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Stated Preferences and Decision-Making: Three Applications to Health

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APPORTS DES PRÉFÉRENCES DÉCLARÉES À LA DÉCISION PUBLIQUE : TROIS EXEMPLES EN SANTÉ

JEL Codes: D6, C83, I18, Q51, H4.

The Workshop in Non-market Valuation (WONV) aims at strengthening the network of researchers in this field by offering the French community and the international research network the opportunity to meet every year. This event was launched in Nantes (France) in 2013 and led to a special issue of the Revue d’économie politique in 2015. The second edition took place in Aix-en-Provence, followed by Nancy in 2015 and Bordeaux in 2016. Structured around keynote sessions, each WONV gives all participants the opportunity to present and discuss recent theoretical and empirical approaches in non-market valuation. Stated preference methods are covered, like contingent valuation and discrete choice experiments, as well as revealed preference methods, like hedonic price and travel cost methods. Non-market valuation methods are commonly used in economic sectors like environment, health, transportation, education.

On 25 and 26 June 2014, the second edition of WONV was organized at Aix-Marseille University in Aix-en-Provence. Keynote lectures were given by Nick Hanley (University of Stirling, UK), James Hammitt (Harvard University, USA and Toulouse School of Economics, France) and Jason Shogren (University of Wyoming, USA). Twenty communications were selected for presentation.

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2. Dominique Ami, Frédéric Aprahamian, Olivier Chanel, Emmanuel Flachaire and Stéphane Luchini composed the local scientific and organizing committee of this second edition, which was funded by Aix-Marseille School of Economics and OT-Med.
in four sessions: Methodology, Choice Experiments, Revealed Preferences and Health and Stated Preferences. The editors of *Revue économique* agreed to consider a refereed set of selected papers for this special issue.³

Three papers were selected, all dealing with stated preferences and health economics. Among the non-market methods, stated preferences are still controversial (see, e.g., the three papers in the special issue of the *Journal of Economic Perspectives*: Carson [2012], Hausman, [2012] and Kling, Phaneuf and Zhao [2012]), despite having been around for more than 50 years. One of the main criticisms, perhaps the most disturbing for economists, is that stated preference methods use surveys to elicit individual preferences. Respondents face hypothetical choice problems and they may not act the same way in a hypothetical situation as in a real situation. This is the so-called “hypothetical bias,” which usually means that respondents in stated preference surveys tend to be willing to pay more than they would if monetary incentives were at stake. This is not only due to the lack of monetary incentives to tell the truth, but also because projecting oneself into a hypothetical situation—often for public goods or policies that are not familiar to the respondent—is not easy. This of course raises questions about the reliability of welfare estimates obtained by these methods and their use in public decision processes. Yet, in many fields, economic analysis is impossible without a measure of preferences, and stated preference methods are often the only way to pass on useful information to policy-makers. They can reveal the value the population places on a good or service when no price is available, either directly on a market or indirectly through revealed preference methods. Because they are quite flexible, surveys offer the opportunity to design any ex ante specific scenario and to produce detailed analysis on individual behavior regarding non-marketed public or private goods. Moreover, research on stated preference methods has been prolific in the last decades and many survey devices have been put forward to help design reliable surveys. To name a few: cheap talk scripts that warn subjects about the mistakes they may make in hypothetical situations (Cummings and Taylor [1999]; Ami et al. [2011]); truth-telling oath procedures aimed at inducing real economic commitment without money (Jacquemet et al. [2013], [2016]); or commitment procedures that foster respondent motivation (for instance, to preserve the environment by signing a petition (Ami et al. [2014])). Elicitation mechanisms have been extensively tested and compared in terms of statistical efficiency and reliability (see, e.g., Vossler, Doyon and Rondeau [2012]). There is also an extensive literature on information provision in the survey (see, e.g., Hanley and Munro [1995] and Spash [2002]) and on ways to help respondents take better-informed decisions (see, e.g., Adler, Hammitt and Treich [2014]). Many deal with the fact that preferences stated in surveys may not be consistent preferences but rather attitudes towards public goods, and may be subject to behavioral failures (for suggestions on dealing with these issues, see, e.g., Kahneman and Sugden [2005], Sugden [2005] and Shogren and Thunström [2016]). Experiments in the lab can also usefully complement survey data (Shogren [2005]; Jacquemet et al. [2011]).

³ Dominique Ami, Frédéric Aprahamian, Olivier Chanel and Stéphane Luchini acted as guest editors for this special issue, and Nicolas Jacquemet was the corresponding associate editor for the *Revue économique*.
Interest in stated preference methods has grown in many countries, but their use in France, in particular for public decision-making, remains limited—surprisingly, since there is a real French culture of economic valuation, often referred to as “calcul économique.” This may be due to a reticence to use money as a “numéraire” when assessing public goods and policies. It seems that this feeling is particularly strong among the health care community, mistakenly so (Fleurbaey, Luchini and Schokkaert [2009]). It is possible to carry out a cost-benefit analysis based on stated preferences and still respect ethical principles (Fleurbaey et al. [2013]). This special issue aims at showing that stated preference methods can legitimately be used in economic analysis when people’s preferences need to be determined and market prices or revealed preferences are not obtainable.

The three papers in this issue rely on stated preference methods to provide support in public decision-making. All focus on health issues. The first paper by James Hammitt compares monetary and health-utility measures to value non-fatal health risks. The second paper by Olivier Chanel, Alain Paraponaris, Christèle Protière and Bruno Ventelou analyzes how French general practitioners’ (GPs) labor supply would respond to a change in their fee per consultation. The last paper, by Christel Protière, Olivier Chanel, Catherine Nogues, Isabelle Coupié, Emmanuelle Mouret-Fourme, GENEPSO cohort investigators and Claire Julian-Reynier explores a bioethics debate on access to diagnostic tests before or during pregnancy to limit the risk of developing breast and ovarian cancer at a younger age. All three papers open the way to a better ex ante understanding of individual and public decisions on health policies.

The first paper, Hammitt [2017], deals with a challenging issue: how to estimate the willingness to pay (WTP) per quality-adjusted life year (QALY). Changes in health risk can be valued using two main classes of metrics. The first are based on monetary measures whereas the second are based on health-adjusted life year measures. In this paper, after presenting each approach separately, Hammitt offers a theoretical framework where empirical issues about estimates can be discussed.

Monetary measures, like WTP for a reduction in health risk, rely on the standard expected utility model developed in the context of mortality risk. The value of a statistical life (VSL) is defined as the marginal rate of substitution between wealth and mortality risk. Hammitt’s paper shows how this model can be applied to a non-fatal health condition and identifies new issues arising from this interpretation. The utility of wealth conditional on survival becomes the utility conditional on initial health condition and the utility of wealth conditional on dying during the period is interpreted as the utility of impaired health states. However, non-fatal health conditions can take many different forms, and in many cases it is important to at least distinguish between chronic and transient impaired health states. Moreover, although things are straightforward when the marginal utility of wealth is assumed to be greater for survival than for death, the increase of marginal utility with health is more open to debate. From a theoretical perspective, it is difficult to define clearly the sign of many potential

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4. At the last annual conference of the French Association of Environmental and Resource Economists (FAERE) in September 2016, there was only one parallel session amongst 24 devoted to stated preference methods.
impacts on individual utility, like the impact of the cross-effect between health and income or the impact of an increase in life expectancy. However, this approach is relevant to estimate tradeoffs between risk and wealth. Moreover, apart from the usual (restrictive) conditions on existence of expected utility, no additional hypotheses on individual preferences are required. This is not the case when health-adjusted life year measures of health risk like QALY and disability-adjusted life years (DALY) are used. QALY is shown to depend on health, itself measured according to an index like the health-related quality of life (HRQL) and longevity, but assumed to be independent from other factors like wealth or consumption. Other assumptions can introduce challenges, as when HRQL is assumed to depend on health state alone. When estimating WTP for health risk reduction based on QALY measures, it is common to assume that WTP is proportional to expected change in QALY and it has been demonstrated that WTP per QALY is a constant that can be inferred from estimates of VSL.

The second part of Hammitt’s paper looks at a recent and promising avenue of research on fatal health risks (Adler et al. [2014]), now exploring it for non-fatal risks by comparing monetary and health-utility measures and discussing its relevance for welfare evaluation. Empirical evidence is discussed. The strategy for estimating the monetary value of an expected change in QALY is to assume that utility for health and longevity are conditionally independent of wealth. This makes it possible to express the utility depending on health, longevity and wealth by means of a positive affine function of QALY. Moreover, for the extreme case, this utility is similar to the utility conditional to survival introduced when defining VSL. This model enables theoretical arguments to be discussed, like the assumption that WTP per QALY is constant for instance. It also offers a way to empirically explore the arguments: in two stated preference surveys, respondents were asked to state WTP to reduce the probability of suffering an acute illness in the first case, and a chronic illness in the second case. Econometric models are used to estimate the elasticities of WTP with respect to risk reduction, duration and severity of illness. In both studies, respondents are found to be sensitive to the size of risk reduction (elasticities are significantly different from zero and range between one-half and one). Moreover both sets of findings refute the hypothesis that WTP is proportional to the expected change in QALY.

From these results, estimated WTP to reduce risk, value per statistical case and average value per QALY are calculated, for various combinations of loss in HRQL and duration of illness. For instance, the value of a statistical case of illness is found to be about $10,000 for acute illness and about $1 million for chronic illness. Finally, these elicited values are compared to the average values per QALY derived from VSL. For long-term illness and small health changes, the two values are comparable. In most other cases, elicited values are greater than implicit values, except for the extreme case of long-term severe health change.

The second paper, by Chanel et al. [2017], uses contingent valuation to analyze the labor supply of a sample of French general practitioners (GP), focusing on how they would adjust their supply to an increase in fee per consultation. In centralized health systems (like France) or in large health insurance coverage systems (like the USA), one of the objectives of decision-makers (public in the former, private in the latter) is to guarantee an adequate supply of medical services to meet countrywide demand. A revised fee per consultation is one
possible method, but a fee increase will not necessarily lead to an increase in supply. Indeed, with an average income about 2.5 times greater than the French average but an average working week of 46 hours against the usual 35, GPs may be prone to trade extra money for extra leisure time.

The authors purposely implement three hypothetical scenarios with different increases in consultation fees to explore this issue. This allows them to overcome the absence of variability in consultation fees that precludes any direct actual observation of the elasticity of hours worked to the level of the fee. Their results show that most of the GPs (69.1%) will not change the number of hours worked, while 29.6% will decrease their supply and only 1.3% increase it. This confirms that most of the GPs are in the vertical part of the labor supply curve, while about one third are in the backward-bending part preferring an increase in leisure to an increase in earnings.

Additional evidence that wealth may influence this tradeoff can be found in the regressions, although this is not stressed by the authors. They find GPs from Bourgogne and Basse-Normandie regions to be more significantly willing to decrease the number of hours worked w.r.t. those of the three other regions studied. It is worth noting that the average GP’s overall revenue in these two regions is greater than the French average (€151,166 in 2014, according to Assurance Maladie [2016a]), whereas it is lower in the three other regions.

However, caution is required when assessing the elasticity of the number of hours worked to fee levels, as the fee per consultation is not the only source of revenue for French GPs. There are additional fees per consultation (for patients below 6 or above 80, for complementary medical acts provided during the consultation, for patients with long-term illnesses), a capitation lump sum per patient registered with the GP, a pay-for-performance system (Rémunération sur objectifs de santé publique) based on 29 health and efficiency objectives, a yearly bonus for GPs practicing in areas lacking medical supply, and an annual amount of money for improving computerization of patient monitoring and follow-up. Overall, a GP earns on average an extra €8 per consultation (i.e., 30% in addition to the €22 fee in application at the time of the survey), which may affect GPs’ actual behavior when facing a consultation fee increase.

Recently, the French Health authorities have reached an agreement with GPs that involves a €2 increase in the consultation fee (i.e., about a 10% increase) from May 2017 (Assurance Maladie [2016b]). This will be a good opportunity to check whether GPs facing an actual increase will adjust their supply, as predicted by the models based on hypothetical increases. In the end, this agreement is seeking ways other than consultation fees to improve supply, a conclusion also reached by the authors. It makes medical deserts more attractive, with a grant of €50,000 for GPs who settle for at least three years in these areas, and who use new technologies to improve care coordination and to provide better patient care.

The third paper by Protière et al. [2017] is not just an applied health economics study. It indirectly addresses two fundamental questions: “How much are we willing to pay in order to avoid our future children being exposed to a higher risk of developing a specific disease?” and the associated ethical problem: “Should/would we know?”

Because high-risk penetrance genes such as BRCA1/2 cause 2-5% of neoplasms, carriers have a higher risk of developing some cancers, like breast and ovarian cancers, at a younger age. To avoid transmitting this mutation, one
of the few solutions available is to resort to an in vitro fertilization (IVF) enabling only embryos not affected by the mutation to be implanted into the maternal uterus. This is the pre-implantation genetic diagnosis (PGD). A second option is the prenatal diagnosis (PND), which is performed through amniocentesis. In the case of a particularly severe disease, a therapeutic termination of pregnancy (TOP) can be proposed.

Using a sample of 460 French BRCA1/2 mutation carriers unaffected by cancer (GENEPSO cohort) and a contingent valuation, Protière et al. [2017] elicit their preferences regarding access to PGD and PND. Several interesting results are obtained. For instance, 28% of the respondents declared that in the event of a future pregnancy, they did not want to benefit from either PGD or PND. An unexpected result is that PND is more often considered preferable to PGD: 43.7% of the 460 respondents would not wish to receive PGD and 34.6% would not wish to receive PND.

After careful selection of the respondents who have a positive willingness to pay for PGD and PND, and because the order of evaluation is always PGD before PND, the authors use a simultaneous statistical model to estimate the mean WTP of the sample. Another interesting result is that the mean WTP for PGD (€1,952) and for PND (€1,808) are similar even if some differences appear, depending on whether respondents give a WTP to both diagnoses or only one of them. This is surprising, since the real cost of PGD is between €2,700 and €8,110 in France, while PND costs about €675.

Despite some minor limitations, this economic study points to a clear desire for systematic information and for access to PGD and PND. Because we observe that countries across Europe have significantly different regulations regarding access to PGD (allowed in 56%, forbidden in 12% and unregulated in 32%) and PND (allowed in 96% and forbidden in 4%), this study shows that ethical and economic considerations are of comparable importance.

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