

The diagnostic index

**FROM THE BIRMINGHAM RESEARCH UNIT OF THE
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Man's experience and knowledge grows with the tools and instruments which he has learned to make and to use. The simple flintstone evolved into the neolithic hand-axe and the tanged arrowhead, the most modern devices of their day and the forerunners of the knives and spears of bronze that were to follow. So it is with the instruments of research in practice. New developments telescope the rate of change into decades and years, but some of the methods now in use will doubtless still function a century ahead, in parallel with new methods which can already be envisaged and others of which we do not yet dream.

Until the 1950s the clinical documentation of general practice was undertaken by exceptional individuals of the calibre of Budd, Mackenzie, and Pickles. There was no way in which the ordinary doctor could sift the unique material which passed daily through his hands. It was the first National Morbidity Survey, carried out in over a hundred practices in 1955–1956, which showed that research recording could be added to service practice without detriment and that doctors without formal training in research could become reliable and consistent research workers. The College had taken a full part in the design and conduct of this first survey and had learned that general practitioners needed their own research tools and instruments of a different character from those used in hospitals and taught in medical schools.

In those days the science of statistics was in a phase of rapid evolution. It was beginning to influence medical thinking even in the face of considerable resistance from the traditionalists, who coined the phrase "lies, damned lies, and medical statistics" to express their distaste. For the general-practitioner research worker, however, the burgeoning of statistics could not have come at a better time for, by the application of statistical methods to large masses of data, order and understanding became a practical possibility. General practice, by its frequent brief contacts between doctor and patient, generates data in large amounts. The first National Morbidity Survey confirmed this and emphasised the need to standardise the way in which morbidity data were obtained. The more general practitioners interested in their own research the greater the opportunity for between-observer variation.

The first problem then, was to see what could be standardised. Attempts had been made at an *International Classification of Diseases and Causes of Death* which produced volumes that hospital clinicians and pathologists could conveniently use, but which were little help to those in practice. The first attempt by the Research Committee of the College at a classification of diagnosed morbidity in general practice was a hierarchical one, related to the *I.C.D.* Though a useful version it was not popular, and it was replaced by a second, a short list which could be related to the international classification. The categories were selected on grounds of the frequency of occurrence of the conditions to which they referred, and of their severity. This classification was introduced in 1963 and has served since, with minor adjustment for the Second National Morbidity Survey.

The standardisation of nomenclature was an essential preliminary to the method of data recording compatible with the circumstances of practice. The method had to be one which the doctor used himself, for in the 1960s secretaries were rare in general

practice. The key to a method was provided by T. S. Eimerl, then in practice in Penketh, who devised a loose-leaf ledger in which were entered identities by diagnosis. This ledger was designed to fit the pocket and contained overlapping sheets held in place by a ring-binder in the spine of the ledger. This principle was adopted at about the same time by Walford, of Felsted, who used a larger desk-type ledger, selecting for entry those items which were of particular interest. These ledgers came to be called after their 'onlie begetters' and became respectively the 'E-book' and the 'W-book'. They were effective indexes to good clinical records.

Both Eimerl and Walford had been involved in the work of a group of members of the Research Committee of Council based on Birmingham. This group had devised and tested the classification described above and after discussion merged this with the ring-backed ledger, using the desk-top version. The classification was printed out on the interleaf cards which separated the overlapping banks of data sheets. These data sheets were unstructured, identities being entered into the enlarged 'E-book' as an index to clinical records.

The next stage towards the evolution of a true diagnostic index was arranging the data sheets so that punch cards could be prepared from them. Hollerith punch cards accommodated 80 columns of coded information and this limit was accepted. Coding boxes were allotted for the identification of the doctor, the diagnosis, the sex of the patient, and his identity in the form of a Hogben number. This consisted of the first three letters of the surname followed by the first initial of the first forename and the full date of birth expressed in day, month, and year form. Subsequent columns indicated the type of episode of the illness or were deliberately unspecified to allow for flexibility.

The effect of these changes was to ensure the recording of a standardised basic minimum of data about each episode of illness seen by the doctor. The uncommitted columns could be used for special studies, but it was the basic minimum that mattered, for this could be accepted as consistent, between observers and across practices—insofar as diagnosis in general practice can ever be deemed consistent. There will always be individual preference of choice for the diagnostic terms used by doctors, and differences in requirements between one observer and another before the criteria for a given diagnosis are met. Work is going on to minimise or compensate for these differences, but that is a matter for the future rather than the present.

The new ledgers were quickly accepted by doctors in this country, and before long enquiries came from overseas. A consignment was sent to New Zealand at the request of John Marshall. One of these, it was said, eventually found its way across the Iron Curtain and another was demonstrated by two New Zealanders at an international conference in Canada. John Radford arranged for 50 ledgers to be distributed in Australia, where difficulty was experienced in obtaining refill data sheets. The Australians, too, were unhappy over the eponymic description 'E-book' and suggested that it be renamed for what it was, a diagnostic index. Indexes were sent to Newfoundland where John Ross organised the Canadian end of the first comparative study of morbidity in populations of similar genetic origin on both sides of the Atlantic. Other ledgers were sent to individuals in Canada from Labrador to British Columbia.

It was in Canada that the College Classification was found to work least satisfactorily. Westbury and Tarrant submitted it to critical evaluation and the need for a shorter set of categories was expressed by Rowe in Australia. These observations surprised no-one when it was remembered that the classification had been based on the experience of general practitioners in the United Kingdom under the British National Health Service. The fact that the method was found to work, and work quite well, under conditions so far apart as a village in Papua—New Guinea, a Royal Society expedition to Abyssinia, or an Israeli Kibbutz was all the more surprising.

Europe and Scandinavia received index ledgers to be used and found to succeed, or fail, according to their appropriateness to the character of general practice in each country. The fullest use of the method was in Holland, where it formed one part of the data acquisition system used in the first National Morbidity Survey carried out there. It was in the United States of America, however, that the method took root and spread.

Dr Maurice Wood was responsible for the introduction of the diagnostic index into the Medical College of Virginia at Richmond. The interest which this aroused led to his informal appointment as an 'importing and distributing agent' and a continuous flow of exported indexes was maintained for two years until arrangements were made for them to be printed with the blessing of the Research Unit in New York and also in Toronto. Some of the Canadian indexes carried the 'Canuck Classification' designed by Westbury. In both the U.S.A. and Canada the index was taken up more as an aid to intern teaching than a method of research, though the research potential was, and is being, exploited in both the campus and independent practice contexts.

I.C.H.P.P.C.

The potential of the index for international use was quickly appreciated by the World Organisation of Colleges and Academies of General Practice, provided that an internationally acceptable classification of terms to be recorded could be devised. At its fourth biennial conference in Melbourne a working party of general practice taxonomers was set up under the chairmanship of Westbury of Calgary. The outcome of this decision was the International Classification of Health Problems in Primary Care (I.C.H.P.P.C.) which was endorsed by W.O.N.C.A. in Mexico City in 1974. An amalgam of diagnostic categories had been beaten into acceptable shape by general practitioners from 11 countries.

Use of diagnostic registers

The coming of the I.C.H.P.P.C., which will replace the College Classification, has led the Birmingham Research Unit to review the use that is being made of indexes in their current version. Since 1971 they have formed the basis of the Second National Morbidity Survey—at first in over 50 practices, now continuing in a smaller group restricted for reasons of cost. The Unit was, however, concerned to know how much was being made of the indexes which had been distributed to doctors in this country, and in early 1976 a questionnaire was carried out among doctors who were known to have received index sets from Birmingham; 316 were sent out to doctors who were known to have received indexes; 200 were returned. In 18 instances the recipient had left. Analysis was carried out on 192 completed questionnaires.

It appeared that 11 (six per cent) of recipients did not get the method started, usually quoting difficulty in securing agreement of their partners. A hundred (55 per cent) recipients had continued to record since starting their indexes while a further 55 (30 per cent) had stopped its use for one reason or another. Six recipients had left general practice, or had retired. Six indexes were used in universities either operationally or as demonstration material.

Of those who had continued to use the index, three had records beginning before 1960 while 33 began recording at some time in the decade of the sixties; 63 had begun their indexes in the 1970s. In 62 practices the whole range of diagnoses covered by the indexes were recorded while in the remainder some selection by interest was exercised. In 20 practices record was made of every item of service undertaken. Of the total number of index users 39 take part in the Research Unit's weekly return system providing epidemiological data on selected conditions.

The diagnostic index was used in some personal or practice research project in 82 instances; 19 of those who had stopped their indexes had used them for a research

project of their own. Of those who responded, 39 had taken part in the Second National Morbidity Survey and 12 were members of a continuing study group working with the Office of Population Censuses and Surveys and the Birmingham Research Unit on further development of the method and special studies made possible by the collected data; 91 users of diagnostic indexes also maintain age-sex registers.

Such were some of the bare facts. Comments accompanying the questionnaires showed that the range of uses to which indexes had been put was extremely wide. Projects included workload studies before and after a move to a health centre, incidence studies of psychiatric disease, hypertension, diabetes, and patient identification for immunisation programmes. Papers resulting from these studies include publications on herpes zoster, depression, and team care in practice. A full list of projects and publications would be tedious, but equally remarkable was the extent to which doctors had been stimulated to introduce further data collection systems into their practices, running in parallel with their indexes. These methods include 'S-cards', daily ledgers, feature cards, cope-chat cards for a geriatric study and a cumulative summary of all investigations carried out in the practice.

Some of those who had stopped recording felt it of no value to them to record all diagnoses and expressed a preference for a shortened version of the index. Such an index would contain a selected list of diagnoses, chosen for a particular purpose. One such short list index has been introduced by Grob, the diagnoses selected being those which might be assumed to have some relationship to measurable environmental factors. Other possible short lists include conditions generally agreed to be 'serious and significant' or those that are of particular interest and use to undergraduate and post-graduate teachers. While the shortened lists are, to some extent, a softer option they have and will have a useful part to play in practice documentation in the future.

As the stone axe came to be replaced by bronze, so the diagnostic index that we know now will be replaced by more sophisticated methods. The coming of the I.C.H.P.P.C. has led to the design of a Morbidity Index, on similar principles, by Robert Sullivan and others at Duke University, Texas. We, too, must plan for the transition. Alternatives include the production of new interleaf sheets carrying the I.C.H.P.P.C. classification for use in existing ledger carcasses, or the adoption of the new plastic ledgers now being produced in America. These have certain disadvantages, one being that they can only with difficulty be persuaded to lie flat on the secretary's desk.

The changeover will take several years. Studies begun under the College Classification will run their full course. As soon as decisions about principles are made, the I.C.H.P.P.C. will be adopted by the Birmingham Research Unit and new material may be made available through it. Comparisons between the College and I.C.H.P.P.C. classifications will not be hard to make for both can be reduced to *I.C.D.* terms and the latter is largely an extension of the former.

The diagnostic index principle seems to have stood the test of time. A vast amount of machine-manipulable data is stored in the ledgers of over 100 practices. This can be fully exploited only when money is available. Meanwhile the Research Unit samples the material as effectively as possible, partly manually and partly with the help of the Office of Population Censuses and Surveys at Titchfield. Some of the data is of historical interest. Further analysis will reveal trends and permit forecasts, and continuing use of full diagnostic indexes in a selection of highly organised practices is likely to remain a valuable source of new knowledge in the future. Developments in scientific as well as medical technology increase both the need for, and potential value of, studies of the natural history of disease. These can be undertaken only in primary medical care.