REVIEW ARTICLE:

The measurement of morbidity in general practice

D M Fleming

Royal College of
General Practitioners,
Lordswood House,
54 Lordswood Road,
Harbourne,
Birmingham B17
9DB, United Kingdom
D M Fleming

A fourth morbidity survey in general practice covering England and Wales will begin in September 1991. It is therefore timely to examine the relevance and importance of such surveys and to consider how the information obtained in this way relates to that from other sources of health statistics.

The desire to compare patterns of mortality by cause in differing countries and groups of people was the impetus for the development of the International Classification of Diseases (ICD).[1] The first classification was adopted in 1855, based substantially on the work of the distinguished English medical statistician, William Farr. Mortality statistics, however, are only one part of an information system for monitoring the health of a nation and in particular for assessing the effect of health care. Farr observed that for every person who died, there were two with chronic disabling illnesses and it was equally important to obtain information about them.[2]

The potential for obtaining information from the British National Health Service with its unique identification of patients (NHS registration number) was recognised almost 50 years ago,[3] but the technology necessary to achieve it has only emerged in recent years. In making this point, the distinction must be recognised between information routinely collected for specific purposes and that available from detailed interrogation of a database where all the data are linked by person specific coding. Ad hoc registration of patients with infectious diseases, those with cancer, and those undergoing termination of pregnancy, respectively, provide examples of databases for preventive action, for monitoring trends over time, and for legal surveillance. One patient may be registered under all three headings. Almost universal patient registration, and a tradition of secondary care delivered only following referral from primary care, has resulted in the patient record in British general practice becoming the repository of total health care details. Sadly there has never been adequate investment in this record system.

This review is primarily concerned with the measurement of morbidity for general practice based morbidity surveys (MSGPs), but will impinge on the more general problems of describing and measuring morbidity. People may suffer several episodes of illness; only some of these are brought to the attention of general practitioners[4 5] and it is only then that we can attempt to measure them scientifically. Surveys based on communities are necessary for estimating the total burden of illness. The Sickness Survey,[3] conducted during the Second World War and in the early fifties, involved coding patient reported morbidity into diagnostic groups. It foundered under the weight of trivial illness. In the General Household Survey,[6] patient reported morbidities have not been classified except for those in which general practitioners were consulted.

At the outset of this review, it is prudent to remember two general points: firstly, measurement and the purpose for which information is needed are not separable; and secondly, most complex problems require a variety of measurements.

The need for morbidity information from general practice

HEALTH FOR ALL BY THE YEAR 2000

Target 26 of the programme for "Health for All by the year 2000"[7] stresses the importance of health care systems based on primary care. Target 27 is concerned with the provision of health care according to need and of adequate access for all persons. The relationship between demand and need is difficult to define.[8] Demand is the point at which individuals bring morbidity problems to medical care (to general practitioners). Response to demand may be inferred from the average consultation rate per person in a given practice, but such a rate does not necessarily indicate response to need. The categorisation of the rubrics of the disease classification into "Serious", "Intermediate" and "Trivial" in the morbidity survey of 1981[9] was introduced to help distinguish demand from need. However, the distinction can only really be recognised by professional observers using objective criteria. Finally, Target 35 is concerned with monitoring the aims of Health for All 2000; it is difficult to conceive such a programme without a major contribution from general practice.

ECONOMICS

As Appleby[10] has pointed out: "the main constraints on health care are now more financial than medical or technical, and the separation of clinical judgement from financial responsibility will soon end". In 1987 the average principal in general practice in England and Wales had a registered list of approximately 2000 persons. The total cost of national health services for 2000

persons was £865 000 including approximately £500 000 for hospital services, £90 000 for pharmaceutical services, and £65 000 for general medical services. In view of the general practitioner's role as gatekeeper to hospital based services, the economic importance of understanding the referral process far exceeds that of understanding prescribing.[11] Though these figures oversimplify the situation, it is our ignorance of the underlying facts that emphasises the need for better information. In order to measure health care, or to study the economics of the referral process, the requisite information must be related to morbidity.

The escalation of health care costs throughout the Western world will compel governments to monitor health care expediture more carefully. In order to do this, databases with person linkage are essential.[12]

EPIDEMIOLOGY
As a general determinant of health care expenditure, the role of the general practitioner is important, but so also are the demographic, geographical, social, and environmental factors which influence need and certainly affect demand. In the United Kingdom, the vast majority of health problems calling for medical intervention are dealt with completely by general practitioners. For example, the third morbidity survey in general practice included more than 5000 persons diagnosed as asthmatic of whom only 292 were referred for specialist care.[13] In a study of the effects from a pollution incident occurring in Germany, the combined incidence of all respiratory diseases presenting to general practitioners was used as a possible indicator of adverse effect.[14]

The British general practitioner authorises almost all prescribed medication outside hospitals. The combination of prescribing information and comprehensive morbidity data facilitated the major study of oral contraception undertaken by the Royal College of General Practitioners[15] and is the basis of the "event monitoring" approach to the recognition of adverse drug reactions.[16]

The fourth morbidity survey will include information about postal district, occupation, ethnic origin, marital status, and social class. These data will be obtained from specific enquiries within the practices to be undertaken by trained personnel instead of by a census linkage exercise as undertaken in the second and third surveys.

THE PUBLIC REQUIREMENT FOR INFORMATION
Quite apart from the economic issues relating to the distribution of resources for health care, there is a national demand for information about the health risks of communities. The intense interest in the influenza epidemic at the end of 1989 exemplifies public concern with illness quite apart from the importance of influenza as a public health matter. Public awareness is maximal in those conditions with changing prevalence, especially where related to public policy. The impact of vaccination policies requires monitoring, and since illnesses such as mumps, measles, and rubella are managed almost entirely by general practitioners, the appropriate place for monitoring is in general practice.

Attitudes towards professional services are changing. The Department of Health is encouraging audit of medical care[17] and this policy is not simply the act of a cost conscious government but also reflects the need for public accountability.

Collection and storage of data
THE CONSULTATION
The consultation with a general practitioner is the point of entry into the United Kingdom health care system and represents public awareness of problems which might be addressed by the health service. It reflects public opinion of the ability of the health care system to make some response to demand and is the starting point for resource provision.

Patients bring problems and not diagnoses to doctors. A man aged 55 years with abdominal pain and diarrhoea may present because a friend had recently had a colostomy operation. Typical results of assessment might be "no abnormal findings on examination, no identifiable pathogen on stool culture, a few scattered diverticuli on barium enema and an isolated benign polyp on sigmoidoscopy". This example encapsulates the potential problems in the diagnostic process: it is difficult to verify the existence of symptoms; the reason prompting a patient to consult is not necessarily the immediate symptom; examination findings may contribute little to diagnosis; the results of investigation may not explain the morbidity.

Howie described diagnosis as the "Achilles heel",[18] believing it to be the label assigned to justify action rather than the basis for action. Given the need for information about morbidity, methods are needed whereby the morbidity content of medical encounters can be described. In MSGPs, the diagnoses or symptoms as interpreted by the general practitioner are entered in the most specific terms available, with opportunity for subsequent amendment. If presenting symptoms are used as alternatives to diagnostic terms, there is a loss of medical interpretation. Coulter emphasised the contribution of the additional information available from the general practitioner when seeking epidemiological as opposed to sociological data.[19] There is however an element of subjectivity about the diagnostic label used by individual doctors, partly relating to their own idiosyncratic interpretation of problems and partly to the frequent need to make choices or include all possible alternatives to describe patients' problems.[20]

Diagnostic criteria have been tested in practice based morbidity surveys in North America.[21] There can be no exception to the application of strict diagnostic criteria for use in therapeutic trials wherever conducted, but the application of such criteria to describe morbidity presenting at routine consultation is fraught with difficulty.[22] Criteria may not be fulfilled at the time of consultation and there may be no further opportunity to see the patient; many important diagnoses are based largely on the history and

cannot be verified; "the dividing line between different types of illness usually tends to be less distinct in the earlier than in the later stages of disease"[3]; interpretation of results from investigations is not always clear, especially where unequivocally positive results only occur at a specific time in the course of an illness. Doctors have to make judgements about the clinical material before them and they do so on the basis of their experience of the condition and of the patient, the consultation and examination findings, and their scientific knowledge.

The bridge between information contained in clinical records and morbidity data suitable for analysis includes classification and indexing. In the past, these tasks were undertaken in manual indexing systems[23] which were labour intensive, involving a series of tasks each with the potential for recording error. The use of computers in general practice simplifies the capture of morbidity data because data can only be entered for correctly registered persons, diagnostic coding is automated using appropriate software, multiple problems can be entered easily, and episode typing can be validated. Notwithstanding these advantages, there is no substitute for good recording discipline within the practices.

CLASSIFICATION OF DATA
The need to store data efficiently has become as important as the need to analyse them. "User friendly" access systems retaining high specificity of detail and linking directly to the major classification systems are essential. The "Read classification" indexes common medical terms in a variety of classification systems including the ICD and its acceptance as a standard data entry system for the British NHS is to be welcomed. The specificity of detail is needed to achieve effective communication between the various sectors of an integrated health care system, yet a classification system must be sufficiently flexible to permit the entry of comparatively imprecise terms. In the absence of rigid diagnostic criteria, the value placed on terms will always depend upon the individual doctor and the setting in which the entry is made.

The limitations of a manual indexing system for use within practices lay behind the development of the truncated version of the ICD for use in morbidity surveys.[24] There have been other approaches to disease classification[25–27] but particular reference should be made to the International Classification of Primary Care.[28] This is an important classification used particularly in the Netherlands.[29] It was developed in order to facilitate analysis of the relatively unsophisticated data from general practice. It is a biaxial classification with one axis classifying disorders by the major bodily systems and the other providing for 30 symptom codes, 40 codes concerned with the process of care, and 30 diagnostic codes. The strength of the classification is the comprehensive coverage of all aspects of care, the weakness is the lack of diagnostic specificity. From the operational point of view, the need to document the three dimensions is time consuming and analysis can be difficult if reason for encounter and diagnosis are confused. However, the principles governing the development of this system will influence the path to a fully computerised medical record.

Analysis and interpretation
Morbidity data from general practices may be presented as person consulting rates, episode rates, or consultation rates. The demominator is usually the practice list size. For epidemiological purposes and for evaluating trends over time, person specific data are essential. It is known that practices vary considerably in the average number of consultations per person during a year, a statistic which reflects doctor determined variability as well as person determined variability. Consultation data may be used for examining workload and for internal practice audit. Data based on episodes may be used for making estimates of resource provision (a person may have several episodes of myocardial infarction requiring intensive care). However, the boundary of an episode may be difficult to define: the onset may only be determined retrospectively, the ending never truly determined, and both may occur outside a survey period.

In any fixed period, a person may be diagnosed with several related conditions: for example, hypertension, angina, and myocardial infarction. For proper interpretation of such diagnostic data, analysis should be based on the recognised "diagnosis related groups" as well as on the individual diagnoses. To achieve this, person specific data are essential. More extensive analyses by the ICD diagnostic groupings are proposed for the fourth general practice morbidity survey than have been produced in previous surveys.

In the analysis of trends over time, fashions in diagnosis must be borne in mind. Asthma provides a striking example: many more people are labelled asthmatic now than was the case 20 years ago, but there remains doubt about the extent to which the prevalence has increased.[13] Strict diagnostic criteria provide the ideal epidemiological solution but these can only be applied in specific circumstances, for example where diagnosis is based on biopsy. An illness such as asthma is extremely variable in its manifestation in individual cases. An alternative approach adopted in both the major MSGPs and in the Weekly Returns Service of the Royal College of General Practitioners[30] involves exploiting the known consistency of recording behaviour in individual practices[20] and recruiting sufficient and well distributed recorders. In the comparison of data from the second and third MSGPs, the analysis was restricted to those practices contributing to both surveys.[31 32]

During the last 20 years, the medical profession has become increasingly familiar with statistical concepts: probability, confidence intervals, and statistical power are commonplace in medical literature. The importance of the sampling procedures is sometimes overlooked. Practices willing to embrace the discipline of continuous recording of diagnoses are inevitably biased. Detailed examination of the representativeness of the populations at risk and of practice characteristics is thus essential for proper analysis of general practice morbidity surveys.

The major general practice morbidity surveys have been particularly valuable in providing bench marks to validate other surveys in general practice, especially those in which the survey method involves reporting from "all consultations", or from "consecutive cases". Examples of such bench marks are: the average rate of consultations per person registered lies between 3 and 3.5 per annum (pre 1990); 70% of the population consult in any one year; the majority of general practitioners undertake between 100 and 150 consultations per week; 40% of all consultations are with male patients: 50% of patients consulting with diabetes are aged 65 or more.

Future prospects

The installation of computers in practices has radically changed the scene for gathering information. The next major step will come when the computerised record replaces the manual record. At the moment, both are required. The computerised record with its comprehensive coverage of both morbidity and prescribing brings a new dimension to epidemiological survey. If it is to be realised to the full, a commensurate recording discipline must be brought to the practices and the quality of recording tested. We may also now look towards an integrated computerised record containing information from all branches of medicine. The prospects for epidemiological study in the coming decade are truly exciting.

Summary

(1) The need for morbidity data based on general practice arises because: (a) the consultation in general practice is the entry point into the health care system; (b) among the health problems brought to the attention of doctors, most are dealt with completely in general practice; (c) general practice records can provide a comprehensive database for health care.

(2) The routine measurement of morbidity has to be based on "working diagnostic terms" derived by consensus amongst recorders because: (a) many episodes of illness involve only one consultation and the doctor is required to make the most of the information available to him at the time; (b) the specification of criteria would require validating evidence of conformity and this is not a realistic option on a wide scale; (c) health care data which include the opinion of the general practitioner are more valuable than data based on patient perceptions of illness.

(3) The analysis and interpretation of data from general practice: (a) should preferably be based on persons as the unit of analysis; (b) when based on consultations, may be useful for examining workload, but has limited epidemiological value; (c) can, by person linkage, facilitate the study of disease concurrence; and (d) is essential for managing the health care system and monitoring the public health.

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