Multi-disciplinary research can be more than parallel-disciplinary research: the case of GPs’ use of magnetic resonance imaging

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**Objectives.** We aimed to show how in multi-disciplinary research data collected to meet the needs of one discipline can provide information of value to another.

**Methods.** Using the critical incident technique, 25 GPs were interviewed about recent scans requested for patients with knee and lumbar spine complaints. Transcripts of the interviews were scrutinized from both a medical and an economic perspective.

**Results.** Five key economic issues where further research is needed were identified.

**Conclusions.** The total value of the information provided by multi-disciplinary research may exceed the sum of the information collected to meet the requirements of the individual disciplines.

**Keywords.** Multi-disciplinary research, parallel-disciplinary research.

Introduction

Health services research is increasingly being undertaken on a multi-disciplinary basis. This normally means representatives of each discipline ensuring that appropriate research questions are addressed, relevant outcome measures are chosen and data collection mechanisms are put in place to capture the data each requires for his or her own purposes. At the same time, however, it can often be the case that data collected to meet the needs of one discipline will end up providing information of value to another. We illustrate this using the example of interviews with GPs undertaken as part of a larger study on GPs’ use of Magnetic Resonance Imaging (MRI), which includes an economic evaluation of alternative methods of GP access to MRI.

In an early phase of this research, and independently of the economic appraisal, a sub-study was conducted which interviewed GPs who had requested MR scans in the previous 12 months in order to determine *inter alia* the reasons why the scans were ordered. Details of methods and results from this part of the study have been reported.¹

Although the interviews were not designed to capture data for the economic evaluation, it became clear when reviewing the tape recordings that responders had raised a number of qualitative issues related to, but not directly part of, the quantitative assessment of costs and effects. The purpose of the present paper is to describe the range of economic issues that arose during these interviews despite any direct input by the economists into the design of the data collection for this phase of the study. This will illustrate how multi-disciplinary research that involves full inter-disciplinary co-operation can achieve more than multi-disciplinary research, which essentially involves simultaneous uni-disciplinary studies.

Methods

GPs from 52 of the 73 practices in South Glamorgan were identified from computerized hospital records as having requested an MR scan during 1994. A sample of 30 of these 52 practices, stratified to reflect the fund-holding/non-fundholding ratio in South Glamorgan,¹² was randomly selected. As similarities in clinical behaviour may exist between members of the same
medical partnership, only one GP from each sample practice was interviewed to maximize the variability in responses. As 80% of all scans requested by South Glamorgan GPs were for MRI of the knee or lumbar spine, the interviews were restricted to discussion of these two MRI applications.

Taped interviews were conducted by a psychologist from the research team (MRR). The semi-structured interview schedule was piloted with four GPs from a neighbouring Health Authority who had requested MR scans (two high users and two low users). The revised schedule was used in interviews with 23 South Glamorgan GPs during which 62 scans (18 knee, 44 lumbar spine) were discussed. Data collection and analysis followed the critical incident technique. Each scan request was regarded as the critical incident and the interview focused upon that event. For each scan, GPs were asked to describe the circumstances leading to the scan request, what other investigations the patient had previously undertaken and what the management of the patient would have been if a scan had not been available. Probing techniques were used to expand responders’ answers where appropriate. Following the critical incident technique, inductive categorization of the reasons for request of the scan was based solely on the interview data and has been reported elsewhere. Validity of data produced in the critical incident interview is enhanced by focusing upon a recent and specific event (the referral of a patient for a scan). The use of additional assessors in the analysis also served to strengthen the rigour of the research. Subsequently, the interview transcripts were reviewed independently by two health economists from the research team (DC and JH) for emergent themes and these were agreed by consensus. Several interesting messages concerning the economics of alternative methods of access were apparent. Each theme is illustrated with data identified by the study number of the GP and the patient case number (if more than one case was discussed by the GP).

Results: key economic issues

(1) Efficiency depends on whether MRI is a complement or substitute for X-ray
The efficiency of MRI is dependent on the effect which MRI use has on the demand for X-rays. The interviews provided evidence of some of the reasons why GPs request X-rays.

“I usually ask for an X-ray first because once I didn’t and it was asked for . . . so I always ask for an X-ray first and review that before deciding on a scan.” (GP 14)

The above response was typical and suggests that GPs may often request X-rays because they feel that they are expected to, rather than because they want information from the X-ray to help decide whether to request an MRI scan. If this is the case then the assessed cost of MRI, which will include the cost of pre-MRI X-rays, is higher than it need be. This indicates inefficiencies in current practice which could be easily corrected.

Health service research, however, normally involves the use of pragmatic evaluations, i.e. research conducted in settings which are as close to normal practice as possible. Cost-effectiveness information gleaned from such studies may therefore be misleading if it is biased by the existence of such correctable inefficiencies.

(2) Efficiency depends on whether requests are according to need or to demand
In unregulated markets, goods and services are consumed according to demand, which is defined as a willingness and ability to pay the market price. When goods or services are removed from the marketplace and provided by the state at zero price, then alternative distribution mechanisms must be employed. In the case of the British National Health Service, demand was to be replaced by ‘need’.

While the term ‘need’ can have different interpretations, economists tend to regard need in terms of an individual’s capacity to benefit from health care. Viewed this way, a need for MRI exists only when it is anticipated that the scan result will make a difference to the way the patient is managed, and a scan which in the doctor’s view is not needed represents an inefficient use of resources.

At zero price, however, patients can still ‘demand’ services. There may be no money price to pay, but consuming the service can still impose costs in terms of travel, time off work or childminders, or simply from foregoing leisure time. GPs may thus be under a great deal of pressure to order scans because patients demand them. The efficiency of open access to MRI will be less the greater the influence of patient pressure on the decision to request a scan. The interviews provided considerable evidence that such patient pressure is a factor, as exemplified in the following representative quote.

“One of the reasons I requested it, [was that the patient] said ‘My brother told me the only way you can really find out what’s going on in your back is to have an MRI scan’.” (GP 5/1)

(3) Efficiency can be affected if lesser needs displace greater needs
The interviews provided evidence that many GPs had requested scans specifically to reduce the time their patient had to wait for an out-patient appointment with the consultant. Typical comments included:

“You’re always aware that if you’re going to refer somebody that it’s going to take an awful lot of time and . . . if you have an MRI result . . . it does give you weight.” (GP22/7)
Evidence that GP referrals for MRI are not made solely on the basis of clinical factors is an important starting point for such a debate.

(5) Should reassurance to patients be included as a benefit when measuring efficiency?

All scan results, negative as well as positive, are of value to the doctor because they provide information which leads to more effective care of the patient. There may, however, also be an additional direct benefit (as defined above) to patients from a negative scan result. There is growing evidence from the literature on the economics of health screening that people can put a high value on the reassurance provided by negative test results, although this is not universally accepted.

The interviews suggest that GPs are aware that evidence that supports their own judgements will be valued by the patient, and may request a scan specifically for the reassurance benefits it will provide the patient.

“(This) was a tremendously positive use of an MRI scan in my opinion in that it didn't show anything.” (Pilot/2)

This quotation concerned a negative scan result on a patient with a previous carcinoma of the breast. The GP felt that the scan provided more reassurance than would have been possible from his own word alone. Patient reassurance was mentioned numerous times.

Conclusions

Although the GP interviews were conducted independently of the economic appraisal, they illustrate the range of economic issues which can arise even without being intentionally addressed and at the very least they suggest where further economic research might be directed.

For example, evidence that a proportion of GP requests for MRI may be based on patient demand rather than on clinical need suggests that current use of MRI services might be inefficient due to factors outside the control of those providing the service. Research to identify the extent to which allocation by need is being compromised by patient pressures can thus be of much value. At the same time, the interviews provided evidence that patient demand might not be wholly misplaced since what the patient may largely be demanding is extra reassurance which for whatever reason is not being provided by the doctor alone.

The suggestion that scans may be requested with the specific aim of reducing the waiting time similarly indicates the possibility of current inefficiencies. On the other hand, when a scan identifies serious problems (i.e. greater need) then the speeding up of treatment will increase efficiency. Clearly, research can shed much light on this issue.

The prevalent belief (real or imagined) that an X-ray must be undertaken before an MRI scan can be requested,
suggests that any pragmatic economic evaluation of MRI may be exaggerating the true cost of MRI by including the costs of X-rays which might be wholly unnecessary to produce the benefits of MRI.

Evidence that non-clinical factors may influence the decision to request a scan emphasizes the importance of adopting what economists refer to as a ‘social welfare approach’ in economic evaluations, i.e. designing the appraisal to take account of all costs, regardless who bears them, and all benefits, regardless to whom they accrue. Any narrower perspective, although permissible in economic appraisal, will not take account of productivity gains from earlier return to work and may thus considerably understate the true benefits of MRI.

Perhaps the main message to emerge is that much light can be shed on issues relevant to one of the disciplines in a multi-disciplinary research team from data collected by others and for different purposes. Collaboration offers the opportunity to exploit such opportunities but can only do so if multi-disciplinary research means a multi-disciplinary approach to a given issue and not simply parallel uni-dimensional research within a single study. Economists in particular may be given the opportunity to exploit the qualitative approach of their collaborators to inform more fully an economic appraisal.

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References