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 who 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 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.

**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 SMOKEFREE 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 504 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...
Abstracts

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 (5ng/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 fol-
lowing legislation. Significant socioeconomic patterning remained,
with 26.3% and 72.0% of children from the poorest and most afflu-
ent 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 smok-
ing in cars and homes.

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

OP56

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Background Smoking during pregnancy is recognized as the most
important preventable risk factor. Maternal smoking accounts for
20–50% 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 preg-
nant 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 ur-
inary 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=0.08). 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 deliv-
ery 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 pro-
motion 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 dia-
betes and mortality appears to differ by geographic location. The
role that Body Mass Index (BMI) plays also requires further explora-
tion. 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 dia-
betes 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 2008) 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 multino-
minal 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 dia-
betes, 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 adjust-
ment for BMI category (OR 1.49, 1.47–1.64). 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 with-
out 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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A22