The International Classification of Diseases
Two Hundred Years of Development

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The INTERNATIONAL CLASSIFICATION OF DISEASES, as well as its antecedents, has been around a long time. Its roots may be traced back to the 18th century works "Nosologica Methodica" of Francois de Lacroix (better known as Sauvages) to Linnaeus' "Genera Morborum," and to William Cullen's "Synopsis Nosologiae Methodicae." As a matter of fact, the statistical study of disease began a century earlier with John Graunt's analysis of the London Bills of Mortality.

A classification of diseases has been defined as a systematic categorization of morbid entities to which conditions are assigned in accordance with established criteria (*1*). These criteria determine the nature of the classification. For example, a classification could be based on one or several different axes; the choices depend on the specific uses to be made of the data to be compiled. Because of its nature, a general, broad-based statistical classification cannot strictly follow one simple axis if it is to serve the needs of many users. The various rubrics of such a classification represent a series of necessary compromises between axes, based on considerations such as anatomical site, etiology, circumstances of onset, and manifestation of disease. Even so, a single classification cannot fit all the specialized needs of users, but it should provide a common basis of classification for general statistical use and for the tabulation, storage, and retrieval of disease-related data. Classification is fundamental to the quantitative study of any phenomenon and is recognized as the basis for scientific generalization, an essential element in statistical methodology.

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Purpose of a System

The purpose of a statistical classification is often confused with that of a nomenclature or catalog of approved terms for describing and recording clinical and pathological expressions. A nomenclature should be extensive so that any morbid condition that can be specifically described has its own designation. However, this complete specificity prevents a nomenclature from serving satisfactorily as a statistical classification. William Farr (1807–83), the first medical statistician of the General Register Office of England and Wales, aptly described the aims of a statistical classification of disease (*2*):

> The causes of death were tabulated in the early Bills of Mortality (*Tables mortuaires*) alphabetically; and this course has the advantage of not raising any of those nice questions in which it is vain to expect physicians and statists to agree unanimously. But statistics is eminently a science of classification; and it is evident, on glancing at the subject cursorily, that any classification that brings together in groups diseases that have considerable affinity, or that are liable to be confounded with each other, is likely to facilitate the deduction of general principles.
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> Classification is a method of generalization. Several classifications may, therefore, be used with advantage; and the physician, the pathologist, or the jurist, each from his own point of view, may legitimately classify the diseases and the causes of death in the way that he thinks best adapted to facilitate his inquiries, and to yield general results.
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> The medical practitioner may found his main division of diseases on their treatment as medical or surgical; the pathologist, on the nature of the morbid action or product; the anatomist or the physiologist on the tissues and organs involved; the medical jurist, on the *suddenness* or the *slowness* of the death; and all of these points well deserve attention in a statistical classification.
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> In the eyes of national statists the most important elements are, however, brought into account in the ancient subdivision of diseases into plagues, or epidemics and endemics, into diseases of common occurrence (sporadic diseases), which may be conveniently divided into three classes, and into *injuries* the immediate results of violence or of external causes.

Why has a statistical classification of diseases persisted, in one form or another, for more than 200 years? Without such a tool, researchers could not have undertaken studies of the temporal and spatial distributions of certain diseases or made estimates of the effects of diseases on populations, especially in terms of the force of mortality on age, sex, and other subgroups; nor would it have

been possible to study countless other epidemiologic aspects of disease in human populations. The statistical trends in mortality, especially those showing specific causes of death, that have been recorded according to the classification comprise one of the oldest and most valuable sets of health-related data.

Without the recognition of the importance of an international standard to be agreed on and followed by many nations, the utility of the classification would be severely limited. The ability to exchange comparable data from region to region and country to country, to allow comparisons from one population to another, and to permit study of disease over long periods are the strengths of the International Classification of Diseases. In more recent years, the traditional uses have been expanded. Beyond the obvious epidemologic uses, the Classification is now used, intra- and internationally, for the indexing and retrieval of medical records and medical audit systems and in planning and evaluating a variety of health services.

Evolution of the ICD

Historically, the international importance of a statistical classification of diseases was so strongly recognized at the first International Statistical Congress held in Brussels in 1853 that the participants assigned to William Farr and Marc d'Espine of Geneva the task of preparing a "uniform nomenclature of causes of death applicable to all countries" (*2a*). At the next Congress in Paris in 1855, Farr and d'Espine submitted separate lists based on different axes of classification. Farr's list was organized into five main groups: epidemic diseases, constitutional or general diseases, local diseases arranged according to anatomical site, developmental diseases, and diseases resulting from violence. D'Espine's list was arranged according to the nature of the diseases: gouty, herpetic, hematic, and so forth. A compromise list of 138 rubrics was adopted by the Congress and subsequently revised in 1864, 1874, 1880, and 1886. While this classification was not universally accepted, its main principle of grouping diseases by anatomical site, as proposed by Farr, survived and strongly influenced subsequent international classifications of diseases.

The next significant development occurred in 1891 when the International Statistical Institute (ISI), the successor to the International Statistical Congress, meeting in Vienna, formed a committee under the direction of Jacques Bertillon of Paris to prepare a new classification of causes of death. The committee presented a report that was adopted at the ISI meeting in Chicago in 1893. The Bertillon Classification of Causes of Death, as it was first called, received general approval and was adopted by several countries and a number of cities. In 1898, the American Public Health Association recommended the adoption of the Bertillon classification by the civil registrars of Canada, Mexico, and the United States. The association also suggested that the classification be revised every 10 years.

In 1899, the ISI heard a report from Bertillon on the progress of the classification and adopted the following resolution:

> The International Statistical Institute, convinced of the necessity of using in the different countries comparable nomenclatures:
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> Learns with pleasure of the adoption by all the statistical offices of North America, by some of those of South America, and by some in Europe, of the system of cause of death nomenclature presented in 1893;
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> Insists vigorously that this system of nomenclature be adopted in principle and without revision, by all the statistical institutions of Europe;
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> Approves, at least in its general lines, the system of decennial revision proposed by the American Public Health Association at its Ottawa session (1898);
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> Urges the statistical offices who have not yet adhered, to do so without delay, and to contribute to the comparability of the cause of death nomenclature.

The French Government, acting on the ISI resolution, called the first International Conference for the Revision of the Bertillon, or International, Classification of Causes of Death, in Paris in 1900, thus beginning a series of revision conferences approximately 10 years apart.

After Bertillon's death in 1922, ISI established cooperative arrangements with the Health Organization of the League of Nations; the League had appointed its own Commission of Statistical Experts to study the classification of diseases and causes of death as well as related problems of medical statistics. An international commission, with equal representation from ISI and the League's Health Organization, drafted the proposals for the Fourth (1929) and Fifth (1938) Revisions.

The Sixth Decennial Revision Conference in 1948 was a significant event in international vital and health statistics. The Conference not only approved a modified classification for morbidity and mortality and a set of international rules for selecting the underlying cause of death, but it also recommended a comprehensive program of international cooperation including the establishment of national committees on vital and health statistics to coordinate national health statistical programs and to serve as a link with WHO (*3*).

The Seventh Revision Confer-

ence was held under WHO auspices in Paris in 1955 and, in keeping with a recommendation of the WHO Expert Committee on Health Statistics, the revision was limited to essential changes. The Eighth Revision Conference was convened by WHO in Geneva in 1965. The Eighth Revision was much more extensive than the Seventh, but it retained the basic structure and the philosophy of classifying a disease according to its etiology rather than a particular manifestation.

The Ninth Revision

The International Conference for the Ninth Revision was convened by WHO in Geneva in 1975 and was attended by delegates from the Member States. In addition, a number of international organizations sent representatives to the meeting. The proposals considered were similar to those taken up in connection with the Eighth Revision but with much additional detail. Some of the major innovations adopted are (*1a*):

(i) optional fifth digits in certain places to allow additional detail.
(ii) an independent, optional, 4-digit coding system for classifying histological varieties of neoplasms, followed by a fifth digit indicating behavior. This system can be used in addition to the normal code indicating topography.
(iii) the role of the alternative classifications based on either external cause of injury or nature of injury has been changed. The nature of injury has become the axis for the main classification while the external cause of injury becomes a supplementary code to be used where relevant with codes from other parts of the classification. However, for underlying cause of death statistics, the external cause code will be used in preference to the nature of injury, when only one axis is used.
(iv) optional dual classification of certain diagnostic statements to allow "secondary" codes to show manifestations in addition to the traditional etiology codes.
(v) categories in the Mental Disorders Chapter include descriptions of their content to help overcome the problems in this field where international terminology is not standard.

In addition, the Ninth Revision contains recommendations for supplementary classifications of "Procedures in Medicine" and "Impairments and Handicaps." The Revision Conference also adopted a series of recommendations dealing with topics such as lay reporting of morbidity and mortality, the establishment of a special certificate of perinatal death to be used in lieu of the regular death certificate, the selection of a single cause for statistics of morbidity, and multiple-condition coding and analysis of death certificates.

The Ninth Revision of the International Classification of Diseases comes into effect on January 1, 1979. A modification of the classification is being prepared for use with U.S. morbidity data. This modification, to be called "Ninth Revision, International Classification of Diseases, Clinical Modification" (ICD-9-CM), will be completely compatible with the official Ninth Revision, but it adds extensive detail at the fifth digit level to enable full indexing of hospital records and other clinical uses. In addition, it will contain detailed codes of clinical and diagnostic procedures. The clinical modification is a cooperative effort by organizations, within and outside the Federal Government, called together by the National Center for Health Statistics, U.S. Public Health Service.

Recently, the National Center for Health Statistics was designated as the WHO Center for Classification of Diseases for North America. There are six WHO Centers, established to assist countries with problems encountered in the classification of diseases and the use of the ICD. These Centers are located in Paris (for French language users), São Paulo (for Portuguese), Moscow (for Russian), and Caracas (for Spanish); the two Centers for English language users are in London and, for North America, in the Washington, D.C., area.

The staff of the North American Center, in addition to providing general support and assistance to users of the Eighth and, after January 1, 1979, the Ninth Revision, are currently planning future activities related to the development of the Tenth Revision. The Tenth Revision is far in the future, but the influence and usefulness of the International Classification of Diseases is of such impact on the health activities in the United States and Canada that the Center's staff wish to obtain as wide as possible input into the revision process. Thus, although the Eighth Revision is still in use and the Ninth Revision and its U.S. modification await introduction, the historical revision cycle is poised for a new round. Comments and suggestions for Canadian and U.S. input into this international process should be directed to

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References

1. World Health Organization: Manual of the international classification of diseases, injuries, and causes of death. Geneva, 1977, p. VII; (*a*) pp. XVI, XVII.
2. Registrar General of England and Wales: Sixteenth annual report. London, 1856, appendix, pp. 75–76; (*a*) p. 73.
3. Report of the International Conference for the Sixth Decennial Revision of the International List of Diseases and Causes of Death. World Health Organization Official Records, No. 11, Geneva, December 1948, pp. 23–32.