

health inequalities and one that is particularly relevant in a worsening macroeconomic climate is that there has been insufficient economic analysis or inadequate adoption of an economic perspective in these areas. The DETERMINE project sought to address this deficit in a discrete work package strand coordinated by the Institute of Public Health in Ireland.

Design Using a specifically designed data collection instrument, examples of economic evaluations conducted on relevant policies and actions were identified and the benefits and barriers to using economic arguments in this area were explored.

Setting Data were collected by partners representing Belgium, Czech Republic, England, Estonia, Finland, Iceland, Netherlands, Northern Ireland, Norway, Poland, Republic of Ireland, Scotland, Slovenia, Spain and Wales. In addition, one partner collected data at the EU level (EuroHealthNet).

Main Outcome Measures The rationale is that where such work has been undertaken, results should be disseminated to influence decision-making in favour of addressing health inequalities. If such work has not been undertaken it is important to understand why this is the case.

Results Findings show that much work is occurring and there are examples of good practice. Barriers and opportunities to progressing work were identified and described by project partners.

Conclusions Economic arguments are a useful approach to tackling health inequalities when used in conjunction with a range of mechanisms. Our research showed diversity across Europe regarding the desire to use such an approach as well as availability of data and tools.

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MANDATED ATTENDANCE AT PARENTING WORKSHOPS IMPROVES WOMEN'S HEALTHCARE KNOWLEDGE BUT MAY WIDEN HEALTH INEQUITIES IN LOW AND MIDDLE INCOME COUNTRIES

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¹I Forde, ¹T Chandola, ¹M G Marmot, ²O Attanasio. ¹Department of Epidemiology and Public Health, University College London, London, UK; ²Department of Economics, University College London, London, UK

Background Conditional cash transfer schemes (CCTS) are relatively new policies in low and middle income countries which aim to improve the health and welfare of poor families by investing in their knowledge, skills and resources. Families are offered regular cash as long as they comply with certain conditions. One of these is that mothers/carers attend workshops where parenting and children's healthcare issues are discussed. We hypothesised that presence of a CCTS in Colombia would be associated with an increase in women's healthcare knowledge.

Design and Setting We analysed data from Familias en Acción, Colombia's national CCTS. Households from participating areas and control areas (matched on environmental and socioeconomic criteria) were prospectively surveyed in 2002 and 2006. Women were asked three questions on home-management of acute diarrhoeal illness (ADI), an important cause of childhood mortality for which cost-effective, home-based interventions are available. The sample comprises 5047 women from areas where Familias was operating and 3461 women from control areas.

Outcome Measure and Analysis A marker of healthcare knowledge was constructed from responses to survey items on home-management of ADI, using WHO guidelines to identify correct responses. The effect of Familias was estimated using an ordered probit model, controlling for individual, household and regional characteristics.

Results Familias was associated with nearly three-fold higher workshop attendance ($\times 2.6$, $p < 0.05$) and improved knowledge at follow-up (probit coefficient, $\beta = 0.160$, $p = 0.010$). Multivariate analysis indicated that women's age ($\beta = -0.002$, $p = 0.042$), literacy ($\beta = 0.221$, $p < 0.001$), level of completed formal education ($\beta = 0.260$,

$p < 0.001$) and involvement in community activities ($\beta = 0.057$, $p = 0.033$) were independently associated with improved knowledge. Household wealth ($\beta = 0.045$, $p = 0.030$) and head-of-household literacy were also independently associated ($\beta = 0.072$, $p = 0.015$). Women's literacy (76%) did not improve.

Conclusions Familias is associated with increased healthcare knowledge amongst participating women. Women who are younger, literate, better educated, involved in their community and who live in better-off households with a literate head-of-household, however, show greater knowledge gain relative to other households. CCTS may widen health inequities by leaving behind women with lowest levels of completed formal education, household resources and community participation. Further thought must be given to the role these workshops play in relation to overall CCTS objectives. The most marginalised households may benefit from additional support to overcome illiteracy and strengthen community involvement.

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SOCIAL DETERMINANTS OF DISABILITY AMONG THE IMMIGRANT POPULATION IN CHILE

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¹B Cabieses, ¹H Tunstall, ¹K E Pickett. ¹Department Health Sciences, University of York, York, UK; ²Facultad de Medicina, Universidad del Desarrollo, Chile

Introduction Chile is a middle-income country that has experienced progressive economic stability and improvement of its health status, however, one persistent and complex public health problem is disability. Social determinants of health have emerged as a significant aspect of current debates on this health problem. This analysis focuses on the international immigrants, who have not necessarily benefited from the country's economic development.

Objective To compare the social determinants of disability between the international immigrants and the Chilean-born population.

Methods Cross-sectional analysis of a Chilean population-based survey of 268 873 people. Independent variable: any disability (visual/hearing/speaking/learning/physical/psychiatric; dichotomous variable). Dependent variables: socio-demographics (age/sex/marital status/geographic location), socio-economics status (3 categories, low/medium/high, by combining income, occupation and education through complete-linkage hierarchical cluster analysis), and material living standards (overcrowding/sanitary conditions/quality of the housing). Descriptive, comparative and adjusted multiple logistic regression models were estimated using STATA 10.0.

Results 1% of the sample reported being an international immigrant and a further 0.67% did not respond to the question on migration status. International immigrants reported a lower prevalence of disability than the Chilean-born (3.55% vs 6.93%, $p < 0.001$); and a clear inverse gradient of disability emerged by immigrants' socio-economic status. There was a significant association with single status, self-employed/public-sector employees, and being ill and retired ($p < 0.001$). International immigrants living > 20 years in Chile and those from Peru had a higher chance of disability (OR 2.95 and 7.85, respectively). A protective effect of living in rural areas (OR 0.99) and a negative association with adequate quality of material living standards (OR 0.96) was also found. Those who preferred not to report their migration status showed a higher prevalence of disability than the international immigrants (7.42%, $p < 0.001$), particularly if they were in the poorest income quintile (OR 6.91).

Discussion Social determinants of disability varied between the international immigrants, those who did not respond to the migration status question and the Chilean-born population. Immigrants showed a clear inverse gradient of disability by socio-economic status. A possible healthy migrant effect was apparent among the international immigrants, but disappeared after 20 years living in Chile. Those who did not respond to the question on migration, potentially undocumented immigrants, showed some

particular poverty-related vulnerability towards disability. Overall, international immigrants were a complex and heterogeneous group and their social determinants for disability require further consideration in future health policy interventions in Chile.

Methods and miscellaneous

P65 A NEW INDEX TO ASSESS THE IMPACT OF COLLINEARITY IN EPIDEMIOLOGICAL RESEARCH

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A Woolston, Y-K Tu, P D Baxter, M S Gilthorpe. *Centre for Epidemiology and Biostatistics, University of Leeds, Leeds, UK*

Background The problem of collinearity due to high correlations between explanatory variables in multiple regression is often overlooked in epidemiological research. The assumption that covariates are independent implies that all pair-wise covariate associations should be negligible—an unlikely scenario for biological and epidemiological data. Small but significant departures from the assumption of independence can severely distort the interpretation of a model and the role of each covariate. If the relative impact of collinearity on the estimates is not understood, these effects can potentially obscure the conclusions of the study.

Methods The impact of collinearity must be assessed in relation to the model environment. Factors such as the relation of the response with the predictors, the sample size and the variation of the covariates each have the potential to exacerbate or relieve the symptoms of collinearity. We present a novel approach to assessing the overall uncertainty in the model estimates, which adjusts in relation to these factors. The index will aid the researcher in the decision towards whether a result is of biological relevance or if it is a consequence of the uncertainty generated by collinearity.

Results We consider data from a paper by Lipkin (1988) in the *American Journal of Clinical Nutrition*. The study examines the role of factors associated with substantial calciuresis. A hypothetical model is proposed involving measures of calcium and potassium in the diet—two highly correlated predictors. Both produce positive coefficients when entered individually, but the sign of diet protein becomes negative when entered simultaneously. The variance inflation factor (VIF) of 4.51 suggests that the collinearity is not considerable (Belsley, 1991). However, when the VIF index is adjusted using model R^2 , the impact appears more substantial than first thought. We propose an alternative diagnostic that utilises the additional influences as a basis to assess the impact of collinearity on the model estimates.

Conclusions The results of significance testing for collinear variables within multiple regression should not be the only criteria by which we judge whether collinearity is a problem. The role of collinearity must be carefully assessed and understood using an appropriate index. Measuring the impact of collinearity using overly simplistic diagnostics, such as the VIF, may lure a researcher into a false assurance of the results. Similarly, a model consisting of highly collinear predictors may be relatively unaffected when considered in relation to other factors in the model.

P66 OPT OUT AS AN ACCEPTABLE METHOD OF OBTAINING CONSENT IN MEDICAL RESEARCH

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¹A Vellinga, ^{2,3}M Cormican, ²B Hanahoe, ⁴K Bennett, ¹A W Murphy. ¹*Discipline of General Practice, School of Medicine, NUI Galway, Ireland;* ²*Department of Medical Microbiology, University Hospital, Galway, Ireland;* ³*Discipline of Bacteriology, School of Medicine, NUI Galway, Ireland;* ⁴*Department of Pharmacology & Therapeutics, Trinity Centre for Health Sciences, Dublin, Ireland*

Introduction A prospective cohort study was set up to investigate a possible association between antibiotic prescribing and antibiotic

resistance of *Escherichia coli* urinary tract infection in the community. A direct link between prescribing and resistance was analysed by searching the records for previous prescription of antibiotics for patients with a suspected urinary tract infection. Participating practices were requested to send a sample from all patients presenting with symptoms of urinary tract infection. Upon receipt of the sample in the laboratory, a letter explaining the study, an opt out form and a freepost envelope were sent to all adult patients. A website with additional information and including an “opt-out” button was set up for the study.

Results A total of 1362 urine samples were submitted by the 22 participating practices representing 1178 adult patients. The 22 practices send in between 15 and 115 samples. In total, 193 patients actively responded to the letter: 142 opt-outs by letter, 15 through the website, 2 who opted out by phone and 12 who sent the letter back without indication, making a total of 171 patients or 14.5% opt-out, 22 patients (1.9%) explicitly opted in. Opt out percentages varied from 6.1% to 25.5% by practice. We received 2 expressions of concerns over the opt-out method. A response to the concerns was communicated through their GP practice and no further concerns were expressed. The total group consisted of 941 women (79.9%) and 237 men (20.1%). Their mean age was 50.9 (SD 20.8) and median age was 47. Patients who opted out were slightly older (50.4 vs 52.8) and the percentage of females was slightly higher (79.5 vs 83%) but these differences were not found to be significant. Patients who opted out through the website were significantly younger than those who used the letter (non-parametric, 53.5 vs 38.7). The number of patients with a positive urine sample (identified organism) was 395 (34.2%). Patients with a positive sample were not more likely to opt-out compared to those with a negative sample.

Conclusions Overall the opt-out method was well received and participation in the study reached 86.5%. The low number of complaints indicates that this is a generally acceptable method of patient recruitment. The 13.5% opt out shows that it effectively empowers patients to decline participation. The high comparability of the patients opting out with the rest of the patients is reassuring for extrapolation of the results of the study.

P67 THE ASSOCIATIONS OF SERUM 25-HYDROXY-VITAMIN D AND IONISED CALCIUM WITH LUNG FUNCTION AND ALLERGEN SKIN PRICK TESTS IN ADOLESCENTS AND ADULTS: FINDINGS FROM A CROSS-SECTIONAL STUDY USING THE US THIRD NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY (NHANES III)

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¹A M Tolppanen, ¹D Williams, ²J Henderson, ¹D A Lawlor. ¹*MRC Centre for Causal Analyses in Translational Epidemiology, Department of Social Medicine, University of Bristol, Bristol, UK;* ²*Department of Community Based Medicine, University of Bristol, Bristol, UK*

Objective To examine the association of circulating levels of 25-hydroxyvitamin D (25(OH)D) and ionised calcium with lung function and sensitisation to common environmental allergens in adolescents (12–19 years) and adults (20–59 years).

Design Cross-sectional study.

Participants Participants of the US third National Health and Nutrition Examination Survey (NHANES III), a representative sample of the non-institutionalised US population, with data on serum 25(OH)D levels and spirometry (adolescents, n=2074; adults, n=4647) and 25(OH)D levels and skin prick tests (adolescents, n=1914; adults, n=4782).

Main Outcome Measure Forced expiratory volume in 1 s (FEV₁) and forced vital capacity (FVC) from Spirometry. Skin prick test responses to a standardised allergen panel comprising indoor allergens (house mite; *Dermatophagoides farinae*, cat, German cockroach),