Classification of Consequences of Disease and Health Care Planning and Evaluation

In a preliminary report to the WHO Study Group on the Measurement of Levels of Health, Sir Andrew Davidson, a WHO consultant, stated, 'The whole problem (of measurement of health levels) obviously bristles with difficulties, appears almost insoluble and fully justifies the comment of the Secretary-General of the United Nations Organization... "a most difficult and challenging problem".' If measurement of health levels is difficult, as undoubtedly it is, the measurement of the consequences of disease is certainly no less so. The WHO is, therefore, to be congratulated for undertaking the almost impossible task of publishing, on a trial basis, the International Classification of Impairments, Disabilities and Handicaps (ICIDH).

There is no knowing at this time if the ICIDH, or a revised version of it, will ever enjoy the currency and stature of the now authoritative International Classification of Diseases (ICD). But one thing is certain, and that is, the ICIDH will serve as a stimulant to the health care community for a profound rethinking of the problems of health and disease that hopefully will lead to some needed changes in the structure and complexion of health care as we know it today.

Traditionally, health care, particularly medical care in the narrower sense of the term, has been disease-oriented rather than health-oriented. Even in developed countries where the impact of infectious and many other types of diseases on health has been reduced practically to zero, the typical health practitioner still treats diseases instead of people as individual persons. This emphasis on diseases, rather than people, as the authors of the ICIDH note, is no longer adequate because the majority of the people with health problems are not sufferers from aetiologically-known and treatable diseases. Rather, as life expectancies continue to rise, more and more people are suffering from such things as arteriosclerosis, arthritis and other degenerative conditions for which biomedical research has yet to produce a cure. It thus behoves the health care community to re-assess its role and perhaps modify both its attitude and its practices to meet human needs. The ICIDH may be just the catalyst to start the processes of change.

New Approaches to Care

In the past few years many thinking scientists of the health care community have become disaffected with traditional health care practices and have initiated actions to change them. The emergence of what is known as behavioural medicine is a notable example. The main thrust of behavioural medicine is the marshalling and integration of biological, social science and behavioural knowledge to get a patient well. Whether or not this branch of medicine, which focuses on persons and behaviour, will become accepted by the health care community and the people it serves remains to be seen. It can be said at this time that if behavioural medicine will make a contribution to health care it will be because of its commitment to the resolution of health problems whether or not their aetiologies are known.

Although its original intent was to monitor the quality or performance of the health care system, the 'sentinel health events' model proposed by Rutstein and his colleagues by its very nature is concerned with the consequences of disease. This model is premised on the thesis that if a health care system functions satisfactorily, then preventable and manageable diseases, disabilities and untimely deaths should not occur. To the extent that any of these diseases, disabilities and untimely deaths does occur, it becomes a 'sentinel health event' — a warning that something is amiss somewhere in the health care system, which includes the patient as an integral part. The Rutstein group has twice published updated versions of the extensive list of unnecessary diseases, preventable disabilities and untimely deaths that was published with the original article. Also, this group is now working with several government agencies and academic institutions to broaden the scope of applications of this model to a variety of health care situations, including the control of (man-made) occupational and environmental diseases and hospital care.

The disease-staging concept of Gonnella et al, while emphasising the proper treatment of disease, is in effect concerned with the prevention and management of the consequences of treatable and/or manageable diseases. Gonnella and his group are not the first to conceptualise the disease-staging...
method; epidemiologists have been staging diseases, such as tuberculosis and cancer, for decades. What Gonnella and his group have done is the systematic development and documentation of comprehensive sets of outcome criteria for staging a large number of diseases that can be used by a health care system to match patient needs with the appropriate levels of care. Evaluators and care providers can monitor the effectiveness of the care system by projecting patient progress against the criteria for each of the stages of a disease. The concept calls for a review of the roles of the care provider, the patient and the community if unexpected deterioration of patient health status is observed while under treatment. Thus this concept, like the LCIDH, can be profitably used as an adjunct to the ICD in the study of diseases and their consequences.

ICIDH Definitions Problems

One of the main difficulties with using the ICIDH is likely to be the arbitrary definitions of the 3 sequentially independent dimensions of impairments, disabilities and handicaps, as the authors of the document are well aware. Even with the help of several clarifying devices, including the use of different parts of speech for different dimensions, and the attribution of the different dimensions to different levels (impairments to organs, disabilities to persons and handicaps to society) one still has difficulty in differentiating the terms impairments, disabilities and handicaps that over the years have been used interchangeably in everyday usage. For example, it would be difficult to ascribe some of the coded intellectual and psychological impairments to the organ level when they are not caused by organic problems. On the other hand, it would be just as difficult to attribute some of the coded locomotor disabilities, such as walking or climbing stairs, to the person level when the immediate cause is organic in nature.

Whether or not one agrees with the somewhat arbitrary definitions of impairments, disabilities and handicaps, one has to admit that if the consequences of disease could be successfully categorised by some scheme similar to the conceptual framework given in the ICIDH, the endeavour would have great utility to health services planners and researchers. Proper management of the consequences of many diseases requires the input of specialised skills from many disciplines and a good classification scheme can help in the identification, assignment and evaluation of the services provided by each of these disciplines, such as medicine, psychiatry, psychology, nursing, and social service.

Although a variety of single and aggregated health outcome indicators have appeared in the literature, they usually have limited utility in health care evaluation either because they are too broad in nature to be causally linked to the care system, or, if they are narrowly focused, too few in number for the comprehensive assessment of a care system. For example, the global indicator of mortality rate or life expectancy is not a useful measure of health care outcome because in many developed countries the care system now plays only a modest role in lowering mortality rate. On the other hand, such narrowly focused indicators as the per cent of children under age 5 who had diphtheria can be directly linked to the care system, but inoculating children against this disease is but one of many functions of health care. A large number of the focused indicators would be required in assessing a system caring for a large population whose health status spans the spectrum from critically ill to healthy. A fairly exhaustive compilation of properly classified diseases and their consequences in the spirit, if not format, of the ICIDH could be the very foundation on which to build an inventory of specific indicators for all occasions.

Model of Care Evaluation

It is not implied in the foregoing paragraph that the availability of a classification scheme of the consequences of disease or even measures of such consequences suffices for purposes of health services evaluation. Being able to identify and measure a specific health outcome with some degree of precision is but one of several problems which the evaluator must resolve in order to establish a causal relationship between the care provided and the outcome. This is so because a person's health status is affected by many factors, of which only a few are known, and of these few, only some are amenable to intervention in our present state of medical knowledge and technology.

In a comment on the Davidson report,6 Crew stated that health (or disease) 'can profitably be considered with reference to its cause.' According to Crew, a person's health status may be caused by personal or genetic factors, environmental factors, the interplay of personal and genetic factors, and chance (developmental mishap) factors. These, of course, are the most important of the known factors affecting health. This model does not lend itself to health services evaluation because it provides no room for the effect of health care. I present a conceptual model based on the Crew model in which the chance factor is replaced by the more
general disease factor. Structurally, the model is

\[ \psi_i = \alpha_i + \beta_i + \alpha_m \beta_i + \theta \delta_i \]  (1)

where \( \psi_i \) is person i's overall health status, \( \alpha_i \) the effect of genetic or personal factors on i, \( \beta_i \) the effect of environmental factors, \( \alpha_m \beta_i \) the synergistic effect of personal and environmental factors, \( \delta_i \) the effect of disease, and \( \theta \) the effect of health care. \( \delta_i \) is a binary factor whose value is one if disease is present and zero if disease is absent. \( \theta \) is assumed to be constant, although this assumption is not crucial to the model. Its value is less than one if the effect of care is deleterious, one if care is absent or has no effect, and greater than one if the effect is salutary.

Equation (1) conceptually represents traditional medicine because the object of medicine is the treatment of disease, not persons. This is the situation the authors of ICIDH believe no longer tenable because of the changed and changing complexion of health and disease in many parts of the world and should be altered. The new conceptual model should be:

\[ \psi_i = \theta (\alpha_i + \beta_i + \alpha_m \beta_i + \delta_i) \]  (2)

Equation (2) shows that the effect of health care on the overall health status of a person is mediated through its effect on all the factors in the model. This model is in the spirit of the ICIDH, the 'sentinel health events' model, and the disease-staging model, all of which say, implicitly if not explicitly, that the health care system has just as much responsibility for the patient and his environment as for the treatment of disease that afflicts him. Equation (2) says that, with the successful control of many of the diseases that once were the scourge of humanity, the traditional disease model of

\[ \text{aetiology} \rightarrow \text{pathology} \rightarrow \text{manifestation} \]

is no longer adequate, since it is limited only to diseases with known aetiologies.

A word needs to be said about \( \alpha_i \). Since in our present state of knowledge little can be done about most genetic problems, \( \alpha_i \) largely represents personal factors, such as lifestyles, health habits, temperament, etc. Theoretically if not in practice, these factors can be modified or altered with the effective application of the latest health education techniques. In the developed countries, where, as the authors of the ICIDH point out, chronic and degenerative diseases have replaced acute and infectious diseases as the main health problem, more health care resources should be devoted to personal and environmental factors and less to the treatment of disease. If there is a dominant message from the authors of the ICIDH, it is that it no longer suffices for a health care system to be concerned with only the curing function of health care; it must also accept responsibility for exercising the caring function. To be sure, there is still room for specialists using the traditional medicine model to combat disease. However, the mainstream of practitioners will be evaluated not in terms of how effectively they treat disease, but rather in terms of how well they care for people.

MARTIN K CHEN

REFERENCES
The Rise and Fall of Malaria in Europe
A Historico-Epidemiological Study
L.J. Bruce-Chwatt and J. de Zulueta

The authors trace the biological origins of malaria in Europe and follow the course of the disease from ancient times until its eradication in the twentieth century. The book is an epidemiological study of the geographical, climatic, entomological, sociological, economic, and political factors that have influenced the disease as a public-health problem, as well as an historical study. The authors describe in detail the malaria eradication programmes successfully undertaken by the various countries and co-ordinated by the World Health Organization. Illustrated £12

Foundations of Epidemiology
Abraham M. Lilienfeld and David E. Lilienfeld

'It is well written, thoughtful, and concise . . . includes good examples of the use of mortality and morbidity statistics in understanding the epidemiology of conditions.' The Lancet. For this second edition a 35-page appendix on statistical procedures has been added. Paper covers £7.95

Oxford Medical Publications