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Special issue on health econometrics: editors' introduction

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We were fortunate to have been able to solicit papers for this special issue of Empirical Economics from the 2nd Health Econometrics Workshop that took place on 15–17 July 2010 at the Catholic University of the Sacred Heart (CUSH), Rome, Italy. Not all the papers appearing in this issue, however, are from that conference. Some of the articles were regular submissions to the journal in health economics that were a good fit with this special issue. The Workshop was organized and sponsored by the CUSH along with the Inter-University Research Centre on Public Services at the University of Milan-Bicocca (Italy), the University of Bergamo (Italy) and Brunel University (UK).

This special issue in health econometrics contain important contributions in health economics as well as econometric methodology applied to health. These include estimating the role of the quality of schooling as a determinant of inequalities of opportunity in health using data from England and Wales. The application of panel

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data and spatial econometric techniques to estimate the effects of spending on health care across OECD countries on life expectancy beyond those accounted for by medical innovations. Estimating a dynamic panel system GMM model to obtain the effects of diet, physical activity, drinking and smoking on weight using Chinese data. Estimation of a mixed logit econometric model in preference space rather than willingness to pay space using Tanzanian data. Estimation of a dynamic model of habit formation applied to the consumption of antibiotics using Italian panel data. Estimating the effects of perceived differences in the quality of health care using regional and socioeconomic inequalities in access to care in Italy. Estimating an extension of the basic vignette model to analyze gender differences in self-assessments of health in Europe. Estimating the amount of cost sharing in the diagnosis related groups (DRGs) system using data from Iceland. Investigating the effect of policies aimed at limiting the phenomenon of upcoding using data from Italian hospitals. Using the panel unit root approach of Bai and Ng to account for cross section dependence arising from common shocks across various countries to study causation between health and income. Applying a new generalization of the concept of cointegration to obtain a highly significant relationship between health expenditure and health outcomes.

All of the papers selected for this special issue have gone through the usual process of peer review for *Empirical Economics*, and we would like to thank all of the referees for their hard work.

1 Summary of contributions

Inequalities in health are widely observed within and between nations, regions and individuals. Less appreciated are the inequalities of opportunity in health that in many instances are likely to dictate the health disparities that ultimately arise. Using the 1958 NCDS cohort data, Andrew Jones, Nigel Rice and Pedro Rosa Dias explore hypotheses about the role of the quality of schooling as a determinant of inequalities of opportunity in health. The authors are able to use a quasi-experimental approach to these questions by using information on comprehensive schooling reforms that took place in England and Wales. Their analysis uncovers statistically and economically significant associations between several measures of education quality and a set of health and health-related outcomes even after controlling for a rich set of factors that are widely thought to influence health and opportunities in health.

The disparities in health outcomes across countries are widely recognized but not as well understood. Using panel and spatial econometric approaches, Badi H. Baltagi, Francesco Moscone and Elisa Tosetti model in the context of a health production framework, life expectancy outcomes in OECD countries over the period 1960 to 2007. The inputs in their production function include health and social spending, measures of medical innovation and population lifestyle measures. The authors find that spending on health care has significant impacts on life expectancy beyond those accounted for by medical innovations. They also find considerable spatial spillovers in life expectancy, suggesting technological interdependence may be important.

Shu Wen Ng, Edward C. Norton, David K. Guilkey and Barry M. Popkin study the relative importance of diet, physical activity, and health behaviour of smoking

and drinking on weight for a set of Chinese males, using data from the China Health and Nutrition Survey. The authors use a dynamic panel system GMM approach that explicitly includes time and spatially varying community-level urban city and price measures as instruments, to obtain estimates for the effects of diet, physical activity, drinking and smoking on weight. Results show that about 5.4% of weight gain is due to declines in physical activity and 2.8–3.1% is due to dietary changes over time.

Estimation of models of willingness to pay has become a prominent feature of applied welfare analysis in health economics. In many instances there arise alternative strategies for and approaches to such estimation. Using a mixed logit econometric framework, Arne Risa Hole and Julie Riise Kolstad provide an innovative comparison of estimation in preference space versus estimation in willingness to pay space in the context of Tanzanian Clinical Officers' job choices. For the data they examine, the authors find a superior model fit using the preference space approach, although the differences tend to be small. The authors suggest that specification and sensitivity testing is likely to be important in such analyses.

Increasing bacterial resistance to antibiotics is a growing problem that is linked to hospital acquired infections and other adverse consequences for health care systems and public health. To learn more about this problem Massimo Filippini and Giuliano Masiero make the analogy between the use of antibiotics and consumption of addictive substances. This allows them to draw on economic models of habit formation and use these to analyse the dynamics of the consumption of antibiotics using panel data at the level of 20 Italian regions for the period 2000–2007. Using this framework they are able to provide evidence of the extent of lagged adjustment in consumption levels. This evidence indicates that persistence in consumption is relatively weak.

Perceived differences in the quality of health care provided within public and private sectors can influence the decision to opt for private specialists. Massimo Baldini and Gilberto Turati explore whether there is an interaction between the influence of perceived quality and whether or not a household faces liquidity constraints due to their level of disposable income. In the Italian context this is associated with regional and socioeconomic inequalities in access to care. Differences across income groups, having controlled for morbidity, are quantified using Bank of Italy survey data from the 1990s.

Franco Peracchi and Claudio Rossetti use anchoring vignettes to analyze gender differences in self-assessments of health in Europe. They estimate an extension of the basic vignette model that allows for potential correlation in the self-assessments of health on different domains by including an unobservable individual effect, common to all domains but different across individuals, in both the thresholds and the equations for the latent health problems. In their application they find that vignettes help narrow gender differences in self-assessments of health, although these differences are not entirely eliminated.

Elín J. G. Hafsteinsdóttir and Luigi Siciliani analyse the cost sharing in the DRGs system in Iceland using data from 2003 to 2005. The authors estimate the degree of cost sharing by regressing the price for each individual patient against its cost, using both ordinary least squares and the instrumental variables approach. Once the potential endogeneity between price and cost is taken into account, the instrumented estimate of cost sharing is in the range 0.11–0.14. Further, results show that more than half

of cost sharing appears to be associated with procedural DRGs, i.e. the retrospective features of the classification system (such as the type of treatment provided).

Giorgio Vittadini, PaoloBerta, GianmariaMartini and Giuditta Callea investigate the effect of policies aimed at limiting the phenomenon of upcoding, using data on a set of Italian hospitals for the years 2007–2008. The authors study the impact of a law that introduces a minimum length of stay for discharges with complications. Results show that the policy has been effective in limiting upcoding, since, after the law, the probability of a discharge with complications decreased by 3%, and the length of stay rose by 0.17 days more than the length of stay of a discharge in the control group. Also, the hospital's revenue on a discharge with complications decreased by 8.5% more than the observed revenue change on a discharge in the control group. The authors also found evidence of an ownership effect on upcoding, since not-for-profit and for-profit hospitals have been more affected by the law than public hospitals.

Declan French investigates the relationship between health and income, using data on a set of OECD countries over the last 50 years. The author adopts the PANIC approach by Bai and Ng that accounts for cross section dependence arising from common shocks across various countries. Results show that there is consistent cross section dependence in the data, and that there exists a bi-direction causation between health and income. This finding is shown to be robust to dynamic specification and many mortality-based measures of population health.

Stephen Hall, P. A. V. B. Swamy and George S. Tavlas propose a new generalization of the concept of cointegration that allows for the possibility that a set of variables are involved in an unknown nonlinear relationship. Although these variables may be unit-root non-stationary, there exists a nonlinear combination of them that takes account of such non-stationarity. The authors then apply this technique to obtain a highly significant relationship between health expenditure and health outcomes.