

**Reassurance, Regret and Uncertainty:  
Testing *Ex Ante* Sources of (Dis)Utility  
and the Welfarist Account of  
Social Welfare**

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This paper considers an issue that has received little attention in the literature on health state evaluation: the relevance of the *ex ante/ex post* distinction in the assessment of quality of life. *Ex post* evaluations are based on experience of the health state being evaluated. *Ex ante* evaluations are made in anticipation of actually experiencing the health state, and are able to capture sources of pre-outcome (dis)utility such as anticipatory fear, anxiety, hope and dread. Which perspective should be used for economic evaluation? From the welfarist perspective it might be argued that *ex ante* evaluations should be used, because all sources of utility are relevant. From the extra-welfarist perspective it might be argued that *ex post* evaluations should be used, because economic evaluation should be based solely on realised outcomes, at least in the context of a publicly financed health service. We sought the views of the Australian public on this issue. Using social willingness to pay questions, we asked respondents to select between alternative health services which either did, or did not, take pre-outcome sources of utility into account. Respondents were asked whether or not tax payers should pay a higher price for services that increased pre-outcome utility, and for which patients would be prepared to pay personally. They were also asked whether they would accept *less spending on other health services* for services that increased pre-outcome utility. The results indicated little support for welfarism. Of respondents, only 32.6 per cent would accept an increase in taxes for everyone to provide a service preferred by patients for its reassurance. Only 29.8 per cent would accept an increase in taxes to provide a service preferred by patients for its minimisation of potential for regret. Less decisively, 43.1 per cent would accept an increase in taxes to provide a service preferred by patients for its avoidance of uncertainty. On average, only 28.6 per cent of respondents would accept less spending on other health services to provide these services. The implications of these findings for economic evaluation studies are, first, that the Australian community does not believe that the purpose of its publicly financed health system should be to increase utility as defined by private willingness to pay and, second, that the gold standard for health-state measurement should elicit *ex post* evaluations from patients, not *ex ante* evaluations from the public.

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# Reassurance, Regret and Uncertainty: Testing *Ex Ante* Sources of (Dis)Utility and the Welfarist Account of Social Welfare

## Introduction

Health states resulting from an intervention may be judged *ex ante* or *ex post* – before the outcome is experienced or after it is experienced, respectively. If it is thought that economic evaluations should be based on data from health states that have actually occurred, then *ex post* judgements should be used. On the other hand, *ex ante* judgements are able to capture pre-outcome sources of utility, such as reassurance and the avoidance of regret and uncertainty, which arguably should be included in health economic evaluations. Little attention has been paid to the *ex ante/ex post* distinction in the literature, and what attention it has received has been theoretical. As a result, it is unclear whether members of the public in Australia, or other countries, want their national health schemes to pay for pre-outcome sources of utility. The present paper reports the results of a survey of the preferences of the Australian public concerning three pre-outcome sources of disutility: anxiety (conversely reassurance), regret and uncertainty. The primary hypotheses to be tested are: (I) that the Australian population is willing to pay to avoid these sources of disutility, where willingness to pay (WTP) is measured by increased taxes, and (II) that the Australian population is willing to accept less spending on other health services to avoid these sources of disutility.

By implication, the results of the survey provide a test of community support for two fundamentally different theoretical frameworks: welfarism and extra-welfarism. Orthodox welfarism is characterised by the joint assumptions that social welfare is a function of individual utilities, and that individual utilities are a function of commodities (i.e. goods and services) consumed by those individuals (Culyer 1989). From the welfarist perspective, anything that affects an individual's preferences for health services is relevant to the measurement of "utility" and therefore should be included in an economic evaluation. This includes the avoidance of *ex ante* sources of disutility such as anxiety, regret and uncertainty. The rationale for this position hinges on the apparent arbitrariness of excluding some sources of utility: "If they [i.e. regret, disappointment, anticipation, anxiety, hope, fear, etc.] are actually experienced by the decision maker, then are these attributes any less legitimate than wealth? (Wu 1999, p. 188).

An alternative theoretical framework is provided by "extra-welfarism". The term is commonly used to indicate health per se as an alternative objective to utility in economic evaluations (Culyer 1989; Culyer 1990; Wagstaff 1991). This form of extra-welfarism "replaces utility with health as the primary outcome of interest for evaluation" (Hurley 1998, p. 375). Alternatively, health is sometimes viewed as a supplementary, but independent, objective in the social welfare function (Sen 1985a; Sen 1993). According to this second form of extra-welfarism, health benefits for the rich and poor, or for different age groups, might be weighted differently for equity reasons (Williams 1997). Within the framework of "health maximising extra-welfarism" (Hurley 2000, p. 65), economic evaluation should be based on *realised health outcomes* – that is, what people

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actually do experience (*ex post*) as a result of a health intervention, as opposed to what they *imagine* they will experience (*ex ante*).

If the *ex ante* perspective is considered appropriate, a cross-section of the general population is the obvious source of utility scores in economic evaluations, since the pre-outcome emotions of the general public (fear, anticipated regret, anxiety, and so on) have not been transformed by the process of adaptation to the health state. By contrast, gold standard *ex post* evaluation of health states is clearly achieved when patients themselves are consulted, since only patients have experience of the health state in question. This distinction is not clearly reflected in the practice of measurement. For pragmatic reasons a cross-section of the public, implying the *ex ante* perspective, is usually questioned about health states envisaged in real time, with no pre-outcome feelings – a perspective more suited to *ex post* measurement. The important question asked in this paper, therefore, is whether measurement should be welfarist – in which case the omission of relevant pre-outcome sources of utility is an error – or extra-welfarist – in which case the use of the general public to derive health state values is, at best, a research-budget based compromise.

Special difficulties surround *ex ante* measurement. For example, people may find it very hard to imagine what a health state will be like *ex ante*. They may have to rely on health state descriptions that are incomplete or too hard to visualise (Ubel, Loewenstein et al. 2003). Also, they may have alternative sources of information about the health state (health professionals, the media, friends and family), not all of which are accurate, and which colour the evaluation of the health state from the *ex ante* perspective. Finally, even if the information is accurate, from the *ex ante* perspective people may focus excessively on one aspect of a health state at the expense of a more balanced assessment, and this may differ from individual to individual. That is, judgements made from the *ex ante* perspective may be subject to a “focusing illusion” (Ubel, Loewenstein et al. 2001). Measurement problems of this sort are generally not accepted as being decisive in the choice of measurement strategy. Unless the problems are extreme, there is widespread support for the dictum that it is preferable to carry out imperfect measurement of the right concept than superior measurement of the wrong concept. The present paper is concerned with the prior question of selecting the appropriate concept – that is, whether *ex ante* measurement or *ex post* measurement should be used in economic evaluations.

In the next section we look at three anticipatory feelings that may arise when assessments are made from the *ex ante* perspective: reassurance, regret and uncertainty.

## Reassurance

The potential importance of reassurance is illustrated in a study by Bytzer, Hansen et al. (1994). Two approaches may be adopted when dyspepsia is initially diagnosed (which is often functional): investigation to try and discover the cause (e.g. endoscopy), or treatment (e.g. with H<sub>2</sub> blockade). The study by Bytzer, Hansen et al. failed to detect any significant differences, in terms of symptom relief or health-related quality of life after one year, between groups receiving an endoscopy and those receiving treatment (Bytzer, Hansen et al. 1994; Thompson 1995). Despite this, however, the study also found

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greater *patient satisfaction* among patients managed by prompt investigation. Tebaldi and Heading (1998) explain this in terms of the *reassurance* that investigation brings. Patients often seek medical attention out of fear their symptoms might indicate the presence of some serious underlying cause, with symptom relief being a secondary consideration. In the case of dyspepsia, in particular, the authors argue that reassurance should be a part of the clinical management of the condition, and should also be included in economic evaluations of treatments of the condition: “for many patients with dyspepsia it is not symptom resolution but knowledge that the symptoms are not ‘serious’ that is their main concern. If this is important for the patients it must somehow be assessed and costed in economic appraisals of dyspepsia management” (Tebaldi and Heading 1998, p. 17).

Studies of patients’ attitudes towards screening programs provide further evidence of the importance of reassurance. For example, Santalahti, Aro and colleagues investigated women’s reasons for participating in two prenatal screening tests: serum screening and mid-trimester ultrasound screening. “When women’s personal reasons for participation were asked about, reassurance was the single most often-mentioned item in both the serum screening and the ultrasound groups” (Santalahti, Aro et al. 1998, p. 156). Of participants, 41 per cent cited reassurance about the health of the fetus among their reasons for participating in the serum screening test, and 65 per cent cited this reason for undergoing ultrasound screening. In a separate study, Kornman, Wortelboer, et al. asked women undergoing second-trimester screening for fetal Down’s syndrome, whether they would have preferred the test earlier if it was available. “Seventy-six per cent of those who participated in the second-trimester screening programme would have preferred the test to have been in the first trimester, mainly because of the easier termination of pregnancy and/or the earlier reassurance provided” (Kornman, Wortelboer et al. 1997, p. 1011). This was confirmed in a study by de Graff, Tijnstra, and colleagues, who examined the preferences of two groups of women: those at high risk of a fetal abnormality (Down’s syndrome) and those at low risk. Of those in the first group, 95 per cent stated a preference for first-trimester serum testing, and of those in the second group, 86 per cent preferred an earlier test. “The main advantages for earlier screening were given as earlier reassurance and ‘easier’ termination in the case of an affected fetus” (de Graff, Tijnstra et al. 2002, p. 627). Reassurance is also a powerful motivation for women undergoing breast cancer screening (Brain, Gray et al. 2000; Farmer 2000; Holloway, Porteous et al. 2004).

In many of these cases, seeking reassurance is sensible, and cannot be separated from the desire to prevent an adverse outcome or serious illness. However, it raises the possibility that reassurance *per se* might be of value to patients, independently of any health effects that might accompany it. This is what we sought to ascertain in the present study. In particular, we sought to determine whether people would be willing to pay (in terms of increased taxes), or accept less spending on other health services, for reassurance *per se* - that is, when it is not tied to improved health outcomes.

## Regret

Expected utility theory, as axiomatised by von Neumann and Morgenstern (1947), is a powerful model of choice under uncertainty. However, an impressive body of experimental findings provides evidence that people systematically violate the axioms of

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expected utility theory (Kahneman, Slovic et al. 1982; Schoemaker 1982; Loomes and Sugden 1987; Kagel and Roth 1995; Kahneman and Tversky 2000; Luce 2000). In response to this, alternative models of choice under uncertainty have been developed, such as “regret theory” (Bell 1982; Loomes and Sugden 1982; Anand 1985; Bell 1985; Loomes and Sugden 1987; Loomes 1988). Regret theory is based on the premise that individuals are concerned not only with the outcomes of their decisions, but with minimising the chance that they will feel regret at having made a wrong decision. Similarly, disappointment theory is based on the premise that individuals are concerned with avoiding disappointment when a decision turns out worse than expected. Regret is defined as “a psychological reaction to making a wrong decision” and disappointment as “the psychological reaction to the outcome of an event not living up to its expectations” (Salkeld, Ryan et al. 2000, p. 269). Note that regret violates the independence axiom of expected utility theory. The value of an alternative depends on the other alternatives available when the choice is made: the better (worse) the outcomes associated with these other alternatives, the greater is the potential for regret (rejoicing) (Stewart, Chater et al. 2003).

Smith, Hall et al. found that patients with colon cancer would choose adjunct chemotherapy to accompany surgery, rather than surgery alone, even though the adverse quality-of-life effects of chemotherapy more than offset the value of the additional years of life (Smith, Hall et al. 1993). Smith postulated that this apparently irrational behaviour occurred because patients wanted to avoid anticipated regret (Smith 1996). The subjects in this study, adopting an *ex ante* perspective, anticipated regretting their failure to undergo chemotherapy if cancer recurred, and to avoid this were prepared to endure the additional “disutility” of chemotherapy. In fact, the fear of regret was so acute that “patients all felt they had no alternative but to go with the option that offered them the best chance of survival, no matter how small that additional chance, nor how bad the treatment” (Smith 1996, p. 113).

In a UK study, Ryan used (personal) WTP to test whether women (and their partners) who had been through IVF (In Vitro Fertilization) treatment were motivated to undergo that treatment by psychological feelings of regret and disappointment (Ryan 1998). Among other things, respondents were asked how much they would be willing to pay for an IVF attempt. Of these, 229 provided an *ex ante* WTP valuation (either they were currently undergoing IVF but did not know the outcome, or were not currently undergoing IVF but had done so and were prepared to try again) and 78 provided an *ex post* WTP valuation (expressing their WTP for their most recent attempt). Agreement with the statement, “One of the reasons we are trying (or tried) IVF is that in later life I will know we have tried everything possible,” was a statistically significant predictor of WTP in the *ex ante* group. Ryan comments: “attempting to prevent regret may be an important motivational factor in the decision to go through ARTs [Assisted Reproductive Techniques]” (Ryan 1998, p. 199). Moreover, the more individuals agreed with the statement, “When our first attempt at IVF failed I was surprised,” the less they valued assisted reproductive techniques. “This suggests that the psychological feeling of disappointment may be an important factor when looking at total utility from undertaking IVF” (Ryan 1998, p. 199). The significance of regret and disappointment was supported by the responses of the *ex post* group. Although WTP was substantially higher for the *ex ante* group, the *ex post* group also gave a positive valuation to “trying everything possible to have a child.” Of the 78 individuals in the *ex post* group, 65 had left the programme

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without a child. Even so, “the childless still provided a positive valuation for the service” (Ryan 1998, p. 199). The author sums up the study in this way: “The results indicate that the psychological feelings of ‘regret’ and ‘disappointment’ may be major motivators for individuals seeking ARTs” (Ryan 1998, p. 198).

Elstein, Holzman et al. speculate that regret explains an anomaly in the prescribing pattern of physicians (Elstein, Holzman et al. 1986). The researchers asked a group of physicians whether or not they would prescribe estrogen for a group of menopausal women. Twelve written case histories were presented to the physicians that differed along three dimensions: cancer risk, severity of vasomotor symptoms, and osteoporosis risk. In the first part of the study the optimal treatment was calculated based on the physicians’ own subjective probabilities and utilities. This suggested that the physicians ought to recommend estrogen treatment, or be indifferent between estrogen and no estrogen. On the contrary, however, the majority of physicians recommended against estrogen treatment. One possible explanation for this is that, although estrogen treatment offered the highest expected value based on the physicians’ own probabilities and utilities, it also carried a low but increased risk of death. The authors speculate that the physicians’ choices were influenced by an attempt to avoid regret (on the part of their patients and possibly themselves), which would be considerable if cancer developed after treatment. “It may well be argued ... that human judgement is influenced by aspects of the task that are excluded by the expected utility model but ought to be included: for example, the attribution of responsibility and anticipation of regret” (Elstein, Holzman et al. 1986, p. 255). Commenting on this study, Landman reaches the same conclusion: “a decision that appears incoherent within orthodox decision theory is seen as coherent within a theory that takes regret into account” (Landman 1993, p. 146).

Again, in the study reported below we attempted to ascertain whether members of the Australian public, adopting a social perspective, would be willing to pay, or would be prepared to accept less spending on other health services, to avoid the possibility of regret. As in the case of reassurance, the assumption was made that no objective health benefits are associated with avoiding regret (although of course there may be). That is, the questions were designed to detect the value associated with the avoidance of regret *per se*.

## Uncertainty

*Risk* refers to situations where the probabilities associated with the possible outcomes of a decision are known. *Uncertainty* refers to situations where the probabilities are unknown – “where the information available to the decision-maker is too imprecise to be summarised by a probability measure” (Epstein 1999, p. 579). Uncertainty about the future can give rise to intense feelings of apprehension (Caplin and Leahy 2001). For example, with probabilities that are not easily calculated, a treatment may return a patient to full health, may have no effect at all, may kill the patient, or may be of only partial benefit. The uncertainty (or “vagueness” or “ambiguity”) that accompanies this situation induces an aversive reaction, the strength of which increases with the degree of uncertainty, the consequences involved, and the period of delay until the uncertainty is resolved (Caplin and Leahy 2001). In apparent support of this, several studies have reported that some subjects, when given the choice, prefer a large electric shock now to a smaller shock in the future. (The “future” may be seconds away or days.) Presumably,



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this is done to avoid the period of anticipatory anxiety associated with the delayed shock (Cook and Barnes 1964; Loewenstein 1987). “Many subjects choose the larger shock rather than waiting anxiously for the smaller shock” (Caplin and Leahy 2001, p. 59).

Uncertainty aversion has been subject to a good deal of theoretical discussion in the context of expected utility theory, its variants, and rivals (Montesano and Giovannoni 1996; Epstein 1999; Ma 2000; Klibanoff 2001; Di Mauro and Maffioletti 2004), and has received increasing attention in the health context (Andersson and Lyttkens 1999; Andersson and Lyttkens 2000; Oliver 2000; Wakker 2000). The dislike of uncertainty can be seen in the Ellsberg paradox. Here, subjects are asked to choose a preferred lottery from each of two pairs, A and B, and C and D. In Ellsberg’s original formulation this involved drawing balls from an urn. The payoffs and probabilities of choosing either a red, black or yellow ball are given in Table 1. Although the urn contains 60 black or yellow balls, the exact percentage of each colour is uncertain. Ellsberg found that large numbers of people preferred A to B and D to C, in contradiction of expected utility theory (Ellsberg 1961). This suggests that decision makers give events with unknown probabilities a lower weight in their outcome evaluation. This is different from risk aversion: subjects are not preferring a sure option to a risky one with an equal or greater expected value. Rather, choices seem to be shaped by “a third dimension of the problem of choice: the nature of one’s information concerning the relative likelihood of events” (Ellsberg 1961, p. 657) – that is, uncertainty per se.

The Ellsberg paradox deals with uncertain *outcomes*. Another possible source of (dis)utility connected with uncertainty concerns *the timing of its resolution* (Mossin 1969; Dréze and Modigliani 1972; Spence and Zeckhauser 1972; Kreps and Porteus 1978; Wu 1999.) Pope refers to the period of time after a choice is made, but before its consequences are known, the “pre-outcome period” (Pope 2000, p. 225). Uncertainty during this period may give rise to disagreeable feelings such as fear and apprehension, or agreeable feelings, such as hope and excitement. Wu notes two general reasons why a person may prefer to have uncertainty resolved immediately. First, it may facilitate *physical preparedness*: planning for the future is more difficult in the face of unresolved uncertainties. Second, it may facilitate *psychological preparedness*: “when resolution of uncertainty is delayed, psychological considerations such as anxiety, anticipation, dread, hope, and impatience are relevant; knowing what the future will bring may permit psychological preparedness, even if nothing can be done to affect this future” (Wu 1999, p. 160).

Heckerling and Verp highlighted the importance of uncertainty aversion in a comparative study of two antenatal screening tests for pregnant women: amniocentesis and chorionic villus sampling. They calculated the expected utility of both tests, based on probabilities and utilities obtained from the literature (e.g. of spontaneous abortion, therapeutic abortion, chromosomal abnormalities, indeterminate results). The expected utility of amniocentesis, which is a second-trimester test, exceeded that of chorionic villus sampling, which is a first-trimester test. However, the delay involved in the second-trimester test carries a burden of increased anxiety, which can be high (Robinson, Garner et al. 1988). When this is taken into account chorionic villus sampling may become the procedure of choice: “The utilities of all outcomes occurring after the results of amniocentesis become available, may be diminished by a ‘cost of anxiety’ from having to wait until the second trimester for these results.... The expected utility of amniocentesis

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was quite sensitive to this cost, decreasing sharply as the cost of anxiety increased. For a cost of anxiety greater than 0.1 utility unit [on a scale of 0 to 100], chorionic villus sampling would be preferred; for a cost of less than 0.1 unit, amniocentesis would be preferred" (Heckerling and Verp 1991, pp. 664-665).

In the present study we attempted to determine whether people would be willing to pay, or would accept less spending on other health services, to avoid the delayed resolution of uncertainty in connection with a medical treatment. Again, the questions were framed to detect the dislike of uncertainty *per se*, by decoupling uncertainty aversion and health maximisation. Subjects were asked to indicate their social WTP, or their willingness to accept less spending on other health services, to avoid uncertainty during the pre-outcome period, independently of any net health gain.

In summary, the survey sought to establish whether the public believes that the objective of a publicly funded health system should be to improve population health alone, or whether it should be to increase "utility" more generally construed.

## The Survey

A pilot of the questionnaire was mailed to 100 households in Melbourne, Australia, in December 2003. Another 600 questionnaires were subsequently mailed in April and May 2004. Seven suburbs were chosen representing 5 different "SEIFA" (Socio-Economic Indicators For Areas) groups. The questionnaire contained three questions, one each on reassurance, regret, and uncertainty. Two different versions of the questionnaire were used, to test whether the order in which arguments were presented would alter responses.

*Social* WTP rather than *personal* WTP was used in the present study. Respondents were asked to indicate whether they would be willing to pay higher taxes (or accept less spending on other health services) in exchange for the provision of more expensive services preferred by patients due to their avoidance of pre-outcome disutilities. Respondents were told that these patients were *personally* willing to pay the extra cost for the preferred health service. That is, *respondents* were asked to indicate their *social* WTP (or their willingness to accept less spending on other health services) for health services preferred by patients, where *patients'* preferences were indicated by their *personal* WTP.

The questionnaire contained three questions, in each of which respondents were asked to choose between two health services putatively being considered for inclusion in Medicare, Australia's universal and publicly funded health insurance scheme. Service "A" was described as cheaper than service "B", but service "B" was said to be preferred by patients. Both services would be used to treat the same patients, and would cure the same number of people. But only one treatment could be included in Medicare. Before making their selection, respondents were asked to consider arguments for and against each of the services.

### *Question 1. (Reassurance)*

Question 1 involved two special treatments for patients with heart disease:

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Treatment “A” involves very little contact with a doctor. It is a course of prescription drugs that the patients can administer themselves. Exactly 1,000 patients will be completely cured if this treatment is included in Medicare.

Treatment “B” requires constant testing and interaction with the doctor. Exactly 1,000 patients will be completely cured if this treatment is included in Medicare.

Treatment A was described as being “much cheaper” than treatment “B”. However, treatment “B” was described as being preferred by patients. Treatment “B” was said to be preferred by patients because of the reassurance that people get from ongoing contact with the doctor. This was described as being *unsupported* by the evidence:

*The reason is that they like the ongoing contact with the doctor that “B” requires. They value personal treatment. Further, they have an intuitive belief that, despite the scientific evidence which shows that “A” and “B” are equally effective, the personal service must be better for them.*

The preference for treatment “B” on the part of patients was said to have been detected in surveys. Respondents were also told that patients would be personally prepared to pay the extra cost of “B”. That is, the preference for treatment “B” was based on patients’ personal WTP. The main question for respondents was:

Should the community (including yourself) pay the extra cost of “B” because of people’s preferences, despite the identical outcomes from the two treatments?

To stimulate their thinking about the question, respondents were given two arguments to consider. The first, in favour of treatment “A”, suggested that the community should not have to pay for the reassurance people get from ongoing contact with the doctor, when this is not matched by evidence showing the superiority of treatment “B” in terms of health outcomes (in this case, patients cured).

**(1) Treatment “A” should be included in Medicare because the role of Medicare is to improve health.** *The factors involved in the preference for “B” (people’s intuitive, but wrong, beliefs) are outside the scope of the service for which the community and taxpayers should have to pay. The choice of “A” saves money.*

The second argument, in favour of treatment “B”, focused on consumer sovereignty - respecting patients’ choices, as reflected in their personal WTP:

**(2) Treatment “B” should be included in Medicare because this is what people with the disease want, and would be prepared to pay for. Whenever possible, Medicare should give people the services that they prefer.**

Respondents were then asked to indicate which of the two treatments they would include in Medicare, under two different conditions:

- (1) In your opinion which treatment should Medicare pay for **if the extra cost of “B” means higher taxes for everyone?**

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- (II) Which option should Medicare pay for ***if the extra cost of “B” means less spending on other health services?***

*Question 2. (Regret)*

Question 2 was identical to Question 1, except that respondents were told that the reason why patients are willing to pay more for treatment “B” is to avoid the possibility of regret:

This case is identical to the previous one, except that the reason why people are willing to pay more for “B” than “A” is that *they anticipate that if they do not get better they will be angry with themselves for not following their intuition. That is, if they select “A” and do not get better they will regret not ignoring the scientific evidence, as they suspected all along that treatment “B”, which involves more personal contact with the doctor, must be superior.*

Again, two arguments were presented to stimulate thinking. The first – identical to (1) above - put the extra-welfarist position that Medicare should focus on improving the health of the community, whereas the second – identical to (2) above - put the welfarist position that Medicare should give people the goods and services they want. Respondents were asked to state their preferences for treatment “A” or treatment “B” by answering questions identical to (I) and (II) in Question 1.

*Question 3. (Uncertainty)*

The third question was the same as the previous two questions, except that treatments “A” and “B” were described as offering different probabilities of cure:

**Treatment “A” involves the provision of care to 3,000 patients, but there is only a 1 in 3 chance of each patient recovering. This means that 1,000 patients will be cured. Patients who do not get better are given ordinary Medicare services.**

**Treatment “B” involves the provision of care to 1,000 patients, but all of these will recover. Patients who do not receive the treatment are given ordinary Medicare services.**

Respondents were told that the reason why patients are willing to pay more for treatment “B” is to avoid the uncertainty associated with treatment “A”:

**Treatment “A” is much cheaper than “B”. However, treatment “B” is preferred by people with the disease. The reason for this is that *people do not like the uncertainty associated with “A” after the treatment has begun.***

The following two arguments were given in favour of the treatments:

- 1. Treatment “A” should be included in Medicare because the role of Medicare is to improve health. *The factors involved in the preference for “B” (people’s dislike of uncertainty) are outside the scope of the service for which the community and taxpayers should have to pay. The choice of “A” saves money.***

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**2. Treatment “B” should be included in Medicare because this is what people with the disease want, and would be prepared to pay for. Whenever possible, Medicare should give people the services that they prefer.**

Respondents were then asked to indicate their preference for “A” or “B”, as in the previous two questions.

## Results

Of the 100 pilot questionnaires, 14 were returned by the post office marked “Return to Sender”. Excluding these, the response rate was 26 per cent ( $N = 22$ ), after one reminder letter and a replacement copy of the questionnaire were sent. Again excluding those marked “Return to Sender”, the response rate for the main survey was 32 per cent ( $N = 169$ ), after one reminder letter and a replacement copy of the questionnaire were sent. The combined response rate was thus 31 per cent ( $N = 191$ ). This response rate is probably deceptive. In 2002, in the course of developing the AQoL II (Assessment of Quality of Life instrument Mark II), the Centre for Health Economics at Monash University contacted 2,135 people in Melbourne to arrange interviews. Of these, 7.4 per cent were excluded due to language difficulties, 2.3 per cent due to illness, and 1.2 per cent had a death in the family or were caring for a relative. The present study sampled from the same population and across the same SEIFA groups. Allowing for the same exclusions, the response rate comes closer to 42 per cent. The demographic characteristics of respondents are given in Table 2.

An earlier version of the questionnaire was distributed by the Centre for Health Economics in 1997, but the results were unpublished. This earlier questionnaire differed from the current questionnaire in only one respect (detailed below). However, no significant differences were detected in responses to any of the questions. The data from the earlier study ( $N = 100$ ) have therefore been incorporated into the present study, bringing the total number of valid cases to 291. In both the 1997 study and the present study, two versions of the questionnaire were used: one giving arguments (1) and (2) in that order, the other giving these arguments in the reverse order. Because no significant order effects were detected, the data from the two versions have been pooled.

Responses to the question on reassurance are given in Table 3. Of respondents, 32.6 per cent indicated that they would support the provision of the service that patients wanted – that is, the service offering the greatest reassurance (B) - if this would require an increase in taxes for everyone. By contrast, 67.4 per cent chose the cheaper service (A). Similarly, only 25.8 per cent of respondents would provide the service offering the greatest reassurance *if this would require less spending on other health services*. In this case, 74.2 per cent chose the cheaper service. This suggests that our respondents either placed a low value on reassurance as an *ex ante* source of utility, or did not consider that it was a benefit that should be provided at public expense. Indeed, the resistance to giving patients the service for which they are personally willing to pay is greatest when this would require less spending on other health services, suggesting support for “health-maximising extra-welfarism”. Support for A was greater among the more highly educated ( $p < 0.01$ ) and the more affluent ( $p < 0.01$ ).

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Responses to the question on regret are given in Table 4. This time 29.8 per cent of respondents would provide the service offering the least potential for regret (B) - although this was the service preferred by patients - if this would require an increase in taxes for everyone. By contrast, 70.2 per cent chose the cheaper service (A). Similarly, only 24.7 per cent of respondents would provide the service offering the least opportunity for regret *if this would require less spending on other health services*. In this case, 75.3 per cent chose the cheaper service. Again, the low level of support for eliminating regret as an *ex ante* source of disutility was greatest when this involved less spending on other health services. The support for A under condition (II), but not under condition (I), was greater among the more highly educated ( $p < 0.05$ ), and support for A under both conditions was greater among the more affluent ( $p < 0.01$ ).

Responses to the question on uncertainty are given in Table 5. The rejection of the welfarist position was least decisive in the case of uncertainty. This time, 43.1 per cent of respondents would provide the service offering no pre-outcome uncertainty (B), if this would require an increase in taxes for everyone. By contrast, 56.9 per cent chose the cheaper, more uncertain option (A). Similarly, only 35.4 per cent of respondents would provide the service avoiding pre-outcome uncertainty *if this would require less spending on other health services*. In this case, 64.6 per cent chose the more uncertain option. Again, the low value placed on eliminating uncertainty as a source of *ex ante* disutility was greatest when this involved less spending on other health services. No statistically significant differences were detected among those choosing service A and those choosing service B.

Using the McNemar test (Berenson and Levine 1992, pp. 475-476), we compared the proportions of those choosing service A in Question 1 (on reassurance) with those choosing service A in Question 2 (on regret), under both scenario I ("higher taxes for everyone") and scenario II ("less spending on other health services"). No statistically significant differences were detected under either scenario ( $p < 0.05$ ). However, there *were* statistically significant differences under *both* scenarios when the proportions of those choosing service A in Question 1 (on reassurance) were compared with those choosing service A in Question 3 (on uncertainty). Similarly, there were statistically significant differences under both scenarios when the proportions of those choosing service A in Question 2 (on regret) were compared with those choosing service A in Question 3 (on uncertainty). This suggests that not all *ex ante* sources of (dis)utility are considered on a par. Our respondents were more sympathetic to the avoidance of uncertainty than to the avoidance of regret or the provision of reassurance.

In the 1997 survey, in the question on uncertainty, treatment B was described as being based on people's "intuitive, but wrong beliefs". This seemed an inaccurate description of uncertainty aversion, and a potential source of bias in the earlier study. Hence, in the present version the more neutral expression "people's dislike of uncertainty" was used instead. However, no significant differences in responses were detected.

Table 6 shows the pattern of responses to all three questions (reassurance, regret, and uncertainty) under condition (II) – that is, if the choice of B would mean less spending on other health services. The first, second, and eighth rows are most significant, indicating, respectively, unvarying preference for treatment A (extra-welfarism), the special

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consideration given to uncertainty, and unvarying support for the public provision of services where there is a private willingness to pay the full price (welfarism).

## Discussion

The empirical studies surveyed earlier reveal the existence and significance of the *ex ante/ex post* distinction. However, to our knowledge, no studies have sought to determine whether the general public thinks the *ex ante* or *ex post* perspective is appropriate for health economic evaluations. This lack of attention is surprising, since the outcomes of health decisions are typically uncertain, and present considerable scope for reassurance and regret.

Empirical results are never conclusive, and our study may be subject to undetected sources of bias. For example, it is possible that some respondents favoured treatment B in Question 1 not because they considered the reassurance that comes from ongoing contact with the doctor important, but because they believed that ongoing contact with a doctor would increase the chances of unrelated medical problems being picked up earlier. In this example, however, any such bias would increase the number of respondents preferring service B, and our conclusion that service A was generally preferred would be strengthened.

As with all such studies, it is possible that respondents did not think carefully enough about the questions. The consequences of uncertainty, for example, are potentially very unpleasant. Wu refers to the psychological utility or disutility of waiting for uncertainty to be resolved *anxiety*, and notes that it may be far from irrational to want to avoid it: “it is quite reasonable for sufferers of anxiety to pay something to avoid suffering anxiety and its emotional and physical consequences: sleepless nights, lack of concentration, loss of productivity, excessive impatience and irritability, etc” (Wu 1999, pp. 188-189). An alternative study methodology might have mitigated this form of bias by measuring strength of preference for the different scenarios and demonstrating (potentially) a preference for either service “A” or service “B” that was sufficiently strong to increase confidence in the conclusions. We judged that this approach was not feasible with a postal survey.

## Concluding Remarks

Welfarism is based on the libertarian premise that revealed preferences are the gold standard for the measurement of “utility”. People’s *ex ante* attitudes towards reassurance, regret, and uncertainty are therefore relevant because they affect people’s revealed preferences. If a person selects treatment A over treatment B because it minimises anxiety, or uncertainty, or the likelihood of regret, then treatment A (by definition) produces more “utility”, since a preference for it has been revealed. Extra-welfarism, by contrast, derives more from the “material welfare” tradition of Pigou and Marshall (Robinson 1986). It may replace or, alternatively, supplement “utility” generally construed with *health-related* “utility” (quality of life), or with more objective criteria, such as “functionings” (Sen 1982; Sen 1993).

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The respondents to our survey stated preferences that implied support for extra-welfarism, and a rejection of welfarism. Overwhelmingly, they rejected higher taxes, or the sacrifice of other health services, to include services in Medicare offering reassurance, reduced regret or uncertainty, even when they were informed patients were personally willing to pay for the extra cost. In all three cases, the rejection of the option preferred by patients was greatest when this meant less spending on other health services. In brief, when adopting a social perspective – when asked to make an ethical judgement, rather than a judgement based on self-interest - respondents endorsed extra-welfarism, and rejected welfarism.

Further work needs to be done on the significance of the *ex ante/ex post* distinction. For example, other sources of *ex ante* (dis)utility apart from those considered here need to be investigated, especially since our results suggest that the public in Australia does not consider all sources of *ex ante* (dis)utility equally important. Similarly, the strength of preference for avoiding different *ex ante* sources of (dis)utility should be measured. Related to this, the validity and reliability of the social WTP as a method for eliciting social preferences needs to be tested. We consider the present study as a first step in investigating some of these issues. However, despite the many possible caveats, our results strongly suggest that the Australian community does not believe that the purpose of its publicly financed health system should be to increase utility as defined by private willingness to pay. Other communities, of course, may have different social values.



**Table 1: Choices in the Ellsberg Paradox**

	<b>Red</b>	<b>Black</b>	<b>Yellow</b>
	30		60
Lottery <b>A</b>	\$100	\$0	\$0
Lottery <b>B</b>	\$0	\$100	\$0
Lottery <b>C</b>	\$100	\$0	\$100
Lottery <b>D</b>	\$0	\$100	\$100

**Table 2: Respondent Characteristics**

<b>Characteristic</b>	<b>Category</b>	<b>Years</b>	<b>%</b>
Gender	Male		48.4
	Female		51.6
Age	Mean	53.5	
	Standard deviation	16.4	
	Median	52	
Country of origin	Australia		76.7
	Other		23.3
Education	Primary schooling only		6.1
	Secondary schooling not completed		14.0
	Secondary schooling completed		24.4
	Trade qualification		10.8
	Degree		26.9
	Postgraduate qualification		14.3
	Other		3.6
Main activity	Full-time work		26.6
	Part-time casual work		11.0
	Working full-time or part-time*		19.5
	Unemployed		0.4
	Retired or pension		25.9
	Home duties		12.1
	Studying		1.1
	Other		2.1
Household income (Aus \$)	< 20,000		13.6
	20,001 – 30,000		14.7
	30,001 – 40,000		12.5
	40,001 – 50,000		8.2
	50,001 – 60,000		8.7
	60,001 – 80,000		10.3
	> 80,000		32.1
Self-rated health	Very good		43.3
	Good		44.9
	Fair		10.7
	Poor		0.5
	Very poor		0.5
Importance of religion/ spirituality	Important		46.8
	Neither		25.5
	Unimportant		27.7

\* The 1997 survey did not differentiate between full-time and part-time work.

**Table 3: Responses to the question on reassurance**

<i>Condition/Service</i>	<b>Number</b>	<b>Percent</b>	<b>Valid Percent</b>
(I) Higher taxes for everyone			
<b>A</b>	<b>188</b>	<b>64.6</b>	<b>67.4</b>
<b>B</b>	<b>91</b>	<b>31.3</b>	<b>32.6</b>
Missing	12	4.1	-
Total	291	100.0	100.0
(II) Less spending on other health services			
<b>A</b>	<b>204</b>	<b>70.1</b>	<b>74.2</b>
<b>B</b>	<b>71</b>	<b>24.4</b>	<b>25.8</b>
Missing	16	5.5	-
Total	291	100.0	100.0

**Table 4: Responses to the question on regret**

<i>Condition/Service</i>	<b>Number</b>	<b>Percent</b>	<b>Valid Percent</b>
(I) Higher taxes for everyone			
<b>A</b>	<b>198</b>	<b>68.0</b>	<b>70.2</b>
<b>B</b>	<b>84</b>	<b>28.9</b>	<b>29.8</b>
Missing	9	3.1	-
Total	291	100.0	100.0
(II) Less spending on other health services			
<b>A</b>	<b>210</b>	<b>72.2</b>	<b>75.3</b>
<b>B</b>	<b>69</b>	<b>23.7</b>	<b>24.7</b>
Missing	12	4.1	-
Total	291	100.0	100.0

**Table 5: Responses to the question on uncertainty**

<i>Condition/Service</i>	<b>Number</b>	<b>Percent</b>	<b>Valid Percent</b>
(I) Higher taxes for everyone			
<b>A</b>	<b>156</b>	<b>53.6</b>	<b>56.9</b>
<b>B</b>	<b>118</b>	<b>40.5</b>	<b>43.1</b>
Missing	17	5.8	-
Total	291	100.0	100.0
(II) Less spending on other health services			
<b>A</b>	<b>173</b>	<b>59.5</b>	<b>64.6</b>
<b>B</b>	<b>95</b>	<b>32.6</b>	<b>35.4</b>
Missing	23	7.9	-
Total	291	100.0	100.0

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**Table 6: Answer patterns regarding less spending on other health services.**

<i>Pattern</i>	<i>Percentage (Number)</i>
<b>A A A</b>	<b>54.3 (158)</b>
<b>A A B</b>	<b>10.7 (31)</b>
A B A	1.0 (3)
A B B	1.0 (3)
B A A	1.7 (5)
B A B	1.4 (4)
B B A	0.7 (2)
<b>B B B</b>	<b>18.6 (54)</b>
Missing	10.7 (31)
Total	100.0 (291)

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