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Book of Abstracts

The abstract are sorted by type of presentation (oral/poster) and by Last name of the authors

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Risk of Bias in Model-Based Economic Evaluations: The ECOBIAS Checklist

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Background

Economic evaluations are becoming increasingly important in helping policymakers to efficiently allocate scarce resources. Several biases can occur when performing economic evaluations. It is therefore important for policymakers to be able to assess potential biases and for researchers to minimize them. Earlier research revealed which biases exist in trial-based economic evaluations.

Objectives

This article aims first to identify biases that are specifically related to model-based economic evaluations and to illustrate their potential impact on economic outcomes using examples from the literature. Second, the article aims to present a checklist for assessing the risk of biases in economic evaluations (the ECOBIAS checklist), which can be used for trial- and model-based studies.

Methods

Several possible sources of bias in model-based economic evaluations were identified using the Philips guideline for good practices in modelling economic studies as a structuring framework. Biases were identified and illustrated using evidence from previously published model-based economic evaluation studies. Examples of biases were found through a scoping review, scrutinization of systematic reviews that used the Philips guideline, working-group meetings and discussions with the lowlands Health Economics Study Group (IolaHESG). By combining biases that can occur in trialbased with those that can occur in model-based studies, which were identified in a previous article by the author group, a checklist for assessing biases in economic evaluations was developed (ECOBIAS).

Results

Eleven additional model-specific biases were identified and classified by structure, data and consistency of the model. These biases are related to structural assumptions, model type, time horizon, data selection (such as treatment effects), assessment of uncertainty and internal validation. The impact of these biases could be massive, changing the outcomes from being highly cost-effective to not being cost-effective at all. The ECOBIAS checklist aims to help researchers identify biases and includes a total of 22 biases, of which eleven are specific for modelling economic studies.

Conclusion

In this study, we identified several biases that are related to model-based economic evaluations and developed the ECOBIAS checklist for identifying biases in economic evaluations. We hope that our results and the ECOBIAS checklist will help to reduce biases in future economic evaluations and will increase faith in model-based economic evaluations in particular.

Key-words: bias, model-based studies, cost and outcomes, economic evaluation, systematic error, checklist

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A Comparison of Time Spent in Physical Activity and Commuting across BMI Categories

Supervisors: Colin Green, Economics Department Lancaster, University Lancaster, Bruce Hollingsworth, Division of Health Research Lancaster, University Lancaster

Physical inactivity has been identified as the sixth leading cause of disease burden in the US. Less than half of US adults meet the Center for Disease Control and Prevention's Physical Activity Guidelines and just over one quarter report spending no time at all on physical activity. Previous research has considered the role that time use plays in health outcomes and, in particular, shows commuting time and time spent in physical activity are inversely related. We separately consider individuals with different levels of health, to test whether individuals with poorer health will spend additional free time exercising.

We model differences in commuting time as an exogenous change in the amount of time available for other activities. We use data from the American Time Use Survey (ATUS) Eating and Health Modules from 2006 to 2008. ATUS respondents provide a diary of all of their activities from 4 a.m. on the previous day until 4 a.m. on the interview day. Activities are reported per-minute and classified into activity categories; multi-tasking is not reported. The data include socioeconomic variables, perceived health status, and self-reported height and weight. In order to only consider individuals who face a strong time constraint, we limit our sample to individuals who have worked at least seven hours on the diary day. We use a seemingly unrelated regression model, which allows for the correlation of error terms for each individual's daily activities and takes advantage of the fact that the sum of time spent in each activity is equal to the total amount of time in a day.

We find that a ten percentage increase in time spent commuting decreases the time a normal-weight individual engages in physical activity by 1.5%; for overweight and obese individuals, physical activity decreases by roughly 0.8%. Looking at males and females separately, most of this difference is driven by overweight and obese females; for this group, a 10% increase in commuting time is associated with a 1.1 % increase in time spent on physical activity, indicating a more complex relationship. For obese females who do exercise, the increase in commute time has the expected relationship of decreasing physical activity time. However, the likelihood such a person exercises increases with commute time – indicating that individuals who have longer commutes are more likely to exercise. This relationship may be explained by socioeconomic differences that vary by commute time and are not captured by conventional control variables.

These findings suggest that policies aimed at simply giving individuals more time to engage in physical activity may not be effective for overweight and obese individuals who do not already exercise. Alternative incentives for engaging in physical activity may be needed for these at-risk individuals.

Keywords: Obesity, Body Mass Index, Physical Activity, Health Behaviors, Time Use, Commuting

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Effect of day and time of arrival at the Accident and Emergency department on the probability of admission, short-stay and 30 day mortality in England

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Supervisors: Tim Doran, Matt Sutton

The National Health Service in England has committed to consistent services on a 24/7 basis, beginning with urgent care. However, little evidence exists to support this policy beyond the finding of raised mortality amongst patients admitted at weekends. Little attention has been paid to the interaction between demand and supply factors at different points in the care pathway across the time of the week. We examine how the probabilities of hospital admission, short stays, and mortality vary by time and day of arrival at the Accident and Emergency department. We use merged patient-level data from Hospital Episodes Statistics on A&E attendances and admissions for 2013/4. We include a range of demand and supply measures, including the hospital occupancy rate and the availability of admitting consultants. We find that patients attending A&E during weekend daytimes are less likely to be admitted. Patients attending overnight are more likely to be admitted for a short stay. Lower occupancy and higher consultant availability increase the probability of admission, but have no significant effect on the probabilities of short-stays or mortality for admitted patients. Fluctuations across day and time are more pronounced in the probabilities of admission and short-stays than in mortality. Further analysis focusing on patient pathways could improve implementation of 24/7 services.

Key words: weekend mortality, readmissions, survival analysis.

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***Interactions between social and private insurance
under ex-post moral hazard***

Supervisor: Florence Naegelen, CRESE, University of Besançon, Besançon, France.

So far, in the theoretical literature on mixed systems of insurance, complementary and supplementary insurances have been treated as being the same thing. In this article we question this assumption. We develop a model where the optimal social insurance rate varies according to re-distribution and ex-post moral hazard provoked by insurance. This game has three stages and is solved through backward induction. The optimal social insurance is chosen first by maximizing social welfare. Second individuals choose their private insurance contracts. In the third stage they decide on their level of labour and consumption of health and other goods. We consider the effect of banning complementary insurance. We show that whereas the presence of complementary insurance decreases the optimal size of social insurance, the effect of supplementary insurance is unclear.

Keywords: Social insurance, health insurance, ex-post moral hazard, topping-up, redistribution.

JEL Classification. D82; I13; I18.

Arjun Bhadhuri

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***Capturing health spillovers for economic evaluation: a comparison of the
Q-5D-5L and SF-6D***

Co-authors: Kate Jolly, Sue Jowett, Hareth Al-Janabi (Health and Population Sciences, University of Birmingham)

supervisor: Hareth Al-Janabi (Health and Population Sciences, University of Birmingham)

Background and objectives

Patient illnesses (especially chronic illnesses) can impact the mental and physical health of family members, for example some family members may have to provide physically demanding informal care. Even family members that do not provide care may be affected psychologically from witnessing a family member with an illness. Such effects are important to capture – in theory – in economic evaluations conducted under a societal or healthcare perspective.

The question then remains, what instrument best captures the ‘spillover’ of patient illness (and interventions) on the health of family members? The objective of this research is to compare the validity of two widely used health-related quality of life instruments - the EQ-5D-5L and SF-6D - in capturing health spillover effects to both informal carers and other family members.

Methods

This study used data from a survey to assess the family impact of meningitis. Meningitis results in a number of disabling after effects related to behaviour, mental and physical health; creating a range of caring situations. The family member survey was completed by 1587 family members of meningitis survivors at baseline in May 2012, and 1022 family members at follow-up in May 2013. Further information about the family members of the patients affected by meningitis was also collected at both time points. A literature review of factors associated with spillover effects was undertaken to identify constructs related to the caring context and patient health predicted to be associated with impaired health of family members. Associations between these constructs and family members’ health outcomes (assessed by the EQ-5D-5L and SF-6D) were used to assess validity.

Three types of validity were examined- known groups validity, construct validity and responsiveness. Under construct validity, hypotheses regarding associations were tested and examined using Spearman’s Rank and Mann Whitney tests. Effect sizes and correlation coefficients were also reported to assess the magnitude of associations.

Results

Completion of the EQ-5D-5L was 96% and the SF-6D 92%. The SF-6D potentially demonstrated better known groups validity than the EQ-5D-5L. Both the EQ-5D-5L and the SF-6D demonstrated substantial construct validity, as they were able to detect many associations between factors predicted to be associated with family member health spillover. The SF-6D performed slightly better in terms of construct validity and responsiveness to variations in the caring situation of the carers.

Conclusion

Although there were nuances in terms of which measure was more sensitive to which construct, both the EQ-5D-5L and the SF-6D exhibited sufficient construct validity to justify their use as measures of family member health in economic evaluation.

Key words: Comparison, EQ-5D, SF-6D, health spillovers, caregivers, non-caregivers, family members, validity

Carla Blázquez Fernández

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Do the unemployed hit the bottle during an economic downturn? The case of Spain

Supervisor: David Cantarero Prieto (Department of Economics/Universidad de Cantabria, Santander)

Drawing on data from the Spanish National Health Survey for the years 2006 and 2011-2012, we analyse different socioeconomic issues that affect drinking behaviour. Precisely, adopting both an individual-level and business cycle perspectives, we jointly examine how unemployment and macroeconomic conditions affect heavy alcohol consumption. Two main approaches are used to analyse the data, discrete-choice models and matching techniques. On the one hand, at the micro-level, we provide empirical evidence that being unemployed reduces the probability of being a heavy drinker with respect to those non-unemployed. Nonetheless, the difference between

unemployed and employed seems to have disappeared in the crisis period and so, unemployed would drink relatively more than in the non-crisis one. On the other hand, the findings indicated that at the macro-level through the crisis it would be less general drinking. For Spain, this means pursuing the goals of existing public-health programs without forgetting next important challenges.

Keywords: Heavy drinking; Crisis; Unemployment; Spain; Discrete-choice models; Matching techniques.

JEL Classification I12; I18; E32

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Risk and information aversions' influences on screening decision

Co-author: Marlène Guillon (Paris School of Economics)

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The information provided when individuals choose to screen is instrumental as emotion-provoking. Thus two risks intervene in the decision-making process. We want to investigate how the different attitudes of individuals towards these risks influence the decision to get tested. The first one applies to the future health states: screening diminishes the risk of the worse health state occurrence. It leads to a positive relationship between risk aversion and the propensity to screen. The second risk is due to the emotion-provoking component of information. The negative value and the disutility directly derived from getting this information may induce screening avoidance. By considering into one model these two aspects, we investigate how and when information and risk aversion influence the screening decision.

Keywords: Screening decision; Risk aversion; Anticipated emotions; Information aversion

JEL Classification Numbers: I12; D03; D81

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Timing of changes in smoking behaviors with family events

Supervisor: Florence Jusot (PSL, Université Paris - Dauphine, Paris)

This work proposes an innovative approach to estimate the impact of family events (living with a partner, first childbirth and separation) by considering the timing of changes in smoking behaviors. Empirical strategy consists in using a set of dummies that describes the timing of life events in the discrete time logistic regression of smoking initiation, cessation and probability. In particular, we consider leads and lags effects up to three years around the event to measure both anticipation and adaptation. This empirical work is based on the data derived from the Santé et Titulaires Professionnels (SIP) survey conducted in France in 2006, which made it possible to retrospectively date the age of biographical events such as family and health events. This article highlights the usefulness of research on anticipation and adaptation effects with family events to understand the dynamic effects of smoking

behavior over the life cycle. First childbirth and separation are associated with anticipation effects for women whereas contemporary effects are found for men. A protective effect a living with a partner is also confirmed with contemporary effect on cessation and adaptation effect on initiation. Moreover, we found heterogeneity in smoking behavior across educational level and showed differences in adaptation to family events which could explain the increase in smoking inequalities during the transition to adulthood.

Key words: smoking, life events, life cycle, longitudinal analysis, education

Clémence Bussière

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Primary health care use among community-dwelling adults with disabilities: a structural equation modeling application based on French national survey data

Supervisor: **Nathalie Pelletier-Fleury** (CESP, Team 1 – Health economics and health services research unit (Inserm U1018))

There is evidence of social disparities in the use of primary health services in most European countries, and these disparities particularly affect people with disabilities. Many factors influencing disabilities interact to limit access to health care. Following the capability approach, the objectives were 1/ to determine the relationships among potential indicators to assess disability-related capabilities and 2/ analyze their simultaneous effect on primary health care use (GP and nurse care; cervical, breast, and colorectal cancer screenings) in community-dwelling adults. We used structural equation modeling methodology, which allowed us to simultaneously test relationships and measure the (unobserved) capabilities. The data source was the Health and Disability Survey – Ordinary Household Section, 2008 (n = 29,9931). Inspired by the International Classification of Functioning, Disability and Health framework, potential disability indicators were selected to model five latent variables: health conditions, cognitive, physical, societal, and socioeconomic capabilities. The model's goodness of fit provided strong support for our conceptual capability model. By reasoning all things being equal for all models, we showed a lower likelihood of nursing care use among people with lower cognitive capabilities. Contrary to what is usually found, we did not observe any significant influence of either cognitive or physical capabilities for any type of cancer screening use, but we showed that individuals with lower societal capabilities were less likely to be screened for breast or colorectal cancers. Socioeconomic capabilities positively influenced the use of cervical and breast cancer screening. Finally, apart from health condition capabilities, we did not observe any influence of other capabilities on access to GP care. Considering the capability approach, which suggests public action oriented toward restoring the capabilities of individuals, future programs should seek to increase societal support to compensate for the disability situation. This could be helpful in reducing inequalities in health care access.

Keywords: France; primary care; disability; capability approach; access to care; health inequalities; structural equation modeling.

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Hospital Competition and Universal Coverage of Health Care

Supervisor: **Stéphane Gauthier** (PSE - Paris 1 Panthéon-Sorbonne, Paris)

This work aims at exploring the effects of hospital competition on treatment decisions and its consequences for the regulation of hospital care under a Prospective Payment System. We develop a model where patient's mobility across hospital is based on the patients' knowledge of hospitals practices and their preferences over treatment alternatives. The economic incentives introduced by PPS lead hospitals to internalise patients' preferences in their treatment decisions and change the hospital response to the reimbursements contract. When a regulator cannot infer the population faced by a given hospital but only the treatments provided and patients have preferences for advance treatment, hospitals competition increases the social cost of an efficient allocation of treatments. As a result, we find that hospital strategic interaction for attracting patients leads both to increase the dumping incentives of hospitals for high severity patient and to decrease overall welfare.

Keywords: hospital regulation, hospital competition, health care provision, prospective payment system.

Gin Nie Chua

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External validity of discrete choice experiment: early findings from a field experiment

Co-author: Dr Terry Porteous (Academic Primary Care Unit Division of Applied Health Sciences, College of Life Sciences and Medicine, University of Aberdeen)

Supervisors: Professor Mandy Ryan (Health Economics Research Unit, Division of Applied Health Sciences, College of Life Sciences and Medicine), **Professor Christine Bond** (Academic Primary Care Unit, Division of Applied Health Sciences, College of Life Sciences and Medicine, University of Aberdeen)

Background

Discrete choice experiments (DCE) have been applied extensively in economics to elicit preferences. A key methodological question surrounding DCE is external validity i.e. the extent to which participants' choices, made in a hypothetical DCE context, reflect their actual preferences. The disparity between a respondent's stated preference and actual behaviour, known as hypothetical bias, threatens the external validity of valuation results and may lead to the under - or over - estimation of benefits. External validity of DCE is underexplored in all areas of application especially in health care; this is primarily due to the difficulty in setting up a real market offering all the same choices presented in the DCE. This is the first study to assess the external validity of a DCE using a within - sample, field experiment.

Aims

This study aimed to assess the external validity of a DCE applied in the health care context using a within - sample, field experiment. Method: A within - sample, field experiment was set up. The experiment was applied within the context of community pharmacy and the service to be valued was a pharmacy - based health check service. In Phase I, participants were asked to indicate their preference for the health check in a DCE. Subsequently, in Phase II, they were contacted and offered a real opportunity to purchase and attend the health check. The 'real' offer was a choice set randomly selected from the pool of choice sets presented in the hypothetical DCE. This allowed for similar availability of alternatives in the real world environment as in the DCE survey. Participants' choice behaviours under hypothetical and actual conditions were compared; where there was a discrepancy, participants were interviewed to explore reasons for their decisions (Phase III).

Results

Data collection is currently ongoing. To date, out of the 423 individuals who participated in Phase I of the study, 113 individuals have been available for Phase II study. Of the 91 participants who said in the DCE, that they would take up the health check in the DCE, only 30 (33%) participants followed through with their decision when offered a real choice. Of the 91 participants who said that they will take up the health check in the DCE, only 30 (33%) participants followed through with their decision when offered a real choice. The distribution of choices made by participants was significantly different in hypothetical and real setting.

Conclusion

Preliminary finding from this empirical study found that many individuals behaved differently in DCE and real life. Further insight into why individuals behaved inconsistently is important to gain a more comprehensive understanding on the issue of external validity and to guide us to design better DCEs in the future.

Key words: Discrete Choice Experiment, External Validity, Hypothetical Bias

Éric Defèbvre

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Working conditions and work-related chronic diseases: A career-long retrospective study

Co-author: Thomas Barnay (Rouen University, Créam ; Labor, Employment and Public Policy (Tepp))

Supervisor: Thomas Barnay (Rouen University, Créam ; Labor, Employment and Public Policy (Tepp))

Reconstructing a retrospective, lifelong panel of 5,500 individuals on French survey data, we use a Difference in differences method allowing us to take into account the endogeneity of working conditions as well as unobserved heterogeneity. We define a treatment variable including the simultaneity and duration of exposure to both physical and psychosocial working conditions. At this stage, our main results are as follow. Men are much more exposed than women to detrimental physical and psychosocial working conditions, but the latter experience the biggest impact on their health status, assessed in our study using the declaration of chronic diseases. For women, we find an effect of exposure on chronic diseases up to 20 years after the exposure to physical working conditions, and to 15 years in the case of psychosocial work strains. In men, we find an impact of physical exposure to working conditions on their declaration of chronic diseases during the 5 years following the treatment. A possible next step to this work would be the implementation of an exact matching method, prior to the Difference in differences methodology.

Key words: working conditions; chronic diseases; difference in differences methodology

JEL classifications: J81; I14; C32

Magali Dumontet

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French GPs' practice location choices: a within-region analysis

Co-author: Anne-Laure Samson (PSL, Université Paris-Dauphine, LEDa-Legos)

Supervisor: Carine Franc (INSERM-CESP Team 1)

In France, as in many OECD countries, the uneven geographic distribution of physicians has been a recurring issue. Because it raises concerns about fairness and efficiency, this unsatisfactory distribution has become a major issue in the regulation of medical demography. In France, GPs are free to choose their practice location; thus, it is particularly important to study the determinants of GPs' location choices. Using an exhaustive database of 6,812 French self-employed GPs who entered into private practice between 2005 and 2011, we analyze the determinants of GPs' practice location choices within a region. We find that individual variables, such as gender and marital status, do not influence the choice of practice location. However, we show that practice location choice within a region is influenced by numerous factors, such as health care supply, including indicators of expected medical activity and the expected annual fees; the share of home visits; health care demand; and living conditions in the area (i.e., number of movie theaters, number of railway stations). We also analyze the impact that three public

policies aimed at increasing the number of GPs in rural areas may have on the geographic distribution of GPs in different areas.

Key words: General practitioners, practice location, underserved areas

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Retirement, intergenerational time transfers, and fertility

Co-author: Thomas Siedler (University of Hamburg, Department of Economics, Hamburg)

Supervisor: Prof. Thomas Siedler

Retirement increases the amount of leisure time. Retired parents might choose to invest some of their time into their adult children, e.g. by providing childcare. Such intergenerational time transfers can have important implications for retirement and family policies. This paper estimates the effects of parental retirement on their adult children's fertility and labor supply. We use a representative household panel dataset from Germany to link observations on parents and adult children, and we exploit eligibility ages for early retirement using a regression discontinuity design for identification. The results show that early parental retirement induces a significant and considerable increase in (adult) children's fertility. It also decreases labor supply of daughters. The analysis of time use data shows that retired parents provide childcare and assist their children with domestic duties. The findings suggest that early retirement policies can have important spillover effects on younger generations.

Keywords: retirement, fertility, intergenerational transfer, SOEP, time use

JEL Codes: J13, J14, J22, J26

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The effects of exercise and relaxation on health and wellbeing in a short panel of individuals with long-term conditions

Co-author: Eleonora Fichera, Ben Buckeldee, Matt Sutton (Manchester Centre for Health Economics, University of Manchester)

Supervisors: Eleonora Fichera, Matt Sutton

Better management by individuals of their long-term condition is promoted to improve health and reduce healthcare expenditure. However, there is limited evidence on the determinants and consequences of self-management activity. We investigate the impact of opportunity cost on levels of exercise and relaxation and the impact of these investments on health and wellbeing in the short term. We derive a simple model in which individuals choose their self-management activities to maximise their utility subject to a time constraint. Linear regression and two stage least squares regression methods are used on a longitudinal dataset on over 3500 individuals with at least one long term condition. We measure the opportunity cost of time and knowledge through education and employment status and find that employment reduces relaxation and education increases exercise. We then examine the effects of these choices on the Euroqol-5D score, self-assessed health and happiness. After controlling for the endogeneity, we find that neither exercise nor relaxation affect EQ-5D. Exercise significantly improves self-assessed health and relaxation improves happiness. Our findings show that individuals tailor their self-

management activities to their economic constraints, with effects on different aspects of their utility. Interventions to encourage self-management should take account of heterogeneous constraints and preferences.

Key words: health investments, long-term conditions, panel data, opportunity cost

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***Psychosocial risks exposure and mental health status:
analysis from SIP survey.***

Co-authors : Damien Sauze, Roméo Fontaine (LEDI (UMR 6307, CNRS & Université de Bourgogne, Inserm U1200), Dijon)

This paper study the link between psychosocial risks exposure, especially 2 dimensions classified by the College of expertise on monitoring psychosocial risks at work (2011), “demands at work” and “lack of autonomy and latitude”, and mental health status thought an indicator of risk for Major Depressive Episode.

We use data from a French survey, health and professional career (“santé et itinéraire professionnel”, SIP), which comprises 2 waves. The first one in 2006 and the second one in 2010, so pre- - and post- - crisis. We concentrate our analysis on employed population in private sector at one of the 2 waves of the survey. The link between psychosocial risks and worker’s mental health is measured by bivariate probit model.

This analyse reveal a positive link between exposure to “demands at work” and to “lack of autonomy and latitude” with the probability to be “risky” for major depressive episode. Individuals working at one of the 2 waves of the survey and exposed to a degree of 15 to “demands at work” on a scale of 15 have a probability to be “risky” of 58% while those exposed to a degree of 1 on the same scale have a probability to be “risky” of 12%. This positive relation is less pronounced for “lack of autonomy and latitude”.

JEL: J81; J28; C35

Keys words: worker’s mental health, psychosocial risks factors, working population, SIP survey.

Marlène Guillon

Paris School of Economics

Bare sexual behaviors: The role of time and risk preferences in condom use

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Supervisor: Pierre-Yves Geoffard

By using a survey on sexual behaviors among patients of three anonymous HIV testing centers in Paris, we study the factors associated with condom use among three groups: heterosexual men, women and men who have sex with men (MSM). Among the three studied groups, we find heterogeneity in condom use as well as heterogeneity in its determinants. The association between condom use, time preference and risk attitude is analysed. We find that time and risk preferences are personality traits associated with condom use choices. The effects of time and risk

preferences nevertheless appear to differ between groups. Risk attitude is more strongly correlated with condom use among heterosexual men compared to heterosexual women. On the other hand, time preference is a better predictor of condom use among heterosexual women and MSM. Our results are the first to provide empirical evidence of the association between sexual behaviors, time preference and risk attitude. These results stress out the need to take into account the heterogeneity in sexual behaviors' determinants and to differentiate prevention messages by risk groups.

Keywords: HIV/AIDS, risky sexual behaviors, time discounting, risk attitude, public policy

JEL Classification: D03, D81, D91, I18

Jack Higgins

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Risky health behaviours and educational engagement amongst the young

Co-author: Robert McCall, Rachel Meacock, Matt Sutton (Manchester Centre for Health Economics, University of Manchester)

Supervisor: Rachel Meacock, Matt Sutton

The strong association between health and education is well-established in the health economics literature. However, this is a complicated mechanism at all stages of life, from child to adult. In the simplest case, there is inherent reverse causality between health and education and further, they are likely to be jointly-determined by a common factor. Unhealthy behaviour also has a role to play, with the literature confirming its significance in relation to both education and health. We propose one mechanism for the interplay between these variables which focuses on early life, where education is still being "caused" by individual factors, specifically unhealthy behaviour. We test this mechanism using data from the adult and child sections of Understanding Society, which includes information on educational engagement, unhealthy behaviours such as smoking and drinking and a host of individual and household level characteristics. We compare several methods of addressing the endogeneity of unhealthy behaviour; correlated random effects probit estimation and recursive bivariate probit methods are compared to models which ignore this endogeneity such as pooled and random effects probit models. We find that unhealthy behaviour influences educational engagement before controlling for endogeneity and, to a lesser extent, after using the appropriate methods. In particular, we find that those who binge drink are 6.3 percentage points ($p < 0.05$) more likely to play truant and those who smoke are between 6.9 and 8.7 percentage points ($p < 0.001$) more likely to play truant, although the magnitude and significance of this last finding goes away when endogeneity is controlled for.

Key words: Recursive Bivariate Probit; Child Health; Risky Behaviour; Education

Konrad Himmel

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Risk Selection in the German Social Health Insurance Do Insurers Use Individual Characteristics?

Co-author: Jan Brosse (Hamburg Center of Health Economics)

We conduct a field experiment to test whether risk selecting applicants on the basis of individual characteristics is a strategy used by funds in the German social health insurance (SHI). Though risk adjustment in the German SHI includes age, sex, disability groups and chronic conditions, we find a significant lower probability for older individuals to get any response by funds after requesting a contract form and general information. We observe the

same for the probability to get a follow-up contact. We also find some evidence that revealing a chronic condition causes lower response rates for young individuals. But we observe the largest drop in response-probability when an individual is old and suffers from a condition that is not included in risk adjustment. Selection increases when we exclude the smallest funds or those which seem to be financially better off.

Keywords: risk selection, audit study, social health insurance

JEL classification: H5 I18

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Ashes to ashes, time to time Parental time preferences and their role in the intergenerational transmission of smoking behavior

Co-author: Andreas Kucherz (University of Augsburg, Faculty of Business and Economics, Health Economics Department, Augsburg)

Supervisor: Robert Nuscheler (University of Augsburg, Faculty of Business and Economics, Health Economics Department, Augsburg)

Intergenerational correlations of risky health behaviors such as tobacco consumption are well established. There is still limited empirical evidence, however, about the channels and mechanisms through which the transmission process is driven. This paper aims at analyzing parental time preferences and their role in the intergenerational transmission of smoking. The analysis is based on the 2008 wave of the German Socio-Economic Panel (SOEP). We use a linear probability model (LPM) to estimate the child's likelihood of being a current smoker. The SOEP contains a number of socio-economic characteristics as well as meaningful measures of individual time preferences, namely, general measures of personal impulsivity and patience. This enables us to distinguish between short-term and long-term time preferences. We identify direct effects of father's time preferences. That is, an increasing level of father's patience and impulsivity directly decreases the child's smoking probability significantly. Analyzing the interactions of parental time preferences and smoking status shows significant effects of father's time preferences conditional on his smoking status. For the mother, we do not find meaningful time preference effects. Our results not only point to important differences between mother and father but also reveal that parental time preferences are significant factors in the transmission of adverse health behaviors such as smoking.

Keywords: Family economics, intergenerational transmission, smoking, time preference, patience, impulsivity.

JEL classification numbers: D9, D10, I12, J12, J13, J16, Z10

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Socioeconomic inequalities in informal payments for health care: An assessment of the 'Robin Hood' hypothesis in 33 African countries.

Co-author: Bruno Ventelou (Aix-Marseille University (Aix-Marseille School of Economics), CNRS & EHESS. GREQAM, ORS PACA)

Supervisor: Bruno Ventelou

In almost all African countries, informal payments are frequently made when accessing health care. Some literature suggests that the informal payment system could lead to quasi-redistribution among patients, with physicians playing a 'Robin Hood' role, subsidizing the poor at the expense of the rich. We empirically tested this assumption with data from the rounds 3 and 5 of the Afrobarometer surveys conducted in 18 and 33 African countries respectively, from 2005 to 2006 for round 3 and from 2011 to 2013 for round 5. Nationally representative samples of people aged 18 years or more were randomly selected in each country, with sizes varying between 1048 and 2400 for round 3 and between 1190 and 2407 for round 5. We used the 'normalized' concentration index to assess the level of inequality in the payment of bribes to access care at the local public health facility and implemented a decomposition technique to identify the contributors to the observed inequalities. We obtained that: i) the socioeconomic gradient in informal payments is in favor of the rich in almost all countries, indicating a rather regressive system; ii) this is mainly due to group differences in supply side factors like lack of medicines, absence of doctors and long waiting times, as well as regional disparities. Although essentially empirical, the paper highlights the need for African health systems to undergo substantial country-specific reforms in order to better protect the worse-off from financial risk when they seek care and makes some policy recommendations.

Keywords: Africa; Socioeconomic inequalities; Informal payments; Supply side factors; Concentration index; Poor/rich gap; Decomposition technique

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Workers' Compensation Insurance: Influence of Experience Rating on Musculoskeletal Disorders

Co-author: Anissa Afrite (IRDES, Research Institute in Health Economics, Paris)

Supervisor: Paul Dourgnon (Research director at IRDES, Research Institute in Health Economics, Paris)

This paper provides new insights into experience rating (ER) in the area of workers' compensation insurance (WCI). In France, the WCI for private-sector workers is a public insurance system funded by firms. Premiums paid by firms are experience rated: as the past costs of work-related injuries and illnesses increase, so does the importance of premiums. ER should encourage firms to invest in occupational prevention and reduce work-related costs. Occupational Musculoskeletal disorders (OMSDs) are the most prevalent recognized workrelated diseases. These disorders are induced by repetitive gestures and adverse postures at work. We address the following question: as an incentive tool, does ER help reduce OMSDs' incidence and related absences? We use an exhaustive administrative establishment database for the years 2004 to 2010 extracted from the public French insurance files. Our estimations are based on a natural experiment. We implement a difference-in-difference approach combined with a stratified propensity score-matching methodology to measure the influence of ER on OMSD outcomes. The key result is that in high OMSD-prevalence sectors, ER induces a substantial diminution of OMSDs' incidence, related absence days and related indemnities.

Keywords: experience rating, workers' compensation, musculoskeletal disorders

JEL: J28; I13; I18

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Health forgone for whom? Estimating the social distribution of opportunity costs in the English NHS

Co-authors: Richard Cookson, Karl Claxton (Centre for Health Economics, University of York)

Supervisor: Susan Griffin (Centre for Health Economics, University of York)

Background

In cost-effectiveness analysis, the health opportunity cost of expenditure decisions within a fixed health care budget is represented by the so-called 'cost-per-QALY threshold', which estimates the health foregone from displaced activities when funds are reallocated to a new intervention. We estimate the age, gender and socioeconomic distribution of the marginal displaced QALY.

Methods

Hospital Episode Statistics (HES) are used to estimate the socioeconomic distribution of health care utilisation for all disease codes in the International Classification of Diseases (ICD) that make up NHS spending, where the Index of Multiple Deprivation measures socioeconomic status. These estimates are then combined with previous estimates of the cost-per-QALY threshold by age, gender and ICD code, based on sub-national expenditure and health outcomes data. Sensitivity analyses explore alternative data sources and methods to estimate this socioeconomic distribution.

Preliminary Results

For every displaced QALY, 0.47 comes from men and 0.53 from women. Initial findings suggest that there is a substantial social gradient over opportunity costs, with 0.27 of each displaced QALY coming from the most deprived quintile group, compared with 0.13 from the least deprived.

Conclusions

Our findings are of general interest to NHS decision makers and stakeholders, in providing information about who gains or loses most from changes in NHS expenditure. They can also be used to evaluate the health inequality impacts of costincreasing health sector interventions, by allowing for estimation of the net distributional effect on the population

Keywords: health inequalities, cost-effectiveness threshold, cost-effectiveness analysis

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Mental Health Financing: an empirical approach for a NHS

Co-author: Pedro Pita Barros (Nova School of Business and Economics, Lisbon & CEPR, London)

Supervisor: Pedro Pita Barros

This paper provides new insights into experience rating (ER) in the area of workers' compensation insurance (WCI). In France, the WCI for private-sector workers is a public insurance system funded by firms. Premiums paid by firms are experience rated: as the past costs of work-related injuries and illnesses increase, so does the importance of premiums. ER should encourage firms to invest in occupational prevention and reduce work-related costs. Occupational Musculoskeletal disorders (OMSDs) are the most prevalent recognized workrelated diseases. These disorders are induced by repetitive gestures and adverse postures at work. We address the following question: as an incentive tool, does ER help reduce OMSDs' incidence and related absences? We use an exhaustive administrative establishment database for the years 2004 to 2010 extracted from the public French

insurance files. Our estimations are based on a natural experiment. We implement a difference-in-difference approach combined with a stratified propensity score-matching methodology to measure the influence of ER on OMSD outcomes. The key result is that in high OMSD-prevalence sectors, ER induces a substantial diminution of OMSDs' incidence, related absence days and related indemnities.

Keywords: experience rating, workers' compensation, musculoskeletal disorders

JEL: J28; I13; I18

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Disability Insurance Benefits and Work Preferences: Evidence from a Discontinuity in Benefit Awards

Co-author: Stefan Boes

Supervisor: Prof. Stefan Boes, Department of Health Sciences & Health Policy, University of Lucerne

This paper quantifies the effects of disability insurance (DI) benefits on the labor market decision of existing DI beneficiaries using data from the Swiss Household Panel. We use a fuzzy regression discontinuity (RD) design to identify the causal effect of DI benefits on the decision of working full-time, part-time or staying out of the labor force by exploiting a discontinuity in the DI benefit award rate. Overall, our results suggest that the Swiss DI system creates substantial lock-in effects which heavily influence the working decision of existing beneficiaries: The benefit receipt increases the probability of working part-time by about 41%-points, decreases the probability of working full-time by about 42%-points but has little or no effects on the probability of staying out of the labor force for the average beneficiary. Hence, DI benefits induce a shift in the work preferences of existing beneficiaries in the sense that they reduce their work intensity from working full-time to part-time adding a possible explanation for the low DI outflow across the OECD.

Keywords: Disability insurance benefits, fuzzy regression discontinuity design, labor market participation, endogenous switching models, maximum simulated likelihood

JEL Classification: J2, C35

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Does Unemployment Predict Health and Well-being in Later Life? Evidence from UK panel data

Co-author: Matt Sutton

Supervisor: Professor Matt Sutton (MCHE, University of Manchester, Manchester)

Older people represent a growing proportion of the population in developed countries. These people are a major driving factor of the demand for health and social care services and their increasing prevalence is expected to increase spending on health services. In this paper, we aim to identify people who are likely to have lower levels of health and well-being in later life using variables from their working lives. We do this by using the British Household Panel Survey and Understanding Society to track individuals as they enter older age. We use observed event data taken from their working lives, namely whether or not an individual has ever been unemployed, and use this to predict later life health and well-being. We find that becoming unemployed leads to long lasting health and well-being penalties, with large and statistically significant reductions in GHQ, overall life satisfaction, self-assessed

health, the physical and mental health components of the SF12 and the SF-6D health utility index. These results are robust to including pre-unemployment health. However, we do not find a relationship between unemployment duration and later life health and well-being, suggesting further analysis may be required. Given we consider long time frames between unemployment and health and well-being, we argue our results do not suffer from possible reverse causation.

Key words: unemployment; later-life health and well-being; long-term effects

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What should the NHS do: train more doctors, or better incentivise existing ones? An analysis of UK doctors' labour supply

Co-authors: Bruce Hollingsworth, Ian Walker (Economics Department, Lancaster University Management School (LUMS), Lancaster)

Supervisors: Bruce Hollingsworth, Ian Walker

Training doctors is expensive and entails largely fixed costs irrespective of how the National Health Service (NHS) in the UK utilises its labour input. Even now, the majority of these costs are borne by the government through the NHS. The cost burden of training a doctor is the same whether that individual works part-time, quits to change career, retires early, or moves elsewhere in the world to practice.

Addressing a shortage of trained doctors by expanding training is both very expensive and requires a long lead time. Also, approaching shortages through the intensive margin requires knowing how close to existing capacity we are, how doctors are being utilised and how greater utilisation might be incentivised. Therefore, it is paramount to understand the labour supply of doctors and its determinants.

Looking at official data on a simple headcount, it is clear that the supply of doctors, both GP and hospital-based clinicians, has been rising monotonically over time for many years. This has been a consequence of the policy trend consisting on training more young people to become doctors by expanding training capacity. That is, the expansion during last years has been carried out at the extensive margin. One noteworthy feature of the growth in the number of doctors is that the proportion of female doctors, especially GPs, has been rising fast. Yet, this is not what we can observe in many occupations where the labour supply of females is quite different than that for males especially when young. Hence, it is inaccurate and unclear that one can assume that the intensive margin has remained unchanged in this case.

This paper documents the main features of the utilisation of doctors: by examining their variation in hours of work per week; their retirement behaviour; career moves out of medical practice including to becoming economically inactive; and, to the extent that this is possible with available data, movements out of the UK. For our analysis, we use a pooled cross-sectional dataset (Quarterly Labour Force Survey, QLFS) from 1994 to 2014. We find a growth in the number of female community-based doctors working parttime, earlier retirement, and we find an overall reduction in the doctors' labour supply despite the increase in the number of doctors.

Keywords: doctors' labour supply; female GP's; NHS; incentives

JEL Classification: J01, J21, J45.

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Direct and indirect dynamic effects of mental health on physical health in the older English population

Co-authors: Eleonora Fichera, Matthew Sutton (Manchester Centre for Health Economics, University of Manchester)

Supervisor: Luke Munford

Research has found a strong link between mental health and physical health though little is known about the causal pathways from the one to the other. This paper aims to fill this gap in the literature by analysing the indirect and direct effect of past mental health on present physical health. We use a dynamic mediation framework and test mediation through two past health investment variables (social interaction and physical activity), and one past health consumption variable (cigarette smoking). We use data on 8,721 individuals aged 50+ years from six waves (2002-2012) of the English Longitudinal Study of Ageing (ELSA). Mental health is defined by the Centre for Epidemiological Studies Depression Scale (CES-D) and physical health is defined by the Average Daily Activities of Living (ADL). We find that the total indirect effect explains 7%-9% of the total effect of past CES-D on present ADL through the mediators. 86% of the total indirect effect is explained by physical activity. Stronger moderation effects are found for older ages and males. Health care policies aiming at changing physical health need to consider the strong relationship between mental health and physical health, particularly at older ages.

Keywords: Mental health; Physical health; dynamic models, Mediation analysis

JEL Classification: C25, C35, D01, I12, I18

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Can Physicians' Remuneration Affect Their Prioritisation of High-Need Patients?

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Supervisor: Kim Rose Olsen

Many health care systems use provider payment as an instrument to ensure an efficient and equitable delivery of health care services. However, as there exists only a limited amount of suited natural experiments and it is difficult to retrieve data on patients' needs, little is known about how provider payments affect treatment patterns. We therefore use a fully incentivised, controlled laboratory experiment to test how different capitation-based remuneration schemes affect access to health care amongst patients with different needs for health care services. In our experiment, physicians choose quantities of health care services for patients with different gains from treatment. We test three different types of capitation systems: Capitation without a financial incentive ("employed physician"), capitation with a financial incentive ("self-employed physician"), and risk-adjusted capitation. The results reveal that when physicians face a trade-off between own income and patients' health gain, they on average decrease the amount of health care service given to patients. The high-need patients tend to experience the greatest loss of care. We find that risk-adjusting capitation based on patients' expected need of health care affects physicians' prioritisation of patients over and above the financial effect. On average we find that risk-adjustment (holding total payment constant) leads physicians supplying relatively more services to patients triggering a high-payment compared to patients triggering a low-payment. However, in our experiment this effect is

not strong enough to show an average change in high (low)-payment patients' access to treatment under risk-adjusted capitation compared to pure capitation.

Keywords: Provider behaviour; Health care; Equity; Financial incentives; Risk-adjustment,

JEL Classification: I11, I14, C91

Sandra Pellet

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Horizontal and Vertical Equity in Healthcare Access in post-soviet Tajikistan

Supervisors: Florence Jusot (Université Paris-Dauphine), Cécile Lefèvre (Université Paris-Descartes)

After the collapse of the USSR, Tajikistan was the only country that had to overcome a devastating civil war for more than 5 years (1992-1997). The healthcare system, already underfinanced at the end of the Soviet Union, has been severely damaged by conflicts which deteriorated the infrastructures, by cuts in expenses and the resulting lacks in materials, by the departure of numerous doctors, etc. Following the war, the state, supported by international donors, has launched healthcare reforms, despite a very strong budgetary constraint.

The collapse of the socialist state and the withdrawal of welfare provision endangered universal free access to healthcare. On the one hand the state made a list of types of healthcare, patients are charged for (like laboratory tests) even if the universality is still officially written in the constitution. On the other hand the habits of "gift" (under-the-table payments) have been generalized in some places, and become more or less an obligation, since doctors had to deal with the deprivation of their wages (Falkingham, 2004). Therefore a kind of private financing system emerged, without any insurance scheme, generating tremendous out-of-pocket payments: household expenditure covers more than 70% of the total health expenditure. Therefore, the consequences of the emergence of this partly-informal private financing system in terms of equity in access to care and financing of healthcare needs to be explored.

The data used in the analysis is a nationally representative survey based on a sample stratified by region and type of area : the Tajikistan Living Standards Survey (2007). The large sample of 4800 households (or 29000 individuals) allows also a regional analysis. Indeed, since the system of payments is largely informal, regional characteristics may emerge. The analysis proposes to study the distribution of health expenditure along with the income distribution. If in absolute terms the poorest spend less than the richest, in relative terms the poorest support a bigger burden (vertical inequality). The methodology in this paper comes from the taxation studies, the Kakwani Progressivity Index (KPI), adapted to health expenditure analysis (Abu-Zaineh et al., 2008; Cissé et al., 2007), more precisely the disaggregated approach. We statistically test the inequality dominance between the Lorenz curve of the prepayment income index and the concentration curve of the health payments. The dominance criteria will be computed at each quantile of the distribution. Also, we analyse separately hospital and ambulatory expenditure.

According to the concentration curves, the in-patient expenditure is above the Lorenz curve of income index, showing the regressivity of the financing of hospital care. The ambulatory expenditure is more concentrated on rich, it is under the Lorenz curve of income (positive KPI) which may indicate a relative progressivity of the informal financing system of out-patient care. Since a large part of health costs are informal, there is room for manoeuvre, since physicians have a certain flexibility in the way of fixing prices. That is the hypothesis proposed by Schwarz et al.(2013) : doctors try to estimate the socio-economic status and lower their prices for the poorest. In this case an informal system of redistribution may exist. Otherwise, this might reflect a lower consumption of out-patient care, meaning horizontal inequity (people needing the same healthcare do not receive the same). This paper is dealing with disentangling these two hypothesis.

Key words: out-of-pocket, health inequality measure, bootstrap inference method, post-soviet economy..

Laurène Petitfour

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Estimating and explaining the efficiency of township hospitals in Shandong province in the context of the drug policy reform

Co-authors: Xie Zhe Huangfu, Martine Audibert, Jacky Mathonnat (CERDI, Université d'Auvergne, Clermont-Ferrand)

Supervisors: Martine Audibert, Jacky Mathonnat (CERDI, Université d'Auvergne, Clermont-Ferrand)

To cope with the rising price of drugs, in 2009 the Chinese government launched a large pharmaceutical reform. Its key element is the implementation of a National Essential Medicine List (NEML), leading to a reorientation of incentives for health services financing. Health facilities are not anymore allowed to make any profit on drug sales ("zero mark-up policy"), while this used to be their main source of revenue. Different compensation schemes have been implemented by the authorities. In a context of redesigning the financing structure of health care facilities, it is crucial to understand how the NEML reform has affected –or not health care facilities activity and efficiency. This study relies on a survey data from a sample of 30 randomly selected Township Hospitals (TH) of the rural prefecture of Weifang (Shandong province). Using a two-stage procedure, it aims at assessing the THs' technical efficiency scores and then at identifying the determinants of this efficiency. The first stage is realized with a non-parametric frontier approach, the so-called 'partial frontier' method, (order-m) to deal with the problem of dimensionality of the sample. The identification of the determinants of efficiency is made with fractional regressions (Ramalho, 2011). Results show that the average efficiency remains constant between 2006-09 and 2010-12, around 0.65. The most significant and robust factors of technical efficiency are the share of subsidies in the TH incomes (negative effect), and the number of covered inhabitants per bed (positive effect). It suggests that drug reform hasn't improve TH efficiency, on one hand because of a "soft budget constraint effect", and on the other hand because it had limited success in reducing the financial barriers to universal access to healthcare -out-of-pocket payments -, and in improving perceptions of TH healthcare quality.

Keywords: Health system in China, Efficiency, Partial frontier method, Pharmaceutical reform.

Céline Pilorge,

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Pharmacy monopoly and price competition for OTC drugs: the French example

Supervisor: Thomas BARNAY (Professeur des Universités en sciences économiques, CREAM, Centre de Recherche en Économie Appliquée à la Mondialisation, Rouen, France, Laboratoire ERUDITE)

This study investigates the price efficacy of the officinal monopoly for the distribution of OTC (over the counter) drugs based on the French example. The price of these medicines, which is not regulated, is theoretically subject to market competition. The data concerns 30 drugs in a sample of 4700 French pharmacies for the period 2006-2008. It was used to analyse whether price competition takes place or not on this market segment. The level of the prices was compared subject to the degree of competition in the area surrounding the pharmacy; this competition was measured by a floating density indicator. The results show that there is very little competition. Whereas the degree of competition varies widely between pharmacies, most pharmacies sell at the same price. In particular, the pharmacies that are a priori subject to a high level of competition do not set prices as low as those in local monopoly. Moreover, the standard of living of the population don't seem to have an effect on drugs price, for a given density level. Finally, these results questions on the effects of a liberalization of the OTC drugs market, since competition depends both on the number, diversity and characteristics of the actors, but also on product characteristics and consumer habits

Keywords: OTC drugs; price variability; imperfect competition

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The monetary value of informal care: implications of using different well-being measures

Supervisor: Hugh Gravelle (Centre for Health Economics, University of York, York)

This paper calculates monetary values for the commodity informal care using the well-being valuation method. For that, we use two subjective well-being measures, happiness and life satisfaction, in order to see whether different ways of measuring utility provide similar results in terms of the monetary compensations individuals demand for informal care. Moreover, we estimate the happiness and the life satisfaction model using longitudinal data and both a linear fixed effects and an ordered logit estimation and we, therefore, also compare the differences in money values when using different estimation methods. Finally, for both happiness and life satisfaction models we calculate monetary values by different groups of individuals according with their gender, household income and whether they are informal carers. We find that monetary values are sensitive to both the well-being measure used and the applied estimation method. Moreover, we find that the fixed effects ordered logit is sensible to the number of observations of each model and the number of categories of the well-being measures.

Keywords: Informal care, well-being valuation method, income groups, distributional weights.

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Explaining Ambulatory Care Sensitive Conditions emergency admissions variation. A GP practice level analysis

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Supervisor: Hugh Gravelle (Centre for Health Economics, University of York, York)

Ambulatory Care Sensitive Conditions (ACSCs) are conditions which should not result in emergency admissions if managed appropriately in primary care. We use English general practice data for 2006/7-2011/12 to examine (a) whether practice characteristics (number of GPs and measures of practice quality) affect ACSC admissions and (b) whether the number of GPs affects practice quality. Quality is measured by QOF clinical performance, and the proportions of patients able to make urgent appointments, to make advance appointments, and to see their preferred GP. We estimate poisson fixed effect models of ACSC emergency admissions and linear practice fixed effect models of the four quality measures. ACSC admissions are lower in practices with higher scores on the four quality measures and with more GPs. Practices with more GPs have higher proportions of patients able to make urgent and to make advance appointments. The average overall effect of 1 additional wte GP is to reduce the annual number of ACSC admissions by 0.48. The mean number of wte GPs in a practice is 4.39 so that the % increase in the number of GPs is over 20%. Increasing the four quality measures by 1/5th of their means would lead to reductions in annual ACSC admissions per practice of 1.92 for ability to get urgent appointments, 0.18 for ability to advance appointments, and 1.32 for QOF clinical quality.

Key words: primary care, ACSCs, general practitioners, quality

Mujaheed Shaikh

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Pharmaceutical Expenditure and Economic Growth

Co-author: Afschin Gandjour

Supervisor: Prof. Dr. Afschin Gandjour (Professor of Health Management, Frankfurt School of Finance & Management, Management Department)

Studies on the economic benefits of health care spending have been usually limited to a consideration of savings from reducing expenditures elsewhere in the health care system as well as productivity gains. Yet, health care may have wider economic implications which can be captured by economic growth. In this paper, we assess the effect of a particular type of health spending - pharmaceutical spending - on growth in gross domestic product (GDP) as well as the reverse effect. We use a panel dataset for a 184 countries from 1995 to 2006, and use a two-step instrumental variable procedure where we first estimate the reverse causal effect of GDP on pharmaceutical expenditure using tourist receipts as an instrument for GDP. In the second step we construct an adjusted pharmaceutical expenditure series where the response of pharmaceutical expenditure to GDP is partialled out and use this endogeneity adjusted series as an instrument for pharmaceutical expenditure. Our estimations show that GDP itself has a strong causal positive impact on pharmaceutical spending with elasticity in excess of unity, supporting the argument of reverse causality. In the second step, we find that when the quantitatively large reverse causal effect of GDP is accounted for, a 1 percentage point increase in pharmaceutical spending decreases GDP per capita significantly by 0.09 to 0.25 percentage points. We discuss different mechanisms that might drive the results and test for these. Our results suggest making more efficient use of pharmaceutical spending; especially reducing wastage in drug expenditures so that either more is gained out of every dollar spent, or the same gains occur with reduced spending.

Keywords: Public pharmaceutical expenditure, economic growth, instrumental variables, multiplier effect.

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Role of financial and non-financial incentives in improving cancer screening in general practice. A discrete choice experiment.

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Supervisor: Carine Franc

Cancer screening is a major health policy issue worldwide. Due to the organization of healthcare supply in France, general practitioners (GPs) have become key actors in the target provision of breast, cervical, and colorectal cancer screening. However, they may lack the necessary incentives to engage in effective screening practices. Our aim was to reveal GPs' preferences for devices and combinations of devices that could be implemented or strengthened to improve their involvement in breast, cervical, and colorectal cancer screening activities and to investigate preference heterogeneity. Five attributes were defined based on qualitative work, four of which were non-monetary and the last was a financial incentive. GPs' preferences were elicited using a single profile discrete choice experiment (DCE): 402 representative GPs were recruited nationwide and completed the DCE study, together with sociodemographics, practice style and case-mix. Preference heterogeneity was investigated through latent class logit models. All the devices had a positive and significant impact, but the magnitude was different according to the type of cancer: GPs exhibited higher preferences for additional information about screened

patients and compensated training in the context of breast and cervical cancer screening, but were more sensitive to additional remuneration for colorectal cancer screening. Moreover, we identified groups of GPs with similar patterns of preferences that were related to their medical and screening activities. The study provides new findings for policymakers that are interested in prioritizing levers in order to improve the provision of cancer screening services.

Keywords: cancer screening, discrete choice experiment, latent class analysis, incentives, interactions, preference heterogeneity.

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Integrating motherhood and employment

Co-authors: Marisa Miraldo, Katharina Hauck (Imperial College London, Business School, London)

Supervisor: Marisa Miraldo, Katharina Hauck (Imperial College London, Business School, London)

Integrating family and work responsibilities is a central issue for working mothers in high-income countries made easier by state-mandated workplace policies. In this study, we examine one such policy, workplace breastfeeding legislation, allowing mothers to express breast milk during work hours and its impact upon breastfeeding rates in the context of the United States (US). The US has one of the lowest rates of exclusive breastfeeding in the world. Only 14% of US mothers breastfeed their child exclusively for the first 6 months. In comparison to other high-income countries, the US has weak legislation protecting breastfeeding mothers at the workplace, for example, through workplace policies that guarantee working mothers facilities to express and store breast milk, with only 24 out of 50 states having such policy. Breastfeeding has been shown to be associated with many health benefits, and the US Surgeon General has issued a Call to Action for employers, researchers and government leaders to take on a commitment to increase and support breastfeeding and remove barriers that discourage breastfeeding such as those related to the workplace. We exploit variation, at state level, in the scope and timing of implementation of employment legislation that enable mothers to breastfeed or express breast milk during work hours, on breastfeeding rates. We use differences-in-differences methodology and data from the Panel Study of Income Dynamics supplemented with the Child Development surveys over a period of 22 years from 1990-2011. We carefully control for other impacts on breastfeeding rates and for underlying trends in breastfeeding and female labour force participation such as employment. Our results show that breastfeeding laws have a positive and significant impact of up a 1.2% increase on breastfeeding rates for treatment states. The applications of this study are relevant in informing policy and economic issues such as gender equality, economic development, workplace and family friend labour force polices, and healthcare policies.

Keywords: Breastfeeding, Labour Force Participation, labour force policies, breastfeeding legislation, family-friendly workplace policies

Anne-Laure Soilly

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Cost-of-Illness Analysis of Preterm Births in France.

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Supervisor: Pr. Sophie Bejean, Pr. Jean-Bernard Gouyon, Dr. Catherine Lejeune

Introduction

Prematurity (birth occurs before 37 wGA⁽¹⁾) is in a permanent increase for the 20 last years in the world, as in France (6.8% in 1998, 7.4% in 2010). Because of severe consequences in terms of mortality and morbidity, prematurity is a public health problem worldwide. The economic impacts of prematurity in France remain unexplored at present.

Research oriented to this topic could lead to improved knowledge on the efficiency of prevention strategies of prematurity and/or its consequences.

Hypothesis

Very preterm birth (≤ 32 wGA) is a significant risk factor for medical complications and long term handicaps, and the single most important cause of perinatal mortality and morbidity leading to important direct medical costs, which can be at least partially avoided by the implementation of adequate preventive strategies.

Objectives

To evaluate the average direct medical costs incurred by surviving very preterm births during the first year of life, according to the health insurance system point-of-view. To compare the distributions with other surviving preterm and full term births.

Material and Methods

Databases from The National Health Insurance Inter-Regime Information System (SNIIRAM) are used, retrieving more detailed data on reimbursements related to all hospital stays and ambulatory cares for each births in 2009-2010. The care pathways are described in order to identify main characteristics between groups of births. Descriptive analyses of costs distributions are made for various items of expenditure. Comparative analyses of the distributions between very preterm and the others groups of births are carried out with a Mann Whitney test.

Main Results

A total of 472.077 surviving births were included, 5.38 % of them was preterm (< 37 wGA) and 0.78 % very preterm (≤ 32 wGA). At birth, the very preterm were hospitalized significantly longer (mean length of stay = 49.41 days (± 29.22) vs. 5.06 (± 6.12) globally), and significantly more often admitted in intensive care unit (63.52% of them vs. 1.07% globally). They were significantly more often readmitted (43.95% of them vs. 15.27% globally) during their first year. Average costs of hospital stays in their first year were significantly higher: 43.469,28 € ($\pm 36.585,99$) vs. 2.380,40 € ($\pm 5.237,96$) at 37 wGA, as were their average ambulatory costs: 3.351,20 € ($\pm 4.585,32$), vs. 788.87 € ($\pm 1.119,22$) at 37 wGA. Among very preterm infants, physiotherapy (concerning 13%-20% of them), respiratory support (1-3%), hospital pharmacy (1-5%) and biology exams (4%) where the most commons, compared to other infants.

Conclusion / Discussion

The results reveal an inverse relationship between costs and gestational ages (GAs), and important differences in terms of needs and costs of medical cares between GAs. Our work presents a first economic framework on prematurity in France that should be used to justify the improvement of prevention strategies of prematurity and its consequences. Need are expressed in terms of scientific and practical advances for better anticipation of maternal risk situations (medical and psychosocial risk factors). The benefit of prevention would be estimated by avoided costs but also much suffering.

(1) wGA : weeks of Gestational Age.

Keywords: Prematurity; Costs analysis; Medical costs; Reimbursements; Prevention.

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Childhood Obesity in the UK: Is Fast Food a Factor?

Co-author: Peter J. Dolton

Supervisor: Professor Peter J. Dolton (Department of Economics, University of Sussex, Brighton)

It has often been suggested that the exposure to fast food is a cause of increasing obesity. If true, this has massive public health policy implications. This paper studies the BMI of children and adolescents at a time when fast food restaurants started to open in the UK providing a dramatic geographic variation in the exposure to the intensity of treatment of fast food. This is akin to a natural experiment. We use data collected on the time and location of the openings of all fast food outlets in the UK between 1968 - 1986, along with data on objectively measured BMI of 10 and 16 year olds from the 1970 British Cohort Data. The relationship between distance from the children's homes and how long a fast food outlet have been open on children's BMI is estimated. We do not find any support for a statistically significant relationship between the access to fast food, BMI, nor its changes.

Keywords: Childhood and Adolescent Obesity, Fast Food

JEL codes: I120, I190

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Being dependent rather than disabled in France: does the institutional barrier at 60 affect care arrangements?

Supervisors: Pierre-Yves GEOFFARD (Paris School of Economics & Ecole des hautes études en sciences sociales (PSE-EHESS)), Agnès GRAMAIN (Institution: Université Paris 1 Panthéon-Sorbonne, Research unit: UMR 8174 (CES))

In developed countries, individuals having difficulties with the activities of daily living may benefit from public home care subsidies. The French institutional framework distinguishes between disability schemes, accessible to individuals below 60, and dependence schemes, open to those aged 60 or more. We assess whether this institutional threshold has an impact on care utilization rates among individuals with impairments living in the community. We use the French Health and Disability Survey on Households (HSM) to get a sample of individuals aged 50 to 74 with restrictions in ADL or IADL and living at home. Controlling for factors that could affect home care utilization independently from the differences in public schemes, we fit a bivariate probit model to account for the simultaneity of formal and informal care utilization decisions. We find that being a "dependent elderly" rather than a "disabled adult" increases the non-medical formal care utilization rate. Decrease of informal care utilization around the threshold is less robust, but is suggestive of small substitution effects consistent with what is found in the literature. We also provide evidence that the distinction between disability and dependence schemes has an impact on institutionalization. Overall, our results show that the institutional barrier of age 60 influences the way individuals' day-to-day difficulties are being compensated.

Keywords: long-term care, disability, dependence, public policies.

JEL Classification: C30, I12, J14, J18.

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Patient group submissions and the reimbursement decisions of the Scottish Medicines Consortium: do patients' views matter?

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Supervisor: Prof. Mandy Ryan (FRSE, Health Economics Research Unit (HERU), University of Aberdeen), **Dr. Graham Scotland** (Health Economics Re-search Unit (HERU), University of Aberdeen, UK)

When appraising new technologies, the Scottish Medicines Consortium (SMC) considers patient group submitted statements alongside evidence of clinical and cost-effectiveness. Patient group submissions include information on how the medical condition affects patients' quality of life and how it impacts on carers. However, it is unclear how this information affects appraisal outcomes. This paper is the first to assess the impact of patient group involvement on SMC's reimbursement decisions. A dataset was compiled from publicly available documents summarising SMC appraisals between January 2009 and December 2013. These documents include the number of patient groups that submitted statements to SMC. Variables capturing 'clinical' and 'economic' evidence were extracted as additional determinants of SMC decisions. Logistic regression models were estimated to assess how the number of patient groups involved in the appraisal process affects the decision outcome. Our analysis accounts for different approaches that can be used to compare the new health technologies to more than one existing alternative. 162 SMC submissions were used in the analysis. Of these, 34% received a positive funding decision, 33% were accepted with restriction and 33% were rejected. In total 65% of submissions were accompanied by at least one patient group submission. Based on our final model we find that every additional patient group statement is associated with on average a 14.5% increase in the probability of a positive reimbursement decision. Our results suggest that patient perspectives influence SMC reimbursement decisions. This raises questions about how patient groups should communicate their views on new technologies and how decision makers should interpret such evidence alongside other measures. Future research should also discuss how policies can encourage patient group involvement.

Keyword: SMC, HTA, reimbursement, patient involvement, decision criteria, Recommendation, pharmaceutical, Scotland, patient

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Long-term Impacts of Job Displacement on Job Quality and Satisfaction Indicators: Evidence from Germany

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Supervisor: Etienne Wasmer, Eve Caroli

We investigate the long-term impact of job displacement on several dimensions of job quality and measures of satisfactions. We identify displaced workers due to a plant closure to evaluate the impact of displacement ten years after. We use the German Socio-Economic Panel data from 1984 to 2012, containing information on job quality - hours worked, desired hours, job security, permanent contract, earnings - and self-reported satisfactions - job, life and health satisfaction. Our empirical strategy is based on propensity score matching on pre-treatment covariates and pre-treatment outcomes. We find that displaced workers have lower job quality than their counterparts, up to ten years after the displacement. Job displacement increases the probability of working more than forty-eight hours per week up to ten years and decreases the probability of having a permanent contract up to six years after the displacement. In terms of overall satisfaction, displaced workers are less satisfied with their job and their life until seven years after the displacement and they are less satisfied with their health one year after the shock until six years.

Keywords: Job displacement, plant closure, job quality, matching method, panel data.

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The effects of in-utero exposure to influenza on the child mental health and longevity of a british cohort

Co-authors: , Eleonora Fichera, Matt Sutton (Manchester Centre for Health Economics, Institute of Population Health, University of Manchester)

Supervisors: Matt Sutton, Eleonora Fichera

Identifying the causal impact of in-utero health shocks on later-life outcomes is difficult given that unobservables which determine these outcomes also predict the probability of health shocks. In order to combat this, previous studies have made use of pandemics as natural experiments, but studies examining effects on childhood mental health outcomes remain scarce. We examine the effects of the 1957 Asian influenza epidemic on childhood social and emotional development. This is an important gap in the literature, given that associations between socio-emotional outcomes in childhood and later-life outcomes are well-established. We use data from the National Child Development Study (NCDS), whose cohort members were exposed to the epidemic prior to birth, to study the epidemic's effects on a range of mental health outcomes at ages 7 and 11 and on survival at various ages. Exogenous variation in exposure to the epidemic by geographical location is used to identify these effects. The results suggest that in-utero exposure to influenza has little effects on mental health in childhood, but significantly reduces age at death, primarily through an increase in the probability of being stillborn. In addition, we find that longevity effects cannot be explained by influenza's effect on childhood mental health. These results suggest that current advice that pregnant women should receive flu vaccinations to protect against the risk of complications in pregnancy should be continued, and suggest that it should be encouraged more widely in countries where it is not currently commonplace.

Key words: Childhood interventions, lifetime benefits, all-age longitudinal data, coarsened exact matching

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Long-Term Care insurance versus self-insurance: Are assets substitute or complementary to Long-Term Care Insurance?

Co-authors: Roméo Fontaine (LEDi, Université de Bourgogne, Fondation Médéric Alzheimer), Manuel Plisson (Fondation Médéric Alzheimer)

In the economic literature, many studies try to explain why so few individuals subscribe to long-term care insurance. This article focuses on the relationship between LTC insurance and assets by studying simultaneously LTC insurance demand and asset accumulation using the direct observation of five dimensions of individuals' preferences (risk aversion, time preference, family altruism, informal care preference, impatience) and a measure of financial literacy allowed by the 2012 wave of the "Préférences et Patrimoine face au temps et au risque" (PATER) survey. We estimate a five equations multivariate probit by maximum simulated likelihood method. The LTC insurance demand is modelled using a two-part model where the first step is the dependency risk perception. Three assets outcomes are also estimated: whether the individual owns his primary residence, whether the individual owns another real property and the amount of his financial assets. Besides the effect of socio-demographic characteristics, our results highlight the role of individuals' preferences in the decision of hedging against the risk of dependency: preference for the present plays an important role in the

perception of the risk of dependency, while risk aversion, preference for family based care and altruism explain LTC insurance demand. Second, none of the three assets outcomes is significantly associated with dependency risk perception. Third, financial asset and ownership of a holiday home are negatively associated with the probability to buy a LTC insurance given the risk perception. These results suggest the patrimony so accumulated is not exclusively dedicated to LTC, but for individuals considering being one day dependent, patrimony only is partially substitutable to LTC insurance.

Key words: LTC insurance, risk perception, patrimony, time-preference, risk aversion, informal care preference, family altruism.

JEL codes: D84, G02, I13, J14.

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Economic evaluation of food fortification to prevent population vitamin D deficiency

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Supervisor: **Emma Frew**, Health Economics Unit, University of Birmingham

Background

Vitamin D (VD) is essential for bone health. It can be found in a limited number of foods such as cod liver oil, fatty fish and milk but the main source of VD is through exposure to sunlight. Recently, global population levels of vitamin D have been decreasing and this has been linked to a global resurgence of rickets and deaths from cardiomyopathy. In the UK in particular, an increasing proportion of individuals in all age groups are now being diagnosed as VD deficient and public health decision makers are considering alternative strategies to improve the population VD status.

There is not enough sunlight throughout the year for adequate VD levels in the UK population, and the UK diet does not provide sufficient levels of VD without food fortification. The World Health Organisation recommends food fortification as a cost-effective strategy to tackle malnutrition in low and middle-income (LMI) settings, where malnutrition is a life-threatening condition. To date, there has been no economic evaluation reported of VD food fortification in either a developing, or a developed country. This study will report a first-stage economic analysis of food fortification in a UK setting.

Aim

To estimate the costs and benefits of mandatory fortification of wheat flour with Vitamin D in the UK.

Methods

A decision-analytic model-based analysis with a lifetime horizon comparing two strategies for food fortification: 1) fortification of wheat flour with VD and 2) current UK practice defined as mandatory fortification of spreadable fats and voluntary fortification of breakfast cereals. The model will adopt a societal UK perspective and thus will include costs and benefits from the health care, industry and government sector. Information on food patterns in the UK population will be collected from the Scientific Advisory Committee on Nutrition (SACN) and from the literature on ethnic diet and food composition. The efficacy of food fortification with VD will be based on the best available evidence, with preference to systematic reviews of the literature, when available. Cost data will be collected from national databases on health costs and resource use, and on industry and statutory reports.

Results and Conclusion

Preliminary results of the model will be presented at the conference. The costs and outcomes will be reported transparently for the health, food industry and government sector. The analysis will report the incremental cost-effectiveness of the fortification of wheat flour in the UK, versus current practice. Where possible, appropriate one-way and multi-way deterministic sensitivity analysis will be carried out to reflect the uncertainty in the data. This study will provide valuable information pertaining to the cost-effectiveness of increasing UK population VD levels through fortifying wheat flour with vitamin D. This will be an early-stage evaluation reporting the costs and outcomes of food fortification from a societal perspective and thus will benefit hugely from the opportunity for constructive discussion on the model structure, the data parameters, and the appropriate way to present the results to public health decision makers.

Keywords: Food fortification, Vitamin D, Economic evaluation, decision analytic model, UK

Anne-Charlotte BAS

LEGOS, Paris-Dauphine University and IRDES

The role of prices in the dental-care recourse

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Supervisor : Pr. Jérôme Wittwer (LEGOS, Paris Dauphine University and ISPED, Bordeaux University PARIS France)

Background

In France, dental practitioners can set extra billings on denture medical procedures. It's imply important rest-to-be-paid by the patient. This burden imposed on patient compounds financial access problems and inequality access problems. Indeed, dental care are in first position for care refused for financial reasons. It concern 11% of the french population and 3/5 of this renouncement are for dentures (data ESPS 2010). The purposes of this study are to understand how dentures fee's are fixed and to clarify how the individual characteristics of demand interact with those of supply, price in particular, to determine seeking dental care.

Methods

We had focus our interest on one denture precisely : the inlay-core. This prothesis is an act open to extrabillings, easy to identify on the data-base and her quality is homogenous a priori. We worked on the data-base of the individual consumption submitted to the public health insurance (Echantillon Général des Bénéficiaires, EGB) and on the french declarative survey on health, access to healthcare and medical coverage : ESPS (Enquête Santé et Protection sociale). We first studying price fixation with a cross-effect model. On this purpose, we exploited the interdepartemental variations of inlay-core prices, based on the price observed by social insured persons with an inlay-core consumption in each department. In a second time, we explain the dental care seeking with a multilevel model and use data base ESPS linked to EGB.

Results

We observed that a high median standard of living increases by 57 € the median price rate of the inlay-core in the department. An important density of dental surgeons entails a decrease of the median price rate of the inlay-core. The probability of dental care seeking is influenced by age, median standard of living in the department, density of dental practitioners, price and to the interquartile range of price.

Conclusion

Interdepartmental inequalities in dentists supply are linked with those in standard of living and contribute to inequity in access to services. The practitioners' installation not being controlled, these disparities are dedicated to become more marked. We have to check if the negative effect of density on price and the positive one of standard of living balance each other or if an intervention could be possible and desirable.

Keywords: dental care, inequalities, access to care

Laura Dysart

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Exploration of the effect of time preference on change in self-management behaviours in older adults with at least one chronic health condition**Co-author: Paul McNamee, Marjon van der Pol** (Health Economics Research Unit, University of Aberdeen, Aberdeen)**Supervisor: Paul McNamee****Aims**

With nearly 70% of all health and care spending in England directed towards the treatment of chronic health conditions, self-management can help to offset the burden of preventable complications from the NHS. Successful self-management allows an individual to manage immediate symptoms while reducing the risk of developing future complications, co-morbidities, or acute events. Adoption of a healthy lifestyle is among the types of behaviours associated with successful self-management and includes smoking cessation, physical activity, healthy eating, and limited alcohol consumption. Economic theory suggests that individuals with higher value for the future are more inclined to adopt a healthy lifestyle compared to individuals with a higher value for the present. The cost of adopting a healthy lifestyle is experienced immediately while the benefits are experienced in the future as lower morbidity and longer life expectancy. Previous research in this area has shown a statistically significant relationship between self-management and time preference; however, it has focused primarily on adherence and the absence of longitudinal data means that direction of causality could not be established. This study will explore the effect of time preference on self-management behaviour for a large sample of older British adults with chronic health conditions using a validated approach of measuring time preference. By using two waves it is possible to examine the role of time preference in both uptake and maintenance of selfmanagement behaviour.

Data

Waves 5 and 6 of the English Longitudinal Survey of Ageing were used. This cohort survey follows a representative sample of older (50+) British households and includes a wide range of questions on health. In wave 5, a validated approach for eliciting time preference was solicited from a subsample of respondents.

Methods

Respondents who self-reported with hypertension, diabetes, high cholesterol, asthma, pain and arthritis were included in the analysis (n=784). Self-management behaviours investigated are smoking, alcohol consumption, physical activity, and healthy eating. The main interest is in whether time preference is associated with either uptake and/or maintenance of behaviour. Alcohol consumption, physical activity, and healthy eating are modelled using a multinomial logit where the dependent variable is change in behaviour and categorized as: did not engage in the health behaviour in either wave; engaged in the first wave only; engaged in the second wave only; and maintained the same frequency/level of consumption across waves. Due to insufficient changes in smoking status, the relationship between time preference and smoking is examined across the two waves using probit. Subgroup analysis investigated the effect of symptomatology on the relationship between time preference and self-management. Sensitivity analysis explores the robustness of results to changes in categorization of the dependent variable and time preference variable.

Results

Results will be presented at the conference.

Key words: Time preference; self-management; chronic health conditions

Ourega-Zoé Ejebu

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Impact of working conditions and mental illness on absenteeism in the public sector: evidence from the BHPS

Supervisor: Dr Diane Skåtun (Health Economics Research Unit (HERU), University of Aberdeen)

Objective

Using available UK data and empirical methods, this ongoing research explores the role of two aspects of employees' well-being, job-satisfaction and mental-illness; as predictors of absenteeism in the private and public sectors. The research also considers variations in absenteeism rates within the public sector: in vocation-based sub-sectors (such as NHS workers and teachers) and the non-vocational public sector.

Background

The public sector is undergoing continued reductions in resourcing and subsequent reductions in staffing while the demand for public services is intensifying. This may indirectly contribute to an increasing level of stress and absenteeism rate. Considering this latter is a measure of productivity, it is increasingly important to identify (and address) the main causes of its occurrence. According to ONS (2014), mental illness (or mental health problems such as stress, depression and anxiety) contributes to a significant number of lost working days. It also accounts for one of the greatest cost arising from long-term sickness absence (Verow and Hargreaves, 2000). Besides, mental illness is one of the main causes of absenteeism in the public sector (after musculoskeletal illness). Recent research suggests absenteeism rate due to mental illness is larger in public sector than in the private sector (Hussey et al., 2012; Whittaker et al., 2012). The literature also suggests employees' motivation, retention and performance are strongly associated with their vocation status (Heyes, 2005; Barigozzi and Turati, 2012) and job satisfaction (Clark, 1996); which in turn are critical to provide high-quality public service.

Methods

Random-Effects (RE) logistic regression model for sickness absence will be applied to allow for repeated observations on the same individuals. All the waves (1991-2008) of the British Household Panel Survey (BHPS) will be used (238,996 observations). Measures of sickness absence, job satisfaction and mental illness are directly obtained from the respondents. Different aspects of job satisfaction will also be considered (satisfaction with pay, working hours, work-colleagues and manager, etc.). We are also interested in the effect of such components within the public sector, in particular focusing on vocation-based services such as NHS and teaching compared to the non-vocational public sector.

Results

Descriptives suggest the proportion of employees reporting being off sick (2139) varies with occupational setting, such that 61% were working in the private sector; 11% in the NHS or Higher education; 18% in the local Government and 5% in the civil service. Looking at employees reporting being off work for 'other reason', the trend is relatively similar (64% are private sector employees, 18% work in the local Government; 8% are from the NHS or higher education and 4% are employed in the civil service). There are noticeable variations between vocational-intensive sectors and non-vocational occupation. Whilst the descriptives do not explain absenteeism variations across different job sectors, our ongoing empirical analysis will aim to bring more insight to the absenteeism variations across vocation-intensive and non-vocational sectors, as well as looking at other occupational classifications.

Keywords: public sector, vocation-intensive sector, job satisfaction, mental illness, absenteeism

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The Impact of Errors in Patient Safety

Supervisor: Pedro Pita Barros (Nova School of Business and Economics, Lisbon)

Purpose

Medical errors are the third leading cause of deaths annually – it has a higher impact than breast cancer and AIDS (WHO, 2012).

The euro-barometer survey (2010) found that almost half of those surveyed feel that they could be harmed by the healthcare system in their country. Even though the patients are aware of this situation, it may appear that few studies have explicitly considered the intensity errors measurement and which are the most damaging or deadly errors. As such, the need to examine the impact of errors in patient safety in hospitals became evident to us.

Cardiothoracic surgical service was our research choice. The study was implemented in a single hospital over a period of time. This hospital only does heart surgeries and each and every process is duly mapped from patient entrance until their discharge. Building on these notions, this article sets out to examine what types of errors exist in cardiothoracic surgical hospitals and what are the possible causes for them. To complement the study, a number of examples are suggested.

This study also has the potential to highlight how to recover from errors. We put forward a number of mechanisms that are needed for detecting, preventing and to respond to these errors. Finally we reflect about error propagation.

Methodology

One-to-one semi-structured interviews, observation process and document analysis were performed with nurses and physicians in a single hospital of cardiothoracic surgery. Interviews were transcribed and qualitative analyses were analyzed according to Miles and Huberman coding (Miles and Huberman 1994).

Preliminary Findings

At this time two of the three main research questions were analyzed. Our research suggests 18 different types of errors. The most frequent are medication, diagnostic and treatment and process errors, namely communication and information check and passage. Medication errors are related with medication change, mainly generics and ampoules. Generics because they look very similar and calcium ampoules because the package was identical, however one ampoule was to compensate the calcium deficit, the other calcium chloride was an emergency drug.

From the very start, the diagnostic errors are related with wrong diagnoses evaluation. This is exemplified by a situation when it was not evaluated if the patient has a prerespiratory insufficiency and they needed respiratory optimization before the surgery. When the healthcare professionals were asked to give their opinions as to which are the possible causes of errors, they mentioned external and internal causes. External related with task execution and disruptions in communication and systems. Internal connected with scheduling, staff fatigue, unplanned shortage of capacity and misinterpretation of language.

Contribution

The study findings will lead to errors classification in hospitals. It will also provide guidelines to improve patient safety and examples of patient safety best practices.

Key words: Healthcare Services; Patient Safety; Medical Errors

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On the estimation of the monetary value of a QALY: Opportunity cost of health funding decisions in Spain**Co-author: Iván Castilla Rodríguez, Cristina Valcárcel Nazco, Lidia García Pérez, Renata Linertová, Pedro Serrano Aguilar** (Health Technology Assessment (HTA) Unit of Canary Islands, Santa Cruz de Tenerife)**Supervisor: Laura Vallejo Torres** (Health Technology Assessment (HTA) Unit of Canary Islands, Santa Cruz de Tenerife)

Health economic evaluation estimates the incremental cost per unit of effectiveness between a new technology and its comparator. Effectiveness is usually measured as Quality Adjusted Life Years (QALY). Many health care systems claim to incorporate the economic evaluation criterion in their investment decisions. However, cost per QALY information alone does not allow to draw recommendations about the inclusion or not of the new technology. To enable economic evaluation to be considered into decision making, information on willingness and ability to pay for a QALY by health systems is needed.

Different perspectives and methodologies have been proposed in the literature to arrive at the so-called cost-effectiveness threshold. In this project, we conducted a systematic review of the literature, and the studies identified were categorized in two different perspectives: i) the estimated value that society places on a QALY, and ii) the estimated cost of generating a QALY. Although most previous research have focused on the first perspective, the second vision appears to be gaining momentum. The argument is as follows. Within the context of a fixed health care budget, the adoption of a new technology that imposes additional costs on the health care system would require the displacement of some existing services. Disinvesting on existing interventions will most likely result in health decrements for individuals elsewhere. Funding decisions should consider whether the health expected to be gained from the use of a new technology exceeds the health expected to be forgone elsewhere as other services are displaced. Recent studies in the UK have attempted to quantify this average opportunity cost, in order to estimate the cost-effectiveness threshold for its use in economic evaluation (Claxton et al. 2013).

We aim to build on this previous work, and to develop a model that takes into account Spanish data availability and that is able to address some previous limitations. Similarly to this recent study, we propose to estimate through econometric modelling the average effect of a reduction in health care expenditure on health outcomes across Spanish regions along a time period, using administrative population and survey panel data. We are currently at the data collection stage. We have created a region-based database with information on mortality, life expectancy, health expenditure and quality of life (QoL) for the panel of data considered, as well as information on control variables regarding health and resources needs. We aim to present the analytical framework and advances made towards the econometric modelling.

Key words: Quality-Adjusted Life Year (QALY); willingness to pay; threshold; economic evaluation

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MCDA applied to health care decision-making: a systematic review

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Objectives

The aim of this study is to assess how Multi-criteria Decision Analysis (MCDA) is applied to health care decision-making. Three MCDA categories were considered (value measurement methods, outranking techniques, goal and reference point methods) as well as specific purpose methods related to health care. These methods can be applied to different levels of health care (for example at government, clinical and patient levels).

Data sources

Four databases (Embase, Medline, Web of Science and PubMed) were searched from 1980 to December 8th, 2014. A structured search query was developed for each one, using multi criteria decision analysis as the discipline and health care as the search field.

Review Methods

A systematic review of the literature was performed to find studies and applications of different MCDA methods in the health care area. The results were used to propose a classification of MCDA methods in different contexts of health care. Then a meta-analysis was conducted to capture the link between the context and the method.

Results

768 publications were identified and selected through the first search phase. Papers were then excluded in the second phase if not health care related and when no MCDA techniques were applied. 64 papers were finally identified for further analysis. The first was published in 1999 and the majority (n=46) since 2011, and most studies were undertaken in Europe (n=13), Asia (n=11) and North America (n=8). In the majority of instances they were case studies (n=47), sometimes supported by literature reviews (n=25). The context analysis showed that studies were mostly performed in the process of deciding which treatment to give, and generally related to clinical level decisions. When process analysis was considered, it was observed that all three categories of MCDA methods were applied in the health care area. However, value measurement methods seemed to be preferred presumably as they are less complicated and simple to use.

Conclusion

This systematic review proved that MCDA methods are useful and efficient in health care decision-making processes. Although many models exist, in the majority of studies value measurement techniques are used.

Keywords: systematic review, MCDA, health care.

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Do determinants of breast cancer screening differ when organized versus opportunistic screening is used?

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Supervisors: Guillaume Hollard (Ecole Polytechnique, Palaiseau), Florence Jusot (Université Paris Dauphine, Paris)

After 10 years of existence, the French population-based breast cancer screening is confronted to several limitations. Whereas horizontal equity of access to breast cancer screening is a priority, large socioeconomic inequalities are reported (Devaux and Looper 2012, Jusot, Or and Sirven 2012). Only screening regularity will induce breast cancer mortality reduction but, screening regularity is still heterogeneous and differs from the 2 years interval recommended (Leive and Stratmann 2014 and the National Institute of Cancer 2013's report). Two types of screening coexist and compete for eligible women: organized and opportunistic screening. They mainly differ in the fact that opportunistic screening is based on doctor's prescription and not free of charge.

Our paper aims at understanding the socioeconomic and health care supply determinants of breast cancer screening consumption, controlling for the type of screening performed and potential selection bias.

We use individual data from the French Health, Health Care and Insurance Survey (ESPS) of 2006. Each observation is associated with administrative data of health care consumption between 2006 and 2009, therefore we can distinguish between organized (in the program) and opportunistic screening and control for the number of visits to gynecologists and general practitioners. Variables from the Eco-Santé database are added to take account of health care supply at the "département" scale.

Using this very rich set of variables, we first explain the decision to screen at least once between 2006 and 2009, then the type of screening chosen (opportunistic vs organized) controlling for the decision to choose to screen. Lastly, we observe the probability to screen regularly after controlling for both previous decisions.

Our results show multidimensional social inequalities which influence various steps of the screening process. Having low education, having lived life adverse events and being a beneficiary of the UMC (universal medical coverage) are determinants associated with no screening between 2006 and 2009. Being in poor health (both self-assessed and having a chronic long term illness) is also related to no screening. Any visit to a doctor as well a higher density of gynecologists and radiologists in one's "département" predict a higher probability to screen. We then find that being wealthy, holding a college degree, benefiting from supplementary health insurance and visiting regularly a gynecologist determine the use of opportunistic screening. Controlling for the selection due to choosing one type of screening, we investigate the determinants of screening regularity. Results provide evidence that beneficiaries of the UMC are less likely to screen regularly even though they opted for organized screening. A queuing phenomenon is observed as too many eligible women for too few radiologists diminish the probability to screen regularly. Moreover, wealth determines screening regularity for women who chose to screen opportunistically.

To conclude, even after controlling for selection biases, we observe that determinants differ according to which type of screening is used. As health insurance and contextual determinants seem to influence screening regularity when organized screening was chosen, mainly income inequalities are related to regularity after using opportunistic screening.

Keywords: social inequalities, organized screening and opportunistic screening.

Source of funding: Ligue Nationale Contre le Cancer

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Statins prescription in the NHS Health Check Context

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Supervisor : Fabrice Etile (Research Director, INRA Paris Research Affiliate, Paris School of Economics, Econometrics & Data Group (HEDG, York)).

Among the various causes of mortality, cardiovascular disease (CVD) is one of the main causes of mortality and a key factor of health inequalities in many countries (1). Over four millions people in England are estimated to have a cardio-vascular disease. In prioritizing the reduction of premature mortality the Department of Health implemented the NHS Health Checks (HC) policy in 2009; this national risk assessment and management intervention focuses on people aged 40 to 74 living in England, who does not have an existing cardiovascular disease.

Statin medications are usually prescribed for cholesterol lowering and for prevention of cardiovascular and several clinical trials (2-4) have shown that statins reduce the risk of death. In the past years, the prescriptions of statins have increased (5) and several studies have shown that the prescription of statins for high-risk patient has increased after the introduction of HC. Dalton et al. (2011) showed that the percentage of patients identified at high risk and receiving a statin prescription rose from 24.9% before the HC to 43.4% after the HC in 29 practices. The same study found that statin prescription has increased from 27% to 39% for patients at low risk. Artac et al. (6) confirmed that in the first two years of implementation of HC, half of the patients at high risk were prescribed statins in general practice in 3 practices. Nevertheless, our data suggest that it still exists disparities of prescription between PCTs. Understanding how statins are prescribed is particularly relevant for policy-makers to implement prevention programme.

As PCTs differ in terms of population characteristics and hence in terms of need for health care (7) this study investigates whether disparities in both high and low dose statins prescription between PCTs remain after we control for a number of morbidity and lifestyle variable. Finally this article addresses two questions. First, could it be that geographic variations reflect differences in need? Second, do geographic variations are linked with the health check programme?

Our analysis was conducted using the British National Formulary (BNF) data, which give information about statins prescription including the volume and the dosage in each PCT in 2012. In addition, we extracted health checks data from NHS England statistics including the number of people who received an HC within each PCT. Multivariate regressions was used to evaluate the impact of health variables like prevalence of CVD and risky behaviours on statins prescription. The prescription of statins are likely to vary with a number of parameters at PCT level: therefore deprivation index, income, and physicians rate per residents were also controlled for.

Preliminary results shows positive and significant association between NHS HC and high dose prescription: controlling for lifestyles and risk factors of CVD, a 10% increase of the number of NHS HC implies a 0.9% increase of the number of high dose statins prescribed. However, the association between prescription and deprivation is non significant: there are no more differences in prescription between PCTs taking into account prevalence of diabetes, hypertension and stroke. Another interesting result is the significant association between risky behaviours variables and the prescription only for high dose statins.

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Key words: Cardiovascular disease, Health Check, Statin prescription

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Care arrangements and caregivers' health: should we care about how they care?

Supervisor: Thomas Barnay (University of Rouen; Centre for Research in Economic Globalization (CREAM); Research Team on Use of Time Data in Economics (ERUDITE) and Institute for Labor Studies and Public Policies (TEPP), Rouen)

In the current context of aging population, it is important to study informal caregivers who are the main providers of support for dependent elderly people in France. Indeed, informal care has many economic (employment consequences, out-of-pocket expenditures) and non-economic (physical, social and emotional well-being) costs. Recent economic papers (Bobinac et al. 2011; Byrnes et al. 2009; Hansen et al. 2013; Coe and Van Houtven 2009; Do et al. 2013; Van den Berg 2014) have shown that informal care has negative health effects but have not assessed whether heterogeneous care arrangements lead to different health consequences.

This work aims at estimating from French data the effect of care arrangements on the depreciation of caregivers' health capital. The main objective is to investigate the effect of social support (informal support and formal home care); I also study the effect of care intensity and of the relationship between the caregiver and the elderly.

This study uses a sample of 880 non-coresiding caregivers from the French Disability and Health Survey (2008) and estimates the effect of care arrangements on three variables: reporting that informal care affects general health, reporting that it leads to depression and reporting that it decreases the mental well-being (mental tiredness, stress and anxiety).

I take into account the potential endogeneity of formal home care using two different specifications: simultaneous equations (with a categorical formal care variable) and instrumental variables models (with hours of formal care). The instrument for formal home care is the proportion of individuals who received the Personal Autonomy Allowance in French departments (needs-based national program administered at the departmental level that covers part of the formal home care received by individuals at least 60 years of age who need help for activities of daily living).

The (preliminary) results highlight that naïve models underestimate the effect of formal home care in the general health and the depression models due to reverse causality. I show that formal home care decreases the probability of reporting general health problems and depression while it has no effect on the mental well-being. On the other hand, informal support decreases by about 15% the risk of mental well-being loss and by 5% the probability of reporting general health problems. Concerning informal care intensity, caregivers providing a daily assistance are at higher risk of general health problems (+7%) and well-being loss (+7%). Finally, it seems that when informal care results from a personal choice (care provided by friends and neighbors, grandchildren) or when family ties are weaker (children-in-law) it reduces the health risk, as compared to care from children or siblings. In terms of public policies, measures aimed at mitigating the adverse effects of informal care should primarily

focus on intensive caregivers and policymakers should improve the financial access to formal care and encourage informal support and solidarity, not only from the family but also from the social network (friends, neighbors) of dependent elderly people.

Keywords: Informal care; General health; Mental health; Formal care; Informal support; Care relationships

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The Greener, The Happier? The Effects of Urban Green and Abandoned Areas on Residential Well-Being

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Supervisor: **Prof. Gert Wagner** (German Institute for Economic Research (DIW Berlin)/Executive Board, Graduate Center, Berlin)

This paper investigates the effects of urban green and abandoned areas on residential well-being in major German cities, using panel data from the German Socio-Economic Panel (SOEP) for the time period between 2000 and 2012 and cross-section data from the European Urban Atlas (EUA) for the year 2006. Using a Geographical Information System (GIS), it calculates the distance to urban green and abandoned areas, measured as the Euclidean distance in 100 metres between households and the border of the nearest urban green and abandoned area, respectively, and the coverage of urban green and abandoned areas, measured as the hectares covered by urban green and abandoned areas in a pre-defined buffer area of 1,000 metres around households, respectively, as the most important determinants of access to them. It shows that, for the 32 major German cities with more than 100,000 inhabitants, access to urban green areas, such as parks, is significantly positively associated, whereas access to abandoned areas, such as brownfields, is significantly negatively associated with residential well-being, in particular with life satisfaction, as well as mental and physical health. The effects are strongest for residents who are older, accounting for up to a third of the size of the effect of being unemployed on life satisfaction. Using data from the Berlin Aging Study II (BASE-II) for the time period between 2009 and 2012, this paper also shows that (older) residents who report living closer to greens have been diagnosed significantly less often with certain medical conditions, including diabetes, sleep disorder, and joint disease.

Key Words: Life Satisfaction, Mental Health, Physical Health, Medical Conditions (Diabetes, Sleep Disorder, Joint Disease), Urban Land Use, Green Areas, Greens, Forests, Waters, Abandoned Areas, SOEP, BASE-II, EUA, GIS, Spatial Analysis

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The price of time: Quantifying survival improvements per cost unit of hospital treatments in Switzerland

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Supervisor: Beat Hintermann

We compute average cost-effectiveness ratios for the treatment of different diseases in Swiss hospitals. Costs are measured by the diagnosis-related group (DRG) based reimbursements (lump-sum compensations) for Swiss hospitals, which reflect the hospitals' average costs for the treatment of a particular disease. Treatment effectiveness is measured by the difference between the average mortality rate of a given disease as observed in Swiss hospitals and the counterfactual mortality in the absence of treatment. We define the counterfactual mortality of any disease by its natural history, which we obtain by a systematic review of the epidemiological literature. We limit the scope of our study to survival improvements of treatments, neglecting quality of life measures. As a consequence, we consider only diseases which exhibit high mortality rates and where the survival effect is arguably the major effect of the treatment. To estimate the actual mortality rates, we use data from all hospital admissions in Switzerland between 1998 and 2013, which contain precise information on diagnoses, treatments, patients' characteristics and admission and discharge dates. Every patient is identified by an ID number which allows us to track his or her entire hospitalization history during the given time span. This allows us to observe the in-hospital mortality. However, a share of patients dies outside a hospital. We estimate the out-of hospital mortality by using information on re-hospitalizations following the approach of Farsi and Ridder (2006). Using data on the duration of in-and out-of-hospital spells allows us to estimate the distribution of these spells and to infer the mortality rates outside of the hospital. This procedure relies on the assumption that patients cannot enter other hospitals than those which are included in the sample. Because our sample contains 99% of Swiss hospitals, this assumption arguably holds for the vast majority of observed cases.

Our analysis can be understood as complementary to assessments of marginal costs and benefits of treatments, which serve as the standard benchmark for the evaluation of technological progress in medicine. As hospitals increasingly depend on lump-sum compensations based on average costs, it seems important to inform policymakers about average benefits as well. Finally, our results could constitute a main ingredient for further normative analysis. To the best of our knowledge, no such estimation of average costs and benefits for different diseases has been performed to date. Even though we apply our method to Swiss data, our approach is also applicable to other countries, as the database of untreated mortalities is not country-specific. The paper is subject to ongoing work. Preliminary results suggest significant differences of cost-benefit-ratios across diseases.

Keywords: cost-effectiveness, hospital care, survival analysis, natural history.

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Combining simulation and patient data to find optimal specifications for estimating risk-adjusted mortality rates

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Hospital risk-adjusted mortality rates (RAMRs) are a key measure of hospital performance. Improved data collection methods, greater uniformity across hospitals of administrative data quality, and the adoption of big data methods in estimation of patient mortality risk in hospital settings can lead to great improvements in estimations of RAMRs. This improvement presents a new opportunity to measure the quality of different methods of aggregating patient risk to hospital RAMRs. This quality is measured in a number of dimensions: across goodness of fit measures, across subsample sizes, and across variation in accuracy and precision of patient risk scores. Accurate estimation of RAMR is important for empirically accurate pay for performance based remittance of costs to health facilities as well as in research in patient care where hospital level effects are important.

We consider aggregation of patient risk into RAMR in three different ways. Hospital RAMRs can be defined as the observed mortality rate of a hospital divided by the predicted mortality rate times the overall mortality rate in the entire population. This can be directly estimated on a subsample using an estimation of predicted mortality from fitting a binomial model of mortality against patient risk scores across the entire sample and using fitted probabilities from that model aggregated to the hospital level. Alternatively, RAMRs can be estimated from including a varying hospital level effects in the model of mortality. This effect can be estimated from a probability model (a random effect), or as a fixed effect. We use data from the New York State Inpatient Databases generated by the US Healthcare Costs and Utilization Project, and focus on records from patients diagnosed with acute myocardial infarction from 2005 to 2007 (around 50,000 patients across 324 Hospitals). Patient risk scores are estimated from patient demographics and recorded comorbidities. For further exploration we create simulated hospital RAMRs and simulated patient records. These simulations allow precise control of variation across

Keywords: Risk Adjusted Mortality Rates, Varying Effects, Facility Quality, Simulation and Modelling

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Decentralization in the health system: a spatial analysis for Brazil and Colombia

Supervisor: Marco Tulio Aniceto França

Many Latin American countries built Social Security System, especially in health, which were intended to ensure this service to the entire population. While Brazil made an effort to strengthen the Sistema Unico de Saude – SUS after launched the Constitution in 1988, Colombia did the same process 5 years late, releasing the 100th law. But there is a difference between these countries because Colombia divided the services in two different areas: subsidized and contributory.

The reasons for the decentralization process and therefore the distribution of the resources from central to local authorities is to close the policymaker for the population demands in order to guarantee access for the whole population. Municipals would have more knowledge about local demand than Federal government, so it is conceived in the same way, although the type of organizational structure of the countries and the same health system can differ in the transfer between entities.

However, there are deeply difference when is compared what was planned in the Constitution and the final result because there are a higher fragmentation in the delivery of health in both countries, maintaining the coverage problems and do not guarantee the efficacy of the health service.

We will use the spatial econometrics analysis to compare the effects of decentralization between Colombia and Brazil through the use of expenditure transferred to municipalities to be performed attention to the health network (in Hospitals and primary health care). The objective is to verify whether health care served its purpose of universality, and if generated poles of hospital care were in countries. This is further would verify whether resources were being maximized and potential

generating economies of scale, which could provide better health care. As a proxy to offer beds and doctors per 1,000 inhabitants were used, however, to verify the type of care, the use of an instrumental variable is suggested: number of highly complex equipment per capita, thus more than an installed capacity is observed the degree of care that can be provided by the municipality. Since decentralization depends on the government organization in all areas, a policy variable was included to verify the impact of local policy on the allocation and use of resources. The control variables were the rate of infant mortality, the years of schooling, GDP per capita, the ratio among population over 60 years and the total population. The centroids of the municipalities and the distances (maximum and average) entered care centers (Hospital and Basic Primary). Three models were estimated: SEM, SAR and SDM through an OLS estimation and maximum likelihood. The results for the two countries are comparable: there are no economies of scale demonstrated in health care, the degree of political influence in the region in the central government defines the revenue of the municipality, and care has not been according to epidemiological vectors or health characteristics of the population, as if to comply with minimum standards of compliance budget.

Key words: decentralization, system health, spatial

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The cost effectiveness of personal-centered care, The case of acute coronary heart syndrome

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The general objective of this study is to compute short- and long-term cost-effectiveness measures associated with personal-centered care. The particular intervention that we study is the provision of personal-centered care to patient that suffer from acute coronary heart syndrome events. This intervention has been compared to traditional care in a randomized controlled trial. At baseline, information about socioeconomic characteristics, life-style factors and history of morbidity were collected. Health-related quality of life (EQ-5D) is measured at baseline, and at three and twelve months. Information about direct resource utilization (health care and pharmaceutical utilization) and indirect effects (temporary work absenteeism) were collected throughout the clinical trial. The analysis of short-term cost effectiveness pertains to the time frame of the clinical study, while the analysis of long-term cost effectiveness explores published epidemiological information in order to extrapolate morbidities and resource utilization for a longer period of time (2 – 5 years). For this purpose, a simulation model will be constructed, using the information generated within the clinical trial as a benchmark.

Key words: Health economics Acute Coronary heart syndrome Cost-Effectiveness EQ-5D

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Balancing incentives and risks in provider-payer contracts: introducing risk for better performance

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Supervisors: Jeroen Struijs, Rudy Douven, Johan Polder

In healthcare, there is a shift towards value-based payment models. “Value is defined as the health outcomes achieved per dollar spent” (Porter and Teisberg 2006). These payment models create value by introducing incentives to deliver high-quality and efficient care, as opposed to the traditional fee-for-service models that incentivize volume rather than value. Incentives to deliver value can be created by holding providers accountable for the quality and cost of care delivered. However, given that providers do not have full control over their performance, holding providers accountable for their performance inevitably introduces risk. These emerging payment models thus introduce risk to healthcare providers operating in a market that is already associated with uncertainty, while providers can only bear a certain level of risk.

From a societal perspective, the optimal contract should combine the highest attainable incentives to deliver value at the maximum level of risk a provider can bear. Here we make an important distinction between types of risk. On the one hand, risk is introduced by external factors that create uncertainty and do not contribute to incentives to deliver value, such as inflation, let us call it “unintentional risk”. On the other hand, risk is introduced via the payment model design to create incentives to deliver value, such as a two-sided global budget, let us call it “intentional risk”. Given that providers can only bear a certain level of risk, welfare gains can be realized by minimizing “unintentional risk” to leave maximum room for introducing “intentional risk”. To determine how much intentional risk to introduce via the payment model thus requires that we know: (1) what external factors introduce unintentional risk (2) whether and how the negative impact of this unintentional risk can be mitigated, and (3) what determines a provider’s ability to take on risk. These questions were investigated by means of semi-structured interviews with key stakeholders in the healthcare sector in Massachusetts, USA, analyzing provider-payer contracts in the Netherlands, and the literature.

Multiple external factors introduce unintentional risk, we classify four main categories: macroeconomic, market behavior, healthcare and, public policy, law and regulation. The negative impact of these risks can be mitigated by, either: lowering the overall level of risk or by adopting contractual clauses that reduce the negative consequences of risk. The providers’ ability to take on risk largely depends on the providers’ current financial position, and the providers’ ability to control and predict performance. If the level of unintentional risk cannot be brought down below the providers’ maximum acceptable risk level, a fee-for-service contract is preferable. If the level of unintentional risk falls below the providers’ maximum acceptable risk level, there is room to introduce intentional risk via the payment model to create incentives for delivering value. More specifically, the difference between the unintentional risk level and the providers maximum acceptable risk level determines the optimal degree of risk-sharing. Provider-payer contracts may thus improve welfare and health care by finding the right balance between risks and incentives.

Key words: contracts, financial incentives, risk-sharing, uncertainty

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Diabetes severity and duration and their effect on labour market outcomes in Mexico

Supervisor: Marc Shuhrcke, Centre for Health Economics, University of York, York

Objective

Diabetes has been shown to adversely affect labour market outcomes. However, most studies so far have relied on cross-sectional data and self-reported diabetes from high-income countries, limiting causal inference and the relevance of the results to low- and middle income countries, where a large proportion of people with diabetes remains undiagnosed.

Methods

To extend the knowledge about the labour market effects of diabetes in Mexico by investigating the effect of diabetes on employment chances, labour income and work hours in Mexico using panel data as well as information on diabetes biomarkers. Methods Data from three waves (2002, 2005, 2009) of the Mexican Family Life Survey are used allowing for the estimation of panel data fixed effects models of the effect of self-reported diabetes and diabetes duration on labour market outcomes. Using fixed effects I am able to account for unobserved heterogeneity due to personal characteristics and improve the causal interpretation of the estimates. The data further provide information on glycosylated hemoglobin (HbA1c) measurements for a subsample of survey participants in 2009, which I use to explore how diabetes severity affects labour market outcomes and if these effects differ between diagnosed and undiagnosed people with diabetes.

Results

Panel data results indicate a negative impact of self-reported diabetes on the probability of being employed in Mexico (-5.4 percentage points (pp) ($p < 0.05$) for men and -4.7 pp ($p < 0.05$) for women), but no effects on wages or work hours. When looking at time passed since diagnosis, the largest effect on employment chances for men is found about 6 to 10 years after diagnosis (-7.3 pp ($p < 0.1$)), while for women chances are reduced within the first two years after diagnosis (-9.6 pp ($p < 0.05$)) and after more than 15 years (-23.6 pp ($p < 0.01$)). Additionally, I find a reduction in labour income for females 15 years after diagnosis. Using only the data from 2009, adverse effects across the different labour outcomes are mainly found for those with self-reported diabetes and an HbA1c between 6.5%--8%. I find no effects of undiagnosed diabetes nor for people with self-reported diabetes but HbA1c levels below the diabetes threshold of 6.5%.

Conclusion

The results confirm earlier findings of a negative effect of diabetes on employment chances in Mexico and show that these effects can appear relatively recent after the diagnosis. They further show that a diagnosis of diabetes together with HbA1c levels just above 6.5% are sufficient to reduce employment chances and productivity. These results indicate that the adverse effect of diabetes can appear soon after diagnosis and with relatively well controlled diabetes and therefore might not solely be explained by physical health impairments due to diabetes but other factors could be at work as well.

Keywords: diabetes, productivity, Mexico, biomarkers, panel data

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Geographic variation in breast cancer screening in France: a spatial econometric approach

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The breast cancer is the first cause of cancer mortality in the European Union (Ferlay et al., 2013). Mammography is the best screening tool in order to detect early breast cancer and then decrease the mortality (Wübker, 2014). The decrease of mortality due to screening is ranged between 10% and 30% (Ouédraogo et al., 2014). European Union recommends reaching 70% of the targeted population for mammography screening (Karsa, 2008).

A significant part of woman has not followed the recommendation and thus has not been screened during the two last year (50 % in France in 2009). Given the importance of screening several studies focus on the reasons of non uptake. They point out that women with a higher socio-economic status (income, education level, occupation) are more likely to have a mammogram (Martín-López et al., 2013 ; Damiani et al., 2012 ; Dourado et al., 2013). In France, since 2004 a national organized breast cancer screening program is implemented for every woman 50-74 and it is free of charge. Results for France also emphasize the positive correlation between socio-economic status and screening uptake.

Few studies focus on regional variation in cancer screening and they show that difference in geographic accessibility to health care services (especially by considering the physician density) can impact cancer screening uptake (Fleischer et al., 2008 ; Gorey et al., 2010 ; Vogt et al., 2014). However, they use cross-sectional data and do not take into account the potential spatial spillover effect between areas. These spillover effects emerged from informal communication through personal contacts between areas (Vogt et al., 2014).

The aim of this proposal is to analyze regional variation in the use of mammograms in France during the period 2004-2012 and to assess the extent of spatial interaction of breast cancer screening rates between French departments. We use data taken from the French Institute for Public Health Surveillance (InVS) in order to have screening rates uptakes for each department. Variables of interest are physician density (GP, gynaecologist, radiologist), economic situation (unemployment rates or GDP), mortality rates and risky behaviour (cirrhosis morbidity and traffic accident). We use a dynamic spatial Durbin panel model to estimate the determinants of cancer screening uptake and to capture the influence of neighbouring areas' variables on screening rates.

On the period 2004 to 2012 the average screening rates increases from 47% to 55.5%. The average extreme rates are 67% (maximum) and 27% (minimum). Our first results point out that high cancer mortality is associated with higher mammography uptake. Moreover, risky behaviours decrease cancer screening. Specialist density and economic situation lead to lower screening rates. It can be explained by the fact some radiologist may suggest mammography outside the national program by proposing shorter delay (Menvielle et al., 2014). Finally, our result highlight clear spatial spillovers, thus neighbouring areas' variables have an impact on the cancer screening uptake in the observed area.

Keywords: Cancer screening, France, Spatial analysis, Health care access

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Self-reported health and gender: the role of social norms

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The literature on health and gender has long evidenced that women consistently report worse self-rated health than men do while their probability of dying is lower than men's throughout their life. A first explanation for the gender gap in self-reported health relies on "true" health differences: women would suffer more than men from chronic diseases. Another explanation has to do with sex differences in health-reporting behaviour. In this paper, we investigate the importance of social norms in the working environment in accounting for differences in self-reported health across men and women.

To do so, we use the 2010-wave of the European Working Condition Survey (EWCS). The dataset contains detailed information on individual working conditions, earnings, work-life balance, hours worked and work organisation. It also covers several aspects of health as well as demographic and socio-economic characteristics. A key feature of this survey is that it has also information on the gender structure of the work environment for each respondent. We include in our study only individuals aged 65 and below and thus our final sample consists of 30,124 individuals from 30 European countries.

As a first step, we estimate the effect of gender on self-reported health by probit. We replicate the standard result that women report worse health than men, whatever the health outcome we consider – i.e. general self-assessed health, well-being but also more specific symptoms such as hearing problems, skin problems, backache, muscular pain in upper or lower limbs, headache and eyestrain, stomach ache, respiratory difficulties, depression and anxiety, fatigue and insomnia.

As a second step, we proxy social norms by the gender structure of the workplace environment and study how the latter affects self-reported health for men and women separately. Our findings indicate that individuals in workplaces where women are a majority tend to report worse health than individuals employed in mixed-gender work environments, be they men or women. The opposite holds for individuals in workplaces where men are a majority: men tend to report fewer health problems than when employed in mixed-gender environments and the same goes for women – although the effects are not significant at conventional levels. These results are robust to controlling for a large array of working condition indicators, which allows us to rule out that the poorer health status reported by individuals working in female-dominated environments could be due to worse job quality. We interpret this evidence as suggesting that social norms associated with specific gender environments play an important role in explaining differences in health-reporting behaviours across sex, at least in the workplace.

Keywords: health, gender, social norms.

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The effect of social health insurance on horizontal inequity in health care utilization: evidence from the New Rural Cooperative Medical Scheme in rural China**Supervisors:** Prof. Bruce Hollingsworth (Health Research Department, Lancaster University, Lancaster), Prof. Colin Green (Economic Department, Lancaster University, Lancaster)

China introduced a heavily subsidized voluntary health insurance program, the New Rural Cooperative Medical Scheme (NRCMS) in 2003. The program aimed to increase the access to health care and reduce the incidence of financial catastrophe related with large out-of-pocket payments. Although many studies have evaluated the effects of the NRCMS on health care utilization, medical expenditure and health outcomes, very little is known whether the program reduces the inequity in access to health services. The paper evaluates the effects of the NRCMS on income-related inequity based on panel data from China Health and Nutrition Survey (CHNS). The outcome variables are obtained by estimating the concentration indices of the utilization of formal medical care, preventive care, folk doctors and different levels of health facilities after standardization of differences in health need. The independent variables include individual-, household- and community-level characteristics. We employ propensity score matching and difference-in-difference methods to account for the adverse selection problem that the insured people may select themselves into the program based on unobservables that cannot be controlled in the regressions. The results suggest that the NRCMS significantly reduces the inequity in folk doctor utilization, but we find no effect of the program on other outcome variables. The limited impact of the NRCMS on equity outcomes may be due to the low reimbursement rates under the insurance package and insufficient protection towards the poor people. Therefore, more improvements are needed to make the insurance package more comprehensive and more effective to target the rural poor.

Key words: impact evaluation; difference-in-difference; propensity score matching; China

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Caesarean section use: The impact of hospital staff structure

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Introduction

The use of C-sections varies substantially between countries (14%-50%¹) and within a single country. In France, there is a great variability in the rates of C-sections between regions and between hospitals^{2,3}. According to WHO recommendations, this rate should be below 15%⁴. Delivery by C-section increases the risk of maternal mortality, maternal and neonatal morbidity and complications for future deliveries^{5,6,7}. Furthermore, the average cost of a C-section is at least twice as high in numerous OECD countries as for a normal delivery¹. What is the value of doing C-sections that are not medically necessary? A recent French study shows that 28% of planned C-sections could be avoided⁸. The research literature identifies the characteristics of maternity units as an important determinant. Heterogeneity of practices has been found, in particular, between different levels of care, between different juridical status and within a single institution^{9,10}. Organizational factors such as hospital staff structure are less studied. A French analysis showed that the more obstetricians there are per patient bed, the more probable it is that C-sections will be performed¹¹. In a preliminary study of the Yvelines administrative region, we find that the number of midwives negatively influences the likelihood of having a C-section¹². Our hypothesis is that the structure of the hospital maternity staff impacts the use of C-section and plays a role in its variability.

Hospital staff and obstetric practices

The French law sets the number of medical staff in maternity departments. The number of midwives varies each year based on the annual number of births in the hospital. From 1 000 births, and for each additional 200 births, this number increases by a midwife full-time equivalent. If from one year to another, a hospital exceeds the permitted threshold variation (often slightly), it must hire a midwife if positively exceeds the threshold (or remove if it drops below). So this is an exogenous shock. Due to the closure and merger of maternities observed in recent years, the number of maternity births has moved.

Data and econometric strategy

We have used two French databases covering the Yvelines administrative region for the period of 2008- 2013. The first database is drawn from the initial infant health certificate and contains all deliveries performed in this region (information on pregnancy and delivery: diagnoses and co-morbidities). The second database, drawn from the French annual statistics for hospitals, contains all the hospitals with obstetrics care (status, level of facilities, size, medical staff and location). The perinatal network checked these data. We thus have a database comprised of 103,207 deliveries across the ten hospitals of this region. In our sample, from one year to the next, hospitals exceed the threshold of variation (treated hospitals) while others do not exceed these thresholds (control hospitals). To learn how the introduction of a midwife affected the use of C-sections, we apply the difference-in-difference (DID) framework. More specifically, the effect of this introduction is identified through differences between control and treated hospitals in changes in the probability of having a C-section over the time periods between two years. We control for all medical diagnoses of patient and hospital's characteristics. Over the period 2008-2013, there has been a partial merger of two maternity hospitals that were excluded from the analysis, they were prepared before.

Results

Our results show that treated hospitals that have increased their number of midwife, had a decreased likelihood of C-sections. Conversely, those who decreased their number of midwives had an increased likelihood of C-sections. Currently we work on rate of midwives per patient and per bed. In addition, we determine how decreases the likelihood of having a C-section when the number of midwives increased by 1% (elasticity study).

Keywords: C-section, Heterogeneity, Hospital staff.