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A stated preference approach to assessing health care-quality improvements in Palestine: from theoretical validity to policy implications[☆]

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Abstract

User fees have been promoted as a potential complementary funding mechanism for health care in developing countries. In this paper, we appraise the use of contingent valuation (CV) as a tool to help develop user fees schemes that could be used to assist in allocating, and partially fund, health care. A random sample of 499 patients seeking care in primary health care centers, in Palestine, were asked to reveal their willingness to pay values for specified improvements in the quality of delivered medical care. Empirical analysis suggests that, in this context, CV can lead to internally consistent results and useful policy implications.

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1. Introduction

The Palestinian health care system is going through a critical “transitional” period (Hamdan and Defever, 2002), and the question of its funding arises as a key element to ascertain efficient and equitable health care delivery (NSHP, 1999). However, the lack of sufficient public financial resources continues to hinder social and economic developments, including health care provision (MAS, 2000). Complementary financing strategies, based on mobilizing private resources, were proposed by international organizations to temper public financial shortages in developing countries (World Bank, 1987). The strategy that attracted policy- and decision-makers’ most attention consists of introducing user fees (co-payments) to be paid by the patients at the point of consumption – this is commonly known as “cost recovery” (McPake et al., 1993). In such strategy, mobilization of additional funding through user fees is considered as a way to allocate resources for improving the quality of delivered care (Creese, 1991; Griffin, 1992; Barlow and Diop, 1995).

Pricing decisions, however, have proven to be a difficult area of decision making for health care providers who may – legitimately – fear that increased fees will cripple demand and create barriers to access for poor clients (Foreit and Foreit, 2003). Early evaluation of the so-called “Bamako Initiative”, that was launched in 1988 to promote cost recovery policies in many African countries (UNICEF, 1990), has strongly suggested that these programs have tended to focus on their user fees component while disregarding improvement of quality of care (Litvack and Bodart, 1993). Experiences in cost recovery have, however, demonstrated that without visible and immediate improvements in quality of care, user fees implementation will cause service utilization to drop (Alderman and Lavy, 1996; Mariko, 2003). Planning user fees on the basis of patients’ preferences for improving the quality of delivered care should therefore be considered as the most appropriate way to reconcile increased efficiency and better access to health services (Asenso-Okyere et al., 1997; Onwujekwe et al., 1998, 2000; Kadir et al., 2000; Forsythe et al., 2002).

Contingent valuation (CV) (Mitchell and Carson, 1989) is currently the most commonly used stated technique to assess the distribution of patients’ preferences, through eliciting their willingness to pay (WTP) values. Although CV has been mainly developed and applied within areas of public transport (Jones-Lee et al., 1985; O’Reilly et al., 1994) and environment (Hanley et al., 1998; Bergstrom, 2001), it is becoming increasingly used in the context of health care (Donaldson et al., 1997a; Luchini et al., 2003). WTP distribution, as obtained from CV studies, can be used for different purposes (Diener et al., 1998). To date, most CV studies have been carried out to inform budget allocation decisions of publicly financed health care systems, via conducting cost–benefit analysis (CBA) of alternative programs (Protiere, 2002). Another use of CV, although less frequent (Diener et al., 1998; Gafni, 1998), consists of market research with the purpose of assessing demand, and, subsequently, prices for goods to be traded in private markets. The aim of conducting monetary valuation for market research purposes is to construct demand curves for goods usually not yet available in the market place (Bala et al., 1999). A similar approach can however be used to inform decision-makers about the extent to which private resources could be mobilized – and from whom – to assist in funding health programs using a cost-recovery policy. We will further refer to this subset of market research application as *WTP-finance studies*. Similar

interventions using variants of the CV technique are well known in areas like outdoor recreation analysis; here, a “fee” to use the facility is the usual payment mechanism (Teasley et al., 1994; Betz et al., 2003). It is important to note that in developed countries, most CV studies have been done for the purposes of CBA, whereas most CV studies in developing countries have been performed for the purpose of setting a price (Forsythe, 2001).

In this paper, we present a CV study applied to primary health care (PHC) in Palestine. As a response to the current financial crisis of public budgets in the emerging Palestinian state, our study aims to supply local health care providers with complementary information to help develop co-payment schedules that could be used to assist in allocating, and partially fund, health care services. However, given the controversy surrounding the use of surveys involving valuation of hypothetical scenarios, it was also important to test the feasibility and the validity of the method in this context. A CV questionnaire was designed to assess the value of improving the quality of PHC from the patients’ perspective. A set of quality attributes was used to specify the nature and degree of quality improvements to be valued by the respondents. In the following section, we briefly describe the political context of the study and provide some background information. In the third section, we present the questionnaire instrument and the study sample, beside the econometric/statistical techniques used. Results are then presented and discussed in the fourth and fifth sections, and are followed by some concluding remarks.

2. Background

Following the signature of the “Oslo Peace Agreements” between Israel and the Palestinian Liberation Organization (PLO) in 1993, a Palestinian Ministry of Health (PMOH) was established under the auspices of the Palestinian Authority (PA). Its primary role is to provide comprehensive health care services to the Palestinian population and to promote an efficient and equitable utilization of health care resources (NSHP, 1999). The PMOH found itself confronted with a complex and heterogeneous health care system with respect to its actors and organizations (Barghouti and Lennock, 1997). Four main actors were assisting in health care provision: a “weak” governmental health care sector depending on the Israeli administration; a group of Palestinian non-governmental organizations (PNGOs) playing an essential role in primary health care delivery; United Nations for Works and Relief Agency (UNRWA) serving the Palestinian refugees of the 1948 war; and finally, a private sector only accessible to the most wealthy groups of the population (Barghouti and Diabes, 1996a,b). Being unable to replace all that existed before, which would not have been the best solution given limited resources, the PMOH chose to benefit from this diversity and to rather play a role of coordination between the already existing health care providers (Barghouti and Lennock, 1997). Thus, PNGOs who currently manage more than 30% of the available PHC centers, were asked to retain their role, especially, at the PHC level, beside a number of governmental and UNRWA structures.

Following the Oslo agreements, international donations that were the main sources of direct funding for most PNGOs became centrally managed by the PMOH. In order to improve and develop the health care infrastructure dilapidated by years of neglect, and to use a significant share of international funds for creating new health facilities, the PMOH restricted

the access of PNGOs to these international donations and urged them to ensure a significant part of their funding by themselves. One potential solution was to involve patients in the funding process and to mobilize private resources (McPake et al., 1993). Some PNGOs had already used similar financial policies to ensure efficient utilization of health care services and prohibit service abuse. Similar financial policies were also envisaged by the PMOH as a way to guarantee future financial sustainability and self-sufficiency. Indeed, implementing cost recovery schemes was listed as one of the strategic objectives in the Palestinian National Health Plan (NSHP, 1999, p. 28). Our study was designed as a way to provide managers of private-not-for profit PHC, as well as public providers, with complementary information concerning the level and structure of user fees to be implemented, based on an assessment of the value for the users of potential quality improvements in the supply of medical services.

3. Materials and methods

3.1. Questionnaire design

A CV questionnaire was designed to assess the value of improving the quality of PHC services. Improvements over seven quality attributes were separately assessed using a *decomposed valuation scenario* (O'Brien and Gafni, 1996) – the attributes and their corresponding measurement scales are presented in Appendix A. This was preferred to the *holistic scenario* approach (O'Brien and Gafni, 1996) in order to facilitate scenario comprehension and to allow for inter-attributes comparisons. An implicit assumption under the decomposed valuation is that utility variations following improvements in one attribute do not depend on the levels of other quality attributes (Kim et al., 1998; McDaniels and Roessler, 1998). However, in order to get a proxy-estimation of the total value, a semi-holistic valuation scenario, using simultaneous improvements over the three most important attributes for the respondent to be ameliorated, was also investigated.

The questionnaire was divided into three sections. In Section 1, study objectives and political implications were presented, alongside some introductory information about CV. In order to justify the use of monetary valuation and thus enhance CV validity, examples about everyday price/quality tradeoffs were cited; and the expected positive association between value and WTP was emphasized. Given that improvements in the “Drug Availability” attribute was believed to be the easiest to understand – patients usually pay for their medications and there is a well-known problem of drug shortage in PHC centers¹ – this attribute was used to illustrate the hypothetical valuation exercise. Available substitutes (private pharmacies) were mentioned, and respondents were reminded of the ‘*doing nothing*’ option. Finally, it was stressed to the respondents that their answers should represent a maximum extra user fee they would be prepared to pay out-of-pocket at every new medical consultation at the PHC to benefit from the improvement. Information in this section was memorized by the

¹ This was verified by our own results mainly for the governmental PHC centers; 35% of patients frequenting governmental PHC centers were not able to find all their prescribed medications in the center versus 12% in the NGO PHC centers ($P < 0.0005$).

interviewers and presented to each respondent before asking any valuation question (see [Appendix B](#)).

In [Section 2](#), respondents characterized the *status quo* level of each of the attributes, and assessed a transition from the *status quo* to the preferred state.² Ordinal measurement scales were used to describe the levels of five of the attributes, whereas quasi-interval scales, based on a Likert-scaling technique ([Ryan et al., 2001](#)), were used to characterize the “Doctor–Patient Relationship (DPR)” and the “Chance of Recovery” attributes (see [Appendix A](#)). Qualitative measurement scales were preferred to objective measures because different individuals might perceive the same objective improvement differently which might bias the valuation process. Given that the *status quo* quality level varied across respondents, and that the *new* proposed quality level was identical for the entire sample, variable degrees of quality improvements – depending on the *status quo* quality level – were assessed by the different respondents.

A general question about whether the patient would be willing to pay any extra user fee to benefit from a better quality was asked before starting the partial valuation questions. The same question was repeated at the end of the study to verify if patients’ preferences varied with the information presented in the questionnaire or due to a better understanding of what was intended by improving the quality of delivered care. WTP questions were asked in two stages: respondents were first asked whether they would be willing to pay any extra user fee to benefit from the improvement, and only in case of a positive answer, were they then questioned about their maximum WTP value. A user-based financing mechanism, with out-of-pocket payments at the point of consumption, was chosen to be the payment vehicle in the study; and a payment card technique was used to elicit patients’ WTP values. Those who were not willing to pay were asked a “Why?” open question (see [Appendix C](#) for the whole valuation scheme). At the end of the questionnaire, respondents were given the possibility to revise all their WTP answers.

Given that a high percentage of respondents were expected to be aged and illiterate, which might affect their capacity to conceive standard payment card format with only a list of numerical values, photographs of local money coins were inserted beside each numerical value. Discrete increasing amounts going from zero to ten New Israeli Shekels (NIS) – at the moment of the study 1 NIS = 0.24 US Dollars – were listed on a separate sheet of cardboard and presented to the respondents for each WTP question. Values were selected taking into consideration what patients actually pay for the services, and what they would have paid for private doctors with equivalent qualifications. To avoid truncated data, respondents were given the possibility to specify a value if greater than 10 NIS. Furthermore, to remind respondents that they were being asked about seven different attributes, all susceptible to improved quality, and that the current question concerned only one attribute, the seven attributes were listed in the payment card beside the listed values (see [Appendix D](#) for an example of the payment card).

² The “highest” category on each measurement scale was treated as the preferred state of the corresponding attribute ([Appendix A](#)). However, for “Geographical Proximity” and “Waiting Time” attributes, respondents were also asked to identify the distance and the waiting time they perceive as “Very Close” and “Not Long at All”, respectively. This was used to assess the consistency of qualitative measurement scales.

Following the seven partial WTP questions, respondents were asked to select the three attributes they considered as the most important for them to be ameliorated; and they stated the monetary value for a simultaneous improvement over them. For this purpose, each respondent was presented with a scale containing one of two sets of values (0–20 or 0–30 NIS). Respondents were asked to indicate the amounts they were sure that they would be willing to pay, and those they were sure that they will not be willing to pay. If the respondent declared willing to pay A but not B ($>A$), where B is the consecutive value in the set, her/his maximum WTP was taken as the mean of A and B . Again, an open-ended question was used to avoid truncated data if the stated WTP value exceeded the highest number in the set. The last section included respondents' socioeconomic and demographic characteristics. The survey instrument is available at the corresponding author's website at: <http://www.geocities.com/awadmataria/CVquestionnaire.pdf>.

3.2. Study sample

Two university students and two community health workers were recruited and trained to administer the questionnaire during a one-month period (from 14/07/01 to 13/08/01). Respondents were randomly selected amongst patients seeking care in four PHC centers situated in the Ramallah District – one of the principle districts located in the West Bank and under the responsibility of the Palestinian Authority. The centers were selected to represent the different types of PHC facilities existing in Palestine. The four selected centers were: Ramallah Governmental PHC center which is a governmental-urban PHC center; Al-Zaka PHC center which is a non-governmental-urban PHC center; Beet-Liqya Governmental PHC center which is a governmental-rural PHC center; Bido-Union of Palestinian Medical Relief Committees' (UPMRC) PHC center which is a non-governmental-rural PHC center. Patients were directly addressed on exit from the doctor's room. They were given some basic information about the study to get their consent to participate; and were given time to visit the local pharmacy if they wanted to. Once terminating the interview in hand, the fieldworker addressed the next patient to come out of the doctor's room; any adult getting out from a consultation was eligible to take part in the study.

During the general study, 785 patients were approached and asked to participate in our questionnaire and 499 (63.6%) gave their consent. Interviews lasted between 15 and 90 min with an average of 28.4 (± 8.2) min. An equal number of individuals were recruited from the two urban PHC centers, counting for 70% of the sample. In addition, respondents were equally distributed between governmental and non-governmental PHC centers. In 75.8% of the cases the respondent was the patient her/himself, while, in the rest of the cases, mainly when the consulting patient was a child, the accompanying adult person answered the questionnaire. Some sample characteristics are summarized in Table 1.

3.3. Econometric/statistical tools and validity testing

The consistency of the qualitative measurement scales used to characterize quality levels for the "Geographical Proximity" and the "Waiting Time" attributes was assessed using an analyses of variance (ANOVA), based on respondents' declared travel and waiting times

Table 1
Sample characteristics

Variable	N (%) or mean (\pm S.D.)
Sample size (response rate)	785 (63.6%)
Sample size (net)	499
PHC center	
Ramallah Governmental PHC center	175 (35.1%)
Al-Zaka PHC center	177 (35.5%)
Beet-Liqya Governmental PHC center	83 (16.6%)
Bido-UPMRC PHC center	64 (12.8%)
Gender (female)	383 (76.8%)
Age (years)	35.9 (\pm 13.7)
Education (formal schooling years)	8.5 (\pm 4.6)
Marital status	
Married	405 (81.2%)
Widowed/widower	24 (4.8%)
Divorced	6 (1.2%)
Single	58 (11.6%)
Occupancy (housewife) ^a	63.8%
Living zone	
City	60 (12.2%)
Village	415 (84.2%)
Refugee-camp	18 (3.7%)
Reason for the medical visit	
Chronic disease and condition	109 (21.8%)
Acute inf. and common illnesses	327 (65.5%)
Pregnancy	21 (4.2%)
Emergency	12 (2.4%)
Others	30 (6.0%)
Insurance status (insured)	373 (75.4%)
User fee co-payment (free) ^b	271 (54.7%)
Number of person per household	7.4 (\pm 3.6)
Number of persons <14 years old	3.1 (\pm 2.2)
Number of person in charge	7.5 (\pm 3.7)
Came more than once during last year	89.2%
Examined by a generalist ^c	67.5%
Household monthly income (NIS)	
\leq 1000	128 (26.8%)
]1000–2000]	182 (38.1%)
]2000–3000]	97 (20.3%)
]3000–4000]	38 (8.0%)
]4000–5000]	19 (4.0%)
>5000	14 (2.9%)

^a Other occupancies included: 11.2% employed, 7.5% workers, 6.9% independent, 4.7% unemployed, 4.1% students and 1.4% others.

^b Global mean user fees = 6.3 (\pm 8.1) NIS.

^c Amongst the 161 patients examined by specialists, 150 patients were recruited from the two NGO PHC centers.

(in min). A DPR- and a Chance of Recovery-scores were calculated based on the five Likert questions. For each item, respondents' answers from "strongly disagree", "disagree", "undecided", "agree" to "strongly agree" were coded as 1–5, respectively. A score was calculated by taking the average of respondents' answers for the five questions and multiplying the result by 20 for technical reasons (range [20,100]). Before calculating the Chance of Recovery-score, items 2, 4 and 5 were re-coded, inversely. The two Likert-scales were assessed for their internal reliability using the Cronbach's alpha technique.³

Tobit regression analysis for limited dependent variables (Tobin, 1958) was used to examine the association between stated WTP values and respondents' demographic and socioeconomic characteristics. This was preferred over the ordinary least square (OLS) estimator which fails to account for qualitative differences between the limit observations (those with zero WTP) and the non-limit observations (those with WTP > 0), leading to erroneous estimation of the marginal effects (Donaldson et al., 1998). Seven Tobit regression analyses were conducted; each concerned a partial WTP value (dependent variable) and a list of independent variables, including corresponding quality attribute's *status quo* level, and respondents' demographic and socioeconomic characteristics. Independent variables in the model are listed in Table 2. Each of the regressions was followed by Ramsey (1969) RESET test⁴. Descriptive analyses were obtained using the computer software SPSS release 9 for Windows; and econometric analyses were carried out using Stata release 7.0 for Windows.

The internal validity of stated WTP values, which reflects whether the values behave as one would expect a priori, was ascertained by examining the association between the WTP values and respondents' income. Another validity feature examined by the analysis consists of the construct validity of WTP values. This reflects the aptitude of CV to discriminate between the value of different degrees of quality improvements (O'Brien and Viramontes, 1994; Leedy, 1997). It could be argued that such a test is also a form of *sensitivity to scope* test (Carson, 1999; Yeung et al., 2003).

4. Results

4.1. Characterization of quality status quo level

Table 3 presents respondents' current estimation of five of the seven attributes used to measure the quality of services in the PHC centers. Ninety-two percent of the respondents came to the center either on foot and/or by public transportation versus 7% who used their private cars. The mean travel time to the center was about 45 min, with significant variations

³ Internal reliability concerns whether each scale is measuring a single idea, and hence whether the items making up the scale are internally consistent. With Cronbach's alpha, the items are divided into two groups, a score is calculated for each half, and then a correlation coefficient is generated for the two-half scores. The process is repeated with all possible splitting and the average of the resulting correlation coefficients is calculated. The rule of thumb is that the result should be 0.8 or above to consider the scale as internally consistent (Bryman and Cramer, 1999).

⁴ The test is based on augmented regression including squares, cubics and quadratics of the fitted values. The auxiliary augmented model is: $y = X\beta + \alpha_1 y^2 + \alpha_2 y^3 + \alpha_3 y^4 + \varepsilon$. The test of specification error is then a joint test of $\alpha_1 = \alpha_2 = \alpha_3 = 0$. H_0 : there is no misspecification; H_1 : there is a misspecification.

Table 2
Independent variables' specification for the Tobit regressions

GPVFAR	Geographical proximity; 1 for "Very Far", 0 for otherwise
GPFAR	Geographical proximity; 1 for "Far", 0 for otherwise
GPAVGE	Geographical proximity; 1 for "Average", 0 for otherwise ^a
WTVLONG	Waiting time; 1 for "Very long", 0 for otherwise
WTLONG	Waiting time; 1 for "Long", 0 for otherwise
WTAVGE	Waiting time; 1 for "Average", 0 for otherwise
WTNLONG	Waiting time; 1 for "Not long", 0 for otherwise ^b
ATTDVBAD	Attitude; 1 for "Very bad", 0 for otherwise
ATTDBAD	Attitude; 1 for "Bad", 0 for otherwise
ATTDGOOD	Attitude; 1 for "Good", 0 for otherwise ^c
SAMNEVER	Seeing the same doctor; 1 for "Never", 0 for otherwise
SAMRARE	Seeing the same doctor; 1 for "Rarely", 0 for otherwise
SAMEOFTN	Seeing the same doctor; 1 for "Often", 0 for otherwise ^d
DRPRC	Doctor–patient relationship; average of five items' scores multiplied by 20, range [20,100]
DRUGNONE	Drug Availability; 1 for "None of them", 0 for otherwise
DRUGSOME	Drug Availability; 1 for "Some of them", 0 for otherwise ^e
RECOVSC	Chance of Recovery; average of five items' scores multiplied by 20, range [20,100]
SEX	Sex; 1 for female, 0 for male
AGE	Age, in years
EDUC	Education, number of schooling years
INCOME	Income in New Israeli Shekel, measured using intervals of 500 NIS (continuous)
LOCATION	Location; 1 for rural, 0 for urban
NATURE	Nature; 1 for NGO, 0 for governmental
REASON	Reason of medical visit; 1 for acute reason, 0 for chronic condition
PAYMENT	Payment; 1 for charged service, 0 for free service

^a Geographical proximity = "Close" and "Very close" are combined and included in the constant.

^b Waiting time = "Not long at all" is included in the constant.

^c Attitude = "Excellent" is included in the constant.

^d Seeing the same doctor = "Always" is included in the constant.

^e Drug Availability = "All" is included in the constant".

between respondents (± 40 min). The distance to the center was perceived as "Far" or "Very Far" by more than the half of the sample. Respondents declared that a travel time of about 12 min would be considered as "Very Close". On average, respondents waited 35 min (max = 270 min) before meeting the doctor. This was perceived as "Long" or "Very Long" by 38% of them. Respondents declared that a waiting time less than 20 min would be perceived as "Not Long at All". In general, respondents did not complain about the attitude of the personnel of the centers. Most of them (96%) declared being received and treated in an "Excellent" or "Good" manner. Only half of the respondents were always examined by the same doctor; about one-fifth of the patients rarely meet, or have never met, the same doctor in the center. In 93.3% of the cases, patients received a prescription. Three quarters of those who got a prescription were able to find all their medication(s) in the local pharmacy of the center; 16% did find some and 8% did not find any of their drugs. Most of those who were able to find their medications in the center (>95%) were able to buy them all. Regarding the Doctor–Patient Relationship, patients spent on average less than 8 min with the doctor. This was estimated insufficient by approximately one third of them. For the measurement of the quality of DPR, the answers to the five Likert questions led to the estimation of a mean DPR

Table 3
Characterization of quality *status quo* level

Attributes	Categories	N (%)
Geographical proximity	Very Far	159 (32.1%)
	Far	110 (22.2%)
	Average	141(28.5%)
	Close or Very Close	85 (17.1%)
Waiting time	Very Long	95 (19.1%)
	Long	93 (18.7%)
	Average	124 (24.9%)
	Not Long	96 (19.3%)
	Not Long at All	89 (17.9%)
Staff attitude	Excellent	281 (56.3%)
	Good	197 (39.5%)
	Bad	15 (3.0%)
	Very Bad	6 (1.2%)
Seeing the same doctor	Always	266 (53.7%)
	Often	60 (12.1%)
	Rarely	65 (13.1%)
	Never	41 (8.3%)
	First visit	63 (12.7%)
Drug Availability	All	351 (76.1%)
	Some	73 (15.8%)
	None	37 (8.1%)

score of 63.7 (± 22.6), range [20,100]. Patients' answers to the five Likert scaling questions concerning their Chance of Recovery following the medical visit led to the estimation of a mean Chance of Recovery score of 63.4 (± 16.8), range [20,100].

4.2. Stated WTP values

Most of the respondents (93.4%) declared, in general, they were willing to pay higher user fees to benefit from better quality, and only few of them (eight individuals) changed their answers at the end of the valuation exercise. As shown in Table 4, improvements for

Table 4
Percentage of respondents willing to pay for improvements over each of the attributes, and mean WTP values per attribute

Attribute	Contributors (%) (WTP > 0)	WTP (NIS): mean (\pm S.D.) ^a
Geographical proximity	70.1	7.8 (± 15.0)
Waiting time	59.4	4.1 (± 8.9)
Attitude of PHC center's staff	41.3	4.2 (± 11.2)
Seeing the same doctor	47.3	4.2 (± 8.9)
Doctor–patient relationship	65.7	6.4 (± 13.9)
Drugs availability	74.6	6.2 (± 10.4)
Chance of Recovery	78.5	8.0 (± 13.0)

^a Non-contributors (WTP = 0) were included in calculated means.

which patients were willing to pay the most (8 NIS) included the “Chance of Recovery” attribute – which was used to reflect the competence of the practicing doctor as perceived by the patient – and the “Geographical Proximity” of the PHC center. Given the difficult transportation conditions in Palestine at the time of the study – due to the persisting political conflict and following the explosion of the second Palestinian Intifada, the Israeli army installed checkpoints at all the cities’ entries and between principle villages – an expected result was to observe patients willing to make sacrifices to have medical centers located close to their living zones with competent practitioners. WTP for improvements over DPR and “Drug Availability” came in the second place with values being around 6 NIS. The lowest stated WTP values (4 NIS) concerned proposed improvements over the “Waiting Time” attribute. Indeed, the high unemployment rates due to the unstable political conditions had probably affected patients’ appreciation of time. WTP values for improving the “Staff Attitude” and “Meeting the Same Doctor” attributes were also limited and this has to be related to the already existing high level of satisfaction for these attributes (Table 3).

“Drug Availability”, “Geographical Proximity” and DPR were the three attributes cited most frequently as being the most important for the respondent to be ameliorated. Respondents were willing to pay on average an extra user fee of 16 NIS to benefit from a simultaneous amelioration over their three most important attributes. A simple *t*-test demonstrated that stated WTP values were subadditive. This can be explained by normal income effects and the possibility of inter-attributes substitutability.

For each attribute, a relatively high number of respondents declared they were not willing to pay for the improvement – this varied from 21% for the “Chance of Recovery” attribute up to 59% for the “Attitude of the PHC center’s staff” attribute. However, few of them gave reasons indicating a potential “protest” answer. Moreover, the number of respondents who declared they were not willing to pay for all the seven attributes – valued separately – was remarkably low (20 persons). This means that most of those who declared they were not willing to pay for one quality attribute were not giving a similar systematic answer for the other attributes. Hence, and based on these two arguments, all “zero” values given by respondents were included in the analysis.

4.3. Econometric/statistical analysis

Analysis of variance revealed that patients who declared living at further distances, or waiting longer before meeting the doctor, experienced, respectively, longer travel and waiting times ($P < 0.01$). This shall confirm the suitability of using the above qualitative measurement scales to specify the extent of quality improvements to be valued by the respondents. Similar significant results were obtained based on the Cronbach’s alpha technique to assess the Likert-scaling internal reliability ($\alpha = 0.90$ and 0.72 , respectively). Tobit regression results are presented in Table 5 and the marginal effects are calculated in Table 6. The latter consists of: (1) variations in the positive WTP values, and (2) variations in the probability of stating a positive WTP value for respondents who declared that they were not willing to pay (McDonald and Moffitt, 1980; Roncek, 1992).

In accordance with our a priori expectations, the degree of quality improvement was significantly associated with the stated WTP values. This can be added to evidence on the

Table 5
Factors influencing partial WTP values (Tobit regression analysis)

Independent variable	<i>B</i> (<i>B</i> S.E.)						
	Geographical proximity (WTP)	Waiting time (WTP)	Attitude of staff (WTP)	Same doctor (WTP)	DPR ^a (WTP)	Drug Availability (WTP)	Chance of Recovery ^a (WTP)
Constant	-14.459*** (4.888)	-2.928 (3.084)	-3.949 (4.814)	-9.564** (4.374)	9.726** (4.369)	-0.303 (2.973)	18.566*** (3.902)
GPVFA	16.671*** (3.227)	-	-	-	-	-	-
GPFAR	13.426*** (3.326)	-	-	-	-	-	-
GPAVGE	10.322*** (3.196)	-	-	-	-	-	-
WTVLONG	-	7.604*** (2.063)	-	-	-	-	-
WTLONG	-	7.667*** (2.120)	-	-	-	-	-
WTAVGE	-	0.429 (2.049)	-	-	-	-	-
WTNLONG	-	1.522 (2.136)	-	-	-	-	-
ATTDVBAD	-	-	17.294** (8.335)	-	-	-	-
ATTDBAD	-	-	17.858*** (5.553)	-	-	-	-
ATTDGOOD	-	-	7.593*** (2.487)	-	-	-	-
SAMNEVER	-	-	-	9.696*** (3.386)	-	-	-
SAMRARE	-	-	-	14.297*** (2.961)	-	-	-
SAMEOFTN	-	-	-	6.279** (2.560)	-	-	-
DPRSC	-	-	-	-	-0.163*** (0.048)	-	-
DRUGNONE	-	-	-	-	-	3.073 (2.291)	-
DRUGSOME	-	-	-	-	-	0.691 (1.739)	-
RECOVSC	-	-	-	-	-	-	-0.174*** (0.047)
SEX	-2.070 (1.512)	-0.493 (0.979)	-1.238 (1.672)	1.463 (1.641)	0.789 (1.652)	0.316 (1.240)	-1.119 (1.178)
AGE	0.044 (0.064)	-0.133*** (0.045)	-0.165** (0.073)	-0.107* (0.062)	-0.115* (0.064)	-0.017 (0.046)	-0.139*** (0.049)
EDUC	0.106 (0.204)	0.190 (0.140)	-0.095 (0.231)	<0.001 (0.206)	0.169 (0.201)	0.553*** (0.148)	-0.075 (0.156)
INCOME	1.128*** (0.399)	0.595** (0.269)	0.890* (0.461)	0.576 (0.377)	1.390*** (0.386)	0.381 (0.273)	1.483*** (0.302)
LOCATION	-8.389*** (2.274)	-1.172 (1.411)	-11.356*** (2.700)	-1.777 (2.302)	-5.024** (2.184)	1.065 (1.432)	-3.222* (1.650)
NATURE	0.779 (3.939)	2.399 (1.633)	-0.637 (3.361)	5.868 (3.771)	-0.673 (2.634)	2.668 (3.059)	2.185 (3.201)
REASON	-0.194 (0.271)	0.056 (0.184)	0.511 (0.334)	-0.159 (0.250)	-0.173 (0.270)	-0.172 (0.197)	0.032 (0.209)
PAYMENT	5.463 (3.907)	-1.240 (1.151)	0.659 (2.664)	-0.966 (3.470)	-0.514 (1.684)	-7.805** (3.057)	-3.594 (3.105)
Number of observations	476	478	478	414	477	440	475
Number of censored observed	137	195	280	228	166	112	99
Log likelihood	-1545.13	-1230.62	-1004.54	-884.06	-1449.33	-1375.19	-1614.80
Probability > χ^2	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
RESET (probability > <i>F</i>)	0.1181	0.9703	0.0392**	0.5482	0.4190	0.5750	0.7444

Notes: *B* = coefficient, *B* S.E. = standard error of the coefficient.

^a DPR score and Chance of Recovery score; range [20,100].

* *P* < 0.10.

** *P* < 0.05.

*** *P* < 0.01.

Table 6
Marginal effects of factors influencing WTP values (Tobit regression analysis)

Independent variable	Geographical proximity (WTP)		Waiting time (WTP)		Attitude of staff (WTP)		Same doctor (WTP)		DPR (WTP)		Drug Availability (WTP)		Chance of Recovery (WTP)	
	B'	B''	B'	B''	B'	B''	B'	B''	B'	B''	B'	B''	B'	B''
GPVFAR	0.336***	7.391***	–	–	–	–	–	–	–	–	–	–	–	–
GPFAR	0.269***	6.111***	–	–	–	–	–	–	–	–	–	–	–	–
GPAVGE	0.214***	4.456***	–	–	–	–	–	–	–	–	–	–	–	–
WTVLONG	–	–	0.242***	3.078***	–	–	–	–	–	–	–	–	–	–
WTLONG	–	–	0.243***	3.116***	–	–	–	–	–	–	–	–	–	–
WTAVGE	–	–	0.014	0.155	–	–	–	–	–	–	–	–	–	–
WTNLONG	–	–	0.050	0.561	–	–	–	–	–	–	–	–	–	–
ATTDVBAD	–	–	–	–	0.346**	6.537	–	–	–	–	–	–	–	–
ATTDBAD	–	–	–	–	0.357***	6.742**	–	–	–	–	–	–	–	–
ATTDGOOD	–	–	–	–	0.147***	2.243***	–	–	–	–	–	–	–	–
SAMNEVER	–	–	–	–	–	–	0.259***	3.516**	–	–	–	–	–	–
SAMRARE	–	–	–	–	–	–	0.373***	5.459***	–	–	–	–	–	–
SAMEOFTN	–	–	–	–	–	–	0.168**	2.125**	–	–	–	–	–	–
DPRSC	–	–	–	–	–	–	–	–	–0.004***	–0.062***	–	–	–	–
DRUGNONE	–	–	–	–	–	–	–	–	–	–	0.090	1.436	–	–
DRUGSOME	–	–	–	–	–	–	–	–	–	–	0.021	0.307	–	–
RECOVSC	–	–	–	–	–	–	–	–	–	–	–	–	–0.004***	–0.080***
SEX	–0.045	–0.830	–0.016	–0.177	–0.024	–0.356	0.038	0.449	0.017	0.299	0.010	0.139	–0.028	–0.518
AGE	0.001	0.018	–0.004***	–0.048***	–0.003**	–0.047**	–0.003*	–0.033*	–0.003*	–0.044*	–0.001	–0.007	–0.004***	–0.064***
EDUC	0.002	0.043	0.006	0.068	–0.002	–0.027	<0.001	<0.001	0.004	0.064	0.017***	0.243***	–0.002	–0.035
INCOME	0.024***	0.452***	0.020**	0.214**	0.017*	0.256*	0.015	0.177	0.031***	0.526***	0.012	0.167	0.038***	0.686***
LOCATION	–0.182***	–3.183***	–0.038	–0.417	–0.204***	–3.042***	–0.046	–0.538	–0.111**	–1.837**	0.032	0.474	–0.083*	–1.452**
NATURE	0.017	0.313	0.078	0.865	–0.012	–0.183	0.153	1.824	–0.015	–0.255	0.081	1.178	0.055	1.012
REASON	–0.004	–0.078	0.002	0.020	0.010	0.147	–0.004	–0.049	–0.004	–0.066	–0.005	–0.076	0.001	0.015
PAYMENT	0.117	2.211	–0.041	–0.447	0.013	0.189	–0.025	–0.296	–0.011	–0.195	–0.237***	–3.385**	–0.091	–1.654

Notes: B' is the marginal effects for the probability of being uncensored and B'' is the marginal effects for the expected WTP value conditional on being uncensored; E (WTP | 0 < WTP).
 * P < 0.10.
 ** P < 0.05.
 *** P < 0.01.

construct validity of the method.⁵ In effect, our results suggest that the probability that a respondent living “Very Far” from a PHC center be willing to pay in order to have a “Very Close” center, is 0.34 greater than that of a respondent living “Very Close” or “Close” to a PHC center. Moreover, those living “Very Far” from the center were willing to pay approximately 7.5 NIS more at every medical visit to have a “Very Close” PHC center (for illustrative purposes, these two results are underlined in Table 6). Patients living “Far” or at an “Average” distance from the center were willing to pay, respectively, 6 and 4.5 NIS more at every consultation to have a Very Close PHC center. All the results were significant at 1% level.

Similar results were obtained for the “Waiting Time” and “Staff Attitude” attributes. Indeed, respondents waiting “Very Long” before meeting the doctor or feeling they are treated “Badly” by the personnel of the center, were willing to pay significantly more (3 and 6.5 NIS, respectively) to have each of these attributes getting improved to the highest level. The “Very Bad” category was not significant and this may be due to the small number of individuals in this category (six patients).

Respondents were also willing to pay in order to be “Always” able to meet the same doctor in the center. However, those who “Rarely” meet the same doctor had a higher probability of stating a positive WTP value, and declared higher WTP values, in comparison with those who “Often” meet, or have “Never” met, the same doctor in the center. It can be argued that, those who “Often” meet the same doctor might have estimated that it was not worthwhile to pay more just to see her/him every time because next time they will most probably meet the same one. On the other hand, those who have “Never” met the same doctor in the center do not probably feel the advantage of meeting the same doctor every time they come to the center; therefore, they might have judged this attribute as “not important”.

The negative sign of the coefficients of the DPR- and the Chance of Recovery-scores was expected (significant at 1% level). This means that the probability that a respondent declares a positive WTP value decreases as the DPR-score or the Chance of Recovery-score increase – a higher DPR- and Chance of Recovery-scores indicate a better satisfaction from the relationship with the doctor and a higher expected chance of recovery, respectively. Given that the two scores are indices, results cannot be expressed in more substantive terms.

With regard to the “Drug Availability” attribute, although the coefficients had the expected sign and order, they were not significant. This might be due to a problem in the framing of the valuation question for this attribute. Indeed, respondents were asked about their WTP values to be “Always” able to find their prescribed medications in the center, therefore, even those who found their prescribed medications in the center at the moment of the study were willing to pay significant amounts to be “Always” able to find them. A better question framing that considers the number of times the patients find their prescribed medications in the center might lead to more robust results.

As expected, the income variable had a positive coefficient in the seven Tobit regressions. This was significant for five of the seven attributes, excluding “Seeing the Same Doctor” and “Drug Availability” attributes. Results suggest that respondents with higher household

⁵ A similar significant association between stated WTP values and the degree of quality improvement was obtained from the analysis of covariance (ANCOVA) of the different partial WTP values, using income as a covariate.

income of 500 NIS, have a higher probability of 0.02 to state a positive WTP value to have a “Very Close” PHC center, and are willing to pay an extra 0.5 NIS for this purpose, all things being equal. On the other hand, they have a higher probability of (0.02–0.04) to state a positive WTP value for improvements over the other significant attributes, and they are willing to pay between 0.2 and 0.7 NIS as an extra user fee for such improvements. Assuming that preferences are equivalently distributed among different income classes, this positive association can be seen as an evidence of CV’s internal validity, in eliciting values for quality improvements.

Females had a tendency to state lower WTP values for improvements over the “Geographical Proximity”, “Waiting Time”, “Attitude of the staff” and “Chance of Recovery” attributes; however, the sex variable was not significant. In general, elderly patients had a lower probability of stating positive WTP values for improvements over most of the attributes (significance levels varied between 1 and 10%). This was not the case for the “Geographical Proximity” attribute where they were willing to pay more to have a closer PHC centre; however, the result was not significant. Respondents with more schooling-years were willing to pay more in order to “Always” find their prescribed medications in the center ($P < 0.01$).

Although, no significant differences were found between WTP values stated by respondents recruited in governmental and non-governmental PHC centers, patients recruited from the rural PHC centers were willing to pay less to benefit from better quality. Furthermore, no significant differences were found between respondents seeking care for chronic problems and those coming to the center due to an acute condition. Finally, the results suggest that respondents who were charged for the service had a lower probability of 0.24 ($P < 0.01$) of stating a positive WTP value to be “Always” able to find their prescribed medications in the center. They were also willing to pay 3.4 NIS ($P < 0.05$) less than the respondents who get the service freely to benefit from the improvement, all things being equal.

5. Discussion

In this paper, we addressed the question of the potential use of WTP values, elicited through CV technique, to help develop co-payment schemes that could be used to assist in allocating and partially fund health care in developing countries. The validity of WTP results was also assessed using Tobit regression analysis. The discussion below is divided into two parts: firstly, we consider the way in which the WTP distribution was obtained and thus discuss issues related to the CV instrument and its validity in the context of WTP-finance studies. Secondly, we tackle the question of how policymakers can make use of the WTP information to implement quality improvements and elaborate funding mechanisms.

5.1. WTP distribution and CV method

The validity of CV studies is sometimes questioned especially in the context of developing countries (Asenso-Okyere et al., 1997; Onwujekwe et al., 2001). Before our study has been carried out, it could be argued that the critical current political situation of Palestine may jeopardize the feasibility and validity of using such tools to elicit patients’ preferences

for having access to health care services. In contrast with such a priori fears, empirical analyses of the stated WTP values in our study demonstrate a quite “strong” internal and construct validity of WTP studies. This can be attributed to the relatively weak hypothetical bias in the valuation scenario. Hypothetical bias often constitutes a major threat to the validity of CV method (Johannesson and Jonsson, 1991). Stated simply, this represents the extent to which the scenario and the valuation task are believable by the respondents (O’Brien and Viramontes, 1994) and thus depends on the degree of realism of the valuation scenarios (O’Brien and Gafni, 1996). In our study, the valuation scenarios were quite realistic, in the sense that respondents were asked about their user-based WTP values for health care – something for which patients in Palestine, and in many other developing countries, are used to because they often make financial contributions to access medical services through out-of-pocket payments at the point of consumption. This is due to the absence of any publicly funded sickness insurance fund at national level and to the limited population coverage of governmental insurance schemes. Similar proofs of the theoretical validity of CV in assessing health care in developing countries were already available from previous CV studies (Hassan et al., 1994; Asenso-Okyere et al., 1997; Onwujekwe et al., 2001, 2002). Moreover, similar strong validity results have been obtained with stated preferences techniques applied to assess the value of recreational commodities in which the common payment vehicle is a hypothetical “fee” for the facility (Teasley et al., 1994).

Realistic scenarios also enhance external validity; i.e. the capacity to transpose the sample results to the general population (O’Brien and Gafni, 1996). This is an important issue mainly in the context of WTP-finance studies since monetary valuations are indeed intended for pricing purposes. The main unrealistic component in the study was asking the respondents for a maximum WTP value. However, it has been recognized (Arrow et al., 1993) that under certain conditions, CV can allow valid results. Except for the elicitation technique and the payment vehicle, our CV instrument adhered to the other recommended conditions (Gafni, 1991; Morrison and Gyldmark, 1992).

Our study used the payment card elicitation technique (Mitchell and Carson, 1989), instead of the sometimes recommended dichotomous referendum format (Gafni, 1991; Arrow et al., 1993). The validity of the payment card technique in the context of health care was previously ascertained (Donaldson et al., 1995, 1997b). Indeed, it can be argued that the payment card elicitation technique resembles respondents’ behavior in their everyday life where they usually “shop around” looking at different prices before taking a purchasing decision. Moreover, some authors find that the arguments for using the referendum elicitation technique remain unpersuasive (Gyldmark and Morrison, 2001); and it seems beyond doubt that the referendum approach does not lead to “conservative” valuations as was initially thought to be case (Arrow et al., 1993; Ryan et al., 2004). On the other hand, a user-based payment vehicle was preferred over the often recommended insurance-based approach (Gafni, 1991; Arrow et al., 1993). The main arguments advanced in favor of the insurance-based approach consist of its resemblance with the way health care is financed in developed countries, and its capacity to capture values beyond the direct patient’s health benefit, e.g. option and altruistic values, by incorporating uncertainty in the valuation process. In our study, the user-based approach was selected because it resembles more the way patients effectively pay for medical services in

Palestine in the absence of any national sickness fund. However, this made our instrument neither able to incorporate uncertainty in health care demand, nor able to assess altruistic values.

The decomposed valuation scenario approach was used to avoid high cognitive burden on the respondents and thus increase the precision of results. In the health care literature, only four CV studies – to our knowledge – have used such decomposed valuation scenario approach (Klose, 1999). O'Brien et al. (1995) and Dranitsaris (1997) attempted to assess, respectively, the value of a new antidepressant drug that reduces the risk of seven common side effects, and the value of a chemotherapy cytoprotective agent used in cancer supportive care. Due to the absence of any a priori theoretical model to aggregate partial WTP values, neither of the two studies was conclusive on the total value of the good. The other two studies (Berwick and Weinstein, 1985; Tolley et al., 1994) combined holistic and decomposed scenarios in the same valuation, and demonstrated a subadditive nature of WTP values – explained by normal income effect and inter-attributes substitutability. The only recommendation on this issue was given by O'Brien et al. (1995), who stated that if multiple attributes are to be valued, it would be useful to identify the three or four most valuable ones and base the WTP exercise on them. This allows for a conservative estimation of the total value. In our study, we followed this recommendation and a subadditivity result was demonstrated.

Respondents in our study were randomly selected amongst patients seeking care in four PHC centers, selected to be representative of the different PHC existing in Palestine (urban/rural, governmental/non-governmental). Unfortunately, due to practical constraints in data collection, especially in the difficult context of the “crisis” situation in Palestine, we were not able to get detailed information about non-respondents. Moreover, the absence of information about the characteristics of the centers' clienteles made it impossible to compare our sample characteristics with the characteristics of the whole clientele to verify whether a bias has occurred. However, the relatively high response rate is expected to temper this risk. Another limitation pertains to the use of in site consulting patients, instead of the general population, to draw our study sample. Consequently, our results might incorporate a bias toward those people living in the right location or with sufficient resources to attend the centers under study. This should not be a problem if the results are considered from the perspective of PHC directors, with the private objective of maximizing revenues. However, if the intention is to maximize population access, future applications should consider sampling from the general population.

As mentioned above, the question of how WTP values have been acquired can be separated from issue of how these values are to be used. However, the authors agree with O'Brien and Gafni (1996) that the objective of the study; i.e. CBA or market research (including WTP-finance studies), should be explicitly presented to the respondents. We believe that this shall reinforce method's internal and external validity by enhancing scenario realism. It is in the present authors' opinion that if direct co-payment is to be used as the co-funding mechanism, then a more realistic payment vehicle like the user-based approach is to be preferred to the recommended insurance-based approach. Finally, we stress that in contrast to CBA, WTP-finance studies search for effective payment structure changes. This is not a consideration in monetary valuations for CBA, and, moreover, this point is often emphasized to respondents as part of the study (Donaldson et al., 1995).

5.2. Policy implications

Results of stated WTP values for improving the quality of health care have mainly been used to generate two important economic measures; namely, consumer surplus (CS) and demand elasticity (ξ) (Betz et al., 2003). Whether to use the one or the other, depends indeed on the aim of the CV study, i.e. CBA or market research (including, WTP-finance studies). If CV is being conducted to inform budget allocation decisions, CS appears to be the judicious economic measure. CS can be used accompanied with information about the total intervention costs to assist in allocating a limited budget to maximize social welfare. In our study, we did not attempt to estimate the cost of the different quality improvements; this can be done in further investigations. However, under the assumption that the different improvements father the same social cost, our results suggest that effort should, in the first place, go into two main improvements. Firstly, upgrading the competence of PHC doctors to enhance patients' chance of recovery, and, secondly, to implementing more PHC centers in distant areas to reduce patients' travel time and efforts in accessing health services. An important assumption in the latter analysis is the equivalent distribution of WTP values amongst different demographic and socioeconomic classes (Donaldson, 1999).

The objective of our study was to examine the existence of a potential private market that can be utilized to co-fund quality improvements. Here, the economic measure of interest is demand assessment, including price-elasticity estimation. In this paper, we did not attempt to estimate price-elasticities and potential revenues' retention – although, this would be possible in further analysis. However, results from Tobit regression already provided significant information about the direction of demand elasticity with respect to different key variables.

For instance, female demand seems to be more elastic than males if the quality improvement that accompanies user fee increase concerns the Geographical Proximity, Waiting Time, Staff Attitude or Chance of Recovery attributes. An inverse behavior is encountered with respect to Seeing the Same Doctor, DPR and Drug Availability attributes. For each of the last three attributes, females were willing to pay more than males to benefit from such quality improvements, indicating a less elastic demand for females. Consequently, introducing co-payments may penalize females less than males, as long as, the extra revenues are invested in improving one or more of the three quality attributes: improving DPR, Drug Availability or Being Able to See the Same Doctor. These results should be treated with caution because the coefficients of the SEX variable were not significant. Let us consider a service principally used by females like Mother and Child PHC centers. If the policymaker envisages improving certain quality features of the service and co-funds the improvement using user fee increments, then, to be socially acceptable and financially sustainable, the quality improvement should concern one of these quality attributes; e.g. DPR, Drug Availability or Being Able to See the Same Doctor. This means, enabling women to: meet the same doctor every time they come to the center and/or pass sufficient time with her/him to get good and enough information, and/or finally to make drugs available in the center and to secure the procurement system for drugs.

Another interesting result concerns the elderly patients who appear to behave more elastically to price increases than young patients. Consequently, an equivalent price in-

crease shall penalize elderly more than young patients. In this case, a price discrimination approach (Gertler and Hammer, 1997) where different user fees are charged from young and elderly patients, would permit mobilization of needed extra revenues without extremely penalizing sensitive groups of the population. Patients living in rural areas also appear to be more sensitive for price increases than those living in urban areas, for almost all the quality improvements in the study. Again price discrimination would permit collection of a good share of the urban consumers' surplus to co-subsidize rural members.

One should recognize that optimal pricing should have different structures depending on provider's objectives. In the case of a public decision-maker, with objectives going beyond maximizing revenue retention, issues pertaining to equitable access might play an important role in constructing the co-payment scheme. For instance, in the case of a relatively inelastic demand with $|\xi| = 1/2$, a 10% increase in the user fee shall diminish demand by 5% and have a positive impact on total revenues (+4.5%). Although, a private provider with a revenue-maximizing objective might find such user fee increment profitable, a public provider has to take into account the accessibility of the 5% of the clientele who may be discouraged by the price increase.

The major limitation of any CV study is its dependence on hypothetical markets that makes it impossible – in most of the cases – to verify respondents' answers. However, the practical implementation of health care reforms in Palestine will give new opportunities to observe real patients' behaviors and to compare their evolution between sectors (public/NGO run centers versus private sector) and before and after the introduction of both quality improvements and cost-recovery policies. This may create the opportunity to confront effective responses of patients' behaviors to policy changes with the WTP values obtained in this study, in a way to assess CV external validity.

One of the assumptions in the developed theoretical model for our study is the inter-attribute independence, i.e. the value of improvements over one attribute does not depend on the level of other attributes. However, a patient might value improvements over one attribute more or less depending upon how well the service is suited with respect to other attributes. For instance, a patient might support having a Very Far PHC center – and thus value less improvements over the Geographical Proximity attribute – if she/he knows that she/he shall not wait long before meeting the doctor. Further analysis is needed to verify the existence of such inter-attribute dependence and to adjust over it.

Unfortunately, the political situation at the time of the study was very bad. Check points were installed at all the entries of all the cities depriving rural population from an easy circulation to and out of the cities and between villages. This had strongly affected travel time to urban centers; and to many rural centers which are usually installed in key villages. The study period was also accompanied with a high rate of irregular employment which would have affected respondents' incomes and their appreciation of "Time"; some respondents clearly said that they were willing to wait and not to pay because they have nothing else to do, except being home. Given that this situation had persisted for a long time before the beginning of the study, it can however be considered that this had become the "normal" living situation. Therefore, our study is already a practical tool for persisting in carrying out reforms of health care funding mechanisms in Palestine, in spite of a war-like situation.

6. Conclusion

Our results demonstrate the good feasibility of CV when applied to the question of developing co-funding mechanisms to assist in financing health care quality improvements in developing countries. The relatively low hypothetical bias and the realistic valuation scenarios used in the study led to the strong internal consistency of stated WTP values. Whatever technique used to obtain the WTP values, the results can have two different political implications depending on the evaluator's objectives. Public decision-makers who wish to make the best use of the available limited budget, can use the results to detect whether the program is firstly worthwhile implementing relative to other uses of the resources at stake. Private decision-makers (e.g. PHC center directors) can use the data to assess demand and estimate price elasticity to elaborate revenue-maximizing objectives. To take a method elaborated in developed countries and to apply it to developing ones without adaptation is highly contested by many decision-makers. However, developing countries that are usually deprived from social security schemes, and where patients pay out of pocket for many medical services, may represent a quite fertile field for CV with much less hypothetical bias and greater likelihood of validity. We conclude that WTP approach is a potentially valuable tool with applications going beyond economic evaluation; however, our study remains an exploratory one and the empirical agenda will be large before recognizing the CV as a valid and reliable measurement tool in such difficult context.

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Appendix A. Quality attributes and their corresponding measurement scales

Attributes	Measurement Scale
1. Geographical proximity	Very Far, Far, Average, Close, Very Close.
2. Waiting time	Very Long, Long, Average, Not Long, Not Long at All.
3. Attitude of PHC center's staff	Excellent, Good, Bad, Very Bad.
4. Being able to see the same doctor	Always, Often, Rarely, Never.

Appendix A (Continued)

Attributes	Measurement Scale
5. Being able to discuss her/his problem with the doctor and receive sufficient information about her/his health status and the prescribed treatment(s)	Multi-item Likert-scaling; continuous: range [20,100]. Items: 1. I stayed sufficient time with the doctor. 2. The doctor explained to me my health problem. 3. The doctor explained to me how to use the prescribed treatment(s). 4. The doctor explained to me what I should do to prevent (or not to complicate) my health problem in the future. 5. The information was clear and sufficient.
6. Being able to purchase the prescribed treatment(s) at the center	All, Some of Them, None.
7. Chance of Recovery	Multi-item Likert-scaling; continuous: range [20,100]. Items: 1. I usually recover after being examined by the doctor of the center. 2. Many times, I need to go to a private clinic to be re-examined by a better doctor. 3. The doctor who examined me was a good doctor who knows what he is doing. 4. Private doctors are more competent. 5. In general, I prefer to go to private clinic.

Note: Attributes 2, 4, 5 and 7 were used in previous health care monetary valuation studies (Ryan et al., 2001); attributes 1, 3 and 6 were included due to their relevance to our study context. Respondents were also asked to add other quality attributes that they consider of importance; however, these were not included in this analysis.

Appendix B. Introductory information as presented to respondents

“We are conducting a study to assess the value of primary health care services provided for you by PHC centers. Our aim is to *IDENTIFY* the main characteristics of these services as users, *yourself*, see them, and to *DETERMINE THE VALUE* of these services as you, *yourself*, estimate it . . . This will inform us about; first, your own conception of the main characteristics of the PHC services; second, what aspects of the services should be improved in order to attain your expectations.

The method that we are going to use, measures the value you put on health care services. This involves asking you about the *maximum* amount of money you are prepared to pay in order to get a health care service with precise characteristics. As you know, from your everyday experience, nobody can procure everything. Each of us is confronted, everyday, with situations where she/he has to take a decision about what to purchase and what not! In fact, we are always taking such decisions in our lives. For example, if you want to buy something, you ask yourself is it worth its price? If your answer was “Yes” and you do need it so, you do “buy” it. If it was “No”, you “don’t buy” it, because what you would spend on it is more valuable for you. For example, if you felt that a car mark (a dress or a T-shirt) is better than the others, so you would be willing to pay more to get this car mark (dress or T-shirt); knowing that you are not forced to buy the better one. On the other hand, you would not accept to pay what you would be willing to pay for the better one in a one that you estimate of lower quality.

I will ask you questions like: “What is the *maximum* amount of money that you would be willing to pay so that you can *always* find the prescribed treatments in the PHC center?” You are supposed to answer by giving the *maximum* amount of money that you are prepared to pay *as extra user fees*, to be paid at every coming visit, in order to get this improvement in the service. Your answer is considered as the maximum amount of money that you are effectively prepared to pay (extra to what you are already paying) in order to have the medicaments *always* available in the center. You should keep in mind that you can always buy the treatments from a private pharmacy or you can simply decide not to buy them at all, using your money for something else, you are the one who shall take the decision. *Also, if you are willing to pay more to get something so this means that this thing is more valuable for you.*”

Appendix C. The seven partial valuation questions

<ul style="list-style-type: none"> • benefit from a PHC center similar to this one and located “Very Close” to your home? • have a PHC center with a “Waiting Time” that you estimate as “Not Long at All”? • benefit from an “Excellent” attitude from the PHC center staff? 	<ul style="list-style-type: none"> • have a PHC center “Very Close” to your home; • have a PHC center with a “Waiting time” that you estimate as “Not Long at All”; • benefit from an “Excellent” attitude from the PHC center staff; 		
<p>Would you be willing to pay any amount of money (even small amounts like 1, 2, 3 or 4 NIS) more than what you already pay in order to ...</p> <ul style="list-style-type: none"> • “Yes” → 	<p>What is the maximum amount of money that you would be willing to pay, extra to what you currently pay, in order to ...</p>	<ul style="list-style-type: none"> • be able to see the same health professional every time you come to the center; • be able to stay sufficient time with the doctor to discuss with him your health problem, receive sufficient and clear information about your disease and the prescribed treatment(s)? • be able to find the prescribed treatment(s) the center? • be examined by more competent doctors and to have a higher chance of recovery? 	<ul style="list-style-type: none"> • be able to see the same health professional every time you come to the center; • be able to stay sufficient time with the doctor to discuss with him your health problem, receive sufficient and clear information about your disease and the prescribed treatment(s); • be able to find the prescribed treatment(s) “Always” available in the center; • be examined by more competent doctors and to have a higher chance of recovery; <p>knowing that this extra amount of money will be paid at every visit? →</p> <p>Payment Card</p>
<ul style="list-style-type: none"> • “No” → 	<p>Why?</p>		

Appendix D. Payment Card (photocopied on a separate sheet of cardboard)

0 NOTHING



Geographical Proximity.
Waiting Time.
Attitude of the PHC center staff.
Seeing the same doctor.
Discuss the problem with the doctor.
Drug Availability.
Chance of Recovery



>10 : _____

References

- Alderman, H., Lavy, V., 1996. Household responses to public health services: cost and quality tradeoffs. *World Bank Research Observer* 11, 3–22.
- Arrow, K., Solow, R., et al., 1993. Report of the NOAA panel of contingent valuation. *Federal Register* 58, 4601–4614.
- Asenso-Okyere, W.K., Osei-Akoto, I., et al., 1997. Willingness to pay for health insurance in a developing economy. A pilot study of the informal sector of Ghana using contingent valuation. *Health Policy* 42, 223–237.
- Bala, M.V., Mauskopf, J.A., et al., 1999. Willingness to pay as a measure of health benefits. *Pharmacoeconomics* 15, 9–18.
- Barghouti, M., Diabes, I., 1996a. Infrastructure and health services in the Gaza Strip. Health Development Information Project in cooperation with the World Health Organization. Ramallah, Palestine.
- Barghouti, M., Diabes, I., 1996b. Infrastructure and health services in the West Bank. Health Development Information Project in cooperation with the World Health Organization. Ramallah, Palestine.
- Barghouti, M., Lennock, J., 1997. Health in Palestine: Potential and Challenges. MAS Discussion Papers, Ramallah, Palestine.
- Barlow, R., Diop, F., 1995. Increasing the utilization of cost-effective health services through changes in demand. *Health Policy and Planning* 10, 284–295.
- Bergstrom, J.C., 2001. The role and value of natural capital in regional landscapes. *Journal of Agricultural and Applied Economics* 33, 283–296.
- Berwick, D.M., Weinstein, M.C., 1985. What do patients value? Willingness to pay for ultrasound in normal pregnancy. *Medical Care* 23, 881–893.
- Betz, C., Bergstrom, J., et al., 2003. A contingent trip model for estimating rail-trail demand. *Journal of Environmental Planning and Management* 46, 79–96.
- Bryman, A., Cramer, D., 1999. *Quantitative Data Analysis with SPSS Release 8 for Windows, a Guide for Social Scientists*. Routledge, New York.
- Carson, R., 1999. *Contingent Valuation: a User's Guide*. Department of Economics, University of California, San Diego. Discussion Paper 99-26.
- Creese, A.L., 1991. User charges for health care: a review of recent experience. *Health Policy and Planning* 6, 309–319.
- Diener, A., O'Brien, B., et al., 1998. Health care contingent valuation studies: a review and classification of the literature. *Health Economics* 7, 313–326.
- Donaldson, C., 1999. Valuing the benefits of publicly-provided health care: does 'ability to pay' preclude the use of 'willingness to pay'? *Social Science & Medicine* 49, 551–563.
- Donaldson, C., Jones, A.M., et al., 1998. Limited dependent variables in willingness to pay studies: application in health care. *Applied Economics* 30, 667–677.
- Donaldson, C., Shackley, P., et al., 1997a. Using willingness to pay to value close substitutes: carrier screening for cystic fibrosis revisited. *Health Economics* 6, 145–159.
- Donaldson, C., Shackley, P., et al., 1995. Willingness to pay for antenatal carrier screening for cystic fibrosis. *Health Economics* 4, 439–452.
- Donaldson, C., Thomas, R., et al., 1997b. Validity of open-ended and payment scale approaches to eliciting willingness to pay. *Applied Economics* 29, 79–84.
- Dranitsaris, G., 1997. A pilot study to evaluate the feasibility of using willingness to pay as a measure of value in cancer supportive care: an assessment of amifostine cytoprotection. *Support Care Cancer* 5, 489–499.
- Foreit, J.R., Foreit, K.G.F., 2003. The reliability and validity of willingness to pay surveys for reproductive health pricing decisions in developing countries. *Health Policy* 63, 37–47.
- Forsythe, S., 2001. *An Economic Evaluation of HIV/AIDS Services in Kenya: a Practical Policy Application of Contingent Valuation (Thesis)*. Liverpool School of Tropical Medicine, Liverpool, UK.
- Forsythe, S., Arthur, G., et al., 2002. Assessing the cost and willingness to pay for voluntary HIV counseling and testing in Kenya. *Health Policy Planning* 17, 187–195.
- Gafni, A., 1991. Willingness-to-pay as a measure of benefits. Relevant questions in the context of public decision-making about health care programs. *Medical Care* 29, 1246–1252.
- Gafni, A., 1998. Willingness to pay. What's in a name? *Pharmacoeconomics* 14, 465–470.

- Gertler, P.J., Hammer, J.S., 1997. Strategies for pricing publicly provided health services. World Bank Policy Research Working Papers, Washington, DC.
- Griffin, D.C., 1992. Welfare gains from user charges for government health services. *Health Policy and Planning* 7, 177–180.
- Gyldmark, M., Morrison, G.C., 2001. Demand for health care in Denmark: results of a national sample survey using contingent valuation. *Social Science & Medicine* 53, 1023–1036.
- Hamdan, M., Defever, M., 2002. A 'transitional' context for health policy development: the Palestinian case. *Health Policy* 59, 193–207.
- Hanley, N., MacMillan, D., et al., 1998. Contingent valuation versus choice experiments: estimating the benefits of environmentally sensitive area in Scotland. *Journal of Agricultural Economics* 49, 1–15.
- Hassan, E., El Nahal, N., et al., 1994. Acceptability of the once-a-month injectable contraceptives cyclofem and mesigyna in Egypt. *Contraception* 49, 469–488.
- Johannesson, M., Jonsson, B., 1991. Economic evaluation in health care: is there a role for cost–benefit analysis? *Health Policy* 17, 1–23.
- Jones-Lee, M.W., Hammerton, H., et al., 1985. The value of safety: results of a national sample survey. *Economic Journal* 95, 49–72.
- Kadir, M.M., Khan, A., et al., 2000. Out-of-pocket expenses borne by the users of obstetric services at government hospitals in Karachi, Pakistan. *Journal of the Pakistan Medical Association* 50, 412–415.
- Kim, T., Kwak, S., et al., 1998. Applying multi-attribute utility theory to decision making in environmental planning: a case study of the electric utility in Korea. *Journal of Environmental Economics and Management* 41, 597–609.
- Klose, T., 1999. The contingent valuation method in health care. *Health Policy* 47, 97–123.
- Leedy, P., 1997. *Practical Research: Planning and Design*. Merrill, New Jersey.
- Litvack, J.I., Bodart, C., 1993. User fees plus quality equals improved access to health care: results of a field experiment in Cameroon. *Social Science & Medicine* 37, 369–383.
- Luchini, S., Protiere, C., et al., 2003. Eliciting several willingness to pay in a single contingent valuation survey: application to health care. *Health Economics* 12, 51–64.
- Mariko, M., 2003. Quality of care and the demand for health services in Bamako, Mali: the specific roles of structural, process, and outcome components. *Social Science & Medicine* 56, 1183–1196.
- MAS (Economic Policy Research Institute), 2000. *Social Monitor* 3. MAS, Ramallah.
- McDaniels, T., Roessler, C., 1998. Multiattribute elicitation of wilderness preservation benefits: a constructive approach. *Ecological Economics* 27, 299–312.
- McDonald, J.F., Moffitt, R.A., 1980. The use of Tobit analysis. *The Review of Economics and Statistics* 62, 318–321.
- McPake, B., Hanson, K., et al., 1993. Community finance of health care in Africa: an evaluation of the Bamako Initiative. *Social Science & Medicine* 36, 1383–1395.
- Mitchell, R., Carson, R., 1989. *Using Surveys to Value Public Goods: the Contingent Valuation Method*. Resources for the Future, Washington, DC.
- Morrison, G.C., Gyldmark, M., 1992. Appraising the use of contingent valuation. *Health Economics* 1, 233–243.
- NSHP, 1999. *National Strategic Health Plan (1999–2003)*. Palestinian National Authority, Palestine.
- O'Brien, B., Gafni, A., 1996. When do the "dollars" make sense? Toward a conceptual framework for contingent valuation studies in health care. *Medical Decision Making* 16, 288–299.
- O'Brien, B., Viramontes, J.L., 1994. Willingness to pay: a valid and reliable measure of health state preference? *Medical Decision Making* 14, 289–297.
- O'Brien, B., Novosel, S., et al., 1995. Assessing the economic value of a new antidepressant. A willingness-to-pay approach. *Pharmacoeconomics* 8, 34–45.
- Onwujekwe, O., Chima, R., et al., 2002. Altruistic willingness to pay in community-based sales of insecticide-treated nets exists in Nigeria. *Social Science & Medicine* 54, 519–527.
- Onwujekwe, O., Chima, R., et al., 2001. Hypothetical and actual willingness to pay for insecticide-treated nets in five Nigerian communities. *Tropical Medicine & International Health* 6, 545–553.
- Onwujekwe, O., Shu, E., et al., 2000. Willingness to pay for the retreatment of mosquito nets with insecticide in four communities of south-eastern Nigeria. *Tropical Medicine & International Health* 5, 370–376.
- Onwujekwe, O., Shu, E., et al., 1998. Willingness to pay for community-based ivermectin distribution: a study of three onchocerciasis-endemic communities in Nigeria. *Tropical Medicine & International Health* 3, 802–808.

- O'Reilly, D., Hopkin, J., et al., 1994. The value of road safety: UK research on the valuation of preventing non-fatal injuries. *Journal of Transport Economics* 28, 45–59.
- Protiere, C., 2002. La méthode de l'évaluation contingente appliquée au domaine de la santé: contexte d'évaluation simultanée de plusieurs programmes (Thesis). Faculté des Sciences Economiques et de Gestion, Université de la Méditerranée, Marseille, France.
- Ramsey, J.B., 1969. Tests for specification errors in classical linear least squares regression analysis. *Journal of the Royal Statistical Society, Series B* 31, 350–371.
- Roncek, D.W., 1992. Learning more from Tobit coefficients: extending a comparative analysis of political protest. *American Sociological Review* 57, 503–507.
- Ryan, M., Scott, D., et al., 2004. Valuing health care using willingness to pay: a comparison of the payment card and dichotomous choice methods. *Journal of Health Economics* 23, 237–258.
- Ryan, M., Scott, D., et al., 2001. Eliciting public preferences for healthcare: a systematic review of techniques. *Health Technology Assessment* 5, 1–186.
- Teasley, R., Bergstrom, J., et al., 1994. Estimating revenue-capture potential associated with public area recreation. *Journal of Agricultural and Resource Economics* 19, 89–101.
- Tobin, J., 1958. Estimation of relationships for limited dependent variables. *Econometrica* 26, 24–36.
- Tolley, G., Kenkel, D., et al., 1994. *Valuing Health for Policy: an Economic Approach*. University of Chicago Press, Chicago, IL.
- UNICEF, 1990. *The Bamako Initiative Planning Guide*. UNICEF, New York.
- World Bank, 1987. *Financing Health Services in Development Countries: an Agenda for Reform*. World Bank, Washington, DC.
- Yeung, R., Smith, R., et al., 2003. Willingness to pay and size of health benefit: an integrated model to test for sensitivity to scale. *Health Economics* 12, 791–796.