# Preliminary Results of a Healthcare Contingent Valuation Study in Greece*

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*Abstract:*

*Purpose: The primary aim of the present study was to elicit a WTP estimate for a health improvement targeting the general Greek population. Moreover, it intended to investigate socioeconomic, demographic and determinants differences between those willing to pay for a health improvement and those not willing to pay for such an improvement (protest responders).*

*Design/Methodology/Approach: A specially designed questionnaire employing the iterative bidding technique and the EuroQoL-5D-3L tool was used. A representative sample of the general Greek population (n=1,342) completed the questionnaire via telephone interviews – computer-assisted telephone interview method for random sample selection. Socioeconomic, demographic and determinants differences between participants willing to pay (n=528) and protest responders (n=395) were assessed through Chi-square and Mann-Whitney U Test.*

*Findings: The average WTP estimate for a health improvement was €26,280. Participants willing to pay for a health improvement differed significantly from protest responders with respect to age (p=0.000), household size (p=0.018), number of household members having a part- or full-time job (p=0.000), education (p=0.000), marital status (p=0.000), household income (p=0.000) and utility (p=0.003). Respondents willing to pay for the hypothetical treatment differed significantly from protest responders with respect to their views towards quality of healthcare services and healthcare personnel (p=0.000 and 0.005, respectively).*

*Practical Implications: Preliminary findings revealed that, when the general Greek population is considered, the WTP estimate for a health improvement falls within the World Health Organization's criterion currently used in Greek healthcare economic evaluations.*

*Originality/Value: To the best of our knowledge, this is the first study aiming at eliciting a monetary value for a health improvement targeting the general Greek population and identifying socioeconomic differences between willing and not willing to pay individuals.*

*Keywords: Economic evaluation, Euro-QoL-5D-3L, iterative bidding, utility.*

*JEL codes: I10, I19.*

*Paper type: Research article.*

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## 1. Introduction

The present study falls within the wider research area of health economics. The health sector is one of the most important sectors within a country's economy, as it absorbs a substantial part of the Gross Domestic Product (GDP) (OECD, 2017) and is closely related to ensuring and maintaining citizens' quality of life. It is, therefore, particularly important for a country to establish state-level health policies with specific goals in order to succeed in improving people's quality of life. On that ground, scientific research in the field of health economics is perhaps one of the most powerful lever for the formulation of specific strategies and targeted health policies, as it provides the necessary tools for developing and adopting methods that lead both to saving valuable resources and guiding quality in health services provision.

During the past decades, sustainability of healthcare systems due to increased healthcare needs and scarcity of healthcare resources constitutes a major challenge in the health sector. Hence, economic evaluation has been widely adopted by healthcare policy-makers to facilitate informed decision-making in budged allocation and reimbursement of medical interventions (Tilling *et al.,* 2016; Ryen and Svensson, 2015; Drummond *et al.,* 2015). In the context of economic evaluation, the Contingent Valuation (CV) Method constitutes a tool that can be used to assess values related to people's preferences (Drummond *et al.,* 2015; Gyrd-Hansen, 2003).

More specifically, this method aims at determining the maximum willingness-to-pay (WTP) for a medical treatment/technology/intervention with no market value (Bobinac *et al.,* 2010; Gyrd-Hansen, 2003; Bateman *et al.,* 2002). This WTP value is then combined with a health improvement/outcome offered by this specific treatment. One way to measure this health improvement/outcome is by using Quality-Adjusted Life-Years (QALYs). QALYs constitute a common measurement unit assessing both duration and quality of life (QoL) and allowing comparison among different economic evaluation studies (Drummond *et al.,* 2015). This WTP per QALY value defines a threshold that renders a treatment/technology/intervention as cost-effective with respect to its reimbursement (Drummond *et al.,* 2015; Bobinac *et al.,* 2012).

Last but not least, it is important to mention that WTP per QALY seems to be affected by people's socioeconomic and demographic characteristics (Lim *et al.,* 2017; Mavrodi *et al.,* 2017; Sund and Svensson, 2017; Gao *et al.,* 2015; Alayli-Goebbels *et al.,* 2014; Zhao *et al.,* 2011; Bobinac *et al.,* 2010; Shiroiwa *et al.,* 2010;

King *et al.,* 2005; Gyrd-Hansen, 2003) and determinants associated with healthcare services provision satisfaction (Gyrd-Hansen, 2016; Shiroiwa *et al.,* 2010).

In Greece, due to the necessity to allocate efficiently a shrunk healthcare national budget, focusing on assigning a monetary value to a QALY and thus set such cost-effectiveness threshold for reimbursement purposes is vital. So far, Greek economic evaluations adopt the World Health Organisation (WHO) recommendation of one to three times the country's GDP per capita to assess cost-effectiveness of treatments (Terpos *et al.,* 2019; Tzanetakos *et al.,* 2018; Marseille *et al.,* 2015). Nevertheless, no research has yet examined the appropriateness of this threshold for decision-making within the Greek healthcare environment.

Furthermore, in Greece, WTP per QALY estimates have only been elicited for specific treatments and patient populations (Terpos *et al.,* 2019; Tzanetakos *et al.,* 2018; Mavrodi *et al.,* 2017; Kontodimopoulos and Niakas, 2006). To the best of our knowledge, no previous empirical research has targeted the general Greek population for eliciting a WTP per QALY estimate. This estimate could facilitate policy-making by aiding financial healthcare resources allocation; a very important aspect for the Greek health sector when considering the economic austerity of the last decade.

The main aim of the present study was to elicit a WTP estimate for an additional QALY targeting the general Greek population via the CV method. Moreover, it intended to investigate demographic, socioeconomic, and determinants differences between those willing to pay for an additional QALY and those not willing to pay (protest responders).

## 2. Literature Review

Economic evaluation in the health sector is defined by Drummond *et al.* (2015) as *"the comparative analysis of alternative courses of action in terms of both their costs and consequences".* Therefore, economic evaluations describe cost/benefit comparisons of alternative treatments. In most economic evaluations, costs are measured in a unanimous way (in monetary terms), whereas benefits measurement units differ significantly (Drummond *et al.,* 2015). The latter has led to the development of several economic evaluation methods addressing these differences in benefits comparisons.

Such methods are the cost-consequence analysis, the cost-minimisation analysis, the cost-effectiveness analysis, the cost-utility analysis and the cost-benefit analysis (Drummond *et al.,* 2015; Gray *et al.,* 2012). Within healthcare, using non-monetary values, like QALYs, for assessing treatment benefits is widely accepted (Tilling *et al.,* 2016), rendering cost-utility and cost-effectiveness analyses as the preferable economic evaluation methods among researchers (Ryen and Svensson, 2015).

## 2.1 State Preference Techniques (SPTs)

Within the economic evaluation framework, a treatment's benefit on an individual's health can be monetised via two techniques: the revealed preference technique (RPT) and the stated preference technique (SPT) (Gray *et al.,* 2012; Bateman *et al.,* 2002). The first deals with individuals' preferences revealed via their actual decisions and choices, whereas the second with the stated value an individual assigns to a benefit (McIntosh *et al.,* 2010; Bateman *et al.,* 2002). Healthcare market is not perfect due to risk, uncertainty, externalities, information asymmetry and oligoly. Therefore, the value assigned to a healthcare benefit is more accurately measured via SPTs (McIntosh *et al.,* 2010).

SPT consists of two methods: the choice modelling method (CMM) and the contingent valuation method (CVM). CMM focuses on individuals' preferences regarding specific characteristics and properties of a treatment, whereas CVM aims at obtaining a monetary estimate for the perceived value of a treatment as a whole (Gray *et al.,* 2012). CVM is widely used in the healthcare sector, since it offers relatively easy to interpret and use results (Fonta, Ichoku and Kabubo-Mariara, 2010) and allows evaluation of services with which users have limited or no prior experience (McIntosh *et al.,* 2010).

## 2.2 Contingent Valution Method (CVM)

In CVM respondents are asked to consider a scenario for a hypothetical treatment, not yet available in the market, and state their maximum WTP to ensure the benefit of this treatment (Bateman *et al.,* 2002). WTP value can be elicited through a number of methods. Based on the literature, the most frequently used elicitation methods are: a) open-ended question (Gyrd-Hansen and Kjaer, 2012; Byrne, O'Malley and Suarez, 2005), b) iterative bidding technique (Mavrodi *et al.,* 2017; Martín-Fernández *et al.,* 2014; Zhao *et al.,* 2010; King *et al.,* 2005), c) payment card/scale (Bobinac *et al.,* 2010; Pinto-Prades, Loomes and Brey, 2009), and d) dichotomous choice question (Shiroiwa *et al.,* 2013; Gyrd-Hansen and Kjaer, 2012; Shiroiwa *et al.,* 2010). The open-ended question constitutes the simplest and easiest to apply approach. Respondents are free to state any monetary value they are willing to pay.

However, it has high non-response rate, zero responses and outliers are more frequent and is less reliable since respondents report a value for a treatment with which they are not familiar (Fonta, Ichoku and Kabubo-Mariara, 2010). Iterative bidding technique introduces the respondent to a bidding game, where he has to accept or reject an already provided value (bid). Payment card is a technique based on visual aids, where respondents have to select their preferred maximum value over a list of pre-defined values presented on a card (McIntosh *et al.,* 2010). This method cannot be used in telephone surveys. With dichotomous choice question (either single- or double-bounded) respondents are presented with a set value and they have to either accept or reject it (yes/no answer). Despite being highly reliable, since respondents cannot affect the magnitude of WTP value, it offers limited information

due to the fact that respondents are just asked to accept or reject a given value (Watson and Ryan, 2007).

As mentioned in the previous section, demographic and socioeconomic characteristics and healthcare services satisfaction determinants seem to have an impact on WTP per QALY. More specifically, age (Lim *et al.,* 2017; Sund and Svensson, 2017; Alayli-Goebbels *et al.,* 2014; Martín-Fernández *et al.,* 2014; Bobinac *et al.,* 2010; Shiroiwa *et al.,* 2010; Gyrd-Hansen, 2003), gender (Nimdet and Ngorsuraches, 2015; Alayli-Goebbels *et al.,* 2014; Martín-Fernández *et al.,* 2014), educational level (Lim *et al.,* 2017; Mavrodi *et al.,* 2017; Sund and Svensson, 2017; Alayli-Goebbels *et al.,* 2014; Martín-Fernández *et al.,* 2014; Shiroiwa *et al.,* 2013; Bobinac *et al.,* 2010; Shiroiwa *et al.,* 2010), marital status (Lim *et al.,* 2017; Zhao *et al.,* 2011), professional status (Sund and Svensson, 2017; Gao *et al.,* 2015; Zhao *et al.,* 2011; Shiroiwa *et al.,* 2010; King *et al.,* 2005), household size (Licke, Hens and Beutels, 2017; Martín-Fernández *et al.,* 2014; Bobinac *et al.,* 2010), household income (Lim *et al.,* 2017; Mavrodi *et al.,* 2017; Sund and Svensson, 2017; Gao *et al.,* 2015; Nimdet and Ngorsuraches, 2015; Alayli-Goebbels *et al.,* 2014; Martín-Fernández *et al.,* 2014; Shiroiwa *et al.,* 2013; Zhao *et al.,* 2011; Bobinac *et al.,* 2010; Shiroiwa *et al.,* 2010; King *et al.,* 2005; Gyrd-Hansen, 2003), health state (Shiroiwa *et al.,* 2013; King *et al.,* 2005), healthcare system satisfaction (Shiroiwa *et al.,* 2010), access to healthcare services, quality of healthcare services and personnel (Gyrd-Hansen, 2016) have been found to affect WTP per QALY. Therefore, when designing a CV study such characteristics and determinants should be considered.

Lastly, it is important to mention that when designing a CV study researchers should consider how to deal with those participants not willing to pay for the treatment, called protest responders. Protest responders refer to those participants that are unwilling to pay for the hypothetical treatment or report zero WTP value. This negative attitude could be because a) they cannot estimate their actual WTP value and thus, state zero WTP, b) do not want, indeed, to pay for the treatment, or c) believe that paying for the treatment is someone else's responsibility (i.e. NHS') (Fonta, Ichoku, Kabubo-Mariara, 2010; Dalmau-Matarrodona, 2001). Protest responders' replies should be assessed thoroughly so as to identify the reasons guiding this attitude.

## 3. Methodology

### 3.1 Study Desing and Sample Population
The research took place in January-February 2019. A representative, with regards to age, gender and region of residence, sample of the adult Greek population was randomly selected. Respondents' recruitment was performed by the University Research Institute of the University of Macedonia, Thessaloniki Greece. Respondents completed the survey tool via telephone interviews through the

Computer-Assisted Telephone Interview (CATI) method, to ensure random sample selection.

**3.2 Research Tool**
A specially designed questionnaire constituted the research tool. The questionnaire consisted of four parts: i) assessment of respondents' current health state; ii) WTP elicitation; iii) assessment of determinants; and iv) socioeconomic/demographic characteristics.

For assessing respondents' current health state the EuroQoL-5D-3L (EQ-5D-3L) tool was used. This tool is widely used in CV studies (Nimdet *et al.,* 2015; Sund and Svensson, 2017). Respondents' health state as reported using the EQ-5D-3L was translated into utility values based on the related reference values of Greek tariffs (Kontodimopoulos *et al.,* 2008). Utility values range between 0 (death) and 1 (perfect health) (Drummond *et al.,* 2015). Few health states might be translated into negative utilities, indicating health states worse than death (Gray *et al.,* 2012). In our study, deciding to assess participants' current health state and conduct the survey via telephone interviews defined the choice of EQ-5D-3L over other relevant tools.

To elicit WTP, respondents were provided with the following hypothetical scenario: *"I would like you to imagine that there is a new treatment available in the market, which is not reimbursed by the NHS or any private insurance. For as long as you are administered this treatment, you are relieved from any health problem you are experiencing and you recover to perfect health, with no symptoms, no side effects and no risk associated with the treatment. This treatment is administered to you for as long as you are paying for it from your net household income".* This scenario was followed by a filter question (Donaldson *et al.,* 2011): *"Would you be willing-to-pay for this treatment? Yes or No?".* This filter question allowed us to clearly identify protest responders and assess their characteristics separately. Respondents replying positively to the filter question were then asked to elicit their maximum WTP value through the iterative bidding technique. The study focused on individual perspective, since participants were asked to consider a treatment that would improve their own health. Our choice of the iterative bidding technique, as an elicitation method, was guided primarily by the survey method (telephone interviews), which prohibited the use of methods requiring visual aids like the payment card, and the fact that no similar treatment is available in the market, meaning that no reference values exist, prohibiting the use of the dichotomous choice elicitation method.

For the iterative bidding technique the lower bid was €1 and the maximum bid €8,192. Starting from the lower (maximum) bid, after participants' positive (negative) response, the payment was doubled (halved) until they were unwilling (willing) to pay the specified amount (Mavrodi *et al.,* 2017; Gao *et al.,* 2015; Martín-Fernández *et al.,* 2014; Zhao *et al.,* 2011; King *et al.,* 2005). Following a previously used rule (King *et al.,* 2005; Gao *et al.,* 2015), the maximum bid was set

at 10 times the monthly net national disposable income (€13,991), without tough exceeding it (Hellenic Statistical Authority …, 2019).

In the third part of the questionnaire respondents' overall satisfaction from healthcare services provision was examined through a 0-10 satisfaction scale (0 referring to extremely dissatisfied and 10 to extremely satisfied) (Shiroiwa *et al.,* 2010). Access to healthcare services, quality of healthcare services and personnel were assessed through three pre-defined statements (Gyrd-Hansen, 2016) for which respondents were asked to state the extent to which they agree with each statement (to a great/moderate/little extent/not at all). It is important to note that quality of healthcare personnel was measured indirectly by assessing doctors' respectfulness. Evaluating doctors' medical knowledge and expertise is difficult and subjective. Therefore, we decided to focus on an indirect quality measurement, which would be easier for participants to assess.

Lastly, respondents had to provide information regarding their age, gender, educational level, professional status, marital status, household size, number of household members that hold either a part- or full-time job and net monthly disposable household income.

### 3.3 Data Analysis
Elicitation of the WTP per QALY value was based on participants expressing a utility value less than 1. Perfect health participants (utility=1) were excluded from the analyses to avoid zero QALY gains and division by a zero denominator (Mavrodi *et al.,* 2017; Gao *et al.,* 2015; Byrne, O'Malley and Suarez, 2005). Moreover, protest responders -participants stating 'no' in the filter question- were, also, excluded from the WTP per QALY estimation. Using the EQ-5D-3L Greek tariffs, a utility value for each participant was computed. WTP per QALY was estimated as the ratio of the annual stated WTP over utility improvement from individual's current health to perfect health (Mavrodi *et al.,* 2017; Gao *et al.,* 2015; Martín-Fernández *et al.,* 2014; Zhao *et al.,* 2011; Nimdet and Ngorsuraches 2015). It is important to note that discount rate and life expectancy were not considered, since in our analysis we captured payment for only one year.

Descriptive statistics are provided for the WTP per QALY estimate and, also, for those participants willing to pay and for protest responders. Socioeconomic/demographic characteristics and satisfaction determinants differences between participants willing to pay and protest responders were assessed through Chi-square test and Mann-Whitney U Test.

### 4. Results

### 4.1 Preliminary WTP per QALY Estimation
A representative, with regards to age, gender and region of residence, sample of 1,342 subjects participated in the survey. 410 participants (30.6%) were excluded

from WTP per QALY estimations since they were in a state of perfect health (utility=1). Out of the remaining subjects, 528 (39.3%) were willing to pay for the hypothetical treatment, whereas 395 (29.4%) were identified, via the filter question, as protest responders and 9 participants refused to answer the WTP valuation question. The mean and median WTP per QALY estimate were €26,280 (standard deviation was €83,547) and €2,793 (interquartile range was €14,427), respectively. The minimum WTP per QALY estimate was €17 and the maximum €646,737.

### 4.2 Preliminary Analysis of Demographic and Socioeconomic Characteristics

Demographic and socioeconomic characteristics of those willing to pay and protest responders are given in the following Table 1. The two participants groups differed significantly with respect to age (p=0.000), household size (p=0.018), number of household members having a part- or full-time job (p=0.000), education (p=0.000), marital status (p=0.000), household income (p=0.000) and utility (p=0.003).

*Table 1. Demographic and socioeconomic characteristics of study participants willing to pay for the hypothetical treatment (n=528) and of protest responders (n=395)*

| | Willing to pay | Protest responders | Significance (p-value) |
|---|---|---|---|
| Gender: woman [N (%)] | 281 (53.2) | 227 (57.5) | 0.133[a] |
| Age (years) [mean (SD)] | 46.2 (16.6) | 53.9 (17.7) | 0.000[b] |
| Household size [mean (SD)] | 3.0 (1.3) | 2.8 (1.3) | 0.018[b] |
| Number of household members holding a full-time or part-time job [mean (SD)] | 1.4 (1.0) | 1.1 (1.0) | 0.000[b] |
| Education [N (%)] | | | |
| No/Elementary | 19 (3.6) | 56 (14.2) | |
| High School | 179 (33.9) | 161 (40.8) | |
| Private College (IEK) | 55 (10.4) | 40 (10.1) | 0.000[a] |
| Higher education (University) | 274 (52.0) | 138 (34.9) | |
| Professional status [N (%)] | | | |
| Employed for wages | 175 (33.1) | 109 (27.6) | |
| Freelancer | 122 (23.1) | 58 (14.7) | |
| Pensioner | 106 (20.1) | 125 (31.6) | 0.000[a] |
| Student | 40 (7.7) | 19 (4.9) | |
| Unemployed | 79 (15.0) | 76 (19.2) | |
| Marital Status [N (%)] | | | |
| Unmarried | 184 (35.1) | 81 (20.8) | |
| Married | 304 (57.8) | 246 (63.0) | 0.000[a] |
| Divorced | 16 (3.0) | 22 (5.7) | |
| Widowed | 22 (4.1) | 41 (10.5) | |
| Net monthly disposable household income [N (%)] | | | |
| Less than €500 | 59 (11.6) | 62 (16.7) | |
| €500-€1000 | 160 (31.6) | 169 (45.7) | |
| €1001-€1500 | 148 (29.1) | 80 (21.6) | 0.000[a] |
| €1501-€2000 | 75 (14.9) | 41 (11.2) | |
| More than €2000 | 65 (12.9) | 18 (4.8) | |
| Utility value [mean (SD)] | 0.695 (0.224) | 0.647 (0.260) | 0.003[b] |

[a]*Chi-square test, a=0.05;* [b]*Independent Samples Mann-Whitney U Test, a =0.05. Numbers do not round up due to missing values not presented here.*
**Source***: Authors' calculations.*

### 4.3 Preliminary Analysis of Satisfaction Determinants

Preliminary results regarding the four satisfaction determinants under examination are presented in Table 2. Protest responders compared to participants willing to pay seemed to believe to a higher extent that public hospitals and health centres offer high quality services (p=0.000) and employ high quality personnel (p=0.005). Participants' responses with respect to equity in access did not differ significantly between the two participants groups. Similarly, overall satisfaction rate did not differ significantly between the two participants groups. However, both participants groups reported, in absolute numbers, a satisfaction score slightly below 5.

**Table 2.** *National healthcare services satisfaction rate and national healthcare services provision assessment for those willing to pay for the hypothetical treatment (n=528) and protest responders (n=395)*

| | Willing to pay | Protest responders | Significance (p-value) |
|---|---|---|---|
| National healthcare services overall satisfaction rate* [mean (SD)] | 4.4 (2.4) | 4.6 (2.7) | 0.270[a] |
| *Pre-defined statements assessing healthcare services provision: To what extent do you agree with the following statements ...* | | | |
| 1. All Greek citizens have equal access** to public healthcare services [N (%)] | | | |
|     Agree to a great extent | 122 (23.3) | 74 (19.3) | |
|     Agree to a moderate extent | 192 (36.7) | 140 (36.5) | |
|     Agree to a little extent | 91 (17.4) | 57 (14.9) | 0.094[b] |
|     Not agree at all | 118 (22.6) | 112 (29.3) | |
| 2. Public hospitals and health centres offer healthcare services of high quality [N (%)] | | | |
|     Agree to a great extent | 40 (7.7) | 58 (15.0) | |
|     Agree to a moderate extent | 220 (42.3) | 167 (43.1) | |
|     Agree to a little extent | 131 (25.1) | 63 (16.0) | 0.000[b] |
|     Not agree at all | 130 (24.9) | 100 (25.9) | |
| 3. Doctors in public hospitals and health centres are respectful [N (%)] | | | |
|     Agree to a great extent | 165 (31.5) | 144 (37.0) | |
|     Agree to a moderate extent | 232 (44.2) | 186 (47.9) | |
|     Agree to a little extent | 67 (12.8) | 32 (8.3) | 0.005[b] |
|     Not agree at all | 61 (11.6) | 26 (6.8) | |

[a]*Independent Samples Mann-Whitney U Test, a=0.05;* [b]*Chi-square test, a=0.05. *Satisfaction rate is measured on a 0-10 scale, where 0 is extremely dissatisfied and 10 extremely satisfied; **By the term "access", it is meant the distance from the closest specialised doctor and/or the distance from the closest tertiary hospital and/or the waiting time from appointment setting till visiting a hospital doctor or a sickness fund doctor.*
**Source:** *Authors' calculations.*

### 5. Discussion

To the best of our knowledge, this is the first Greek study to elicit a monetary value to a health improvement employing a representative sample of the general Greek population, and assess differences between individuals willing to pay, for such an improvement, and protest responders.

Preliminary findings revealed that the general Greek population is willing to pay €26,280 for an additional QALY. The above WTP per QALY estimate falls within the WHO's criterion currently used in Greek healthcare economic evaluations –one to three times the country's GDP per capita, the Greek GDP per capita for 2018 was €15,446 (IMF, 2019). Therefore, the WHO threshold used in Greek economic evaluations is by no means unreasonable or inappropriate.

The estimated WTP per QALY value differed from that found in the literature. Studies with individual perspective and focus on the general population like ours, reported either higher (Bobinac *et al.,* 2012; Zhao *et al.,* 2011; Bobinac *et al.,* 2010; Gyrd-Hansen, 2003) or lower (Shiroiwa *et al.,* 2013; Gyrd-Hansen and Kjaer, 2012; Pinto-Prades, Loomes and Brey, 2009) estimates (in 2019 Euros).

These dissimilarities could be explained considering the different demographic/socioeconomic characteristics of the samples (Bobinac *et al.,* 2010; Pinto-Prades, Loomes and Brey, 2009) and the different elicitation techniques (Shiroiwa *et al.,* 2013; Bobinac *et al.,* 2012; Gyrd-Hansen and Kjaer, 2012; Bobinac *et al.,* 2010; Pinto-Prades, Loomes and Brey, 2009; Gyrd-Hansen, 2003). Moreover, studies adopting the same elicitation technique as our study but with samples from patient-specific populations showed lower WTP per QALY estimates (Mavrodi *et al.,* 2017; Gao *et al.,* 2015; Martín-Fernández *et al.,* 2014; King *et al.,* 2005).

Analysis of participants' demographic/socioeconomic characteristics revealed that protest bidders are, on average, older, have to financially support families with less working members, have lower educational level, have more pensioners and unemployed and more married and widowed among their rankings compared to those willing to pay and are less affluent. Hence, protest responders in our study might be unwilling to pay for the treatment due to lower life expectancy and the tendency observed among elder individuals to accept more easily deteriorating health (Gyrd-Hansen, 2003). Another explanation could be their inability to afford such a treatment because of increased household financial needs and/or limited household budget.

Considering the satisfaction determinants, our analysis showed that, on average, both participants groups are slightly dissatisfied (satisfaction score below 5) regarding the Greek NHS services. During the past decade Greece is undergoing a severe debt crisis that has indisputably affected the Greek NHS. The latter has to finance an increased demand for public services through a rather shrunk budget.

Understaffing, fewer resources, deterioration of access to and provision of healthcare services are only few of the problems the Greek NHS faces, affecting undoubtedly the quality of healthcare provision (Simou and Koutsogeorgou, 2014) and thus, individuals satisfaction. Assessment of NHS services provision through the three pre-defined statements revealed that differences do exist between the two participants groups with regards to their view towards access and quality of healthcare services and quality of healthcare personnel. However, further analysis is essential in order to identify the nature of these differences.

## 6. Conclusion

The present study constitutes a first attempt to elicit a WTP value for an additional QALY considering the general Greek population. Our preliminary findings suggest that the WHO's criterion currently used in Greek economic evaluations is appropriate. However, further research and sub-group analysis is essential in order to confirm and validate this outcome. Moreover, individuals that are willing to pay for the hypothetical treatment bare different demographic and socioeconomics characteristics and their behaviour is affected by different determinants compared to those not willing to pay (protest responders). One could argue that the above results could be significant for the Greek healthcare policy-makers, since they might facilitate resources allocation and identification of groups of citizens that might be willing to pay out-of-pocket for such a treatment.

It is important to note that the present study is subject to one major limitation: satisfaction determinants are assessed through pre-defined statements. Despite the fact that these statements derived from the literature, they might not cover all parameters that might affect an individual's satisfaction regarding healthcare services provision.

Lastly, since this is a preliminary study, our aim is to further investigate through regression analysis the effect of demographic/socioeconomic characteristics and satisfaction determinants on the magnitude of the WTP per QALY estimate (multiple linear regression) and individual's tendency to pay or not for the hypothetical treatment (logistic regression).

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