EDITORIALS

Statistics — again

A N editorial in the *Journal* in 1982[1] discussed statistics and general practice. We are raising the subject again, not only because of its importance, but also because the *British Medical Journal* has drawn attention to the need for statistical guidelines for contributors to medical journals.[2] Although the suggested guidelines are not designed specifically for general practice, they do provide a useful standard against which to judge the statistical content of those papers submitted to this *Journal* that use (or should have used) statistical methods.

The purpose of statistical analysis is to draw scientific inferences about a general population on the basis of data collected from a particular sample drawn from that population. More specifically, the role of a statistical test is to assist the investigator in deciding whether a particular phenomenon observed in the sample can be attributed to chance in the selection of that sample. If the phenomenon cannot easily be explained by chance, then the investigator will infer that that phenomenon is true of the population as a whole. (In statistical jargon, the phenomenon is said to be 'statistically significant'.)

It follows that statistical analysis is unnecessary in many original papers. In particular, statistical analysis is not needed in purely descriptive papers—those that report observations, typically from a single general practice, with a view to stimulating other general practitioners, rather than drawing scientific conclusions, either about that practice or more generally. Thus if the *Journal* were to adopt these statistical guidelines for contributors,[2] descriptive papers would not be affected. The *Journal* will continue to publish papers which present original observations about general practice clearly and accurately.

In principle, only those researchers who seek to draw inferences about a population wider than that from which they collect data need to consult these statistical guidelines.[2] As the authors point out, however, the guidelines are not intended as a substitute for statistical skill or experience. At best, they show that statistics has much more to contribute to scientific interpretation than mere significance tests, and give general advice on statistical design, analysis and presentation. Although the guidelines—or the checklist summarizing them[3]— would serve as a basic agenda when planning inferential research, the general practitioner who intends to under-

take such research would be well advised to take two other precautions.

First, we would encourage him to seek statistical advice on his project, especially before collecting data and before writing up. Two years ago,[1] we suggested that such advice was more widely available than was often realized, and listed many possible sources—departments of medical statistics and community medicine within medical schools, statistical departments in universities, polytechnics and regional health authorities, and the College's research units and faculty research committees. Although the demand for such advice has perhaps increased in the meantime, we believe that the intending researcher will still find that it is almost always given freely and sympathetically. In our experience, the typical research project in general practice needs only two short statistical consultations, the first and more important before data collection, and the second before writing up.

Second, we would encourage him to familiarize himself with statistical methods and, more importantly, statistical thinking. Although the number of suitable courses is increasing, many intending researchers will want, or be obliged, to read up the subject. Unfortunately, there is no book on statistics written specifically for general practitioners. We therefore suggest that the intending researcher should consult both Altman's excellent introduction to statistical thinking,[4] and Swinscow's brief but sound summary of statistical methods.[5] As these two books are very different, however, he may prefer a single coherent account of statistical thinking and methods. Among the many books on offer, we would mention Hill's classic textbook on medical statistics,[6] Castle's programmed textbooks,[7,8] and Remington and Schork's more comprehensive textbook.[9]

All these textbooks give more prominence to the normal distribution than would have been appropriate if they had been written for general practice. Both the annual number of episodes of illness per patient and the duration of those episodes provide examples of variables that are common in general practice and have a distribution far from normal. Such variables are conveniently analysed by statistical methods which make fewer assumptions about their underlying distribution. These methods, often described as 'distribution-free' or 'non-parametric', are well described by Siegel[10] and Sprent.[11]

A measure of the fact that the *British Medical Journal's* statistical guidelines[2] were not designed for general

practice is that they pay too little attention to distribution-free methods. Nevertheless, we commend these guidelines to the authors of inferential papers intended for the *Journal*. They provide both a fair target for these authors to aim at and a useful yardstick for the *Journal's* statistical assessors. Most importantly, they underline the basic message of this editorial: statistical advice is often needed and readily available.

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References

1. Russell IT, Barley SL. Statistics and general practice. (Editorial.) *J R Coll Gen Pract* 1982; **33**: 331-333.
2. Altman DG, Gore SM, Gardner MJ, *et al.* Statistical guidelines for contributors to medical journals. *Br Med J* 1983; **286**: 1489-1493.
3. Gardner MJ, Altman DG, Jones DR, *et al.* Is the statistical assessment of papers submitted to the 'British Medical Journal' effective? *Br Med J* 1983; **286**: 1485-1488.
4. Altman DG. Statistics and ethics in medical research. In: *Statistics in practice*. London: BMA, 1982.
5. Swinscow TDV. *Statistics at square one*. London: BMA, 1978.
6. Hill AB. *A short textbook of medical statistics*. London: Hodder and Stoughton, 1977.
7. Castle WM. *Statistics in small doses*. Edinburgh: Churchill Livingstone, 1977.
8. Castle WM. *Statistics in operation*. Edinburgh: Churchill Livingstone, 1979.
9. Remington RD, Schork MA. *Statistics with applications to the biological and health sciences*. London: Prentice-Hall, 1970.
10. Siegel S. *Nonparametric statistics for the behavioural sciences*. Maidenhead: McGraw-Hill, 1956.
11. Sprent P. *Quick statistics*. Harmondsworth: Penguin, 1981.

To classify is to clarify

IF it is to improve, any discipline must be able to analyse itself so that it can develop its strengths and diminish its weaknesses. The process of analysis frequently consists of the three C's—classifying, counting and comparing—and it is no accident that general practice emerged as a discipline at a time when systems of analysis became more common.

It has been a particular contribution of the research units of the Royal College of General Practitioners that they have created some of the most important tools for the job. For example, it was the Birmingham Research Unit, led by Drs Crombie and Pinsent, who in the 1950s and 1960s developed the age-sex register,[1] the first and still the most important basic analytical tool of general practice. This simple device, which divides patients in a practice by their two most fundamental variables, can be considered as a classification of the consumers of medical care. It has moved during the last 30 years from being an interesting research instrument in the 1950s, to a tool of training practices in the 1970s and a part of the day-to-day service arrangements of the majority of general practitioners in this country in the 1980s. Indeed, the Royal College of General Practitioners is currently selling, through its Information Service, as many as three million age-sex cards a year.

However, although this classification is excellent as far as it goes, it provides no information about other important factors, namely the nature of the problems which patients bring to doctors, the diagnoses which doctors make, and the activities of medical practice. Clearly some other system of analysis is required, and the E book[2,3] (named after Dr T. Eimerl, who invented it, and developed by the Research Committee of the then College of General Practitioners), which is a morbidity or diagnostic register, is the next most important system. The central idea is very simple. Categories are created which represent the main problems dealt with by doctors, and entries are made accordingly. A diagnostic register may be comprehensive and cover every single contact between patients and doctors throughout the year, or it may be partial and limited to a shorter defined list of common or especially important diseases. Thus the diagnostic register answers the question of what a general practitioner does, while the age-sex register answers the question of who he does it for.

Following the development of the diagnostic register, the Birmingham Research Unit subsequently arranged for two national morbidity surveys[4,5] to be undertaken using this system. This early RCGP system also influenced other international systems of classification[6,7] and helped trigger worldwide interest in the nature of diseases seen in primary health care.

A new classification

The news that in December 1983 the Council of the Royal College of General Practitioners had approved a new form of diagnostic register came as a surprise to many people. Why should yet another version be introduced? Why should it differ from those used in the past or those in current use today? The answer lies first in the need to relate the College's system of classification to the WHO *International Classification of Disease (ICD)*,[6] and secondly, in the need to adapt it to make it as suitable as possible for microcomputers in general practice.

ICD

The *International Classification of Disease* is accepted internationally and is in use worldwide. Furthermore, it is not necessarily based on primary, secondary or tertiary health care, although the pathological basis of its system of classification makes it in some ways more appropriate for use by hospital-based services. Therefore, as primary health care became more involved in the comparison of its work with secondary care, it