Essentials of Health Economics

Part I (continued)—What is economics?

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In applying economics to problems of health care economists try to compare different patterns of use of resources with the various patterns of benefits which arise. This costing is never a simple and value-free exercise. The principal ingredient in costing is asking the right question. Because of the squeeze on NHS resources of late the question: Can you cost this please? is posed more frequently by doctors to accountants and economists. Although greater awareness of costs can create a better climate for increasing efficiency, the question is unfortunately often posed without a real understanding either of the nature of the cost or of the problem (the two are, in practice, inextricably linked). Such a question ought always to be answered by, Why? because unless the nature of the problem to be solved is understood the wrong cost figure may well be calculated.

What is the right costing question?

The answers to the question, What is the cost of a delivery in a Scottish specialist maternity unit? were £540, £510, and £210, and many others were possible.¹ To determine which answer is appropriate much more specific questions have to be asked as follows:

- (a) What is the current NHS unit cost of a delivery in a Scottish specialist maternity unit? Answer: £540.
- (b) If we wanted to increase the number of deliveries in Scottish specialist maternity units, assuming that the number of beds can be increased, what would be the extra NHS cost per delivery? Answer: £510.
- (c) If we wanted to increase the number of deliveries in Scottish specialist maternity units, assuming that the number of beds is fixed, what would be the extra NHS cost per delivery? Answer: £210.

Two important considerations emerge from these questions. Firstly, the unit cost in the first question is the only one that is an "average" cost, since this would presumably be calculated by dividing the relevant total costs by the number of deliveries. (In practice such a figure must be of doubtful relevance to any choices in maternity care.) The other two questions relate to changes "at the margin"—that is, to alterations in size. Often in health care questions are not of the type, Should we do this or not? but rather, Should we do more (or less) of this? Such

marginal changes may result in very different costs (and benefits) from the average (an obvious point yet one frequently lost sight of).

The case of the sixth stool guaiac serves to highlight this phenomenon. In the USA Neuhauser and Lewicki² examined the costs of pursuing a protocol of six sequential tests for detecting asymptomatic colonic cancer. Each test can detect about 92% of the cancers being looked for in the screened population, so that the second test detects about 92% of the 8% not detected by the first test and so on. The costs include the screening itself and barium enemas for all positive cases. After six sequential tests the mean cost (that is, total costs divided by total cases detected by all six tests) was estimated at less than \$2500. But the marginal cost (that is, the extra cost per case detected by the sixth test and the figure relevant to deciding whether to perform six tests or five) was over \$47m. Clearly, it is important to ask the right costing question.

Whose costs should be considered?

The issue of whose costs should be considered needs to be addressed. The analysis in these maternity care examples was restricted to the NHS. If, however, the original question had been posed to determine the optimum mix of GP and specialist unit beds then ideally the costs would have included those falling on the local authorities, the patients, and their families, and friends. Furthermore, the costs would have included social intangible costs, which frequently might not be thought of as costs in the regular sense. Thus, for a husband to visit his wife in hospital relevant costs would have included not only transport but also the husband's time, even if this had been leisure time. This is an example of an opportunity cost. (Had his wife been at the local GP unit instead of a distant specialist unit he might have been able not only to visit his wife on a Saturday but fit in his game of golf as well.)

Why is the timing of costs important?

When costs occur in time is also important. Because as individuals and as a society we tend to prefer good things sooner and bad things later, we can invest and get a positive return on our investment. Hence, we discount the future. Thus, a cost of, say, £1000 now and £1000 in 10 years' time cannot be treated the same. The latter means less sacrifice because we could invest, say, £500 now at some positive rate of interest and have it accumulate to £1000 by the end of the 10 years. Costs occurring at different points in time have, therefore, to be valued differently. This is particularly important in comparing options in which the time profile of costs and benefits are very different; for example, many screening programmes incur costs immediately but the benefits spread over many years.

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Can economics be applied to humanitarian activities?

The simple response is, it already is—albeit frequently subconsciously and in ignorance of some of the implications of doing so. The benefits of health care are, of course, difficult to quantify and placing values on them, to make them comparable with costs, is even more problematical. Presumably one of the main benefits of health care is better health—decreased mortality, less morbidity, decreased pain, and increased mobility—and increased care and comfort. Even ignoring the problem of defining health, the fact that such an intangible concept comes in such varied guises clearly creates problems of measurement, particularly since health is not a value-free concept. Different dimensions will be weighted differently by different individuals. For example, not everyone will accept the same surgical risk to improve some debilitating condition. Indeed the choice of dimensions is not value free.

Who should make the value judgments?

A major question to be posed is, Who is to do the valuing? Given the nature of the NHS, are patients and potential patients (that is, the public at large or perhaps Parliament as their representatives) the best people to decide on the values (and hence priorities) to be adopted in health care? Do they want to be involved? Are they sufficiently knowledgeable about health and health care? Would they not prefer that some third party accepts responsibility for exercising value judgments over these choices? In practice does not the Health Service, and in particular the medical profession, exercise considerable influence over the choices of resource allocation and hence of priorities?

While this is not the place to debate this issue in detail, it is important to appreciate that the problem cannot be avoided. Since decisions are presently being made on the allocation of resources, then at least implicitly values are being placed on the benefits of health care. Using the underlying concept of opportunity cost, we should only do those things where the benefits (advantages) outweigh the costs (disadvantages). Thus, if a decision is made to proceed with a particular policy at a cost of

£x then implicitly the benefits are being valued at something in excess of £x. If the decision is against proceeding, the benefits are being valued at something less than £x. Thus, in the example of the sixth stool guaiac the implied value of the benefit of detecting an asymptomatic case of colonic cancer was in excess of \$47m.

In essence, therefore, health benefits are difficult to measure. But since such measurements are already taking place (albeit badly) and indeed have to take place, this is no situation for the faint hearted. We have to try to improve present decision-making in the NHS. The ideal measurement of health is a long way off but to improve on present measurements is a much less daunting task.

Conclusions

In so far as economics can make a visible contribution to health care planning this will normally be seen in the form of the results of various analyses. Such data will, we hope, lead to more rational decision making and hence improved health care, and more health, from the available resources. But the methodology of economics—the thinking underlying this particular discipline—is more important than all the analyses and data arising from it. Economic analysis is a way of thinking and a science of behaviour. Most importantly, we want to persuade doctors to be much more aware of economics than they have been in the past. If the medical profession thinks of economics as something that only economists do, then economics cannot make any real contribution to health care planning and evaluation.

References

- 1 Gray AM, Steele R. *Programme budgeting in maternity care*. University of Aberdeen: Health Economics Research Unit, 1979.
- 2 Neuhauser D, Lewicki AM. What do we gain from the sixth stool guaiac? *N Engl J Med* 1975;293:226-8.

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Part II of the series will be published next week.

MATERIA NON MEDICA

The pond

Not everyone buying a suburban house acquires a large pond over 11 metres across, in this case the culmination of years of work by the previous owner, who had created miniature islands, mains-fed rocky waterfalls, and outflow channels all over the lawn. All this was 30 years ago, and certainly it had its delights for us too, teeming with wild life from carp to frogs, with a fox coming to drink in the early morning, and a heron, statue-like, standing ready to pounce. Beyond piping the outflow and making good the lawn we did nothing until the arrival of our son, when a heavy chain link fence and secure gate was essential, though later on this did not prevent him getting round it and falling in. We masked our relief in loud laughter in seeing a sodden and algae-covered youngster boogie his way back to the house, but as the years passed we felt the iron curtain had served its purpose so we removed it. Our fencing problems, however, were by no means over as the ducks had taken to one island and were clearly nesting. In the best nature-loving tradition we bought rolls of chicken wire and surrounded the whole pond margin, a tedious and messy business but all to no avail. The brood appeared and took to the water, but by the end of the day they had got through the netting or impaled themselves on it and were otherwise liquidated by the cats. Thereafter the chicken wire was used to cover the islands to discourage nesting, though every year the ducks, usually two males and a female, have come to take their ease and then fly away.

Over the years the fish population declined, freeze-ups proved fatal,

there could have been cannibalism, and possibly the stork had a hand in it, as did our cat. Continuing growth of the surrounding trees made autumn an increasing penance with leaf clearing so my wife ordained that it be filled in and a sunken garden created in its place. One large carp of unknown sex remained, however, so we asked the superintendent of the royal parks at Hampton Court for his advice. This eminent gentleman was immensely helpful and offered to have it collected. In very short order a Land Rover appeared carrying the Royal Arms and Parks insignia, bearing a tall elegant gentleman in a fore and aft cap with an assistant carrying waders and all sorts of fishing impedimenta. Our expert quickly sized up the situation, located the unsuspecting fish, leaped nimbly on to one of the islands and scooped it up with one pass of a butterfly net affair—indeed the heron could not have done better. Within an hour our carp was safely in the Long Water at Hampton Court, where possibly a boy meets girl situation may develop.

The sunken paved garden is now complete, a little austere at present with overtones of a new town pedestrian precinct, but as time passes it will improve with rose tubs, shrubs, and garden seats. Indeed already I can visualise a sort of Forsyte Saga scenario, with Old Jolyon on a summer's day walking down to his garden seat, there to breathe his last, and in a way it would be a happy chance if the same sort of thing could happen to me. Typically in these final scenes something is said to comfort the closing eye: mine would be of myself still relatively in my prime going down to the pond very early on a hot summer morning, the sun's rays already starting to glance across it and seeing mother duck with her overnight hatched brood circling slowly round, though I hope by then the untidy sequel to that magic moment might by then have been forgotten.—ROBERT CUTLER, honorary dental consultant, Kingston.