amse
école d'économie d'aix-marseille
aix-marseille school of economics

Working Papers / Documents de travail

Accounting for Protest Attitudes in Willingness to Pay for Universal Health Coverage

Mohammad Abu-Zaineh
Olivier Chanel
Khaled Makhloufi

WP 2018 - Nr 54

Accounting for protest attitudes in willingness to pay for universal health coverage

Mohammad ABU-ZAINEH[a,b]
Olivier CHANEL[b]
Khaled MAKHLOUFI[a]

[a] Faculty of Medicine, Aix-Marseille Univ, INSERM, IRD, UMR 912 (SESSTIM), 27 Bd Jean Moulin, 13385Marseille Cedex 5, France
[b] Aix-Marseille Univ., CNRS, EHESS, Centrale Marseille, AMSE, and IDEP, 5 boulevard Maurice Bourdet CS50498 F-13205 Marseille cedex 01, France.

Corresponding author: Olivier Chanel, phone: +33(0)4 13 55 25 35. E-mail: olivier.chanel@univ-amu.fr

Abstract

In their attempts to implement universal health coverage (UHC), different developing countries encounter different types of obstacles. In Tunisia, major challenges include a widespread informal sector and protestors' general discontent with rising economic insecurity and inequality, the rollback of the state and public welfare. We apply a contingent valuation survey to a non-healthcare-covered Tunisian sample *vis-à-vis* joining and paying for a health insurance scheme. We pay attention to the nature of the willingness-to-pay (WTP) values obtained, distinguishing *genuine null* from *protest* values. The latter may reflect not only protesters' beliefs regarding the survey, but also their lack of trust in government's commitment to ensuring the provision of quality healthcare. We use alternative econometric modeling strategies to account and correct for selection issues arising from protest answers. Our results support the presence of self-selection and, by predicting protesters' WTP, allow the "true" sample mean WTP to be computed. This appears to be about 14% higher than the elicited mean WTP. The WTP of the poorest non-covered respondents represents about one and a half times the current contributions of the poorest formal sector enrollees, suggesting that voluntary affiliation to the formal health insurance scheme could be a step towards achieving UHC. Overall, we highlight the importance of taking into account protest positions for the evaluation of progress towards UHC.

Keywords: Willingness-to-pay; Contingent valuation; Universal health coverage; Self-selection; Protest attitude.
JEL Codes: C34, C52, I13

1. Introduction

On 21 May 2013, World Bank Group President Dr Jim Yong Kim set the goal for universal health coverage (UHC): to "*close the gap in access to health services and public health protection for the poorest 40 per cent of the population in every country*" (World Bank 2013, p. 64). Alshamsan et al. (2017) for instance showed that in the Gulf States, the poorer segments of the population are more likely to borrow money for medical purposes, and fail to obtain emergency funds. Following the adoption of UHC as a key to achieving the 2015-2030 Sustainable Development Goals and the World Bank's twin goals of ending extreme poverty and increasing equity and shared prosperity, several countries in the Middle East and North Africa (MENA) region have accelerated their efforts to expand health coverage to the excluded segments of the population (Saleh et al. 2014; Asbu et al. 2017). One of the key issues obviously concerns the health financing policies that should be implemented. Alami (2017) showed that reforms seeking to extend current health coverage on a contributory and formal employment basis are unlikely to succeed, leaving swathes of the active working population without any health coverage. Indeed, the widespread labor market informality, the rollback of the State and public welfare, and the protesters' discontent with increasing economic insecurity and inequality stand as major challenges (Wagstaff 2010; Alami and Karshenas 2012; Carrin and James 2015; Kutzin et al. 2016). Yet the field lacks a systematic analysis of how protest positions may impact health financing policies based on voluntary affiliation, and hence, the implementation of UHC-oriented reforms.

We propose to fill this gap by using a Contingent Valuation (CV) survey to elicit preferences from the non-covered Tunisian population regarding *a voluntary health insurance scheme* (VHIS) (see Nosratnejad et al. 2016; for a recent review of willingness-to-pay (WTP) for health insurance in low- and middle-income countries (LMIC)). Stated preference methods help inform decision-makers on the hypothetical demand for not yet available or non-market goods or services. Analyses, however, generally focus on valid WTP and do not frequently pay enough attention to the impact of "*protest*" WTP. The latter may result from the respondent's protest beliefs or attitudes *via-à-vis* the survey or the proposed scenario (Jorgensen and Syme 2000; Meyerhoff and Liebe 2006), the payment vehicle *per se* (Strazzera et al. 2003), or, for UHC, the lack of faith in institutions (De Allegri et al. 2006; Cunha-e-Sá et al. 2012) and the capacity of governments to ensure the provision of good healthcare for all (Jehu-Appiah et al. 2011). These protest answers differ from stated "*genuine null WTP*" – indicating the respondent's unwillingness to join due to either a budget constraint or a null valuation of the expected utility – because they hide an unexpressed demand. We use appropriate econometric modeling strategies to properly disentangle genuine null values from protest answers and estimate the true demand for a VHIS.

We find evidence of self-selection issues reflecting protest behaviors against the survey / because of lack of confidence in the government. Our results suggest that the segments of the population not covered

by any health insurance scheme would be willing to join the current formal scheme. In particular, using an ordered-probit-selection (OPS) model (Jimenez and Kugler 1987), we find that the WTP of the poorest non-covered population represents about one and a half times the formal sector's poorest enrollees' contributions. This suggests that voluntary affiliation to a mandatory health insurance scheme could be a way towards achieving and financing UHC in Tunisia (Chahed and Arfa 2014), and more broadly in the LMIC.

As in other countries in the MENA region, *de jure* entitlement to the Tunisian National Health Insurance Fund "*Caisse Nationale d'Assurance Maladie – CNAM*" – is mainly based on formal sector employment (Anonymous 2015; Alami 2017). Despite the remarkable efforts made to extend *CNAM* coverage – through medical assistance plans, health card programs and the self-employed regime – the uptake in the informal sector (about 40% of the labor force) (Gatti et al. 2011) remains severely limited by *ad hoc* selection criteria and restrictions on entitlements (Arfa and Elgazzar 2013). The continuing large-scale exclusions of the informal sector may also be due to a protest attitude towards the continuing prevalence of high out-of-pocket payments, which represented 38% of total health expenditure in 2014 (WHO 2017), the rise of private healthcare providers, and lack of confidence in the government's capacity to deliver the healthcare needed (Abu-Zaineh et al. 2014). Testing for the presence and consequences of such protest attitudes on WTP for a VHIS may therefore contribute to the move towards UHC not only in Tunisia, but in LMIC.

The remainder of the paper is structured as follows. Section 2 presents the survey design and the data collection and describes the econometric methodology. Section 3 reports the results, which are then discussed in Section 4.

2. Materials and methods

2.1 Survey design and data collection

A CV study was conducted in Tunisia between August 1st and September 30th 2013 with the aim of eliciting the willingness-to-join, and willingness-to-pay for, on a voluntary basis, the current formal health insurance scheme run by CNAM. The inclusion criterion concerns all Tunisian citizens who are not covered by any health insurance schemes. Given that most of the non-covered segment of the Tunisian population belongs to the informal sector, the sampling points were carefully chosen in the spirit of Muhib et al. (2001)'s method of sampling hard-to-reach populations. We sampled from '*Al-Souk'*, marketplaces where most of the informal sector's activities take place, and '*Al-Mydan*', public spaces for youth demonstrations (since the popular revolt – known as the '*Jasmine Revolution'* - that began in late 2010). To take into account the huge differences in access to health facilities across Tunisia (Chahed and Arfa 2014; Ministry of Public Health 2016), eight governorates were sampled over the North, the Center and the South of Tunisia (see

Figure 1).

The survey instrument was developed by a group of researchers and refined using two pre-tests (pilots). The questionnaire was administered face-to-face by well-trained interviewers. After the main objectives of the CV study were introduced, respondents were asked to give the reason(s) why they are not covered by the current national health insurance scheme, *CNAM*. *CNAM* proposes coverage for public sector facilities, with a cap imposed on the annual amount of co-payments (Anonymous 2015). Respondents were asked to reveal their preferences *vis-à-vis* voluntary enrollment in an already existing health insurance scheme (VHIS) run by the *CNAM*. If respondents were not willing to join, they were asked to state the reason(s) and whether they would join the scheme if it was offered free or at a very low cost. This was intended to help distinguish between genuine null WTP values and protest answers. Note that the three willingness-to-join / to-join for free / to-join at low cost questions prevent us from observing null WTP responses that are in fact protest answers. Other studies may face the additional difficulty of identifying genuine null WTP from protest null WTP. Non-protesters were asked to state their maximum WTP values.

[INSERT FIGURE 1 ABOUT HERE]

Three different elicitation techniques were employed to gather information on respondents' WTP values: the well-known Open-Ended (OE) and Payment Card (PC) techniques (Donaldson et al. 1997; Ryan et al. 2001), and a newly introduced technique known as the Circular Payment Card (CPC). The CPC uses a visual representation of a circular card with no pre-determined start or end points. Accordingly, the interviewer presents the CPC at a random position, and asks respondents to spin it until they find the bracket that best corresponds to their WTP values. The impact of using different elicitation formats to elicit these WTP has been addressed elsewhere (Anonymous 2017). Finally, the questionnaire gathered information on the respondents' socio-economic, socio-demographic and health characteristics. In addition, respondents were asked to state their opinions on the proposed insurance scheme. All subjects were asked to give their full consent to participate in the study and no financial incentives were proposed.

The initial sample covered 456 subjects, of whom 30 refused to participate, resulting in a response rate of 93.42%. The overall sample was then randomly split into three equal and mutually exclusive sub-groups to respond to the above-mentioned three WTP elicitation formats. The range and centering of the bids on the PC and CPC were chosen based on the WTP values elicited through two pre-tests conducted in early July 2013.

2.2 Methods

The appropriate strategy for modeling WTP values hinges on the specific format chosen to elicit these values (Gyldmark and Morrison 2001; Dong et al. 2003). In the context of our study, three formats were employed. While the OE format involves stating a point estimate of WTP, the PC and CPC state an interval with two specified thresholds. Thus, the actual elicited WTP value can be used in the case of OE, while with PC and CPC this value can be reliably approximated using the middle of the bid-range elicited (Cameron and Huppert 1989; Bärnighausen et al. 2007; Alhassan et al. 2013).

2.2.1 Identifying genuine null and protest WTP

The willingness-to-pay stated by respondent *i,* WTP_i, corresponds to the amount that would equalize her/his *ex-ante* utility level (i.e., before joining the VHIS) and his/her *ex-post* utility level (i.e., after joining the VHIS), i.e. the Hicksian compensating measure. WTP_i can be positive, null or missing. The null values may simply reflect genuine values, indicating the respondent's unwillingness to join the scheme due to either a budget constraint or a null valuation of her expected utility. In this case, when the question is whether s/he would join a scheme offered free, or at a very low cost, a 'Yes' answer is expected (*genuine null WTP*). Missing WTP values may reflect a protest attitude *via-à-vis* the proposed scheme, the public provider or confidence in the government/CNAM. In this case, the respondent reveals her unwillingness to participate by refusing to join even at null (or low) cost (*protest answer*). Given their intrinsically different meanings reflecting two different behaviors (the first reflects a rational behavior while the second reflects a self-selection issue), the two types of response should be accounted for and distinguished in any econometric strategy. In what follows, we present econometric models that properly account for these two types (see Supplementary Appendix for a detailed presentation).

2.2.2 Models not accounting for protest values

We first consider, as a benchmark, a simple linear regression model to estimate the WTP values. Clearly, this model takes no particular account of null WTP values, which may lead to biased and inconsistent estimates (Amemiya 1973). One way to distinguish positive WTP from genuine zero WTP is the Tobit model (Tobin 1958). However, given that respondents with non-protest WTP may not be randomly drawn from the whole sample of respondents, we need to account for the possible correlation between variables explaining the participation and the unobserved individuals' heterogeneity, i.e. sample selection issues.

2.2.3 Sample selection model accounting for protest values

We consider the standard Heckit sample selection model (Heckman 1976) that simultaneously specifies a probit-type equation for selection (predicting whether or not the respondent is willing to join the

VHIS for free or at low cost, WTJ) and a linear-type equation for WTP conditional on the individual not being a protester.

2.2.4 Sample selection model accounting for protest and null values

The ordered-probit-selection (OPS) model differs from the standard ordered probit with sample selection in that it allows continuous variables to be observed based on an ordered-probit selection rule. It was derived from Terza (1983)'s seminal work, first applied in Jimenez and Kugler (1987), and mainly used since then to account for selection based on performance indicators (see Greene and Hensher 2010; or Buch et al. 2014). The OPS model can however also account for selection induced by protest answers in CV surveys (cf. Cho et al. 2008; Brouwer and Martin-Ortega 2012). We distinguish between genuine null WTP (those who are willing to join for free or at low cost), protest answers with unobserved WTP and strictly positive WTP values.

The estimations present no particular difficulties when the log likelihood is maximized using standard unconstrained optimization methods (see Chiburis and Lokshin 2007; for the OPS model). All statistical analyses are performed using STATA SE12 software.

3. Results

3.1 Descriptive Results

Table 1 provides descriptive statistics on respondents' socio-economic and demographic characteristics as well as their needs and preferences *via-à-vis* the proposed social insurance scheme. The majority of respondents are male (67%), living in urban areas (80%), employed (79%), and completed secondary education (52%). Average respondent age is 35.4 and average monthly household income is TND 558.11 (at the time of the survey, 1 TND (Tunisian Dinar) = € 0.455 = $ 0.605), about one and a half times the minimum monthly salary in Tunisia. The majority of respondents report good health (84%), although about 38% report at least one outpatient visit during the last 3 months. About 37% declare they are able to pay for healthcare services in the event of illness.

Interestingly, while 34% of the respondents declare that they do not have any insurance coverage due to the complexity of administrative procedures, about 49% state that their lack of insurance coverage is due to the fact that their professional activities are not officially declared. This is in line with previous studies (Gatti et al. 2011; CRES / BAD 2016) suggesting that almost half of the young Tunisian population work in the informal sector. Lastly, it is worth noting that about 44% of the respondents live in disadvantaged governorates (see also Figure 1).

[INSERT TABLE 1 ABOUT HERE]

About 58 respondents (13.5%) reveal a willingness-to-join the proposed VHIS if it was offered free or at very low cost, but give null WTP (*genuine null WTP*). 32 respondents (7.5%) show a protest attitude, refusing to join the proposed VHIS even for free *(protest WTP*), somewhat less than the 13.3% found in Ahmed et al. (2016)'s study on WTP for community-based health insurance among informal workers in urban Bangladesh. The quarterly mean WTP of the non-protest respondents is 36.32 TND, and 42.58 TND when computed on strictly positive WTP values. Finally, the median WTP (including the genuine null WTP) is 35 TND, which means that, on average, 50% of the respondents are willing to pay about 2.16% per quarter (35/(539*3)) of their income to join the VHIS.

3.2 Conditional analyses of WTP

In all cases, a parsimonious model was considered after explanatory variables were removed step by step by decreasing p-values. They include survey-specific variables (interviewer effect, survey point and format), respondents' socio-economic, socio-demographic and health characteristics (health status, use of healthcare and ability to pay for treatment for a given illness, risk aversion and reasons for not being covered by health insurance). All significant variables in the full model remain significant in the parsimonious models.

3.2.1 Models not accounting for protest answers

In the OLS and the Tobit models estimated over the sub-sample of non-protest WTP, the same explanatory variables are significant, with similar signs and comparable marginal effects on WTP (see Table A1 in Supplementary Appendix). Expectedly, household equivalent income appears to be significantly correlated with WTP. This provides evidence of the validity of the stated preference survey (see Bishop and Woodward 1995). Similarly, WTP values appear to be significantly positively associated with individuals' employment status (*Work*), risk aversion attitude (*DumGamb*), ability to afford health services (*FinancialHealth)* in addition to the presence of one chronic condition in the family (*Chronic member)*. Unsurprisingly, individuals declaring no need for health insurance (*NoNeed)* appear to be less willing to pay for VHIS. Finally, a statistically significantly negative effect is also found for the two survey-specific variables, with interviewer 2 and OE and PC elicitation formats leading to lower WTP values compared to other interviewers and CPC format, respectively.

3.2.2 Accounting for potential self-selection: Heckman model

A Heckman model is estimated over the whole sample and explicitly accounts for the potential effect of protest answers (see Table A2 in Supplementary Appendix). It is worth noting, first, that the two equations predicting the WTJ and the WTP are significantly negatively correlated (p-value$= 0.029$). While

this gives support to the self-selection hypothesis, it indicates that the selection-specific variables negatively affect the WTP through the correlation parameter ρ. WTJ the VHIS appears to be significantly negatively associated with household equivalent income, living in a rural area and declaring no need for insurance. By contrast, both education level and living in a disadvantaged governorate are positively associated with WTJ the VHIS. As regards the survey-specific variables, WTJ is affected negatively by interviewer 3 and positively by the PC elicitation format.

For those willing to join the VHIS, we find a significantly positive effect of household equivalent income, employment status, and the presence of a chronic condition on WTP. WTP values tend, however, to decrease with smoking status and living in a rural area, and also with some survey-specific variables (Interviewer 2 and OE and PC formats).

3.2.3 Sample selection model accounting for protest and null values

Results in Table 2 are obtained from estimating the OPS model over the whole sample. The OPS model independently accounts for the issues related to both genuine null WTP and protest answers. Average marginal effects (AME) are given for each of the three modalities of the ordered Probit: $Pr(genuine\ null\ WTP)$, $Pr(protest\ WTP)$ and $Pr(WTP > 0)$. Overall, results show similar patterns to those obtained from the Heckit and the Tobit models. In particular, the presence of a chronic condition significantly increases $Pr(WTP > 0)$ and decreases both $Pr(genuine\ null\ WTP)$ and $Pr(protest\ WTP)$, whereas living in a rural area and declaring no need for health insurance have the opposite effects. A new variable enters the selection equation - having at least one child under 5 years old at home – and is negatively associated with both $Pr(genuine\ null\ WTP)$ and $Pr(protest\ WTP)$ but positively associated with $Pr(WTP > 0)$ and WTP amount. Also of note, the correlation coefficient between the selection and WTP equations does not significantly differ from 0.

[INSERT TABLE 2 ABOUT HERE]

Using the OPS model estimates makes it possible to compute the adjusted-WTP values that account for both genuine null WTP and selection issues in relation to protest WTP values. Table 3 shows that the predicted WTP for protesters is on average TND 51.82, leading to a sample mean WTP of TND 38.2 once null and protest answers are accounted for, 14% more than the observed TND 33.59. It is worth noting that the mean predicted WTP for protesters is higher than for non-protesters.

[INSERT TABLE 3 ABOUT HERE]

4. Discussion

This paper attempted to shed light on the importance of protest answers when estimating the societal demand for a universally available HIS. These protest behaviors may be explained by lack of confidence in government's capacity to fulfill its commitments, with claims that current arrangements for financing and delivering healthcare may involve social exclusion and inequities. They lead to protest WTP answers from respondents currently uninsured in surveys assessing the desirability of UHC. This is especially relevant in countries like Tunisia, with a large informal sector (about 40% of the workforce) and high unemployment (about 15.3% of the workforce in 2013) (Loayza and Wada 2010; NIS 2014). Because our CV survey proposed an existing HIS to respondents not facing urgent healthcare interventions (like Russell 1996; Mataria et al. 2006), the obtained WTP is likely to be closer to the true ability to pay.

It may be that properly accounting for these protest answers can reveal the true demand for a VHIS, which will impact health financing policies and hence the implementation of UHC-oriented reforms. When expressed as a fraction of 2013 Tunisian gross national income per capita (World Bank 2017a), our sample showed an average WTP of 2.13%, higher than the meta-analytical 1.18% found by Nosratnejad et al. (2016) over ten countries. We compare existing social health insurance (SHI) contributions at the time of the survey and predicted WTP for the proposed VHIS. The SHI contribution rates differ depending on the individual's income and employment status. Based on the official CNAM rate for the third quarter of 2013 for "independent workers", those with quarterly income above the reference TND 580.4 pay a rate of 6.75% of the reference income TND 870.59, yielding a quarterly SHI contribution of TND 58.76. For "low-income independent" workers with quarterly income below TND 580.4 (affiliated under the special regime implemented in 2002), a rate of 2.5% is applied to this figure, yielding a quarterly SHI contribution of TND 14.51.

In our sample, the 34 respondents with quarterly individual income lower than TND 580.4 are willing to pay about one and a half times the formal sector enrollee's contribution: TND 24.11 (standard deviation 14.25) vs. TND 14.51. The remaining 392 respondents with income higher than TND 580.4 are willing to pay more than low-income respondents - TND 39.42 (20. 34) vs. TND 24.11- although less than the existing contribution of TND 58.76.

In addition, protest attitudes seem to be driven by the lack of adequate health care facilities in rural areas, as well as the view of some respondents that they do not need health insurance. Our results corroborate existing evidence (WHO 2015; World Bank 2015; Alami 2017) that enrollment in health insurance schemes does not solely depend on income, but on other factors such as the adequacy and spatial distribution of healthcare services. This finding reflects the protestors' discontent with the existing unequal distribution of health facilities: high-level public-sector healthcare providers are mostly located in urban centers, and the better-off segments of the population benefit most.

Nonetheless, we find that WTP values tend to increase with individuals' income, level of education and poor health status, in accordance with Nosratnejad et al. (2016)'s review on WTP for HIS in Asian and Sub-Saharan African countries. Our results also support the presence of self-selection issues concerning the elicitation formats or interviewers, which are standard survey-related effects.

Horton (2018) shows how UHC has been misused by oppressive political regimes that seek to acquire, administer and preserve power while ignoring other basic human freedoms and rights. Although the path towards achieving UHC remains context-specific, our results should provide insights for many developing countries in their quest for UHC. The protests in Tunisia, which have also been heard in other MENA region countries, made a clear case for impartiality in matters of human rights and entitlement to health care. Our finding on the importance of taking the protestor's voice into consideration suggests that a country's progress towards UHC cannot be achieved solely by increasing the level of government commitment to the health sector. There is also an urgent need to improve the quality of global governance, democracy and institutions (Bousmah et al 2016; Alami 2017). By the same token, both the World Bank and the World Health Organization are breaking new ground by arguing that UHC is not only about ensuring access to health services, but is also "*an investment in human capital and a foundational driver of inclusive and sustainable economic growth and development. It is a way to support people so they can reach their full potential and fulfil their aspirations* (World Bank 2017b: p. v)". The above clearly suggest that it is not the breadth of coverage alone that matters, but the depth of that coverage and the explicit entitlement to a specific package of services that can fulfill the population's needs. Previous research conducted in Tunisia shows that the financial protection offered by the SHI system is rather modest due to its shallow coverage (Abu-Zaineh et al. 2013, 2014; Makhloufi et al. 2015). Our results on how other non-income factors (e.g., lack of adequate, quality healthcare services) affect the protest answers suggest that efforts to promote UHC may not succeed unless accompanied by improved spatial distribution of healthcare services and greater depth of coverage.

5. Conclusion

This investigation highlights the importance of taking into account *protest* positions for the evaluation of progress towards UHC. It has been argued that SHI may act as a "*stabilizing institution*" particularly in fragile and politically unstable settings (Obermann et al. 2006; Chapman 2016). We show that a voluntary affiliation to a mandatory HIS may be acceptable to the majority of the uninsured subpopulations. Moving towards UHC requires removing restrictions on entitlement to a socially acceptable and financially feasible benefit package. Indeed, continuing reliance on payroll contributions from formal employment has long hindered efforts to extend coverage to certain subpopulations such as informal workers, the self-employed, the unemployed and the vulnerable. The issue of whether to subsidize or to tax-finance the enrollment of

these subpopulations remains open (Acharya et al. 2012; Kutzin et al. 2016; Tangcharoensathien et al. 2011). The immediate priority should be changing the modality of enrollment and reducing spatial inequality in access to quality care, as well as improving the delivery capacity of the overall healthcare system. This of course requires a firm government commitment to health as a right to which all citizens are entitled.

Acknowledgments: This work was carried out with the support of the A*MIDEX project (no. ANR-11-IDEX-0001-02) funded by the "Investissements d'Avenir" French Government program, managed by the French National Research Agency (ANR) and the Applied Health, Equity and Development (AHEAD) Research Network. We thank Marjorie Sweetko for her thorough re-reading of the English.

6. References

Abu-Zaineh, M., Arfa, C., Ventelou, B., Romdhane, H. B., & Moatti, J.-P. (2014). Fairness in healthcare finance and delivery: What about Tunisia? *Health Policy and Planning*, 29(4), 433–442.

Abu-Zaineh, M., Romdhane, H. B., Ventelou, B., Moatti, J.-P., & Arfa, C. (2013). Appraising financial protection in health: the case of Tunisia. *International Journal of Health Care Finance and Economics*, 13(1), 73–93.

Acharya, A., Vellakkal, S., Taylor, F., Masset, E., Satija, A., Burke, M., et al. (2012). The impact of health insurance schemes for the informal sector in low- and middle-income countries: A systematic review. *World Bank Research Observer*, 28(2), 236–266.

Ahmed, S., Hoque, M.E., Sarker, A.R., Sultana, M., Islam, Z., Gazi, R., et al. (2016). Willingness-to-pay for community-based health insurance among informal workers in urban Bangladesh. *PLoS ONE* 11(2): e0148211.

Alami, R. (2017). Health financing systems, health equity and universal health coverage in Arab countries. *Development and Change*, 48(1), 146–179.

Alami, R., & Karshenas, M. (2012). Deficient social policies have helped spark the Arab Spring. *Development Viewpoint, 70.* Centre for Development Policy and Research. https://www.soas.ac.uk/cdpr/publications/dv/file74447.pdf. Accessed 31 March 2018.

Alhassan, M., Loomis, J., Frasier, M., Davies, S., & Andales, A. (2013). Estimating farmers' willingness to pay for improved Irrigation: an economic study of the Bontanga Irrigation Scheme in Northern Ghana. *Journal of Agricultural Science*, 5(4), 31-42.

Alshamsan, R., Leslie, H., Majeed, A., & Kruk, M. (2017). Financial hardship on the path to Universal Health Coverage in the Gulf States. *Health Policy*, 121(3), 315 – 320.

Amemiya, T. (1973). Regression analysis when the dependent variable is truncated normal. *Econometrica*, 41(6), 997–1016.

Anonymous (2015). Reference removed for double binding reviewing.

Anonymous (2017). Reference removed for double binding reviewing.

Arfa, C., & Elgazzar, H. (2013). *Transforming Tunisia's health care for the poor*. UNICO studies series 4 Consolidation and transparency, Washington, DC: The World Bank.

Asbu, E. Z., Masri, M. D., & Kaissi, A. (2017). Health status and health systems financing in the MENA region: roadmap to universal health coverage. *Global Health Research and Policy,* 2:25.

Atkinson, A.B., Rainwater, L., & Smeeding, T.M. (1995). *Income Distribution in OECD Countries, Evidence from the Luxembourg Income Study*. In: Volume 18 of OECD Social Policy Studies. Paris: Organisation for Economic Co-operation and Development.

Bärnighausen, T., Liu Y., Zhang X., & Sauerborn, R. (2007). Willingness to pay for social health insurance among informal sector workers in Wuhan, China: a contingent valuation study. *BMC Health Services Research*, 7, 114.

Barsky, R. B., Juster, F. T., Kimball, M. S., & Shapiro, M. D. (1997). Preference parameters and behavioral heterogeneity: an experimental approach in the health and retirement study. *The Quarterly Journal of Economics*, 112(2), 537-579.

Bishop, R., & Woodward, R. (1995). *Valuation of environmental amenities under certainty*. In: D. Bromley (Ed.), Handbook of Environmental Economics (pp. 543–667). Oxford: Blackwell Publishers.

Bousmah, M.-a.-Q., Ventelou, B., & Abu-Zaineh, M. (2016). Medicine and democracy: The importance of institutional quality in the relationship between health expenditure and health outcomes in the MENA region. *Health Policy*, 120(8): 929-935.

Brouwer, R., & Martin-Ortega, J. (2012). Modeling self-censoring of polluter pays protest votes in stated preference research to support resource damage estimations in environmental liability. *Resource and Energy Economics,* 34*,* 151–166.

Buch, C. M., Koch, C. T., & Koetter, M. (2014). Should I stay or should I go? Bank productivity and internationalization decisions. *Journal of Banking & Finance,* 42, 266–282.

Cameron, T. A., & Huppert, D. D. (1989). OLS versus ML Estimation of non-market resource values with payment card interval data. *Journal of Environmental Economics and Management*, 17, 230-246.

Carrin, G., & James, C. (2005). Social health insurance: key factors affecting the transition towards universal coverage. *International Social Security Review*, 58, 45-64.

Chahed, M. K., & Arfa, C. (2014). Monitoring and Evaluating Progress towards Universal Health Coverage in Tunisia. *PLoS Medicine*, 11(9), e1001729.

Chapman, A. R. (2016). Assessing the universal health coverage target in the Sustainable Development Goals from a human rights perspective. *BMC International Health and Human Rights,* 16:33.

Chiburis, R., & Lokshin, M. (2007). Maximum likelihood and two-step estimation of an ordered-probit selection model. *The Stata Journal*, 7(2*)*, 167-182.

Cho, S.-H., Yen, S. T., Bowker, J. M., & Newman, D. H. (2008). Modeling Willingness to Pay for Land Conservation Easements: Treatment of Zero and Protest Bids and Application and Policy Implications. *Journal of Agricultural and Applied Economics*, 40(1), 267–285.

CRES/BAD, Centre de Recherches et d'Etudes Sociales / Banque Africaine de Développement. (2016). Protection sociale et économie informelle en Tunisie. Défis de la transition vers l'économie formelle. Resource document. http://www.cres.tn/uploads/tx_wdbiblio/Secteur_informel_Tunisie.pdf. Accessed 2 April 2018.

Cunha-e-Sá, M. A., Madureira, L., Nunes, L. C., & Otrachshenko, V. (2012). Protesting and Justifying: A Latent Class Model for Contingent Valuation with Attitudinal Data. *Environmental and Resource Economics,* 52 (4), 531-548.

De Allegri, M., Sanon, M., & Sauerborn, R. (2006) ''To enrol or not to enrol?'': A qualitative investigation of demand for health insurance in rural West Africa. *Social Science & Medicine*, 62, 1520–1527.

Donaldson, C., Thomas, R., & Torgerson, D.J. (1997). Validity of open-ended and payment scale approaches to eliciting willingness to pay. *Applied Economics*, 29(1), 79–84.

Dong, H. J., Kouyate, B., Cairns, J., & Sauerborn, R. (2003). A comparison of the reliability of take-it-or-leave-it and the bidding game approaches to estimating willingness-to-pay in a rural population in West Africa. *Social Science and Medicine*, 56(10), 2181-2189.

Dror, M. D., Radermacher, R., & Koren, R. (2007). Willingness to pay for health insurance among rural and poor persons: field evidence from seven micro health insurance units in India. *Health Policy*, 82(1), 12–27.

Gatti, R., Angel-Urdinola, D., Silva, J., & Bodor, A. (2011). *Striving for better jobs: The challenge of informality in the Middle East and North Africa region: Overview*. Washington, DC: World Bank.

Greene, W. H., & Hensher, D. A. (2010). *Modeling Ordered choices. A primer*. Cambridge, UK: Cambridge University Press.

Gyldmark, M., & Morrison, G. C. (2001). Demand for health care in Denmark: Results of a national sample survey using contingent valuation. *Social Science and Medicine*, 53(8), 1023-1036.

Heckman, J. (1976). The Common structure of statistical models of truncation, sample selection and limited dependent variables and a simple estimator for such models. *Annals of Economic and Social Measurement*, 5(4), 120–137.

Horton, R. (2018). Offline: The misuse of universal health coverage. *The Lancet*, 391, January 20.

Jehu-Appiah, C., Aryeetey, G., Spaan, E., de Hoop, T., Agyepong, I., & Baltussen, R. (2011). Equity aspects of the national health insurance scheme in Ghana: who is enrolling, who is not and why? *Social Science & Medicine*, 72(2), 157–165.

Jimenez, E., & Kugler, B. (1987). The earnings impact of training duration in a developing country: an ordered Probit selection model of Colombia's Servicio Nacional de Aprendizaje (SENA). *The Journal of Human Resources,* 22(2*),* 228-247.

Jorgensen, B. S., & Syme, G.J. (2000). Protest responses and willingness to pay: attitude toward paying for stormwater pollution abatement. *Ecological Economics*, 33(2), 251-265.

Kutzin, J., Yip, W., & Cashin, C. (2016). *Alternative financing strategies for Universal Health Coverage.* In: R. Scheffler (Ed.), World Scientific Handbook of Global Health Economics and Public Policy, Vol. 1 (pp. 267-309). New Jersey: World Scientific.

Loayza, N., & Wada, T. (2010). *Informal labor in the Middle East and North Africa: basic measures and determinants.* Mimeo. Washington, DC: World Bank.

Madden, D. (2008). Sample selection versus two-part models revisited: the case of female smoking and drinking. *Journal of Health Economics,* 27(2*),* 300-307.

Makhloufi, K., Ventelou, B., & Abu-Zaineh, M. (2015). Have health insurance reforms in Tunisia attained their intended objectives? *International Journal of Health Economics and Management*, 15 (1), 29–51.

Mataria, A., Giacaman, R., Khatib, R., & Moatti, J-P. (2006). Impoverishment and patients' "willingness" and "ability" to pay for improving the quality of health care in Palestine: an assessment using the contingent valuation method. *Health Policy*, 75(3), 312–328.

Meyerhoff, J., & Liebe U. (2006). Protest beliefs in contingent valuation: explaining their motivation. *Ecological Economics*, 57(4), 583–94.

Ministry of Public Health (2016). Health map year 2015. Resource document. Ministry of Health, Tunisia. http://www.santetunisie.rns.tn/images/docs/anis/stat/cartesanitaire2015.pdf. Accessed 26 September 2017

Muhib, FB., Lin, LS., Stueve, A., et al. (2001). A venue-based method for sampling hard-to-reach populations. *Public Health Reports*, 116(Suppl 1), 216-222.

NIS, National Institute of Statistics Tunisia. (2014). *National survey of population and employment, ENPE 2013* (Arabic). Resource document. http://www.erfdataportal.com/index.php/catalog/100/reports? Accessed March 31 2018.

Nosratnejad, S., Rashidian, A., & Dror D. M. (2016). Systematic review of willingness to pay for health insurance in low and middle income countries. *PLoS ONE* 11(6): e0157470

Obermann, K., Jowett, M. R., Alcantara, M. O., Banzon, E. P., & Bodart, C. (2006). Social health insurance in a developing country: the case of the Philippines. *Social Science & Medicine,* 62, 3177–3185

Russell, S. (1996). Ability to pay for health care: concepts and evidence. *Health Policy and Planning*, 11(3), 219-237.

Ryan, M., Scott, D. A., Reeves, C., Bate, A. van Teijlingen, E. R., Russell, E. M., et al. (2001). Eliciting public preferences for healthcare: a systematic review of techniques. *Health Technology Assessment*, 5(5), 1–186.

Saleh, S. S., Alameddine, M. S., Natafgi, N. M., Mataria, A., Sabri, B., Nasher, J., et al. (2014). The path towards universal health coverage in the Arab uprising countries Tunisia, Egypt, Libya, and Yemen. *The Lancet*, 383(9914), 368–381.

Strazzera, E, Genius, M, Scarpa, R, & Hutchinson, G. (2003). The effect of protest votes on the estimates of WTP for use values of recreational sites. *Environmental and Resource Economics,* 25*,* 461–476.

Tangcharoensathien, V., Patcharanarumol, W., Ir, P., Aljunid, S.M., Mukti, A.G., Akkhavong, K. et al. (2011). Health in Southeast Asia 6 - Health-financing reforms in southeast Asia: challenges in achieving universal coverage. *Lancet,* 377*,* 863–73

Terza, J. (1983). A two stage estimator for models with ordinal selectivity. *Proceedings of the Business and Economics Section of the American Statistical Association*, 484–486.

Tobin, J. (1958). Estimation of relationships for limited dependent variables. *Econometrica*, 26*,* 24-36.

Wagstaff, A. (2010). Social health insurance re-examined. *Health Economics*, 19(5), 503–517.

WHO, World Health Organization (2015). Tracking universal health coverage: First global monitoring report. Resource document. World Health Organization. http://apps.who.int/iris/handle/10665/174536. Accessed March 31, 2018.

WHO, World Health Organization (2017). Global health expenditure database. Resource document. World Health Organization. http://apps.who.int/nha/database/Select/Indicators/en. Accessed March 29 2018.

World Bank. (2013). *Fairness and Accountability: Engaging in Health Systems in the Middle East and North Africa*: *The World Bank Health Nutrition and Population Sector Strategy for MENA (2013-2018)*. Washington, DC: World Bank.

World Bank. (2015). Going universal: How 24 Developing Countries are implementing Universal Health Coverage reforms from the bottom up. Resource document. World Bank. https://openknowledge.worldbank.org/bitstream/handle/10986/22011/9781464806100.pdf. Accessed March 31 2018.

World Bank. (2017a). World Bank Open Data Tunisia. Resource document. World Bank. https://data.worldbank.org/country/tunisia. Accessed March 31 2018.

World Bank (2017b). Tracking Universal Health Coverage: 2017 Global Monitoring Report 122029. Resource document. World Health Organization and the International Bank for Reconstruction and Development. http://apps.who.int/iris/bitstream/10665/259817/1/9789241513555-eng.pdf. Accessed March 31 2018.

Figure 1 Map of Tunisia showing governorates in the sample

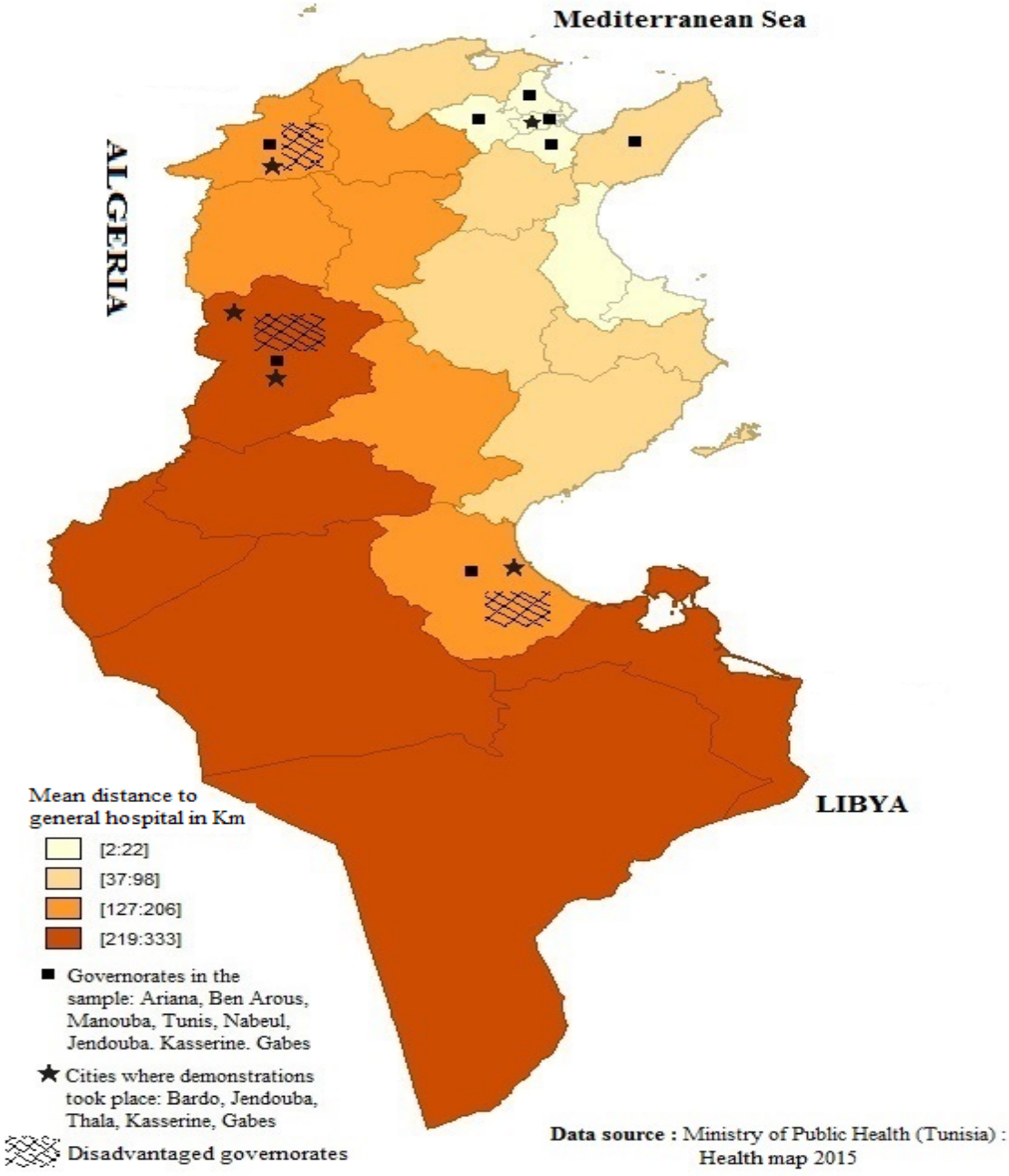

Table 1: Descriptive statistics (n= 426)

Variable definition	Mean (Std. dev.)
Dependent variables	
WTP for VHIS (quarterly, in TND) if WTP>0 (n=336)	42.58 (25.34)
WTP for VHIS (quarterly, in TND) if WTP≥0 (n=394)	36.32 (27.85)
Respondent characteristics	
Male = **1** if male, **0** if female	0.669 (0 .471)
Age = individual's age (in years)	35.384 (10.394)
Household size = number of household members	2.598 (2.011)
Child = **1** if at least one child under 5 years old in the household, **0** otherwise	0.133 (0.340)
Elderly = **1** if there is a person more than 65 years old in the household, **0** otherwise	0.051 (0.221)
Married = **1** if Married, **0** otherwise	0.417 (0.493)
NoSchool = **1** No schooling, **0** otherwise	0.023 (0.151)
Elementary = **1** primary school, **0** otherwise	0.213 (0.410)
Secondary = **1** secondary education, **0** otherwise	0.516 (0.500)
High School = **1** higher education, **0** otherwise	0.246 (0.431)
Household Income = Monthly household income (in TND)	558.11 (464.15)
Individual Income = Monthly respondent income (in TND)	539.14 (456.87)
Equivalized Income[a] = [Monthly income / (Household size)$^{0.5}$] (in TND)	425.80 (425.72)
Work = **1** if employed /self-employed, **0** otherwise	0.788 (0.408)
Rural = **1** living in rural area, **0** otherwise	0.197 (0.398)
DisadvantagedGov.[b] = **1** living in disadvantaged governorate, **0** otherwise	0.443 (0.497)
Other variables	
NonDeclared = **1** uninsured due to no declared work, **0** otherwise	0.490 (0.500)
Administration = **1** uninsured due to administrative procedures, **0** otherwise	0.340 (0.474)
NoNeed = **1** uninsured due to no need, **0** otherwise	0.663 (0.198)
RiskAverse = **1** if risk-averse, 0 otherwise[c]	0.885 (0.319)
Gamble[c] from **1** if risk lover to **6** if extremely risk averse	5.196 (1.411)
Respondent-specific health variables	
Self-reported health status = **1** if self-reported health status is good, **0** otherwise	0.835 (0.371)
Outpatient respondent = **1** if at least one outpatient care during the last 3 months, **0** otherwise	0.380 (0.486)
Inpatient respondent = **1** if at least one hospitalization during the last 8 months, **0** otherwise	0.093 (0.292)
Chronic condition = **1** if respondent reports a chronic condition, **0** otherwise	0.124 (0.330)
FinancialHealth = **1** if can afford health services, **0** otherwise	0.370 (0.483)
Smoking = **1** if consuming tobacco products, **0** otherwise	0.460 (0.498)
Health variables specific to the family members of the resp.	

Outpatient member = 1 if at least one outpatient care in household during the last 3 months, 0 otherwise	0.5 (0.500)
Inpatient member = 1 if at least one hospitalization in household during the last 8 months, 0 otherwise	0.140 (0.348)
Chronic member = 1 if one household member reports a chronic condition, 0 otherwise	0.185 (0.389)
Survey specific variables	
OE=**1** if open-ended elicitation format, **0** otherwise	0.331 (0.471)
PC=**1** if payment card elicitation format, **0** otherwise	0.322 (0.468)
CPC=**1** if circular payment card elicitation format, **0** otherwise	0.347 (0.477)
PublicSquare = **1** if sample point is a public square, **0** if informal market	0.420 (0.494)
Interviewer#1-5 = Dummy variables for each of the 5 interviewers	-

WTP: Willingness To Pay. OE: Open Ended. PC: Payment Card. TND: Tunisian Dinar.

[a] Equivalized income is computed based on the OECD equivalence scale, by dividing household income by the square root of household size (see Atkinson et al., 1995).

[b] According to decree n° 2008-387 of February 11, 2008, see Figure 1.

[c] Based on six modalities generated according to the method of Barsky et al. (1997).

Table 2: Regression results: Ordered probit selection model

	Model 2					
	Selection equation: Ordered Probit				WTP equation	
Variables	Parameter (*p*-value)	AME on Pr(WTP=0)	AME on Pr(protest)	AME on Pr(WTP>0)	Parameter (*p*-value)	AME on WTP
Noneed (=1)	-1.271*** (<0.0001)	.215*** (<0.0001)	0.070*** (<0.0001)	-0.285*** (<0.0001)		-2.817*** (<0.0001)
Chronic member (=1)	.495** (0.033)	-0.084** (0.034)	-0.027** (0.038)	0.111** (0.032)		1.096** (0.028)
Child (=1)	0.777*** (0.006)	-0.132*** (0.006)	-0.043*** (0.009)	0.174*** (0.005)		1.723*** (0.004)
Rural (=1)	-0.594*** (0.002)	0.101*** (0.002)	0.033*** (0.003)	-0.133*** (0.002)		-1.317*** (0.003)
Interviewer 2 (=1)	-1.111*** (<0.0001)	0.188*** (<0.0001)	0.061*** (<0.0001)	-0.249*** (<0.0001)		-19.776*** (<0.0001)
Cut off 1	-1.744*** (<0.0001)					
Cut off 2	-1.373*** (<0.0001)					
Constant					22.937*** (<0.0001)	
OE format (=1)					-5.844** (0.035)	-5.844** (0.035)
PC format (=1)					-6.892** (0.014)	-6.892** (0.014)
Equiv. Revenue (euros)					0.0231*** (<0.0001)	0.0231*** (<0.0001)
Work (=1)					9.618*** (0.001)	9.618*** (0.001)
RiskAversion (=1)					9.636*** (0.008)	9.636*** (0.008)
FinancialHealth (=1)					5.592** (0.027)	5.592** (0.027)
Rho (ρ)					-0.156 (0.422)	-
No. obs.	426					
Joint nullity test (p-value)	227.45*** (<0.0001)					
$\ln L_0$						
Log likelihood	-1726.824					

AME = average marginal effects. OE: Open Ended. PC: Payment Card. WTP: Willingness To Pay. * if p<0.10, ** if p<0.05, *** if p<0.01.

Table 3: Observed and predicted WTP (in TND) based on Ordered probit selection model

	Mean Protest WTP (n=32)	Null WTP (n=58)	Mean Positive WTP (n=336)	Mean WTP with null WTP (n=394)	Mean WTP with null and protest (n=426)
Observed WTP	- (-)	0 (0)	42.58 (25.34)	36.32 (27.85)	33.59[a] (28.44)
Predicted WTP	51.82 (18.42)	0[b] (0)	43.49 (14.13)	37.09 (20.21)	38.20 (20.43)

WTP: Willingness To Pay. TND: Tunisian Dinar. Standard deviation in brackets. [a] Wrongly assuming that protest WTPs are equal to 0. [b] Setting predicted values to 0.

Supplementary Material Statistical Appendix

The simple linear regression model to estimate the WTP values is as follows:

$WTP_i = X_i'\beta + \varepsilon_i;\ \varepsilon_i \sim N(0, \sigma_\varepsilon^2)$ (1)

where X_i is a set of explanatory variables specific to respondent *i*, and ε_i is the error term. The expected WTP is given as $E[WTP_i|X_i] = X_i'\beta$.

The Tobit model that distinguishes positive WTP from genuine zero WTP modeled the WTP as a latent variable WTP_i^* as follows:

$WTP_i^* = X_i'\beta + \varepsilon_i;\ \varepsilon_i \sim N(0, \sigma_\varepsilon^2)$ (2)

where $WTP_i = WTP_i^*$ if $WTP_i^* > 0$, and $WTP_i = 0$, otherwise. The expected WTP is given by

$$E[WTP_i|X_i] = \Phi(x_i'\beta/\sigma)X_i'\beta + \sigma\phi(x_i'\beta/\sigma)$$

where ϕ is the density function of the standard normal distribution and Φ is the corresponding cumulative distribution function. The pair (WTP_i, X_i) is observed when respondent i chooses to join the VHIS.

The sample selection model simultaneously specifies a probit-type equation for selection (willing to join the VHIS for free or at low cost, WTJ_i) and a linear-type equation for WTP conditional on the individual not being a protester as follows (Heckman, 1976):

$WTJ_i^* = Z_i'\alpha + u_i;\ u_i \sim N(0, \sigma_u^2)$ (3)

where WTJ_i=1 if $WTJ_i^* > 0$ and WTJ_i= 0 if $WTJ_i^* \leq 0$. Z_i is a set of variables explaining the decision of individual i to join the VHIS and u_i is the error term.

The WTP given WTJ_i=1 can then be estimated as:

$WTP_i = X_i'\beta + \varepsilon_i;\ \varepsilon_i \sim N(0, \sigma_\varepsilon^2)$ (4)

Equation (4) is estimated on the subsample of non-protest WTP. The joint distribution of error terms in equations (3) and (4) is assumed to be:

$(u, \varepsilon) \sim N[(0, 0, 1, \sigma_\varepsilon^2, \rho)$

where σ_u^2 is normalized to 1, and ρ is the correlation coefficient between the two error terms. The expected WTP accounting for selection is given as:

$E[WTP_i|X_i, Z_i, WTJ_i = 1] = X_i'\beta + \rho\sigma_\varepsilon\lambda(Z_i'\alpha)$ (5)

where $\lambda(Z_i'\alpha) = \phi(Z_i'\alpha)/\Phi(Z_i'\alpha)$ is the inverse Mills ratio. If the estimated correlation coefficient, $\hat{\rho}$, is not statistically significantly different from zero, then the two error terms are independent. This suggests that selection bias resulting from the protest attitudes is not a problem; hence other modeling strategies estimating equations (3) and (4) separately (e.g., two-part model) may be relevant (Madden, 2008).

The ordered-probit-selection (OPS) distinguishes between genuine null WTP (those who are willing to join for free or at low cost) and protest answers with unobserved WTP. Consider the

underlying latent model:

$$y_i^* = W_i^{'}\alpha + u_i \qquad (6)$$

where y_i is observed as per the following ordered-probit selection rule,

$$y_i = \begin{cases} 0\ (genuine\ null\ WTP)\ if\ c_0 \le y_i^* < c_1 \\ 1\ (protest\ WTP)\ if\ c_1 \le y_i^* < c_2 \\ 2\ (WTP > 0)\ if\ c_2 \le y_i^* < c_3 \end{cases}$$

where $c_0 \equiv -\infty$, $c_3 \equiv \infty$ and c_1 and c_2 are estimated simultaneously along with parameter α. The WTP_i is not observed if $y_i = 0, 1,$ while strictly positive WTP_i values (if $y_i = 2$) can be modeled using equation (1). The error terms of the ordered-probit and the OLS equations are assumed to follow a bivariate normal distribution $(u, \varepsilon) \sim N[(0, 0, 1, \sigma_\varepsilon^2, \rho)$, where the variance of u is normalized to 1 to allow identification; ρ, is the linear correlation coefficient between ε and u and σ_ε^2 is the variance of ε. The expected WTP conditional on an observed strictly positive WTP is given as:

$$E[WTP_i | X_i, W_i, y_i = 2\ ] = X_i^{'}\beta + \left\{[1 - \Phi(c_2 - W_i^{'}\alpha - \rho\sigma_\varepsilon)]/[1 - \Phi(c_2 - W_i^{'}\alpha)]\right\} \qquad (7)$$

References

Heckman, J. (1976). The Common structure of statistical models of truncation, sample selection and limited dependent variables and a simple estimator for such models. *Annals of Economic and Social Measurement*, 5(4), 120–137.

Madden, D. (2008). Sample selection versus two-part models revisited: the case of female smoking and drinking. *Journal of Health Economics,* 27(2), 300-307.

Table A1: Regression results: OLS and Tobit models

Variables	**OLS Model** Parameter (*p*-value)	**Tobit Model** Parameter (*p*-value)	Marginal effect
Constant	22.943** (<0.0001)	22.144*** (<0.0001)	- -
OE format (=1)	-5.778*** (0.050)	-6.904** (0.039)	-5.931** (0.039)
PC format (=1)	-7.062** (0.012)	-7.769** (0.015)	-6.673** (0.015)
Equiv. income (euros)	0.01879*** (<0.0001)	.01784*** (<0.0001)	.01533*** (<0.0001)
Work (=1)	9.290*** (0.001)	10.574*** (0.001)	9.083*** (0.001)
FinancialHealth (=1)	6.321** (0.028)	7.237** (0.025)	6.216** (0.023)
NoNeed (=1)	-13.575*** (0.006)	-17.780*** (0.003)	-15.273*** (0.003
Chronic member (=1)	5.431* (0.096)	6.365* (0.070)	5.467* (0.070)
DumGamb (=1)	8.340** (0.039)	8.037* (0.063)	6.904* (0.061)
Interviewer 2 (=1)	-23.107*** (<0.0001)	-28.407*** (<0.0001)	-24.401*** (<0.0001)
Sigma (σ)	-	26.084	-
No. obs.	394	394	
LRI / adjusted R^2	0.3155		
Joint nullity test	23.49***	18.03***	
(p-value)	(<0.0001)	(<0.0001)	
lnL_0			
Log likelihood		-1629.94	

OLS: Ordinary Least Squares. OE: Open Ended. PC: Payment Card. LRI: Likelihood Ratio Index. * if p<0.10, ** if p<0.05, *** if p<0.01.

Table A2: Regression results: Heckman selection model

Variables	Model 2			
	Selection equation (Probit)		WTP equation	
	Parameter (*p*-value)	Marginal effect	Parameter (*p*-value)	Marginal Effect
Constant	1.268*** (<0.0001)	- -	32.121*** (<0.0001)	- -
OE format (=1)			-5.129* (0.085)	-5.129* (0.085)
PC format (=1)	-0.541** (0.023)	-0.051** (0.017)	-7.265** (0.011)	-7.840*** (0.005)
Equiv. income (TND)	-0.00047* (0.055)	-0.000044* (0.055)	0.01874*** (<0.0001)	.01824*** (<0.0001)
Work (=1)			10.648*** (<0.0001)	10.648*** (<0.0001)
Tobacco (=1)			-5.189** (0.029)	-5.189** (0.029)
NoNeed (=1)	-1.113*** (<0.0001)	-.106*** (<0.0001)		-1.181* (0.072)
Chronic member (=1)			6.682** (0.040)	6.682** (0.040)
Elementary	1.000** (0.029)	0.095** (0.018)		1.061** (0.036)
Secondary	.834*** (0.005)	.079*** (0.001)		0.885** (0.030)
Rural	-0.630** (0.019)	-0.052** (0.012)	-7.578** (0.013)	-8.246*** (0.007)
DisadvantagedGov.	0.978*** (<0.0001)	0.093*** (<0.0001)		1.038** (0.049)
Interviewer 2			-21.822*** (<0.0001)	-21.822*** (<0.0001)
Interviewer 3	1.086** (0.022)	0.103** (0.011)		1.152 (0.125)
Rho (ρ)	-	-	-0.276** (0.029)	-
No. obs.	426			
Joint nullity test (p-value)	160.14*** (<0.0001)			
$\ln L_0$	-1885.846			
Log likelihood	-1876.262			

OE: Open Ended. PC: Payment Card. * if p<0.10, ** if p<0.05, *** if p<0.01,