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# Tests of Intrahousehold Resource Allocation Using a CV Framework: A Comparison of Husbands' and Wives' Separate and Joint WTP in the Slums of Navi-Mumbai, India

VIMALANAND S. PRABHU *

**Summary.** — Husbands and wives from 422 households in the slums of Navi-Mumbai, India, were interviewed separately first and jointly thereafter in a contingent valuation framework to assess their individual and joint household willingness to pay (WTP) for malaria vaccines. Husbands' and wives' demand differed significantly when they were interviewed separately but not when they were interviewed jointly. The author rejects the common preference model and unified (bargaining) model of intrahousehold resource allocation. Researchers should consider the complexity of intrahousehold decision making when they conduct stated preference surveys, even in patriarchal societies.


*Key words* — intrahousehold resource allocation, Malaria vaccine willingness to pay (WTP), behavioral aggregation, contingent valuation, India, Asia

## 1. INTRODUCTION

Contingent valuation (CV) is increasingly used in developing countries to measure the value of health-related outcomes, including household willingness to pay (WTP) for vaccines, such as malaria (Cropper, Haile, Lampietti, Poulos, & Whittington, 2004; Lampietti, 1999), typhoid (Canh *et al.*, 2006), and HIV/AIDS (Whittington *et al.*, 2008). Authors of most of the CV studies interview only a single respondent within the household assuming that households adopt the common preference model of intrahousehold resource allocation. The common preference model is based on restrictive assumptions—either the respondent is a dictatorial decision-maker in the household or the household members have similar preferences.

Consensus is emerging that some level of intrahousehold "bargaining" takes place and that the use of alternative models of intrahousehold resource allocation should be explored. Alternative models of intrahousehold resource allocation [1] include the unified household model based on the Rotten Kid Theorem (Becker, 1974, 1981), cooperative bargaining models based on the Nash equilibrium (McElroy & Horney, 1981), collective models that focus on pareto optimality (Chiappori, 1988, 1991), and non-cooperative bargaining models based on Cournot-Nash bargaining (Chen & Wooley, 2001). These models differ mainly by whether household members pool their income (Pollak, 2003), a concept pioneered by Thomas (1990) and refined by others, such as Lundberg, Pollak, and Wales (1997). Individuals who do not pool their income express their different preferences during consumption. Their individual (labor or non-labor) income, rather than the total household income, affects their expenditure patterns. Thus, the common preferences model can be rejected if the marginal utility of income differs for husbands and wives.

Researchers have attempted to study the intrahousehold resource allocation using a CV framework. A comparison by Lampietti (1999) of husband and wife responses found that husbands' and wives' behavioral characteristics might not be pooled for the purchase of a hypothetical malaria vaccine but might be pooled for the purchase of a bed net. In individual (i.e., separate) interviews of husbands and wives, Whittington *et al.* (2008) found that although spouses had the same average demand, wives were significantly more likely than husbands to allocate vaccines to their daughters than to their sons at lower prices. However, in none of the CV studies were husbands and wives interviewed jointly.

The current study undertook interviews of husbands and wives for their individual choices first (separate interviews in different rooms) and then jointly (together in a single room) for a combined choice thereafter about their WTP for a malaria vaccine. The CV framework adopted for this study here is used for the first time.

A study of intrahousehold resource allocation should observe both (1) the differences in household member preferences and (2) the way members aggregate their preferences. A multiple-interview-per-household CV study can achieve the first objective. However, aggregation in a CV format is difficult, might require a research design with potentially unrealistic settings (Adamowicz *et al.*, 2005), might impose logistical constraints on the fieldwork, and could be resource intensive. When two parents state different WTP to save their child from one day of cold symptoms, Bergstorm (2003) asks whether the maximum, or perhaps the minimum, of their WTP should be used. Because of the complexity of preference aggregation, it has been attempted only once in a stated preference format. Arora and Allenby (1999) mailed husbands and wives two

* Vimalanand S. Prabhu, PhD, who was a UCIS REACH Fellow in the Department of Public Policy, The University of North Carolina at Chapel Hill, thanks Dr. F. Reed Johnson, Dr. Dale Whittington, and Dr. David Guilkey for their help and support during this research; Dr. Ajay Behl and Dr. Paul Farnham for their comments; Ms. Karen Foster for helping in copy-editing; and dedicates this research to his wife, Purva. The study was possible from a two-year, $30,000 REACH Grant from the University Center for International Studies, The University of North Carolina at Chapel Hill, Chapel Hill, NC. Further correspondence can be made at Centers for Disease Control and Prevention, MS-E30, 1600, Clifton Rd. NE, Atlanta, Ga. 30333 or via email at prabhu@unc.edu. Final revision accepted: September 16, 2009.

survey questionnaires with conjoint choices for an electric oven range and a lawn mover, to be completed separately first and jointly later. Husbands and wives expressed different preferences, and an inferred measure based on aggregated responses was more predictive than individual responses. Such studies have never before been conducted in a CV framework.

Rosenzweig and Schultz (1982,1984) questioned the worth of complicated models of bargaining because, in some societies, more complex models of intrafamily resource allocation may not yield empirically distinguishable predictions. Their argument may seem compelling in India, a stereotypical patriarchal society in which women suffer from lower literacy rates, labor participation, and earnings than men (Ministry of Finance, India, 2004). In such a patriarchal society, if women do not make any decisions, are issues of intrahousehold resource allocation worth portraying to be more complex than they really are?

Empirical evidence suggests that even in male-dominated societies, women exert some control over expenditures (Chen, Huq, & D'Souza, 1981; Neuhouser, 1989). In the Second National Family Health Survey of married women in India (IIPS and ORC Macro, 2000), nearly 57% and 37% of ever-married women in urban and rural areas, respectively, reported autonomy in spending decisions related to their self-earned income. This indicates that women make consumption-related decisions in the household and that some level of household bargaining may take place.

This study has three main objectives: (1) examine differences in husbands' and wives' WTP for a malaria vaccine in the slums of Navi-Mumbai, India, when interviewed separately and jointly, (2) examine whether the common preference model approach can be rejected, and (3) explore the characteristics of wives who change their opinions.

## 2. RESEARCH DESIGN, SAMPLE CHARACTERISTICS, AND SURVEY METHODS

To measure the differences in husbands' and wives' preferences, married couples were invited to a central place and interviewed separately for their WTP for a (hypothetical) malaria vaccine for their household members. To aggregate their responses, husbands and wives were brought together and allowed a short private discussion (of about 2 min).[2] The WTP question was repeated, and the couple was requested to respond jointly. Vaccine characteristics such as price, effectiveness, and duration remained constant for both husbands and wives during the separate and joint interviews. A common answer was not forced during the joint interview because the couples might not necessarily reconcile their differences in a short time. This setup provided four WTP responses: from husbands when interviewed separately, from husbands when interviewed with their wives, from wives when interviewed separately, and from wives when interviewed with their husbands.

Couples twice provided oral consent[3] at the beginning of the separate interview and before the joint interview. To maintain confidentiality of responses, the separate interviews were conducted in different rooms using a team of three enumerators for each household interviewed—one each for the husband, the wife, and the joint interview. A helper assigned to each team assisted in recruiting the couples for the interview. There were two teams and one field supervisor. Wives were always interviewed by women. Fieldwork started in November 2005 and ended in March 2006. Interviews for the main survey began in January 2006. Four pretests for 120 couples were conducted.

### (a) *Location and sampling*

The city of Navi-Mumbai was a suitable location to study the demand for a malaria vaccine. Although overall incidence of malaria has declined, malaria is endemic to, has risen or remained constant in, certain pockets of Navi-Mumbai. Important contributing factors include the subtropical humid climate, storage of water in open drums because of inadequate water supply, inadequate drainage of rainwater in slums and quarries, and a steady pool of immigrant workers with low resistance to malaria.

Assuming a cell size of about 40 persons per cell for 10 price-efficacy cells (two efficacies and five prices), the study required a sample size of about 400 households. Three communities at high risk[4] and one at low risk for malaria were selected for sampling. The sampling was performed on the basis of a government-issued household survey receipt number, which generally was displayed in bold red ink on the door of the dwelling. The dwellings were mostly in sequential order. The number was confirmed by the original receipt. After a reconnaissance survey to find the starting and the ending numbers for sampling purposes, the households were sampled randomly using Stata 8.0 (Stata Corporation, College Station, TX, USA). The final survey instrument was bilingual in Marathi and Hindi. A total of 422 couples in 422 households were interviewed. The study excluded households in which the husband, wife, or both rejected the hypothetical scenario, resulting in a final sample size of 405 households.

### (b) *Survey instrument*

The final CV questionnaire comprised 10 sections. The first four sections were filled out in the respondents' homes, at which time the appointment was scheduled, the consent was obtained, the respondents' homes were observed, and the general questions were asked about the household and demographics. The remainder of the survey was conducted in the field office. The sections 5–7 were filled out separately for husbands and wives. The respondents were assessed for their knowledge of malaria (section 5) and vaccines (section 6). Information was provided about the malaria symptoms, transmission, and prevention, and about vaccines in general.

Next, the hypothetical scenario (section 7) was presented. The explanation of vaccine effectiveness constituted a crucial component of the hypothetical scenario. The authors customized the scenario used by Canh *et al.* (2006) for local conditions. The respondents were explained the concept of effectiveness and were tested for comprehension. If the respondents failed the first time, the concept was explained again, the respondents were retested, and the survey was continued irrespective of the respondents' understanding of effectiveness. A total of 401 (95%) of husbands and 376 (87%) of wives interviewed understood the effectiveness scenario.

The actual WTP question followed the explanation of hypothetical scenario and testing of effectiveness. The participants were asked, "Suppose that this malaria vaccine costs Rs. XYZ for the single dose needed for one person. Would you buy one or more of this vaccine for the members of your family?" If the respondent replied in the affirmative, he or she was asked, "Who would you buy this vaccine for?" This approach was modeled on the WTP question posed by Cropper *et al.* (2004). Husbands and wives were then united and given two minutes of privacy for a short discussion on their combined preferences for the vaccine. The WTP question was repeated to the couple.