CONTINGENT VALUATION IN HEALTH CARE: IS THERE MORE TO IT THAN JUST VALUING HEALTH STATUS?*

Richard D Smith
Health Economics Group
School of Medicine, Health Policy and Practice
University of East Anglia
Norwich, NR4 7TJ
Tel: 01603 593617. Fax: 01603 593604. Em: Richard.Smith@uea.ac.uk

ABSTRACT

A general population sample of 208 Australian respondents completed a contingent valuation survey which asked them to value 10 scenarios. These scenarios varied according to: (i) scenario 'richness'; (ii) the manner with which the health benefit is achieved; (iii) the manner with which the health reducing problem is caused; (iv) whether there is an externality value element; and (v) whether there is an option value element. Results indicate that 'pure' health status change directly accruing to the individual making the valuation is the most significant element (forming over 70%) of the value being elicited in a CV survey, with little or no variation according to variance in scenario 'richness', the manner with which the health benefit is achieved or additional externality or option value effects, although disease 'labels' do have a significant effect. The implications for CV research in health care is outlined in the discussion.

*The research described in this paper was conducted whilst the author was at the Health Economics Unit, Faculty of Business and Economics, Monash University, and was funded by a Faculty Research Grant. The author would like to thank Jeff Richardson for providing comments on the ideas contained in this paper, Angela Robinson for comments on an earlier draft and, of course, to all those who completed the interviews. Needless to say, the usual caveat applies.

INTRODUCTION

Although more common in environmental economics, interest in the use of contingent valuation (CV) to value the benefits of health (care) has increased substantially over the last decade [1-3]. Much of this interest has been methodological, especially concerning whether practices used in other areas, principally environmental economics, may be applicable to health (care) [4-6].

CV involves the specification of a hypothetical market, through which the provision of the 'good' (benefit) being valued is contingent upon the individuals expressed willingness to pay (WTP) for that good [7]. Although there are issues concerning, for example, the possible insensitivity of WTP to the scale/scope of the good being valued, the appropriateness of different questionnaire formats, and the choice of payment vehicle, perhaps the most fundamental component in specifying this contingent market is the 'scenario' being valued [3].

The 'scenario' is the description of the 'good' which is presented to respondents, and is thus fundamental to the veracity of the resultant WTP values; apart from characteristics of the individual (tastes, preferences, income etc), the expressed WTP value should be determined by the characteristics portrayed in the scenario (and not significantly affected by other attributes of the contingent market; allowing of course for possible 'random' variation in values consistent with random utility theory). To ensure that the value obtained is for the 'same' good across individuals, the scenario must encompass all the relevant features of that good that are likely to cause variation in value[1]. If the scenario fails to provide clearly defined information about attributes of importance, respondents will fill these 'information gaps' with default assumptions (i.e. guesses) concerning characteristics of the good in question [9-11]. This will "render a CV study's estimates *uninterpretable* because there is no way of knowing what they were buying [and] even if this was known, it would differ from one respondent to another" [11; p13 (emphasis added)][2]. The scenario presented to respondents is therefore a critical issue; if it is inappropriate

[1] A clearly defined scenario is also required to ensure 'economic validity' of the results, as a key axiom of economic theory is that as the characteristics of a good change so the value of it will, *ceterus paribus*, change. If the good is described vaguely it is to be expected, therefore, that WTP responses will be vague, and thus, for example, insensitive to the scope of the good offered [8].

[2] It has also been noted that vagueness in the scenario being valued may also lead to 'double-counting' within a CBA, such as in terms of the effect on lost income of a disease or treatment [12].

then the 'validity' of the subsequent WTP values are in question regardless of subsequent measurement issues [3,11,13].

However, although work concerning scenario construction and presentation has been conducted within environmental economics [14-19][3], it remains an under-researched aspect of CV as applied to valuing health (care) [2,3,23]. It is therefore unclear the extent to which practice within environmental economics should, or could, be adopted in health economics [6,24]. In this respect the key issue is the type of good being valued. Environmental economics is predominantly concerned with the 'non-use' valuation of large and unfamiliar commodities (or at least commodities in an unfamiliar situation), such as national parks [25], coastal waters [26] or biodiversity [27]. In contrast, it may be argued that the private (i.e. rival and excludable, and therefore tradable), rather than public good, nature of health, the greater familiarity of respondents with health care *overall*, the increase in private payment for many interventions, and the general understanding of disease, prevention and treatment mean that the scenario in health (care) CV surveys market could be simpler than in other contexts[4]. For example, the primary characteristic of importance may be health benefit, with this benefit largely accruing to the individual concerned, providing 'use value' rather than non-use value [32]. However, it could equally be that information on more 'procedural' aspects of treatment is a significant factor in health (care) valuation [23].

Conceptually, this may mean that WTP values for health (care) are more robust (valid and reliable) than those for environmental goods. More practically, this may mean that complex scenarios describing the commodity being valued are not required, or at least to the degree of detail as they are in valuing environmental commodities [3]. It may also be that, since the benefits are directly health-related, these take such primacy in the valuation exercise that the other attributes of the (benefits of the) good in question have only a 'marginal' impact on overall WTP. This may, for instance, offer one explanation for 'insensitivity to scale/scope' [33,34].

[3] For example, finding that even apparently 'irrelevant' changes in wording of the question (from the perspective of normative theory) can produce substantial changes in the valuation of those scenarios [20-22].

[4] In a similar fashion to other 'private' goods that are valued using CV, such as boating [28], recreational angling [29] and cross-country skiing [30]. For CV studies in these areas, it has been argued that the respondent may have some experience of the good, and that the good will certainly be familiar and directly experienced, such that "people are likely to have clear preferences for, or opinions about it" [31; 1995; p98].

Overall then, there may an argument to be made for scenarios within health (care) CV studies to be simpler than those within environmental studies.

However, there is a paucity of empirical evidence to support to refute this argument. This study thus contributes to the literature on CV in health (care) by assessing variance in WTP that may be due to: (i) changes in the 'richness' of description of the health benefit being valued; (ii) changes in the manner with which this health benefit is achieved; (iii) changes in the manner with which the health problem is caused; (iv) an externality effect (health benefit accrues to another) rather than use value; and (v) option value (health benefit in future) rather than current use value. The study methodology and results are presented below, and the paper concludes with implications for the design and conduct of CV studies in health care and suggestions for further research.

METHODS

Sample

Respondents (any English-speaking person aged over 18) were identified through random selection from Melbourne electoral rolls within census collector divisions, stratifying for socio-economic status. This method was used to obtain a representative sample of the Melbourne population. As this study was methodological in orientation, the sample size was based on the maximum number that would be able to be interviewed within the budget and time available rather than through a statistical power calculation.

Survey administration

The sample was split between two modes of survey administration: telephone and face-to-face interview. As detailed elsewhere, WTP values were not shown to vary significantly according to which mode of survey administration was used, and these data are thus pooled [35].

'Good' being valued

The CV exercise reported here was part of a larger survey concerned with exploring various methodological issues in the application of CV in the health (care) context. The exercise reported

here was designed to elicit WTP for a series of 10 health state scenarios, designed to test whether WTP would significantly differ according to:

1. variance in scenario 'richness';
2. the manner with which the health benefit is achieved;
3. the manner with which the health reducing problem is caused;
4. whether there is an externality value element; and
5. whether there is an option value element.

The 'base scenario' (from which all other scenarios were derived) comprised a series of statements concerning a hypothetical health state taken from the Assessment of Quality of Life (AQoL) instrument [36]. This is a multi-attribute utility instrument that comprises five dimensions of three items each, each with four levels (from A to D, corresponding to best through worst health) [37]. This instrument is summarised in Table 1. The 'base' scenario used in this paper corresponded to '2b, 5b, 7b, 8b, 10b, 13b, 14b and 15b' from the AQoL.

Table 1: AQoL Dimensions and Items

Dimension	Item*
1. Illness	1. Use of prescribed medicines
	2. Reliance on medical aids
	3. Receiving regular medical treatment
2. Independent living	4. Household tasks
	5. Self-care
	6. Mobility
3. Social relationships	7. Relationships with others
	8. Social isolation
	9. Family role
4. Physical senses	10. Seeing
	11. Hearing
	12. Communication
5. Psychological well-being	13. Sleep
	14. Anxiety and depression
	15. Pain

* Where each item has 4 levels from a to d, corresponding to best through worst health.

A further nine scenarios were then built from this 'base scenario'. The key feature of each scenario is outlined in table 2[5]. With reference to the five hypotheses above, WTP values for these scenarios were used as follows in comparison with the 'base' scenario:

1. variance in scenario 'richness' – scenarios 6 and 7 *vs* scenario 1;
2. the manner by which the benefit is achieved – scenarios 2, 3 and 4 *vs* scenario 1;
3. the manner by which the health problem is caused – scenarios 8 and 9 *vs* scenario 1;
4. whether externality value was elicited – scenario 5 *vs* scenario 1; and
5. whether option value was elicited – scenario 10 *vs* scenario 1.

Table 2: outline of key features of scenarios

Scenario	Key feature
1	'Base' scenario describing health status only (from AQoL)
2	As scenario 1, but with symptom relief due to drug treatment
3	As scenario 1, but with symptom relief due to surgical treatment
4	As scenario 1, but with symptom relief due to drug prevention
5	As scenario 1, but symptom relief (benefit) accrues to another person (externality effect)
6	Same health state as scenario 1, but more 'narrative' manner of presentation
7	As scenario 6, but with greater level of narrative detail
8	As scenario 1, but with a 'mild disease' (stroke) causing symptoms
9	As scenario 1, but with a 'severe disease' (bowel cancer) causing symptoms
10	As scenario 1, but with symptom relief obtained in the future for payment now (option value)

The scenarios were presented to respondents in random order (determined utilizing a random number generator prior to the interview)[6] to enable a test for the presence of an 'order effect' in the resultant WTP values [38,39].

WTP elicitation

Respondents were asked to assume that they were about to enter the particular 'poor health' scenario presented, which would last for a period of one year, upon completion of which they

[5] In order to keep the interview to a manageable length, and minimize 'order effects', scenarios 1,2,4,6,8 and 10 were valued by the 'face-to-face' interview sample, and scenarios 1,3,5,7 and 9 by the 'telephone' sample. Each sample valued scenario 1 for comparative purposes.

[6] For surveys administered 'face-to-face', this sequence was simply enforced by the interviewer during the interview. For those administered by telephone, scenarios were mailed to respondents in the assigned, random, order. Respondents were therefore not involved in the random sorting of scenarios, although there is no guarantee that they did not look through them prior to responding to the telephone interview.

would revert back to their current state of health. They were then asked (after checking that their current state of health would be preferred to the health state described in the scenario!) to state the *maximum* amount that they would be willing-to-pay to *avoid* this health state (either through a preventive or treatment measure, according to the precise scenario being considered).

Respondent WTP was expressed as being paid out-of-pocket (OOP) as a fortnightly figure, which is the traditional pay period for most people in Australia. All values where then re-calculated as annual figures and repeated back to respondents. Respondents were reminded to consider how much they could afford to pay when giving their response.

Respondents who provided a valuation of zero were asked to clarify whether they were simply not willing to pay anything, that they did not actually value the change in health state (i.e. were indifferent between the poor health state and their current health), or that there was another reason – such as income constraint or ethical objections to such valuation. Respondent WTP was elicited using the payment card format [40,41].

Statistical Analyses

Primary statistical analyses were conducted to test five null hypotheses; that there would be no significant difference in WTP values elicited according to:

1. differences in scenario 'richness';
2. the manner by which the benefit is achieved;
3. the manner by which the health problem is caused;
4. the presence of externality value (as distinct from use value); and
5. the presence of option value (as distinct from current use value).

As the WTP data was positively skewed, a non-parametric statistical analysis (Wilcoxon paired comparison (signed rank) test) was performed [42].

A secondary analysis was to conduct an ordinary least squares regression for each scenario WTP value to test for differences in possible explanatory factors across scenario, and, importantly, to

test for order effect in scenario valuation through specifying a dummy variable to represent whether the scenario being valued had been valued first (before any other) or not. The regression model was specified to be parsimonious, yet encompass the main variables that might be expected to influence WTP, including: age; gender; whether the respondent had private health insurance; their level of education; income; self-reported health status; whether the exercise was felt to be difficult or distressing; and the time taken to complete. As the WTP data was skewed, data was log-transformed and a logistic (Logit) regression (where ln(WTP) is the dependent variable) performed[7] [43]. This regression was subject to the Ramsey RESET test for model misspecification, and the Cook-Weisberg test for heteroscedasticity. All analyses were conducted using SPSS (ver. 9.0) for Windows.

RESULTS

Response rate

Between September 1st 1998 and January 31st 1999, 600 households were identified, according to the procedure outlined above, and contacted by telephone to request their participation in the survey. Of this 600, 204 were unavailable to be interviewed. Of the 396 eligible for enrollment, 350 agreed to be interviewed and 314 completed the survey; with 36 respondents removed (e.g. non-completion of valuation questions, 'protesting' or misunderstanding). A sub-sample of 106 used a different payment card format, giving significantly different responses, and were thus excluded from the analysis here [35]. The final sample is thus 208.

Demographic, background and interview characteristics

Respondents were on average aged 43 (±2.2), 42% were male and 82% married/defacto. Eleven percent had experienced some health problem within the last five years, and 5% regularly incured health care expenditure. Twenty-three percent had private health insurance, 45% had dependents, 81% were in paid employment and mean annual personal income was AU$ 45,867 (±3,469) (and mean annual household income was AU$88,395 (±12,899)), where 85% share household income

[7] Note that the natural logarithm of zero is unspecified, which requires the dependent variable to become ln(WTP+1). However, as the results demonstrate, there were no 'valid' zero values used in the analysis, and thus the dependent variable could remain as ln(WTP).

and 77% faced an income constraint that was personal rather than household. Most (89%) report their health as 'OK' or better and feel in control of their health (79%). Few found it difficult to imagine themselves in the scenarios (15%), found it difficult to provide a WTP answer (28%), or found the interview distressing (14%). The mean length of interview was 64 (±2.0) minutes.

Willingness to pay values

Table 3 provides a comprehensive breakdown of WTP responses by scenario. The differences shown between mean and median values indicate a positively skewed distribution (coefficient of skewness from 8.6 to 27.3 across the 10 scenarios), while large standard errors and deviations indicate a wide spread of responses.

Table 3: WTP ($AUS) for change in health state by scenario

SCENARIO	Mean	SE	Median	Mode*	St Dev	Min	Max
1 (Base)	5,115	634	3,615	2,400	6,160	520	28,600
2 (drug R_x)	5,200	666	3,780	2,400	6,411	520	28,600
3 (surg R_x)	4,965	592	3,500	2,400	5,895	480	24,200
4 (drug prev)	5,270	615	3,600	2,400	6,122	520	28,600
5 (externality)	1,915	478	1,150	960	4,865	120	7,200
6 (narrative)	5,355	650	3,800	2,400	6,114	520	28,600
7 (more narrative)	4,740	598	3,550	2,160	4,680	480	19,200
8 (stroke)	5,970	682	4,100	2,880	7,021	720	31,200
9 (cancer)	6,440	646	4,800	3,600	7,225	720	36,000
10 (option)	3,350	501	2,600	1,920	4,713	120	12,000

*Where multiple modal values exist, the smallest value is shown.

Table 4 (overleaf) presents the results of tests for significant differences in WTP between scenario 1 and all other scenarios.

Tables 3 and 4 indicate a remarkable degree of consistency between WTP values given for the base scenario (1) and those values given for scenarios which explicitly state whether drug treatment (2), surgical treatment (3) or drug prevention (4) will be used to ameliorate the symptoms expressed in the scenario. Contrary to expectation, this suggests that 'process utility' (as defined in this paper as the means by which symptoms are treated or prevented) may not significantly influence the 'desirability' of the benefits being valued. This supports previous

literature in CV indicating that process utility may not significantly affect WTP [44], but contradicts others [23].

Table 4: Wilcoxon (signed ranks) test of differences in WTP between scenario

Relationship between scenarios	Significance Level (*P*=x)
1 (Base) vs 2 (Drug R_x)	0.286
1 (Base) vs 3 (Surg R_x)	0.217
1 (Base) vs 4 (Drug prev)	0.236
1 (Base) vs 5 (Externality)	0.008*
1 (Base) vs 6 (Narrative)	0.182
1 (Base) vs 7 (More narrative)	0.093**
1 (Base) vs 8 (Stroke)	0.034*
1 (Base) vs 9 (Cancer)	0.017*
1 (Base) vs 10 (Option)	0.011*

* significant at 5%, ** significant at 10%

The differences in WTP between the base scenario (1) and those scenarios which expand with a greater level of narrative (6 and 7) are also not quite as expected. It was hypothesised, *a priori*, that a greater level of detail concerning the symptoms would generate significant differences in WTP. However, for scenario 6, expressing symptoms in a moderate narrative form, there was no significant difference. For scenario 7, where the narrative was more extensive, the WTP value was not significantly different at 5%, but was just significant at 10%; and in this case, significantly lower. Informal feedback from respondents indicates that the manner with which the symptoms were presented in this scenario (a greater level of detail about how these symptoms may effect one's daily life) was less 'stark', with the symptoms appearing to have far less of a disruptive impact on daily living than was imagined from the 'base' scenario description.

The only areas where a significant difference in WTP value was found were between the base scenario (1) and those presenting externality or option value (5 and 10 respectively), and those 'labeling' the symptoms (8 and 9 respectively). A disease label, such as stroke (8) or cancer (9) significantly increased the WTP value of avoiding the associated symptoms than unlabeled symptoms (1). Again, informal feedback from respondents suggests that 'labeling' generates an

additional set of assumed symptoms that were not explicitly described, together with suggesting a *prognosis* that was explicitly absent and not invoked in the non-labeled scenario (1).

The most powerful results, however, were the significant differences in WTP between the base scenario (1), which expressed symptom relief as use-value directly accruing to the respondent, and those scenarios where the value of symptom relief would occur to another (scenario 5) or was a future possibility (scenario 10). Once the future is invoked, or the benefit accrues to someone other than the respondent, WTP drops significantly, suggesting that use-value is the dominant source of value in the CV exercise; although still suggesting that there may be some other sources to be elicited. However, assuming that the sum of use and non-use value will be greater than these aspects valued together, it is unlikely that they will comprise a significant *additional* value to that obtained for direct current use-value.

Regression analysis

Table 5 lists the independent variables used in the regression analyses, with the log-transformed WTP for each scenario (lnWTPx, where x=1-10) as the dependent variable.

Table 5: Variables included in logit regression analysis

VARIABLE NAME	DEFINITION
LnWTPx	Log WTP for scenario x, where x=1-10
Age	Age in years
Gender	Gender: 1=female, 0=male
PHI	Health insurance cover: 1=private health insurance, 0=otherwise
Educ	Education level: 1=high school certificate or higher, 0=less than HSC
Inc	Annual income in AU$
Health	Self assessed health status: 1=OK/good/very good, 0=otherwise
ScenDiff	Whether respondents found it difficult to imagine themselves in the scenario: 1=yes, 0=no
WTPDiff	Whether respondents found it difficult to answer the WTP questions: 1=yes, 0=no
Distress	Whether the respondent found the interview distressing: 1=yes, 0=no
Time	Time to complete interview in minutes
Order	1=scenario valued first, 0=otherwise

The results of the regression analyses are provided in table 6 (overleaf). As one can see, this model passes tests for misspecification and heteroscedasticity for each of the 10 regressions

performed. The model also explains a high level (25% to 30%) of the variance in WTP. There is also evidence to support construct validity, where LnWTPx is significantly, and positively, associated with income. Apart from income, WTP is also significantly (although predominantly weakly) associated in all analyses with age, current health status and the difficulty with which respondents found expressing their WTP value. Interestingly, however, the sign for these variables does not always remain constant. Although age generally has a negative correlation with WTP (such that the older are, *ceterus paribus*, WTP to pay less), this becomes a positive relationship (the older WTP more) for scenarios 8 (stroke) and 9 (cancer). This may be because ordinarily the young may be expected to have a higher current state of health (and hence receive a greater benefit from avoiding the poor health scenario being valued), but may see themselves at far less risk of stroke or cancer than those who are older, and thus be bringing this additional factor in to the analysis.

Of the remaining variables, gender is a (weakly) significant factor explaining WTP for scenario 5 (externality), where females are WTP more than males, suggesting that women may have a greater level of 'caring' than men when it comes to alleviating ill health for others. Having private health insurance is a (weakly) significant factor influencing WTP for scenario 10 (option value), which perhaps indicates that those with insurance assume that this will cover any future illness and so are WTP significantly less in addition to this (despite being told explicitly in the survey that any insurance they had would not cover this). Experiencing difficulty in valuing the scenarios led to a significantly lower WTP in all cases except scenarios 5 (externality) and 10 (option value), where it led to higher values. It is hard to interpret this finding, other than that difficulty generally influences values, which may be an indicator of increased 'robustness' of results. However, that the two cases of sign reversal are those concerning non-current use is probably not coincidence. The impact of distress that the interview may cause was only found to significantly influence WTP values for scenarios 5 (externality), 8 (stroke) and 9 (cancer), the latter case increasing WTP and in the former decreasing it. This may be intuitive, as one may expect people to find deciding upon the health of others a more distressing activity than for oneself, and that the use of disease 'labels' will, perhaps inevitably, conjure up pictures of those who the respondent may know suffering from those diseases.

TABLE 6: Logistic regression results (standard errors in parentheses)

Variable	LnWTP1	LnWTP2	LnWTP3	LnWTP4	LnWTP5	LnWTP6	LnWTP7	LnWTP8	LnWTP9	LnWTPl0
Cons	+3.104* (0.249)	+2.659* (0.205)	+3.604* (0.175)	+2.725* (0.198)	+4.033* (0.250)	+3.513* (0.216)	+2.966* (0.215)	+3.053* (0.281)	+2.821* (0.302)	+2.959* (0.205)
Age	-0.031** (0.011)	-0.047** (0.027)	-0.035** (0.023)	-0.042** (0.033)	-0.050** (0.038)	-0.033** (0.024)	-0.039** (0.029)	+0.017** (0.006)	+0.012** (0.010)	-0.029** (0.023)
Gender	-0.199 (0.224)	-0.341 (0.259)	-0.302 (0.401)	-0.216 (0.432)	+0.148** (0.113)	-0.452 (0.655)	-0.316 (0.298)	-0.203 (0.403)	+0.248 (0.319)	-0.344 (0.393)
PHI	+0.636 (0.754)	+0.548 (0.298)	+0.484 (0.658)	+0.536 (0.832)	-0.263 (0.250)	+0.649 (0.958)	+0.661 (0.715)	+0.288 (0.416)	+0.377 (0.307)	-0.084** (0.045)
Educ	+0.413 (0.951)	+0.752 (0.792)	+0.946 (0.684)	+0.695 (0.862)	+0.466 (0.633)	+0.775 (0.882)	+0.681 (0.959)	+0.214 (0.281)	+0.634 (0.711)	+0.441 (0.580)
Income	+0.612* (0.228)	+0.681* (0.364)	+0.645* (0.513)	+0.630* (0.265)	+0.418* (0.321)	+0.591* (0.355)	+0.517* (0.214)	+0.682* (0.401)	+0.499* (0.259)	+0.561* (0.311)
Health	+0.162** (0.106)	+0.242** (0.235)	+0.201** (0.204)	+0.137** (0.143)	+0.247** (0.218)	+0.195** (0.113)	+0.158** (0.108)	+0.327* (0.309)	+0.368* (0.362)	+0.254** (0.234)
Scen diff	-0.076 (0.259)	-0.017 (0.224)	+0.100 (0.308)	-0.066 (0.129)	-0.113 (0.212)	-0.009 (0.119)	-0.309** (0.164)	+0.027 (0.306)	-0.093 (0.276)	-0.073 (0.355)
WTP diff	-0.446** (0.379)	-0.368** (0.288)	-0.451** (0.406)	-0.408** (0.452)	+0.161** (0.159)	-0.394** (0.326)	-0.408* (0.356)	-0.455** (0.411)	-0.484** (0.229)	+0.266* (0.188)
Distress	-0.023 (0.067)	-0.034 (0.102)	+0.042 (0.237)	-0.059 (0.287)	-0.030** (0.014)	+0.016 (0.091)	-0.009 (0.055)	+0.018** (0.008)	+0.029** (0.030)	+0.025 (0.081)
Time	-0.154 (0.519)	-0.284 (0.915)	-0.216 (0.592)	-0.299 (0.613)	-0.119 (0.298)	-0.416 (0.564)	-0.307 (0.882)	-0.116 (0.205)	-0.510 (0.957)	-0.234 (0.367)
Order	+0.032 (0.088)	+0.017 (0.051)	+0.040 (0.123)	+0.106 (0.226)	-0.112** (0.081)	+0.078* (0.002)	-0.027** (0.022)	+0.019** (0.004)	+0.044** (0.029)	-0.007 (0.064)
N	208	104	104	104	104	104	104	104	104	104
Adj R^2	0.32	0.27	0.34	0.25	0.35	0.24	0.32	0.33	0.32	0.28
Ramsey (*p* value)	0.202	0.351	0.249	0.341	0.283	0.410	0.226	0.304	0.297	0.503
Cook-Weisberg (*p* value)	0.583	0.416	0.508	0.348	0.314	0.299	0.521	0.473	0.388	0.272

* Significant at 5%. ** Significant at 10%.

Finally, for five of the scenarios, WTP was significantly influenced by whether that scenario had been the first to be valued or not (i.e. there was an order effect). For scenarios 1 to 4 (the base scenario, and those offering drug or surgery treatment, or drug prevention) and scenario 10 (option value) there was no significant order effect. For the remaining scenarios: presenting scenario 5 (externality) first resulted in a lower WTP (perhaps because in other cases the respondent had thought of the impact on themselves first, and the symptoms thus generally became more 'important'); presenting scenario 6 (narrative) first increased WTP for it, whereas presenting scenario 7 (more narrative) first reduced the WTP for it. It may be in these cases that some narrative makes the symptoms more 'vivid' and thus yields higher WTP for scenario 6, but the fuller account in scenario 7 tends to 'embed' the symptoms more in daily life, and thus minimize their apparent effect); and presenting scenarios 8 (stroke) or 9 (cancer) first results in a higher WTP in both cases, perhaps for the reason outlined above.

DISCUSSION

The overall impression drawn from these results is that there *may* be more to WTP than just health status – but perhaps not much. Given the range of issues addressed, and the presence of some order effects, it is impossible to be definitive. However, a tentative summary may be that 'pure' health status change directly accruing to the individual making the valuation may be the most significant (perhaps comprising over 70%) element of the value being elicited in a CV survey. The addition of aspects of process, such as drug or surgical treatment, or prevention, makes little or no difference to the value placed on health status change. Similarly, increasing the narrative description also makes little difference, although the use of disease labels does make a difference, most likely through invoking aspects of the condition that are not explicitly being valued (and therefore deemed by the researcher to be irrelevant – if they *are* of relevance then they should be included in the scenario and as such these aspects are perhaps an issue of ensuring 'correct' scenario specification)[8].

[8] Although whether such labels *should* be used is, of course, a more complex issue than can be discussed adequately here. For example, does the use of such labels provide more 'valid' valuations, or is it in some way 'biasing' the valuation by changing (incorrectly) the question that respondents think they are answering? However, that they are of importance means that this issues needs further deliberation.

Although there is some expression of value attached to others being able to have their health improved, this is significantly less than the value placed on the individual themselves experiencing this benefit. Similarly, there is some value placed on maintaining treatment availability for possible future use, but this again was a low value, and reflects a form of 'discounted' use-value.

Clearly there are caveats to be placed on these results, and they are presented here only as indicative of wider potential. For example, the analysis is still based on what may be considered a relatively small and select sample, and the results would need to be replicated in a larger, more generalisable, sample before more definitive results could be presented (for example, Australians may be more accustomed to paying for health care than those in other countries). Similarly, the results relate to the specific good being valued (a health state scenario), and again one would like to see the results replicated across a range of other goods.

However, these results hold some interesting potential for the use of CV in health (care). For example, if 'pure' health status change (symptom description with no disease labels or narrative) and use-value dominate overall WTP, then there may be less complexity in developing and using CV in health (care) than may currently be thought, or indeed experienced by researchers in other areas, such as environmental and transport contexts. For example, the NOAA recommendations place great emphasis on the production of a substantial scenario for the valuation of complex non-market goods [45,46]. However, the differences in health (care) compared to environmental goods, as indicated in the introduction to this paper, may make CV in health care more akin to the valuation studies of 'simple', private, goods [28,29,30,31,47]. Together with other emerging evidence [35], it seems that the widespread use of WTP is perhaps more feasible than many suspect. The possibility, for example, of using telephone surveys becomes far greater if one is assessing changes in health status only, and do not have to run through a complex series of scenarios and factors associated with the intervention being valued. Interesting, it also suggests that 'benefit transfer' may be possible in health (care) to a greater, and possibly more robust, level than considered previously [48].

Overall, these results are perhaps sufficient to encourage CV practitioners within health to look toward the development of methodology that is most suitable for valuing health (care), and rely less on importing that developed for valuing environmental goods. For example, one might suggest that the familiarity of health (care), the focus on use-value and the primary benefit being change in health status might lead respondents to find it easier to understand what is presented and thus easier to 'generate' a WTP value in health than in environmental economics. If this is the case, then less information may need to be presented to respondents, which allows for less descriptive scenarios and context factors to be influential; much in the same way in which QALYs are generated using very 'tight' descriptions of health benefits.

Of course, it is to be acknowledged that this does not infer that conducting CV in health will be problem free; but it may be that there are *different* problems to address to those in the environmental context (for example, whether the prevention versus cure difference is robustly non-significant). However, it is *these* aspects of CV methodology that need to be researched more systematically, rather than following the environmental agenda; if they are they may well reveal that CV is far more applicable to health (care) evaluation than many may think [49].

REFERENCES

1. Diener, A., O'Brien, B., Gafni, A., 1998. Health care contingent valuation studies: A review and classification of the literature. Health Economics 7, 313-326.
2. Olsen, J.A., Smith, R.D., 2001. Theory versus practice: A review of 'willingness-to-pay' in health and health care. Health Economics 10, 39-52.
3. Smith, R.D., 2003. Construction of the contingent valuation market in health care: a critical assessment. Health Economics 12, 609-628.
4. Klose, T., 1999. The contingent valuation method is health care. Health Policy 47, 97-123.
5. Hanley, N., Ryan, M., Wright, R., 2003. Estimating the monetary value of health care: lessons from environmental economics. Health Economics 12, 3-16.
6. Smith, R.D., 2000. The discrete choice willingness-to-pay question format in Health Economics: should we adopt environmental guidelines? Medical Decision Making 20, 194-206.
7. Johansson, P-O., 1995. Evaluating Health Risks: An Economic Approach. Cambridge University Press: Cambridge.
8. Kartman, B., Stalhammar, N.O., Johannesson, M., 1996. Valuation of health changes with the contingent valuation method: a test of scope and question order effects. Health Economics 5: 531-41.
9. Fischhoff, B., Furby, L., 1988. Measuring values: A conceptual framework for interpreting transactions with special reference to contingent valuation of visibility. Journal of Risk and Uncertainty 1, 147-184.
10. Smith, R.D., Dobson, M., 1993. Measuring utility values for QALYs: two methodological issues. Health Economics 2, 349-355.
11. Mitchell, R.C., Carson, R., 1993. Current issues in the design, administration and analysis of contingent valuation surveys. Working Paper, Department of Economics, University of California, SanDiego, Cal.
12. Currie, G.R., Donaldson, C., O'Brien, B.J., Stoddart, G.L., Torrance, G.W., Drummond, M.F., 2002. Willingness to pay for what? A note on alternative definitions of health care program benefits for contingent valuation studies. Medical Decision Making 22, 493-497.
13. Mitchell, R.C., Carson, R., 1989. Using surveys to value public goods: The contingent valuation method. Resources for the Future: Washington DC.
14. Cummings, R.G., Taylor, L.O., 1988. Does realism matter in contingent valuation surveys? Land Economics 74, 203-215.
15. Bergstrom, J., Stoll, J., Randall, A., 1989. Information effects in contingent markets. American Journal of Agricultural Economics 72, 685-691.
16. Bergstrom, J., Stoll. J., Randall, A., 1990. The impact of information on environmental commodity valuation decisions. American Journal of Agricultural Economics 72, 614-621.
17. Munro. A., Hanley, N., 1999. Information, uncertainty and contingent valuation. In: Bateman IJ & Willis KG (eds). Valuing environmental preferences: theory and practice of the contingent valuation methods in the US, EU and developing countries. Oxford: Oxford University Press, 1999: pp258-301.
18. Bennett, R., Blaney, R., 2002. Social concensus, moral intensity and willingness to pay to address a farm animal welfare issue. Journal of Economic Psychology 23, 501-520.
19. Aizen, I., Brown, T., Rosenthal, L.H., 1996. Information bias in contingent valuation: effects of personal relevance, quality of information and motivational orientation. Journal of Environmental Economics and Management 30, 43-57.

20. Tversky, A., Kahneman, D., 1981. The framing of decisions and the rationality of choice. Science 211, 453-458.
21. Gerard, K., Dobson, M., Hall, J., 1993. Framing and labelling effects in health descriptions: Quality of life years for treatment of breast cancer. Journal of Clinical Epidemiology 46, 77-84.
22. Jones-Lee, M.W., 1989. The Economics of Safety and Physical Risk. Blackwell: Oxford.
23. Protiere, C., Donaldson, C., Luchini, S., Moatti, J-P., Shackley, P., 2004. The impact of information on non-health attributes on willingness to pay for multiple health care programmes. Social Science and Medicine, 58, 1257-1269.
24. Sheill, A., Gold, L., 2002. Contingent valuation in health care and the persistence of embedding effects without the warm glow. Journal of Economic Psychology 23: 251-262.
25. Bateman, I.J., Langford, I.H., 1997. Non-users willingness to pay for a national park: an application and critique of the contingent valuation method. Regional Studies 31, 571-582.
26. Langford, I.H., Georgiou, S., Day, R.J., Bateman, I.J., 1999. Comparing perceptions of risk and quality with willingness to pay: a mixed methodological study of public preferences for reducing health risks from polluted coastal bathing waters. Risk, Decision and Policy 4, 1-20.
27. Spash, C., Hanley, N., 1995. Preferences, information and biodiversity preservation. Ecological Economics 12, 191-208.
28. Sellar, C., Stoll, J.R., Chavas, J.P., 1985. Validation of empirical measures of welfare change: a comparison of non-market techniques. Land Economics 61, 156-175.
29. Davis, J., O'Neill, C., 1992. Discrete choice valuation of recreational angling in Northern Ireland. Journal of Agricultural Economics 43, 452-457.
30. McCollum, D.W., Gilbert, A.H., Peterson, G.L., 1990. The net economic value of day use cross country skiing in Vermont: a dichotomous choice contingent valuation approach. Journal of Leisure Research 22, 341-352.
31. Hutchinson, W.G., Chilton, S.M., Davis, J., 1995. Measuring non-use value of environmental goods using the contingent valuation method: problems of information and cognition and the application of cognitive questionnaire design methods. Journal of Agricultural Economics 46, 113-126.
32. O'Shea, E., Stewart, J., Donaldson, C., Shackley, P., 2001. Eliciting preferences for resource allocation in health care. The Economic and Social Review 32, 217-238.
33. Smith, R.D., 2004. Sensitivity to scale in contingent valuation: the importance of the budget constraint. Journal of Health Economics (in press).
34. Yeung, R.Y.T., Smith, R.D., McGhee, S.M., 2003. Willingness to pay and size of health benefit: an integrated model to test for 'sensitivity to scale' Health Economics 12, 791-796.
35. Smith, R.D., 2004. Its not just *what* you do, its the *way* that you do it: a comparison of contingent valuation questionnaire formats and survey administration in health care. Journal of Health Economics (submitted).
36. Smith, R.D., 2001. The relative sensitivity of willingness-to-pay and time-trade-off to changes in health status: an empirical investigation. Health Economics 10, 487-497.
37. Hawthorne, G., Richardson, J., Osborne, R., 1999. The Assessment of Quality of Life (AQoL) instrument: a psychometric measure of health related quality of life. Quality of Life Research 8, 209-224.
38. Boyle, K.J., Bishop, R.C., Walsh, M.P., 1985. Starting point bias in contingent valuation bidding games. Land Economics 61, 188-194.
39. Stewart, J.M., O'Shea, E., Donaldson, C., Shackley, P., 2002. Do ordering effects matter in willingness-to-pay studies of health care? Journal of Health Economics 21, 585-599.

40. Donaldson, C., Thomas, R., Torgerson, D.J., 1997. Validity of open-ended versus payment scale approaches to eliciting WTP. Applied Economics 29, 79-84.
41. Frew, E.J., Whynes, D.K., Wolstenholme, J.,L., 2003. Eliciting willingness to pay: comparing closed-ended and payment scale formats. Medical Decision Making 23, 150-159.
42. Siegal, S., Castellan, N.J., 1988. Nonparametric Statistics for the Behavoural Sciences, Second Edition. McGraw Hill, Singapore.
43. Gujarati, D., 1988. Basic Econometrics. McGraw-Hill, Singapore, chapter 6.
44. Donaldson, C., Shackley, P., 1997. Does "process utility" exist? A case study of willingness to pay for laparoscopic cholecystectomy. Social Science and Medicine 44, 699-707.
45. Arrow, K., Solow, R., Portney, P., Leamer, E., Radner, R., Schuman, H., 1993. Report of the NOAA panel on contingent valuation. Federal Register 58, 4601-4614.
46. Arrow, K., Solow, R., Portney, P., Leamer, E., Radner, R., Schuman, H., 1994. Natural resource damage assessments: Proposed rules. Federal Register 59, 1062-1191.
47. Kealy, M.J., Turner, R.W., 1993. A test of the equality of closed-ended and open-ended contingent valuations. American Journal of Agricultural Economics 75, 321-331.
48. Bateman, I.J., Carson, R.T., Day, B., Hanemann, M., Hanley, N., Hett, T., Jones-Lee, M., Loomes, G., Mourato, S., Ozdemiroglu, E., Pearce, D.W., Sugden, R., Swanson, R., 2002. Economic valuation with stated preference techniques: a manual. Edward Elgar, Cheltenham, Chapter 1: 42-51.
49. Cookson, R., 2003. Willingness to pay methods in health care: a skeptical view. Health Economics 12, 891-894.