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Eliciting Preferences for Collectively Financed Health Programmes: the 'Willingness to Assign' Approach[*]

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Abstract. Improving public involvement in health system decision making stands as a primary goal in health systems reform. However, still limited evidence is found on how best to elicit preferences for health care programs. This paper examines a contingent choice technique to elicit preferences among health programs so called, willingness to assign (WTAS). Moreover, we elicited contingent rankings as well as the willingness to pay extra taxes for comparative purposes. We argue that WTAS reveals relative (monetary-based) values of a set of competing public programmes under a hypothetical healthcare budget assessment. Experimental evidence is reported from a deliberative empirical study valuing ten health programmes in the context of the Catalan Health Service. Evidence from a our experimental study reveals that preferences are internally more consistent and slightly less affected by 'preference reversals' as compared to values revealed from the willingness to pay (WTP) extra taxes approach. Consistent with prior studies, we find that the deliberative approach helped to avoid possible misunderstandings. Interestingly, although programmes promoting health received the higher relative valuation, those promoting other health benefits also ranked highly.

Resum. La millora de la participació col·lectiva en la presa de decisions es presenta con un dels objectius principals de la reforma dels sistemes sanitaris. No obstant això, la evidencia respecte a com estimar les preferències entre programes sanitaris es encara limitada. Aquest article examina una eina d'elecció contingent per estimar les preferències per programes sanitaris anomenada *disposició a assignar* (DAS). La DAS revela la valoració (monetària) relativa d'un conjunt de programes sanitaris que hipotèticament poden formar part d'un pressupost de reforma fix. L'article presenta evidencia d'un estudi experimental de reforma de les prestacions del Servei Català de la Salut. S'estimen les preferències per múltiples programes utilitzant la DAS juntament amb altres eines d'elecció. Els resultats indiquen que la DAS és més consistent que altres tècniques com ara la disposició a pagar (DAP) impostos addicionals. El mètode deliberatiu de revelació de preferències sembla haver millorat la revelació de preferències. Tot i que els programes més valorats són aquells que comporten millores de salut, altres programes que suposen millores en l'equitat o en altres beneficis del sistema com ara els beneficis de procés són altament valorats.

1. Introduction

In collectively financed health systems, setting priorities among healthcare programmes can be often envisaged as a decision making problem of choosing from a portfolio of competing programmes, each one achieving large-scale benefits, which are constrained by a fixed budget with which to fund them all. In undertaking a budgetary programme, one key issue is the measurement of programmes benefits based on public tradeoffs as revealed by citizens. Public values are considered as necessary inputs to public decisions if decisions are directed to satisfactory provision of health care programmes. However, there is still widespread agreement on a suitable method to effectively elicit the benefits of a broad range of programmes. Therefore, we believe there is still space for methodologically oriented research to examine how different elicitation methods perform in assisting priority setting in health care.

Much research has been undertaken on measuring values and eliciting preferences for health programmes. The most widely accepted method for measuring benefits in health and healthcare is the quality adjusted life-years (QALY) approach. However, significant controversies have emerged both with regard to the underlying decision-making model, around particularly regarding the assumptions of which benefits are seen as relevant to health decision-making, which we shall concentrate on here. Primarily, QALYs fail to include health system dimensions other than health gains, namely process utility and equity benefits, among others (Donaldson, 1990; Olsen, 1997; Mooney, 1994; Money, 1995; Pauly, 1995; Donaldson and Shacley, 1997; Olsen and Donaldson, 1998). Although some attempts have been undertaken from an extra-welfarist approach (Nord et al., 1995; Nord et al., 1999), both cost effectiveness analysis (CEA) may exhibit difficulties in capturing important trade-offs between the underlying dimensions of health programmes in that they rely exclusively on health gains. Furthermore, even when evaluating healthcare programmes that achieve only health gain benefits, there is evidence indicating that individual valuations of health gain might be programme-dependent (Eddy, 1991). Therefore, alternative preference elicitation methods might be preferable if they impose no restriction on the nature of benefits under valuation.

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The alternative method to CEA in the light of economic evaluation is the willingness to pay (WTP) approach. From a theoretical standpoint WTP methods ideally capture the existing wide range of benefits under valuation. Moreover, elicited values provide an indication of preference strength (Donaldson, 1990; Donaldson and Shackley, 1997; Olsen and Donsaldson, 1998, Shackley and Donaldson, 2000; Thomas et al., 2000, Stewart et al., 2002). However, few studies that have been undertaken in valuing multiple programmes to assist priority-setting in collective health systems indicate some difficulties, among them a significant discrepancy between programme rankings and WTP (Stewart et al., 2002), a protest bias as some people may not be willing to pay any extra taxes (Thomas et al., 2000), and difficulties in envisaging the opportunity costs of certain programmes as well as budget constrain. Although some of these drawbacks are currently under research and seem to show appealing results (e.g., allowing WTP to be elicited for multiple programmes), one might argue that WTP methods fail to capture the nature of social preferences in collectively-funded health care. That is, they rarely contemplate explicitly the collective budget restriction - whereby funding some programmes implies not funding others - that individuals face as citizens in addition to that of health care usurers. Indeed, Kanheman and Ritov (1997) find that in a collective context, WTP measures may elicit the willingness to contribute rather than consumers' preferences. Thus, even when budget information is provided for limited number of programmes, it's rarely contextualised with the opportunity costs and tradeoffs related to other programs that could be collectively funded.

Thus, we believe that if preference elicitation methods should guide priority-setting decisions, alternative methods might need to be designed to focus on how preferences should be elicited in the context of a choosing among a set of programs involving on the one hand a multiplicity of health system benefit dimensions and, on the other hand searching for a collective choice decision making scenario where individuals are expected to choose as citizens by taking into account opportunity costs of funding other programmes. This method allow a wider generalisation than alternatives tools such as the willingness to wait (Thomas et al., 2000) and conjoint analysis techniques which still rely on individuals rather than social preferences. In particular, some recent approaches in the public budgeting literature are remarkable such as budget games have been developed to balance a government budget as a tool to priority setting (Peters, 1996). Robins and Simonsen (2002) develop a preference elicitation method where they link WTP for their shares of desired levels of public

expenditure to the budget constraint faces by decision makers. In a recent study, Blomquist et al (2004) develop a similar technique to balance a budget to collect individual's relative values of public programs in a context in which allocations are consistent with a fixed amount.

This study examines the experimental evidence of a contingent choice elicitation tool with the aim of eliciting collective preferences for health programmes. The tool analysed is a money metric budget-based instrument that we name as 'willingness to assign' (WTAS)[1]. Similar methods have been outlined in the literature, such as the budget pie experiments dating back to Clark (1974), Robins and Simonsen (2002) and Blomquist et al (2004). The WTAS can be viewed as an adaptation of the willingness to pay approach to a collective setting (Dolan et al., 2002), in order to take into account the budgetary constraints of the health system. Respondents were selected from specific social groups (for example, trade unions, neighbourhoods, etc) and were required *to assign* the amount of disposable budget which is collectively funded to a set of potentially competing health programmes. WTAS values represent a collective assessment of the *social preference strength* for alternative programmes. In so doing we aim to capture possible trade-offs between the programmes that individuals as citizens perceive in a political market. The remarkable feature of this setting is that in a political market individuals are supposed to exhibit expressive behaviour (Common, 1997). Therefore they evaluate health programmes according to their perceived concerns over their broader social impact rather than solely for their individual benefits. Arguably, the method allows one to capture both the complementarily and exclusivity of healthcare programmes, and to reveal the opportunity costs forgone when assigning funds to specific programmes. This instrument is compared with the willingness to pay approach for comparative purposes and consistency is examined by comparing the results with a previous contingent ranking elicited by the participants in the study.

The remainder of the paper is structured as follows. Section 2 introduces the conceptual background, and offers a further discussion of the methodology. Section 3 is devoted to the study design. In Section 4 we report the results attained and section 5 concludes with a discussion of the implications of those results.

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[1] It was designed as in the light of a research programme aiming at finding quantitative measures to measuring the monitoring of health system performance, with the specific objective of identifying priority-setting mechanisms

2. The WTAS method

Under publicly financed systems healthcare can be envisaged as a 'community commodity'. Therefore, arguably individuals take the role of social decision-makers when eliciting preferences for goods that would not only affect their own welfare, but rather others among them might be affected (Dolan et al., 2002). If this assumption holds true then preferences among a set of competing health programmes may have at least two different dimensions: an individual (or selfish) and a collective dimension. Therefore, some share of the individual intensity of preferences for different health programmes may be seen as interdependent or interpersonal (Mooney, 1994). Interpersonal preferences hypothetically are captured through the willingness to pay (WTP) methods identifying 'altruistic' preferences when individuals are asked about their willingness to contribute to the funding of certain programmes that provide no benefit to themselves (Olsen and Donaldson, 1998). However, in revealing their social preferences individuals might exhibit concerns over fairness which differ from altruistic concerns in that they might represent either inequality aversion or reciprocal fairness (Fehr and Fishbacher, 2002).

One way of interpreting social preferences in this context is the Margolian approach of the 'fair share' allocation rule (Margolis, 1982). According to this approach, human psychology in the allocation of resources always show a trade-off between individual and social values; that is, individuals have to choose between selfishness and collective interest. This study sets out to amplify individual utility functions to include something more that individual utility and using specific aggregation rules may have some influence on revealed preferences. Community preferences imply that individuals may not answer to the WTP questionnaire as individual decision-makers, but rather as citizens. One possible method to elicit and include interdependent preferences may be the use of WTP in a political market scenario. Within a WTP setting, Olsen and Donaldson (1998) elicited the willingness to contribute in terms of extra earmarked taxation per annum for a helicopter ambulance service and two alternative programmes. They found some zero protests to the payment method, even though these were small participants found difficulties in stating their willingness to pay. Moreover, absolute values had to be re-scaled into relative preferences and no direct rankings were calculated to test consistency. Finally distributional concerns emerged as relevant, since the willingness to pay is linked to the ability to pay, which is not the principle guiding the NHS funding.

The WTAS method is based on asking what is the maximum amount that individuals would assign to a given set of healthcare programmes within the constraints of a fixed budget. It requires individuals to act as decision-makers as members of a simulated political healthcare market. Results on the absolute amount individuals assign to specific programmes are meaningless, insofar as they rely on the defined budget constraint. Therefore, we examine values in terms of relative preferences which might be interpreted as providing the preference strength for specific health care programmes. The rationale of this research relies on the need to elicit collective priorities in order to guide health decision-making. In a political market, respondents are compelled to elicit their preferences as hypothetical citizens, therefore involving altruistic concerns. Thus, individuals are free to value a wide range of dimensions concerning health system benefits. The idea derives from a general discussion offered by Common (1997) on valuing environmental benefits. He suggests that when 'socially wider benefits' are valued, even though individual answers correspond to a contingent market question format, the answers in fact represent their preferences as citizens.

Since the problem that this paper examines is part of social decision-making, we consider the decision-making unit as being held by small groups (n_i), representative of a societal profile ($N = \{\sum n_i\}$). Let us assume a hypothetical health system resource allocation problem for a public health agency (i.e the Catalan Health Service (CHS) in Catalunya). At that time the CHS had planned a 4,000 million PTAs budget increase — equal to 24 million euros — to be devoted to the funding of a possible set of 'new programs'.[2] Decision-makers have to evaluate a number of programmes (i.e ten programmes) that have been proposed for funding according to the revealed benefits. The total cost of those programmes is in excess of the fixed capital budget, therefore some programmes may not be funded. The problem therefore is to select a set of programmes — within the budgetary constraints — which best meet the perceived health system benefits. We assume the existence of multidimensional benefits that people perceive in health systems. Therefore, a multidimensional utility model would be a clear foundation from which to explain the decision process.

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[2]   A new programme implies an increase in health system coverage, in the sense that it improves the on the remaining set of benefits that the system aims to offer. However, alternatively one might consider the opposite decision-making problems, that is, a reduction in health system coverage. The problem between considering one or other decision-making context is the same, in that it may change results considerably..

The theoretical instrument for assigning values to health programmes is formalised as a social evaluation function. A social evaluation function is a numerical representation of an individual social welfare judgement regarding a certain course of action, such a healthcare programs presumably embodying the welfare value judgements of society regarding health system benefits. Let $Y = (Y_1,....,Y_n) \in R^n$ be an allocation set of possible health programmes each one showing a particular dimension of health system benefits $X = (X_1,.......,X_n)R^n$. Therefore, for all social states S is a measurable subset of Y, $Y(X)$ is a monotonic transformation of X. The assumption of this paper is that each individual values each Y according to a social welfare judgement as if s/he was a decision-maker who cares about overall social welfare :

$$V_i(Y(X)) = W^j(v^j(X_1),......v^j(X_n)) \tag{1}$$

where $v^j(X)$ is the value function, that is a numerical individual welfare judgement on the basis of sufficient information to be assessed for each programme. We do not assume that all individuals in society arrive at the the same judgements, but we do assume that within every group there will be a high degree of consensus over which benefits are valued higher.

We define a social evaluation function (Brekke, 1996) for different dimensions of health system benefits. In the interest of simplicity we adopt the additive utility function and therefore we assume additive independence. The multidimensional utility function is as follows:

$$v(X^1_i) = \sum_{j=1}^{5} k_j v_j^1(X_j) \tag{2}$$

where k reflects the relative valuation of the utility of the benefit X_j in the total individual social value function of individual i , where total value is restricted by budget constraints as follows:

$$\Delta V = k_1 \Delta v_1^i + ... + k_n \Delta v_n^i \tag{3}$$

Therefore, if programme Y_1 is socially preferred to programme Y_2, then $v(Y_1(X)) \geq v(Y_2(X))$.

Let us consider a citizen acting as a decision-maker that has to assess an amount of monetary units as a result of a budgetary increase to a set of health care programmes $Y = (Y_1,....,Y_n)$, each one displaying a particular dimension of health system benefits $X = (X_1,........X_n) \in R^n$. The initial healthcare programmes available within a system are $Y^0 = (Y^0_1,....,Y^0_n)$, while their associated budget is $M^0 = (M^0_1,.....,M^0_n)$. A health system reform is viewed as an extension of the former programmes $Y^* = (Y^*_1,....,Y^*_n)$ that has an associated budget of M^* that should be assessed according to its benefits. Then, the willingness to assign approach attempts to determine the amount of monetary units that, independent of costs, each participant would assign according to their social welfare gains. This can be formally represented as the difference between two social expenditure functions as follows:

$$WTAS = E(V^*, Y^*_j) - E(V^*, Y^0_j) \tag{4}$$

where V^* reflects the final welfare value .

3. Methods

Although survey-based questionnaires tend to be preferred due to their convenience in terms of larger sample size, the aim of this study is to test a new method of eliciting preferences for competing health programmes rather than to achieve a representative sample of the population. The methodological approach adopted is based on the use of the small deliberative groups that previously participated in focus groups on the problems of the health system. This methodology, although sacrificing the large sample of alternative techniques gains a great depth of information, while maintaining the survey design. Accordingly, we have directed our towards a few specific groups of the general public in order to elicit what we might call 'reasoned preferences'. Table 1 gives a description of the groups involved. Individuals participated in deliberative groups according to their socioeconomic status. Moreover, participants were provided with an information processing task that they were equipped to undertake — according to their cultural and educational level. Furthermore, valuation was preceded by a deliberation on the benefits of each programme taking some 40-60 minutes, which in turn warmed up participants to the processes involved in the health system. The standard value elicitation surveys are constrained in what regards improvingthe reasoning and resolveing apparent contradictions in answers through a check conducted after

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a discussion around those answers. Therefore the preference and values obtained by using this method are expected to express more precisely real decision-making in any field. Indeed, deliberation was shown to assist individuals in stating preferences for healthcare programmes, in that participants were able to undertake their required valuation exercises in less than 30 minutes. Indeed, there is considerable evidence of the effect of deliberation in providing reasoning while eliciting preferences (Dolan et al, 1999 and Cookson and Dolan, 2000). Additional evidence on the importance of deliberation on the valuation of risk and safety is found in Cookson (2000).

Table 1.
Participants in the Study

	Segmentation Criteria	Educational Level	Group Number	Male	Mean Age
G1	Low Income	Undergraduate students	13	7	25
G2	Middle High Income	Skilled workers	8	6	47
G3	Middle –Low Income	Industrial workers	15	12	39
G4	Middle – High Income	Post graduate students	13	5	32
G5	High Income Groups	Skilled professionals	9	3	42
G6	Middle-Low	Trade union officials	8	5	57

Figure 1.

Programme : BREAST CANCER

Expected Outcome: a 15% reduction in mortality

Description: Extension to the risk population of a programme to eradicate breast cancer. It will be implemented by a mailing quotation in order to realise a biennial mammography to all the women between 50 and 65 years. Currently it covers the 15% of the population.

Respondents were given some details on the Catalan health service as well as on the budget restrictions that it faces. The system of policy decision-making was explained to respondents as involving a set of programmes to be implemented up to the limits of the available disposable budget. Subsequently, participants were asked to attach their willingness to assign under a hypothetical budget increase hypothetically collectively funded by taxes. Participants were asked to act as if they were advisors for the Catalan Health Plan — in order

to improve realism a summarised public health system budget was provided. During the questioning, participants were reminded that the amount assigned to every programme has been partially paid by their taxes and that in future they will continue to pay an undetermined proportional amount through the current financing mechanisms.[3] They were asked to imagine that the proportional taxes paid to the public sector had been returned and they were participating in the reassessment of a hypothetical budget increase. However, since they were asked to act as decision-makers, altruistic concerns were in fact inherent in their responses.

One of the potential problems with this experiment may be that it may involve complex decisions requiring a protracted reasoning process. Moreover, a second problem could relate to the framing format. Since individuals may have little experience in allocating public funds, they could find the experiment difficult to perform. In order to overcome this possible limitation the chosen scenario was defined in a simple way. The experiments were undertaken by grouping individuals of similar social class and skills, which enabled some prior discussion. Finally, the valuation process relied on eliciting a contingent ranking of those programs evaluated, which enables the testing of the consistency of individual responses to the WTAS questionnaire. Then, respondents were stated their WTAS for each programme and one of the groups responded as well to an exercise on the willingness to pay taxes for comparative purposes.[4] The implementation procedure required in many cases an effort to aid responses, i.e some people were reminded to imagine that they had to purchase the weekly food for their family in the market and they had a fixed amount of money with which to buy it. Moreover, they were not required to spend the whole budget, if they did not then the remaining money would be assigned to other public sector benefits. However, all of them did.

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[3] We did not want to describe accurately the payment mechanism since then 'protest bias' could arise, we simply said that it would be collectively financed. The advantage is that this prevents strategical behaviour, since the individual participation in this healthcare 'reform' is not defined. The disadvantage is that there is a greater probability of a moral satisfaction bias.

[4] One of the main features in applying this method is that it can be seen as simulating a real voting process and at the same time is a conformable exercise of assigning a budget to different goods as in the family decision-making process, even though the context of the decision-making was far from that of the individual/familiar decision regarding how to assign a monthly salary.

Table 2. Healthcare Reference Competing Programmes

Programme	Benefit dimension and expected outcomes
1.Breast Cancer: Biennial Mammography to all the women aged between 50 and 65.	Health Gain (15% mortality reduction)
2.Coordination between primary and specialist care: programmed meetings between Primary Attention Centres and specialists	Process (Improvement of quality attention due to a major integration and co-ordination of patient attention)
3. Professional immediate access to clinical history: information system to obtain clinical information on patients immediately.	Process (Improvement in the efficacy and quality of attention)
4.Attention and user information: information campaign to improve user attention units.	Process (Improvement in access, information and user's satisfaction)
5.User treatment: education programme consisting of 30-hour courses for the administrative personnel on the treatment of users.	Process (Improvement in patient satisfaction)
6. Medical check: voluntary medical check for the whole population every three years	Health gain Preventive detection and health consultation on hypertension, alcoholism and gynaecological problems.
7.Waiting lists: plan for reducing accumulated waiting lists in non elective surgery	Process Reduction of the waiting time from 240 to 120 days
8. Lifestyles: informational programme on healthy lifestyles to children addressed at parents .	Health gain Promotion of healthy lifestyles, improving scholar's communication and collaboration between parents and children.
9.Odontology (access to free dental care for children under 12, currently only extractions covered)	Equity Improvement of dental health of less affluent families.
10. Medicines Bonus: annual bonus per worker in order to avoid co-payments which relate to declared income on the personal income tax.	Equity (Improvement in equity. Nobody would pay more, but people with less income could be benefited. The current situation is that people should pay the 40% of the price of medicines while for chronic illness it is 10%.)

Six deliberative groups recorded their preferences among ten competing health programmes (see Figure 1 and Table 2) between December 1998 and June 2000. Sessions lasted about two hours and participants were encouraged to participate in a dinner on completion of their session. The groups were selected with the advice of two social researchers. When selecting the groups, time availability was considered as was the willingness to participate. Therefore, the ideal group profile should be one that meets some active mobility conditions in terms of the interpersonal social relationship network and contains the sufficient number of people (6 to 15).

In order to design a realistic healthcare programme choice scenario, we sought advice from headquarter-managers of the Catalan health service. The design led to a set of 'new' but applicable health care programmes that were supposed to improve the status quo as regards coverage. When selecting the number of programmes, the results from a focus group experiment were taken into account, as this part of the experiment was viewed as a continuation of the previous one. The programmes were described in a card and a set of questionnaires was designed containing a programme description.

Three different elicitation methods were employed:

The contingent ranking . This is a simple ranking method hypothetically capturing the ordinal priority of different programmes. Participants provide their rankings on a numerical scale of 1–10.

Question (1): *Please could you rank each programme (after every single programme had beens explained and comprehension was ensured) from 1(the least preferred) to 10 (the most preferred)?*

Willingness to assign (WTA). This was based on an open-ended valuation question that considered a hypothetical budgetary increase Respondents were asked to assign from a fixed remaining budget the amount of public resources that they were willing to devote to each programme. The idea underlying this method is one of relative values and trade-offs, therefore any budget size variation according to the monoticity criteria should not affect the preferences elicited, as they were considered in terms of relative values.

<u>Question 2</u>: *Imagine the possibility of setting yourself the priorities of the health system as if you were the decision maker. Imagine you have 4,000 million PTAs (20.4 million euros) (say 4,000 for simplicity) and you were asked to assign the money to each health programme in the system (you do not have to exhaust the whole budget, this would be interpreted as devoting resources to other sectors). How would you as a 'citizen' assign public resources.*

Willingness to pay taxes. This scenario relied on the hypothetical context in which the subject imagined that s/he was an individual earning an annual wage of 12,000 euros and paying a 20 per cent tax, assuming a flat tax rate. A payment card was employed so that each participant could tick a specific amount for each programme. The question was framed as follows:

How much in extra tax are you willing to pay for programme X ?

(0, 3 euros, 6 euros, 12 euros, 18 euros, 30 euros, 60 euros,120 euros or 240 euros)

The hypothetical scenario defined in this study was fully understood after some discussion. However, the test for the willingness to pay taxes yielded a significant number of refusals or protest responses, since three participants merely answered that they would not pay any extra taxes for additional funds. The use of this method might allow one to examine the extent to which the WTAS instrument improves the remaining elicitation methods.

4. Results

A total of 66 people participated in the exercises. Participants felt comfortable with these exercises, despite the large number of programmes, and few participants needed help to complete the WTAS exercise, which suggests that it was understood, although for future research the practical implementation should be carried out. No significant differences were found in terms of age and gender.

Table 3. Mean WTAS (in million euros) and WTP Taxes (in euros)

Programme	G1	G2	G3	G4	G5	G6	WTP (G4)
1	4.640	2.463	3.125	4.085	3.06	3.95	61.1
2	1.648	1.239	1.592	2.643	1.99	1.68	41.7
3	2.139	1.390	2.496	1.703	2.23	1.27	0.0
4	0.701	1.629	1.449	1.198	1.51	1.02	45.4
5	0.892	1.668	1.857	1.401	1.96	1.63	42.7
6	3.971	3.030	3.329	3.977	2.25	3.26	54.7
7	3.227	4.886	3.611	2.739	2.37	2.82	30.6
8	0.801	2.288	1.885	1.747	1.16	1.79	31.1
9	2.794	2.587	2.510	3.024	2.20	2.99	12.8
10	3.227	2.860	2.185	1.524	1.92	2.02	10

Table 4. Share of the Collective Budget (%)

Programme	G1	G2	G3	G4	G5	G6
1	19.3%	10.2%	13.0%	17.0%	14.8%	17.6%
2	6.9%	5.2%	6.6%	11.0%	9.6%	7.5%
3	8.9%	5.8%	10.4%	7.1%	10.8%	5.7%
4	2.9%	6.8%	6.0%	5.0%	7.3%	4.6%
5	3.7%	6.9%	7.7%	5.8%	9.5%	7.3%
6	16.5%	12.6%	13.8%	16.5%	10.9%	14.5%
7	13.4%	20.3%	15.0%	11.4%	11.5%	12.6%
8	3.3%	9.5%	7.8%	7.3%	5.6%	8.0%
9	11.6%	10.8%	10.4%	12.6%	10.6%	13.3%
10	13.4%	11.9%	9.1%	6.3%	9.3%	9.0%

Tables 3 and 4 display the results of the WTAS both in absolute terms and as a percentage of the budget. Interestingly, although there were significant differences between groups when compared in pairs, results indicate that some of the most valued programmes do not vary significantly across groups. In addition, standard deviation was quite stable at least for the willingness to assign responses. Additionally, when a test for equality of means was undertaken results confirm the rejection of the null hypothesis, that is preferences seem to be *complete*, people prefer one programme to another. The programmes that were found to be more valued were the medical check (programme 6) and the breast cancer (programme 1) offering health gain benefits, along with waiting list programme (programme 7) bringing process utility benefits and the dentistry (programme 9) and medical bonus programmes (programme 10), bringing equity benefits. Therefore, these results emphasise that there may

be more than just health gains in the individual's collective utility function, although one might argue that *people show a moral satisfaction effect, by* overvaluing those programmes aiming to remedy high risk conditions. This might be the case of younger students (group 1). However, this effect does not seem to be a plausible explanation for the values attached to programme 6. In addition, the visibility of an opportunity cost might diminish the moral satisfaction effect. Individuals in this experiment are aware that the assignment of an excessive monetary valuation to one programme may reduce the available resources for alternative programmes. The last column of Table 3 provides the mean estimates of the WTP taxes for each program elicited using a payment card. Results suggest that there are significant differences in terms of the consistency criteria across groups.

One additional issue is that of invariance to the elicitation method, that is whether reference reversals emerge. When implementing the WTAS to a broad set of programmes there was some evidence of preference reversals. In order to better capture the existence of preference reversals as well as the consistency of the estimates with their ordinal properties, Table 5 provides the estimates of the rank-correlation coefficient between rankings elicited and the implicit ranking that result from the money-metric valuation of programmes. Since our data is ordinal, the best way to test the validity is to test the consistency of rankings. In order to do so we apply the Spearman correlation coefficient . The assumption is that the observed ranking can be expressed as follows: $R = V + e, E(e) = 0, Var(e_{ij}) = 0$, that is, the ranking of a group can be understood as an addition of a 'real' ranking plus a random error, with a zero mean and constant variance. The null hypothesis is that there is no correlation between the rankings and the random errors, such as between the random errors. From this assumption the Spearman coefficient is: $\sigma^2{}_{XV} = \dfrac{\sigma_v^2}{\sigma_x^2}$, that is to vary between –1 and 1.

Table 5. Ordinal association between preference rankings and WTAS vs WTP

Method	WTAS						WTP
Group	Group1	Group2	Goup3	Group4	Group5	Grup6	Group 4
Spearman	0.9	0.745	0.855	0.67	0.62	0.80	0.34
	(5.8)	(2.2)	(4.6)	(4.5)	(3.2)	(5.6)	(3.9)
Low correlation (<0.5)	3	2	4	4	1	1	10
High non significant (>0.5)	4	2	5	5	5	2	3
High significant (>0.5)	6	4	6	4	3	5	0
N	13	8	15	13	9	8	13

*t-value in brackets.

Results suggest that there are significant differences in terms of the consistency criteria across groups. However, for all groups the Spearman correlation coefficient is above 0.6. At the individual level only 16 individuals out of 66 exhibit a low association between the elicited ranking and the implicit ranking from the WTAS estimates. Interestingly, consistency can be attributed to higher skills. Conversely, rankings that could be implicitly derived from the WTP responses highlight a low correlation coefficient which remain at the individual level for 10 out of 13 individuals. This feature might result from substantial differences in the decision-making setting. In addition, we ran WTP regressions for the determinants of income, residence, gender and age. Interestingly, gender and residence in about 30 per cent of cases are significant predictors of the willingness to pay for certain programmes such as cancer, coordination, lifestyles and revision. However, we do not report these results due to the small sample size.

Individual consistency could be examined at the aggregate level by employing non parametric tests for equality of rankings between both the WTAS and WTP and its rank at the programme level. Interestingly, as Table 6 show we cannot reject that both the mean and median rank resulting from the WTAS equal the contingent rank. However, WTP could not meet the equality for half of the programmes involved.

Table 6. Test for Equality of Contingent Ranking and the Implicit Rankings from WTAS and WTP Estimates

	Willingness to Assign			Willingness to Pay Taxes		
	Wilcoxon* (p-value) Ho: PR=WTAS	Snedecor and Cochran** (p-value) Ho: median PR= median WTPR PR>WTAS	PR<WTAS	Wilcoxon* (p-value) Ho: PR=WTP	Snedecor and Cochran** (p-value) Ho: median PR= WTPR Ha: PR>WTP	Ha: PR<WTP
Attention	0.24	0.94	0.17	0.18	0.98	0.07
Styles	0.25	0.91	0.25	0.01	0.98	0.07
Treat	0.27	0.85	0.36	0.07	0.96	0.14
Bonus	0.83	0.65	0.65	0.43	0.91	0.21
Odontology	0.59	0.85	0.36	0.94	0.85	0.36
Coordination	0.32	0.91	0.25	0.92	0.39	0.78
PPIHCAI	0.43	0.9	0.25	0.19	0.77	0.40
Lists	0.79	0.74	0.5	0.061	0.006	0.99
Cancer	0.77	0.5	0.81	0.065	0.08	0.98
Revision	0.23	0.93	0.22	0.006	0.05	0.99

* Tests the equality of matched pairs of observations using the signed-ranks test. The null hypothesis is that both distributions are the same.

** Tests that the median of the difference of observations is zero. The alternative hypothesis employed states that the WTP rank is lower than the preference ranking.

5. Discussion

This study has examined the WTAS as a method for eliciting preferences for competing healthcare programmes. The method indicates the overall funds that are available for an *incremental* reform of a given health system. The method per se allows individuals to assign their funds in the way that arguably best suits their social preferences but when eliciting preferences they are *constrained* by a public budget which is assumed to collectively collected. This study can be seen as a contribution to the ongoing debate on whether the WTP should be used to aid priority setting in healthcare (Olsen and Donaldson, 1998). Unlike the WTP, the WTAS deals with social preferences and enables the individuals to be aware of collective budget restrictions. However, the values that are elicited cannot be interpreted as absolute, but rather relative valuations.

According to this limited small-scale experimental evidence, the willingness to assign seems to be less misrepresented by the preference reversal phenomenon than the willingness to pay approach. The WTAS estimates are to a large extent consistent predictors of individual preferences. Results obtained from a rank correlation analysis in this context indicate that the

WTAS is a better predictor of individual preferences than the WTP taxes. Thus, this provides some support for the view that the WTAS captures individuals' relative valuation (relative preference) of a single health system improvement. Despite the fact that one could argue ex - ante that the method is too complex, evidence suggests that in fact it works well in deliberative and collective settings. This method can be an extension of the inherent rationality of assigning a budget in a collective setting, such as that of individual families.

Whereas WTP refers to an individual assessment of the value of a good as a consumer, the WTAS might deal with collective preferences closely linked to political concerns. The willingness to assign, however, is more closely connected to the Kanheman and Ritov (1994) contribution model suggesting the willingness to contribute as a citizen to the funding of a particular programme. Conversely, individuals eliciting their WTP are theoretically limited to their budget rather than to a collective budget contraint. Therefore, the respondent might actually experience an unknown trade-off between the programme and other unknown goods. Therefore, even accepting that the WTP could be a measure of preference intensity, this would not express the real trade-offs that are implicit in decision-making settings

Our results, although from a small-scale study, exhibit remarkable associations between individual priorities and values, which can be understood as better capturing the decision-making problem perspective. Therefore, in the light of these results the experimental study identifies evidence pointing out that the WTAS seems to be internally more consistent than for alternative methods. However, we should bear in mind the reduced sample size and that some preference reversals pre-exist. Some explanation for larger consistency might not be attributed only to the method nut to the feature that the experiment seemed quite realistic to participants as far as the programs under evaluation were effectively under scrutiny by the Catalan health service. We believe that realism is an important matter to pursue when designing experiments.

The study reveals that there is something more than health gain in the individuals health related utility functions. Furthermore, these other attributes play a role when examining preferences for healthcare programmes. Therefore, if we extend the finding that health system benefits go beyond pure health gains, instruments assuming an a priori dimension of benefit may misrepresent individual preferences. . However, although there is

evidence in the literature (Nord et al., 1995) that people might not respond to the QALY maximisation model, programmes dealing with health gain appear to receive the highest relative valuation.

This study is a first attempt at implementing a preference elicitation method to assist priority setting for a large number of competing health programmes. However, it is not without limitations. As other elicitation techniques, respondents might be affected by the effect of uncertain effect of their decisions, framing of questions, heuristics and availability of information (Viscusi, 1989) The first notable limitation is feature that individuals might wish to allocate funds to other health programmes. In this respect the method employed is limitative, although slightly less limitative than WTP methods. However, unlike the WTP, individuals are not allowed to keep funds for themselves. Participants were told that any additional funds would be assigned somewhere else, but none of the participants left any funds to assign. This might be consistent with the fact that healthcare ranks as the first public expenditure priority, as revealed in public opinion surveys. Although it might be an operative tool to guide priority setting, it should be recognised that the incremental approach might limit the scope for health reform. Further research may need to examine the WTAS in a setting that enables participants to forgo already covered programmes. Finally, although the methods and the warming up through a deliberative approach were intended to encourage individuals to respond according to a collective decision-making approach, it might well be the case that some individuals responded strategically as significant differences were identified among health programmes. Therefore, issues relating to aggregation might restrict this approach to some extent. Costa (2003) analysed the social consistency of the WTAS approach by examining whether WTAS estimates were consistent with a social ranking which did not violate the Arrow impossibility conditions by combining the majority rule and the borda rule. Results suggested that on aggregate, rankings implicitly derived from the WTAS were highly correlated with the hypothetically derived social rule.

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