Statistics and general practice

IN 1834, the Statistical Society of London (now the Royal Statistical Society) was founded to ‘‘procure, arrange and publish facts calculated to illustrate the condition and prospects of society’’. That foundation can now be seen as a watershed in the evolution of statistics as a separate discipline distinct from, though closely related to, mathematics on the one hand and the social sciences on the other. From the very beginning, medical statistics was designated as one of the four main fields of interest of the new Society. The early exponents of the study of medical statistics included such names as Sir Edwin Chadwick, William Farr and Florence Nightingale.

In the century that followed, the practice of statistics, like the practice of medicine, became increasingly professionalized. (Unlike medicine, however, statistics cannot strictly be termed a profession since no formal qualification is required of intending practitioners; furthermore, no formal register of practitioners is maintained.) Not surprisingly, these increases in professionalism resulted in a certain lack of rapport between the practitioners of medicine and the practitioners of statistics in medicine. The views of many doctors were perhaps summarized by the opening words of a leading article published in the Lancet (1937):

‘‘Statistics . . . tend to induce a strong emotional reaction in non-mathematical minds. This is because statisticians apply, to problems in which we are interested, techniques which we do not understand. It is exasperating, when we have studied a problem by methods we have spent laborious years in mastering, to find our conclusions questioned . . . by someone who could not have made the observations himself.’’

This leader was written to introduce the first of a series of articles on medical statistics by Dr (now Sir Austin) Bradford Hill. Very soon afterwards, these articles were reissued in book form as Principles of Medical Statistics (Hill, 1937). This book is now in its tenth edition (Hill, 1977) and rightly regarded as the classic text on the subject. In the Preface to the first edition, Hill argued that, to close the gap between medicine and statistics, ‘‘the worker in medical problems . . . must himself know something of statistical technique, both in experimental arrangements and in the interpretation of figures’’. Had he also addressed himself to his fellow statisticians in that text, it is likely that he would have advised them to work more closely with doctors and to communicate more effectively with them.

Thus the publication of Principles of Medical Statistics may be seen as a major step in the evolution of medical statistics as a collaborative activity involving both doctors and statisticians. Nearly half a century later, three fruits of closer collaboration can be identified. First, hundreds of statisticians are now based in medical institutions, with the result that consultation between the two disciplines is easier, more frequent and more effective. Secondly, the teaching of medical statistics, both to undergraduates and to postgraduates, now places more emphasis on developing numeracy and stimulating awareness of statistical thinking than on communicating the finer points of statistical theory. Finally, it is increasingly accepted among the members of both disciplines that the joint contribution of medicine and statistics to scientific knowledge exceeds the sum of their individual contributions; in other words, medicine and statistics, though dissimilar, are mutually dependent.

Unfortunately, general practitioners tend to collaborate less with statisticians than hospital doctors do. The reason for this is not hard to find: since medical statisticians are based almost exclusively in medical schools and hospitals, general practitioners find more difficulty than hospital doctors in attending statistical courses and in consulting with statisticians, let alone in establishing the symbiotic relationship which could be regarded as the ideal. As readers of the Journal are well aware, this problem of access to statistical resources is but one manifestation of a more general problem—the need to develop a system of continuing medical education for general practice which fulfils the needs of general practitioners while taking proper account of their relative geographical isolation. Although the case for such an educational system is supported by the College, it is at the grass roots that more progress has been made; for example, the small group is increasingly being used as a basic educational method, both for vocational training and for continuing education.

The problem of access to statistical resources must also be tackled at the grass roots, especially at a time of reduced expenditure on education and research. Practitioners undertaking research should be encouraged to seek statistical advice, especially before collecting data and before writing up. I believe that such advice is more widely available than is often realized and that it is...


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almost always given freely and sympathetically. In addition to departments of medical statistics and community medicine within medical schools, such advice is to be found in statistical departments in universities, polytechnics and regional health authorities and in the College’s research units and faculty research committees.

The Journal is firmly committed to encouraging close collaboration between general practitioners and statisticians. As Altman (1982) has recently argued, medical journals have an ethical responsibility for ensuring the quality of published research and, in particular, the statistical content of such research. In the past, the Journal has tried to discharge this responsibility by sending any submitted article with substantial statistical content to a statistical assessor as well as to two or more general practitioner assessors. Although this policy has averted the publication of some unsound papers, it has not always treated all authors equally. A few authors who correctly recognized that statistical methods were appropriate have been subjected to a searching statistical assessment while others with less statistical insight have escaped more lightly.

The Journal is therefore proposing to strengthen these arrangements: in future, submitted articles which seek to draw conclusions from data will be seen by a statistical assessor as well as by the statutory practitioner assessors. However, there will be no change in the (previously implicit) responsibilities of the authors of such papers. As before, they will be expected to communicate with Journal readers in as simple and non-technical a manner as possible. At the same time, they should include a description of their statistical methods and findings which is adequate to convince the assessors, and Journal readers, of the validity of their conclusions. (It follows from this that papers which use data only for illustration or description, for example of a single practice, will not be seen by a statistical assessor.)

To implement this policy the Journal has recruited a cadre of career statisticians, all with experience of general practice and general practitioners. These statistical assessors will be encouraged to be as constructive as possible and, where necessary, to make explicit suggestions for improving analysis or presentation. Any author who has an article returned with such suggestions will be told that any revised article will be sent to the same statistical assessor; this process is intended to help the Editor, the assessor and, most important, the author.

The main justification for this new policy is that it will improve the quality of articles published in the Journal and thus contribute to the development of general practice research in the UK. Readers of the Journal should benefit from both a general improvement in quality and from the specific knowledge that each article with statistical implications has been seen by a professional statistician. Finally, it is hoped that the
Journal's explicit commitment to maintain statistical standards will stimulate closer collaboration between general practitioners and statisticians, to the benefit of both disciplines.

IAN RUSSELL
Statistical Adviser
S. L. BARLEY
Editor

References


Recognizing the unusual

No matter how much childish pleasure we take from relating our successes, there is no doubt that most of us learn more from our failures; hearing about other people's failures probably appeals to an unworthy sense of superiority at the same time as pointing up the lesson. We therefore draw the reader's attention to Dr Campion's account of a case of epiglottitis on pages 350-351. All the ingredients of failure are there—a pattern of established recurrent illness (in this case croup), and a home visit at the bleary, cortisol-depleted hour of 04.00. Fortunately, Dr Campion arranged to revisit before, rather than after, his morning surgery, and before the septicaemia and toxicity of this horrid disease had carried off the child. But he might not have been so lucky, and we are the beneficiaries of his experience. We invite our readers to join Dr Campion: a common symptom or sign and an unusual cause that at least in the beginning eluded the doctor. Boasting and self-congratulation will be much less acceptable than an honest admission of failure.