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

[1]D McAllister,* [2]S Wild, [3]J Maclay, [4]A Robson, [2]D Newby, [2]W MacNee, [4]A Innes, [4]V Zamvar, [2]N Mills. [1]NHS Fife, Fife, UK; [2]University of Edinburgh, Edinburgh, UK; [3]NHS Greater Glasgow, Glasgow, UK; [4]NHS 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 (FEV_1) is a robust accurate measure of pulmonary physiology and predicts all-cause mortality, yet the relationship between FEV_1 and outcome in patients undergoing cardiac surgery is unknown. We hypothesised that FEV_1 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 FEV_1 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. FEV_1 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 FEV_1, 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 FEV_1 (800 ml). FEV_1 improved discrimination of the EuroSCORE for mortality.

Conclusions Reduced FEV_1 strongly predicts increased length of stay and in-hospital mortality following cardiac surgery.

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

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

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

and Clyde differ by socioeconomic status and by calendar time. The children were inspected in 2006/7, 2007/8, 2008/9 and in 2009/10. A mean d$_3$mft score was created for the four posterior teeth in the upper arch and also for the two central incisors in the upper arch. The difference between the anterior and posterior scores was calculated. Additionally, an endpoint of the occurrence of obvious caries experience in both the anterior and posterior teeth was created for the upper arch. The analyses were repeated within the fifths of the Scottish Index of Multiple Deprivation. We sampled a total of 10 022 children. The anterior-posterior difference was statistically greater for the most deprived children vs the most affluent children; adjusted mean difference of differences =0.03 (0.02, 0.05), p<0.001. These differences have reduced with calendar time, and by 2009/10 there was no anterior-posterior difference (mean=0.00 for both the most deprived and the most affluent children). Over the four year period, there was more caries in both the anterior/posterior teeth for deprived children (6%) than in affluent children (1%); OR=5.76. This effect was also reduced by 2009/10. There is evidence that the pattern of decay in the upper arch is different in more deprived communities, with more caries in the anterior teeth and more decay in both the posterior/anterior teeth simultaneously. These effects were reduced by calendar time as population prevalence reduced.

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

The aim of this study was to apply tests of inequality to dental inspection data from 3-year-old children in Greater Glasgow and Clyde and to compare and contrast their usefulness. Dental inspections were repeated from 2006/7 to 2009/10. The measures of caries experience used were d$_3$mft >0 and mean dmft, while the measure of socioeconomic status was "quintiles" of the Scottish Index of Multiple Deprivation. Analyses of each year's data included: raw summaries by SIMD score; logistic regression (LR) models with ROC plots and c-index; Significant Caries Index (SIC); Population Attributable Risk (PAR); Concentration Index; Gini Coefficient and Lorenz Curves; Slope Index of Inequality (SII) and Relative Index of Inequality (RII). We inspected 10 022 three year old children (19% of the population). The prevalence of obvious decay was 26%, 25%, 18% and 17%, in the 4 years. Raw analyses revealed a drop in absolute inequality, but little change in relative inequality. The SII values over the 4-year period were −1.61, −1.38, −1.16 and −0.54, respectively. ORs from the LR models provide relative estimates (backed up by the ROC plots), the SIC and the PAR are good at picking up the absolute reduction, the Concentration Index does not add much information, the GINI coefficient does pick up inequality but is counter-intuitive in this context, and the SII and RII are useful. We found that standard analyses such as LR and ROC are good for estimating dental inequalities, but other methods are needed to more graphically demonstrate reductions in absolute inequality.

[1,2]K McPherson,* [2]T Marsh, [2]M Brown. [1]University of Oxford, Oxford, UK; [2]National Heart Forum, London, UK

Introduction Estimates suggest that by 2020 around 40% of adults will be obese, this is likely to cause a serious rise in related morbidity and mortality and health service cost. This work examines the Health Survey for England from 1993 to 2008, to test for a recent change in the apparently inexorable rise in the prevalence of obesity.

Methods We compared these projections using methods developed for the Foresight Tackling Obesities programme for 2020 using eight years of survey data from 1993 to 2000 inclusive and compared them with projections using data from 2001 to 2008. We tested for a difference between the two projections and for a difference from the recent projections to the observed prevalence in 1993.

Results All eight groups have a lower projected rate of obesity in 2020 from the recent data than from the previous 8 years. All of these projections are well above the rate observed in 1993. Most notably children are recently becoming more obese at a slower rate while males aged 21−40 seem to have uniquely overcome their rising obesity in recent years.

Conclusion There is evidence for a flattening of obesity growth, at this stage only among the young. These data are cross sectional and inferring future cohort effects is less reliable, but obviously if the trends currently observable among the young represent lasting effects among cohort then the projections in the very long term made by Foresight may have been too pessimistic.

[1]A Memon,* [2]S Polack, [3]M Al-Khawari, [3]M Qabazard, [4]A Suresh. [1]Brighton and Sussex Medical School, Brighton, UK; [2]London School of Hygiene and Tropical Medicine, London, UK; [3]Ministry of Health, Kuwait, Kuwait; [4]Faculty of Medicine, Kuwait University, Kuwait, Kuwait

Introduction It is estimated that incidence of type 1 diabetes (T1D) will double between 2005 and 2020 in most countries. In recent decades, Kuwait has experienced substantial increase in the incidence of T1D (from 4.0/100 000 in 1980−1981 to 21/100 000 in1992−1997). We conducted a population-based case-control interview study in Kuwait to examine antenatal/perinatal factors that may be associated with the risk of T1D in the offspring.

Methods 376 case-control pairs (aged 0−19 years) individually matched on age, gender, nationality, and district of residence.

Results Univariate conditional logistic regression analysis showed that maternal age ≥25 years (OR=1.8, 95% CI 1.3 to 2.6), paternal age ≥30 years (2.1, 1.5 to 2.9), gestational diabetes (1.8, 1.1 to 3.2), birth order ≥3 (2.3, 1.4 to 3.7), having >5 siblings (1.9, 1.1 to 2.1), diabetes in sibling(s) (8.3, 2.9 to 23.2), autoimmune disease in mother (1.7, 1.1 to 2.5) and congenital malformation in the family (3.9, 2.1 to 7.1) were associated with a significantly increased risk of T1D; whereas maternal use of coffee, analgesics and vitamins were significantly protective. There was no association with parental consanguinity, parity, gestational age, caesarean delivery, or birth weight. In the multivariate analysis, birth order ≥4 (4.5, 1.6 to 12.3) and maternal use of vitamins during the pregnancy (0.2, 0.1 to 0.3) remained independently associated with T1D.

Conclusion A host of factors in the antenatal/perinatal period influence the risk of T1D in the offspring. Overall, the study presents a profile of increased risk with increasing age of parents, birth order, and number of siblings. The novel finding for a protective effect of maternal use of vitamins during pregnancy warrant further investigation.