The quality of health services research in medical practice in the United Kingdom

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Abstract

Study objective—The aim was to determine the scope and quality of published health services research concerned with medical practice in the United Kingdom.

Design—Scope of health services research was reviewed in articles published in 41 medical and public health journals in 1985. In random sample of 60 papers stratified by study design, 18 key research parameters were assessed for the quality of reporting and application in the studies.

Main results—Over 80% of the research described in 246 articles was carried out by clinicians, mostly without acknowledged epidemiological or statistical assistance. More than half the studies were descriptive and only 17% were trials. In studies of hospital services, 4% covered long term care, in contrast to 67% concerned with inpatient care. One third of studies were conducted in general practice but only 10% of these included an assessment of clinical outcome. Important research parameters were often not reported; for example, response rates were missing in 52% of the studies, and comparability of cases and controls was not stated in 42% of relevant studies. Major inadequacies were found in the conduct of research, particularly in the selection of controls, allowance for confounding factors, objectivity of measurements, application of statistical tests, and conclusions reached.

Conclusions—Published health services research concerned with medical practice in the United Kingdom is often conducted by clinicians without expert assistance. The quality of reporting and methods employed are deficient in many respects. Short training courses and other initiatives are required to enhance the quality of health services research in medical practice.

given rise to more difficult choices in the spending of resources and highlighted the need for good health services research.

Surveys of clinical research have examined study designs,³ quality of controlled trials,⁴⁻⁶ and adequacy of statistical methods,⁷⁻¹⁰ but no such surveys have been concerned with health services research. In this study, we reviewed the scope and quality of health services research published in medical journals during a recent year in the United Kingdom. The aim was to identify deficiencies in order to make suggestions on how health services research in medical practice might be improved.

Methods

We reviewed 41 journals published in the United Kingdom in 1985. These comprised the major general medical journals (eg, *British Medical Journal* and *Lancet*), specialist medical journals (eg, *Gut* and *Clinical Radiology*) and those covering public health and social medicine (eg, *Journal of Epidemiology and Community Health*, *Social Science and Medicine*). The journals reviewed are listed in the appendix. Nursing, paramedical, and other journals were excluded as we were concerned primarily with health services research related to medical practice. Books, monographs, and ad hoc reports were not included because of expected difficulties in obtaining a comprehensive selection and because most relevant research is published primarily in journals.

Every article in each journal was examined and those concerned with health services research were selected for review. Health services research was defined for the purposes of this study as the evaluation of the adequacy, effectiveness, and efficiency of medical care, including assessments of the need for medical care and of professional and public attitudes. The research could be concerned with any medical service excluding nursing, paramedical services, administration, hotel, and other non-clinical activities. Epidemiological studies concerned with the aetiology and natural history of disease, and research restricted to the clinical features of diagnosis and outcome of treatment were also excluded. Prior to selecting the articles, two of us (CS, FGFR) reviewed articles from five journals published during the previous year (1984), and found good agreement in deciding whether or not an article met the criteria of health services research.

Information on each of the selected articles was abstracted by one of us (CS) onto a standard recording form enquiring about features such as

During the first 15 years following the introduction of the National Health Service, very little health services research was carried out in the United Kingdom.¹ Since the mid-1960s, health services research has been firmly on the agenda, but the appropriateness and quality of such research has become a matter of increasing concern. This has resulted in frequent changes in the mechanisms for commissioning and funding research.² In recent years, financial restraints, increasing patient demand, an aging population, and the high costs of medical technology have

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the specialty in which the research was conducted, the aspect of the service studied, the professional discipline of the authors, and the study design (using an abbreviated version of a taxonomy described by Feinstein¹¹). Inter- and intraobserver variability were found to be minimal when a random sample of 25 papers had repeat reviews by two of us (CS and FGRF).

Subsequently, a stratified random sample of 60 papers comprising three groups (cross sectional studies, cohort studies, and trials) was selected for more detailed review of the quality of research. Information on each paper was abstracted independently by two of us (FGRF and WMG) onto a standard recording form which had been pretested on papers not included in the study. This form had a list of 18 key research parameters concerned mostly with study methods, for example, "Was the study group representative?". In responding, the reviewer ticked one of the following: "Yes", "Partly", "No", "Don't know", or "Not relevant". Papers on which there was considerable disagreement between the reviewers (at least three items answered "Yes" by one reviewer and "No" by the other) were

discussed and a consensus appraisal reached. Minor discrepancies were not discussed and the assessment of one reviewer (FGRF) was used in the analysis.

The data were analysed on the Edinburgh University mainframe computer using SPSS-X.

Results

SCOPE OF HEALTH SERVICES RESEARCH

Review of the 41 journals published in 1985 identified 246 articles concerned with health services research out of a total of about 5800 original articles. One hundred and three articles (42%) appeared in the *British Medical Journal*, 28 (11%) in the *Journal of the Royal College of General Practitioners*, 15 (6%) in *Lancet*, and less than 5% in each of the other journals. The source of funding for the research was stated in one third of articles and comprised the Medical Research Council, DHSS or other government agency (15%), charitable trust (10%), regional or district health authority (6%), and other sources (2%). According to the identifiable authorship of the articles, 206 (84%) of the research projects were carried out by clinicians and of these only 14 had an epidemiologist or statistician as coauthor. Statisticians were coauthors or were mentioned in the acknowledgements in only 31 (13%) of articles.

One third of the research projects were conducted in general practice and almost one quarter in both medical and surgical specialties. Eleven per cent involved more than one specialty. Of those in hospital, 67% were concerned with acute inpatient care, 24% with outpatient services, and 4% with long stay care. Multicentre studies were conducted on 44% of occasions and were slightly more common in studies based in general practice (53%) in comparison to those based elsewhere (39%), although this difference was not statistically significant ($\chi^2 = 3.25$, 1 df, $p > 0.05$).

Each study was categorised as descriptive or analytical (in which at least one hypothesis was being tested). Overall, 44% of studies were analytical, but this showed some variation between specialties: 31% in the surgical specialties compared to 48% in general practice and in other specialties ($\chi^2 = 4.2$, 1 df, $p < 0.05$). The distribution of study designs is shown in the figure. There was little variation between specialty groups. The most common design was cross sectional, in keeping with the high proportion of descriptive studies. Seventeen per cent of studies were trials, but randomisation of subjects or interventions occurred in less than one third of these.

The aspects of care covered by the research are shown in table I. Process (ie, what patients receive when under medical care) was the aspect most commonly evaluated (48% of studies). Outcome was assessed in almost one third of studies, but this varied considerably with the location of the evaluation ($\chi^2 = 41.83$, 3 df, $p < 0.01$). In studies conducted in general practice, only 10% included an evaluation of outcome. By contrast, the provision of services was examined in a high proportion of studies in general practice (45%) compared to those conducted elsewhere (29%),

Distribution of study designs in health services research.

Table I Aspects of evaluation by service location

Aspect of evaluation	% Of research			
	General practice (n = 80)	Acute inpatient (n = 62)	Day/outpatient Community health (n = 44)	Total research (n = 246)
Provision of services	45	28	30	36
Need/demand	23	20	21	22
Process	49	57	43	48
Use of services	30	31	36	30
Outcome	10	41	50	32
Economic	5	8	7	7
Sociological/psychological	6	7	7	7

but this difference was not statistically significant ($\chi^2=2.79$, 1 df, $p>0.05$). Only 7% of studies included any form of economic assessment or evaluation of the psychological or sociological aspects of care.

QUALITY OF HEALTH SERVICES RESEARCH

Out of 60 articles selected for more detailed review the study design of one had been misclassified, and it was excluded. The remaining 59 articles were representative of the original 246 in that there were no statistically significant differences in the distributions of research location (general practice, medical specialties, etc) ($\chi^2=1.22$, 3 df, $p<0.05$) nor in the proportion that was multicentre ($\chi^2=3.56$, 1 df, $p>0.05$). Inadequacies in the quality of research are shown in table II. Many important parameters were not reported: the reproducibility of measurements was omitted in 92% of articles; response rates were missing in 52%; and the comparability of controls to cases was not mentioned in 42% of relevant studies. Among studies in which details of the research were reported, major inadequacies in study methods were identified (table II). In nearly half the studies in which comparisons were made between two or more groups, an inadequate account was taken of confounding factors. In more than one quarter of studies, major inadequacies were found in the statement of objectives, selection of controls, objectivity of measurements, application of statistical tests (irrespective of whether the correct test had been applied), and in the conclusions of the research. In one third to one half of studies, other parameters were found to be imperfect, particularly the overall study design, representativeness of samples, comparability of controls, and validity of measurements.

In order to assess whether omissions in reporting and inadequacies in the research varied with study designs and specialty group, numbers of unreported and inadequate parameters were summed for each paper and a mean percentage value calculated for each study design and specialty group. No substantial variations were found although omissions in reporting differed significantly between the specialties (22% of

parameters in surgical specialties not reported, 21% in medical specialties, and 14% in general practice) (ANOVA, $p=0.03$). Overall, inadequacies in study methods and in the reporting of research were found in every paper.

Discussion

According to our survey, much of the published health services research concerned with medical practice in the United Kingdom is conducted by clinicians without epidemiological or statistical assistance and without major sources of funding. General practice and acute inpatient care were studied most often and there was a dearth of studies concerned with long term care. Overall more than half the studies were descriptive and there were very few properly controlled trials—these are usually the best arbiter of the success or otherwise of medical care, although it should be recognised that trials may not be appropriate nor feasible in answering many research questions. Despite the profusion of studies in general practice, only one in 10 attempted to assess outcome, and overall it was extremely unusual for a study to include an economic component or to assess the psychological or sociological impact of care (although these aspects could conceivably have been reported in journals of other disciplines).

The quality of the research described in the articles was deficient in many respects. The lack of reporting of many research parameters could have been due to poor reporting or because the parameters were not included in the study design. For example, the reproducibility of measures was probably not assessed in most studies. Even among studies with a high level of reporting, inadequacies were identified in many aspects of the research. Perhaps the most notable were that, in over two thirds of relevant studies, some inadequacy was found in the statement of objectives, the objectivity of the measurements, the consideration of confounding factors in the analysis, and in the conclusions. No paper had a clean bill of health.

There are, of course, several limitations to our survey. Firstly, only one year, 1985, was covered, although there is no reason to suspect that health services research papers were very different from those published during other years. Secondly, although standard criteria were used to assess the quality of research, the assessment was undoubtedly subjective, as determined by two medical epidemiologists with experience in conducting health services research. Some of the detail could be open to dispute but our findings overall should provide a reasonable indication of the quality of research currently reported in the United Kingdom. Thirdly, our assessment of the adequacy of the components of research could not take any account of the practical difficulties of conducting the research unless these were obvious or stated in the article. Finally, we have not considered the importance or appropriateness of the research or its potential impact on medical care.

Neither the scope nor the quality of health services research has been formally reviewed elsewhere although the Department of Health and

Table II Inadequacies in the reporting and methods of health services research

Study parameter (Number of eligible studies ^a)	% Not reported in eligible studies	% Inadequacies of method in eligible studies reporting parameter	
		Very inadequate	Partly inadequate
Specification of objectives (59)	na	27	42
Overall study design (59)	na	17	35
Representativeness of sample (59)	22	9	49
Controls:			
selection (19)	11	29	12
comparability (19)	42	18	36
Measurement:			
validity (59)	20	6	42
objectivity (59)	3	33	38
reproducibility (58)	92	0	0
Completeness:			
response (27)	52	5	21
compliance (22)	32	0	13
dropout (26)	27	11	11
Analysis:			
confounding accounted for (40)	na	48	25
statistical tests applied (53)	6	36	10
Conclusions:			
based on evidence (59)	3	28	41

^a Studies are ineligible if the parameter is not relevant to the study design
na = not applicable

Social Security and Scottish Home and Health Department have adopted a policy of identifying priority areas for research. In keeping with the findings of our survey, priorities have included long term care for the mentally and physically handicapped (although the emphasis is now on community care). The poor quality of research has long been recognised by journal editors and referees of papers on health services research.

Reviews of clinical research have also produced disappointing results. Fletcher and Fletcher surveyed clinical research in three major journals over a period of 30 years and found a similar spectrum of study designs in recent years to that found in our study.³ Randomised controlled trials comprised only 5% of articles published in 1976; nearly half the studies were cross sectional. They also found that researchers more commonly use existing databases than collect new data specifically for the purposes of the research. The reporting of clinical trials has also been shown to be deficient in many respects.⁴⁻⁶ In a review of 11 methodological items in 67 trials published during one year in four leading medical journals, Der Simonian *et al* found that 56% were clearly reported, 10% were ambiguously mentioned, and 34% were not reported at all.⁵ Likewise, statistical problems have been shown to be commonplace in clinical research⁷⁻¹⁰ and have led to the publication of guidelines¹² and checklists¹³ for contributors to medical journals.

Concern has been expressed in recent years about the lack of good quality health services research in the United Kingdom. Much attention has been given to how research should best be funded, but a fundamental problem is the lack of a clearly defined career pathway for both medical and non-medical professionals interested in health services research. The Medical Research Council and Wellcome Trust have established training fellowships in order to increase the cadre of those with professional expertise, but this needs to be backed up by permanently funded posts in universities and in the NHS in which the main commitment is to health services research. It should be recognised, however, that such a policy would not have an immediate effect because a long period of training and work experience is required for researchers to attain the standards necessary to become principal investigators on substantive projects.

Nevertheless, as our survey has shown, much health services research is conducted by clinicians with apparently little help from epidemiologists or statisticians. In view of this, attention also needs to be given to providing short term basic training for clinicians in methods of health services research, rather akin to short courses currently held on epidemiology in clinical practice. The essentials of health services research might also be incorporated into vocational training of general practitioners and hospital doctors and might be included in the public health medicine component of undergraduate curricula. But, as well as enhancing training, encouragement needs to be given to clinicians to seek assistance from epidemiologists, statisticians, and economists. In Scotland, networks of advisers have been set up recently in Health Board areas. Also, the Scottish Home and Health Department

has established a system of mini project grants (£5000 maximum) and it is hoped that clinicians who might not previously have been motivated to make the effort to apply for a full grant might apply for a mini project grant. By doing so they would at least have made a limited attempt to plan and design a study and would be less likely to start a project without any form of prior discussion or peer review.

We suspect that health services research is often perceived by clinicians as not "real" research and is thought to be easy to carry out. In reality it is fraught with difficulties, particularly as the population orientated environment in which the research is often conducted cannot be so easily controlled as in the laboratory or ward. In therapeutic practice, the properly conducted randomised controlled trial has long been recognised by the medical profession as an essential step prior to the widespread introduction of a new drug. Where possible the same scrutiny needs to be applied to health services particularly as the pattern and organisation of medical care may have a major influence on clinical outcome.

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Appendix

LIST OF JOURNALS REVIEWED

Age and Ageing
Anaesthesia
Annals of Rheumatic Disease
Annals of Surgery
Annals of the Royal College of Surgeons of England
Archives of Disease in Childhood
British Heart Journal
British Journal of Anaesthesia
British Journal of Clinical Practice
British Journal of Dermatology
British Journal of Diseases of the Chest
British Journal of Obstetrics and Gynaecology
British Journal of Ophthalmology
British Journal of Plastic Surgery
British Journal of Psychiatry
British Journal of Radiology
British Journal of Rheumatology
British Journal of Surgery
British Journal of Urology
British Medical Journal
Clinical Radiology
Community Medicine
Genito-Urinary Medicine
Gut
Health Bulletin
Health Trends
Hospital and Health Service Review
Injury
Journal of Bone and Joint Surgery
Journal of Epidemiology and Community Health
Journal of Laryngology and Otology
Journal of Medical Genetics
Journal of Neurology, Neurosurgery and Psychiatry
Journal of the Royal College of General Practitioners
Journal of the Royal College of Physicians of London
Lancet
Public Health
Quarterly Journal of Medicine
Scottish Medical Journal
Social Science and Medicine
Thorax

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- 6 Lionel NDW, Herxheimer A. Assessing reports of therapeutic trials. *BMJ* 1970; iii: 637-40.
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