

on data contained in the Survey on Household Budgets (POF 2002–2003).

Materials and Methods This analysis is conducted with the data from POF 2002–2003 which involved interviews on a sample of 48 470 families.

Results The sum of all drug costs for diabetes treatment equals US\$ 249 million. Among those who have acquired any drugs for diabetes care the average expense was US\$ 6.30. 31.1% of the drugs for diabetes were obtained through the NHS and 64.2% were bought in a drugstore or pharmacy. Those with family incomes of up to US\$ 137.00 spend the equivalent of 4.28% the income on medicines for diabetes. While those with family incomes above US\$ 2000.00 have a drug spending for diabetes equivalent to 0.51% of their income.

Conclusion Brazil spends the equivalent of 0.02% of its GDP on medicines for the treatment of diabetes. The average monthly spend on medicines for diabetes is US\$ 6.30. Despite the health system in Brazil claim to be universal, only 31% of medications for diabetes were covered by the system.

P2-177 ACCUMULATION OF OBESITY-RELATED EATING BEHAVIOURS AND THE INCIDENCE OF TYPE 2 DIABETES AMONG MIDDLE-AGED JAPANESE MEN AND WOMEN: THE CIRCULATORY RISK IN COMMUNITIES STUDY (CIRCS)

doi:10.1136/jech.2011.142976j.12

^{1,2}K Maruyama,* ²M Kiyama, ^{2,3}S Sato, ^{1,2}T Ohira, ²K Maeda, ^{1,2}H Noda, ²S Nishimura, ²A Kitamura, ²T Okada, ^{1,2}H Imano, ²M Nakamura, ²Y Ishikawa, ⁴M Kurokawa, ⁵K Yamagishi, ¹H Iso. ¹Osaka University Graduate School of Medicine, Osaka, Japan; ²Osaka Medical Center for Health Science and Promotion, Osaka, Japan; ³Chiba Prefectural Institute of Public Health, Chiba, Japan; ⁴Osaka Prefecture University School of Comprehensive Rehabilitation, Osaka, Japan; ⁵University of Tsukuba Graduate School of Comprehensive Human Sciences, and Institute of Community Medicine, Tsukuba, Japan

Introduction To examine whether the accumulation of obesity-related eating behaviours such as eating quickly, eating until full, eating right before bedtime and breakfast skipping are associated with incidence of type 2 diabetes mellitus (T2DM) among middle-aged Japanese men and women.

Methods The 2840 subjects (890 men and 1950 women) who were aged 40–69 year and free of T2DM were enrolled at baseline survey from 2003 to 2006 in a community-based longitudinal study, the CIRCS. The subjects were asked following four eating behaviours by questionnaire at baseline: “speed of eating”, “eating until full”, “eating right before bedtime” and “breakfast skipping”. T2DM was defined as fasting serum glucose ≥ 7.0 mmol/l, non-fasting serum glucose ≥ 11.1 mmol/l or medication for T2DM. We followed up to March 2010, and calculated HR and 95% coefficient interval (95% CI) of T2DM by using Cox proportional hazard model after adjustment for potential risk factors.

Results During 7-year follow-up period, 155 cases (70 men and 85 women) had an onset of T2DM. We calculated multivariate HR (95% CI) of T2DM for each number of eating behaviours among both men and women. Compared with persons without any eating behaviours, the multivariable HR (95% CI) of persons with 1, 2 and ≥ 3 of eating behaviours were 2.35 (1.06 to 5.19), 1.54 (0.65 to 3.63) and 3.24 (1.29 to 8.13), p for trend=0.09 in men and 0.92 (0.52 to 1.62), 0.67 (0.35 to 1.30) and 1.97 (0.92 to 4.22), p for trend=0.67 in women.

Conclusion Our finding suggests that the accumulation of obesity-related eating behaviours raise the risk of T2DM for middle-aged Japanese men.

P2-178 THE ASSOCIATIONS OF DIETARY FOLATE, VITAMIN B₆ AND B₁₂ INTAKES WITH RISK OF SUDDEN CARDIAC DEATH: THE CIRCULATORY RISK IN COMMUNITIES STUDY (CIRCS)

doi:10.1136/jech.2011.142976j.13

^{1,2}M Maruyama,* ^{1,2}T Ohira, ^{1,2}H Imano, ²A Kitamura, ²M Kiyama, ²T Okada, ²K Maeda, ³K Yamagishi, ^{2,4}H Noda, ²Y Ishikawa, ²T Shimamoto, ¹H Iso. ¹Department of Social and Environmental Medicine, Osaka University, Suita, Japan; ²Osaka Medical Center for Health Science and Promotion, Osaka, Japan; ³Department of Public Health Medicine, University of Tsukuba, Tsukuba, Japan; ⁴Department of Health Care Economics and Industrial Policy, Suita, Japan

Introduction To examine whether dietary folate, vitamin B₆ and B₁₂ intakes are associated with the risk of sudden cardiac death (SCD) among Japanese men and women.

Method We conducted a nested case-control study. For each case of SCD entered between 1973 and 2001 in the CIRCS, two controls were randomly selected for each case and matched for age (± 3 years), sex and community from among participants without history of SCD. The 77 cases and 154 controls aged 30–84 years were enrolled. Dietary folate, vitamin B₆ and B₁₂ intakes were assessed by 1 day 24 h dietary recall. We calculated conditional OR and 95% CI of each nutrients for risk of SCD adjusted for potential confounding factors.

Result Higher intake of folate was associated with lower risk of SCD. The multivariable adjusted OR (95% CI) of highest quartile was 0.32 (95% CI 0.12 to 0.82), p for trend=0.06 compared with lowest quartile. However, vitamin B₆ and B₁₂ intakes were not associated with risk of SCD. The multivariable adjusted OR (95% CI) of highest quartile of vitamin B₆ and B₁₂ intakes were 1.25 (95% CI 0.49 to 3.21), p for trend=0.64 and 0.83 (95% CI 0.34 to 1.98), p for trend=0.86 compared with lowest quartiles, respectively.

Conclusion Our findings suggest that higher dietary folate intake is associated with lower risk of SCD among Japanese men and women.

P2-179 A META-ANALYSIS OF THE RELATIONSHIP BETWEEN AGE AT PUBERTY AND TESTICULAR CANCER

doi:10.1136/jech.2011.142976j.14

¹M Maule,* ^{1,2}J A L Malavassi, ¹L Richiardi. ¹Cancer Epidemiology Unit, University of Turin, Torino, Italy; ²CR-Fundacion, Universidad Autonoma de Centro America, San José, Costa Rica

Introduction Testicular cancer is one of the most rapidly increasing tumour types but its aetiology is still largely unexplained. Cryptorchidism and familial testicular cancer, the most established risk factors, may explain <10% of all cases. Among investigated post-natal factors, early puberty was suggested as a potential risk factor but the topic has been poorly investigated.

Methods We undertook a meta-analysis of the association between age at puberty and testicular cancer risk. Search strategies were conducted in PubMed on December 2010. All markers of puberty onset (age at voice change, age at first nocturnal emission, age when started shaving, and reported age at onset) were considered. We re-categorised age at puberty from all the studies into a common three-level variable (younger age than peers, same age as peers, older age than peers), while analyses using quantitative information are ongoing.

Results A total of 348 references were retrieved, of which 11 met the inclusion criteria. Later puberty appeared to be protective. In particular later vs same age at reported onset of puberty gave an OR of 0.65 (95% CI 0.52 to 0.78) based on three studies, later vs same age at voice change an OR of 0.79 (95% CI 0.68 to 0.92) based on five studies, and later vs same age at start shaving an OR of 0.84 (95% CI 0.75 to 0.95) based on five studies. Early puberty showed a smaller or no protective effect.

Conclusion This meta-analysis has found evidence for a protective effect of later puberty for testicular cancer risk.

P2-180 FEV₁ PREDICTS LENGTH OF STAY AND IN-HOSPITAL MORTALITY IN PATIENTS UNDERGOING CARDIAC SURGERY

doi:10.1136/jech.2011.142976j.15

¹D McAllister,* ²S Wild, ³J Maclay, ⁴A Robson, ²D Newby, ²W MacNee, ⁴A Innes, ⁴V Zamvar, ²N Mills. ¹NHS Fife, Fife, UK; ²University of Edinburgh, Edinburgh, UK; ³NHS Greater Glasgow, Glasgow, UK; ⁴NHS Lothian, Lothian, UK

Background Older patients are increasingly being referred for cardiac surgery, consequently novel prognostic markers which reflect physiological reserve and severity of co-morbid disease are now required. Forced Expiratory Volume in one second (FEV₁) is a robust accurate measure of pulmonary physiology and predicts all-cause mortality, yet the relationship between FEV₁ and outcome in patients undergoing cardiac surgery is unknown. We hypothesised that FEV₁ would predict mortality and length of hospital stay following cardiac surgery.

Methods In a retrospective cohort design, records for 2241 consecutive patients undergoing coronary artery bypass grafting and/or valve surgery from 2001 to 2007 were selected from a regional cardiac surgery database and linked to a regional spirometry database. Generalised linear models of the association between FEV₁ and length of hospital stay and mortality were adjusted for age, sex, height, body mass index, socioeconomic status, smoking, cardiovascular risk factors, chronic pulmonary disease, and type and urgency of surgery. FEV₁ was compared to an established risk prediction model, the EuroSCORE.

Results Spirometry was performed in 2082 cardiac surgery patients (93%) whose mean (SD) age was 67 (10) years. Median hospital stay was 3-days longer in patients in the lowest compared to the highest quintile for FEV₁, 1.35-fold higher (95% CI 1.20 to 1.52; p<0.001). The adjusted OR for mortality was increased 2.11-fold (95% CI 1.45-3.08; p<0.001) per SD decrement in FEV₁ (800 ml). FEV₁ improved discrimination of the EuroSCORE for mortality.

Conclusions Reduced FEV₁ strongly predicts increased length of stay and in-hospital mortality following cardiac surgery.

P2-181 RECONSTRUCTING THE HISTORICAL INCIDENCE OF HEPATITIS C INFECTION AMONG SCOTLAND'S IDUS

doi:10.1136/jech.2011.142976j.16

^{1,2}S McDonald,* ^{2,3}M Kretzschmar, ^{1,4}S Hutchinson, ¹D Goldberg. ¹Health Protection Scotland, Glasgow, UK; ²Julius Centre for Health Sciences & Primary Care, University Medical Centre, Utrecht, The Netherlands; ³Center for Infectious Disease Control, RIVM, Bilthoven, The Netherlands; ⁴University of Strathclyde, Glasgow, UK

Introduction The historical incidence of hepatitis C virus (HCV) infection in Scotland's injecting drug user (IDU) population is unknown. From a public health perspective, accurate data on incidence rates over time would improve our understanding of the effects of harm reduction measures initiated in the late 1980s (needle/syringe exchanges, methadone treatment) on the transmission of HCV among Scotland's IDUs. Because HCV-antibody testing only commenced in 1991, and positive diagnoses are often made many years after infection, trends in incidence cannot easily be inferred from trends in the time-series of diagnosed cases.

Methods We applied back-calculation methods to reconstruct HCV incidence using data available on the national HCV Diagnosis database (1991–2009; n=25 000), estimates from the literature regarding time to seroconversion and mortality rates, and the estimated distribution of time between injection debut and diagnosis,

derived via record-linkage between the HCV Diagnosis and the Scottish Drugs Misuse databases.

Results Approximately 50 000 IDUs were estimated to have been infected with HCV during 1960–2009. The shape of the incidence curve varied with region, but a peak in annual incidence was estimated to have occurred around 1993. The model projected approximately 1700 new HCV diagnoses per year over the coming 5 years. Sensitivity analyses were also conducted to explore assumptions regarding mortality rate and the proportion of infected IDUs that are never diagnosed.

Conclusion These incidence data are important for evaluation of the impact of harm reduction initiatives, for informing national public health planning, and for projecting the future burden of HCV-related severe liver disease.

P2-182 THE INFLUENCE OF HEPATITIS C AND ALCOHOL ON LIVER-RELATED MORBIDITY AND MORTALITY IN GLASGOW

doi:10.1136/jech.2011.142976j.17

^{1,2}S McDonald,* ^{1,2}S Hutchinson, ³P Mills, ^{2,4}S Bird, ⁵S Cameron, ⁶J Dillon, ¹D Goldberg. ¹Health Protection Scotland, Glasgow, UK; ²Department of Mathematics & Statistics, University of Strathclyde, Glasgow, UK; ³Gartnavel General Hospital, Glasgow, UK; ⁴MRC Biostatistics Unit, Institute of Public Health, Cambridge, UK; ⁵West of Scotland Specialist Virology Centre, Gartnavel General Hospital, Glasgow, UK; ⁶Ninewells Hospital & Medical School, Dundee, UK

Introduction Infection with the hepatitis C virus (HCV) is associated with the development of severe liver disease, but cofactors – namely alcohol abuse – in Scotland's HCV-positive population complicate estimation of the unique contribution of HCV. We compared the risk of hospital admission/death for a liver-related cause in a large cohort of Glasgow's injecting drug users (IDUs) testing HCV-positive, with IDUs testing HCV-negative.

Methods Data for 6566 current/former IDUs who had been tested for anti-HCV and/or HCV RNA in Greater Glasgow health board between 1993 and 2007 were linked to the national hospitalisation database and deaths registry to identify all admissions and deaths from a liver-related condition. RRs were estimated using Cox regression for recurrent events.

Results The risk of hospitalisation/death from a liver-related or an alcoholic liver-related condition following HCV testing was greater for those IDUs with no prior alcohol-related hospitalisation who tested positive [adjusted hazard ratio (HR) = 3.2, 95% CI 1.5 to 6.7; 4.9, 95% CI 1.8 to 13.1, respectively], compared with those who tested anti-HCV negative, but not for those IDUs with a prior alcohol admission (HR=0.8, 95% CI 0.4 to 1.5; 0.8, 95% CI 0.4 to 1.6). There was little evidence for an increased risk of hospitalisation/death for an exclusively non-alcoholic liver condition for those testing positive (HR=1.5, 95% CI 0.8 to 2.7), after adjustment for previous alcohol-related admission.

Conclusion Within Glasgow's IDU population, HCV positivity is associated with an increased risk of a liver-related outcome, but this is not observed for those IDUs whose problem alcohol use already increases their risk.

P2-183 PATTERNS OF ANTERIOR AND POSTERIOR CARIES BY SOCIOECONOMIC STATUS IN 3-YEAR-OLD CHILDREN

doi:10.1136/jech.2011.142976j.18

¹A D McMahon,* ²Y Blair, ²D R McCall, ¹L M D Macpherson. ¹Glasgow University Dental School, Glasgow, Scotland, UK; ²NHS Greater Glasgow and Clyde, Glasgow, Scotland, UK

The aim was to examine if anterior/posterior patterns of decayed missing and filled teeth in 3-year-old children in Greater Glasgow