inequalities can drive both the population level impact and the distributional impacts of policies is not well understood. In this study we use an existing health economic model of alcohol brief interventions (BIs) to explore how socioeconomic inequalities in different model inputs can affect conclusions about value for money and health inequality and contrast these with similar results for a smoking cessation model.

Methods BI policies were assessed using the Sheffield Alcohol Policy Model. Previous analysis has shown a national BI programme for alcohol to be both cost-effective and inequality-improving. We examined whether these conclusions changed under three scenarios: i) individually excluding socioeconomic gradients in each model input, ii) raising levels of uptake to those in the 'best' group, iii) using different baseline populations. Impacts on total population health and health inequality were assessed using incremental population Net Health Benefit (NHB) and incremental 'Equally Distributed Equivalent' (EDE) health respectively. Results are compared with those from similar analyses undertaken using a smoking cessation model.

Results A national BI programme improved both health (+43,016 QALYs) and EDE (+50,792 QALYs), reducing health inequalities. Excluding gradients in model inputs had generally small effects on NHB (+0% to +10.4%) but a larger effect on EDE (-7.9% to +15.7%), although not enough to change the conclusion that the policy is inequality reducing. Increasing delivery to the 'best' level would increase EDE to a greater extent than NHB (+51.6% and +43.5% respectively), further reducing inequalities.

Conclusion Unlike smoking cessation programmes, BIs are likely to be both cost-effective and reduce inequalities. Considering potential inequalities across all stages of intervention delivery is important when considering the impact of policies on health inequalities, even if it may not substantially affect decisions based solely on cost-effectiveness. The relative importance of socioeconomic gradients in different stages is likely to vary between risk factors and settings.

OP61 HIERARCHICAL MODELS FOR INTERNATIONAL COMPARISONS: A CASE STUDY OF SMOKING, DISABILITY AND SOCIAL INEQUALITY IN 21 EUROPEAN COUNTRIES

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Background International comparisons of social inequalities in health are challenging. The level of disaggregation often required can result in sparse data. We show the value of a hierarchical Bayesian approach that partially pools country-level estimates, reducing the influence of sampling variation and increasing the stability of estimates. A further challenge is how to simultaneously present the level of inequality *and* their precision on relative and absolute scales. We illustrate a new way of displaying estimates of prevalence, relative and absolute inequalities, and the uncertainty of these three estimates, on one plot.

Methods We used the 2014 European Social Survey to estimate smoking prevalence, absolute and relative inequalities for men and women with and without disabilities in 21 European countries. Smoking prevalence estimates are generated from a hierarchical Bayesian model, where we assume country-specific estimates are drawn from an overall 'population distribution'. The model is set up with the likelihood (country-specific data) and priors (the assumed population distribution) pulling in opposite directions. The likelihood pulls the country-specific smoking prevalence estimate towards the observed value, whereas the priors pull the prevalence towards the European average, a phenomenon known as shrinkage. We simultaneously display smoking prevalence for people without disabilities (x-axis), absolute (y-axis) and relative inequalities (contour lines), capturing their uncertainty by plotting a 2-D normal approximation of the posterior distribution from the full probability (Bayesian) analysis.

Results Our model shifts more extreme prevalence estimates, based on fewer observations, toward the European average. For example disabled males in Portugal have a high observed smoking prevalence (53%, 95% Uncertainty Interval (UI): 42%-63%) and a small number of observations (23). The model shifts this estimate, shrinking it to 43% (UI 38%-58%).

Conclusion We argue that our contributions allow for better decision making under uncertainty, through the combination of better statistical inference and an indication of the strength of evidence decision-makers have access to. Sensitivity to shrinkage could indicate whether a policy maker could benefit from more data to make an informed decision. If estimates are insensitive to partial pooling then a policy maker could be relatively confident in their evidence/data. Conversely, in a country where there is a large amount of shrinkage, decision making could still benefit from the collection of more data. Being able to include all this information on a single graphic provides a useful tool for evaluating both the geographical patterns of variation in, and strength of evidence for, differences in social inequalities in health.

OP62 DOES SMOKING, DRINKING, PHYSICAL ACTIVITY, AND SELF-REPORTED HEALTH MEDIATE THE RELATION BETWEEN EDUCATION AND VOTING DURING MIDLIFE? EVIDENCE FROM THE 1958 NATIONAL CHILD DEVELOPMENT STUDY

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Background Education is a strong predictor of voting in most Western countries. New studies, predominantly from the United States, question the role of health as a mechanism reinforcing social inequalities in voting over the life-course. In the United Kingdom, we previously found that heavy smoking, physical inactivity, poor self-reported health, and, to a lesser extent, drinking over the recommended limit were each associated with a lower probability of voting in the 1958 National Child Development Study (NCDS). Building on these findings, this study examines the proportion of the association between educational attainment and voting that is mediated through these health indicators.

Methods We used the data of 6,166 NCDS participants who responded to each sweep between the ages of 23 and 50. We examined educational attainment at the age of 23, smoking, drinking, physical activity, self-reported health at the ages of 23, 32, and 42, and voting behaviour at the age of 42, 46, and 50. Adjusting for non-response and attrition using inverse-

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