

places, the drive and determination of key persons within the national and regional public health administration, and the sustained advocacy from scientific societies, professional bodies, trade unions, and citizens' associations. After a year of review and debate at different levels, the Spanish Parliament changed the partial ban to a total ban, converting Spain to a true smoke-free country from January 2nd, 2011. This change clearly shows that the pressure from the tobacco industry (and some allies in the hospitality sector) can be overcome through combined and continuing actions driven by the different actors involved in tobacco control.

## CHRONIC DISEASE

### 5.2 SOCIAL FACTORS AND CHRONIC DISEASES

#### 05-2.1 IS IT WHERE YOU LIVE OR WHO YOU ARE THAT IS IMPORTANT? AN ANALYSIS OF NEIGHBOURHOOD ENVIRONMENTS, SELF-REPORTED PHYSICAL ACTIVITY AND OVERWEIGHT / OBESITY IN CANADA'S CAPITAL

doi:10.1136/jech.2011.142976b.43

<sup>1,2</sup>S A Prince Ware, \* <sup>3</sup>E A Kristjansson, <sup>4</sup>K Russell, <sup>5</sup>J M Billette, <sup>4</sup>A Ali, <sup>6</sup>M Sawada, <sup>2</sup>M S Tremblay, <sup>7</sup>D Prud'homme. <sup>1</sup>University of Ottawa, Population Health Program, Ottawa, Ontario, Canada; <sup>2</sup>Health Active Living and Obesity Research Group, Children's Hospital of Eastern Ontario, Ottawa, Ontario, Canada; <sup>3</sup>University of Ottawa, Faculty of Social Sciences, School of Psychology, Ottawa, Ontario, Canada; <sup>4</sup>Ottawa Public Health, Ottawa, Ontario, Canada; <sup>5</sup>Health Statistics Division, Statistics Canada, Ottawa, Ontario, Canada; <sup>6</sup>University of Ottawa, Laboratory for Applied Geomatics and GIS Science (LAGGIS), Department of Geography, Ottawa, Ontario, Canada; <sup>7</sup>University of Ottawa, Faculty of Health Sciences, School of Human Kinetics, Ottawa, Ontario, Canada

**Background** In Canada, there is limited research examining the effects of objectively measured neighbourhood environments on physical activity (PA) and obesity.

**Purpose** To determine the relationships between variables from built and social environments and PA and overweight / obesity across 86 Ottawa neighbourhoods.

**Methods** Individual-level data including self-reported leisure-time PA, height and weight were examined using a sample of 4727 adults from four combined cycles (years 2001/2003/2005/2007) of the Canadian Community Health Survey. Data on neighbourhood characteristics were obtained from the Ottawa Neighbourhood Study; a large study of neighbourhoods and health in Ottawa. Binomial multivariate multilevel models were used to examine the relationships of environmental and individual variables with PA and overweight / obesity using population weights.

**Results** Approximately 75% of adults were inactive (<12.5 kJ/kg/day) while half were overweight / obese. Results of the multilevel models suggest that higher numbers of convenience stores and fast food outlets in a neighbourhood were associated with increased odds of being overweight / obese, while a larger number of restaurants was associated with lower odds. Season of data collection was significantly associated with PA in men and women with the odds of PA in winter being half that of summer. Intraclass coefficients were low, and identified that the models explained a small proportion of the neighbourhood-level variance in PA and overweight / obesity.

**Conclusions** Findings from this sample identified that recreation and social environments did not exert significant influences on PA or overweight / obesity, however, food outlets did show a significant

influence on female overweight / obesity. The impact of individual-level characteristics to the model was modest.

#### 05-2.2 THE CHANGING CONTRIBUTION OF SMOKING TO EDUCATIONAL DIFFERENCES IN MORTALITY: ESTIMATES FOR FINNISH MEN AND WOMEN FROM 1971 TO 2005

doi:10.1136/jech.2011.142976b.44

<sup>1</sup>P Martikainen, \* <sup>2</sup>J Ho, <sup>2</sup>S Preston, <sup>2</sup>I Elo. <sup>1</sup>University of Helsinki, Helsinki, Finland; <sup>2</sup>University of Pennsylvania, Philadelphia, Pennsylvania, USA

**Introduction** Major socioeconomic differences in mortality are observed in high income countries. While smoking remains one of the major single causes of mortality, its contribution to levels and trends in socioeconomic differences in mortality remain unclear. We present estimates of the contribution of smoking to educational differences in mortality between 1971 and 2005.

**Methods** Census records linked with death records for all Finns aged 50+ were studied. Smoking attributable mortality is estimated with an indirect method developed by Preston *et al* that uses lung cancer mortality as a proxy for the impact of smoking on mortality from all other causes.

**Results** In the early 1970s smoking attributable deaths constituted about 27% of all male deaths above age 50 and 17% in the 2000s; 1% and 4% among women respectively. At age 50 life-expectancy differentials between men with basic vs high education increased from 3.4 to 4.4 years. In the absence of smoking these differences would have been 1.5 and 3.1 years, 60% and 25% less than those observed. Half of the increase in life-expectancy among men with basic education was attributable to smoking. Among women the contribution of smoking to educational differentials in mortality was negligible in the 1970s but increased to about 10% in the early 2000s.

**Conclusion** Smoking continues to have a major influence on educational differences in mortality among men and its contribution is increasing among women. Anti-smoking efforts can achieve gains in longevity among men and reverse the trend of increasing smoking attributable mortality among women.

#### 05-2.3 A NEW MULTIPLE SCLEROSIS PREVALENCE STUDY IN ABERDEEN CITY, ORKNEY AND SHETLAND

doi:10.1136/jech.2011.142976b.45

<sup>1</sup>E Visser, \* <sup>2</sup>K Wilde, <sup>3</sup>K K Yong, <sup>4</sup>J F Wilson, <sup>1</sup>C Counsell. <sup>1</sup>Population Health, College of Life Sciences & Medicine, Division of Applied Health Sciences, University of Aberdeen, Foresterhill, Aberdeen, UK; <sup>2</sup>Directorate of Information Technology, University of Aberdeen, Foresterhill, Aberdeen, UK; <sup>3</sup>Aberdeen Royal Infirmary, NHS Grampian, Foresterhill, Aberdeen, UK; <sup>4</sup>Centre for Population Health Sciences, University of Edinburgh, Edinburgh, UK

**Background** Multiple sclerosis (MS) is an inflammatory and degenerative disease of the central nervous system of unknown aetiology. It is the commonest cause of chronic neurological disability in young people. The disease is more common in those of Northern European origin and the highest prevalence rates in the world have

been recorded in the North of Scotland. However, there has been no prevalence study in this area since 1983.

**Aims** We undertook a new prevalence study of MS in Aberdeen City, and the Orkney and Shetland islands to: calculate age-gender specific prevalence rates; compare variations in age-gender standardised prevalence rates between areas and over time; calculate prevalence rates by MS sub-type, diagnostic criteria and to gather information on disability status.

**Methods** We used GP-practice records, hospital records and laboratory data for case ascertainment of patients alive and resident in the study area on prevalence day (24 September 2009), verified their diagnoses by reviewing medical records and included participants according to the research diagnostic criteria of Poser, McDonald 2001 and McDonald 2005. Information on disability was gathered from medical records and patient questionnaires. Prevalence rates and CIs were calculated assuming a Poisson distribution and standardised against the Scottish population (30 June 2009).

**Results** We found 590 patients in the combined study area (Aberdeen 442, Orkney 82, Shetland 66). Mean age was 52 years (SD  $\pm 13$ ), and the age-standardised male to female ratio was 1:2 (95% CI 1.6 to 2.1). The standardised prevalence rate for the combined study area was 257 per 100 000 (95% CI 236 to 277), in Aberdeen City 237 per 100 000 (95% CI 214 to 257), in Orkney 421 per 100 000 (95% CI 329 to 512) and in Shetland 305 per 100 000 (95% CI 231 to 379). There were significant differences between Orkney and the other areas, and significant differences in the prevalence rates over time in Orkney and Shetland, but not for Aberdeen City. A relapse-remitting disease pattern was recorded in 50% of participants and 45% of patients had significant disability levels.

**Conclusion** The prevalence of MS has increased in the North of Scotland over the last 30 years, which may reflect methodological differences in studies over time, improved diagnostic methods, or a true increase in prevalence due to improved survival, higher incidence rates or as a result of migration. Currently Orkney has the highest MS prevalence rate in the world. New disability data could be used to plan health services in these communities.

#### 05-2.4 LOW-GRADE SYSTEMIC INFLAMMATION IN EARLY ADOLESCENCE PREDICTS SUBOPTIMAL BONE QUALITY IN LATE ADOLESCENCE: A PROSPECTIVE STUDY IN THE GENERAL POPULATION

doi:10.1136/jech.2011.142976b.46

<sup>1,2</sup>R Lucas,\* <sup>1,2</sup>T Monjardino, <sup>1,2</sup>E Ramos, <sup>1,2</sup>H Barros. <sup>1</sup>Department of Hygiene and Epidemiology, University of Porto Medical School, Porto, Portugal; <sup>2</sup>Institute of Public Health of the University of Porto, Porto, Portugal

**Introduction** Early inflammatory changes may explain the negative impact of adiposity on bone acquisition during childhood. We aimed at estimating the effect of systemic inflammation during adolescence on forearm bone mineral density at 17 years-old.

**Methods** We used data from 377 girls born in 1990 and assessed at 13 and 17 years-old (EPITeen cohort). Adolescents were evaluated through physical examination, including height, weight and bone mineral density (BMD) at the forearm using dual-energy x-ray absorptiometry. Serum high-sensitivity C reactive protein (CRP) was quantified (participants over 10 mg/l were excluded). Associations between CRP and BMD were quantified using linear regression. Coefficients were adjusted for gynaecologic age, weight and height, to minimise confounding by body size.

**Results** Median (25th–75th percentiles) CRP concentration increased from 0.2 (0.1–0.5) mg/l at 13 to 0.6 (0.2–1.7) at 17 years-old. Mean (SD) BMD was 0.362 (0.058) g/cm<sup>2</sup> at 13 and 0.437 (0.052) g/cm<sup>2</sup> at 17. Adolescents in the upper quarter of CRP at 13 had similar adjusted mean BMD at that age but significantly lower BMD at 17 years-old when compared to those in the lowest quarter

(–0.024, 95% CI –0.040 to –0.007). Additionally, girls in the two highest quarters of CRP variation had significantly lower BMD at 17 when compared to the lowest quarter (–0.016, 95% CI –0.031 to –0.001 and –0.027, 95% CI –0.043 to –0.010, respectively).

**Conclusion** Systemic inflammation in early adolescence and its increase during follow-up, predicted lower bone quality in late adolescence, providing evidence that the negative association between obesity and bone accrual is probably mediated by low-grade inflammation.

#### 05-2.5 LIFE COURSE BMI AND RISK OF KNEE OSTEOARTHRITIS AT AGE 53: EVIDENCE FROM THE 1946 BRITISH BIRTH COHORT STUDY

doi:10.1136/jech.2011.142976b.47

<sup>1</sup>A Wills,\* <sup>1</sup>S Black, <sup>2</sup>R Coppack, <sup>1</sup>R Cooper, <sup>1</sup>R Hardy, <sup>3</sup>C Cooper, <sup>1</sup>D Kuh. <sup>1</sup>MRC Unit for LHA, University College London, London, UK; <sup>2</sup>DMRC Headley Court, Epsom, Surrey, UK; <sup>3</sup>MRC Lifecourse Epidemiology Unit, University of Southampton, Southampton, UK

**Introduction** We examined how body mass index (BMI) over the life-course influences the risk of later life knee osteoarthritis (OA), for example, whether knee OA risk accumulates with prolonged exposure to high BMI or whether later rather than earlier adult life is the key period of exposure.

**Methods** A population-based birth cohort study of 3035 men and women who underwent a clinical examination for knee OA at age 53. BMI was measured 10 times from 2 to 53 years. Analyses were stratified by gender and adjusted for occupation and activity levels.

**Results** The prevalence of knee OA was higher in women than men—12.9% (n=194) vs 7.4% (n=108). In men, the association between BMI and knee OA was apparent at age 20 (p=0.038) and remained until 53 yrs (OR per z-score: 1.38; 95% CI 1.11 to 1.71). In women, there was evidence for an association at 15 yrs (p=0.003); this became stronger through adulthood—at age 53 the OR was 1.89 (CI 1.59 to 2.24) per z-score increase in BMI. A structured modelling approach to disentangle the way in which BMI over life influenced knee OA risk suggested that in women, prolonged exposed to high BMI throughout adulthood carried the highest risk, while in men, it was exposure in mid adulthood that explained most of the risk.

**Conclusion** Our study suggests that, particularly in women, the duration of exposure to high BMI in adulthood is important in explaining knee OA risk, and that these associations originate from weight gain in childhood and adolescence.

#### 05-2.6 LAG EFFECTS OF INCOME INEQUALITY ON TOOTH LOSS: A MULTILEVEL STUDY OF US ADULTS

doi:10.1136/jech.2011.142976b.48

<sup>1,2</sup>E K Delgado-Angulo,\* <sup>3</sup>E Bernabé. <sup>1</sup>Department of Epidemiology and Public Health, University College London, London, UK; <sup>2</sup>Departamento Académico de Odontología Social, Universidad Peruana Cayetano Heredia, Lima, Peru; <sup>3</sup>Institute of Dentistry, Barts and The London, Queen Mary University of London, London, UK

**Introduction** Income inequality has detrimental effects on health and oral health. However, this effect is doubtfully instantaneous and most studies have measured both income inequality and health contemporaneously. This study examined the association between state-level income inequality and tooth loss among adults in the United States, under different assumptions about lag periods.

**Methods** This study pooled individual data from the 2008 Behavioural and Risk Factor Surveillance System and state-level data from the US Census Bureau. The Behavioural and Risk Factor Surveillance