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.

Social determinants of disability among the immigrant population in Chile

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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 (5 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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**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 R², 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 sense of security. 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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**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 free post 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 return form back without indicating consent, 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 257 men (20.1%). Their mean age was 59.9 (SD 20.8) and median age was 47. Patients who opted out were significantly older (50.4 vs 52.8) and the percentage of females was slightly higher (79.8 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, 53.8 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.