Willingness to pay for public health policies to treat illnesses☆

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ABSTRACT

As the US pursues health care reform, it is important to understand the patterns in demand for, and opposition to, public provision of medical treatments. Using data from a nationally representative survey, we develop and estimate a utility-theoretic choice model to quantify demand for publicly provided medical treatment policies. We find diminishing marginal utility for increased recoveries and avoided premature deaths. We also show how the utility associated with different types of treatment policies varies with the socio-demographic group that would benefit (e.g. men, women, children, and seniors) and the program's duration and scope. Our model further permits utility, and hence willingness to pay, to vary with each respondent's own gender, age, race, income, community ethnic fractionalization and immigrant composition, as well as the respondent's expected private benefits from the policy and attitude toward government interventions and overall health care funding allocations. Self-interest is a prevailing finding.

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1. Introduction

The government bears a very large share of total spending on health services in the US – about 45% of total direct health expenditures, increasing to 60% if one includes tax subsidies for private insurance and government purchases of private health insurance for public employees (Woolhandler and Himmelstein, 2007). Much of this spending goes toward treating specific illnesses that afflict specific subpopulations. To date, however, researchers lack a clear understanding of what types of government-funded medical treatments the average person most prefers (or most opposes) having to pay for. Nor is it well understood which factors best explain differences across people in preferences over publicly financed medical treatments. We address these knowledge gaps by characterizing peoples' willingness to pay to support government-financed medical treatment programs.

A large and rich, but very different, literature concerns the value of a "statistical" life (VSL) and focuses on individuals' willingness to pay to reduce their own small chances of contracting a fatal illness or suffering a fatal injury. Numerous VSL studies and several meta-analyses evaluate individuals' preferences for *privately provided* risk reductions (i.e. Mrozek and Taylor, 2002; Viscusi and Aldy, 2003; Alberini, 2005; Hammitt and Haninger, 2010; Chestnut et al., 2012). In contrast, we seek to identify individuals' preferences for *publicly provided* policies that make treatments available to

patients who are *already* sick or injured, where *other people* are the beneficiaries of these policies.[1]

Such public policy preferences involve different considerations. First, the individual may be uncertain whether a particular government-funded treatment policy will ever directly benefit him or his family, so the preferences he expresses may be mostly other-regarding (e.g. altruistic or paternalistic) rather than self-regarding. Second, changes in the *risk* of illness or injury are not at issue, since all potential beneficiaries of the policy are already sick or injured. Third, different types of treatment programs may target different groups of beneficiaries (e.g. men, women, children, adults, seniors), and individuals may differentially value medical treatments for different types of people. Finally, government-funded treatment policies are typically financed though mandatory taxes, so attitudes toward taxation may matter.

Our analysis is based on more than 1300 responses to a stated preference (SP) survey which uses discrete choice experiments to evaluate publicly funded medical treatments that increase the number of people who recover, and reduce the number who die prematurely, from specific illnesses or injuries. Within and across choice sets, we assess the effects of variations in the number of increased recoveries, the number of avoided premature deaths, the length of time the policy is in effect (i.e. the commitment period), the type of illness being treated, the size of the afflicted population, and one main experimental variation in choice-elicitation framing.

Our health-policy choices, used alone, do not permit robust estimation of discounting parameters. Thus we estimate jointly, with cross-equation parameter constraints, (1) a submodel to explain public health treatment policy preferences and (2) a submodel to explain choices between different ways of taking some hypothetical lottery winnings. Joint estimation allows us to identify individual-specific discount parameters assumed here to apply to future *utility* derived from any source. We allow the discounting parameter to vary with each individual's attributes, as numerous studies suggest (Warner and Pleeter, 2001; Frederick et al., 2002; Harrison et al., 2002; Silverman, 2003; Andersen et al., 2008). There has, of course, been considerable discussion in the literature about whether people discount future health differently from future money. We build enough utility-theoretic structure into our model so that we can discount the *utility* from future health and the *utility* from future money, while permitting the marginal utilities of health and money to differ.

We assume that a common preference function underlies both the policy choices and the lottery winnings disbursement choices in our study, which allows us to constrain time preferences and the parameters for the marginal utility of net income to be consistent across both types of choices. The estimated degree of risk aversion with respect to net income applies to both the public health policy context and the lottery winnings disbursement context. Ours appears to be the most general and comprehensive joint model, to date, that encompasses time preferences, risk preferences, and the demand for public health policies. We also illustrate the size of bias due to choice elicitation framing effects that occur for treatment programs if researchers choose to focus only on avoided premature deaths and neglect the number of recoveries associated with treatment policies.

Our model allows us to explore how these estimates of willingness to pay per recovery and avoided premature death vary with the age group of the patients who will benefit from specific kinds of treatment programs, and with the ethnic and immigrant composition of the community that will be served. The duration of commitment to each program and the program's geographic scope are permitted to have systematic effects on individual willingness to pay.

Our estimated model also enables us to characterize how demand varies systematically with the gender, age, race and income of the individual who is being asked to value these treatment policies. We can also control for individuals' own ratings of how much they themselves (or their families) might expect to benefit from each policy, their attitudes toward the targeting of public health care expenditures in general, and their attitudes toward government regulation of environmental, health and safety risks overall.

Finally, some people are inclined to reject all publicly financed programs offered for their consideration. We specifically model how support for *any* of these tax-funded medical treatments, regardless of their costs or benefits, varies as a function of a broad range of individual characteristics.

The research upon which this paper is based involves many considerations beyond what can be covered within the page limits of a standard journal article. Throughout, we will refer to an accompanying online Appendix that contains comprehensive supporting information and alternative specifications, including many more tables and figures.[2]

2. Data and survey design

The data used for this analysis were gathered using survey instruments designed specifically to elicit individuals' willingness to pay for publicly provided health policies. The survey was administered in 2003 by Knowledge Networks Inc., an internet-based market research firm offering a representative panel of households in the US who could complete surveys via a Web TV® or personal computer interface.[3]

We have at our disposal a set of responses from 1314 individuals who completed the Treatment Policy survey. At the core of this survey are five main choice sets, each offering the individual two prevention policies, Policy A and Policy B, that reduce future premature deaths and increase future recoveries, as well as a Neither Policy alternative (denoted N). We explain to individuals that they may find it appropriate to choose neither policy by pointing out several possible explanations why a reasonable person might choose neither policy in some cases.[4] Respondents are asked to consider

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[1] Some studies have explored population-level outcomes, focusing on risk-risk tradeoffs, such as Chilton et al. (2002), Cropper et al. (1994) and Subramanian and Cropper (2000). Very few have explored individuals' willingness to pay for public health risk reduction programs, as in Arana and Leon (2002). Some recent work by Lavetti et al. (2014) has considered individuals' willingness to pay for health insurance coverage for others.

[2] Fuller details of the two survey instruments are also available at: http://www.uoregon.edu/~cameron/vsl/public_prevention_framed.pdf and http://www.uoregon.edu/~cameron/vsl/public_treatment_framed.pdf. For this paper, we use the "treatment" survey for the policy choices, but both surveys for the data on time preferences.

[3] Marginal distributions of various socio-demographic variables for both our estimating sample and the U.S Census are provided in Bosworth et al. (2009). The response rate was 79% among invited participants from this consumer panel with excellent sampling properties. The online Appendix contains the details our models to explain the presence of individuals in the estimating sample relative to the 525,078 random-digit-dialed (RDD) initial contact attempts for recruitment to the contemporaneous Knowledge Networks panel from which individuals were invited to participate. Importantly, our selection models do not capture merely the process by which invited panelists decided to complete the survey. Our models go all the way back to the most "random" phase of RDD panel recruitment and reflect all levels of selection between that point and membership in our estimating samples for both portions of this joint model.

[4] These reasons include that (1) they did not believe the policies would reduce health risks, (2) environmental problem does not cause illness, (3) they did not