

How important is gender in assessing the value of maternal health outcomes?

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Paper presented to the HESG meeting, University of Birmingham, January 3-5 2007

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Introduction

The willingness to pay (WTP) method was developed to provide monetary valuation of benefits or outcomes for use in cost-benefit-analysis (CBA). It can be used to value non-market goods and services and can therefore potentially be used to place a monetary value on any aspect of health or health care. WTP uses survey techniques to present respondents with theoretical scenarios relating to a good or service. The rationale for adopting this approach to valuation is that many of the benefits of health care are 'intangible' i.e. unobservable.

When using WTP in a health care context, respondents are required to consider that a market exists for a health care programme or health benefit, and are asked to reveal the maximum they would be willing to pay for such a programme or benefit (Drummond et al. 1997) should they be able to buy it alongside other goods and services. For a given level of income, higher WTP valuations indicate that individuals would derive greater benefit from the programme under consideration.

There have been a number of WTP surveys conducted in developing countries using a range of elicitation techniques. One method of eliciting WTP values is the "open ended" method which captures values using direct questions which request respondents to state their maximum willingness to pay. A variant to this approach is the "payment-card" method where respondents are given some guidance by being presented with a range of possible values. One example of the use of this method in relation to health care in a developing country context is a WTP survey conducted in Tanzania to elicit WTP for district hospital services (Walraven, 1996). Whittington (2002) also used an open ended method in the form of a payment card to elicit individual WTP for a hypothetical vaccine that would provide lifetime protection against HIV/AIDS to an uninfected adult (Whittington, 2002).

Another method obtains values using binary choices (often called a "closed-ended format"). In this format, a number of methods may be used. One method is the "Bidding Game" (BG) technique. This uses a predetermined search algorithm to bid the respondent up or down, conditional upon responses to prompted values. The bidding game technique has also been used extensively in developing country contexts. Applications include WTP for community-based health insurance (Asenso-Okyere, 1997; Amaoko et al, 2002; Dong et al, 2003); for the drug ivermectin for Onchocerciasis (river blindness) in Nigeria (Onwujekwe et al, 1998); WTP for

insecticide treated mosquito nets (Bhatia and Fox-Rushby, 2002) and parental WTP to avoid an episode of diarrhoea in their children (Amin et al, 2004).

Onwujekwe has also developed a WTP format known as the structured haggling format, based on the bidding game format. The structured haggling format was developed to imitate the haggling behaviour found in market transactions in Nigeria (Onwujekwe, 2004). Applications of this method include WTP for re-treatment of mosquito bed nets (Onwujekwe et al, 2004).

An alternative to the bidding game is the “take-it-or-leave-it” (TIOLI) method. In its simplest format, respondents are asked only once whether they would be prepared to pay a certain amount of money for the programme or benefit. In more complex formats, more than one question would be asked of each respondent. One such method is the “binary with follow-up” (BFU) format, using single or multiple follow-up questions. There have been a number of applications of each of these methods in developing country contexts. For example, the TIOLI format has been used in the Central African Republic to measure WTP for quality improvements (Weaver et al, 1996). Similarly, it was used in assessing WTP to avoid an episode of malaria in Mozambique (Whittington et al, 2003) and WTP for cataract surgery in Nepal (Shrestha et al, 2004).

Gender and WTP the method

Whilst there have been a number of health and health-related studies conducted in developing country contexts using WTP methods, there have been a limited number of studies which have analysed gender differences in WTP valuations and the effect of gender on WTP. Dong et al (2003) analysed gender’s effect on WTP for community-based health insurance in Burkina Faso. Using the bidding game technique they found that differences in socioeconomic status, such as education and income, influenced differences in WTP values between men and women. Perhaps not unexpectedly because of their disadvantages in terms of socio-economic status, women were found to have a significantly lower WTP than men. Mujinja et al (2004) conducted a survey in Tanzania for insecticide treated bed nets and analysed the socio-economic and malaria related differences between males and females to examine gender differences in WTP. The authors found that, whilst the average income of men in the survey was twice that of women, there were no significant differences in WTP between them. Carlsson et al (2004) conducted a survey into WTP for a new community plantation in Ethiopia. Both men and women

(spouses) within a household were asked for their WTP. The authors investigate intra household variation in preferences, specifically focusing on differences between male and female values. The author's found large differences in WTP between male and female respondents, with women having significantly lower mean WTP; they also found that the factors which influenced the WTP of men and women differed.

Gender roles and willingness to pay for health

It perhaps seems obvious that women would have an increased willingness to spend more on maternal health as it directly affects them, and this may well partly be the case. However, it is not necessarily the whole story. As policy often ties together maternal and neo-natal health, maternal health is an issue both related to women's own health as well as to that of their children, encompassing women's wider reproductive responsibilities.

Aside from their biological reproductive function, women are also most usually responsible for the "social reproduction" of the family: through caring for the every day needs of children, partners and relatives, preparing food, providing clothing, collecting water and caring for the sick. An important aspect of women's social reproductive identities – their identities as mothers - often includes health care. This is of especial importance in the developing world where the state and/or private market is limited in its capacity to provide adequate health care (Coates, 2005). However, it has also been well-documented that this care extends to ensuring access for the family to the formal health care that does exist (Hillier and Scrambler, 1997; Lorber, 1997), although their access to household resources to pay for such services may be limited.

This limited access to resources has been argued to result from men "withholding earnings (and / or appropriating those of their wives or other household members), to absenting themselves from the home to spend time with male friends, and/or consoling themselves with the transitory fixes offered by drugs, drink, casual sex and gambling" (Chant, 2006: 33-34). Thus, the combined effect of a lower status within the household as well as within society (as exemplified in unequal access to education and employment, amongst other factors), in combination with an increased family burden of responsibility, has lent much weight to "feminisation of poverty" arguments (Moghadam, 2005).

“...although women are often income poor, and this owes to a whole host of discriminatory processes which need to be addressed, what is also critically important is that they are increasingly at the frontline of dealing with poverty...the burden of household survival has long been widely documented as falling disproportionately on women...” (Chant, 2006: 29-30)

The feminisation of “responsibility and obligation” (Chant, 2006) and of poverty has been recognised in poverty reduction strategies such as the Mexican *Oportunidades* programme which operates a cash transfer scheme directly to women. These payments are designed to ensure family nutrition and health but are conditional upon women’s ability to guarantee family visits to the health facilities. The inequities of the intra-household dynamics of resource allocation (which such payments are designed to balance out) are highlighted in Sen’s (1985; 1990) work. The latter develops an understanding of poverty in relation not only to absolute household wealth but, significantly, an individual’s capability to access such resources. Thus, understanding a woman’s willingness to pay for health in general, as well as for maternal health (an issue which combines her own health with that of her children) should perhaps best be understood in this context of feminised poverty, capabilities, and social reproductive responsibility. Assessing the comparative level of this willingness to pay from a gender perspective is the first step towards developing such an understanding of its dynamics.

We present results of a survey undertaken in Nouna, Burkina Faso, to value risk reductions in maternal mortality through the elicitation of respondents’ WTP for health improvements. The objective of this survey was to determine these values by estimating their maximum WTP for a hypothetical scenario which would reduce maternal deaths in the Nouna community by 25% - 50%. This paper presents a component of the resultant analysis in aiming to explore the effect of gender on stated WTP values for such a risk reduction. The characteristics which may influence WTP values (such as income, sex, age, education and an individual’s previous experience of maternal ill health) have also been analysed to determine the relationship between gender and WTP as well as the extent and configuration of any gender differences in WTP.

It is generally assumed that WTP will be affected by the demographic and socio-economic characteristics of individuals. Individuals with higher income and education are expected to be willing to pay more, on the basis of their greater ability to pay. In

addition, individuals with higher education are also hypothesised to be willing to pay more as they are more likely to be aware of the adverse consequences of maternal ill health or death. Hence, on the basis of these assumptions, it would generally be assumed that men would be willing to pay more than women, based on their ability to pay (although, as discussed above, the feminisation of responsibility and obligation may counteract this assumption for certain issues). Age could also influence WTP, with those actively able to work stating higher WTP values. An individual's experience of maternal death or maternal ill health is also likely to positively influence WTP. Individuals with previous experience of maternal complications or maternal death in their household are likely to be willing to pay more for the same reduction in the risk of maternal mortality.

Thus, we test the hypothesis that observed differences in male and female WTP are due to differences in both income and gender differences attributable to maternal mortality being a "women's health issue".

Study site

Burkina Faso is a landlocked West African country. It has an estimated population of 13.8 million (UN, 2005) and is one of the world's poorest countries. The site for this study was Nouna, located in North West Burkina Faso. It is a largely rural area with Nouna town being semi-urban. A number of factors influenced the choice of Nouna as the study site. Firstly, Nouna is a Demographic Surveillance Site. The existence of the Demographic Surveillance Survey (DSS) and an on-going Household Survey (HS) provided a convenient sampling frame. Secondly, the maternal mortality ratio (MMR) for Burkina Faso is high, and in the Nouna area, it is approximated that 60 women die each year due to pregnancy related causes. In addition to this, the Centre de Recherche en Santé de Nouna (CRSN) has extensive expertise in conducting surveys of this type (Dong et al 2002; Sauerborn, 2005).

Pre-test/pilot

Prior to conducting the main survey a focus group and extensive pre-testing and piloting were undertaken in the Nouna community. The purpose of this extensive development phase was to ensure the feasibility of the questionnaire and the appropriateness of the methods used to elicit WTP values. The focus group comprised of members of the CRSN and Centre Muraz (both health research centres within Burkina Faso). The primary purpose of the focus group was to establish the

feasibility of conducting a WTP survey of this type, critically appraise the research protocol and draft versions of the questionnaire.

Following the initial focus group meeting, a pre-test and pilot of the questionnaire took place in Nouna. This consisted of a pre-test of 15 households (30 individuals in total) and a pilot of 40 households (80 individuals in total), with one male and one female member of each household interviewed. Data from the pre-test and pilot phase was analysed to test the general acceptance of the questionnaire (number of non-responses), the acceptance rates of the initial starting bids, and consistency of respondent answers within the questionnaire. On analysis of the data from the pre-test and pilot, and through discussions with research staff at CRSN and with the survey supervisors and enumerators, small amendments were made to the structure and wording of the questionnaire. Small adjustments were also made to the starting bid of the bidding game.

During the pre-test and pilot phases there were extensive supervisor and enumerator training. The same enumerators were retained for all aspects of the study from pre-test through to final survey to ensure that the enumerators were well trained and the interviews were well conducted.

Main survey

A random, representative sample of households was taken from the Household Survey (HS), a subset of the Demographic Surveillance Survey (DSS) in Nouna, Burkina Faso. The DSS is a census survey of the entire Nouna area (undertaken every two years). The Household Survey (HS) is a panel survey conducted every year since 1999 and is a subset of the DSS. There are approximately 990 households (579 rural, 411 semi-urban) in the HS. There are five modules to this survey: household socio-demographic and economic characteristics; morbidity and health seeking behaviours; preventive care and general health; risk pooling in health, knowledge about the community based health insurance scheme and perceived quality of care; and, the enrolment in the community based health insurance scheme.

For the purposes of the WTP survey, 618 households in total from the HS were sampled, with one male head of household and one female member of the household answering the questionnaire (total of 1236 respondents). Demographic and socioeconomic information on individual respondents was collected separately via the HS. To achieve our minimum sample size of 600 households, we sampled

65% of households within the HS. All villages in the HS were identified, with the number of houses in each village selected in order that each village contributed 65% of their total population to the sample. The first house in each village to be interviewed was then chosen randomly.

Elicitation method

There has been much debate between economists over the use of WTP and the methods to elicit WTP values. WTP surveys are sometimes considered unreliable because responses to hypothetical scenarios are likely to be inferior to 'hard' market data, or, at worst, off-the-cuff attitudinal indications (Whittington D et al. 1991). The empirical evidence to support this view was extensively considered by Mitchell and Carson (1989) and Arrow et al. (NOAA, 1993). They both identified a number of potential biases associated with the CV method. Firstly, hypothetical bias; i.e. hypothetical WTP often seems to overestimate real WTP. Secondly, strategic bias; i.e. wilful misrepresentation of responses in order to influence population estimates. There may be a trade-off in the minimisation of these two biases. Other effects may also exist and provide explanations for responses. For example, an embedding effect may exist. Additionally, a warm glow effect may occur; i.e. the CV response may be a general approval for the program to go ahead, rather than a considered valuation of the benefits received based on budget constraints. Finally, yea-saying may exist; i.e. a tendency for respondents to reply yes to an amount offered regardless of the fact that it might be higher than their true WTP.

These potential biases and effects suggest that it is important to be aware of whether or not some methods are more susceptible to certain biases than others. In addition, issues such as the practicality/feasibility of undertaking WTP surveys, particularly in a developing country context, must also be taken into consideration. It could be argued that using WTP methods to value health outcomes in a developing country would be less valid, primarily because developing countries have less developed market structures and prices for goods and services are not usually fixed. However, conversely it may be the case that the application of WTP techniques in developing countries works well precisely because they do not have fixed market prices. This might suggest that iterative techniques such as the bidding game, double-bounded dichotomous choice method and structured haggling method may work well as they represent how individuals function in the market place. Individuals in developing countries are also generally more familiar with making out-of-pocket payments for health care. This should, therefore, make the task of valuing health outcomes in

monetary form easier. However, the use of market based techniques to elicit values could pose problems in itself with the possibility of decision heuristics driving individual valuations. In addition, it has also been found that these types of methods are susceptible to starting point bias.

Bidding game technique

All respondents received the bidding game method (see Box 1 for an example of the bidding game method used). This method was chosen to elicit WTP values due to a number of factors. Firstly, it has been used in WTP survey work previously conducted in Nouna and was found to be both feasible and reliable (Dong et al, 2003). In addition, previous work conducted at the CRSN had found other methods, such as an adapted payment card as inappropriate in this setting.

Respondents were randomly assigned to one of three starting bids (1000, 5000, 8000 CFA), the range of which corresponded to approximately £1, £5 and £8. These were determined on the basis of analysis of the pre-test and pilot and were set to capture both the lower and upper end of the WTP distribution. Results from the pre-test and pilot studies showed that approximately 80% of respondents accepted the low starting bid, 40% were accepted the middle starting bid and less than 25% of respondents accepted the high starting bid. Common initial bids were used for both male and female members of the same household so as to limit the effect of any starting point bias when comparing male and female WTP. In addition, individuals were interviewed separately and, in most cases, on the same day to avoid one individual's bid being influenced by another.

The payment vehicle was a one off out-of-pocket payment for a service re-organisation that would lead to a one time reduction in the number of maternal deaths. To minimise the potential for free-riding, individuals were informed that a threshold level of payment had to be reached for the re-organisation to occur.

Questionnaire and scenario setting

Interviewer administered, structured questionnaires were used to elicit individual WTP for risk reductions in maternal mortality. The questionnaire included a detailed description of the hypothetical scenario (Box 2), questions detailing the respondent's previous experience of maternal deaths or complications in their household or community and questions eliciting the respondents WTP for a risk reduction in

maternal deaths. Demographic and socioeconomic information was collected separately in the HS.

The questionnaire was translated from English into French and back translated. In addition to this, the questionnaire was also translated into the local African language, Dioula.

In practical terms, undertaking CV surveys in developing countries requires that the survey is adapted so that it is culturally specific and acceptable to the population. Surveys of this type in developing countries are often undertaken in areas where the general population have low levels of education and where literacy skills are low. This can have serious implications for the design and conduct of surveys. There is also a general requirement that surveys conducted at the community level are enumerator administered.

Results

In total there were 1236 respondents, with 1205 (98%) respondents stating a positive willingness to pay. Due to the sampling procedure, the sample was divided equally between male and female respondents (618 men and 618 women). Individual characteristics of men and women were analysed to test whether male and female respondents differed significantly (Table 1). There were significant differences between male and female respondents with respect to age, education and annual income. Men were found to be significantly older, have significantly more education, and a higher annual income.

The mean willingness to pay for risk reductions in maternal mortality are given in Table 2. Mean WTP for the sample as a whole across all formats of the questionnaire was 2555CFA; this represents, on average, 7% of the sampled population's annual income. Men were willing to pay significantly more than women (717CFA), however, when WTP was analysed as a proportion of annual income this trend reversed. Income was calculated for each individual, using income from agricultural sources and from other paid employment. Individuals with a WTP as a proportion of income greater or equal to 1 (i.e. they were willing to pay all of their income or more) were omitted from the analysis. 11 individuals in total stated WTP values greater than income. On average, females were WTP 10% of their annual income whereas men were WTP 3.5% of their annual income. The mean WTP demonstrates that men are WTP significantly more in absolute terms; however

women appear to be willing to sacrifice a greater proportion of their income for risk reductions in maternal mortality.

We also found that individuals with higher education were willing to pay more (Table 2). The level of an individual's education was measured in two ways. Firstly, in terms of the number of years of schooling of an individual and secondly, whether an individual had completed primary, secondary or tertiary level education. No women were found to have tertiary level education so this variable was omitted from the analysis. Women with secondary education were on average WTP more than women with primary or no education. A similar trend is found with male respondents. Men with no education and primary education were willing to pay significantly more than females with the same level of education. This is also true of men with secondary education, although the WTP difference is not statistically significant.

Regression analysis

To provide an indication of the most important determinants of WTP and to analyse the factors which influenced WTP whilst controlling for other factors, four ordinary least squares multiple regression models were specified (Tables 3 and 4). The regression models were: Model 1: all respondents; Model 2: all respondents with an additional explanatory variable (sex); Model 3: male respondents only; Model 4: female respondents only. In each model the dependent variable was the log of individual WTP, WTP was log transformed in order to make the distribution of this variable normal.

Explanatory variables included the log of individual annual income, dummy variables for starting bid 5000CFA and starting bid 8000CFA, the low starting bid of 1000CFA was omitted as this was the base variable, respondent age, location of residency, education (measured by years of schooling), and both presence of a maternal complication and/or maternal death in the household were also included in the regression model. The variables included in the regression model, their sign and significance are discussed below.

The variables which were statistically significant in the full sample regression model (both male and female respondents) included the starting bid, annual income, age, education and whether there had been a previous maternal complication in the respondent's household. The coefficient on age was negative, indicating that older people stated lower WTP values.

The variables which were significant for the regression model which included only male respondents (Model 3) were the starting bid values, age (negative coefficient), education and previous history of maternal complications in their household. Income did have a positive coefficient, but was not found to be significantly related to WTP in the male regression model.

In the regression model which included only female respondents (Model 4), starting bid and annual income were the only statistically significant variables.

Discussion

Of the total sampled population 98% respondents stated a positive WTP value. Such high response rates to WTP questions and the lack of 'protest' votes is not uncommon in a developing country setting. This could be due to respondents being more accustomed to making out-of-pocket payments for health care and a familiarity with considering their maximum willingness to pay for goods and services in general (due to a lack of fixed market prices for goods and services and the 'haggling' by buyers and sellers to agree a price).

A key finding of this work was that in absolute terms, men were willing to pay more than women for risk reductions in maternal mortality, but that this trend reversed when analysed as a proportion of annual income. This result would, therefore, indicate that it is women who place a higher value on reductions in maternal deaths as they are willing to sacrifice a greater proportion of their annual income to achieve those gains. This higher value may be related to the increased value on a health issue which affects them as well as their children.

This result hinges on the validity of the income variable. Individual income can be difficult to estimate reliably in these settings as income is determined not only by cash income but also in kind. In addition to this, the notion of individual income, especially for women, and control over income is difficult to grasp. The income data used in the analysis was derived from the Household Survey data. Further research will focus on alternatives to using income as a proxy for ability to pay and will include analysis of expenditure data and asset ownership as alternatives to the income variable.

From the results it is clear that gender is an important determinant of WTP. When analysing the characteristics of the sample, men were found to be older, more educated, and have higher annual incomes. A difference in such characteristics is to be expected since these discrepancies are those which are generally used in indicators of women's unequal status within the household and society, in particular in measures such as the Gender-related Development Index (Dijkstra, 2000). These factors were also found to be significant in the general regression model with income, age and education found to be significant predictors of WTP.

The general regression model also indicated a positive and significant association between income and WTP, therefore indicating that ability to pay is a significant factor in determining WTP values for a risk reduction in maternal deaths. This association between income, as a measure of ability to pay, and WTP is an indication of the theoretical validity of the results. The sign on the income variable for both the male and female regression models was also positive, however, the income variable was only statistically significant in the female regression model. This would suggest that females are taking into consideration budgetary constraints when stating their WTP values, as consistent with the feminisation of responsibility and obligation.

Age was found to be a significant determinant of WTP in the regression analysis. The coefficient for age was negative in both male and female regression models, suggesting that the young are willing to pay more than the aged. Age was found to be statistically significant in the male regression model only.

In all the regression models Bid5000 and Bid8000 were positive and significant. This suggests that individuals who received these higher starting bids as opposed to the 1000 bid had significantly higher WTP. Therefore indicating the presence of starting point bias – where individuals anchor their WTP values to the initial starting bid they received.

It was hypothesised that individuals with a higher standard of education would be willing to pay more for risk reductions. One possible explanation of this could be due to educated respondents being more aware of the adverse consequences of maternal ill health. There were significant differences in WTP between men and women with no education and between men and women with primary level education, but interestingly, no significant difference at secondary education level. The level of education of the respondent was also included in the regression models,

measured in terms of number of completed years of schooling. The coefficients for years of schooling in both male and female regression models are positive, but only significant in the male regression model. Further analysis is required to test whether this is in fact an education effect or an income effect.

Included in the questionnaire were questions detailing the respondent's previous history of maternal deaths and maternal complications in their household. It was hypothesised that respondents who had a previous experience of maternal death or complication would be willing to pay more than respondents who had not, all other things being equal. We found that 27% of respondents had had a maternal complication in their household in the previous five years. 88% of respondents reported to know somebody in the community who had died of maternal causes and 4% of respondents reported a maternal death in their household.

Whether or not the respondent had previous experience of maternal or maternal complication was also included in the regression models. The coefficient for maternal complication in the respondent's household for both male and female regression models is positive, although only significant for the male model. This indicates that men with a previous experience of a maternal complication in their household are WTP significantly more than those without. One possible explanation for this significance in the male regression model could be that direct experience of maternal complications allows men an insight into the adverse consequences of maternal ill health.

Conclusions

There does appear to be a gender effect in WTP for maternal health. It seems logical to suggest that this finding relates to the subject under consideration being a woman's health issue and perhaps women are more willing to sacrifice a greater proportion of their income for risk reductions in maternal mortality – a phenomenon of which they are the most direct victims. However, this result requires confirmation from further analysis of the other determinants of WTP. Indeed, related literature on the feminisation of poverty, and of health and other forms of care in the household, suggests that the picture could be more complex. In other words, women's documented propensity to spend more on family healthcare generally because of their social reproductive role and responsibilities may also affect their willingness to pay for maternal health, although acting in conjunction with their more limited access, or perceived access, to household income. Further research will also focus on

interpretation of the concept of individual income, especially the individual income of women, in societies like Burkina Faso.

The findings here suggest that gender is clearly a factor in willingness to pay for maternal health and that women are more likely to value maternal health more highly, particularly when taking income, and thus ability to pay, into account. Indeed, because of women's unequal access to income within the household and their limited decision-making capacity (Sen, 1985; 1990), it is likely that the findings here are an underestimate of the value they place upon maternal health in comparison with men, given that there is a relationship between willingness to pay and ability to pay. In other words, women's ability to pay is not only related to their own individual income but their perceived ability to use this income (a factor which is invisible in this survey). Should an underestimate be the case, it is further rationale for considering that women place a comparatively much higher value on maternal health than men. The interpretation of this finding is perhaps more complex than at first sight given what is also known about the feminisation of obligation and responsibility (in relation to their social reproductive roles).

Similarly it is interesting to note that men's willingness to pay increases in relation to higher education as well as experience of maternal complications. This may be because men with higher education are more "gender-aware" and thus more likely to consider women's health to be of value. However, an alternative explanation is that men with higher education are better equipped to appreciate all the complex dimensions and implications of maternal health for the household's well-being. It was found that age was negatively related to WTP for men, possibly because men who are of reproductive age value maternal health more highly. Similarly, men's WTP increases with their experience of maternal complications. One possible explanation for this finding is that direct experience of maternal complications allows men an insight into such implications which otherwise might not necessarily appear to affect their household and children greatly.

Clearly an increased value placed upon maternal health by women might be expected because the health outcomes directly affect them. However, it may also be related to women's reproductive responsibilities and obligations since maternal health as a women's health issue may be difficult to separate from maternal health as a neo-natal health issue thus falling into the realm of care for family health. Therefore, an interesting future application of the willingness to pay survey in relation

to gender and maternal health may be to examine women and men's willingness to pay for different aspects of maternal health that are more clearly differentiated in terms of their implications for child's or woman's health outcomes. A second survey has been conducted by IMMFACT into WTP for maternal and perinatal health outcomes and may provide further insight into the importance of gender in assessing the value of maternal health outcomes.

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Box 1

Hypothetical scenario

I would like to ask you some questions concerning your feelings about complications and deaths amongst women who are pregnant. I'm going to do this by asking you to think about a hypothetical situation where the number of deaths and complications is reduced.

To give you a little background, health services aim to prevent illness and disease. However, in many cases, they can be re-organised in order to prevent more illness and disease from occurring. For example, different types of training could be provided for midwives.

I'm going to describe the benefits of a re-organisation of health services. This re-organisation is expected to save the lives of some mothers through the prevention of serious complications. In addition to this, the re-organisation is expected to reduce the number of other complications.

I'd like to know how important this improvement is to you.

At the moment, it's estimated that there are around **60** deaths in Nouna District every year amongst pregnant women. These women die during pregnancy, childbirth, or at a time shortly after, because of complications.

Imagine now, that if a re-organisation was to occur this year, there would be fewer deaths. I'd like you to think about a situation where **45** women would now die next year.

So, what this means is that **15** women next year will be saved as a result of this re-organisation.

If enough individuals make a contribution, the Government and other agencies will also contribute. With enough funds from individuals, the re-organisation can take place, and the lives of **15** women will definitely be saved next year in your District.

What I want to do now is present you with different sums of money and ask which amount of money you will be prepared to pay so that this re-organisation takes place.

In answering these questions, please think about how much you can afford to pay. Think about the things that would have to be given up if you were to pay that particular amount.

Box 2

Example of bidding game technique used (starting bid 5000)

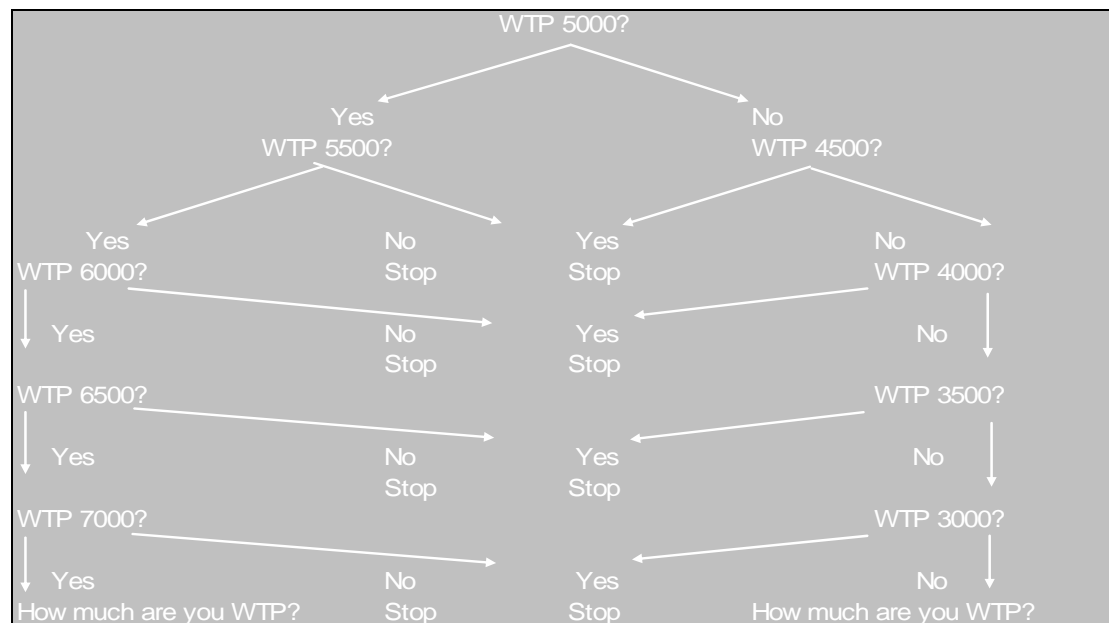


Table 1
Demographic data of respondents

Variable name	Description	Mean			*Test for difference (p)
		Total	Male	Female	
Age	Age of respondent in years	42	46	38	.000
Yearscho	Years of schooling	.9	1.2	.54	.000
Primary	% of respondents with primary education	10%	11.8%	7.7%	.030
Secondary	% of respondents with secondary education	3.7%	5.3%	1.9%	.006
Tertiary	% of respondents with tertiary education	0.7%	1.2%	0%	.022
anninc3	Annual (individual) income	260,627	391,870	110,201	.000
marital status (%):					
single		2.6	3.4	1.6	.083
married		93.7	93.5	94	.781
divorced		0.8	1.4	0	0.01
widowed		2.9	1.6	4.4	0.01

*F test (ANOVA) used to test for differences

Table 2
Male and female WTP and differences in WTP values

Variables	Mean			WTP difference	p
	Total	Male	Female		
Mean WTP	2555	2890	2172	717	**
WTP % of income	7	3.5	10	- 6.5	**
Education:					
None	2376	2670	2156	514	*
Primary	3283	3725	2492	1233	*
Secondary	3215	3373	2700	673	
Marital status:					
Unmarried	2787	2922	2621	301	
Married	2541	2891	2142	749	**
Location of residency					
Nouna town	2475	2792	2093	699	
other	2599	2945	2213	732	*

F- Test – Test for differences between male and female respondents

* Significant at 5% level

** Significant at 1% level

Table 3 Summary of explanatory variables in regression model

Variable name	Description
Bid500 (1 =yes, 0 = no)	Starting bid of 5000CFA (equivalent to £5). This is the middle starting bid. Bid 1000 is used as the base for this dummy variable
Bid8000 (1 =yes, 0 = no)	Starting bid of 8000CFA (equivalent to £8). This is the high starting bid. Bid 1000 is used as the base for this dummy variable
Log annual income	Log transformed, Individual annual income. Measured via income from agricultural sources and from other paid employment.
Age	Respondent age, in years
Nouna (1 =yes, 0 = no)	Location of residency of respondent. Nouna town is semi urban area; all other areas are considered rural locations.
Married (1 =yes, 0 = no)	Indicates whether an individual is married
Years of schooling	Number of completed years of schooling
Maternal complication (1 =yes, 0 = no)	Represents whether there has been a maternal complication in the respondents household in the previous five years
Maternal death (1 =yes, 0 = no)	Represents whether their has ever been a maternal death in the respondents household

Table 4. Regression analysis

Variable	Model 1		Model 2		Model 3		Model 4	
	B	Sig.	B	Sig.	B	Sig.	B	Sig.
Constant	6.037	**	6.619	**	7.162	**	5.698	**
Bid5000 (1 =yes, 0 =no)	.609	**	.616	**	.689	**	.548	**
Bid8000 (1 = yes, 0 = no)	.683	**	.694	**	.696	**	.689	**
Log annual income	.118	**	.081	*	.033		.141	**
Age	-.008	**	-.010	**	-.012	**	-.007	
Nouna (1 = yes, 0 = no)	-.110		-.095		-.047		-.157	
Married (1 = yes, 0 = no)	-.198		-.182		-.123		-.123	
Years of schooling	.031	*	.029	*	.034	*	.022	
Maternal complication (1 =yes, 0 = no)	.277	**	.275	**	.385	**	.155	
Maternal death (1 = yes, 0 = no)	.015		-.002		.086		-.147	
Sex (1= female, 0 = male)	NA		-.226	*	NA		NA	
Adj. R ²	.136		.143		.155		.096	

* Significant at 5% level

** Significant at 1% level

