

**Conclusion** In contrast with existing research, we find that the majority of rises and falls in deaths during the Great Depression was unrelated to economic shocks. Spurious correlations can occur when immediate effects are not decoupled from long-term trends, especially problematic with trending variables, such as GDP. Consistent with existing work, we observed that bank suspensions led to rapid rises in suicides and falls in road traffic fatalities. Further research should investigate alternative explanations for the reductions in infectious diseases and their marked variations across cities and states, such as nutrition, sanitation, the New Deal, Prohibition and other public health measures at the time.

## Diabetes

### 017 SOCIO-ECONOMIC STATUS, INCIDENCE OF TYPE 2 DIABETES AND RELATIVE MORTALITY IN SCOTLAND 2001–2007

doi:10.1136/jech.2010.120956.17

S Wild, for the Scottish Diabetes Research Network Epidemiology Group. *Centre for Population Health Sciences, University of Edinburgh, UK*

**Background** RRs of mortality associated with type 2 diabetes (T2DM) have declined in recent years but are higher in women than men in many populations. The role of socio-economic status (SES) in risk of mortality among people with diabetes is not clear.

**Methods** We used data from a population-based national diabetes register to investigate the associations between T2DM, SES and mortality. SES was categorised with Q5 and Q1 representing the most deprived and most affluent quintiles from an area-based measure. Age-standardised incidence for 2004 and RRs for all-cause mortality among people with incident T2DM of 35 to 84 years of age between 2001 and 2007 were estimated using general population data, the European standard population and Poisson regression models.

**Results** Complete data were available for 111 441 people who developed type 2 diabetes between 2001 and 2007 and there were 8775 deaths before the end of 2007. SES had a more marked effect on age-standardised incidence of T2DM among women (717.5 vs 357.2 per 100 000, age-adjusted RR for Q5 vs Q1 (95% CI) 1.91 (1.62 to 2.25)) than men (comparable estimates 918.6 vs 568.9 per 100 000, 1.59 (1.38–1.84)). Age and SES adjusted RR (95% CI) for mortality were 0.97 (0.93 to 1.01) for men and 1.11 (1.07 to 1.16) for women. Age and sex adjusted RR for mortality associated with type 2 diabetes was lower for Q5 (0.93 (0.89–0.97)) than for Q1 (1.19 (1.12 to 1.27)).

**Conclusion** RRs for mortality associated with incident T2DM were lower in this population than reported in previous studies. Incident diabetes was not associated with increased mortality among men but was associated with higher mortality in women compared to women without diabetes. SES modifies the effect of T2DM on mortality but does not explain sex differences in RR. Further work is required to establish whether these findings can be explained by risk factor patterns.

### 018 FORECASTING DIABETES PREVALENCE USING A SIMPLE MODEL: ENGLAND AND WALES 1993–2006

doi:10.1136/jech.2010.120956.18

<sup>1</sup>M O'Flaherty, <sup>2</sup>J Critchley, <sup>3</sup>S Wild, <sup>2</sup>N Unwin, <sup>1</sup>S Capewell, for the MEDCHAMPS Project. <sup>1</sup>Division of Public Health, University of Liverpool, UK; <sup>2</sup>Institute of Health and Society, Newcastle University, UK; <sup>3</sup>Centre for Population Health Sciences, University of Edinburgh, UK

**Background** Current projections of diabetes prevalence are mostly based on demographic change. Explicitly including trends in obesity and other risk factors could improve the accuracy of the projections and assist in evaluating policy options for prevention.

**Methods** The model integrates population, obesity and smoking trends to estimate future diabetes prevalence. From three starting states (healthy, obese and smokers) the number of people with diabetes and deaths by diabetes status are estimated using a Markov approach. The transition probabilities and RR associated with risk factors were obtained from the literature, except for diabetes incidence that was estimated using DISMOD. For validation purposes, we developed a model for the England and Wales population (1993–2006), and compared model outputs with diabetes prevalence reported by the Health Survey for England (HSE) and the English Longitudinal Study of Ageing (ELSA).

**Results** The prevalence of diabetes mellitus in England and Wales in 1993 was 3% in men and 2% in women (HSE; adjusted for self reporting, 3.9% and 2.6% respectively) and increased to 6% and 4% (7.3% and 5.5%, adjusted) by 2006. Obesity prevalence almost doubled and smoking trends showed a more complex pattern. Comparisons with the HSE showed almost parallel trends, over a period of 13 years. Prevalence as estimated from the model was 7.3% for men and 5.7% for women for 2006 and 8.9% and 7.2% for 2012. The model tends to slightly overestimate prevalence but accuracy improved in later years. The estimated prevalence compared well with that reported in ELSA (Men: model: 9.9%, ELSA: 11.6%; women: 8.3% and 6.8%).

**Conclusions** The model provide a reasonably close estimate of diabetes prevalence for England over the 1993–2006 period, compared with contemporary independent prevalence surveys in the same population. Although the model seems to slightly overestimate prevalence, the observed and modelled trends are almost parallel. Further testing and validation in a range of populations would be desirable but the model appears to provide reasonably accurate estimates of diabetes prevalence that could be used by policymakers.

### 019 ETHNIC DIFFERENCES IN TYPE 2 DIABETES RISK MARKERS IN CHILDREN IN THE UK ARE NOT EXPLAINED BY SOCIO-ECONOMIC STATUS: CHILD HEART AND HEALTH STUDY IN ENGLAND

doi:10.1136/jech.2010.120956.19

<sup>1</sup>C Thomas, <sup>1</sup>C Nightingale, <sup>1</sup>A Rudnicka, <sup>1</sup>C Owen, <sup>2</sup>N Sattar, <sup>1</sup>D Cook, <sup>1</sup>P Whincup. <sup>1</sup>Division of Community Health Sciences, St Georges University of London, London, UK; <sup>2</sup>BHF Glasgow Cardiovascular Research Centre, University of Glasgow, Glasgow, UK

**Objectives** To examine the influence of socio-economic position on type 2 diabetes risk markers in different ethnic groups and determine whether differences in socio-economic position can explain ethnic differences in type 2 diabetes risk.

**Design** Cross-sectional survey of children in 200 primary schools in London, Birmingham and Leicester (Child Heart and Health Study England, or CHASE) in which standardised anthropometric and fasting blood measurements were made. Ethnic origin was defined by parental self-report. Parent's socio-economic position (based on occupation) was measured using the National Statistics Socio-economic Classification (NS-SEC). Statistical analyses were adjusted for age and sex and included a random effect for school.

**Participants** 4796 children (1153 white European, 1306 South Asian, 1215 black African/Caribbean) aged 9–10 years.

**Main outcome measures** Height, adiposity (ponderal index, skinfold thickness, fat mass index, waist circumference), glycated haemoglobin (HbA1c), glucose, insulin resistance, triglyceride, HDL-cholesterol, C reactive protein.

**Results** In the whole study population, NS-SEC showed weak and inconsistent associations with diabetes risk markers. However, there were marked differences between ethnic groups. Low socio-economic position was related to higher adiposity, insulin resistance

and triglyceride levels in white Europeans and to a lesser extent South Asians; opposite patterns were observed in black African-Caribbeans (likelihood-ratio tests for interactions between NS-SEC and ethnicity, all  $p < 0.05$ ). There were marked ethnic differences in diabetes risk markers. Compared to white Europeans, South Asian children had higher fat mass index (% difference 7.3; 95% CI 2.8 to 12.0), sum of skinfolds (5.1; 1.1, 9.4), HbA1c (2.1; 1.6, 2.7), glucose (0.8; 0.2, 1.5), insulin resistance (29.6; 23.1, 36.4), triglycerides (12.9; 9.4, 16.5) and C reactive protein (43.3; 28.6, 59.7) and lower HDL-cholesterol (−2.9; −1.3, −4.5). In contrast, black African/Caribbean children had less marked increases in HbA1c, insulin resistance and C reactive protein but conversely, had lower triglycerides and higher HDL-cholesterol; adiposity levels were not consistently increased. However, adjustment for socio-economic position had no material effect on the ethnic differences in metabolic markers observed.

**Conclusions** Although socio-economic position showed little overall association with diabetes risk markers in this multi-ethnic study population, there were appreciable associations within individual ethnic groups. Ethnic differences in socio-economic position did not explain marked ethnic differences in emerging risks of type 2 diabetes between South Asians, black African-Caribbeans and white Europeans; other explanations for these ethnic differences should be sought.

## 020 INCIDENCE RATE TRENDS IN CHILDHOOD TYPE 1 DIABETES IN YORKSHIRE, 1978–2007: EFFECTS OF ETHNICITY AND AGE AT DIAGNOSIS

doi:10.1136/jech.2010.120956.20

<sup>1</sup>K Harron, <sup>1</sup>P A McKinney, <sup>1</sup>R G Feltbower, <sup>1</sup>C R Stephenson, <sup>2</sup>H J Bodansky, <sup>3</sup>P Norman, <sup>1</sup>R C Parslow. <sup>1</sup>Paediatric Epidemiology Group, University of Leeds, UK; <sup>2</sup>Leeds General Infirmary; <sup>3</sup>School of Geography, University of Leeds, UK

**Objective** To examine incidence rates and trends of childhood Type 1 diabetes in Yorkshire from 1978 to 2007.

**Methods** Data from the population-based Yorkshire Register of Diabetes in Children and Young People was used to analyse the incidence of Type 1 diabetes in children aged <15 years diagnosed in the former Yorkshire Regional Health Authority. Incidence rates (per 100 000 per year) were estimated using mid-year population estimates stratified by sex, age and ethnicity: south Asian (Indian, Pakistani, Bangladeshi) or non-south Asian (all other ethnicities). Ethnicity was assigned using two name recognition programs (Nam Pehchan and SANGRA) and a local expert. Age-sex standardised rates were calculated between 1978 and 2007 and by ethnic-group between 1990 and 2007. Poisson regression was used to assess incidence trends and estimate predicted rates up to 2020. Goodness-of-fit, AIC and likelihood-ratio tests were used to assess model fit.

**Results** 3896 children were diagnosed in Yorkshire between 1978 and 2007. Overall incidence was 18.1 (95% CI 17.5 to 18.6), increasing from 13.3 (1978 to 1987) to 16.9 (1988 to 1997) to 24.1 (1998 to 2007). Incidence increased significantly over time: average annual percentage change (AAPC) was 2.8% (1.8 to 3.8). The inclusion of an age-sex interaction term provided evidence for differences in trends between sexes depending on age, with females having higher incidence and AAPC than males for those aged 5–9.

Overall incidence for non-south Asians (21.4; 20.6 to 22.3) was significantly higher than that of south Asians (14.6; 12.3 to 17.0) over the entire study period. A significant increasing trend in incidence was observed for non-south Asians of 3.3% (1.3 to 5.2) compared to a non-significant trend seen in south Asians (1.9%; −0.4 to 4.3). Overall forecasted incidence for 2020 is 38.3 per 100 000.

**Conclusions** Type 1 diabetes incidence rates have risen almost uniformly for non-south Asians of all ages but not for south Asians, contrary to findings in the Bradford area of Yorkshire between 1978

and 1998. Overall incidence increased most quickly in the 5–9 age-group. Incidence doubled from 12.5 to 25.2 between 1978 and 2007. If current trends continue, rates will rise by 52% to 38.3 between 2007 and 2020.

## Tuesday 7 September 2010 Parallel Session B

### Mental health

## 021 RISK OF OVERDOSE MORTALITY DURING THE INITIAL 2 WEEKS AFTER ENTERING OR RE-ENTERING METHADONE TREATMENT IN SCOTLAND: RETROSPECTIVE COHORT STUDY

doi:10.1136/jech.2010.120956.21

<sup>1</sup>G Cousins, <sup>2</sup>C Teljeur, <sup>1</sup>N Motterlini, <sup>3</sup>C McCowan, <sup>1</sup>T Fahey, <sup>1</sup>B D Dimitrov. <sup>1</sup>HRB Centre for Primary Care Research, Royal College of Surgeons in Ireland, Dublin, Republic of Ireland; <sup>2</sup>Department of Public Health and Primary Care, Trinity College Dublin, Republic of Ireland; <sup>3</sup>Health Informatics Centre, University of Dundee, UK

**Objectives** Heroin users are at high risk of premature mortality. Despite the evidence supporting methadone maintenance programmes (MMT), methadone itself has been associated with drug-related deaths. This study aims to determine whether people prescribed methadone have an elevated risk of overdose mortality during periods of treatment transition, particularly during treatment initiation.

**Method** Retrospective cohort study of 3162 Scottish people prescribed and dispensed liquid methadone between January 1993 and February 2004. Observation time was defined as a period during methadone treatment or a period of maximum 6 months after leaving treatment. Individual observation time was censored after 6 months off-treatment. A person's observation time started again if they re-entered treatment after an off-treatment period. The main outcome measure was drug-related mortality by means of Cox-proportional hazards models during the 12 years of follow-up. Drug-related deaths occurring during treatment or within 3 days after last methadone prescription were considered as cases "on treatment". Fatalities occurring 4 days or more after leaving treatment were considered to be drug-related deaths "off treatment".

**Results** Overall 130 people died, with 51 deaths identified as drug-related deaths (20 off treatment and 31 in treatment). Risk of drug-related mortality was higher during treatment than off treatment (adjusted hazard ratio 11.17, 95% CI 4.51 to 27.64). Inspection of timing of death showed that the risk of drug-related mortality was higher during the initial two weeks of treatment (adjusted hazard ratio 16.93, 95% CI 5.17 to 55.46) compared to the risk of mortality off treatment. Similarly, retention in treatment for more than 3 weeks was associated with increased mortality relative to being off treatment (adjusted hazard ratio 9.97, 95% CI 4.08 to 24.39). In relation to risk of mortality during treatment, being in treatment for 3–10 weeks (adjusted hazard ratio 0.36, 95% CI 0.15 to 0.85) or greater than 10 weeks (adjusted hazard ratio 0.13, 95% CI 0.04 to 0.39) was associated with a reduced risk of mortality compared to the initial two weeks on treatment. These effects were observed after adjusting for all or some of the following covariates; co-prescribing of benzodiazepines, psychiatric admission, number of methadone treatments, overuse of methadone and urine testing, where appropriate.

**Conclusion** Excess mortality risk in the initial two weeks of methadone treatment indicates the need for more care in prescribing and monitoring of methadone when starting or restarting a patient on methadone maintenance therapy.