau of the Budget's recommendations of 1943 were adopted, and the Federal Security Administration (one of the agencies that was combined with others to form the Department of Health, Education, and Welfare in April 1953) was given authority for Federal functions in vital statistics. The National Office of Vital Statistics was established in the Public Health Service, with the head of the office reporting directly to the Surgeon General.

National Center for Health Statistics

In 1960 the National Office of Vital Statistics was merged with the National Health Survey to establish the National Center for Health Statistics (NCHS). Effective in September 1963, NCHS was reorganized, with the Division of Vital Statistics becoming one of five operating divisions. This reorganization separated support activities, such as data processing and publication activities, from the substantive vital statistics program operations.

Dr. Forrest E. Linder, the first director of NCHS, articulated the widely held expectations for the newly established center in his comments at the Public Health Conference on Records and Statistics held in 1962. He envisioned the center as "not just a factory, but a scientific organization," the existence of which would permit greater emphasis on analysis as opposed to mere collection and dissemination of statistics. Holding it to be essential to protect the integrity of NCHS statistics by distinguishing analysis from propaganda or a program for promotion of solutions to problems, he looked to analysis to identify and clarify problems that needed solution.

Dr. Linder saw the center as providing emphasis on methodological research in all areas of concern to health statistics. This included registration methods for vital events, extended relations with the States, more research into operational techniques, and leadership in new areas of data collection, follow-back surveys, and the gathering of institutional data. He welcomed the enlarged relationships made possible by the center, including intergovernmental cooperation, international exchanges, and collaboration with universities, survey centers, and health organizations.

The Health Services Research and Evaluation and Health Statistics Act of 1974 (Public Law 93–353) established NCHS in law and codified its mandate and authorities under section 306 of the Public Health Service Act. The Act provided for NCHS to collect statistics on a broad range of health-related subjects, including births, deaths, marriages, and divorces. It established the National Committee on Vital and Health Statistics as an expert advisory committee to the Secretary of the Department of Health, Education, and Welfare. It called for the center to undertake and support research demonstrations and evaluations regarding survey methods and to provide technical assistance to State and local jurisdictions. Subsequent changes in public laws that established, amended, or extended NCHS authorities did not substantially affect the national vital statistics system.

Supporting activities

The history of vital statistics is interlaced with supportive endorsements and activities of numerous associations and organizations. From the earliest days of their existence, the American Statistical Association, the American Medical Association, the American Public Health Association, and the American Bar Association provided strong support for establishing offices to collect vital statistics. These organizations promoted uniform registration laws for vital events, uniformity in the content of vital records, and an aggressive public health program with vital statistics as a principal component. Their interest and influence continue, as they maintain close relationships with State and Federal activities bearing on the vital statistics program.

In the late 1940's, a report published by the National Bureau of Economic Research on "The Statistical Agencies of the Federal Government" validated the earlier work of these organizations. The study was produced as part of the work of the Commission on

Organization of the Executive Branch of Government, which had been appointed by President Hoover. This commission recommended a new status for the statistical activities of the Federal Government, urging high priority for them among the basic functions of government and emphasizing the need for budgetary resources, training and Federal-State coordination to obtain high-quality, comprehensive, and timely statistics. It reinforced the findings and recommendations of the various organizations and government agencies that during the 1930's and 1940's had been voicing the same concerns.

The report presented specific findings and recommendations pertaining to the statistical activities of the Federal Government. Many were particularly applicable to public health statistics. Foremost among these was the recommendation that "appropriate divisions of the Public Health Service [will] be responsible for the repetitive collection of natality, mortality, and morbidity statistics (which should be part of a unified collection program) and for specialized research, analysis, and statistical testing in this field."

The report also urged exploration of means of coordinating and unifying the statistical reporting systems of Federal and State governments; recognition of the need for recruitment of high-grade statistical personnel; and close liaison between statistical agencies and respondent and user groups. Bearing on the integrity of health statistics was the recommendation that the functions of fact finding be "clearly distinguished from activities involving the setting of social goals or the promotion of special aid programs."

Public Health Conference on Records and Statistics

The Public Health Conference on Records and Statistics (PHCRS) was established to develop and coordinate registration and statistical practices among State registration areas with the cooperation of the National Office of Vital Statistics. This office had its beginnings in 1935 when the Division of Vital Statistics, then in the Bureau of the Census, was mandated to promote a cooperative system of vital records and vital statistics. With Halbert L. Dunn, M.D., as the principal initiator and organizer, the division began convening annual meetings of State registration executives and Federal representatives to assess registration problems and to develop and promote solutions. These annual work conferences, restricted to a geographically representative committee during the war years, proved fruitful and were continued after the war.

In May 1949, the PHCRS was formally established on a permanent year-round basis as a State-Federal organization sponsored by the National Office of Vital Statistics, which had by then been established in the Public Health Service. This brought together the skills and experience of State registrars, vital statisticians, and public health statisticians in a joint effort with the National Office of Vital Statistics to improve registration of vital events and the statistics derived from the registration records.

The conference carried on much of its work through two committees, one on registration and one on statistics. All members, according to their choice, served on one of these two committees. Each committee was divided into subcommittees as needed to explore and make recommendations on specific subjects. Over the years the committee on registration addressed such issues as confidentiality of records, periodic revision of the standard certificates, a model law, completeness of vital registration, marriage and divorce registration, record linkage, and interchange of nonresident birth and death certificates. Issues addressed by the committee on statistics included national morbidity reporting, multiple causes-of-death tabulations, improvement of medical certification, residence allocation, and fetal death reporting.

From 1958 until his retirement in 1973, Junior K. Knee, Assistant to the Director, NCHS, served as executive secretary of the PHCRS. Under his active leadership, the PHCRS was a strong influence in promoting local-State-Federal cooperation. In addition to working toward increased accuracy and completeness of vital records, he was a strong advocate of balancing the attention given to the essential legal purposes of the documents with that given to their potential to provide information not available elsewhere for analysis of public health problems.

Currently, the PHCRS is a biennial meeting sponsored by NCHS. It focuses on health statistics related to emerging public health issues. Its sessions address data needs and issues related to data quality and integrity, methodological aspects of measuring and evaluating health care needs and services, appropriateness of various measures, improving data reliability and validity, data collection and analytic issues, new developments in information and data handling systems, and other pertinent and timely topics as they arise.

National Association for Public Health Statistics and Information Systems

The National Association for Public Health Statistics and Information Systems (NAPHSIS) was organized in 1933 and was first known as the American Association of State Registration Executives. As described in its 50th anniversary history (1), the stated purpose of the association was "to study and promote all matters relating to the registration of vital statistics." The members were "all persons in active executive charge of the registration of vital statistics in a state department and persons holding similar positions in Canada, Mexico, and Cuba. The Chief Statistician for Vital Statistics of the United States Bureau of the Census shall be a member ex-officio."

The association has undergone several name changes. In 1938 the name was changed to the American Association of State and Provincial Registration Executives. In 1939 it was changed to the American Association of Registration Executives (AARE), and in 1958, the name became the American Association for Vital Records and Public Health Statistics (AAVRPHS). In 1980 it was changed to the Association for Vital Records and Health Statistics (AVRHS). In 1995 the name became the Association for Public Health Statistics and Information Systems (APHSIS) and in 1996, the National Association for Public Health Statistics and Information Systems (NAPHSIS). These later changes reflect the broadening interests of the association.

Similarly, the stated purpose of the association also changed over the years. Until 1950, it continued to be "to study and promote all matters relating to the registration of vital statistics." In 1950, it became "to work for the development and maintenance of sound systems of vital records that can provide the information and services needed in the best interest of the people and their government." In the 1958 revision of the bylaws, the purpose of the association read "to provide opportunity for discussion of and group action on problems and policies involved in the administration of vital records and public health statistics programs in the United States, its territories and possessions, and to serve as an advisory group to the Association of State and Territorial Health Officers for the programs." The last sentence of the purpose was amended in 1982 to read ". . . to serve as an advisory group to the Association of State and Territorial Health Officials (ASTHO) and other organizations for these programs." The 1995 revision of the association bylaws states: "This Association will foster discussion and group action on issues involving public health statistics, public health information systems, and vital records registration. The Association will provide standards and principles for administering public health statistics, public health information systems, and vital records registration. The Association will represent the States and Territories of the United States regarding these issues, and will serve as an advisory group to the Association of State and Territorial Health Officials."

The association also widened eligibility for membership as its interests grew. In 1938 it expanded membership to include "all persons in active executive charge of the registration of vital statistics in State and provincial departments in the United States and Possessions, Canada, Mexico, Cuba, New York City, Baltimore, and Washington, DC." In addition to the Chief Statistician for Vital Statistics of the United States, it included as ex-officio members the assistant statistician and officials holding similar positions in Canada, Mexico, and Cuba. It also provided for life membership for members who served for 20 years as a registration executive. The 20-year requirement was dropped in the 1950 bylaws. In 1946, Boston and New Orleans were added to the list of included independent registration areas.

In 1950 the association established a governing council comprised of the association membership as defined in 1946. The right to hold office, to serve on standing committees, and to chair other committees was limited to members of the governing council. Concurrently, persons professionally engaged in vital records work were eligible for election to membership, and individuals or corporations interested in vital records were eligible for sustaining membership by vote of the executive board. In 1958 sustaining memberships were dropped and an associate membership was established for "persons professionally engaged in vital records or public health statistics programs in State or local health departments."

In 1982 the membership categories included governing council members, associate members, and honorary life members. With the 1995 revision of the association bylaws, different membership categories were established. Agency-designated members include State, territorial, and local health departments or other non-Federal Government agencies; these memberships entitle the designation of up to four salaried staff persons of the organization. Individual memberships may be purchased for additional agency staff, including local health department staff who are professionally engaged in public health statistics and information systems, and affiliate (nonvoting) memberships are open to persons not eligible for voting membership who are interested in furthering improvements to public health statistics and information systems. The right to hold office and to attend special closed sessions for voting members only is limited to agency-designated and individual members. Any member may serve on association committees.

The 1958 revision of the bylaws was preceded by a request of the Association of State and Territorial Health Officers (ASTHO) for an evaluation of the functions and relationships of the American Association of Registration Executives (AARE) and the Public Health Conference on Records and Statistics (PHCRS). As a result of that request, the Joint Committee on Vital Records and Health Statistics was established by the executive committees of the AARE and the PHCRS.

At its first meeting, the joint committee discussed and reached tentative agreement on the aims and objectives of public health records and statistics and how they might be achieved. At subsequent meetings the joint committee drafted proposals for reorganizing the AARE and reconstituting the PHCRS into a study program; submitted the proposals for review by members of the AARE and the PHCRS; and after considering the comments received, prepared and submitted final proposals. This added to the existing cooperation in programs between the PHCRS and the AARE and moved the AARE toward expanding its objectives and membership to include both registration and statistics. The 1958 revised bylaws provided the delineation of objectives and reflected the broadened scope of activities sought by ASTHO.

The association's sphere of interest and influence has continuously expanded. In 1956 at the suggestion of the statistics section of the American Public Health Association (APHA), the AARE joined it in a cooperative relationship that led to such joint activities as co-sponsored sessions at the national APHA annual meetings.

The association continues to be the link between the registration areas and the Federal Government in promoting complete registration of vital records and producing from them uniform, accurate, and useful statistics. It has assumed the special function of representing the collective viewpoint of the registration areas in Federal-State relationships. Its strong influence is felt in all matters pertaining to the collection and dissemination of vital and health statistics at the local, State, and Federal levels. The association, as its current name (National Association for Public Health Statistics and Information Systems) implies, will also be a voice with other professional associations, the Federal Government, and State governments on public health statistics, vital records, and information systems issues.

The association held biennial meetings until 1969, when it began annual meetings. Through 1985, in the years in which the public health conference was held, the association held its meeting at the same location immediately preceding or following the conference, making it possible for its members to attend both. Although this was discontinued, the association continues to hold annual meetings, inviting representatives of various Federal agencies. Since 1989, in alternate years the association's annual meeting has been held jointly with NCHS as part of the Vital Statistics Cooperative Program project directors' meeting. The annual conferences include business meetings as well as training sessions on current technology, public health information systems, vital record practices, and leadership development.

Although NCHS has been the prime Federal agency with which the association interacts, it has expanded its relationships with numerous other agencies, including other components of the Centers for Disease Control and Prevention, the Health Care Financing Administration, the Bureau of the Census, the Bureau of Labor Statistics, the Social Security Administration, and the National Institutes of Health. The association is an affiliate of the Association of State and Territorial Health Officials (ASTHO) and is a member of other professional associations such as the Council of Professional Associations on Federal Statistics (COPAFS).

Developmental activities

The Federal Government, with no express constitutional authority to enact vital statistics legislation of a national scope, depends upon the States to enact laws and regulations that provide methods of registration and data collection comparable from State to State.

To achieve the uniformity required for combining data from all States to provide national statistics, certain standards are recommended by the Federal agency responsible for national vital statistics as guides for use by State registration offices. Foremost among these are a model State vital statistics act, proposed as a guide for formulating legislation pertaining to registration of vital events, and model forms containing specified items of information that not only meet the legal needs of individuals but also provide statistical data in a standardized form comparable from one reporting area to another.

Model Vital Statistics Act

The Bureau of the Census submitted the first model bill to the States in 1907, covering both birth and death registration. It provided for forms to include as a minimum the items recommended by the Bureau of the Census. Numerous revisions of both the model law and the recommended forms have followed. The development, periodic review, and revision of the recommended standards became an essential function in obtaining comparable data from State and local registration offices for producing national vital statistics. Responsibility for this function was transferred from the Bureau of the Census to the U.S. Public Health Service in 1946 and now rests with the Division of Vital Statistics in NCHS.

In response to the expressed needs of State executives and Federal agencies, a new Model State Vital Statistics Act was tentatively approved in 1940 and adopted in 1942 (U.S. Bureau of the Census, 1941). For the first time, the Model Act gave a statutory definition of vital statistics, defining them as "the registration, preparation, transcription, collection, compilation, and preservation of data pertaining to the dynamics of the population, in particular, data pertaining to births, deaths, marital status, and the data and facts incidental thereto." This was the first inclusion of marriages and divorces in the model legislation pertaining to vital statistics. This revision also included the first provision for a standard certificate of stillbirth, discarding the making of a birth and a death certificate to cover a stillbirth. It declared vital statistics records to be public records but restricted the right of public inspection.

The increasing demand for reliable certified copies in the 1940's gave added importance to registration and uniformity in forms and consequently to the Model Act and its recommendations.

The Model State Vital Statistics Act was revised in 1959 (U.S. Department of Health, Education, and Welfare, 1960). This revision was not an abrupt departure from earlier model vital statistics acts but rather one in a series of revisions carried out periodically to keep the Model Act current with changing demands upon State vital records systems.

More substantive changes were made in the Model Act in 1977 (National Center for Health Statistics, 1978). This revision provided for a centralized system in each State for the collection, processing, registration, and certification of vital records in which all vital events are reported directly to the State office of vital statistics. It placed the local offices under the direct control of the State registrar and gave the State registrar the option to direct local offices to perform any of those functions when it was in the interest of efficient and effective service. The 1977 revision also made a significant change in the registration of fetal deaths, changing the reporting instruments to statistical reports to be used only for medical and health purposes, as opposed to permanent official records of the system of vital statistics. Modifications were added to provide for filing birth certificates for foreign-born children adopted by citizens in the State where they are adopted. This revision gave special attention to privacy concerns, confidentiality, and fraudulent use of vital records, and strengthened penalty provisions of the Model Act as a deterrent to illegal use of vital records.

Model State vital statistics regulations were first issued in 1973 (National Center for Health Statistics, 1973). It was recommended that both the Act and regulations be considered when a State modifies its vital statistics statutes. The purpose of the regulations was to augment the Model Act and to standardize many of the administrative practices and procedures in effect in vital statistics offices. Consistency among States in day-to-day administrative procedures has been found to improve the uniformity essential for national statistics. The model regulations have been revised in conjunction with all subsequent revisions of the Model Act.

The 1992 revision of the Model Act and regulations (National Center for Health Statistics, 1994) was undertaken with the intention of producing a practical rather than ideal model and one that most States could adopt with few modifications. The intent was to develop a model that was flexible enough to accommodate new technologies that are sure to evolve for the collection, storage, and retrieval of vital records. The Act specifically allows for the electronic production and transmission of vital records. It also removed the requirements for signatures except where the requirement relates to an affidavit.

Provisions of the Model Act concerned with confidentiality and security of vital records were strengthened. Several issues regarding vital records were addressed for the first time as the result of changes in societal attitudes and practices. For example, guidance is provided on the naming of the father, and in some instances the mother, on birth records involving artificial insemination, in vitro fertilization, and surrogate parenthood.

The Model Act recommends to the States that the integrity of vital records and reports be protected through reasonable control of the use of such records, restricting disclosure of information that can identify a person or institution named in any vital record or report. It further recommends that Federal agencies and researchers who are furnished copies of such records be required to enter into agreements that protect the confidentiality of the information provided. The intent is to encourage legitimate and appropriate use of the records for statistical and administrative purposes, while protecting individuals from an unwarranted invasion of privacy.

U.S. standard certificates and reports

The U.S. standard certificates and reports issued as models for the States and independent registration areas to use in developing their registration forms are reviewed periodically to ensure that they meet their intended uses at the local, State, and national levels. Persons involved in the registration and statistical processes at all levels of government are involved in the review. The opinions of major users of the data are also sought. Revisions are made to reflect changing conditions and user needs. The U.S. standard certificates and reports are currently an integral part of the Vital Statistics Cooperative Program through which NCHS obtains data to produce national vital statistics. They contain the minimum basic data set to meet contract requirements.

There have been 11 issues of the Standard Certificate of Live Birth; 10 of the Standard Certificate of Death (in 1915 the birth certificate but not the death certificate was revised); 7 of the Standard Report of Fetal Death (formerly Stillbirth); 4 of the Standard Certificate of Marriage and the Standard Certificate of Divorce, Dissolution, or Annulment; and 2 of the Standard Report of Induced Termination of Pregnancy.

Most of the additions and deletions from one revision to another resulted from changing perceptions as to the usefulness of the items in question in meeting the increasing needs for information.

Before 1937, birth and death statistics published for States, counties, and cities were by place of occurrence. Beginning with data for 1937, most of the geographic tabulations were changed to place of residence. The need for complete and accurate residence information influenced the redesign of the certificates.

The number of items on the birth certificate increased from 33 in 1900 to 60 in 1989, the most recent revision. In recent revisions, most new items relate to information concerning the pregnancy, delivery, and condition of the child.

Similarly the number of items on the death certificate increased from 42 in 1900 to 71 in 1989. Most of the new items related to the expanded cause-of-death certification introduced in the 1939 revision and to items concerning the nature and circumstances surrounding injuries causing death.

Tables showing the changing content of the various standard certificates from the first through the 1989 revision can be found in appendix I. NCHS published three reports describing in detail the standard certificate revisions of 1968 (2), 1978 (3), and 1989 (4).

U.S. standard certificates of birth, death, and fetal death

In the early years, few changes were made in the content of the U.S. standard certificates of birth and death. For the death certificate, the most noteworthy were the addition of autopsy information in the 1918 revision, provision for information concerning injuries from external causes of death in the 1930 version, and revision of the cause-of-death portion of the certificate in 1939. Also in 1939, the Social Security number and more detailed information on place of residence of the deceased were added.

Early expansion of the birth certificate also was gradual. Prior to the 1930 revision, the certificate contained place of birth, identifying information pertaining to the child, and occupation for both the mother and father. Also included were variations of items concerning number of children born to this mother, now living, now dead, and born dead. In the case of stillbirth (the delivery of a product of conception that does not show evidence of life after the delivery), both a birth and death certificate were required to be filed. In the 1930 revision of the Standard Certificate of Live Birth, items relating to stillbirth were added (period of gestation, cause of stillbirth, and whether before labor or during labor). In 1939 more detailed information concerning residence of the mother was added.

In the 1949 revision, both the death certificate and the birth certificate were reformatted. The section containing the medical certification of cause of death was placed on the lower half of the death certificate and a section labeled “For Medical and Health Use Only” was added to the bottom of the birth certificate. The latter contained the items on length of pregnancy, legitimacy, and an added item on weight at birth. The revised format made possible omission of this personal information from certified copies of the certificates. An item on citizenship of the deceased was added to the death certificate in 1949 but was dropped in 1989. Also added was an item indicating whether the decedent was ever in the U.S. Armed Forces. That item was dropped in 1968 but reinstated in 1978. Although only minor changes were made in the content of the death certificate between 1939 and 1989, substantive revisions were made in the birth certificate.

Beginning with the 1939 revision, the birth certificate became the Standard Certificate of Live Birth, and in 1955 the Certificate of Fetal Death was required for stillbirths. In subsequent revisions, the content of the certificate for fetal deaths followed closely the content of the birth certificate, except for the addition of sections containing cause-of-death and burial information. In the 1978 revision, the title was changed to U.S. Standard Report of Fetal Death to reflect the nature of the document as a statistical report rather than a certificate to be filed permanently.

In 1968 items added to the birth certificate and fetal death report were education of mother and father, date of last live birth and of last fetal death, date last normal menses began, prenatal care, complications related and not related to pregnancy, complications of labor, congenital malformations or anomalies of child (or fetus), and birth injuries to child (or fetus). These items expanded the section containing confidential information for medical and health use only.

In 1978 the Apgar score was added to the confidential section of the birth certificate. On both the birth certificate and the fetal death report, a question on whether the mother was married replaced the item on legitimacy. Also on both, an item for specifying concurrent illnesses or conditions affecting pregnancy replaced the item for complications not related to pregnancy.

In the 1989 revision, major changes were made in the content and format of the live birth certificate and the fetal death report. Both forms were increased in size to make room for detailed medical and health information about the mother and child or fetus. Checkboxes were added for these items to simplify completion of the forms and improve the quality of reporting of information useful in studies of newborns. Checkboxes were also added to both for clarity, to provide specific information concerning the attendant, and on the birth certificate, for information about place of birth and the certifier. It was anticipated that electronic filing of certificates would negate the need for large paper documents.

Among the added items providing medical and health information on both the certificate of live birth and the report of fetal death were items indicating specific complications of labor and/or delivery and specific congenital anomalies of child or fetus. Items were also provided on both to obtain for the first time information on obstetric procedures, risk factors for the pregnancy (medical and other, including maternal use of tobacco and alcohol, and weight gain), method of delivery, and for live births, abnormal conditions of the newborn. Items were added to the fetal death report to indicate the occupation and business or industry in which the mother and father worked during the last year, reflecting interest in the effect on the fetus of work-related environmental exposure. Although not added to the birth certificate, States were encouraged to collect and code these items for births if resources permit. This body of information facilitates analyses of interrelationships among specified risk factors, complications of pregnancy, obstetric procedures, and delivery methods, and fetal and infant mortality.

The certificate of death was also enlarged in the 1989 revision. Additional space was provided for the medical certification section. Space was added for more complete reporting of conditions that describe the chain of events leading to death and of other significant conditions contributing to death. Detailed instructions for selected items, including an example for completing the medical certification, fill the back of the certificate. The three separate alternative certificates introduced in 1968 (one for use by physicians, one for medical examiners or coroners, and one suitable for use by both physicians and medical examiners or coroners), were replaced by one for use by all certifiers. The single certificate is believed adequate to meet the needs of most States and, if required, is easily modified.

An item was added to the death certificate for reporting the decedent's education, useful as an indicator of socioeconomic status and a factor in mortality differentials. Another item was added to indicate whether autopsy findings were used in determining cause of death. The item on manner of death was reworded to include checkboxes. Two items, country of citizenship and name of attending physician if other than certifier, were dropped.

A Hispanic identifier was added for the mother and father on the certificate of live birth and the report of fetal death. It was also added for the decedent on the certificate of death, and for the patient on the report of induced termination of pregnancy.

U.S. standard report of induced termination of pregnancy

In January 1973, the U.S. Supreme Court ruled that the restrictive abortion laws in two States were unconstitutional and that, within the first two trimesters of pregnancy, whether an abortion was to be performed or not was a matter between the woman and her doctor (*Roe* v. *Wade*, 410 U.S. 113 (1973); and *Doe* v. *Bolton*, 410 U.S. 179 (1973)). The net result of the rulings was that induced abortion under these criteria became legal in all States. Because of the impact of abortion on fertility and the need for health and demographic data about these procedures, the need for a uniform reporting system was soon recognized. Data needs and reporting requirements for induced terminations differ from those for spontaneous fetal death. Consequently, separate forms were recommended.

The 1978 version of the U.S. Standard Report of Fetal Death was recommended for the collection of data on spontaneous fetal deaths at 20 weeks of gestation and over. A new form, the U.S. Standard Report of Induced Termination of Pregnancy, was recommended for reporting all induced terminations of pregnancy regardless of length of gestation. Unlike the fetal death report, this form does not include the name of the woman having the abortion. Among the items included on the induced termination of pregnancy form were facility name and location, age of patient, whether married or not, date of pregnancy termination, residence, race, education, previous pregnancies, type of termination procedures, complications of pregnancy termination, date last normal menses began, physician's estimate of gestation, name of attending physician, and name of person completing report. In the 1989 revision, an item on dilation and evacuation was added to the list of termination procedures. The item asking for complications of pregnancy termination was deleted because of underreporting, as most complications are not evident until after the report has been filed.

In 1995 the Division of Reproductive Health in CDC took the lead to revise the list of termination procedures on the Standard Report of Induced Termination of Pregnancy. The impetus for this action was the need for one or more categories to identify medical methods used for terminating a pregnancy.

U.S. standard certificates of marriage and divorce, dissolution of marriage, or annulment

The first Standard Record of Marriage and Standard Record of Divorce or Annulment were recommended to the States for implementation on January 1, 1955. The recommended Standard Record of Marriage included the following information concerning both bride and groom: name, place of residence, date and place of birth, previous marital status (and if previously married, the number of marriages and how the last marriage ended), race, usual occupation, kind of business or industry, signature of applicants, and date signed. Certification information included date and place of marriage, date of recording, and signature and title of officiant.

The recommended Standard Record of Divorce, Dissolution of Marriage, or Annulment included the following information concerning both husband and wife: name, place of residence, date and place of birth, number of marriage being dissolved, race, occupation, and kind of business or industry. Decree information included place and date of marriage being dissolved, number of children under 18, plaintiff, party to whom decree was granted, legal grounds for decree, date of divorce, date of recording, and signature and title of court official.

In the 1968 revision of the standard certificates, the titles of the records were changed to U.S. Standard Certificate of Marriage and U.S. Standard Certificate of Absolute Divorce or Annulment. A section for confidential information was added to both the marriage and the divorce certificates. Items added to the marriage certificate were identification of the officiant as religious or civil, education, and for the previously married, date last marriage ended. Items added to the divorce certificate were approximate date couple separated, name of attorney for plaintiff, number of previous marriages ended by death or divorce or annulment, and the total number of living children as well as the number under 18 years of age.

In the 1978 revision, the heading of the marriage certificate was changed to U.S. Standard License and Certificate of Marriage. The recommendation combined in one form both the license and the certificate in order to reduce the workload and number of forms required of the local official responsible for marriage registration.

Changes made in the content of the 1978 and 1989 revisions of the marriage and divorce certificates were minor. They consisted mainly of changes in terminology to clarify intent of certain items. In 1989 type of ceremony was deleted from the marriage certificate and number of children ever born alive of this marriage was deleted from the divorce certificate. Added to the divorce certificate was an item to indicate the number of children under 18 whose physical custody was awarded to husband, wife, joint husband and wife, or other.

Registration areas

The first birth and death statistics published by the Federal Government for the entire United States were based on information collected during the 1850 decennial census. Similar collections were made during each decennial census up to and including the census of 1900. These reports were inaccurate and incomplete, and it became evident that reliable data could be obtained only from States and large cities that had efficient systems for the registration of these events.

In 1880 the Bureau of the Census established a national “registration area” for deaths. It consisted of two States, Massachusetts and New Jersey, the District of Columbia, and several large cities in nonregistration-area States. Those were the areas that could provide adequate statistics. By 1900 eight additional States had been admitted and the annual collection of mortality statistics for the registration area had begun. Each area had been requested to adopt the recommended death certificate and model law and obtain 90 percent completeness of registration. The registration area gradually increased as more States enacted and enforced laws requiring the registration of deaths. Beginning with 1933, all 48 States and the District of Columbia were included.

It was more difficult to obtain accurate and complete registration of births than it was for deaths. The national birth-registration area was not established until 1915. Admission requirements were similar to those for deaths. The birth-registration area included 10 States and the District of Columbia. As with the death-registration area, all 48 States and the District of Columbia had been admitted by 1933. Alaska was added to both registration areas in 1959 and Hawaii in 1960, the years in which they gained statehood.

The early collections of national marriage and divorce statistics began in 1940. These consisted of numbers or estimated numbers of marriages and divorces collected from each State. Detailed statistics were collected and published for both events for States able to submit transcripts of records or statistical tables from which data could be consolidated.

The marriage-registration area (MRA) was established in 1957. It included 30 States, Alaska, Hawaii, Puerto Rico, and the Virgin Islands. New York, counted as one of the 30 States, excluded New York City. In 1979 the MRA reached its peak and included 42 States, the District of Columbia, Puerto Rico, and the Virgin Islands.

The divorce-registration area (DRA) was established in 1958. It was made up of 16 States and the Virgin Islands. The DRA reached its peak in 1986 and consisted of 31 States, the District of Columbia, and the Virgin Islands.

To be admitted to the marriage- and divorce-registration areas, States were required to establish central State files for collecting copies or abstracts of the records, to adopt a statistical report conforming closely in content to the U.S. standard certificates, to maintain regular and timely reporting to the State office by all local areas in which marriages or divorces are recorded, and to agree to tests of completeness and accuracy in cooperation with NCHS. Registration of events and reporting of required items were expected to be at least 90-percent complete. Three States, Arizona, New Mexico, and Oklahoma, did not have central files of marriage records. The same three States plus Indiana did not have central files of divorce records.

The MRA and DRA, patterned after the registration areas used successfully to promote birth and death registration, were never completed. In 1995 the MRA included 45 registration areas and the DRA included only 33. From 1957 and 1958, respectively, to 1995, NCHS obtained detailed marriage and divorce data from States in the MRA and DRA. However, this program ended with data year 1995, when Federal resource constraints forced NCHS to set priorities for data within the National Vital Statistics System. Although the importance of marriage and divorce data was widely recognized, it was also evident that information could be obtained from other sources, including the Bureau of the Census Current Population Survey. Consequently, NCHS made the decision to reduce the scope of the marriage and divorce components of the National Vital Statistics System, thereby ensuring the continued viability of the remainder of the system. As of January 1, 1996, NCHS began to collect and publish only monthly counts of the marriages and divorces registered in each State.

Improvement of data

Efforts to improve the quality and usefulness of vital statistics began with the first collections of data and are still very much a part of the vital statistics program. They include testing for completeness and accuracy of data, querying incomplete or inconsistent entries on records, updating classifications, improving timeliness and usefulness of data, and keeping pace with evolving technology and changing needs for data.

Tests of birth registration completeness

The completeness of the registration of births was long a subject of concern. Early in the 20th century, States and local areas began investigations into underregistration of births. Some compared records of infant deaths or lists of children in school with birth records. Others sent postal cards to every household (or to a sample of households) in the State, requesting a report as to whether a child had been born during a specified time period. These investigations varied greatly from State to State both in methodology and quality. As a result, their findings could not be combined to provide estimates of underregistration of births for the entire country.

The first birth registration test to provide national estimates of underregistration of births, based on uniform data from all States for the same time period, was carried out in connection with the 1940 decennial census. It was accomplished through the joint efforts of the Bureau of the Census (which then had responsibility not only for taking the census but also for the annual collection of vital statistics data) and the State, territorial, and independent city registration offices. This test gave percent estimates of the completeness of birth registration for the United States, each State, county, and incorporated city or urban place having a population of 10,000 or more in 1940 and that part of each county outside of the cities or urban places of 10,000 or more (5).

A second such test was conducted in connection with the 1950 decennial census under the same auspices, except by then the responsibility for national vital statistics data had been transferred to the Public Health Service and placed in the newly established National Office of Vital Statistics.

In both of these studies, copies of birth certificates obtained from State offices of vital statistics were matched against records obtained from the enumerated population of the respective decennial censuses. Special records prepared by census enumerators for all infants alive on April 1 who had been born during preceding months (4 months for the 1940 test and 3 months for the 1950 test) were matched with copies of birth records for all infants born during the same periods. These matches provided information on how many infants were missed by census enumerators as well as how many births were not registered. They also pinpointed problem areas by State and locality and provided estimates of underregistration by race and whether the birth occurred in or out of a hospital.

A third nationwide study of birth registration completeness was based on a sample of births occurring during the 5 years 1964–68 (6). The actual collection of birth information for this study began in June 1969 and continued through March 1970. The study was carried out by the Bureau of the Census with the cooperation of NCHS and the registration offices of the States and the District of Columbia, and the independent city registration offices. The major objective of this test was to improve the estimates of births used in preparing independent estimates of population. For this purpose the main interest was in national estimates by race, a much less costly undertaking than developing estimates for States and local areas. Two continuing household surveys were used in the study—the Current Population Survey and the Health Interview Survey. The Bureau of the Census is the data collection agent for these surveys, which use national probability samples obtained by trained interviewers. In these surveys, interviewers completed a special record, referred to as a “birth card,” for each child alive at the time of the interview who had been born in the 5-year interval 1964–68. The birth cards were reviewed for completeness of demographic information about the child and for items essential for matching purposes. They were then delivered to the State and city registration offices, where each card was matched with the birth certificate for that child. Extensive followup interviews and additional searching procedures were conducted as required to maximize matches.

Estimates from this test of completeness of birth registration indicate that birth certificates are on file for more than 99 percent of children born during the years 1964–68, an improvement over the estimates for 1950 (98 percent) and 1940 (93 percent).

Query programs for improving birth and death data

In keeping with its role of promoting improved accuracy, timeliness, completeness, and uniformity of data contained in the official records of vital events, NCHS and its predecessor agencies have provided to directors of vital statistics offices guidance and assistance in the development and implementation of query programs.

Over the years querying practices have varied in intensity from State to State and from time to time. Variations included differences in procedures employed to identify problems, proportions of records queried, reasons for queries, timeliness of queries, and results achieved by queries.

Currently, the contract between NCHS and individual States provides for the implementation of query programs. NCHS issues instruction manuals to define the general duties and responsibilities of individuals and institutions involved in the registration process. These manuals provide detailed guidelines for query programs and set forth the principles and procedures essential for complete and accurate registration of vital events.

A separate manual deals exclusively with cause-of-death queries. As part of the registration process, vital statistics offices go back to the certifying physician when additional information is needed to clarify illegible, incomplete, imprecise, or questionable entries; to verify causes attributed to diseases that pose serious threats to the health of others; and to facilitate classification of the causes in a manner that ensures the quality of cause-of-death statistics. The query programs serve not only to improve the quality of mortality data and to emphasize their importance for health and research purposes but also to provide guidance to physicians on proper cause-of-death certification.

The current manuals are *Instruction Manual, Part 18, Guidelines for Implementing Field and Query Programs for Registration of Births and Deaths, Vital Statistics* and *Instruction Manual, Part 20, Cause-of-Death Querying, Vital Statistics, Data Preparation*.

NCHS has also developed handbooks and made them available to the States. The handbooks detail item by item how to complete birth, death, fetal death, marriage, and divorce records. Handbooks for death certificates have been prepared for funeral directors, certifying physicians, and for medical examiners or coroners. The handbooks were developed with input from officials in State and local vital records offices, where the handbooks are widely used.

Current Mortality Sample

During World War II, concern over the threat of epidemics and the possibility of a general decline in national health resulting from wartime living conditions produced an urgent need for up-to-date mortality statistics by cause of death. There were large numbers of young people suddenly brought together and closely quartered in training facilities, overcrowded housing in cities with rapidly growing defense industries and activities, longer working hours, strained hospital facilities, and shortages of physicians. All these conditions offered great potential for severe epidemics of virulent diseases. The wait of a year or more following the years in which the deaths occurred before the annual mortality statistics could be made available was no longer tolerable to public health officials. The Bureau of the Census responded to the challenge by setting up a program for taking a monthly 10-percent sample of all death certificates received in State vital statistics offices. Thus, the Current Mortality Sample (CMS) was established. Theodore D. Woolsey was the leading advocate for the development of the CMS, and W. Edward Deming, Ph.D., was the principal advisor on its implementation (7).

The bureau's sampling program was designed so that certain statistics on mortality could be compiled on a month-to-month basis with as little as a 2-month delay between the month a death occurred and the month it was included in the published statistics. Funeral directors or medical examiner/coroners were required to provide a death certificate to their local registrar in exchange for a burial permit. In turn, the local registrars were required to send the death certificates that they had collected each month to the State central vital statistics office for filing. State offices were then able to send monthly samples of the death certificates to the national office. The monthly shipments of death certificates from the local registrars began to arrive in the State offices about the 10th of each month, and by the 20th, most of them had been received. In the sampling program, every 10th certificate of those received between two dates a month apart was selected, copied, and mailed to the Bureau of the Census on the 25th of the month, this being the month following the month in which most of the deaths occurred. At the time the selection was made, the certificates were usually in order by registration districts, thus providing a good geographic distribution of deaths in the sample.

The first data from this sampling program was published February 5, 1943, in the first CMS report, which contained statistics for the month of November 1942. Comparative data for August, September, and October 1942 were also shown, and variation charts for selected diseases for each month of the preceding year were included.

Monthly mortality statistics based on the 10-percent mortality sample are presently published by NCHS in the *Monthly Vital Statistics Report* (MVSR). Data based on the sample are published 1 month after publication of the monthly provisional national and State counts. The provisional counts are the number of events registered in a State during a 30-day period. Prior to 1991, no attempt was made to adjust the occurrence counts to account for differences between occurrence and resident events. Beginning in 1991, adjustment ratios were applied to each State to obtain estimates for births, deaths, and infant deaths by State of residence. The MVSR currently contains much more detailed statistics and charts than the initial CMS report, with considerably greater lag time between the month a death occurs and the month it is included in the published statistics.

Cause-of-death classification

Causes of death are classified for purposes of statistical tabulation according to the *International Statistical Classification of Diseases, Injuries, and Causes of Death*, published by the World Health Organization. This classification originated as the "Bertillon Classification of Causes of Death," prepared in the late 1800's by Dr. Jacques Bertillon, chairman of the committee charged by the International Statistical Institute with preparation of a classification of causes of death for international use. In 1898 the American Public Health Association (APHA) recommended that the classification be adopted by Canada, Mexico, and the United States and that it be revised every 10 years to keep abreast of advances in medicine. The International Statistical Institute accepted the recommendation for decennial revision, and the first revision was adopted by the United States for use in 1900. To date, there have been 10 revisions of this classification, now known as the *International Classification of Diseases* (ICD). The years for which causes of death in the United States have been classified by each revision are as follows:

Revision	*Years covered*
First	1900–09
Second	1910–20
Third	1921–29
Fourth	1930–38
Fifth	1939–48
Sixth	1949–57
Seventh	1958–67
Eighth	1968–78
Ninth	1979 to date

As of the end of 1995, the 10th revision had not yet been implemented.

Traditionally, a single cause of death has been selected for statistical tabulations. When the certifying physician indicated that more than one cause contributed to the death, a procedure was required for selecting the cause to be tabulated. In the earliest editions of the international list, the concept of joint-cause classification was evident. Certain principles for determining the cause to be tabulated when more than one cause was reported were incorporated as part of the general classification scheme. Application of these principles in the interest of continuity and comparability soon resulted in the establishment of definite relationships among various conditions represented by the rubrics of the international list, indicating which took precedence for tabulation as the cause of death.

The desirability of uniform treatment in selecting the cause of death when more than one cause was reported intensified with the increase in medical knowledge. As diagnostic capabilities improved, multiple causes were reported more frequently. The result was a listing of the established relationships in the *Manual of Joint Causes of Death*, first published in 1914 and revised in 1925 and again in 1933 to conform to successive revisions of the international list. The joint-cause relationship expressed in the 1933 manual remained relatively unchanged until this method of selection was discontinued under the sixth revision of the international list, initiated in 1949.

The Sixth Decennial International Revision Conference agreed that the cause to be tabulated should be the underlying cause of death. It concluded that the most useful statistic for public health purposes is the precipitating cause, that is, the disease or injury that initiated the train of morbid events leading directly to death or the circumstances of the accident or violence which produced the fatal injury.

The sixth revision included a revised International Form of Medical Certificate of Cause of Death. The revised format elicits information from the certifying physician as to the sequence of events leading to death. It provides space for an opinion as to the direct or immediate cause of death, intervening causes, the underlying cause starting the train of events leading to death, and a list of other unrelated but contributing causes. This method of selecting the cause of death for statistical purposes was not adopted either in the United States or internationally until the sixth revision of the ICD was implemented in 1949. The United

States, however, used the revised form during the 1940's prior to dropping use of the joint-cause manual. This made it possible to compare the opinions of physicians and coroners as to cause of death with the preference indicated in the joint-cause manual.

This revised selection procedure, still in effect, places responsibility on the physician for reporting causes of death in such an order that the underlying cause of death is indicated by its position on the certification form. It also makes it incumbent upon the nosologist (a person trained to classify diseases in accordance with an organized list of diseases and injuries) to distinguish between properly and improperly reported sequences and requires classification rules to be applied in such cases.

Comparability studies

Each revision of the international list of causes of death has produced breaks in the comparability of mortality statistics. Over the years efforts have been made to evaluate the effects of the classification changes between revisions. Early attempts were limited in both scope and success.

A new approach to the problem was introduced by Dr. Halbert L. Dunn and William Shackley, in a study of the effect of classification and associated coding-rule changes on death rates, as distinguished from the effects of other factors (Dunn and Shackley, 1944)(8). Among the other factors mentioned in the study were decreased fatality due to particular causes as a result of advances in medical science, increased popularity among physicians of causes brought to the forefront through widely published investigations, and the frequently observed excess mortality from all diseases caused by epidemics of communicable diseases.

In this study of the effects of classification changes, all deaths reported for 1940 were first classified according to then-current methods. For comparison, the same certificates were again classified using methods in effect immediately preceding the introduction of the 1938 revision of the international list.

The study presents percentages that show the extent to which comparability had been lost by each international list cause after the adoption of the 1938 revision. These percentages are presented as "reliable evaluations which will be found useful in correcting 1940 death rates for incomparability due solely to classification changes." The authors point out that the corrections apply strictly to 1940 mortality statistics, and although they apply in a general way to the statistics for the decennial period from 1939 to the time of the next list revision, nonclassification factors may also introduce discontinuities during that period. Consequently, the authors state "it cannot safely be assumed that the same adjustments can be made consecutively for each of those years."

Dunn and Shackley's study provided the basis for the recommendation of the international conference for the sixth revision, which convened in 1948. The conference recommended that deaths occurring in the country in 1949 or in 1950 be coded and tabulated twice for the Detailed List of Causes of Death, once using the classification procedures for the fifth revision and again using the sixth revision. These data were then to be published in such a way as to indicate changes resulting from the new revision. Effective with the sixth revision, the United States has since used this method to measure discontinuities in mortality data resulting from revisions of the ICD.

NCHS has published reports providing estimates of the discontinuities between the fifth and sixth revisions (9), sixth and seventh revisions (10), seventh and eighth revisions (11), and eighth and ninth revisions (12) of the *International Classification of Diseases*.

Ranking causes of death

Reference to the "leading" causes of death is a popular way of discussing cause-of-death statistics. The rank order of any cause depends upon the list of causes being ranked and the method of ranking. For comparing rankings among different geographic areas by characteristics of the population such as age, race, and sex, and from one time period to another, established, consistently applied procedures are essential. A procedure for ranking causes of death for official mortality statistics was developed by a working group on mortality statistics and recommended by the Public Health Conference on Records and Statistics at its 1951 meeting. The procedure stipulated that the "List of 64 Selected Causes of Death" (an expansion of the Abbreviated List of 50 Causes of Death, Sixth Revision, designed for use in the National Office of Vital Statistics) be used and the following rules applied:

- Omit the group titles "Major cardiovascular-renal diseases" and "Diseases of the cardiovascular system" and the single titles "Symptoms, senility and ill-defined conditions" and "All other infective and parasitic diseases"
- Rank the remaining group titles and single titles, omitting any title appearing under a group title included in the ranking
- Apply this procedure to deaths by age, race, and sex, with the exception of deaths under 1 year of age
- In published tables of rank order, indicate the list of causes of death that have been ranked, and the procedure used

Effective with 1969 data, category titles beginning with "other" or "all other" were dropped from the ranking.

This ranking procedure has been used continuously beginning with 1950 data. The list of causes providing the basis for ranking has changed slightly over the years and currently has 72 causes. Effective with data year 1987, the category human immunodeficiency virus infection (HIV infection) was added to the list of rankable causes. Alzheimer's disease was added to the list beginning with data year 1994.

A separate cause-of-death ranking for infants was formalized in 1979 with the introduction of the ninth revision of the ICD. The ranking was based on the List of 61 Selected Causes of Infant Death. The group titles "Certain conditions originating in the perinatal period" and "Symptoms, signs, and ill-defined conditions" are omitted from the ranking. Effective with data year 1987, HIV infection was added to the list of rankable causes of infant deaths also.

Automated mortality data system

In the late 1960's, NCHS gave high priority to the development of automated entry, classification, and retrieval of information reported on death certificates. The system is being developed and implemented by components and is continuously updated to meet new requirements and incorporate advanced technology.

The first component of the mortality data system was the Automated Classification of Medical Entities (ACME). Beginning with 1968 data, NCHS began using ACME for selecting the underlying cause of death, replacing manual selection by a nosologist. This computer system was designed to apply the same rules as those applied by a trained nosologist for selecting the underlying cause of death from the reported medical conditions on the death certificate.

ACME requires the manual coding of each entity (disease, accident, or injury) reported in the medical certification section of the death certificate. From those codes, which retain the location and order as reported by the certifier, the computer program automatically assigns the underlying cause of death for each record according to the selection and modification rules of the applicable revision of the ICD published by the World Health Organization. The decision tables by which the selection is made, developed by experienced nosologists in consultation with medical and classification specialists, introduced a new consistency into the selection process. The tables are updated periodically to reflect new information on the relationships among medical conditions and to convert from one revision to another of the ICD.

The second component of the mortality data system to be implemented was TRANSAX, which was developed (1978–80) to facilitate the tabulation and use of multiple cause-of-death data. TRANSAX translates the axis of classification from an entity to a record basis by accommodating linkages of entities provided for by the ICD. For example, diabetes and acidosis both stated on the record become diabetes with acidosis. A data retrieval system (RETRIEVE) was developed in conjunction with TRANSAX to search the files for a particular disease or injury, making it possible to count the number of deaths for which that condition was reported alone or with other conditions and, if the latter, to identify the conditions and count the number of deaths for which such combinations occurred.

Another development for the mortality data system began in 1985 on the Mortality Medical Indexing, Classification, and Retrieval (MICAR) system. MICAR was designed to replace the manual coding required by ACME. With MICAR, data-entry operators enter full text, abbreviations, or reference numbers for cause-of-death terms on personal computer data-entry screens that are similar to the format of a death certificate. After certificates are keyed, MICAR matches each entry (text, abbreviation, or reference number) to the MICAR dictionary and assigns the entity reference number that is the unique identifier in the dictionary for that cause. Any record with an unmatched term is rejected for manual review.

MICAR makes code assignments to each entity based on the presence or absence of cause-of-death terms and their positional relationship to one another, just as was formerly done manually in preparation for selection of the underlying cause of death by ACME. By automating coding rules, MICAR ensures accurate and consistent application of complex coding rules. It also reduces personnel and training requirements. It provides access to every term reported on the death certificate, even those included with other diseases in one ICD category. This detail was not previously available.

A further improvement now underway is Super MICAR, designed to capture the entire medical certification portion of the death certificate, accepting entry of all terms in the order in which they appear. This eliminates reordering the terms into a standard order at time of entry, leaving that to the computer. Super MICAR not only facilitates the editing, querying, and coding functions, but also provides the potential for printing certified death certificates from the computer.

The various components of the Automated Mortality Data System have been and continue to be implemented on a State-by-State basis as automation capabilities and resources permit.

Electronic registration

With the emergence of automated data-processing capabilities, attention has been directed to automating registration of vital events. In an electronic environment, records should be created, edited, coded, queried, and corrected at the source in an electronic format. To date, most progress has been made in automating birth registration. More than one-half of the States have or are in the process of developing and implementing that capability. For data year 1995, almost 70 percent of all births were registered electronically. Pilot studies are being conducted toward development of an electronic death certificate, but are complicated because demographic information on the decedent and cause of death are obtained from different sources.

Electronic preparation and transmittal of birth certificates not only eliminates duplicate (in some cases triplicate) data entry but also produces more accurate information with greatly reduced need for query. This permits flexibility in shifting resources to use in conducting audits of the quality of data on the certificates. It also greatly improves timeliness of data. Once electronic entry of the cause-of-death certification is achieved, electronic preparation and transmittal of death certificates will produce advantages similar to those for birth certificates.

In September of 1994, a working group was formed by NCHS and NAPHSIS to begin discussions of re-engineering the death-registration system using state-of-the-art technology. The group also included representatives from other components of CDC and other Federal agencies, and users and providers of the data, such as the American Health Information Management Association, American Hospital Association, American Medical Association, International Association of Coroners and Medical Examiners, National Association of Medical Examiners, and the National Funeral Directors Association. The work group was charged with examining the current registration process and practices to determine the best means for meeting the various uses of the vital statistics data in the future.

The guiding principles employed by the work group are that the system that is developed must be (a) capable of adapting to changing technology, information needs, and legal mandates; (b) capable of meeting customer needs for prompt registration and information; (c) capable of providing quality information appropriate for its customers while minimizing the reporting burden on suppliers; (d) acceptable to the individuals, organizations, and institutions who participate in the system; and (e) capable of incorporating methods to measure the reliability and validity of the data collected. The working group will develop recommendations for the design of an electronic system built around these guiding principles. It is anticipated that by the year 2000, electronic death certificate systems will be in place in the majority of the States.

Multiple causes-of-death statistics

The traditional selection of a single cause of death for national statistical tabulations resulted in the loss of valuable medical information. In recognition of this, national coding of more than one cause was undertaken in a few scattered years, the most ambitious being in 1955 when up to five additional causes were coded. In the 1970's, utilizing this source of medical data became a major objective of the vital statistics program. The Automated Mortality Data System was developed to provide not only underlying cause-of-death statistics, but through its TRANSAX and RETRIEVE components, to include the capability to tabulate multiple causes. It is now possible to count the number of deaths for which any given disease or injury was reported as a cause, alone or in combination with other causes. All of the various combinations can also be identified and counted. Data for 1978 were the first national data published from this system. It appeared in MVSR, Volume 32, Number 10, Supplement 2, February 17, 1984.

Race and ethnicity data

Obtaining valid vital statistics for populations of specific race or national origin is complicated by the vast number of possibilities and the uncertainties inherent in providing and obtaining classifiable responses. Only the use of broad categories has proven feasible, but in spite of this, pressure for expanding detail increases. This coincides with increasing interest in information concerning specific ethnic or racial groups.

The birth certificate does not provide for reporting of race of the newborn. Prior to 1989, for statistical purposes, classification of the child's race or national origin was based on the race or national origin of the parents. When both parents were not of the same race or national origin, rules had been established for coding various combinations. If only one parent was white, the child was assigned the race of the other parent. If neither parent was white, the child was assigned the race of the father, with one exception: If either parent was Hawaiian or part-Hawaiian, the child's race was assigned to Hawaiian.

Rules were also established for assigning the child's race when race of the parents was not stated. If race was missing for one parent, the child was assigned the race of the other parent. When race was missing for both parents, the race of the child was considered not stated. Assignment of race for these records has changed over the years. These changes in classification rules have produced differences in statistics for racial categories, relatively small for some categories, greater for others. The size of the differences for racial and national-origin groups is discussed in the technical appendices from the volumes of *Vital Statistics of the United States* for the respective years.

Beginning with 1989 data, natality tabulations were modified to show race of the mother, rather than race of the child. Criteria for reporting race of the parents did not change. The change in tabulation was made because the 1989 revision of the standard certificate of live birth included many new items related to the mother (that is, weight gain during pregnancy, alcohol and tobacco use, medical-risk factors, obstetric procedures, and method of delivery). It was determined to be more appropriate to use the race of the mother in tabulating these items. Many of the other items on the certificate also related to the mother, including age, education, month of pregnancy that prenatal care began, number of prenatal visits, marital status, and date of last live birth.

Growth of the Hispanic population in the United States stimulated interest in obtaining vital statistics information pertaining to that group. During the review process for the 1978 revision of the U.S. standard certificates and reports, organizations interested in Hispanic data requested that an item be added for collecting statistics on the Hispanic-origin population. The Technical Consultant Panel (TCP), appointed by the Public Health Conference on Records and Statistics Standing Committee, was given the task of reviewing the 1968 revisions of the standard certificates and developing drafts of new standard certificates and reports.

The TCP recommended that the five southwestern States with substantial Hispanic minorities (California, Colorado, New Mexico, Arizona, and Texas) develop birth and death statistics for the population of Hispanic origin in their States. It further recommended that the list of Hispanic surnames used in conjunction with the 1980 census be used for this purpose. NCHS and the parent group of the panel agreed with the recommendation.

However, in June of 1976, a joint resolution of Congress (Public Law 94–311) required Federal agencies to begin collecting and publishing data on Americans of Spanish origin or decent. Therefore, although an item on ethnic origin was not added to the certificates in the 1978 revision, NCHS recommended that the five southwestern States and other States having significant Hispanic-origin populations, develop a suitable Hispanic-origin identifier for use on the birth and death certificates. Work began with those States toward that objective. During the 1980's the number of States including a Hispanic identifier on their birth and death certificates steadily increased, and NCHS was able to publish both natality and mortality data for this population.

The 1989 revisions of the live birth, death, fetal death, and induced termination of pregnancy forms include a Hispanic-origin question. In addition, NCHS developed a general ancestry question as an option for those States without enough Hispanic population to justify the specific question or for those that may have a need for data on other segments of their population.

In the 1989 revision of the standard certificates and reports, an item requesting yes or no for Hispanic origin and "if yes, specify" was added for mother and father on the live birth and fetal death forms, for decedent on the death certificate, and for patient on the induced termination of pregnancy form. The Hispanic identifier was not recommended for the marriage and divorce certificates.

Mortality statistics for the Hispanic-origin population were published for the first time for 1984 and included data for 22 States and the District of Columbia. Natality statistics for the Hispanic-origin population were first published with the 1978 data and included 17 States. The 1994 data for the Hispanic-origin population included mortality statistics for 49 States and the District of Columbia and natality statistics for 50 States and the District of Columbia.

Fetal death and induced termination of pregnancy data

NCHS adopted the definition of fetal death recommended in 1950 by the World Health Organization. Fetal death was defined as "death prior to the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy." The World Health Organization recommended that for statistical purposes, fetal deaths be classified as early (less than 20 completed weeks of gestation), intermediate (20 completed weeks of gestation but less than 28), late (28 completed weeks of gestation and over), and gestation period not classifiable as early, intermediate, or late.

Until 1939, the procedure recommended nationally for registering a fetal death required the filing of both a live-birth certificate and a death certificate. In 1939 the filing of a newly implemented standard certificate of stillbirth (fetal death) replaced the previous procedure. This form, undergoing several revisions, later became the U.S. Standard Certificate of Fetal Death and, in 1978, the U.S. Standard Report of Fetal Death.

In 1969 CDC established an abortion surveillance system to obtain and publish data on induced abortions for each State. They have published data continuously since that time and are the only source of national data on induced abortions available from the Federal Government.

The Supreme Court decision of 1973 that made induced abortion legal prompted more intensive efforts to obtain national abortion statistics. In the early 1970's, NCHS began developing a national abortion reporting system similar to the reporting system used for other vital events. The intent was for the data system developed by NCHS to eventually replace the abortion surveillance system in CDC. The abortion-reporting area funded by NCHS gradually expanded, as additional registration areas met reporting criteria and as Federal funding became available. However, less than one-half the States established reporting systems that met the NCHS criteria and funding for this program was very limited. As a consequence, NCHS was able to obtain data from only 15 States. Because the prospects for expanding the system any further were unlikely, funding for the system was discontinued by NCHS after data year 1993.

Linked birth/infant death data

Infant mortality rates are one of the most widely used measures to gauge the overall health of a community. Researchers and public health officials are constantly looking for data to help them better understand the causes of infant deaths and to plan strategies and interventions to reduce the number of deaths. A wealth of additional data can be obtained by linking the birth certificates of infants with their death certificates.

The States have a long history of matching birth and infant death certificates for both statistical and registration purposes. NCHS undertook its first major effort to create a national file of linked birth and infant death records for the birth cohort of 1960. The file was constructed by collecting actual copies of linked birth and death certificates from each of the 50 States and the District of Columbia. Of the nearly 110,000 infant deaths to the 1960 birth cohort, certificates for 97.4 percent were matched to the corresponding birth certificates.

The next national linked data set was created for the birth cohort of 1980 by the Division of Reproductive Health, Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control, in a project called National Infant Mortality Surveillance (NIMS). An important side benefit of the NIMS project was a conference held in May 1986 in Atlanta, Georgia. This conference brought together representatives from State maternal and child health programs and State vital statistics offices to exchange information on data needed to monitor the effectiveness and efficiency of maternal and child health programs.

In 1985 NCHS initiated a two-stage evaluation project to determine the feasibility of creating linked birth and infant death files on a routine, annual basis as part of the Vital Statistics Cooperative Program (VSCP). In stage one, a linked file was produced for the 1982 birth cohort of infant deaths that occurred in a nine-State area. A match rate of 96.7 percent was achieved in this pilot, which demonstrated the feasibility of creating the linked file on a routine basis.

In stage two of the evaluation project, State and national linked files for each of the birth cohorts of 1983–86 were created and evaluated with data from all States included. Because of the success of the evaluation project, the provision of the linked birth/infant death file to NCHS was added to State VSCP contracts beginning with the 1987 birth cohort.

Beginning with data year 1995, a significant change was made in the way States provided the linked data to NCHS. Rather than providing the linked information as a birth cohort, they provided it on a period basis, based on the year of death of the infant, not the year of birth. This change will have a major impact on the timeliness of the release of data from the linked file. It will also allow for the release of the linked data set both as a period and birth cohort file, making it even more useful. The development of the linked file has proven to be an invaluable tool in the ongoing struggle to reduce the infant mortality rate.

Training

The Applied Statistics Training Institute (ASTI) was established in 1967 as part of the Office of State Services in NCHS. The short-term training courses were designed to meet the needs of State and local vital and health statistics personnel for concentrated training in practical aspects of health statistics. A workshop on cause-of-death coding was included in the training curriculum. In the first year, more than 100 experienced coders from 35 States were trained in the eighth revision of the ICD.

NCHS provided leadership in the training of public health statisticians through the ASTI program through 1982, when the program was discontinued because of budget restraints.

The Division of Vital Statistics assumed the responsibility to continue training State vital statistics personnel in vital registration methods and statistics. Because the division had worked closely with State and local vital statistics offices in improving timeliness, completeness, and quality of the data, it was logical for DVS to teach the courses being abolished by the dissolution of ASTI. Beginning in 1983, DVS offered two classes: "Vital Statistics Records and Their Administration," which focuses on matters related to the vital registration system, and "Vital Statistics: Measurement and Production," which is a basic vital statistics course with emphasis on measurement and data quality. DVS has continued to offer these courses to State and local personnel annually. Equally important was the continuation of nosology classes that focused on medical coding. The Division of Data Processing assumed the responsibility for these courses and has held them annually since 1983.

A comprehensive disease prevention and health promotion initiative, Healthy People 2000, produced an increase in demand for public health statistics and an increased need for training. As a result, in 1991 steps were taken to reestablish the ASTI program. A series of short-term courses was developed for working public health professionals to guide in setting and evaluating health objectives for the year 2000. Now an ongoing program, ASTI offers courses that focus on current public health concerns. The goals set forth are: to train health professionals in the use of statistical tools; to apply statistical methods in assessing public health problems; to provide early training relevant to statistical requirements of current health legislation and directives; to provide training in effective decision making employing statistical models; and to improve techniques of data collection, analysis, and utilization.

Special projects

Special projects conducted by NCHS have made important contributions in the realm of vital and health statistics. These projects include tests of registration completeness; revisions of the U.S. standard certificates and reports; studies of the effect of the decennial revisions of the ICD on the comparability of cause-of-death statistics; and analyses of natality, mortality, and other vital statistics for presentation to various medical, health, and other associations.

Two unique projects were undertaken by NCHS during the 1960's that contributed substantially to the body of published vital and health statistics and analyses. One was a volume containing vital statistics rates for a 20-year period (1940–60) on mortality, natality, marriage, divorce, and life expectancy. The other involved technical coordinating services and data production for a monograph series focusing on the major health problems of the Nation.

Vital statistics rates in the United States: 1940–60

The volume *Vital Statistics Rates in the United States, 1940–60* (13), coauthored by Robert D. Grove, Ph.D., and Alice M. Hetzel, brings forward to 1960 the basic mortality and natality data included in the previously published volume, authored by Forrest E. Linder, Ph.D., and Robert D. Grove, Ph.D., covering the period 1900–40 (14). It also provides statistics on life expectancy, marriages, and divorces, which were not covered in the earlier volume. This work shows some of the basic series back to the earliest year for which data are available. Population data from the Bureau of the Census used in the computation of rates are also included. The text provides a description of the vital statistics system, definitions and uses of vital statistics rates and ratios, qualifications of the data, and charts summarizing trends for selective vital statistics series. In 1996 a new volume was being compiled titled *Vital Statistics Rates in the United States: 1969–93*.

Vital and health statistics monographs, 1959–61

In the early 1960's, the American Public Health Association sponsored a monograph series to present an indepth study of vital and health statistics. The study was proposed in October 1958 by the statistics section of the APHA. As chairman of the Committee on Vital and Health Statistics Monographs, Mortimer Spiegelman, associate statistician of the Metropolitan Life Insurance Company, spearheaded the proposal and became principal investigator for the project. The committee selected the topics to be covered by the series and suggested authors for the monographs. Conferences were held with authors to establish general guidelines for the preparation of the manuscripts.

Support for this undertaking in its preliminary stages was received from the Rockefeller Foundation, the Milbank Memorial Fund, and the Health Information Foundation. Major support for the required tabulations, for writing and editorial work, and for the related research of the monograph authors was provided by the Public Health Service (Research Grant HS 00572, formerly CH 00075, and originally GM 08262).

This study was initiated in response to an increasing awareness both inside and outside of the Government of the need for information defining the major health problems of the Nation. The study was designed to present critical analyses not only of current vital statistics and health data but also of trends as indicated by data collected over the years. The study was timed to utilize the extensive population data from the 1960 census for computation of rates by various characteristics of the population. The monographs were expected to provide information useful for program and research planning and for educational and general information purposes. First conceptualized as a monograph series based on 3 years of death statistics centered around the 1960 census, the project was soon broadened to include pertinent findings from special surveys and studies of social and economic factors not only in mortality but in morbidity and fertility as well.

Under the leadership of Robert D. Grove, Ph.D., National Office of Vital Statistics, NCHS, and a member of the Committee on Vital and Health Statistics Monographs, NCHS produced special detailed tabulations and computations for the 1959–61 period and performed technical coordinating services for the project. NCHS provided data collected through the vital registration system, obtained population data from the Bureau of the Census for the rate computations, and provided guidance to keep the results consistent with official national figures. Other major sources of statistical data included the National Health Survey and the University of Chicago study of social and economic differentials in mortality based on a matched file of 1960 census records and death certificates.

To achieve some comparability among monographs, a standard set of mortality tabulations was produced for each, using the same classifications for selected characteristics. In general, monograph authors were able to obtain additional tabulations and rate computations of their choosing from available data without need to conform to a uniform pattern.

The *Vital and Health Statistics Monographs, 1959–61,* were published by Harvard University Press, Cambridge, Massachusetts. Titles and authors are as follows:

- *Infant, Perinatal, Maternal, and Childhood Mortality in the United States*, by Sam Shapiro, Edward R. Schlesenger, and Robert E.L. Nesbitt, Jr.
- *Trends and Variations in Fertility in the United States*, by Clyde V. Kiser, Wilson H. Grabill, and Arthur A. Campbell
- *The Epidemiology of Oral Health*, by Walter J. Pelton, John B. Dunbar, Russell S. McMillan, Palmi Moller, and Albert E. Wolff
- *Cardiovascular Diseases in the United States*, by Iwao Moriyama, Dean E. Krueger, and Jeremiah Stamler
- *Digestive Diseases*, by Albert Mendeloff and James P. Dunn
- *The Frequency of Rheumatic Diseases*, by Sidney Cobb, M.D.
- *Tuberculosis*, by Anthony M. Lowell, Lydia B. Edwards, and Carroll E. Palmer
- *Marriage and Divorce: A Social and Economic Study*, by Hugh Carter and Paul C. Glick
- *Infectious Diseases*, by Carl Calvin Dauer, Robert F. Korns, and Leonard M. Schuman
- *Mortality and Morbidity in the United States*, by Carl L. Erhardt and Joyce E. Berlin
- *Accidents and Homicide*, by Albert P. Iskrant and Paul V. Joliet
- *Differential Mortality in the United States: A Study in Socioeconomic Epidemiology*, by Evelyn M. Kitagawa and Philip M. Hauser
- *Epidemiology of Neurologic and Sense Organ Disorders*, by Leonard T. Kurland, John F. Kurtzke, and Irving D. Goldberg
- *Cancer in the United States*, by Abraham M. Lilienfeld, Morton L. Levin, and Irving I. Kessler
- *Mental Disorders/Suicide*, by Morton Kramer, Earl S. Pollock, Richard W. Redick, and Ben Z. Locke
- *Syphilis and Other Venereal Diseases*, by William J. Brown, James F. Donohue, Norman W. Axnick, Joseph H. Blount, Neal W. Ewen, and Oscar G. Jones

Cooperative developments

Vital statistics component of the Cooperative Health Statistics System

The Cooperative Health Statistics System (CHSS) was formally established by the Health Services Research, Health Statistics, and Health Care Technology Act of 1978 (Public Law 95–623). The stated purpose was the production of “comparable and uniform health information and statistics.” Vital statistics, included as one of seven components, provided the nucleus of the system. It received high priority for inclusion in the system because of its importance in providing population-based information essential in identifying health and social problems. It also had a long history of successfully obtaining data through a Federal-State cooperative arrangement.

Considerable departmental and legislative activity preceded formalization of the CHSS. Soon after NCHS was established to coordinate activities in the field of national health statistics, there was an increased awareness of the potential for broadening Federal-State cooperative activities to include a variety of health statistics.

During the late 1960’s and early 1970’s, references to a cooperative health statistics system occurred frequently in departmental memoranda, in testimonies at hearings before House and Senate Committees, and in various pieces of legislation. The first steps toward the development of a cooperative health information and statistics system were authorized by the Health Services Improvement Act of 1970. It authorized the Secretary of the Department of Health, Education, and Welfare “to undertake research, development, demonstration, and evaluation relating to the design and implementation of a cooperative system for producing comparable and uniform health information and statistics at the Federal, State, and local levels.” Funds for this effort were appropriated to the National Center for Health Services Research and Development. Under this authorization, collection of vital statistics data through this arrangement began in 1973. The ongoing national vital statistics program, already operating through the cooperative efforts of Federal, State and local governments, was the first component funded under this act.

The cooperative system was envisioned as a system that would use standard definitions, standard measurements for quality, and standard methods for collecting, processing, and analyzing health statistics. Data originating at the local level would be produced in content and form for use not only at the local level but at the State and Federal levels as well. Through elimination of duplicative efforts, more efficient use of resources and equitable cost-sharing, data of greater detail and better quality would be available to all levels of government.

The vital statistics program already embodied the basic principles of the proposed CHSS. The records were being produced by local officials, sent to the State offices of vital statistics for permanent maintenance in central State files, and for use in compiling and publishing statistics for State and local areas. The State offices forwarded copies of the records to NCHS, where data were edited, coded, tabulated, and published for the Nation.

These procedures began to change in 1971, as NCHS began to accept magnetic tapes of State-coded data, coded according to NCHS specifications. NCHS was providing leadership not only in promoting uniformity in form and content of vital records and registration laws but also in developing new methods for data collection, processing, and dissemination. The birth and death statistics constituted the only series of annual health statistics that covered all events from all jurisdictions in a uniform manner according to specified standards. Although the framework existed, however, there was a recognized compelling need to accelerate improvement of the quality and uniformity of data, to modernize collection and processing methods, to eliminate State-Federal duplication, and to establish an equitable cost-sharing mechanism.

The vital statistics component of the CHSS involved six data sets or subcomponents: births; demographic data for deaths; medical (cause-of-death) data for deaths; marriages; divorces; and abortions. By 1973 six States had already entered into contracts with the Division of Vital Statistics of NCHS to provide computer tapes of birth and demographic death data under the Vital Statistics Cooperative Program (VSCP). Throughout the early developmental period, available funds were insufficient to bring into the VSCP all States technically ready and interested in a contract. Some States provided tapes to NCHS prior to availability of funding. Contracts were negotiated with additional States subject not only to technical readiness but to availability of funds. Funding birth and demographic death data in non-VSCP States was given priority over extending subcomponent coverage in States already in the program. Several States, however, were technically able to and did include cause-of-death data in their first contract.

Beginning in 1971 with the State of Florida (unfunded), the number of States submitting one or more subcomponents of data to NCHS on computer tape steadily expanded as funding became available. By the 1985 data year, all States, the District of Columbia, New York City, Puerto Rico, and the Virgin Islands were submitting birth data and demographic death data on tape. In 1995, 42 States and the District of Columbia were submitting medical death data on tape.

Prior to implementation of the VSCP, the Federal Government reimbursed the States for use of their vital records for national statistics at the rate of 4 cents per record. The first VSCP contracts were negotiated individually with the participating States. It soon became evident that equitable funding among the States required development of a rationale for cost sharing that could be applied to all States.

In January 1981, Dorothy P. Rice, then director of NCHS, established a working group on the completion of the VSCP. The working group was made up of NCHS staff members appointed by the NCHS director and State representatives appointed by the president of the Association for Vital Records and Health Statistics (AVRHS). The group served as a forum in the joint effort of NCHS and AVRHS to define the State/local activities involved in producing vital statistics for use at all levels of government, the cost of those activities, and a rationale for determining the Federal share of that cost. Development of standardized funding criteria to ensure equitable funding among States, and simplification of the contracting process for the VSCP contracts were also major concerns.

The working group constructed a model for standardizing funding among States in terms of in-scope activities and levels of effort. The model provided for a cost formula limited to the accepted level of effort necessary to carry out the in-scope functions of the vital statistics contracts. The working group recommended that implementation of the formula be phased in over a 3-year period beginning with fiscal year (FY) 1983, and that after sufficient experience, the formula be reevaluated and revised if necessary.

In May 1986, Dr. Manning Feinleib, then director of NCHS, established a working group to review the VSCP cost formula and to develop recommendations concerning revision. As with the previous working group, membership was made up of representatives from NCHS and AVRHS.

The working group recommended updating the cost formula, eliminating reference to the “Federal share” in favor of a funding level derived from a base level with annual cost-of-living adjustments (COLA’s). For FY 1989, funding was to be established at the FY 1988 level plus a 4.9-percent COLA, with additions for the cost of collecting and processing new items of data. In succeeding years funding would be established by adding a COLA to the previous year’s level. Additional funds would be provided for implementation of new components. Reduction in the scope of a program would be required to offset any reductions in funding. Full funding to a State would be dependent on the reporting of all minimum basic data-set items. The fee for procurement of photocopies or microfilm copies of records would be increased from 4 cents to 10 cents per image.

In the fall of 1992, Dr. Feinleib established the second working group to review the VSCP cost formula. This working group was charged with reviewing the experience of the last 5 years to evaluate the adequacy of the current formula to (a) adequately and fairly distribute funds among States and (b) assure its relevancy to the current and future operations of the VSCP. Membership again was made up of representatives from NCHS and AVRHS. The 1992 working group recommended that no changes be made in the elements used in the formula to determine the distribution of funds. They also recommended that the 1993 contracts be extended through 1994 and new contracts be written for 1995–99 data. Data on staffing and salaries were collected in 1995 for use throughout the 1995–99 contract period, with annual adjustments for cost of living. In previous contracts, staffing and salary information had been obtained on an annual basis. The committee also discussed the need to modify the formula to reflect automated birth and death systems under development in the States. However, because not all States were at the same point in the development of these systems, the working group recommended that no changes related to automation be made in the formula at this time. NCHS and AVRHS agreed to develop appropriate cost and staffing models to reflect an automated vital record system prior to the next VSCP formula revision.

The working group also discussed ways to encourage timeliness, at both the State and national levels. The new cost formula recommended that States provide data to NCHS as soon as they are received and initially processed, rather than waiting until all quality control is completed. Updated records were to be transmitted as amendments were processed. This would allow NCHS to process and release the data more rapidly.

The working group agreed that in addition to an annual release, data should be published and disseminated on a "flow" basis as they become available. The NCHS current-flow publication plans are discussed in this report under "Vital Statistics in the 21st Century: A Vision for the Future." Thus, the 1995–99 contract set the stage for moving the vital statistics system toward automation, improved timeliness, and new data-release products.

State centers for health statistics

The concept of State centers for health statistics originated in the 1970's under the CHSS. They were to be semi-autonomous organizations housed primarily in State health agencies that would collect and analyze the major health data bases and be a resource for statistical analysis and consultation. During the late 1970's and the 1980's, efforts were made to obtain official State designation for these centers, either through legislation or executive order. In 1980, the Public Health Service developed proposed guidelines for the characteristics, authority, statistical mission, and functions of the State centers. These guidelines were published in the *Federal Register* (July 22, 1980). However, the guidelines were not adopted as regulations by the Public Health Service, although they have served as a model for some States to follow in setting up a comprehensive health statistics program.

All 50 States and the District of Columbia have designated State centers for health statistics, but with varying results. State centers have diverse capabilities, ranges of authority, and placements within State government. Although in most States the center is a part of the health agency, in some the center is located in a human resources agency, or in one case, in the budget and control board. In a few States, the State center plays a major role in the development of information needed for assessment, policy development, and assurance. There are also a number of State centers whose function is limited to the tabulation and analysis of vital statistics.

Supplemental data sources

A number of special data-production activities have been undertaken as part of the vital statistics program. They include follow-back surveys and the National Survey of Family Growth (NSFG), conducted to augment vital records data, and the National Death Index (NDI) established in 1981 as a central source of information to aid researchers.

Follow-back surveys

In the mid-1950's the National Office of Vital Statistics in collaboration with other agencies began conducting studies anchored to vital records. The studies were undertaken with the cooperation of the health departments of the vital registration areas. The health departments approved the studies, authorized the use of vital records in the studies, and when appropriate, cleared the studies with the State medical societies. The vital record was the basic sampling unit. The total file of vital records for the given event during the given period was the sampling frame. Supplementary information about each event was collected from sources of information identified on the certificate. The sample figures were inflated to provide unbiased estimates for the universe from which the sample was selected.

These surveys served as pilot tests for developing survey methodology for collection of national morbidity, mortality, and medical care data and related socioeconomic differentials. They include the following:

- The National Lung Cancer Mortality Study (National Cancer Institute, 1956–57) served as a pilot test for the National Lung Cancer Study conducted later

- The Illness Study of Deceased Persons in the Middle Atlantic States (National Health Survey Program, 1957–58)
- The National Lung Cancer Mortality Study (National Cancer Institute, 1958–60)
- The Illinois Bone Tumor Mortality Study (Argonne National Laboratory, 1958–60)
- The National Study of Socioeconomic Differentials in Mortality (University of Chicago, 1960)
- The National Survey of Hospitalization in the Last Year of Life (National Health Survey Program, 1961)

The National Mortality Surveys were conducted annually from 1961 through 1968 and in 1986 and 1993. The early surveys of the 1960's include information on hospitalization, diagnoses, operations performed, income, education, health insurance, charges for hospital care and surgery, and smoking habits of the deceased. Both the 1986 and 1993 surveys include additional information on the access to and use of health care services during the last year of life, the amount paid for health care by the decedent, the source of other health care payments made on behalf of the deceased, and the household composition, disability, comorbid conditions, cognitive functioning, drinking habits, and socioeconomic status of the deceased.

The 1986 survey also includes information on the deceased's usual intake of specific food groups, use of birth control, sterilization, and history of heart attack among the deceased's parents and siblings. Hospital records for the deceased provide information on diagnostic and surgical procedures performed during the last year of life.

The 1993 survey expands upon the earlier surveys by including additional information on the deceased's use of assistive devices, medical devices implanted or used while living at home, motor vehicle driving behavior, use of drugs, access to firearms at home, organ donorship, behavior and lifestyle-related activities, place of death, and circumstances surrounding injury-related deaths. For unintentional and intentional injury-related deaths, additional information collected from medical examiner or coroner records includes events leading to the death, autopsy results, and toxicological findings.

The National Infant Mortality Surveys were conducted annually from 1964 through 1966. They include information about other children of the mother, household composition, income, employment of mother, education of mother and father, and health insurance.

The National Natality Surveys were conducted annually from 1963 through 1969 and in 1972 and 1980. They include information on medical and dental care and radiological treatment of the mother, parental education, type and length of parental employment, family income, pregnancy history, expectations of having more children, household composition, number and date of marriage(s), health insurance, breast feeding, previous pregnancies, religious preference of husband and wife, health status of mother and infant, whether pregnancy was wanted, and whether mother had an operation to prevent future pregnancies. The 1980 survey included fetal mortality and items on alcohol consumption, electronic fetal monitoring, amniocentesis, and ethnicity.

The National Maternal and Infant Health Survey was a nationally representative follow-back study of women who had reproductive events in 1988. The sample was drawn from the 1988 live birth, fetal death, and infant death vital records from each registration area. It included women who had live births, women who suffered an infant death, and women who had a fetal loss. It provided data on the relationship of such antenatal factors as prenatal care health services, smoking, and use of alcohol and drugs, to adverse outcomes such as fetal loss, low birthweight, and infant death. Prior to the 1988 study, many States excluded out-of-wedlock births from their sample, but because of favorable pretest results, most States included them in the 1988 sample.

A longitudinal followup survey was conducted in 1991, in which mothers from the 1988 National Maternal and Infant Health Survey and their children's medical providers were recontacted to update health histories of mother and child and provide information on such subjects as child injuries, child safety, child care and development, parental employment patterns, use of Federal assistance programs, health insurance, use of pediatric services, and subsequent fertility.

National Survey of Family Growth

The National Survey of Family Growth (NSFG) was established in response to a well-recognized need for information that could be used to develop, manage, and evaluate Federally supported programs related to family planning, childbearing, and maternal and infant health, and to aid in refining population projections. In the late 1960's, NCHS took the initiative to develop an interview survey as one of its ongoing systems in the vital statistics program. It drew upon the expertise of participants in the successful series of privately conducted national fertility surveys—the Growth of American Families Surveys in 1955 and 1960 and the National Fertility Studies in 1965 and 1970.

The NSFG supplements information from the regular data collection programs of NCHS and the Bureau of the Census. In addition to providing deeper explanatory data on birth trends (contraceptions, wanting of pregnancies, and socioeconomic data), it provides data to expand various aspects of vital statistics, including fetal mortality (regardless of gestation), estimates of total annual pregnancies, and family formation and stability. It also provides data on infertility, a critical factor in population replacement as well as an important area of reproductive health.

The need for such data was stated in the "Report of the Secretary of Health, Education, and Welfare Submitting Five-Year Plan for Family Planning Services and Population Research Programs," October 12, 1971, prepared for the Special Subcommittee on Human Resources of the Senate Committee on Labor and Public Welfare. In that document the ongoing efforts of NCHS were recognized, and plans for developing a National Survey of Family Growth by NCHS were set forth.

The Commission on Population Growth and the American Future, in its March 1977 report, gave a strong supporting recommendation for ". . . program support and continued adequate financial support for the Family Growth Survey as almost the first condition for evaluating the effectiveness of national population policies and programs."

The NSFG is now an integral part of the NCHS data-collection systems. Differing from the center's other population-based surveys, it targets a particular aspect of the health experience of a particular segment of the total population, that is, the reproductive histories of women of childbearing ages. It yields data interrelated with other research studies of health and health services. As a result, it has been and continues to be a collaborative undertaking between NCHS and other Federal agencies.

Data for the NSFG are collected in personal interviews using nationwide cross-sectional probability samples of women in the childbearing ages. In cycles I and II of the NSFG, conducted in 1973 and 1976, the sample included women 15–44 years of age who had ever been married or, if they had never been married, had children of their own living with them. Cycle III, conducted in 1982, was expanded to include all women 15–44 years of age, bringing important new information into the survey. Cycle IV, conducted in 1988, linked the NSFG to the National Health Interview Survey (NHIS), a continuing survey conducted every week of every year. The NSFG was the first survey successfully linked to the NHIS in the center's newly developed integrated survey design.

The beginning and early development of the NSFG in the vital statistics system are documented in reports of the U.S. National Committee on Vital and Health Statistics published by NCHS in *Vital and Health Statistics*, Series 4. The survey and sampling designs of the NSFG cycles appear in *Vital and Health Statistics* Series 2, and statistics derived from the surveys are published in Series 23.

National Death Index

Over the years death records have been a fruitful source of information for researchers in the field of medicine. Increasing awareness of the many and varied influences on the length and quality of life has accelerated their use. Death records are utilized in studies to identify and assess environmental health hazards, the effects of specific therapies, the influence of various health programs, and risk factors such as those inherent in some chemicals, drugs, and consumer products. Without a national source for information on fact of death and location of the death record, obtaining access to death records for studies can be a cumbersome process. It can require searches of all of the individual State vital statistics offices for each sought-after record, unless the researcher knows the registration area in which the death occurred. A single source for determining whether or not an individual has died and, if so, the location of the death record greatly facilitates such research in terms of time, money, and effort.

This need for a central source of mortality information for use in medical and health research led to implementation of a national death index in 1981. Leading up to this, in 1964 and again in the early 1970's, a study group was established under the auspices of the Public Health Conference on Records and Statistics to explore the feasibility and means of establishing such a source. Both study groups recommended a national system for locating death certificates that would enable medical and health investigators to ascertain at one central source the fact of and/or place of death for individuals in their studies.

Delay in implementing the recommendations of the study groups was largely the result of concern that once established, there would be pressure to use the system for other than its intended statistical purposes in medical and health research. Until the legality of the restrictions imposed by the participating States could be assured, NCHS was reluctant to undertake responsibility for establishing a national death clearance system. Interest of research groups increased, however, and early in 1976 more intensive discussions began between NCHS and the AAVRPHS executive committee.

In August of 1976, the Office of the General Counsel of the Department of Health, Education, and Welfare rendered the opinion that NCHS could legally limit access to information from a national death index on the basis of its confidentiality legislation in Section 308 (d) of the Public Health Service Act, 42 U.S.C. 242 m. In February 1977, in light of that opinion and after discussions with the executive committee of AAVRPHS, the director of NCHS established a working group to develop plans and procedures for the implementation of a national death index. On August 31, 1978, the working group submitted its final report to the director. As the working group recommended, the index was implemented beginning with 1979 deaths. The first year 46 registration areas participated. A computerized uniform standard data set has since been collected annually from all registration areas. The system, which may be used only for statistical purposes in health and medical research, became available to researchers in January 1981.

All applications for use of the NDI are reviewed by drawing on the expertise of individuals from State vital statistics offices, NCHS staff, and user groups such as the National Institutes of Health, the National Institute for Occupational Safety and Health, medical schools, and private industry. When approved, applicants are instructed to submit their records of study subjects on magnetic tape, floppy disks, or coding sheets. Users of the NDI are required to provide certain minimum information to access the index (that is, first and last name and either a Social Security number or month and year of birth). The provision of additional data items is useful in assessing the quality of the resulting NDI record matches: middle initial, father's surname, day of birth, sex, race, marital status, State of residence, and State of birth.

Once the NDI search is completed, the user is provided with the State and date of death for each possible NDI record match and the corresponding State death certificate number as it appears in the index. The user must then contact the appropriate States and purchase copies of the death certificates to obtain additional information such as cause of death. Although States submit their death records to the Federal office for statistical compilation, analysis, and publication, they reserve the right to respond to all inquiries concerning individuals and to require additional information and confidentiality assurances from the NDI users.

To enhance the services provided to researchers, the NDI program initiated a pilot study in 1995 to determine the feasibility of also providing the coded causes of death to NDI users. NCHS and the National Association for Public Health Statistics and Information Systems (NAPHSIS) are currently evaluating the pilot results. If the pilot leads to a general implementation, NDI users will have the option of obtaining coded causes of death for selected potential matches as part of their NDI output.

As of September 30, 1995, the NDI file contained more than 35 million death records for the years 1979–94. The NDI had assisted 578 research projects by performing 1,551 NDI file searches involving 18.2 million records of study subjects.

Availability of vital statistics data

Vital statistics data are made available to the public in various forms, such as published volumes and reports, special tabulations, and more recently, electronic data products. The latter currently include public use data tapes and CD-ROM disks with the Statistical Export and Tabulation System (SETS) designer kit. Made available through these outlets are counts of events, presentations of rates, ratios, actuarial data, analyses, and discussions of quality, reliability, and methodology. Data obtained by the National Natality, Mortality, and Maternal and Infant Health Surveys are made available in similar forms, as are data from the National Survey of Family Growth.

Publications

Vital Statistics of the United States , bound annual volumes that are distributed to many libraries for use by the public, have been published routinely, beginning with 1937 data and continuing to the present time. They contain numerous tables of detailed vital statistics and technical appendices explaining the sources and qualifications of the data.

Monthly Vital Statistics Report, a report of monthly provisional vital statistics, contains monthly and year-to-date statistics with comparative data for the preceding year. Supplements to the MVSR present annual summaries of provisional data and of final data when they become available.

Vital and Health Statistics, intermittent series reports presenting data, analyses, and information on a wide variety of topics related to NCHS activities, include many reports emanating from the vital statistics program.

Public-use data tapes

Beginning with data for 1968, electronic data tapes are available for purchase containing natality, fetal death, marriage, and divorce statistics, as well as demographic, underlying-cause, and multiple-cause mortality statistics. Also available are data tapes of the linked files of live births and infant deaths beginning with data for the 1983 birth cohort, and of the national follow-back surveys and the National Survey of Family Growth. Measures are taken to protect the confidentiality of individuals and prevent inadvertent disclosure of confidential information. Public-use data tapes accelerate and enhance the availability of data to researchers and allow them to aggregate findings in a format appropriate for their analyses. The public-use data tapes are purchased from the National Technical Information Service.

CD-ROM with SETS

Linked files of live births and infant deaths for the birth cohorts of 1985, 1986, 1987, and 1988 have been produced on CD-ROM using SETS. CD-ROM's are also expected to be available in 1996 for the 1989 through 1991 linked files, for the 1991 fetal death and multiple cause-of-death files, and for the 1992 natality file. In 1995, the 1991 telephone reinterview of respondents in cycle IV of the National Survey of Family Growth was made available on CD-ROM using SETS, and in early 1996, the 1991 longitudinal followup to the 1988 National Maternal and Infant Health Survey was also issued on CD-ROM.

In 1996, a project was initiated to produce a CD-ROM that would enable users to derive frequencies, percentages, and rates for deaths in the United States for the data years 1969–93. This CD-ROM, also formatted and indexed using SETS, would include aggregate numbers for selected variables (age, race, sex, county and State of residence, year of event, and cause of death for decedents), and thus it would be different from the other CD-ROM's just described, which contain individual respondent records. Also being planned was a similar CD-ROM for aggregate natality data to cover the same span of years and to include information on such categories as age, race, birth order, birthweight, prenatal care, education, marital status, and State of residence for mothers of births in the natality file. These aggregates would be retrievable with the appropriate population denominators to create rates.

Vital statistics in the 21st century: A vision for the future

As the National Vital Statistics System approaches its centennial anniversary, it faces a number of challenges. The historical system is based primarily on paper recording of more than 6 million annual birth and death events by thousands of physicians, hospitals, funeral directors, and coroners. These records are typically transmitted through local registration officials, then keyed, queried, and edited as they are received by State offices. The data are transmitted periodically to NCHS as files are completed. After labor-intensive processing in both State offices and NCHS, the data are released to the public on an annual basis as reports or electronic products.

Over the last decade, NCHS and NAPHSIS have taken significant incremental steps to improve the vital records system within its historical structure. Examples of these efforts include the electronic birth certificate and refinements in automated coding. The pursuit of these improvements has led to the conclusion that it is time to change the very nature of the system. NCHS and NAPHSIS have a vision for reinventing the vital statistics system for the 21st century. This vision requires not only automation, but a change in the basic relationships that exist among NCHS, State registration officials, and the providers of source records. The vision was first articulated by John E. Patterson (1992), then director of the NCHS Division of Vital Statistics, at the 1992 annual meeting of the Vital Statistics Cooperative Program State Project Directors. Since that time, it has been refined and is at the beginning stages of implementation.

NCHS and NAPHSIS envision for the year 2000 and beyond a vital statistics system in which birth and death certificates (and possibly other vital events) are created, edited, coded, queried, and corrected at the source point in electronic form; transmitted over high-speed lines to a central location in each State for any State processing and information management; and finally, electronically transmitted to NCHS on a frequent and regular basis.

This redesign would create an information-management partnership between State vital statistics offices and NCHS. Data entry would be shifted from the State office to the source data provider, who completes the original record; the original record would be electronic rather than paper. Data entry would employ standardized, automated editing systems to continually "clean up" the data by the States; changes and updates to the coded record would be transmitted to NCHS and entered in the data file on a continual basis.

These changes would shift the focus of the vital statistics system from batch processing to dynamic processing and from an annual data release to a current-flow release as the data are received from the States. Users could analyze the data, including any preliminary or incomplete data that were available within time-frames of their own choice. For some surveillance purposes, timeliness may be much more important than quality and completeness, and it will be appropriate to use the most current data that are available. For some demographic and epidemiological analyses, however, quality and completeness are of paramount concern, and it may be necessary to wait until the final annual files are available. All of the steps that are required to produce a timely surveillance file on a current-flow basis will also contribute to the timeliness and quality of the final data.

Many of these changes are already underway. In 1995, almost 70 percent of births were registered electronically (although most States were still processing a paper legal record). Experimentation with electronic death registration continues. In 1996, NCHS will begin to release 1995 data on a current-flow basis. Estimates based on 1995 records processed by March 1996 will be released for a variety of mortality and natality variables and will provide detailed data never before available this early. In future years, the release schedule will be adjusted as experience with the system is gained.

Vital records are the primary source of the most fundamental public health information. Data on births, access to prenatal care, maternal risk factors, infant mortality, causes of death, and life expectancy are examples of the types of information provided by vital statistics. Over the past 100 years, the national vital statistics system has matured into a program that can provide complete and continuous information on issues of importance to the Nation's health. NCHS and its State partners will continue to nurture and improve the system as we move into the next century.

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Table 1. Content of the U.S. Standard Certificate of Live Birth, by year revised

Item	*1900*	*1910*	*1915*	*1918*	*1930*	*1939*	*1949*	*1956*	*1968*	*1979*	*1989*
Birth information											
Name of child	X	X	X	X	X	X	X	X	X	X	X
Sex	X	X	X	X	X	X	X	X	X	X	X
Date of birth	X	X	X	X	X	X	X	X	X	X	X
Time of birth	X	X	X	X	X	X	–	–	X	X	X
Place of birth:											
Name of hospital	–	–	–	–	–	X	X	X	X	X	–
Name of facility	–	–	–	–	–	–	–	–	–	–	X
Street and number	X	X	X	–	–	–	–	–	–	–	–
If birth occurred in hospital or institution, give its name instead of street number	–	–	–	X	X	–	–	–	–	–	–
Type of place of birth (checkboxes)	–	–	–	–	–	–	–	–	–	–	X
Street and number if not in hospital	–	–	–	–	–	X	X	X	X	X	X
Township of, or	X	X	X	X	X	–	–	–	–	–	–
Village of, or	X	X	X	X	X	–	–	–	–	–	–
City	X	X	X	X	X	–	–	–	–	–	–
City, town, or location of birth	–	–	–	–	–	X	X	X	X	X	X
Inside city limits	–	–	–	–	–	–	–	X	X	–	–
If outside city or town limits, write rural	–	–	–	–	–	X	X	–	–	–	–
County	X	X	X	X	X	X	X	X	X	X	X
Ward.	X	X	X	X	X	–	–	–	–	–	–
Birth weight	–	–	–	–	–	–	X	X	X	X	X
Single, twin, triplet, etc	X	X	X	X	X	X	X	X	X	X	X
Birth order if not single birth	X	X	X	X	X	X	X	X	X	X	X
Apgar Score:											
1 minute	–	–	–	–	–	–	–	–	–	X	X
5 minutes	–	–	–	–	–	–	–	–	–	X	X
Mother transferred prior to delivery	–	–	–	–	–	–	–	–	–	–	X
Infant transferred prior to delivery	–	–	–	–	–	–	–	–	–	–	X
Mother information											
Maiden name	–	X	X	X	X	X	X	X	X	X	–
Maiden surname	–	–	–	–	–	–	–	–	–	–	X
Full name	X	–	–	–	–	–	–	–	–	–	X
Age	X	X	X	X	X	X	X	X	X	X	–
Date of birth	–	–	–	–	–	–	–	–	–	–	X
Birthplace	X	X	X	–	–	–	–	–	–	–	–
Birthplace (State or country)	–	–	–	X	X	X	X	X	X	X	X
Birthplace (city or place)	–	–	–	X	X	X	–	–	–	–	–
Mother's stay before delivery:											
In hospital or institution	–	–	–	–	–	X	–	–	–	–	–
In this community	–	–	–	–	–	X	–	–	–	–	–
Residence	X	X	X	X	X	–	–	–	–	–	–
State	–	–	–	–	–	X	X	X	X	X	X
County	–	–	–	–	–	X	X	X	X	X	X
City, town, or location	–	–	–	–	–	X	X	X	X	X	X
Street and number	–	–	–	–	–	X	X	X	X	X	X
Inside city limits	–	–	–	–	–	–	–	X	X	X	X
If rural, give location	–	–	–	–	–	X	X	–	–	–	–
Is residence on a farm?	–	–	–	–	–	–	–	X	–	–	–
Mother's mailing address	–	–	–	–	–	X	–	X	–	X	X
Hispanic origin	–	–	–	–	–	–	–	–	–	–	X
Race	X	X	X	X	X	X	X	X	X	X	X
Education	–	–	–	–	–	–	–	–	X	X	X

Table 1. Content of the U.S. Standard Certificate of Live Birth, by year revised—Con.

Item	*1900*	*1910*	*1915*	*1918*	*1930*	*1939*	*1949*	*1956*	*1968*	*1979*	*1989*
Mother information—Continued											
Legitimate	X	X	X	X	X	–	X	X	X	–	–
Mother married?	–	–	–	–	–	X	–	–	–	X	X
Occupation	X	X	X	X	X	–	–	–	–	–	–
Usual occupation	–	–	–	–	–	X	–	–	–	–	–
Nature of industry	–	–	–	X	X	X	–	–	–	–	–
Date (month and year) last engaged in this work	–	–	–	–	X	–	–	–	–	–	–
Total time spent in this work	–	–	–	–	X	–	–	–	–	–	–
Father information											
Name	X	X	X	X	X	X	X	X	X	X	X
Age	X	X	X	X	X	X	X	X	X	X	–
Date of birth	–	–	–	–	–	–	–	–	–	–	X
Birthplace	X	X	X	–	–	–	–	–	–	–	–
Birthplace (State or country)	–	–	–	X	X	X	X	X	X	X	X
Birthplace (city or place)	–	–	–	X	X	X	–	–	–	–	–
Hispanic origin	–	–	–	–	–	–	–	–	–	–	X
Race	X	X	X	X	X	X	X	X	X	X	X
Education	–	–	–	–	–	–	–	–	X	X	X
Residence	X	X	X	X	X	–	–	–	–	–	–
Occupation	X	X	X	X	X	–	–	–	–	–	–
Usual occupation	–	–	–	–	–	X	X	X	–	–	–
Nature of industry	–	–	–	X	X	X	X	X	–	–	–
Date (month and year) last engaged in this work	–	–	–	–	X	–	–	–	–	–	–
Total time (years) spent in this work	–	–	–	–	X	–	–	–	–	–	–
Pregnancy information											
Pregnancy history:[1]											
Live births, now living	X	X	X	X	X	X	X	X	X	X	X
Live births, now dead	–	–	–	X	X	X	X	X	X	X	X
Born dead (stillborn, fetal death)	–	–	–	X	X	X	–	X	X	–	–
Born dead after 20 weeks pregnancy	–	–	–	–	–	–	X	–	–	–	–
Other terminations (spontaneous and induced):											
Under 20 weeks	–	–	–	–	–	–	–	–	–	X	–
Over 20 weeks	–	–	–	–	–	–	–	–	–	X	–
Other terminations (spontaneous and induced at any time after conception)	–	–	–	–	–	–	–	–	–	–	X
Date of last live birth	–	–	–	–	–	–	–	–	X	X	X
Date of last fetal death	–	–	–	–	–	–	–	–	X	–	–
Date of last other termination	–	–	–	–	–	–	–	–	–	X	X
Whether born alive or stillborn	–	X	X	X	X	–	–	–	–	–	–
Cause of stillbirth	–	–	–	–	X	–	–	–	–	–	–
Stillbirth—before labor or during labor	–	–	–	–	X	–	–	–	–	–	–
If stillborn, period of gestation	–	–	–	–	X	–	–	–	–	–	–
Clinical estimate of gestation	–	–	–	–	–	–	–	–	–	–	X
Date last normal menses began	–	–	–	–	–	–	–	–	X	X	X
Length of pregnancy (completed weeks)	–	–	–	–	–	–	X	X	–	–	–
Months of pregnancy	–	–	–	–	–	X	–	–	–	–	–
Premature or full term	–	–	–	–	X	–	–	–	–	–	–
Month of pregnancy prenatal care began	–	–	–	–	–	–	–	–	X	X	X
Number of prenatal visits	–	–	–	–	–	–	–	–	X	X	X
Concurrent illnesses or conditions affecting the pregnancy	–	–	–	–	–	–	–	–	–	X	–
Medical risk factors for this pregnancy (checkboxes)	–	–	–	–	–	–	–	–	–	–	X
Other risk factors for this pregnancy (smoking, alcohol use, weight gain)	–	–	–	–	–	–	–	–	–	–	X
Complications not related to pregnancy	–	–	–	–	–	–	–	–	X	–	–
Complications of pregnancy	–	–	–	–	–	–	–	–	–	X	–
Complications related to pregnancy	–	–	–	–	–	–	–	–	X	–	–
Complications of labor and/or delivery	–	–	–	–	–	–	–	–	–	X	–
Complications of labor and/or delivery (checkboxes)	–	–	–	–	–	–	–	–	–	–	X
Complications of labor	–	–	–	–	–	–	–	–	X	–	–
Obstetric procedures (checkboxes)	–	–	–	–	–	–	–	–	–	–	X
Method of delivery (checkboxes)	–	–	–	–	–	–	–	–	–	–	X
Abnormal conditions of the newborn (checkboxes)	–	–	–	–	–	–	–	–	–	–	X
Congenital malformations or anomalies of child	–	–	–	–	–	–	–	–	X	X	–
Congenital anomalies of child (checkboxes)	–	–	–	–	–	–	–	–	–	–	X
Birth injuries to child	–	–	–	–	–	–	–	–	X	–	–

Table 1. Content of the U.S. Standard Certificate of Live Birth, by year revised—Con.

Item	*1900*	*1910*	*1915*	*1918*	*1930*	*1939*	*1949*	*1956*	*1968*	*1979*	*1989*
Certification information											
Signature of certifier	X	X	X	X	X	X	X	X	X	X	X
Type of attendant	X	X	X	X	X	X	X	X	X	–	–
Date signed	–	–	–	–	–	X	X	X	X	X	X
Date on which given name was added	X	X	X	X	X	X	X	X	–	–	–
Name of registrar adding given name	X	X	X	X	X	X	X	X	–	–	–
Name and title of attendant at birth if other than certifier	–	–	–	–	–	–	–	–	–	X	–
Name and title of attendant if other than certifier (checkboxes)	–	–	–	–	–	–	–	–	–	–	X
Mailing address of attendant	–	–	–	–	–	–	–	–	–	–	X
Name and title of certifier	–	–	–	–	–	–	–	–	–	X	–
Name and title of certifier (checkboxes)	–	–	–	–	–	–	–	–	–	–	X
Name of certifier	–	–	–	–	–	–	–	–	X	–	–
Mailing address of certifier	–	–	–	–	–	–	–	–	X	X	–
Address of certifier	X	X	X	X	X	X	X	X	–	–	–
Signature of registrar	–	–	–	–	–	X	X	X	X	X	X
Registrar.	X	X	X	X	X	–	–	–	–	–	–
Date received by registrar	–	–	–	–	–	–	–	–	–	X	–
Date received by local registrar	–	–	–	–	–	X	X	X	X	–	–
Date filed	X	X	X	X	X	–	–	–	–	–	X
Signature of parent or other informant	–	–	–	–	–	–	–	–	–	X	X
Informant.	–	–	–	–	–	X	X	X	X	–	–
Relation to child	–	–	–	–	–	X	–	–	X	X	–
Nature of industry	–	–	–	X	X	X	X	X	–	–	–
Date (month and year) last engaged in this work	–	–	–	–	X	–	–	–	–	–	–
Total time (years) spent in this work	–	–	–	–	X	–	–	–	–	–	–
Pregnancy information											
Pregnancy history:[1]											
Live births, now living	X	X	X	X	X	X	X	X	X	X	X
Live births, now dead	–	–	–	X	X	X	X	X	X	X	X
Born dead (stillborn, fetal death)	–	–	–	X	X	X	–	X	X	–	–
Born dead after 20 weeks pregnancy	–	–	–	–	–	–	X	–	–	–	–
Other terminations (spontaneous and induced):											
Under 20 weeks	–	–	–	–	–	–	–	–	–	X	–
Over 20 weeks	–	–	–	–	–	–	–	–	–	X	–
Other terminations (spontaneous and induced at any time after conception)	–	–	–	–	–	–	–	–	–	–	X
Date of last live birth	–	–	–	–	–	–	–	–	X	X	X
Date of last fetal death	–	–	–	–	–	–	–	–	X	–	–
Date of last other termination	–	–	–	–	–	–	–	–	–	X	X
Whether born alive or stillborn	–	–	–	X	X	X	X	–	–	–	–
Cause of stillbirth	–	–	–	–	X	–	–	–	–	–	–
Stillbirth—before labor or during labor	–	–	–	–	X	–	–	–	–	–	–
If stillborn, period of gestation	–	–	–	–	X	–	–	–	–	–	–
Clinical estimate of gestation	–	–	–	–	–	–	–	–	–	–	X
Date last normal menses began	–	–	–	–	–	–	–	–	X	X	X
Length of pregnancy (completed weeks)	–	–	–	–	–	–	X	X	–	–	–
Months of pregnancy	–	–	–	–	–	X	–	–	–	–	–
Premature or full term	–	–	–	–	X	–	–	–	–	–	–
Month of pregnancy prenatal care began	–	–	–	–	–	–	–	–	X	X	X
Number of prenatal visits	–	–	–	–	–	–	–	–	X	X	X
Concurrent illnesses or conditions affecting the pregnancy	–	–	–	–	–	–	–	–	–	X	–
Medical risk factors for this pregnancy (checkboxes)	–	–	–	–	–	–	–	–	–	–	X
Other risk factors for this pregnancy (smoking, alcohol use, weight gain)	–	–	–	–	–	–	–	–	–	–	X
Complications not related to pregnancy	–	–	–	–	–	–	–	–	X	–	–
Complications of pregnancy	–	–	–	–	–	–	–	–	–	X	–
Complications related to pregnancy	–	–	–	–	–	–	–	–	X	–	–
Complications of labor and/or delivery	–	–	–	–	–	–	–	–	–	X	–
Complications of labor and/or delivery (checkboxes)	–	–	–	–	–	–	–	–	–	–	X
Complications of labor	–	–	–	–	–	–	–	–	X	–	–
Obstetric procedures (checkboxes)	–	–	–	–	–	–	–	–	–	–	X
Method of delivery (checkboxes)	–	–	–	–	–	–	–	–	–	–	X
Abnormal conditions of the newborn (checkboxes)	–	–	–	–	–	–	–	–	–	–	X
Congenital malformations or anomalies of child	–	–	–	–	–	–	–	–	X	X	–
Congenital anomalies of child (checkboxes)	–	–	–	–	–	–	–	–	–	–	X
Birth injuries to child	–	–	–	–	–	–	–	–	X	–	–

Table 1. Content of the U.S. Standard Certificate of Live Birth, by year revised—Con.

Item	*1900*	*1910*	*1915*	*1918*	*1930*	*1939*	*1949*	*1956*	*1968*	*1979*	*1989*
Certification information											
Signature of certifier	X	X	X	X	X	X	X	X	X	X	X
Type of attendant	X	X	X	X	X	X	X	X	X	–	–
Date signed	–	–	–	–	–	X	X	X	X	X	X
Date on which given name was added	X	X	X	X	X	X	X	X	–	–	–
Name of registrar adding given name	X	X	X	X	X	X	X	X	–	–	–
Name and title of attendant at birth if other than certifier	–	–	–	–	–	–	–	–	–	X	–
Name and title of attendant if other than certifier (checkboxes)	–	–	–	–	–	–	–	–	–	–	X
Mailing address of attendant	–	–	–	–	–	–	–	–	–	–	X
Name and title of certifier.	–	–	–	–	–	–	–	–	–	X	–
Name and title of certifier (checkboxes).	–	–	–	–	–	–	–	–	–	–	X
Name of certifier	–	–	–	–	–	–	–	–	X	–	–
Mailing address of certifier	–	–	–	–	–	–	–	–	X	X	–
Address of certifier	X	X	X	X	X	X	X	X	–	–	–
Signature of registrar	–	–	–	–	–	X	X	X	X	X	X
Registrar.	X	X	X	X	X	–	–	–	–	–	–
Date received by registrar	–	–	–	–	–	–	–	–	–	X	–
Date received by local registrar	–	–	–	–	–	X	X	X	X	–	–
Date filed	X	X	X	X	X	–	–	–	–	–	X
Signature of parent or other informant	–	–	–	–	–	–	–	–	–	X	X
Informant.	–	–	–	–	–	X	X	X	X	–	–
Relation to child	–	–	–	–	–	X	–	–	X	X	–

[1] Prior to 1939, the pregnancy item included the birth registered. Beginning with 1939 the birth being registered is excluded.

X Indicates item included on standard certificate.
– Indicates item not included on standard certificate.

Table 2. Content of the U.S. Standard Certificate of Death, by year revised

Item	*1900*	*1910*	*1918*	*1930*	*1939*	*1949*	*1956*	*1968*	*1978*	*1989*
Decedent information										
Name	X	X	X	X	X	X	X	X	X	X
Name of decedent (in margin)	–	–	–	–	–	–	–	–	–	X
Sex	X	X	X	X	X	X	X	X	X	X
Race	X	X	X	X	X	X	X	X	X	X
Hispanic origin	–	–	–	–	–	–	–	–	–	X
Age:										
Years	X	X	X	X	X	X	X	X	X	X
Months/Days	X	X	X	X	X	X	X	X	X	X
Hours/Minutes	–	X	X	X	X	X	X	X	X	X
Date of birth	X	X	X	X	X	X	X	X	X	
Birthplace:										
State or country	X	X	X	X	X	X	X	X	X	–
City, town, or county	–	–	–	–	X	–	–	–	–	–
City or town	–	–	X	X	–	–	–	–	–	–
City and State or country	–	–	–	–	–	–	–	–	–	X
Citizen of what country	–	–	–	–	–	X	X	X	X	–
How long in U.S., if of foreign birth	–	–	X	X	X	–	–	–	–	–
Marital status	X	X	X	X	X	X	X	X	X	X
Surviving spouse (if wife, give maiden name)	–	–	–	–	–	–	–	X	X	X
Name of husband or wife	–	–	X	X	X	–	–	–	–	–
Age of husband or wife, if alive	–	–	–	X	–	–	–	–	–	
Was decedent ever in U.S. Armed Forces?	–	–	–	–	–	–	X	X	–	X
If yes, give war or dates of service	–	–	–	–	–	X	X	–	–	–
If veteran, name war	–	–	–	–	X	–	–	–	–	–
Social Security number	–	–	–	–	X	X	X	X	X	X
Occupation	X	X	X	X	–	–	–	–	–	–
Usual occupation	–	–	–	–	X	X	X	X	X	X
Name of employer	–	–	X	–	–	–	–	–	–	–
Business or industry	–	X	X	X	X	X	X	X	X	X
Date deceased last worked at this occupation	–	–	–	X	–	–	–	–	–	–
Total time (years) spent in this occupation	–	–	–	X	–	–	–	–	–	–
Residence:										
Former or usual residence	X	X	–	–	–	–	–	–	–	–
State	–	–	–	–	X	X	X	X	X	X
Length of residence in the State (years, months, and days)	–	X	–	–	–	–	–	–	–	–
County	–	–	–	–	X	X	X	X	X	X
City, town, or location	–	–	–	–	X	X	X	X	X	X
If nonresident, give city or town and State	–	–	X	X	–	–	–	–	–	–
Ward	–	–	X	X	–	–	–	–	–	–
Street and number	–	–	X	X	X	X	X	X	X	X
Inside city limits	–	–	–	–	–	–	X	X	X	–
Zip code	–	–	–	–	–	–	–	–	–	X
Education	–	–	–	–	–	–	–	–	–	X
Father's name	X	X	X	X	X	X	X	X	X	X
Birthplace of father:										
State or country	X	X	X	X	X	–	–	–	–	–
City or town	–	–	X	X	–	–	–	–	–	–
City, town, or county	–	–	–	–	X	–	–	–	–	–
Mother's maiden name	X	X	X	X	X	X	X	X	X	X
Birthplace of mother:										
State or country	X	X	X	X	X	–	–	–	–	–
City or town	–	–	X	X	–	–	–	–	–	–
City, town, or county	–	–	–	–	X	–	–	–	–	–
Place of death information										
County	X	X	X	X	X	X	X	X	X	X
City, town, or location	–	–	–	–	X	X	X	X	X	X
Inside city limits	–	–	–	–	–	–	X	X	–	–
Township of, or	X	X	X	X	–	–	–	–	–	–
Village of, or	X	X	X	X	–	–	–	–	–	–
City of	X	X	X	X	–	–	–	–	–	–
Ward	X	X	X	X	–	–	–	–	–	–
Street and number	X	X	X	X	–	–	–	–	–	–
Name of hospital or other institution	–	–	–	–	X	X	X	X	X	–
Name of facility	–	–	–	–	–	–	–	–	–	X
If hospital or institution indicate whether dead on arrival, outpatient/emergency room or inpatient	–	–	–	–	–	–	–	–	X	–
If death occurred in a hospital or institution, give its name instead of street and number	X	X	X	X	–	–	–	–	–	–
If not in hospital or institution, give street address or location	–	–	–	–	X	X	X	X	X	X

Table 2. Content of the U.S. Standard Certificate of Death, by year revised—Con.

Item	*1900*	*1910*	*1918*	*1930*	*1939*	*1949*	*1956*	*1968*	*1978*	*1989*
Place of death information—Continued										
Type of place of death (checkboxes)	–	–	–	–	–	–	–	–	–	X
Length of stay in hospital	–	–	–	–	X	–	–	–	–	–
Length of stay in this community	–	–	–	–	X	–	–	–	–	–
Length of stay where death occurred	X	X	X	X	–	X	X	–	–	–
Length of residence in the State	–	X	–	–	–	–	–	–	–	–
Medical certification										
Cause of death	X	X	X	X	–	–	–	–	–	–
Duration	X	X	X	–	–	–	–	–	–	–
Date of onset	–	–	–	X	–	–	–	–	–	–
Immediate cause of death	–	–	–	–	X	X	X	X	X	X
Interval between onset and death	–	–	–	–	X	X	X	X	X	X
Due to,	–	–	–	–	X	X	X	X	X	X
Interval between onset and death	–	–	–	–	X	X	X	X	X	X
Due to,	–	–	–	–	X	X	X	X	X	X
Interval between onset and death	–	–	–	–	X	X	X	X	X	X
Due to,	–	–	–	–	–	–	–	–	–	X
Interval between onset and death	–	–	–	–	–	–	–	–	–	X
Contributory cause	X	X	X	X	–	–	–	–	–	–
Duration	X	X	X	–	–	–	–	–	–	–
Date of onset	–	–	–	X	–	–	–	–	–	–
Other significant conditions	–	–	–	–	X	X	X	X	X	X
Duration	–	–	–	–	X	–	–	–	–	–
Interval between onset and death	–	–	–	–	–	X	–	–	–	–
Was autopsy performed?	–	–	X	X	–	X	X	X	X	X
Were autopsy findings considered in determining cause of death?	–	–	–	–	–	–	–	X	–	–
Were autopsy findings available prior to completion of cause of death?	–	–	–	–	–	–	–	–	–	X
What test confirmed diagnosis?	–	–	X	X	–	–	–	–	–	–
Major findings of autopsy	–	–	–	–	X	–	–	–	–	–
Did an operation precede death?	–	–	X	–	–	–	–	–	–	–
Date of operation	–	–	X	X	–	X	–	–	–	–
Name of operation	–	–	–	X	–	–	–	–	–	–
Major findings of operations	–	–	–	–	X	X	–	–	–	–
Where was disease contracted if not place of death?	X	X	X	–	–	–	–	–	–	–
For deaths from external causes:										
Accident, suicide, homicide, undetermined, or pending investigation	–	–	–	–	–	–	–	–	X	–
Accident, suicide, homicide, or undetermined	–	–	–	–	–	–	–	X	–	–
Accident, suicide, or homicide	–	X	X	X	X	X	X	–	–	–
Manner of death (checkboxes):										
Natural, accident, suicide, homicide, pending investigation, could not be determined	–	–	–	–	–	–	–	–	–	X
Date of injury	–	–	–	X	X	X	X	X	X	X
Time of injury	–	–	–	–	–	X	X	X	X	X
How injury occurred	–	–	–	–	–	X	X	X	X	X
Injury at work?	–	–	–	–	X	X	X	X	X	X
Place of injury	–	–	–	X	X	X	X	X	X	X
Location of injury	–	–	X	X	X	X	X	X	X	X
Means of injury	–	–	–	–	X	–	–	–	–	–
Manner of injury	–	–	–	X	–	–	–	–	–	–
Nature of injury	–	–	–	X	–	–	–	–	–	–
Was disease or injury related to occupation?	–	–	–	X	–	–	–	–	–	–
If so, specify	–	–	–	X	–	–	–	–	–	–
Certifier:										
Signature and title of certifier	X	X	X	X	X	X	X	X	X	–
Title (checkboxes)	–	–	–	–	–	–	–	–	–	X
License number	–	–	–	–	–	–	–	–	–	X
Separate medical examiner or coroner certification	–	–	–	–	–	–	–	X	X	X
Date signed	X	X	X	–	X	X	X	X	X	X
Date of death	X	X	X	X	X	X	X	X	X	X
Time of death	X	X	X	X	X	X	X	X	X	X
Date pronounced dead	–	–	–	–	–	–	–	X	X	X
Hour pronounced dead	–	–	–	–	–	–	–	X	X	–
Name of attending physician, if other than certifier	–	–	–	–	–	–	–	–	X	–
Name of certifier	–	–	–	–	–	–	–	X	X	X
Address of certifier	X	X	X	X	X	X	X	X	X	X
Dates physician attended decedent	X	X	X	X	X	X	X	X	–	–
Date last seen alive	X	X	X	X	X	X	X	X	–	–
Did physician view body after death?	–	–	–	–	–	–	–	X	–	–
Was case referred to medical examiner or coroner?	–	–	–	–	–	–	–	–	X	X

Table 2. Content of the U.S. Standard Certificate of Death, by year revised—Con.

Item	*1900*	*1910*	*1918*	*1930*	*1939*	*1949*	*1956*	*1968*	*1978*	*1989*
Medical certification—Continued										
Pronouncing physician:										
Signature and title	–	–	–	–	–	–	–	–	–	X
License number	–	–	–	–	–	–	–	–	–	X
Date signed	–	–	–	–	–	–	–	–	–	X
Disposition information										
Burial, cremation, or removal	–	–	–	–	X	X	X	X	X	–
Method of disposition (checkboxes)	–	–	–	–	–	–	–	–	–	X
Date of burial	X	X	X	X	X	X	X	X	–	–
Place of burial or removal	X	X	–	–	–	–	–	–	–	–
Place of burial, cremation, or removal	–	–	X	X	X	–	–	–	–	–
Name of cemetery or crematory	–	–	–	–	–	X	X	X	X	–
Location	–	–	–	–	–	X	X	X	X	X
Name of cemetery, crematory, or other place	–	–	–	–	–	–	–	–	–	X
Signature of funeral director	–	–	–	–	X	–	–	X	–	–
Signature of funeral service licensee or person acting as such	–	–	–	–	–	–	–	–	X	X
License number	–	–	–	–	–	–	–	–	–	X
Name of funeral director (or person acting as such)	X	X	X	X	X	X	X	–	–	–
Address	X	X	X	X	X	X	X	–	–	–
Name of facility (funeral home)	–	–	–	–	–	–	–	X	X	X
Address of facility (funeral home)	–	–	–	–	–	–	–	X	X	X
Other information										
Informant’s signature	–	–	–	–	X	–	–	–	–	–
Informant’s name	X	X	X	X	–	X	X	X	X	X
Mailing address	X	X	X	X	X	–	X	X	X	X
Registrar’s signature	–	–	–	–	X	X	X	X	X	X
Registrar	X	X	X	X	–	–	–	–	–	–
Date received by local registrar	–	–	–	–	X	X	X	X	–	–
Date received by registrar	–	–	–	–	–	–	–	–	X	–
Date filed	X	X	X	X	–	–	–	–	–	X

X Indicates item included on standard certificate.
– Indicates item not included on standard certificate.

Table 3. Content of the U.S. Standard Report of Fetal Death, by year revised

Item	*1930*	*1939*	*1949*	*1956*	*1968*	*1978*	*1989*
Fetal death information							
Name of fetus	X	X	X	X	X	–	–
Sex of fetus	X	X	X	X	X	X	X
Date of delivery	X	X	X	X	X	X	X
Hour of delivery	–	–	–	–	X	X	–
Place of delivery:							
Name of hospital	–	X	X	X	X	X	–
Name of facility	–	–	–	–	–	–	X
State	X	–	–	–	–	–	–
If birth occurred in hospital or institution,give its name instead of street number	X	–	–	–	–	–	–
Street and number if not in hospital	X	X	X	X	X	X	X
Township	X	–	–	–	–	–	–
Village	X	–	–	–	–	–	–
City	X	–	–	–	–	–	–
City, town, or location of delivery	–	X	X	X	X	X	X
Inside city limits	–	–	–	X	X	–	–
If outside city or town limits, write rural	–	–	X	X	–	–	–
County of delivery	X	X	X	X	X	X	
Ward	X	–	–	–	–	–	–
Weight of fetus	–	–	X	X	X	X	X
Single, twin, triplet, etc	X	X	X	X	X	X	X
Order if not single delivery	X	X	X	X	X	X	X
Mother information							
Mother's name (first, middle, last)	–	–	–	–	–	–	X
Maiden name	X	X	X	X	X	–	–
Maiden surname	–	–	–	–	–	–	X
Age	X	X	X	X	X	X	–
Date of birth	–	–	–	–	–	–	X
Birthplace (State or country)	X	X	X	X	X	–	–
Birthplace (city or place)	X	X	–	–	–	–	–
Length of stay in hospital or institution before delivery	–	X	–	–	–	–	–
Residence	X	–	–	–	–	–	–
State	–	X	X	X	X	X	X
County	–	X	X	X	X	X	X
City, town, or location	–	X	X	X	X	X	X
Street and number	–	X	X	X	X	X	X
Inside city limits	–	–	–	X	X	X	X
If rural, give location	–	X	X	–	–	–	–
Is residence on a farm?	–	–	–	X	–	–	–
Zip code	–	–	–	–	–	–	X
Mother's mailing address	–	X	–	–	–	–	–
Race	X	X	X	X	X	X	X
Hispanic origin	–	–	–	–	–	–	X
Education	–	–	–	–	X	X	X
Legitimate	X	–	X	X	X	–	–
Mother married?	–	X	–	–	–	X	X
Trade, profession, or particular type of work done	X	–	–	–	–	–	–
Usual occupation	–	X	–	–	–	–	–
Occupation worked during last year	–	–	–	–	–	–	X
Kind of business or industry	X	X	–	–	–	–	X
Date (month and year) last engaged in this work	X	–	–	–	–	–	–
Total time (years) spent in this work	X	–	–	–	–	–	–
Father information							
Name	X	X	X	X	X	X	X
Age	X	X	X	X	X	X	–
Date of birth	–	–	–	–	–	–	X
Birthplace (State or country)	X	X	X	X	–	–	–
Birthplace (city or place)	X	X	–	–	–	–	–
Hispanic origin	–	–	–	–	–	–	X
Race	X	X	X	X	X	X	X
Education	–	–	–	–	X	X	X
Residence	X	–	–	–	–	–	–
Trade, profession, or particular type of work done	X	–	–	–	–	–	–
Usual occupation	–	X	X	X	–	–	–
Occupation worked during last year	–	–	–	–	–	–	X
Kind of business or industry	X	X	X	X	–	–	X
Date (month and year) last engaged in this work	X	–	–	–	–	–	–
Total time (years) spent in this work	X	–	–	–	–	–	–

Table 3. Content of the U.S. Standard Report of Fetal Death, by year revised—Con.

Item	*1930*	*1939*	*1949*	*1956*	*1968*	*1978*	*1989*
Pregnancy information							
Pregnancy history:[1]							
Live births, now living	X	X	X	X	X	X	X
Live births, now dead	X	X	X	X	X	X	X
Born dead (stillborn, fetal death)	X	X	–	X	X	–	–
Born dead after 20 weeks pregnancy	–	–	X	–	–	–	–
Other terminations (spontaneous and induced):							
Under 20 weeks	–	–	–	–	–	X	–
Over 20 weeks	–	–	–	–	–	X	–
Other terminations at any time after conception	–	–	–	–	–	–	X
Date of last live birth	–	–	–	–	X	X	X
Date of last fetal death	–	–	–	–	X	–	–
Date of last other termination	–	–	–	–	–	X	X
Whether born alive or stillborn	X	–	–	–	–	–	–
Month of pregnancy prenatal care began	–	–	–	–	X	X	X
Number of prenatal visits	–	–	–	–	X	X	X
Physician's estimate of gestation	–	–	–	–	–	X	–
Clinical estimate of gestation	–	–	–	–	–	–	X
If stillborn, period of gestation	X	–	–	–	–	–	–
Length of pregnancy (completed weeks)	–	–	X	X	–	–	–
Date last normal menses began	–	–	–	–	X	X	X
Months of pregnancy	–	X	–	–	–	–	–
Premature or full term	X	–	–	–	–	–	–
Concurrent illnesses or conditions affecting the pregnancy	–	–	–	–	–	X	–
Complications not related to pregnancy	–	–	–	–	X	–	–
Complications of pregnancy	–	X	–	–	–	X	–
Complications related to pregnancy	–	–	–	–	X	–	–
Complications of pregnancy and labor	–	–	X	–	–	–	–
Medical risk factors for this pregnancy (checkboxes)	–	–	–	–	–	–	X
Other risk factors for this pregnancy (smoking, alcohol use, weight gain)	–	–	–	–	–	–	X
Complications of labor and/or delivery	–	–	–	–	–	X	–
Complications of labor and/or delivery (checkboxes)	–	–	–	–	–	–	X
Complications of labor	–	X	–	–	X	–	–
Obstetric procedures (checkboxes)	–	–	–	–	–	–	X
Method of delivery (checkboxes)	–	–	–	–	–	–	X
Was labor induced?	–	X	–	–	–	–	–
Congenital malformations or anomalies of fetus	–	–	–	–	X	X	–
Congenital anomalies of fetus (checkboxes)	–	–	–	–	–	–	X
Was there an operation for delivery?	–	X	–	–	–	–	–
State all operations, if any	–	X	X	–	–	–	–
Did the child die before operation?	–	X	–	–	–	–	–
During operation?	–	X	–	–	–	–	–
Birth injuries to fetus	–	X	–	–	X	–	–
Medical certification information							
Cause of stillbirth	X	–	–	–	–	–	–
Fetal causes	–	X	X	–	–	–	–
Maternal causes	–	X	X	–	–	–	–
Cause of fetal death:							
Immediate cause	–	–	–	X	X	X	X
Whether fetal or maternal	–	–	–	–	X	X	X
Due to	–	–	–	X	X	X	X
Whether fetal or maternal	–	–	–	–	X	X	X
Due to	–	–	–	X	X	X	X
Whether fetal or maternal	–	–	–	–	X	X	X
Other significant conditions of fetus or mother	–	–	–	X	X	X	X
When fetus died:							
Before labor	X	X	–	X	X	X	X
During labor or delivery	–	–	–	X	X	X	X
During labor	X	X	–	–	–	–	–
Unknown	–	–	–	X	X	X	X
Was autopsy performed?	–	–	–	X	X	X	–
If yes, were autopsy findings considered?	–	–	–	–	X	–	–
Signature of certifier	X	X	–	–	X	–	–
Date signed	–	–	–	–	X	–	–
Title of certifier	X	X	–	–	–	–	–
Address of certifier	X	X	–	–	X	–	–
Signature of attendant	–	–	X	X	–	–	–
Date signed	–	–	X	X	–	–	–
Title of attendant	–	–	X	X	X	–	–
Address of attendant	–	–	X	X	–	–	–
Name of physician or attendant	–	–	–	–	–	X	–

Table 3. Content of the U.S. Standard Report of Fetal Death, by year revised—Con.

Item	*1930*	*1939*	*1949*	*1956*	*1968*	*1978*	*1989*
Medical certification information—Continued							
Name and title of attendant (checkboxes)	–	–	–	–	–	–	X
Signature of authorized official if not attended by physician	–	–	X	X	X	–	–
Statement of local registrar or coroner if physician not present	–	X	–	–	–	–	–
Signature	–	X	–	–	–	–	–
Title	–	X	–	–	–	–	–
Disposition information							
Burial, cremation, or removal	–	X	X	X	X	–	–
Date of burial	–	X	X	X	X	–	–
Place of burial or cremation	–	X	–	–	–	–	–
Name of cemetery or crematory	–	–	X	X	X	–	–
Location	–	–	X	X	X	–	–
Signature of funeral director	–	X	–	–	X	–	–
Name of funeral director	–	–	X	X	–	–	–
Address	–	X	X	X	–	–	–
Name of funeral home	–	–	–	–	X	–	–
Address	–	–	–	–	X	–	–
Other information							
Name of person completing report	–	–	–	–	–	X	X
Title	–	–	–	–	–	X	X
Informant	–	X	X	X	–	–	–
Address	–	X	–	–	–	–	–
Signature of registrar	X	X	X	X	X	–	–
Date received by local registrar	–	–	X	X	X	–	–
Date filed with local registrar	X	X	–	–	–	–	–
Date given name added	X	–	–	–	–	–	–
Signature of registrar	X	–	–	–	–	–	–

[1] Prior to 1939, the pregnancy history item included the event being registered. Beginning with 1939, the event being registered is excluded.

X Indicates item included on standard report.

– Indicates item not included on standard report.

Table 4. Content of the U.S. Standard Report of Induced Termination of Pregnancy, by year revised

Item	*1978*	*1989*
Place of induced termination		
Name of facility	X	X
Address (if not hospital or clinic)	X	X
City, town, or location	X	X
County	X	X
Induced termination information		
Date of pregnancy termination	X	X
Previous pregnancies:		
Live births—now living	X	X
Live births—now dead	X	X
Other terminations—spontaneous	X	X
Other terminations—induced	X	X
Date last normal menses began	X	X
Physician's estimate of gestation	X	–
Clinical estimate of gestation	–	X
Complications of pregnancy termination:		
None	X	–
Hemorrhage	X	–
Infection	X	–
Uterine perforation	X	–
Cervical laceration	X	–
Retained products	X	–
Other (specify)	X	–
Type of termination procedures:		
Procedure that terminated pregnancy	X	X
Additional procedures used	X	X
Suction curettage	X	X
Sharp curettage	X	X
Intra–uterine saline instillation	X	X
Intra–uterine prostaglandin instillation	X	X
Hysterotomy	X	X
Hysterectomy	X	X
Dilation and Evacuation (D&E)	–	X
Other (specify)	X	X
Patient information		
Patient identification	X	X
Age	X	X
Marital status	X	X
Residence:		
State	X	X
City, town, or location	X	X
Inside city limits	X	X
County	–	X
Zip code	–	X
Race (checkboxes)	X	X
Education	X	X
Hispanic origin	–	X
Other information		
Name of attending physician	X	X
Name of person completing report	X	X

X Item included on standard report.
– Item not included on standard report.

Table 5. Content of the U.S. Standard License and Certificate of Marriage, by year revised

Item	*1956*	*1968*	*1978*	*1989*
Groom information				
Name	X	X	X	X
Age	–	–	X	X
Date of birth	X	X	X	X
Race	X	X	X	X
Education	–	X	X	X
Usual residence:				
State	X	X	X	X
County	X	X	X	X
City, town, or location	X	X	X	X
Street and number	–	X	X	–
Inside city limits	–	X	–	–
Birthplace (State or foreign country)	X	X	X	X
Marital status:				
Number of this marriage	–	X	X	X
Number of previous marriages	X	–	–	–
Previous marital status	X	–	–	–
How last marriage ended	X	X	X	X
Date last marriage ended	–	X	X	X
Father's name	–	X	X	X
Birthplace (State or foreign country)	–	X	X	X
Mother's maiden name	–	X	X	X
Birthplace (State or foreign country)	–	X	X	X
Occupation	X	–	–	–
Business or industry	X	–	–	–
Bride information				
Name	X	X	X	X
Maiden name if different	X	X	X	X
Age	–	–	X	X
Date of birth	X	X	X	X
Race	X	X	X	X
Education	–	X	X	X
Usual residence:				
State	X	X	X	X
County	X	X	X	X
City, town, or location	X	X	X	X
Street and number	–	X	X	–
Inside city limits	–	X	–	–
Birthplace (State or foreign country)	X	X	X	X
Marital status:				
Number of this marriage	–	X	X	X
Number of previous marriages	X	–	–	–
Previous marital status	X	–	–	–
How last marriage ended	X	X	X	X
Date last marriage ended	–	X	X	X
Father's name	–	X	X	X
Birthplace (State or foreign country)	–	X	X	X
Mother's maiden name	–	X	X	X
Birthplace (State or foreign country)	–	X	X	X
Occupation	X	–	–	–
Business or industry	X	–	–	–
License information				
Signatures of applicants	X	X	–	–
Date signed	X	X	–	–
Groom's signature	–	–	X	X
Bride's signature	–	–	X	X
Date license was subscribed and sworn to	–	–	X	X
Signature of issuing officer	–	–	X	X
Title of issuing officer	–	–	X	X
Expiration date	–	–	–	X
Ceremony information				
Date of marriage	X	X	X	X
Place of marriage:				
State	X	X	–	–
County	X	X	X	X
City	–	–	X	X

Table 5. Content of the U.S. Standard License and Certificate of Marriage, by year revised—Con.

Item	*1956*	*1968*	*1978*	*1989*
Ceremony information—Continued				
Person performing ceremony:				
Title	–	–	X	X
Signature	–	X	X	X
Name	–	–	–	X
Religious or civil	–	X	–	–
Address	–	–	–	X
Date signed	–	X	–	–
Type of ceremony—religious or civil	–	–	X	–
Witnesses to ceremony—signatures	–	X	X	X
Other information				
Signature of local official making return to State health department	X	X	X	X
Date received by local official	–	X	X	–
Date of recording	X	–	–	–
Date filed by local official	–	–	–	X

X Indicates item included on standard certificate.
– Indicates item not included on standard certificate.

Table 6. Content of the U.S. Standard Certificate of Divorce, Dissolution of Marriage, or Annulment, by year revised

Item	*1956*	*1968*	*1978*	*1989*
Husband information				
Name	X	X	X	X
Date of birth	X	X	X	X
Race	X	X	X	X
Education	–	X	X	X
Usual residence:				
State	X	X	X	X
County	X	X	X	X
City, town, or location	X	X	X	X
Street and number	–	X	X	–
Inside city limits	–	X	–	–
Birthplace (State or foreign country)	X	X	X	X
Marital status:				
Number of this marriage	X	X	X	X
If previously married, how many ended by death? divorce?	–	X	X	–
If previously married, last marriage ended by death, divorce, dissolution, or annulment	–	–	–	X
Date last marriage ended	–	–	–	X
Occupation	X	–	–	–
Business or industry	X	–	–	–
Wife information				
Name	X	X	X	X
Maiden surname	–	–	–	X
Date of birth	X	X	X	X
Race	X	X	X	X
Education	–	X	X	X
Usual residence:				
State	X	X	X	X
County	X	X	X	X
City, town, or location	X	X	X	X
Street and number	–	X	X	–
Inside city limits	–	X	–	–
Birthplace (State or foreign country)	X	X	X	X
Marital status:				
Number of this marriage	X	X	X	X
If previously married, how many ended by death? divorce?	–	X	X	–
If previously married, last marriage ended by death, divorce, dissolution, or annulment	–	–	–	X
Date last marriage ended	–	–	–	X
Occupation	X	–	–	–
Business or industry	X	–	–	–
Decree information				
Date marriage was dissolved	X	X	X	X
Type of decree—divorce, dissolution, or annulment	–	X	X	X
Date of entry	X	X	X	–
Date recorded	–	–	–	X
County of decree	X	X	X	X
Title of court	–	X	X	X
Title of court official	X	X	X	–
Signature of certifying court official	X	X	X	X
Title of certifying official	X	X	X	X
Date signed	–	–	–	X
Party to whom decree granted	X	X	–	–
Legal grounds for decree	X	X	–	–
Petitioner	–	–	X	–
Petitioner (checkboxes)	–	–	–	X
Plaintiff	X	X	–	–
Attorney for petitioner	–	–	X	X
Address	–	–	X	X
Attorney for plaintiff	–	X	–	–
Address	–	X	–	–
Number of children whose physical custody was awarded to: husband, wife, joint (husband/wife), other, or no children	–	–	–	X

Table 6. Content of the U.S. Standard Certificate of Divorce, Dissolution of Marriage, or Annulment, by year revised—Con.

Item	*1956*	*1968*	*1978*	*1989*
Other information				
Place of this marriage:				
State or foreign country	X	X	X	X
County	X	X	X	X
City	–	–	X	–
City, town, or location	–	–	–	X
Date of this marriage	X	X	X	X
Date couple separated	–	X	X	–
Date couple last resided in same household	–	–	–	X
Number of children ever born alive of this marriage	–	–	X	–
Living children in this family	–	X	–	–
Children under 18 in this family	X	X	X	–
Number of children under 18 in this household as of the date couple last resided in same household	–	–	–	X

X Indicates item included on standard certificate.
– Indicates item not included on standard certificate.

Appendix II

History and Organization of the Vital Statistics System

Historical Development

Introduction

More than 7,000,000 birth, death, marriage, and divorce certificates were recorded in 1950. Many organizations and many millions of citizens used these records—or certified copies of them—for a variety of personal, legal, health, and other purposes. Vital statistics derived from the records were part of the factual basis for a great segment of the private and public business transacted in the United States. They entered into the planning and operation of health programs, social welfare, education, economic enterprises (ranging from life insurance to the marketing of babies' toys), and a broad gamut of other activities essential to the well-being and prosperity of the country.

Behind the original records, the certified copies, and the vital statistics is a network of local, State, and Federal agencies. The purpose of this section is to tell how the vital records and statistics system of the United States was begun and developed, how its organization, concepts, and practices were continuously shaped by the growth and changing needs of the country. At various stages, new social institutions or advancing technology, particularly in the field of health, created new demands for records and statistics, and sometimes changed the emphasis and motivating drives of the system itself.

This is a reproduction of a document that first appeared in the *Vital Statistics of the United States,* Volume 1, 1950, pp. 1–19.

NOTES: This review of the rise of American registration and vital statistics is based on a limited survey of original and secondary sources. It is ventured as a beginning, in the hope that it will at least set forth the main lines of development so as to give registration and vital statistics personnel a glimpse of their heritage, provide educational material for the schools and the general public, and encourage students with a gift for research in history to dig into the subject matter more deeply.

An effort has been made to tell as a narrative the development of registration and vital statistics down to about 1900. The more recent story is presented more briefly, as a series of high lights.

Most people take vital statistics for granted, assuming that any statistics they need should be freely available as part of today's culture. What distinguishes the men of today from those who lived before the American Revolution is that "we have all learned to talk in size language," as Lancelot Hogben puts it. "We live in a welter of figures: cookery recipes, railway time-tables, unemployment aggregates, fines, taxes, war debts, overtime schedules, speed limits, bowling averages, betting odds, billiard scores, calories, babies' weights, clinical temperatures, rainfall, hours of sunshine, motoring records, power indices, gas-meter readings, bank rates, freight rates, death rates...."[1]

Death rates are among the typical vital statistics that most people assume we have always had available and, without much effort, will continue to have. The real story is quite different: national statistics of deaths and births were achieved only within the present generation, after two centuries of intermittent struggle and building. Marriage and divorce statistics are still incomplete and relatively primitive. Progress in registration and vital statistics has been part of the general advance of science and medicine, which developed by relying on measurements and other quantitative procedures. Medicine and the public health movement flourished by adopting the methods of science, by resorting increasingly to quantitative techniques. Among the most fruitful of these were the basic measurements of vital statistics. In turn, vital statistics were developed primarily because medicine and public health actively promoted and helped build the registration system that makes vital statistics possible in this country.

In recent years, as vital statistics became more precise—more comparable from place to place and from one period of time to another—they were better able to serve the general and specialized demographic needs of business, civil and military branches of government, social research and welfare, and the general public. In the broad spectrum of needs served by

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[1] Hogben, Lancelot, "Mathematics for the Million," p. 20, New York, 1940.

modern vital statistics, the band occupied by health and medicine, though still the most important segment, is only a part of the whole.

In some ways the American system is unique; the reasons for its particular course of development lie in the historic past. In colonial days, when a handful of settlements clung precariously to the eastern edge of the continent, many of our institutions borrowed heavily on the experience of our forefathers before they emigrated from England and other countries. Hence some of the roots of our present vital statistics system began in foreign soil. Some of the major roots lie in the beginnings of America itself—in the fact that Virginia, New England, Delaware, the Carolinas, Georgia, Pennsylvania, New Jersey, and other settlements were sponsored by more or less independent British companies or patrons; that when control of the Colonies passed to the Crown they were ruled by separate royal governors; and that when they won independence they turned, by the nature of their past life and conditioning, to a federal rather than a centralized government, so that the federated States were self-governing in all matters not expressly conferred on the national government by the Constitution.

To apportion the Congressional representation of each State according to its population, the States provided in the Constitution itself for the decennial census. Hence, throughout the course of its development in this country, the census has been a national function. The need for vital statistics, on the other hand, was unrecognized when the Constitution was framed, and the vital records and statistics system developed originally not as a national undertaking, but first as a local, then as a State function. This historic accident, which makes the course of American vital statistics so different from that of countries where the function is national like the census, posed enormous difficulties, and undoubtedly slowed its development by many decades. At the same time, because American vital registration grew in response to local and State needs, it has support and sources of strength that might be lacking if the system were primarily national.

In practice, for the past century, American vital statistics and the census have worked hand in hand. Until recent years, the national functions in vital statistics were in fact lodged in the Census Bureau. Between census data and vital statistics, though they continuously supplement and enrich each other in practice, there are two essential differences. First, the census is based on enumeration—a periodic count of the population and its characteristics made by canvassers in house-to-house interviews; vital statistics, on the other hand, are derived from vital records, which record events that occur to individuals. The second difference is that the census is decennial; vital records are made continuously, as the events occur. This second difference was described in vivid terms by Walter F. Willcox, a former Chief Statistician in the Washington Census Office:

> A census is a sort of social photograph of certain conditions of a population at a given moment which are expressible in numbers, while registration is a continuous, contemporary, movie-camera record of births, marriages, divorces, or deaths. . . . In theory the two are inseparable; a census system which does not flower into registration is almost as fruitless scientifically as capital which does not fructify in income. As the life of an animal or plant cannot be studied from a series of photographs alone showing the stages of its growth, so the life of the American people cannot be studied from a series of censuses unaided by registration.[2]

Beginnings: First use of records

The settlers were predominantly English, and for the most part followed English customs in the new country. They were accustomed to the registration of christenings, marriages, and burials, which in England dated back to 1538, when the clergy in all parishes were first required to keep a weekly record of such events. In 1632, the Grand Assembly of Virginia passed a law requiring a minister or warden from every parish to appear annually at court on the 1st of June and present a register of christenings, marriages, and burials for the year. These were the traditional events conducted by the church, but in effect they provided an account of births, marriages, and deaths.

Apparently little or no statistical use was made of such records, and there was certainly no thought of using them for health purposes. In the beginning, the records were regarded primarily as statements of fact essential to the protection of individual rights, especially those relating to the distribution of property. The emphasis on vital records as legal documents to protect both the individual and the community is clear in the pronouncement of the General Court or legislative body of the Massachusetts Bay Colony in 1639:

> Whereas many judgments have been given in our Courts, whereof no records are kept of the evidence and reasons whereupon the verdict and judgment did pass,. . . it is therefore by this Court ordered and decreed that hence forward every judgment, with all the evidence, be recorded in a book, to be kept to posterity. . . that there be records kept of all wills, administrations, and inventories, as also of every marriage, birth, and death of every person within this jurisdiction.

While this law was based on the English precedent, it differed in two important respects: the responsibility was placed on government officers rather than

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2. Willcox, Walter F., ‘‘Studies in American Demography,’’ p. 195, New York, 1940.

the clergy; and it called for the recording of vital events—births, deaths, and marriages—rather than church-related ceremonies. Connecticut and Plymouth, and eventually other colonies, followed a similar pattern.

Thus, at the basis of the vital registration system was the principle that the records are legal statements of fact that help assure the rights of individuals as conferred by organic laws. Machinery was set up to collect and preserve the records, not at first for statistical reasons, but because authentic evidence was essential to the just administration of law and the protection of individual rights.

With this obligation in mind, Massachusetts (and other colonies) repeatedly strengthened the early registration laws. In 1644, it added a penalty clause for failure to report vital events, and in 1692, in the most comprehensive registration act in the period, it empowered town clerks to collect threepence from the next of kin for each birth or death, to fine individuals for failure to report, and to charge sixpence for "a fair certificate." A century later, in 1795, it required parents to inform the town clerk of births and deaths of children, householders to give notice of those in their households, and institutions to report births and deaths occurring in them.

None of the early registration laws was particularly effective. Although a few cities and towns maintained active registration, for many years not a single State could be said to have a system covering its entire area. Permanent legal records, justified largely by their use as evidence of property rights, seemed unimportant to a footloose population undergoing rapid change. Eastern seaboard cities were swelled by immigrants, many of whom stayed only long enough to hear the call of the western frontiers.

Registration needed a new and more impelling impetus. It was to receive one in the dawning realization by a few gifted statisticians and medical men that records of births and deaths, particularly records of deaths by cause, were needed for the control of epidemics and the conservation of human life through sanitary reform.

From records to statistics

Bills of mortality—consisting of parish lists of interments, usually including cause of death and age of deceased—had been compiled in England for more than a century before any effort was made to analyze them. Towards the end of the 16th century, when an epidemic of plague gripped the city, bills of mortality were published in London to restore public confidence. Vital statistics in the modern sense has been said to take its origin from the publication, in 1662, of "Natural and Political Observations Mentioned in a Following Index, and Made Upon the Bills of Mortality," by John Graunt of London (1620–74). Despite the meagerness of his material, Graunt discerned that vital events often follow regular patterns, for example, that male births exceed female births, that deaths at the beginning of life are relatively high, etc. This demonstration that general truths about the population could be derived from vital records stimulated further analysis both in Britain and in the European continent. The astronomer Edmund Halley (1656–1742), applying mathematical techniques developed in other fields, constructed the first scientific life expectancy table in 1693.

Death records of some sort were apparently kept by American settlements from the earliest days. At the outset, disease ranked with starvation as a threat to the existence of many of the colonies. Malaria, dysentery, and typhoid fever usually decimated settlers on new clearings. Smallpox, which was brought by the settlers themselves, and yellow fever which came in with the Negro slaves, brought repeated devastation. The toll of the recurrent epidemics is detailed in sources such as Winthrop's Journal, various lists of the parish dead complied by the clergy, and burial returns made to town officers by cemetery sextons.

One of the earliest uses of such records for statistical purposes was made in 1721 by the clergyman, Cotton Mather, who noted during a severe smallpox epidemic in Boston that more than one in six of the natural cases died but only one in sixty of the inoculated cases. This is a sophisticated use of statistics, and it is evident that simple records of death by certain causes were available much earlier.

Parallel to the growth of early registration efforts, but mostly unconnected at first, was sporadic rise of local health or sanitary boards, usually in response to an acute epidemic. During the 17th century and most of the 18th, there was probably no permanent organization in English America to promote public health. Outbreaks of disease were met as emergencies, but eventually the larger cities established boards of health as the forerunners of the modern local health departments. Baltimore, in 1793, and Philadelphia, in 1794 (in response to a yellow fever epidemic that killed one-eighth of its population), established the first two local boards. Massachusetts enacted the first State law authorizing the creation of local boards in 1797. From various meager indications, it appears certain that from the very early days the health officers began scanning the burial returns or weekly lists of interments and roughly compiling them in statistical reports. These vital statistics precursors were used—though the extent is difficult to determine—as a means of identifying and combating epidemics, and as a means of reporting health conditions to the community.

In Baltimore, for example, death records have been collected and compiled by the health department since 1797; annual reports, containing lists of deaths by causes, have been issued since 1817. The early reports from time to time called the community's attention to an unusually large number of deaths from a particular disease.[3]

Impact of industrialism

Meanwhile, one of the great pivotal changes in human history was gathering force. It would be oversimplication to pick a single date as the beginning of industrialism and the swift growth of manufacturing centers. But by 1800, it was obvious that the social order was changing, and that the change was bringing with it a train of new problems that the social organization and technology of the time were not equipped to handle. With rapid urbanization came a dramatic increase in slums, crime, and poverty. In England, which was the first country to industrialize, thoughtful men expressed alarm at the overcrowding of cities, the filth and polluted water, and at the abject misery that seemed to be overtaking the poorer classes. Epidemics of old and new diseases struck repeatedly. The reformers of the time groped for whatever vital and health statistics they could get in order to arouse the national conscience to a sanitary awakening.

On the European continent, starting first in France, the industrial revolution brought the same evils and the same reactions. Pierre Louis (1787–1872), in an epoch-making series of studies starting in 1825, introduced rational medical statistics to clinics and general physicians. Louis Villermé (1782–1863) adapted the statistical approach to public hygiene, and in 1828 showed that the condition of neighborhoods was related to disease in Paris and the French provinces. Statistical study of disease and its causes, based on the crude vital statistics of the time and any other data available, began to be used increasingly on the continent and in England as a weapon of sanitary and social reform. It was time for a new weapon, since medical and sanitation practices—such as imperfect quarantine measures—which had seemed adequate for an earlier day, were proving powerless against catastrophic epidemics of typhus, yellow fever, and cholera. This last disease, which by the 1830's had spread from Asia through Russia to Germany to the British Isles and to Canada and the United States, was obviously related to bad sanitary conditions.

According to Shryock,

> After 1831 there was a sudden increase of interest throughout Europe and America in the whole problem of public hygiene. Fear now combined with humanitarianism to demand investigations, cleanups, and general sanitary reform, as these things had never been demanded before. Whenever enthusiasm waned, further invasions of cholera, supplemented by occasional outbreaks of yellow fever, typhoid, typhus, and smallpox, terrified authorities into renewed activity. In these circumstances is to be found the genesis of the modern public-health movement.[4]

Beginnings of modern registration

The general circumstances that led to action against disease led inevitably to revived interest in perfecting vital registration and vital statistics. The crude data of the time were used with telling effect to characterize public health problems, to chart the course of epidemics, and to show the influence of dirt and poverty on disease and death. But in country after country, the early sanitarians became aware of their need for more precise statistics, and some of them expressed this need directly by pressing for effective and comprehensive registration laws. Here again it was apparently the fear of cholera that paved the way for legislative action.

> Panic was a large factor in securing repentance and good works when cholera threatened; as it, likewise, was in an earlier century when plague became epidemic; and in both instances the desire for complete and accurate information as to the extent of the invasion led in England to the call for accurate vital statistics. It may truly be said that the early adoption of accurate registration of births and deaths was hastened by fears of cholera, and by the intelligent realisation that one must know the localisation as well as the number of the enemy to be fought.[5]

In England, Edwin Chadwick (1800–1890), secretary of the Poor-Law inquiry commission, had been led into the study of vital statistics, and then into the general field of public health, by his need for mortality statistics in connection with voluntary insurance schemes. Chadwick was apparently influenced by Villermé in a series of investigations that led in the early 1830's to the reform of the poor laws and of child labor conditions in the cotton mills. Chadwick also strove to establish national registration of deaths, since differences in mortality by area or social group were the kind of vital statistics he could use effectively to hammer for sanitary reform.

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[3] But it was not until 1875, when death certificates were first required by Baltimore law, that any consistent use was made of statistical methods or that death rates by cause were regularly compiled. Similarly, records of live births were not kept until 1875, and birth registration was very defective until about 1915. The Baltimore history should be particularly illuminating to students of registration because of the thorough study made by Dr. William Travis Howard, Jr., "Public Health Administration and the Natural History of Disease in Baltimore, Maryland, 1797–1920," Carnegie Institution of Washington, D.C., 1924.

[4] Shryock, Richard Harrison, "The Development of Modern Medicine," p. 221, New York, 1947.

[5] Newsholme, Sir Arthur, "Evolution of Preventive Medicine," p. 113, Baltimore, 1927.

The English-speaking world lagged in vital registration during this period. According to Willcox, in 1833 the regions in which deaths and births were routinely registered comprised less than one-tenth of the world's population. They covered about 80 million people in France, Belgium, Austria, Prussia, Bavaria, Saxony, the Scandinavian countries with Finland and five cities in the United States, containing only 6 percent of the country's population. The five cities were Boston, New York, Philadelphia, Baltimore, and New Orleans.

The inadequacy of vital statistics in England—and the spur of a devastating cholera epidemic in 1831–32 which took nearly 42,000 lives in Great Britain and Ireland—led in 1836 to enactment of a registration law creating a central register office with responsibility for the records and statistics of births, marriages, and deaths—by cause—for all of England and Wales. According to one authority, the act was written by Chadwick who "took the details and even the phrasing" from Jeremy Bentham's "Constitutional Code."[6]

This act was an historic turning point in the development of registration and public health not only in England but in the United States and many other parts of the world. According to Shattuck in 1850 (see footnote 8), this registration law was the "most important sanitary (public health) measure ever adopted in England; and it has been the foundation of nearly all others. Without it they would have been comparatively of little value."

From this time forward, the course of registration and vital statistics was to be recognized as basic to the development of public health organization and practice. Part of the motivation for the act was to improve vital records as legal documents "for the security of property," but its main orientation was to collect the facts on births, deaths, and disease as a basis for striking at the appalling sanitary conditions of the time. In 1839, Dr. William Farr (1807–83), whom Raymond Pearl called "the greatest medical statistician who has ever lived," joined the Register Office as "compiler of abstracts." Farr compiled vital statistics to present the human cost of sickness and premature death, in a series of brilliant reports which, in Newsholme's words, "have guided sanitary reform and incited it year by year to increased activity." Benjamin Ward Richardson said of Farr's reports that "it is no longer true that pestilence walketh in the dark."

State registration in America

The impact of Chadwick, Farr, and the Act of 1836 on vital statistics in the United States was immediate, specific, and far-reaching. Chadwick inspired Lemuel Shattuck of Massachusetts (1793–1859), whose influence on American registration and the public health movement is probably second to none; Farr's statistical ingenuity in the use of vital data to point up public health problems stimulated Shattuck and others in this country; and the Act of 1836 was the prototype of the first State registration law in America, which Massachusetts adopted in 1842 and strengthened in 1844.

Shattuck was the prime mover. He used the American Statistical Association, which he largely founded in 1839, to induce both the American Academy of Arts and Sciences and the Massachusetts Medical Society to petition the legislature for an effective registration law. The act that Shattuck finally steered through the legislature in 1844 required central State filing; provided for standard forms, fees, and penalties; specified types of information including causes of death; and lodged responsibility for each kind of record in designated officials.

The National Medical Convention, which soon organized formally as the American Medical Association (AMA), channeled medical interest in registration in 1846 by creating a committee to consider methods for improving birth, marriage, and death registration. A year later the newly formed AMA addressed memorials to State legislatures on the need for registration laws.

It was probably about this time that local vital statistics, which previously had been used mostly by sanitary and social reformers, gradually came into routine use by local health officers as a practical guide. The best described example is that of John Simon (1816–1904), who was appointed first Medical Officer of Health in London in 1848, "the prototype of our modern health officer, the first health officer in the modern sense."[7] According to Round, "For John Simon, vital statistics formed the corner-stone of his work."

> Where did Simon get his information regarding the conditions prevailing at the moment and upon what information did he base his acts as medical health officer? From Simon's book on English Sanitary Institutions we find that the death returns of the city registrars were made on Monday mornings and on Monday afternoons they were placed at his disposal, as he says, "in a way which enabled me to complete my use of them during the evening, so that on Tuesday mornings when the weekly courts of the City Commission were held, I was ready with all needful particulars as to the deaths which had befallen the city population during the previous week, and with my scheme of such local inquiries as were to be made in consequence."

During this period, Great Britain and various countries on the continent, thanks to small land areas and a central form of government, carried through

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[6] Political Science Quarterly, vol. 38, p. 45 ff., 1923.

[7] Round, Lester A., "Consumer Demand for Vital Statistics: The Health Officer's Point of View," American Journal of Public Health, vol. 26, p. 489, May 1936.

national investigations of health conditions, and created new health and registration institutions on the basis of the results. The developing United States, with its vast and largely unexplored land area and its Federal-State rather than central form of government, could not be expected to progress as rapidly on a national scale. However, the new American Medical Association made an important contribution by examining conditions of the larger American cities. In 1848, it reported that disease was as prevalent in Boston, New York, and Philadelphia as in London, Manchester, and Glasgow, and that the death rates were even higher in the American cities. These revelations, plus the example of Massachusetts, prompted six additional States to enact registration laws by 1851, though for the most part the laws were ineffective and unenforced.

The Shattuck report

In 1850, Shattuck presented to the legislature his epochal "Report of the Sanitary Commission of Massachusetts," described by C.-E.A. Winslow as "one of the most remarkable documents—perhaps the most significant single document—in the history of public health."[8] In fifty specific recommendations, including the creation of a State board of health whose program was to be based solidly on complete registration and vital statistics, Shattuck anticipated nearly all the public health measures (except those based on the still unborn science of bacteriology) which the next two generations were to introduce. Actually, nearly 20 years were to elapse before Shattuck's detailed plans were to be adopted as the health department organic law of Massachusetts, and then to be widely emulated in other States. These developments will be treated below in chronological sequence.

Shattuck and the census of 1850

Meanwhile, in 1849, the Superintendent of the United States Census, to improve the still-primitive census practice and to make a start toward collecting the first national vital statistics, invited Shattuck to Washington to help draw up plans for the Seventh Federal Census. In his brilliant "Census of Boston for the Year 1845," which Willcox has called "the pioneer among modern American censuses," Shattuck had introduced the basic innovation of making the primary census unit the individual rather than the family. Instead of describing the whole family on a single line, he had given a line on the schedule to each person, which made it easy to record the name, age, birthplace, marital condition, and occupation, and to assemble the data afterward in new and more revealing types of tables. For the 1850 Federal census, Shattuck wrote five of the six schedules as well as the enumerators' instructions. According to Willcox, "The most important improvements during 150 years of Federal censuses resulted from the adoption in 1850 of Shattuck's ideas."

Against his better judgment and over his protest, Shattuck also introduced the practice of using census enumeration to determine births, marriages, and deaths. Unalterably convinced that only a registration system would provide such information, Shattuck deferred to the census officials to include the items "Born within the year," "Married within the year," and "Disease, if died within the year." It was hoped that the resulting vital statistics would be better than none, but the official report later admitted:

> The tables of the census which undertake to give the total number of Births, Marriages, and Deaths, in the year preceding the first of June, 1850, can be said to have but very little value. Nothing short of a registration system in the States can give the required data satisfactorily, and it has been proved that even where such systems have been best established, difficulties continually arise which require a very long time to be removed. Experience has shown that people will not, or cannot, remember and report to the census taker the number of the facts, and the particulars of them which occur in the period of a whole year to eighteen months prior to the time of his calling.[9]

(Despite its obvious defects as a method for collecting national vital statistics, census enumeration of vital events was not entirely abandoned until the census of 1910, when the developing registration area was large enough to provide better national statistics. In defense of the census officials who persisted for 50 years in a discredited method, it must be said that the registration system was not ready to take over any earlier, and the choice was vital statistics by enumeration or no national data at all.)

Registration and public health: 1850 to 1872

During the period 1850 to 1860, registration was working well in a handful of cities and in two States. In the rest of the country, particularly in rural areas, it was too sporadic to afford vital statistics in the modern sense. In an attempt to improve the situation, the American Medical Association in 1855 adopted the following resolutions:

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[8] Shattuck, Lemuel, and others, with a Foreword by Charles-Edward Amory Winslow, "Report of the Sanitary Commission of Massachusetts, 1850," p. VII, reprinted, Cambridge, 1948.

[9] DeBow, J. D. B., "Statistical View of the United States . . . Being a Compendium of the Seventh Census," p. 57, Washington, D.C., 1854.

> RESOLVED, That the members of the medical profession throughout the Union be urgently requested to take immediate and concerted action for petitioning their several legislative bodies to establish offices for the collection of vital statistics.
>
> RESOLVED, That a committee of one from each State be appointed to report upon a uniform system of registration of marriages, births, and deaths.

This action was probably spurred by the very high mortality rates which marked the decade. Since the beginning of the century, to judge from the imperfect statistics of the time, city death rates had been climbing to appalling levels. Immigration filled the urban tenements and overtaxed the rudimentary sanitary facilities. In Chicago, for example, typhoid deaths in 1854 were recorded at a rate of 175.1 per 100,000 population. In New York City, total deaths rose from 21.5 per 1,000 population in 1810 to 36.8 in 1857.[10]

Meanwhile, a number of physicians and sanitarians had been considering the idea of a national public health association. As early as 1851, Wilson Jewell of the Philadelphia Board of Health began planning such a group, and in 1857 he and others were able to organize the National Quarantine and Sanitary Convention. Annual meetings were held until 1861, when the Convention was disrupted by the Civil War. Meeting ostensibly to consider quarantine regulations, the group invariably went beyond these to promote broad plans for sanitation, and paid much attention to vital statistics and the need for improved registration.

By this time, the health field was divided into two opposing camps. In the one were the believers in "contagion," who were convinced that epidemic disease entered the country mainly through the ports, and was spread by infected animals or persons. This camp therefore advocated seaboard quarantine and isolation of the sick. In the other camp were those who looked for the causes of disease in their own (and their neighbors') backyards—in the filth, miasms, and noxious odors of the crowded cities. This was the sanitary group, which tried to fight disease with clean streets, clean water, garbage collections, sewage disposal, and so on. To locate the sore spots, for example, to find the typhoid sources to clean up, the sanitary school placed great stress on vital statistics, and used "before and after" figures as educational material to promote further reform.[11]

The Civil War probably delayed public health and registration by several years, but did both movements some good—"in spite of itself," as Shryock put it.[12] A number of physicians—notably John Shaw Billings (1838–1913), Medical Statistician of the Army of the Potomac—first became interested in public hygiene when disease proved to be a deadlier enemy than the opposing army. After the War, Billings and others were drawn increasingly into the public health movement. Typhoid fever had scourged both North and South, and many of the returning soldiers were carriers. The fantastically high infant mortality rates of the postwar period were taken as an index of bad health conditions in general.

Massachusetts led the way to health reform by enacting, after 19 years' delay, a comprehensive State health law modeled on the Shattuck report. By 1872, the District of Columbia, California, and Virginia followed with similar legislation. Thus began a period of rapid growth in State health organization, which in most instances was to include registration and vital statistics as a regular health department function.

Founding of the APHA and the National Board of Health

In 1872, a group of physicians and sanitarians, including many who had learned the value of statistics in the wartime sanitary commissions, founded the American Public Health Association (APHA). Taking up where the earlier Sanitary Conventions had left off, the APHA worked for an aggressive public health program, based on sanitary reform with a strong vital statistics base as a principal component.

Following a disastrous yellow fever epidemic in the South, Congress, in 1879, created the National Board of Health, largely on the basis of plans advanced by the APHA. The leadership of the APHA and a strong group in the AMA, dissatisfied with the emphasis placed on quarantine measures by the Marine Hospital Service, had wanted a national agency that would work on a broader front—to centralize information, engage in sanitary research, and collect vital statistics.[13] Despite some overlapping of functions and competitive activity between the Board and the Marine Hospital Service (later the United States Public Health Service), the Board made important contributions. Not the least of these was to advance the cause of vital statistics by placing extraordinary value upon complete and uniform vital registration. In its first year it established a standing committee, under Stephen Smith (first president of APHA), and later Billings, to promote uniformity in registration. The weekly Bulletin

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[10] Proceedings and Debates of the Third National Quarantine and Sanitary Convention, p. 523, New York, 1859.

[11] In retrospect, depending on the disease and the actual circumstances of its spread, it is clear that both camps were partly right and partly wrong. But the controversy flared up repeatedly, often with considerable ill-will, until the 1890's when the two groups were reconciled by the findings of bacteriology and medical entomology, as described below.

[12] Shryock, Richard H., "The Early American Public Health Movement," American Journal of Public Health, vol. 27, p. 970, October 1937.

[13] Leigh, Robert D., "Federal Health Administration in the United States," p. 468, New York, 1927.

of the Board undertook immediately to publish mortality summaries from cities able to supply the information from vital records.

The difficulties of publishing national vital statistics at this time are apparent in every issue of the Bulletin. For the year 1879, the Board received annual mortality reports, or weekly reports for the full year, from 24 cities. Fourteen separate forms were represented, "and of these no two are alike. The differences are such as to render direct comparison in some cases impossible, and difficult in all. Not only is there no uniform plan as to nomenclature, classification, or arrangement, but a most ingenious diversity exists as to the selection or omission of the several items of information usually expected in such reports."[14] But the rapid effect of the Board's promotional activity may be seen in the fact that, by March 1880, it was receiving weekly mortality reports from an average of 90 cities, with improvement in the quality of reporting.

In the second year of its existence, the Board called a national meeting of State and local registrars (May 1880) to consider the best methods for collecting and publishing vital statistics, and took up such questions as standard nomenclature for assigning causes of death, comparability of vital records, and problems of obtaining complete registration. As part of the preparation for this meeting, and as a regular function during its brief existence to 1883, the Board collected and published information on State and local registration laws, forms, tables, reports, and registration procedures and methodology, and from time to time it recommended standard models. As a coordinator and promoter of vital statistics, the Board (mainly through Billings) had an immediate impact on the perspectives and methods of the Census Bureau, which for more than a half-century was to carry on and extend the work in registration which the Board had begun.

Leadership by the Census Office: 1880 to 1890

Billings, while still chairman of the National Board of Health's Committee on Vital Statistics, was placed in charge of the 1880 census of mortality. The first three census counts of deaths (1850, 1860, 1870) had fallen short of actual deaths by 40 percent. Under an amendment to the census law of 1880, the Superintendent of the Census could withdraw mortality schedules and accept registration records from any areas having records in satisfactory detail. At Billings' suggestion, a so-called registration area was established in 1880, and registration records were obtained from an increasing number of States and cities in the succeeding censuses.[15] Billings also supplied physicians with books of blank death certificates, and requested them to fill out a form for each death they attended. The books were collected by the census takers and were used to obtain information on additional deaths or to improve the accuracy of death reports received. Using 1880 data, Billings also produced what were considered accurate life tables for 2 States and 12 cities.

Before the 1890 census, the Census Office wrote to all States and cities having 5,000 population or more to obtain an index of probable registration completeness. Experience with the 1880 census had demonstrated that laws governing death registration, degree of enforcement of such laws, and the manner of obtaining and recording data were so varied that the processing of these records by the Census Office was difficult and subject to considerable error.

In an effort to obtain better and more uniform data, the Census Office recommended a form of death certificate to be used in the 1890 census. In that census, prompted by the thought that death and disease are not subject to political boundaries, Billings made the first attempt to produce statistics by geographic and climatic areas.

The Census Bureau, adapting machine techniques used in the textile industry, used the Hollerith mechanical tabulator for the first time on a large scale operation in the 1890 census. Rapid counting and combining of characteristics could now be done with a high degree of accuracy.

The revolution in preventive medicine

During the 1880's, medical science was transformed by a series of discoveries which were to change the course and direction of the public health movement, and multiply its effectiveness against epidemic disease. Koch isolated the comma bacillus of cholera, and Gaffky the organism of typhoid fever (1884). Theobald Smith and F. L. Kilborne opened the way to the control of the arthropod-borne diseases, such as malaria and yellow fever, by tracing Texas fever in cattle to infected ticks (1889). In this period, German and French bacteriologists found the cause of diphtheria, and the causes of other diseases were soon added. These discoveries in disease etiology were accompanied by a series of triumphs in immunology, led by the genius of Pasteur.

The sanitary reformers and the quarantiners found in the new sciences a common meeting ground, and together put public health on a more rational basis. With exact knowledge came discriminating use of tra-

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[14] National Board of Health Bulletin, vol. 1, No. 36, March 6, 1880.

[15] See separate section on birth- and death-registration areas in this chapter.

ditional and new means of disease control. By the 1890's, the best health departments were beginning to achieve dramatic results in preventive medicine. To supplement sanitation and quarantine, they began setting up laboratories to diagnose disease and later to provide typhoid vaccine and diphtheria toxin-antitoxin. Private medicine found in the new discoveries more effective ways of curing the sick.

In all these developments, vital statistics were sharpened to keep pace, to point more precisely to problem areas, and to demonstrate the value of the new techniques in disease control. It was about this time, for example, that comparative infant mortality rates proved the life-saving value of pasteurization of milk, and induced the American dairy industry to move toward modern sanitary methods.

Advances in disease classification

The march of bacteriology and other medical sciences helped also to revolutionize diagnosis, and indirectly to transform vital statistics (particularly, mortality by cause) into a more accurate and useful health adjunct. From the time of Hippocrates (440–357 B. C.), physicians had with varying success tried to diagnose and classify disease by observing its natural history and symptoms. This approach was carried forward by the brilliant English clinician Thomas Sydenham (1624–89), whose objective descriptions influenced medical practice and vital statistics until they were at last overtaken by the precision-methods of the laboratory. Meanwhile, vital statistics struggled along with the prevailing nosology or systematic classification of disease—which was not very systematic until much later. By the second half of the 19th century, physicians were moving away from vague diagnoses like "fever" and had identified a large number of common diseases. The practice of making autopsies and the advance of surgery after the discovery of effective anesthetics in the 1840's led to better diagnosis and classification of disease.

After 1850, steady progress was made in developing an international classification of causes of death and a standard nomenclature. As recommended by the AMA, the Census Office in the 1850 and 1860 censuses employed a classification developed by Farr. In the 1870 census, on the advice of the Surgeon General of the U.S. Army, the classification and nomenclature of the Royal College of Physicians of London in 1869 were adopted.

Efforts were continued by the International Statistical Congress, from the 1850's on, to produce an acceptable classification of causes of death. The United States was a member of this body; Billings, for example, met with the Congress in 1880. Within a few years, as noted above, bacteriology upset the traditional means of identifying many of the common diseases, and was beginning to break down various categorical diseases into two or more distinct entities. Thus, the advent of bacteriology set off a parallel revolution in nosology, and in the resulting vital statistics. In 1898, the APHA formally adopted a modern classification which Jacques Bertillon of France had prepared for the International Statistical Institute. The APHA recommended that this list be revised periodically to keep abreast of medical science. Since then, the list has been revised decennially, on an international basis.

Census leadership after 1900

When the census count of mortality was made in 1900, it seemed likely that a permanent Census Office was to be established, and plans were made accordingly. Prior to the census, intensive correspondence was carried on with each State and with cities of 5,000 population or more. The Census Office collected data and material on law, procedure, estimated rates, probable number of deaths not registered, etc., and released a circular to acquaint registration personnel with the findings. It also recommended a death certificate and requested each area to adopt it by January 1, 1900. Twelve States adopted the form in full; six States and the District of Columbia adopted it in part; and seventy-one major cities in other States adopted the form in full or made revision. The census of 1900 included figures obtained from well-established registration areas which had adopted model laws and where it was believed that 90 percent completeness of registration had been attained.

Marriage and divorce were also matters of public concern. In 1887, Congress passed an act directing the Commissioner of Labor to collect statistics on marriages and divorces for the years 1867 through 1886.[16] In 1905, President Theodore Roosevelt sent a special message to Congress in which he recommended that "the Director of the Census be authorized by appropriate legislation to collect and publish statistics pertaining to that subject (marriage and divorce) covering the period from 1886 to the present time."[17]

Since 1880, the Census Office had consistently advocated national uniformity in State supervision, in basic procedures, and in the forms used for registration of deaths. In the same period, interest in statistics generally became widespread, and there appeared a public disposition to consider statistical reporting a governmental responsibility. The Census Office, which had previously been disbanded between censuses, was

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[16] Wright, Carroll D., "Marriage and Divorce in the United States, 1867 to 1886," Department of Labor, Washington, D. C., 1889.

[17] U. S. Bureau of the Census, "Marriages and Divorces, 1867–1906," p. 4, U. S. Government Printing Office, Washington, D. C., 1909.

made a permanent, full-time agency of the Federal Government in 1902, and was given its present name, the Bureau of the Census.

The organic act provided statutory authority for registration areas for births as well as deaths. From this time forward, the Bureau completely abandoned the 50-year effort to obtain mortality information by census counts, and relied solely upon registration records. As its principal task, the Bureau undertook to develop an annual system of collection of vital statistics data, capable of producing comparable statistics on a national basis. The over-all objective was to develop and maintain a uniform system of registration with respect to such matters as law, forms, procedures, statistical methodology, etc.

It was recognized that these objectives would require the cooperation of outside organizations and the public at large. Organizations that formed working arrangements with the Bureau included the American Medical Association, American Public Health Association, Conference of Commissioners on Uniform State Laws, American Statistical Association, American Bar Association, and the National Tuberculosis Association.

Among the more important steps initiated by the Bureau were: formulation of principles and wording of a model law; drafting of standard forms; preparation of instructions for local registrars, physicians, and others; preparation of a system of mortality classification satisfactory for statistical purposes; formulation of rules of statistical practice; and establishment of working relationships with external groups within and outside the country. As a working concept, the Bureau announced that it would become a central office for mortality statistics, act as a clearing house to harmonize the results of individual efforts in the various State and city offices, and look forward to the possibility of forming a national association of registrars.

In 1907, the American Public Health Association established a Vital Statistics Section to develop closer working relations among registration officials; to promote more effective systems of vital statistics; to aid the adoption of uniform registration methods and publication of statistical data; etc. For many years the APHA had been active in promoting uniform State registration and model laws. At the annual meeting in 1895, various members of the association proposed that it either draft a model law or set forth principles. At its annual meeting in 1900, the APHA adopted principles of a model law for the registration of births and deaths. Strong support for model State laws came from Congress, which on February 11, 1903, adopted a joint resolution requesting State authorities to cooperate with the Census Bureau in securing a uniform system of birth and death registration. By 1907, a model bill, which in 1905 had been adopted by Pennsylvania in draft form, was submitted to the States with the endorsement of a broad list of organizations. The principles of this and subsequent model laws have since been adopted in every State of the Union, either by direct enactment or by regulations.

The Federal Children's Bureau, created in 1912, worked actively with the Census Bureau in many of the State campaigns. Credit should also be given to the able leadership of William Alexander King, chief vital statistician of the Census Bureau, 1900–1906, and Cressy L. Wilbur, who held the position from 1906 to 1914. Through their efforts, uniform State legislation advanced rapidly, and permitted an increasing number of States to qualify for admission to the death-registration area.

About 1913, the Census Bureau began appointing agents in the State health agencies, and authorizing them to use the mailing privileges of Federal officials, to promote registration, and to correct the certificates of birth and death which are the sources of the national statistics.

In 1914, the Bureau published the first table separating nonresident from resident deaths; the data had been lumped together up to that time. Although complete reallocation of deaths by place of residence was not yet possible, the first table was an important step in this direction.

In 1915, the national birth-registration area was formed. Before then, the collection and publication of data were limited to death records because they were more complete, of greater public interest than birth records, and because it was believed that the concentration of census efforts in one field of registration would yield better results than if its efforts were spread thin.[18]

After the United States entered the First World War, the need to provide health authorities with current information on epidemics became apparent. Largely as a war measure, the Census Bureau obtained weekly telegraphic reports on the number of deaths and infant deaths occurring in cities of more than 100,000 population. Beginning October 1917, this information, together with comparative death rates and the proportion of infant deaths to total deaths, was published in a Weekly Health Index, which was later expanded to include separate tabulations of influenza deaths during the pandemic of 1918–19.

The wartime influx of workers into industrial centers, and the growing tendency for serious illnesses of out-of-town residents to be treated in urban hospitals aggravated existing distortions in the crude death rates of many cities and towns. During 1918, the Bureau therefore sought to obtain complete data on the "usual place of abode" of nonresidents who died within the death-registration area. On the basis of this

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[18] Shapiro, Sam, "Development of Birth Registration and Birth Statistics in the United States," Population Studies, vol. IV, No. 1, June 1950.

information, the Bureau published the first tables in which nonresident deaths were reallocated to place of residence. Deaths of nonresidents living outside the registration area were shown separately.

Concerned with the slow growth of the registration areas, the Bureau in 1924 established a committee to bring all States into the registration areas by 1930. The advice and assistance of many varied interests helped advance this program. As a further stimulus, in 1924 the Census Notification of Birth Registration was developed, to be mailed to parents from State vital statistics offices when they received certificates of birth. This offered parents an opportunity to verify or correct information contained in the birth record and helped to promote registration generally.

The following excerpt from a report of the National Resources Committee perhaps best summarized this period:

> The long, hard, often discouraging campaign which was fought to bring States, one by one, into the fold constitutes one of the proudest chapters in the history of the Bureau of the Census . . . . In some States, the boards of health had to be educated to the need, before the citizens of that State could approach the legislature. In others, the legislatures were apathetic, in spite of strong pressures. After the required legislation was passed, there remained the problem of bringing a State up to the minimum quota. Each State had to educate its physicians and undertakers as to their duties, as well as an army of local registrars. The Bureau aided the State registrars in preparing promotional publicity and facilitated the exchange of ideas as to the most effective ways of presenting public health data to the general public.[19]

Division of Vital Statistics: The road to reorganization

The social and economic forces that had been generated in the war and postwar periods worked fundamental changes in the patterns of American life. In December 1929, President Hoover appointed a group of social scientists to make a national survey of social trends—to see what had happened to private economic organization, government functions, public welfare, education, family patterns, the role of women in industry and the home, rural and metropolitan patterns, sports and other recreation, labor organization, and a wide variety of the other interrelated institutions that make up American life as a whole and dictate the form of its social problems. The underlying social data, including vital statistics, came in for close scrutiny, particularly by Stuart A. Rice and his associates who produced several penetrating studies of the current status and developmental needs of social statistics.[20] Both assets and deficiencies were freely discussed, and important suggestions were made for improving Federal vital statistics.

Much the same concern that had led to these studies was reflected in the actions of professional organizations. The Social Science Research Council and the American Statistical Association, which were both interested in improving Federal statistics, combined their respective committees on social statistics in a joint committee, with Professor Robert E. Chaddock as chairman and Dr. Rice as secretary. Though concerned mainly with social welfare data, this committee had related interests in population and vital statistics.

Despite growing demands for improved and more comprehensive statistics to cope with the Depression, sweeping reductions were made in government statistical services early in 1933, following the Economy Act of 1932. These cuts were vigorously protested, particularly when the swift expansion of government functions in the economic crisis created urgent administrative needs for statistics as a factual basis of decisions and programs. In this situation, the need for a thorough reappraisal of government statistical services soon became widely recognized.

In the spring of 1933, the Secretaries of Agriculture, Commerce, Labor, and Interior invited the Social Science Research Council and the American Statistical Association "to furnish immediate assistance and advice in the reorganization and improvement of the statistical and informational services of the Federal Government." In response, the two organizations established a joint Committee on Government Statistics and Information Services (COGSIS), which began work in June 1933 with financial support from the Rockefeller Foundation. Among many other activities, the COGSIS made a preliminary survey of the vital statistics of the Bureau of the Census and the Public Health Service, which was completed in May 1934.[21] This survey, which was begun during the summer of 1933 while Dr. Rice was acting chairman of the committee and which continued in the fall when he joined the Census Bureau as assistant director, marked the beginnings of a drastic reorganization of the work of the Division of Vital Statistics.

For approximately a third of a century, the fundamental task of the Bureau of the Census in the field of vital statistics had been to extend the registration

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[19] National Resources Planning Board, ''Research—A National Resource, Part I,'' p. 210, Washington, D. C., 1938.

[20] See, especially, Rice, Stuart A., and collaborators, ''Next Steps in the Development of Social Statistics,'' and DePorte, Joseph V., ''Guides to Vital Statistics in the United States,'' Volumes I and III in a Report to the President's Research Committee on Social Trends on Social Statistics in the United States, Ann Arbor, 1933.

[21] See the final report of COGSIS, ''Government Statistics,'' Bulletin No. 26, Social Science Research Council, April 1937.

area for births and deaths. With the completion of the birth area by the admission of Texas in 1933, this primary responsibility was accomplished. The period 1933 to 1935 was a time of appraisal and preparation for new types of work for which the Bureau had become responsible. These fell into two main categories: (1) improvement of all reports for the completed registration areas; and (2) research in the new fields of vital statistics which had been opened.

For these tasks, the Division needed considerable strengthening, both in number of personnel and professional training. After the 1930 census, the Bureau as a whole had made little progress in recruiting or holding professional personnel. In the Division of Vital Statistics only the chief statistician was at the professionally classified level. While studies of means to strengthen the Division were under way, an opportunity developed in the summer of 1934, with Federal Emergency Relief Administration Funds, to conduct a campaign in some 20 States to promote birth registration. The COGSIS staff members helped organize this program, which improved registration in nearly all the States and furnished incidental data for checking on weak registration areas. The Committee also helped the Bureau to develop the reporting of births and deaths by place of residence of mother or decedent, beginning January 1, 1935. This greatly improved the data, which had previously been published mainly on the basis of place of occurrence of the birth or death, and which had become distorted by the growing use of city hospitals by rural residents.

At the request of the Census Director, the COGSIS subsequently made a more intensive survey of the Division and developed, among others, the following recommendations:

1. The Division should be strengthened by creating office and field positions for several people with professional degrees.
2. A permanent expert field staff should work systematically to speed up and improve reliability of reporting in the States.
3. The feasibility of rewarding States for especially meritorious cooperation, perhaps by creating a new registration area, should be investigated.
4. A monthly reporting system using provisional figures on births should be established.
5. Systematic plans should be made for publication of special monographic studies.
6. Revisions should be made in annual published volumes providing for more analytical and interpretive text material, standardization of rates for age, tabulation by broad socio-economic groups and certain selected occupational groups, more extensive tabulations by age groups, and omission of considerable costly and relatively unimportant material, such as births by country of birth of mothers.

In 1935, under the new leadership of Halbert L. Dunn, a physician and biometrician, the Division was drastically reorganized, and its professional staff greatly augmented. In the same year, the Secretary of Commerce appointed an Advisory Committee for the Division of Vital Statistics, which at its first meeting recommended that development of the Division should be continued along the following broad lines:[22]

1. Extension of field work in order to secure and maintain completeness and to improve completeness and accuracy of the data noted upon the original certificates, and to promote cooperation between Federal, State, and nonofficial agencies dealing with and interested in vital statistics.
2. Coordination of State and Federal statistical office activities with the object of eliminating overlapping effort insofar as possible.
3. Development of means by which the total data in the birth and death certificate might be made available for special public health and scientific needs.
4. Stimulation of research within the Division by appropriate cooperation of the Division with outside scientific and public health agencies, and by building up within the Division a personnel whose principal duties would be the analysis and solution of important vital statistical problems.

Changing needs for vital records and statistics

By the early 1930's, responsibility for vital records had been largely transferred from civil offices to health departments. As more and more departments employed full-time officers with public health training, they were able to make more intensive use of the records for statistical analysis. In addition to using statistics to locate and deal with disease outbreaks, defective water and sewage facilities, and related sanitation problems, many health departments routinely used them as the basis for maternal, infant, and child care programs, immunization against childhood diseases, and a variety of other personal health services. During the 1930's, the emphasis in public health work shifted even farther away from the sanitation diseases, which by then were under control in most areas. Greater attention was paid to communicable diseases in which case-finding was the key to control. The Public Health

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[22] Dunn, Halbert L., "Development of Vital Statistics in the Bureau of the Census," American Journal of Public Health, vol. 25, No. 12, p. 1322, December 1935.

Service developed a national tuberculosis control program to supplement voluntary and State activities, and greatly expanded national control of venereal diseases through technical and financial aid to the States. In both programs, vital statistics were widely used to map out areas and population groups in which case-finding efforts would be most fruitful. The need for this kind of statistics had, in fact, been part of the impetus for the reorganization of the Vital Statistics Division.

While these health needs for statistics continued, the records suddenly became important to large numbers of individuals, who for the first time in their lives had to prove vital facts about themselves.[23] Beginning about 1935, Federal and State Governments enacted a variety of welfare legislation, such as old age and other social security. As a result of new directions in labor-management relations, the movement toward industrial pension plans became widespread. The common factor in both the public and private plans was the use of the birth certificate as a legal document to evidence the fact of age.

A few years later, the outbreak of World War II produced an additional shift in emphasis. Congress wrote into law provisions against the employment of aliens in certain defense projects, so that for the first time the birth certificate was widely demanded as evidence of citizenship. Early in 1940, State offices were hard pressed to fill requests for birth certificates of persons seeking employment in defense industries. Since many of these births had never been registered, the problem of filing delayed birth certificates became acute. It was estimated that nearly 55,000,000 native persons who were living in 1940 had no birth record on file. Some States did not have express provision in law or regulation governing delayed certificates. The rules and standards in operation in other States varied and were complex, since uniform standards for filing had not been formulated.

The Division of Vital Statistics was called upon by State registrars to aid in the development of acceptable standards. Successive meetings of Federal agencies and State representatives resulted in a set of recommendations which were incorporated in a Manual of Uniform Procedures for the Delayed Registration of Births, issued by the Bureau of the Census on July 16, 1941. Procedures for delayed registration were adopted immediately by a large number of States, but the goal of uniform principles was not fully achieved.

When the United States entered the War, the conversion to all-out war production and the drive to employment in war plants started in earnest. In addition, separate legislation increased the need for certificates, for example, the emergency maternal and infant care program for dependents of service men. Almost immediately, State registrar offices were swamped by the wholesale demand for birth certificates, often by persons born before the establishment of records systems. Many State and local offices abandoned statistical functions to prepare certified copies and to devise means of providing delayed birth certificates for persons whose births had not been registered.

To meet these needs the States reacted with various types of emergency legislation, deviating widely from the model laws which had been providing a fair degree of national uniformity. Needs for certificates were met in diverse ways, and standards acceptable in one State proved either too lenient or too strict in another. Federal agencies requiring such certificates were bewildered by the variety of standards, and pressures began to mount for a return to greater uniformity. The difficulties encountered by State vital statistics offices and by applicants for certified copies led to a series of proposals, numerous bills in Congress, and a general feeling that something drastic would have to be done.

Budget Bureau's recommendations: 1943

In July 1942, the President of the United States urged Congress not to enact any hasty legislation. In the same letter, he acknowledged "great confusion in vital records growing out of the activities of government and industry, particularly in connection with the security and health laws." In view of the need for study, the Budget Bureau at his request made its own survey, and examined the recommendations of an official Commission on Vital Records headed by Dr. Lowell J. Reed, and a report adopted by the Association of State and Territorial Health Officers.[24]

The report of health officers, which foreshadowed the Budget Bureau's recommendations, had warned against solutions offering purely financial relief to the States, solutions that might undermine the work of existing registration agencies, and solutions that would dilute the standards and thus weaken the value of vital records. Instead it proposed the creation of a cooperative vital records system, comprising the existing State and independent city vital statistics offices and a national office to "represent and serve the system from a Federal standpoint, and, by making available financial and technical aid, would work to improve, develop, and integrate the individual units of the system." It called for a program of continuous

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[23] An earlier instance of the use of birth certificates for legal purposes—perhaps the first since colonial days—occurred after World War I when birth certificates began to be used extensively in the enforcement of regulatory laws dealing with child labor and compulsory education.

[24] Measures Relating to Vital Records and Vital Statistics, House Document No. 242, Washington, D. C., 1943.

allotment of money to the present State, city, and Territorial offices to be spent for correcting defects in the registration system and for expansion as required.

The objective of the national office would be "to correct the deficiencies now existing on a national, State, and local basis, in the coordination and standardization of vital records agencies, methods, and requirements." In addition, the plan provided for the transfer of Census Bureau functions in vital statistics to a bureau or division of the United States Public Health Service. The report noted that "assurances have been given by officers of the United States Public Health Service that, if functions of the Division of Vital Statistics are transferred to the United States Public Health Service, the Vital Records Office will have the responsibility and authority to work out in cooperation with the other bureaus and divisions of the United States Public Health Service, and State and other Federal officers, whatever future programs may be mutually desirable and beneficial."

On the basis of these studies, the Budget Bureau recommended against legislation to authorize Federal agencies to issue documents as substitutes for birth certificates. On the positive side, it recommended:

> That a national vital records office should be established as a separate organizational unit in the United States Public Health Service, the head of the office to report directly to the Surgeon General.
>
> This office should work with and through the existing State and local vital statistics agencies with a view to developing a record system which, while nationwide in scope, will preserve the wholesome responsibility of the State and local governments. The proposed office should not only assume the functions of the present Division of Vital Statistics of the Bureau of the Census but should also be authorized to take appropriate steps (within the framework of normal Federal-State relationships) to promote higher standards of performance within and better coordination among the State and local vital records agencies.

The recommendations of the Budget Bureau, the Commission, and the Association of State and Territorial Health Officers were in essential agreement on the need for a cooperative vital records system with the coordinating responsibility placed in a single national agency. Thus, the report was a major turning point in the position of the Federal Government in vital records and statistics. While the Census Bureau had been responsible for publishing vital statistics, and had worked with vague authority to coordinate practices in the independent State offices, no Federal agency had ever been explicitly charged with responsibility for the vital records system.

At that time the Budget Bureau estimated that the Federal Government was spending $2 million a year, and the State and local agencies $6.5 million, for vital records and vital statistics. In addition, the public was paying a total of perhaps $12 million in fees to government agencies and others for services in obtaining documentary evidence. Despite these substantial expenditures, the Budget Bureau found that American vital records were "surprisingly inadequate." Visits to several State vital records offices showed that the wartime volume of demands for certification was not being met promptly and adequately, and that in diverting personnel to the certification problem the States were neglecting the long-run task of seeing that all current births and deaths were promptly and accurately registered. "It cannot be assumed," the Bureau declared, "that needs for adequate vital records will disappear after the war emergency is ended; on the contrary, the course of social evolution points to continually increasing needs for official records of the existence, identity, and status of individuals, and for statistics based on such records."

Wartime cooperative arrangements

Pending Executive or Congressional action on the Budget Bureau's recommendations, the Division of Vital Statistics continued to work toward a coordinated system, but under special handicaps imposed by wartime restrictions. Starting in 1934, the Division had brought the State registrars together in work conferences, to exchange viewpoints and unify registration practices by cooperative agreements. Successive conferences had been held in 1938, 1940, 1941, and 1942, when travel restrictions made large meetings impossible. As an interim device, the American Association of Registration Executives in 1944 urged the Division to establish a representative Council, to deal with the many wartime problems. This new organization, created the same year, consisted of seven regional representatives elected by the registration executives, the President and Secretary of the Registrars' Association, and two Federal officials. From time to time, the regional representatives called regional meetings. Despite the limitations of these stopgap mechanisms, they were invaluable in linking State and national registration and vital statistics interests.

Transfer to the Public Health Service: 1946

The Budget Bureau's recommendations of 1943 were adopted in July 1946, when the President's Reorganization Plan No. 2 gave the Federal Security Administrator[25] authority for Federal functions in vital

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[25] Transferred to the Secretary of the Department of Health, Education, and Welfare, April 1953.

statistics. To administer these functions, and to provide a single locus of authority for vital records at the Federal level, the National Office of Vital Statistics (NOVS) was established in the Public Health Service.

The National Office of Vital Statistics continued to work closely with the Council, which had proved so useful that it was continued even after the annual work conference was resumed in 1947. Through this annual conference and the Council, and in close cooperation with the Registrars' Association and the Statistics Section of APHA, vital records and statistics problems of an interstate and national character were handled with a fair degree of adequacy. But from a public health viewpoint, there were still serious shortcomings. Of paramount importance was the early development of a public health working conference and committee mechanism to unite the skills and experience of all those producing public health statistics. This meant getting registration executives, vital statisticians, and public health statisticians, from all of the registration areas, into a conference-type organization that would function on a permanent basis.

This last essential was finally achieved on May 17, 1949, when the Public Health Conference on Records and Statistics was formally launched. It was conceived as a permanent organization, with working committees assigned to specific problems, and an Executive Committee (Council) to conduct its affairs in the interim between national meetings. The Conference was essentially the culmination and fulfillment of organization and work-methods that had been under development for some time in the Council and the annual meeting of State registrars. But its scope was considerably broadened beyond those of its two predecessors. Of special importance was the broadening of its base to include the whole field of public health statistics in addition to that of vital records and vital statistics.[26]

A measure of the remarkable progress made by the registration system was provided by the second nationwide test of birth registration completeness, which was made in conjuction with the 1950 census. This test indicated that 97.9 percent of the infants born in the early part of that year had birth certificates on file in vital statistics offices. In 24 States and the District of Columbia, birth registration completeness was 99.0 percent or more and in only 7 States was it lower than 95.0 percent. In the first nationwide test, made in 1940, only 92.5 percent of the births had been registered. Thus, the proportion of infants without birth certificates was reduced almost three-quarters in the 10-year period. A detailed discussion of the birth registration tests appears in chapter 6.

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[26] The philosophy and working methods of the Public Health Conference, and the impact of this coordinating mechanism on health records and statistics, are described in ''The Public Health Conference on Records and Statistics,'' by Hazel V. Aune, Canadian Journal of Public Health, December 1951; and in ''Records at Work,'' published by the Public Health Conference, March 1952.

Growth of the Birth- and Death-Registration Areas

The first birth and death statistics published by the Federal Government concerned events in 1850 and were for the entire United States. These statistics were based on information collected during the decennial census of that year. Similar decennial collections were made by census enumerators at each census up to and including the census of 1900, but because of the time interval between the occurrence of a birth or a death and the census enumeration, these reports were inaccurate and incomplete.

In 1880, the Bureau of the Census established a national "registration area" for deaths. This original area consisted of only two States—Massachusetts and New Jersey—the District of Columbia, and several large cities having efficient systems for the registration of deaths, but by 1900 eight other States had been admitted. For the years 1880, 1890, and 1900, mortality data were received from the States and cities included in this expanding area, but birth and death figures for the entire country were still compiled from the reports of census enumerators.

The annual collection of mortality statistics for the registration area began with the calendar year 1900. In 1902, the Bureau of the Census, which had previously functioned only in census years, was made a permanent agency by an act of Congress. This act authorized the Director of the Bureau of the Census to obtain, annually, copies of records filed in the vital statistics offices of those States and cities having adequate death-registration systems. At that time not all States had enacted laws requiring the registration of deaths, and in many States the existing laws were poorly enforced. The important dates in the historical development of birth and death registration in various States and the year in which each State was admitted to the national registration areas, are given in table 1.01.

The death-registration area for 1900 consisted of 10 States, the District of Columbia, and a number of cities located in nonregistration States. The registration area in 1900 included 40.5 percent of the population of the continental United States. The original registration area was predominantly urban and characterized by a high proportion of white persons. If those reporting cities located in nonregistration States are excluded, the population coverage of the death

Table 1.01. Important Dates in the History of Birth and Death Registration: United States

Area	*Records on file for entire area*		*Admitted to registration area*	
	Deaths	*Births*	*Deaths*	*Births*
Alabama	1908	1908	1925	1927
Arizona	1909	1909	1926	1926
Arkansas	1914	1914	1927	1927
California	1905	1905	1906	1919
Colorado	1907	1907	1906	1928
Connecticut	1897	1897	1890	1915
Delaware	1881	1881	1890	1921
District of Columbia	1855	1871	1880	1915
Florida	1899	1899	1919	1924
Georgia	1919	1919	1922	1928
Idaho	1911	1911	1922	1926
Illinois	1916	1916	1918	1922
Indiana	1900	1907	1900	1917
Iowa	1880	1880	1923	1924
Kansas	1911	1911	1914	1917
Kentucky	1911	1911	1911	1917
Louisiana	1914	1914	1918	1927
Maine	1892	1892	1900	1915
Maryland	1898	1898	1906	1916
Massachusetts	1841	1841	1880	1915
Michigan	1867	1867	1900	1915
Minnesota	1900	1900	1910	1915
Mississippi	1912	1912	1919	1921
Missouri	1910	1910	1911	1927
Montana	1907	1907	1910	1922
Nebraska	1905	1905	1920	1920
Nevada	1911	1911	1929	1929
New Hampshire	1850	1850	1890	1915
New Jersey	1848	1848	1880	1921
New Mexico	1919	1919	1929	1929
New York	1880	1880	1890	1915
North Carolina	1913	1913	1910	1917
North Dakota	1908	1908	1924	1924
Ohio	1909	1909	1909	1917
Oklahoma	1908	1908	1928	1928
Oregon	1903	1903	1918	1919
Pennsylvania	1906	1906	1906	1915
Rhode Island	1852	1852	1890	1915
South Carolina	1915	1915	1916	1919
South Dakota	1905	1905	1906	1932
Tennessee	1914	1914	1917	1927
Texas	1903	1903	1933	1933
Utah	1905	1905	1910	1917
Vermont	1857	1857	1890	1915
Virginia	1912	1912	1913	1917
Washington	1907	1907	1908	1917
West Virginia	1917	1917	1925	1925
Wisconsin	1907	1907	1908	1917
Wyoming	1909	1909	1922	1922
Alaska	1913	1913	1950	1950
Hawaii	1896	1896	1917	1929
Puerto Rico	1931	1931	1932	1943
Virgin Islands	1919	1919	1924	1924

NOTE: See tables 1.03 and 1.04 for footnote references to several States.

Table 1.02. Growth of the Birth- and Death-Registration Areas: United States

(Beginning with 1933 and each succeeding year, areas include entire continental United States)

Year	*Estimated midyear population of continental United States*	*Birth-registration States*		*Death-registration States*	
		Estimated midyear population	*Percent of total*	*Estimated midyear population*	*Percent of total*
1933	125,578,763	125,578,763	100.0	125,578,763	100.0
1932	124,840,471	118,903,899	95.2	118,903,899	95.2
1931	124,039,648	117,455,229	94.7	118,148,987	95.3
1930	123,076,741	116,544,946	94.7	117,238,278	95.3
1929	121,769,939	115,317,450	94.7	115,317,450	94.7
1928	120,501,115	113,636,160	94.3	113,636,160	94.3
1927	119,038,062	104,320,830	87.6	107,084,532	90.0
1926	117,399,225	90,400,590	77.0	103,822,683	88.4
1925	115,831,963	88,294,564	76.2	102,031,555	88.1
1924	114,113,463	87,000,295	76.2	99,318,098	87.0
1923	111,949,945	81,072,123	72.4	96,788,197	86.5
1922	110,054,778	79,560,746	72.3	92,702,901	84.2
1921	108,541,489	70,807,090	65.2	87,814,447	80.9
1920	106,466,420	63,597,307	59.7	86,079,263	80.9
1919	104,512,110	61,212,076	58.6	83,157,982	79.6
1918	103,202,801	55,153,782	53.4	79,008,412	76.6
1917	103,265,913	55,197,952	53.5	70,234,775	68.0
1916	101,965,984	32,944,013	32.3	66,971,177	65.7
1915	100,549,013	31,096,697	30.9	61,894,847	61.6
1914	99,117,567	- - -	- - -	60,963,309	61.5
1913	97,226,814	- - -	- - -	58,156,740	59.8
1912	95,331,300	- - -	- - -	54,847,700	57.5
1911	93,867,814	- - -	- - -	53,929,644	57.5
1910	92,406,536	- - -	- - -	47,470,437	51.4
1909	90,491,525	- - -	- - -	44,223,513	48.9
1908	88,708,976	- - -	- - -	38,634,759	43.6
1907	87,000,271	- - -	- - -	34,552,837	39.7
1906	85,436,556	- - -	- - -	33,782,288	39.5
1905	83,819,666	- - -	- - -	21,767,980	26.0
1904	82,164,974	- - -	- - -	21,332,076	26.0
1903	80,632,152	- - -	- - -	20,943,222	26.0
1902	79,160,196	- - -	- - -	20,582,907	26.0
1901	77,585,128	- - -	- - -	20,237,453	26.1
1900	76,094,134	- - -	- - -	19,965,446	26.2
1890	[1]62,947,714	- - -	- - -	19,659,440	31.2
1880	[1]50,155,783	- - -	- - -	8,538,366	17.0

- - - Birth registration area was not established until 1915.

[1] Population enumerated in the Federal census of May 31.

registration States is much lower, representing 26.2 percent of the total population of the United States.

Inasmuch as it is more difficult to obtain accurate and complete registration of births as compared with deaths, the national birth-registration area was not established until 1915, and no birth statistics were published by the Bureau of the Census from 1900 to 1914. The original birth-registration area of 1915 consisted of 10 States and the District of Columbia. The growth of this area is indicated in table 1.02.

Table 1.02 also presents for each year through 1933 the estimated midyear population of the continental United States and the estimated midyear population of those States included in the registration system. Beginning with 1933, the birth- and death-registration areas have included all 48 States and the District of Columbia. The year in which each State was admitted to the birth-registration area is shown in table 1.03, and to the death-registration area in table 1.04.

Prior to 1940, most of the national mortality tabulations published by the Bureau of the Census were based on data collected from the registration areas, but beginning with 1940 all published material given in statistical series for the United States prior to the

Table 1.03. Year in Which Each State was Admitted to the Birth-Registration Area

Year	State	Year	State
1915	Connecticut	1921	Delaware
	Maine		Mississippi
	Massachusetts		New Jersey
	Michigan	1922	Illinois
	Minnesota		Montana
	New Hampshire		Wyoming
	New York	1924	Florida
	Pennsylvania		Iowa
	Rhode Island[1]		North Dakota
	Vermont	1925	West Virginia
	District of Columbia[2]	1926	Arizona
1916	Maryland		Idaho
1917	Indiana	1927	Alabama
	Kansas		Arkansas
	Kentucky		Louisiana
	North Carolina		Missouri
	Ohio		Tennessee
	Utah	1928	Colorado
	Virginia		Georgia
	Washington		Oklahoma
	Wisconsin	1929	Nevada
1919	California		New Mexico
	Oregon	1932	South Dakota
	South Carolina[3]	1933	Texas
1920	Nebraska		

[1] Dropped from the birth-registration area in 1919; readmitted in 1921.
[2] Included in States.
[3] Dropped from the birth-registration area in 1925; readmitted in 1928.

Table 1.04. Year in Which Each State was Admitted to the Death-Registration Area

Year	State	Year	State
1880	Massachusetts	1911	Missouri
	New Jersey	1913	Virginia
	District of Columbia[1]	1914	Kansas
1890	Connecticut	1916	South Carolina
	Delaware[2]	1917	Tennessee
	New Hampshire	1918	Illinois
	New York		Louisiana
	Rhode Island		Oregon
	Vermont	1919	Florida
1900	Maine		Mississippi
	Michigan	1920	Nebraska
	Indiana	1922	Georgia[5]
1906	California		Idaho
	Colorado		Wyoming
	Maryland	1923	Iowa
	Pennsylvania	1924	North Dakota
	South Dakota[3]	1925	Alabama
1908	Washington		West Virginia
	Wisconsin	1926	Arizona
1909	Ohio	1927	Arkansas
1910	Minnesota	1928	Oklahoma
	Montana	1929	Nevada
	North Carolina[4]		New Mexico
	Utah	1933	Texas
1911	Kentucky		

[1] Included in States.
[2] Dropped from the registration area in 1900; readmitted in 1919.
[3] Dropped from the registration area in 1910; readmitted in 1930.
[4] Included only municipalities with populations of 1,000 or more in 1900 (about 16 percent of the total population); the remainder of the State was added to the area in 1916.
[5] Dropped from the registration area in 1925; readmitted in 1928.

completion of the death-registration area in 1933 omits data for registration cities located in nonregistration States, and includes only findings for the registration States. This change decreases the mortality statistics coverage of the United States by the exclusion of cities in nonregistration States, but it has its advantages in that more reliable population estimates are available for the registration States than for the registration areas. No change in coverage has been made for natality statistics since the birth-registration area at no time included cities in nonregistration States.

Because of the growth of the areas for which data have been collected and tabulated, a national series of geographically comparable data prior to 1933 can be obtained only by estimation. Annual estimates of births have been prepared by P. K. Whelpton for the period 1915 to 1934. (See table 6.02 in chapter 6.) These estimates include an adjustment for States not in the birth-registration area prior to 1933 and for underregistration. In conjunction with annual estimates prepared by the National Office of Vital Statistics for the period 1935 through 1949, they constitute a series of data consistent with respect to geographic coverage and registration completeness. Corresponding estimates for deaths are not yet available. However, rates for the expanding groups of death-registration States are approximations to complete national rates, and general comparisons over a long period of years are made. More exact trends for parts of the United States can be secured through the use of some constant area, such as the original registration States, or the registration States of 1920. The crude marriage and divorce rates; birth rates; fetal death ratios; and death, infant mortality, and maternal mortality rates for the registration States, geographic divisions, and individual States for a series of years are given in chapters 5, 6, 7, and 8. Rates or ratios by place of occurrence and place of residence are given in separate tables.

Marriages, Divorces, and Notifiable Diseases

Marriages and divorces

The earliest Federal statistics on marriages and divorces in the United States were collected in a field survey by the Commissioner of Labor, covering the 20-year period 1867 to 1886. A survey covering the next 20 years, and the single-year collections for 1916 and for each year from 1922 to 1932 were made by the Bureau of the Census. In all these studies, marriage statistics were confined to numbers of occurrences, by county, with considerable incompleteness for the first 20 years. Divorce data were considered practically complete, and included detailed statistics on such items as legal grounds (“causes”), duration of marriage prior to divorce, etc.

Table 1.05. Sources of Marriage and Divorce Totals: United States, 1867–1950

Year	*Sources of marriage totals*	*Sources of divorce totals*[1]
1867–86	Estimates published in 1947 by National Office of Vital Statistics, from incomplete data of survey by Comissioner of Labor, published in 1889.	Figures collected (with detailed data) by Commissioner of Labor, published in 1889.
1887–1906	Estimates published in 1947 by National Office of Vital Statistics, from data of nearly complete survey by Bureau of the Census, published in 1908–1909.	Figures collected (with detailed data) by Bureau of the Census, published in 1908–1909.
1907–15	Estimates published in 1928 by Bureau of the Census, from records of selected States.	(Same as marriage.)
1916	Figures collected by Bureau of the Census, published in 1919.	Figures collected (with detailed data) by Bureau of the Census, published in 1919.
1917–21	Estimates published in 1928 by Bureau of the Census, from the records of selected States.	(Same as marriage.)
1922–32	Figures collected each year and published in annual reports by Bureau of the Census.	Figures collected (with detailed data) each year and published in annual reports by Bureau of the Census.
1933–36	Estimates by S. A. Stouffer and L. M. Spencer (American Journal of Sociology, January 1939).	(Same as marriage.)
1937–40	Estimates published in 1942 by Bureau of the Census, from nearly complete survey.	(Same as marriage.)
1941–43	Estimates published in 1946 by National Office of Vital Statistics, from records of selected States.	(Same as marriage.)
1944–50	Figures include estimates and marriage licenses; published annually by National Office of Vital Statistics, from surveys of States and of selected counties.	Estimates published annually by National Office of Vital Statistics, from records of selected States.

[1] Includes reported annulments.

Table 1.06. Year in Which the Central Filing of Marriage and Divorce Records Began

Area	*Marriage*	*Divorce*	*Area*	*Marriage*	*Divorce*
Alabama	1908	1908	New Hampshire	1858	1881
Arizona	–	–	New Jersey	1848	1795
Arkansas	1917	1923	New Mexico	–	–
California	1905	–	New York	1880	–
Colorado	–	–	North Carolina	–	–
Connecticut	1897	1947	North Dakota	1925	1949
Delaware	1913	1935	Ohio	1949	1949
Dist. of Columbia	1811	1802	Oklahoma	–	–
Florida	1927	1927	Oregon	1907	1925
Georgia	–	–	Pennsylvania	1906	1943
Idaho	1947	1947	Rhode Island	1852	–
Illinois	–	–	South Carolina	1950	–
Indiana	–	–	South Dakota	1905	1905
Iowa	1880	1914	Tennessee	1945	1945
Kansas	1913	–	Texas	–	–
Kentucky	–	–	Utah	1919	–
Louisiana[1]	1937	1942	Vermont	1857	1896
Maine	1892	1892	Virginia	1853	1918
Maryland	1914	1914	Washington	–	–
Massachusetts	1841	–	West Virginia	1921	–
Michigan	1867	1897	Wisconsin	1907	1907
Minnesota	–	–	Wyoming	1941	1941
Mississippi	1926	1926			
Missouri	1948	1948	Alaska	1913	1949
			Hawaii	1896	–
Montana	1943	1943	Puerto Rico	1931	1931
Nebraska	1909	1909	Virgin Islands	–	–
Nevada	–	–			

– Not in registration area.
[1] Not all parishes report.

In 1940, the Bureau of Census, through its Vital Statistics Division, undertook a new program of marriage and divorce statistics, following the pattern used for birth and death statistics. Transcripts of marriage and divorce records were collected, chiefly from those States which could provide them through their State offices of vital statistics. For the first time, the Federal program provided some detailed statistics on marriages, more than mere numbers of occurrences. However, the data were for fewer than 30 States. Some detailed statistics on divorces were obtained for 6 to 12 States. Marriage data for 1939 and 1940 were published, as well as divorce data for 1939. This program was discontinued, owing to war conditions. Meanwhile, numbers or estimated numbers of occurrences by State were obtained and published for the years 1937 to 1940.

Beginning in 1944, the Bureau of the Census, at first through its Population Division and later through its Vital Statistics Division, resumed efforts to provide numbers of occurrences. This program has been continued by the former Vital Statistics Division, designated the National Office of Vital Statistics since its transfer to the Public Health Service in 1946.[27] In addition, a program of detailed statistics of marriages and divorces, based on State tabulations, was inaugurated by the National Office of Vital Statistics in 1949. Data for 1950 are presented in tables 1 through 12 in Volume II, as well as in several text tables in chapter 5.

Table 1.05 summarizes some of the preceding discussion, and shows the sources of national marriage and divorce totals from 1867 to 1950.

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[27] For specific references to published reports of earlier surveys, see ‘‘Historical note on earlier studies’’ and footnotes in ‘‘Marriage and Divorce Statistics: United States, 1946,’’ National Office of Vital Statistics, Vital Statistics—Special Reports, vol. 27, No. 10, pp. 171, 172, 1947.

Table 1.06 shows for each State the year in which central filing of marriage and divorce records was started.

Notifiable diseases

The collection of data on notifiable diseases by the Public Health Service had its beginning nearly 75 years ago when, by an act of Congress in 1878, such collection was authorized for use in connection with quarantine measures against such pestilential diseases as cholera, smallpox, plague, and yellow fever. One year later, a specific appropriation was made for the collection and publication of reports of notifiable diseases, principally from foreign ports. In 1893, an act provided for the collection of information each week from State and municipal authorities throughout the United States. In order to secure uniformity in the registration of morbidity statistics, Congress enacted a law in 1902, which directed the Surgeon General of the Public Health Service to provide forms for the collection, compilation, and publication of such data.

Reports on notifiable diseases were received from a very few States and cities prior to 1900, but gradually more and more States submitted monthly and annual summaries. It was not until after 1925 that all States reported regularly.

Until 1942, the collection, compilation, and publication of morbidity statistics was under the direction of the Division of Sanitary Reports and Statistics of the Public Health Service. These functions were transferred to the Division of Public Health Methods in 1942, and to the National Office of Vital Statistics in 1949.

FLOW OF VITAL RECORDS AND STATISTICS IN THE UNITED STATES

Responsible person or agency	*Birth certificate*	*Death certificate*	*Fetal death certificate (stillbirth)*	*Notifiable disease report*	*Reporting officials*	*Marriage record*	*Divorce or annulment record*
Physician or other professional attendant	Completes entire certificate in consultation with parent(s). Files certificate with local registrar of district in which birth occurs.	1. Completes medical certification and signs certificate. 2. Returns certificate to funeral director.	Certifies to the cause of fetal death and signs certificate. Returns it to funeral director.	Reports each case by telephone or by mail on special form to local or State health department.	**Clerk of local goverment**	1. Receives application for marriage license. 2. Verifies information from serological tests. 3. Issues marriage license. 4. Sends completed record of marriage to State registrar.	↓
Funeral director	↓	1. Obtains personal facts about the deceased. 2. Takes certificate to physician for medical certification. 3. Delivers completed certificate to local registrar and obtains burial permit.	1. Obtains facts about the fetal death. 2. Takes certificate to physician for entry of causes of fetal death. 3. Delivers completed cerficate to local registrar and obtains burial permit.	↓	**Marriage officiant**	1. Performs the marriage ceremony. 2. Certifies to facts of marriage and sends the record to license clerk.	↓
Local registrar of vital statistics	Verifies completeness and accuracy. Makes copy, ledger entry, or index for local use. Sends certificates to local health department or to State registrar. ↓	1. Verifies completeness and accuracy. Makes copy, ledger entry, or index for local use. Sends certificates to local health department or to State registrar. 2. Issues burial permit to funeral director. 3. Verifies returns of burial permits. ↓	1. Verifies completeness and accuracy. Makes copy, ledger entry, or index for local use. Sends certificates to local health department or to State registrar. 2. Issues burial permit to funeral director. 3. Verifies returns of burial permits. ↓	↓	**Clerk of court**	↓	1. Provides form for report to petitioner or attorney, or uses petition for decree to make entries on such form. 2. Verifies entries on returned form. 3. Enters final decree facts. 4. Sends completed report to State registrar.
City or county health department	1. Uses certificates in allocating medical and nursing services, follow-up of infectious diseases, planning programs, and measuring effectiveness of activieis. 2. Forwards certificates and case reports to State registrar. ↓				**Attorney for petitioner**	↓	1. Enters personal facts relative to spouses. 2. Returns form to clerk of court. ↓
State health department Bureau of Vital Statistics	1. Queries incomplete or inconsistent information. 2. Maintains files for permanent reference and source of certified copies. 3. Compiles statistics for State and civil divisions of State for use of the health department and other interested agencies or groups. 4. Prepares transcripts or microfilm copies of birth, death, and fetal death certificates, and summary reports of marriage, divorce, and notifiable disease records for transmission to National Office of Vital Statistics. ↓						
Public Health Service National Office of Vital Statistics	1. Prepares and publishes national statistics of births, deaths, fetal deaths, marriages, divorces, and notifiable diseases for official and voluntary consumers. 2. Publishes analyses of data as they relate to public health and social problems. 3. Provides services needed to foster more complete and uniform registration.						

NOTE: In some States certificates of birth, death, and fetal death, and reports of notifiable diseases are not routed through local health departments; in others, there is no central file for marriage and divorce records at the State level.

The Vital Records and Statistics System

Records and statistics of vital events in the United States flow from a coordinated system of separate local, State, and Federal agencies, as shown in the accompanying chart. Legal responsibilities for the registration and preservation of vital records are laid upon private citizens and upon officials at all levels of government. Responsibility for statistical services also is laid by law upon agencies of government at all three levels.

Nevertheless, the strength of the system lies in the recognition by all its participants of their common interests, and the ready cooperation that flows from this understanding. Without it, the system would not have attained its present degree of effectiveness. The success of the record programs and the value of the statistics depend upon the precision and consistency with which the many operations are performed. While the law provides essential authorization for the system, only clear comprehension and the will to strive for the common ends can give it success.

The remainder of this chapter describes briefly the organization and functions of the vital records and statistics system.

Registration and Reporting Activities

Vital records and reports originate with private citizens—members of the families affected by the events, their physicians, funeral directors, clergymen, and others. The responsibilities of these individuals are defined in State laws, and penalties for noncompliance are also provided by statute. The public's understanding of the values of vital records is best evidenced by the fact that State and local officials who administer the State laws very seldom find it necessary to hale offenders into the courts. The system draws millions of reports from the population each year, while the enforcement cases are reckoned only in the dozens.

The following paragraphs describe the usual assignments of responsibility for furnishing facts on birth, death, fetal death, marriage, and divorce registrations.

Registration of births

By law, the registration of births is the direct responsibility of the professional attendant at birth, generally a physician or midwife. In their absence, the parents of the child are responsible for the report. Each birth must be reported promptly—the reporting requirements vary from State to State, ranging from 24 hours after the birth to as much as 10 days. Certificates must be filed with the local registrar of the district in which the birth occurs.

Registration of deaths

By law, the registration of deaths is the direct responsibility of the funeral director, or person acting as such. The funeral director obtains the data required other than the cause of death. The person who supplies the information to the funeral director is usually required to sign the certificate as informant to attest to the truth of the facts entered. The physician in attendance at the death is required to indicate the cause of death. If no physician was in attendance, the coroner, or person acting as such, is required to enter the cause of death. Where death is from other than natural causes, the coroner may be required to examine the body and report the cause of death, even though a physician was in attendance.

In most States, a burial-transit permit must be obtained from the local registrar of the district in which the death occurred, before the body may be removed from the district, buried, or otherwise disposed of.

Registration of fetal deaths (stillbirths)

By law, the registration of fetal deaths (infants born dead) is the direct responsibility of the funeral director, or person acting as such. The funeral director obtains the personal data required other than the cause of fetal death. The person who supplies the data to the funeral director is usually required to sign the certificate as informant to attest to the truth of the facts entered. Where a funeral director is not engaged, the physician is urged, in behalf of improved fetal death registration, to report the event to the local registrar. The physician in attendance at the death is required to certify the cause of fetal death. If no physician was in attendance, the coroner, or person acting as such, may be required to enter the cause of fetal death. The coroner may be required to examine the body and make the report where fetal death was caused by other than natural cause.

A burial-transit permit must usually be obtained from the local registrar of the district where the fetal death occurred, before the body may be removed from the district, cremated, or otherwise disposed of.

Registration of marriages and divorces

In most States, marriage licenses are issued by town or county clerks who obtain the personal particulars from the applicants and verify information from the serological tests. After the marriage is performed, the officiant (cleric or lay person) certifies to the facts of the marriage, and sends the record to the official who issued the license. In approximately three-fourths of the States, there is now also some provision for the local licensing official to send the original, a copy, or an abstract of the completed marriage record to the State registrar of vital statistics. In most States, original divorce and annulment records are filed with the clerk or other official of the court where the decree is granted. Personal particulars are obtained by the clerks from attorneys or petitioners. In approximately half of the States, there is now also some provision for filing a certificate or transcript abstracted from the record with the State registrar.

Vital Statistics Organization

In local areas

Each State is divided into local registration districts for the purpose of collecting vital records. In most cases, the extent of these districts is determined by law. Originally, registration districts were very small, frequently consisting of each city, village, town, township, or road district. With increasing urbanization and improved transportation and communication facilities, districts have been consolidated in some States so that now the entire county comprises the local registration district, while in others each city, incorporated town, or other primary political unit (such as township or civil district) still constitutes the local registration district. The number of registration districts was reduced from close to 30,000 in 1940 to less than 18,000 in 1950, and this trend still is in evidence.

A local registrar is appointed for each district and, where necessary, he is assisted by a deputy local registrar. Local registrars may be appointed or may acquire the duties of registrar in conjunction with legal appointment to civil positions. In some States, the health officer of the county or large city is designated as the local registrar, and the registration of births, deaths, and fetal deaths becomes a regular function of the health department.

The local and county registrars are responsible for the complete, accurate, and timely collection of vital records. The Nation and the States rely on them for the success of the system which can be no more reliable than are the basic data collected. These registrars are the officials who develop and maintain working relationships with the physicians, midwives, funeral directors, coroners, and other persons required by law to prepare and file vital records.

The duties of the local registrar generally include receiving and collecting records of all births, deaths, and fetal deaths in his district; inspecting these certificates for completeness and accuracy; querying, correcting, and completing the inconsistent or missing items; dating, signing, and numbering each record; issuing burial-transit permits; maintaining a local copy, register, or index of the records; reporting infractions of the registration law to county or State officials; promoting registration reporting; and transmitting on a regular schedule, to the local health unit or to the State division of vital statistics, all original certificates received, except where duplicate copies are transmitted and the original records are retained in permanent files by the local offices. In some States, the local registrar issues requested certified copies, for which a fee is usually charged.

In some States, the office of the local registrar sends notifications of birth registration to new parents, to be retained if accurate or to be returned requesting correction if inaccurate; the office may also be responsible for carrying out the preliminary review and abstracting of delayed certificates of birth. In other States, both the notification and delayed registration programs are handled entirely by the State office.

For performance of the prescribed duties, the local registrar usually is paid a fee by the county or State for each certificate filed.

The more recent development of transmitting the certificates first to the county health unit and then on to the State office makes possible their use in current planning, development, and appraisal of the local health program in the many States where this procedure is in practice. For example, death certificates may be examined to determine the causes of death and conditions relating thereto. They may be compared with case records to test the completeness of communicable disease reporting. The birth certificates, and certificates for infant and maternal deaths, indicate the need for and initiate various phases of the local infant and maternal hygiene program. Prompt and accurate information regarding births and deaths becomes in this way a daily tool in the work of an efficient local health organization.

Local registrars of vital statistics generally collect marriage records only where, as in New England the town clerks, or as in Illinois the county clerks, are responsible for all nonjudicial records. Divorces and annulments, of course, are recorded in the courts that hear the suits.

In the States

The primary duties of the State vital records and statistics office are the development and maintenance of State and local procedures for the collection of vital records, the enforcement of the law requiring that the events be registered, and the production of State vital statistics.

Vital records are permanently filed in vital statistics divisions of the State governments. In New England, with the exception of Rhode Island, original records are maintained in the local offices; but in these States duplicate copies are maintained in State offices. In addition, a few large cities have been constituted by State law as independent registration areas which maintain files of their own original records.

Certificates from all parts of the State are received by the State office from the local registrars or county health officers each month, on or before a date specified by law. As a part of the process of receiving, completing, and filing them, the certificates are counted and verified against the number reported to have been sent. They are next examined for completeness, accuracy, and timeliness, and are credited to the account of the appropriate local registrar. Monthly, quarterly, semiannually, or annually, depending upon State practices, vouchers are prepared and transmitted either to the State treasury or to the county commissioners or supervisors who are obligated by law to pay the local registrar. Special query forms or letters are sent to the local registrar or attendant asking for additional or clarifying information, if a certificate is deficient.

In nearly all States, some type of notification of birth form is sent to new parents by either the State or local registrar offices. About half of the State offices issue birth notification forms furnished by the National Office of Vital Statistics. Others have developed their own State forms, and in a number of areas the local office provides its own notification forms. Regardless of the form used or the office issuing it, the practice has been found to be useful both in improving the accuracy of the information contained on the certificate and in improving the completeness of birth registration. Experience has demonstrated that many parents read the notification carefully, and if names are misspelled, or if the date or the place of birth or other information is incorrect, the parents correct the notification form and return it for correction of the certificate.

Correction of vital records is one of the more intricate tasks undertaken by State offices. Two distinct points of view regarding the alteration and correction of original certificates are reflected in differences in the State procedures governing corrections. According to one view, the principal value of the certificate lies in the fact that it is the original and that it has remained unchanged throughout many years. According to the other view, held by the majority, a certificate should be accurate; and if through no fault of the individual concerned there are errors in it, it should be amended upon the presentation of adequate evidence. In those States where the former point of view dominates, the registrar is forbidden, by statute or regulation, to make any alteration on the face of the certificate but he is authorized to file and certify affidavits and other documents attesting to the inaccuracy of the facts appearing on the face of the certificate. In States where the primary emphasis is on accuracy, the registrar may correct the face of the original certificate upon presentation of adequate documentary proof.

In all States, special consideration is given to adoption, legitimation, and foundling cases. The recent tendency among the States has been to make legislative provision for new birth certificates in these instances. The law specifies that the original certificate in adoption cases shall be sealed with the certified court order of adoption, while a new birth certificate is prepared showing the adopting persons as the parents.

Central vital statistics offices issue certified copies of birth and death certificates to qualified persons on request. In recent years, many States have developed forms by which official agencies may obtain confidential verification of birth facts. Many States also use the birth registration card or other type of short form certification of birth facts which does not disclose information concerning birth out of wedlock, adoption, or medical data irrelevant to most certification purposes. A fee is usually charged for certifications and birth cards and the vital statistics offices usually maintain fee accounting systems, although most States require that the revenues be paid into the State treasury. The number of certified copies issued by State offices, although very large, is by no means a measure of the total volume of documents sought and obtained by individuals and agencies as evidence of the facts concerning births and deaths. Many county and municipal officers also issue copies of vital records which were filed with them prior to the establishment of central registration or passed through their hands before reaching State offices.

The task of registering births which were not properly registered within the time prescribed by law, has always been a part of the work of the State vital statistics office. (The development of uniform procedures and standards for filing delayed registrations of birth is referred to in the historical portion of the text in this chapter.) Applicants are required to submit documentary evidence sufficient to warrant the acceptance for filing of a delayed certificate. As indicated elsewhere, some of the local registrars are authorized to conduct preliminary review activities for delayed registration of births, for submittal to the State office. The State registrar is responsible for reviewing and determining whether the evidence presented to the

State or local offices is acceptable. In addition, in a number of States delayed registrations may be filed through the local courts, Nebraska being the only State in which the courts are required by law to adhere to prescribed minimum standards of documentary evidence in accepting delayed registrations.

It is essential that certificates be located easily and quickly, hence the value of an indexing system is apparent. In past years, typical State indexes consisted of handwritten or typed entries of the necessary identifying items for each certificate in ledgers or card files. The present trend is to mechanical preparation of indexes, although the States without tabulating equipment or those with a relatively small volume still maintain card indexes. Regardless of the type, the indexes are either alphabetic or phonetic and, in some States, both systems are used. In the permanent files, the certificates usually are arranged by county and month of event, by surname, and in chronological order. In most States they are bound, usually in books of 500, either in sewed bindings or in some form of post or staple binder.

State offices furnish forms and supplies to local offices as prescribed by law, sponsor training meetings, and provide instruction and advice for local registration officials.

Table 1.06 indicates the year in which the various State offices first provided for centralized registration of marriages and divorces. Where such centralized files are maintained, the State registrar receives the original, a copy, or a partial transcript of the marriage record for marriages performed and some type of transcript for each divorce granted. Offices having central files of marriage and divorce records usually maintain indexes for both types of records and tabulate and publish statistics in some degree of detail.

The procedures employed in processing statistics vary in the different States, as do the resultant statistical services rendered. However, all States prepare monthly, quarterly, annually, or biennially, reports based on data drawn from the various types of certificates filed. Thus, the information on the certificates is used directly in planning, evaluating, and administering health activities.

The State vital statistics offices send copies (transcripts, microfilm, or punched tabulating cards) of each birth, death, and fetal death certificate to the National Office of Vital Statistics of the U. S. Public Health Service.

In the United States

The Department of Health, Education, and Welfare is the Federal agency responsible for publishing national vital statistics, and for giving expression to the national interest in vital records. The Department has entrusted the management of its program to the Public Health Service, because that constituent agency has direct relations with the health agencies that administer vital records and vital statistics operations in the States. The National Office of Vital Statistics is the arm of the Public Health Service that conducts the Federal vital statistics program.

Publications of the National Office provide national statistics of births, deaths, fetal deaths, marriages, divorces, and notifiable diseases. All of these are derived from the routine registrations and reports collected by State and local governments. The data reach the Federal agency through cooperative arrangements with the States. The most detailed of the national reports are those relating to deaths, while the simplest are the statistics of notifiable diseases, which consist mainly of counts of reported cases. At present, the NOVS obtains and publishes annual figures or estimates on numbers of marriages and divorces occurring, together with current monthly figures on numbers of marriage licenses for the United States and divorces for a group of States. In addition, beginning with data for 1948, some tables of detailed marriage and divorce statistics are published, not for the entire United States, but only for those States in which the State vital statistics office is able to furnish such tables. The number of States able to supply these statistics and the amount of obtainable information have increased gradually from year to year.

The National Office provides services needed to foster more complete and uniform registration throughout the Nation. Among these services are: assistance in coordinating vital statistics activities of the various State, city, and county health offices; promotion of more complete registration; the conduct of educational campaigns and tests for completeness of registration; assistance to State officials in developing standard forms, recommended legislation, standard definitions, and statistical tables; assistance to State agencies of a clearing-house nature; and development and promotion of methods for the collection and use of statistical data.

The National Office of Vital Statistics is the focal point of the vital records and statistics system. It provides the nerve center through which conflicting demands upon the system are compromised by interstate action of the responsible technicians. It provides a channel for clarification and resolution of problems in Federal-State relations. It also is the country's representative in the advancement of international comparability in vital statistics, and the source to which international agencies turn for United States data.

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