Discrete choice experiments in health care

NICE should consider using them for patient centred evaluations of technologies

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In many publicly provided healthcare systems, limited resources coupled with unlimited demand result in decisions having to be made about the efficient allocation of scarce resources. This raises questions of how services should be provided (for example, how should patients with cancer be treated? should central clinics, which reduce waiting time but increase travel time for patients, be introduced?) through to the optimal provision and the financing of health care (for example, how should we pay doctors to encourage them to work in remote and rural areas? what would encourage nurses to return to the labour market?). Given the lack of a market for health care, economics techniques inform such decisions.[1] One approach adopted by and further developed in health economics over the past decade is discrete choice experiments.[2 3] In this issue Sculpher et al use this approach to consider patients' preferences in the treatment of prostate cancer (p 382).[4]

Discrete choice experiments are an attribute based measure of benefit[2] that is based on the assumptions that firstly, healthcare interventions, services, or policies can be described by their characteristics (or attributes) and secondly, an individual's valuation depends on the levels of these characteristics. For a review of the stages involved in conducting discrete choice experiments and the information they provide, see Ryan and Farrar[3] as well as the paper by Sculpher et al in this issue.[4]

Discrete choice experiments were introduced into health economics as a technique to go beyond the quality adjusted life year (QALY) paradigm.[5] Users were concerned with many aspects of health care beyond health outcomes. Such factors included waiting time, location of treatment, type of care (for example, surgical or medical), and staff providing care (consultant or specialist nurse) and were referred to as process attributes. Discrete choice experiments allow investigation of the trade-offs between such process and health outcomes attributes.[2–5] Applications of discrete choice experiments have been extended to consider provider preferences[6 7] such as strength of hospital consultants' preferences for various aspects of their work.[6]

More recently the technique has been used to value health outcomes in the provision of care (often beyond those valued within the QALY). For example, Sculpher et al use the technique to establish which health attributes of conservative treatments for prostate cancer are most important to men.[4] They included eight attributes and found that men were willing to contemplate trading off some life expectancy in order to be relieved of the burden of troublesome side effects, such as limitations in physical energy.

At the methodological level, studies find that respondents will complete discrete choice experiments in an internally valid and consistent manner.[2 8 9] An important question in the use of any survey technique is that of external validity—that is, do individuals behave in reality as they state in a hypothetical context? Although limited research has been conducted in this area and future research is clearly important (which is the case for all economic evaluation techniques, including those used in the QALY framework), experience from other areas such as the valuation of environmental goods and services implies that we can be optimistic.

Given the role of the National Institute for Clinical Excellence (NICE) in making recommendations concerning optimal treatments, can it make use of discrete choice experiments? The institute is under increasing pressure to take account of patients' preferences. To date systematic consideration of such preferences has been limited. Typically public preferences are required to elicit quality weights in the QALY paradigm.[10] This is not enough since patients may value outcomes differently to the public and have preferences over aspects of care beyond QALYs.[5 11]

NICE plans to have a patient centred evaluation of technologies in addition to the current assessments of clinical and cost effectiveness. Using the approach of discrete choice experiments allows the integration of patients' values on all aspects of care in one measure. We will be able to see how patients trade different health outcomes as well as process type attributes, alongside each other. Valuation of process and health outcomes from the patients' perspective may well lead to conclusions that conflict with the recommendations of the cost per QALY approach. This is more likely to be the case in comparisons of technologies that differ with respect to outcomes beyond those measured in a QALY, as well as process attributes. Recent examples include the reviews commissioned by NICE on the effectiveness and cost effectiveness of metal on metal hip resurfacing arthroplasty for treatment of hip disease where treatment options differed with respect to process (surgical versus conservative management)[12] and of haemodialysis at home versus hospital or satellite unit for people with end stage renal failure.[13] For such technologies, the crucial question then becomes: what are the implications of patient centred care for the institute's guidelines? This is an important area for future research.

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Facing up to surgical deaths

Each death should be subjected to forensic and statistical analysis

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This issue of the *BMJ* contains two articles on surgical mortality. The first considers the well rehearsed problem of statistical monitoring of surgical performance, whereas the second considers the less researched issue of the impact of surgical death on healthcare providers. Poloniecki et al apply retrospectively seven different statistical tests to compare with a benchmark the death rate in a transplantation programme that was closed because of concerns that the death rate was too high.[1] They show that the point at which an alarm would have occurred had a prospective analysis been carried out varied with the choice of method and that the most scientifically appealing method (mortality chart adjusted for cumulative risks) would have detected only a decrease in the death rate early in the series. This paper is an invitation to reflect on the purpose and usefulness of statistical analysis to monitor performance in health care.

Medical audit was introduced by Florence Nightingale in the 19th century as a process of healthcare improvement. As time went by, and this paper is a good illustration of that trend, statistical analyses have been used increasingly to detect and discipline under-performance. Although the differences in detecting and disciplining are subtle, their implications are important. The detection of under-performance implies that any suspicion of under-performance should ring an alarm and be acted on[2] whereas disciplining it requires near scientific certainty before action is taken. Detection implies candour, self criticism, and openness to blame and can lead to unjust sanctions, whereas genuinely divergent behaviours may remain undetected with disciplining.

An urgent need exists for the medical profession to enter into a dialogue with society—which is represented by consumers (patients and their families), healthcare managers, healthcare organisations, media, litigation lawyers, and the like—to agree on a compromise between these two opposite tendencies. One way forward is to recognise the limitations of statistical methods.[3–5] Statistics interrogate the phenotypes of failures (who, what, where, and when). A forensic analysis is required to investigate their genotypes (how, why). Each failure should be submitted to both methods of investigation. This should be the role of the mortality monitoring group recommended by Poloniecki et al. A need exists for a shift from an accounting approach that tabulates events to a synthetic one that includes the underlying mechanisms. People and organisations that manage potentially hazardous operations successfully are aware of the potential path of failures and develop sensitive strategies that forestall these possibilities.[6] The purpose of a forensic analysis is not only to search for errors or adverse events but also to identify weaknesses of the systems and help develop designs and process modifications that overcome them. Failures can occur without errors; lack of errors does not mean success: "If nothing goes wrong, is everything all right?"[7]

Whether surgical teams should take a break after an intraoperative death is the question addressed by Goldstone et al.[8] They conclude that it is a matter of clinical governance that should be as evidence based as the medicine it seeks to govern. Sadly, perioperative mortality remains an integral part of the surgical trade. In 2002 the National Confidential Enquiry into Perioperative Deaths (NCEPOD) reported 21 991 deaths in the United Kingdom (Scotland excluded) for the previous year. Of these 11% were intraoperative deaths and 15% were unexpected.[9]

How those deaths affect the overall performance of surgical teams in their immediate aftermath depends on a multitude of factors and their interactions, including the circumstantial nature of their occurrence and their impact on individual and team reliability. For the behavioural scientist, reliability refers to the lack of unwanted variance in performance across a range of different working conditions.[10] Reliability is known to be influenced by the so called performance shaping factors, of which emotional and psychological stresses are examples. This must have been the rationale for some to recommend that surgeons should not operate for 24 hours after an intraoperative death.[11] Such a linear reductionist approach, which does not take into account the context surrounding those deaths or the cognitive functions of the individuals involved, such as their resilience and their ability to cope with stress, lacks scientific credibility. Although more scientifically based guidelines are still outstanding, an intraoperative death should be an issue of risk management involving all members of the surgical team, who together should make the decision whether or not to carry on operating.[12] The outcome of these meetings will often be a trade off between conflicting goals.

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