inequality over this period and four measures of individual health: Objectively measured grip strength and lung function, and subjectively reported physical limitation and depressive symptoms.

Results We found that, after adjusting for individual and country-level covariates, exposure to higher average levels of inequality over the long-term was significantly negatively related to objectively measured grip strength and lung function, but unrelated to self-reported physical limitations or depressive symptoms.

Conclusion Our results show that long-term exposure to income inequality may indeed be detrimental to the physical health of older people. However, we found no evidence of an effect of inequality on subjectively reported limitations or depressive symptoms. This may be an effect of unmeasured covariates, or it may be due to the greater accuracy afforded by the objective health measures. To our knowledge this study represents the first direct evidence linking experience of inequality to the health of older people which has made use of either objective measures of health at the individual level, or a measure of inequality exposure over the long term.

Public Health Interventions: Smoking

OP53 DEFINING THE LONG-TERM TREND IN A PUBLIC HEALTH INTERVENTION STUDY: A CAUTIONARY TALE

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Background Numerous studies have reported on the impact of comprehensive smoke-free laws on population health. Many early studies have ignored the potential effect of the long-term trend of the health outcome, and when included, subsequent studies have focused on either linear or non-linear trends. However, the choice of appropriate trend is not always straightforward. We illustrate this by investigating the short-term impact of smoke-free legislation in England, introduced on 1st July 2007, on myocardial infarction mortality.

Methods We investigate the impact of the legislation using weekly counts of all cases aged 18 years or older residing in England with a primary cause of death of a myocardial infarction (ICD-10 I21) between July 2002 to December 2010 (providing 5 years pre-legislative and 3 years and 6 months post-legislative data). We compare a number of models based on an interrupted time series design with a quasi-Poisson generalised additive model that adjusts for seasonality and long-term trends.

Results Myocardial infarction mortality shows a marked decline over the study period. We identify two competing models. The first shows evidence of a complex interaction between the introduction of smoke-free legislation and the long-term trend. We observe an initial statistically significant reduction in mortality (−8.5%, 95% CI −11.1% to −5.8%) coupled with a change in the long-term trend from a reduction of 4% over a six month period to a reduction of 3.5%. The second model fits a nonlinear trend and shows no significant smoke-free effect. Both models offer an almost identical fit.

Conclusion Investigating small effects in the presence of a pronounced long-term trend is complicated by the limitations of the available data. In particular, it is not clear whether we observe a gradual change in the long term trend or a discrete effect directly attributable to the legislation. The two models have near-identical fitted values and GCV scores, but have very different interpretation. We conclude that the data alone are insufficient to distinguish between the two models and warn that overly-simplistic analyses in such situations may result in misleading conclusions.

OP54 SHORT-TERM IMPACT OF THE SMOKEFREE LEGISLATION IN ENGLAND ON HOSPITAL ADMISSIONS FOR ASTHMA AMONG ADULTS

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Background Comprehensive smokefree laws prohibiting smoking in enclosed public places and workplaces have now been introduced in several jurisdictions and there is a growing body of evidence documenting the immediate health benefits to adults, focusing primarily on hospital admissions for heart attacks. A few studies have examined the association between smokefree laws and asthma in adults, but these have limitations such as lacking appropriate adjustment for long-term trends, or having limited statistical power due to a small study population. In this study we investigated the short-term impact of the introduction of smokefree legislation in England on 1st July 2007 on hospital admissions for asthma in adults.

Methods The immediate effect of the legislation was investigated using monthly numbers of emergency admissions for asthma (primary diagnosis, ICD-10 code J45 and J46) in the nine Government Office Regions from April 1997 to December 2010, in the population aged 16 and over. The analysis was conducted using a quasi-Poisson generalised additive model that adjusted for seasonality and region-specific, non-linear, long-term trends.

Results After adjusting for the long-term trend in admissions, we observed a 4.9% (95% CI: 0.6, 9.0) reduction in admissions for asthma immediately after introduction of smokefree legislation in the population as a whole. This implies that almost 1900 emergency admissions for asthma were prevented during the first year of the legislation. The reduction in admissions did not vary significantly across regions.

Conclusion Our finding, based on the largest study to date, adds to the expanding body of evidence that smokefree legislation is associated with positive health outcomes. Further research evaluating the impact of legislation on asthma admissions in other jurisdictions is needed in order to support these findings.

OP55 SOCIOECONOMIC INEQUALITIES IN CHILDHOOD EXPOSURE TO SECONDHAND SMOKE BEFORE AND AFTER SMOKE-FREE LEGISLATION IN THREE UK COUNTRIES

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Background Secondhand smoke (SHS) exposure is higher among children from lower socioeconomic status (SES) families, contributing to the intergenerational reproduction of health inequalities. Legislation prohibiting smoking in enclosed public places was introduced in all UK countries between 2006 and 2007. Although opponents argued that it would displace smoking into the home, legislation has been associated with reduced childhood SHS exposure and increased prevalence of smoke-free homes. In some UK countries however, trends towards widening inequality in childhood SHS exposure have been reported following legislation. This paper combines datasets from 3 UK countries to examine socioeconomic patterning in childhood SHS exposure and smoking restrictions in homes and cars pre- and post-legislation.

Methods We conducted a repeat cross-sectional survey of 10,867 schoolchildren in 304 primary schools in Scotland, Wales and Northern Ireland. Children provided saliva for cotinine assay, completing questionnaires before and 12-months after legislation, including the Family Affluence Scale (a measure of socioeconomic status), and reports of smoking restrictions in homes and cars. Multinomial regression analyses assessed differences between survey years in SHS exposure and private smoking restrictions, with interaction terms to assess SES patterning in changes.

Results SHS exposure was highest, and private smoking restrictions least frequent, among lower SES children pre- and

post-legislation in all countries. Proportions of samples containing <0.1ng/ml (i.e. undetectable) cotinine increased significantly (RR=1.63; 95%CI=1.45 to 1.83), from 31.0% to 41.0%. Although across the SES spectrum, there was no evidence of displacement of smoking into the home, socioeconomic inequality in the likelihood of samples containing detectable levels of cotinine increased (RR=1.10; 95%CI=1.05 to 1.16). Among children from the poorest and most affluent families respectively, 96.9% and 38.2% of post-legislation samples contained detectable cotinine. Socioeconomic gradients at higher exposure levels remained unchanged. Among children from the poorest families, 1 in 3 samples contained greater cotinine concentrations than Scottish bar worker's samples prior to legislation (3ng/ml). Smoking restrictions in homes and cars increased. However, little more than half (55.1%) of children, and only 19.3% of children of smokers, lived in smoke-free homes following legislation. Significant socioeconomic patterning remained, with 26.3% and 72.0% of children from the poorest and most affluent families respectively living in a smoke-free home.

Conclusion Urgent action is needed to reduce inequalities in SHS exposure. Such action should include emphasis on reducing smoking in cars and homes.

OP56 DIFFERENTIAL EFFECTS OF SMOKING CESSATION DURING PREGNANCY ON BIRTH WEIGHT IN A COHORT OF DISADVANTAGED WOMEN

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Background Smoking during pregnancy is recognized as the most important preventable risk factor. Maternal smoking accounts for 20–30% of low birth weight infants (<2,500g), the most common adverse outcome in pregnancy. The objective of this study was to explore the effects of maternal smoking habits: stopping smoking in the first and second trimesters, continuing to smoke, number of cigarettes smoked and socio-demographic factors on infant birth weight.

Methods The study was a longitudinal cohort study of 1,000 pregnant smokers attending public hospital clinics in a disadvantaged catchment area at first pre-natal visit (V1), and assessed at 28–32 weeks (V2) and at one week after birth (V3) using an interviewer-administered questionnaire. The primary outcome variables were: change in smoking status based on self-reported response and urinary cotinine measurement for those who had quit. ANOVA was carried out to test for differences in mean birth weight. A multiple regression analysis with birth weight as the dependent variable was carried out on demographic and smoking characteristics and derived smoking category variables at V3: sustained quitters, continued smokers, successful quitters at V3 and intermittent quitters.

Results The mean difference in birth weight between continued smokers and sustained quitters was significant, (mean difference = 233g, 95% CI=60 – 406g, p=0.008), as was the difference between continued smokers and intermittent quitters (mean difference = 202g, 95% CI =17 – 386g, p=0.03). Regression on baseline variables showed that only 2.4% of the variance (R²) was explained by smoking characteristics; that is, number of smokers in the home other than self or partner (p=0.008) and number of cigarettes smoked per day (p=0.02). A second regression model showed gestation at delivery to be the best predictor of birth weight (R²=44.2). The number of cigarettes smoked at V2 explained an additional 2.1% (p<0.001) and being a sustained quitter 0.5% (p=0.02).

Conclusion In this study a clear gradient was observed around smoking behaviour and birth weight with continued smokers

having infants with lowest birth weights, sustained quitters the highest and intermittent quitters somewhere in between. The study also demonstrated that the negative effects of maternal smoking on birth weight are at least partly reversible. It thus showed a beneficial effect of quitting smoking for at least part of pregnancy and a link between passive smoking and birth weight. These findings are important for the delivery of targeted health promotion messages to smoking women in early pregnancy.

Population Based Studies: Midlife

OP57 ALL-CAUSE AND CAUSE-SPECIFIC MORTALITY AMONG INDIVIDUALS WITH AND WITHOUT DIABETES IN ENGLAND AND SCOTLAND

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Background Although a growing body of evidence demonstrates an increase in cardiovascular disease (CVD) mortality among those with diabetes mellitus, the results related to other causes of death are less homogenous. The strength of the association between diabetes and mortality appears to differ by geographic location. The role that Body Mass Index (BMI) plays also requires further exploration. In the UK, one in 20 individuals is estimated to have diabetes. Therefore, even a small increase in mortality risk among those with diabetes, could result in a large number of deaths among those with the disease. This large general-population cohort study used data from England and Scotland to explore the associations between diabetes and risk of all-cause and cause-specific mortality, and examine the extent to which any increase was attributable to raised BMI.

Methods Nationally-representative, cross-sectional data from 15 years of the Health Survey for England (HSE) (1994–2005) and Scottish Health Survey (SHeS) (1995, 1998 and 2003) were linked with mortality records up to the first quarter of 2011. Odds ratios (OR) and 95% confidence intervals (CI) adjusted for age-group and sex (model 1), plus smoking status (model 2) and additionally for BMI category (model 3) were estimated using logistic and multinomial logistic regression. Participants mentioning cancer at baseline were excluded from the study.

Results Within this sample of 166,600 participants (5,131 with diabetes) there were 19,483 deaths (1,060 among those with diabetes, 18,423 without diabetes). All-cause mortality was greater among those with diabetes when adjusted for age, sex and smoking status (OR 1.52, 95% CI 1.41–1.65), with no reduction when adjusting for BMI category (OR 1.49, 1.37–1.64). Cause-specific mortality among those with diabetes was raised for CVD (model 2 OR 1.73, 1.55–1.93), cancer (1.24, 1.08–1.43) and 'Other' (1.77, 1.54–2.04) with a non-significant increase for respiratory diseases (1.21, CI 0.99–1.47). Additional adjustment for BMI had a minimal impact upon the excess mortality found among those with diabetes: CVD (OR 1.69, 1.49–1.93), cancer (1.24, 1.05–1.45), 'Other' causes (1.75, 1.49–2.07), and respiratory diseases (1.16, 0.92–1.47). Survival was also lower among those with diabetes compared with those without the disease at baseline.

Conclusion Diabetes is associated with an excess of all-cause and cause-specific mortality from CVD, cancer, and 'Other' causes but probably not respiratory diseases. Increased BMI does not appear to be a mediating factor within the association between diabetes and cause-specific mortality.

OP58 IS THE EXCESS RISK OF MYOCARDIAL INFARCTION AMONG PEOPLE WITH DIABETES FALLING OVER TIME?

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