Discussion: Lower autonomy and greater risk-taking found among teenagers with same-sex partners echo the findings of research elsewhere (mainly the US). Further research on underlying psychosocial factors is required.

040 | CIGARETTE AND ALCOHOL CONSUMPTION AMONG YOUNG PEOPLE IN ENGLAND: FINDINGS FROM THE SMOKING, DRINKING AND DRUG USE SURVEY 2008

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Background: The Smoking, Drinking and Drug Use Survey (SDD) among secondary school children in England provides national estimates for the proportions of young people (aged 11–15) who smoke, drink alcohol or take illegal drugs. The survey findings are used to monitor progress towards government targets for reducing smoking and alcohol misuse among teenagers. Until October 2007, it was illegal to sell tobacco products to children under the age of 16 in England. Evidence from SDD 2006 showed that despite this, children under the age of 16 could easily obtain cigarettes from shops and vending machines. From October 2007, it became illegal to sell cigarettes to young people under the age of 18. SDD 2008 is the first survey post implementation of this legislation which can provide empirical evidence against which to assess the impact of this legislative change upon young people's ability to buy cigarettes; impact upon smoking prevalence and assess whether young people have changed how and where they obtain cigarettes. The Chief Medical Officer launched a public consultation on young people's drinking, which advised that young people under the age of 16 should not drink alcohol because of the health risks associated with it. Evidence from previous SDD reports has shown a downward trend in the proportion of young people who have ever drunk alcohol; 61% in 2003, 54% in 2007. Results from the 2008 survey will monitor these trends and provide key estimates on young people's alcohol consumption and behaviour.

Methodology: A representative sample of pupils in school years 7 to 11, were drawn from all state-funded and independent secondary-level schools across England. A random probability sample of both schools and pupils within schools was selected for participation in SDD 2008 and 7798 pupils in 253 schools participated. Pupils completed a self-completion questionnaire which included detailed questions about smoking and drinking consumption, and general questions about relevant behaviours, attitudes and knowledge.

Results: This is first report in the survey series to present nationally representative findings assessing the impact of regulating the sale of tobacco upon young people's smoking behaviour. Trend data about alcohol intake and frequency of consumption will also be presented. The SDD 2008 findings are currently under embargo prior to publication in July 2009.

Conclusions: The survey is a key data resource in the planning of young people's health services, education programmes and policy initiatives in England.

Methods

041 | A NOVEL APPROACH TO TESTING THE LIFECOURSE EFFECT OF BODY SIZES ON BLOOD PRESSURE IN LATER LIFE USING PARTIAL LEAST SQUARES REGRESSION

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Introduction: Recent studies claimed that postnatal catch-up growth might have a stronger impact on health in later life than birth size. As growth is a continuing process in lifecourse, the challenge is therefore to tease out the impact of body size in difference critical phases of lifecourse. One problem is that it is impossible to use ordinary least squares regression to differentiate the effects of birth sizes, growth and current body sizes, because growth is generally defined as the difference between birth and current size. The aim of this presentation is to propose a novel approach to testing lifecourse effects of body sizes on health outcomes using partial least squares (PLS).

Materials and Methods: Longitudinal data from a cohort of 960 males and 834 females recruited in Philippines during 1983–4 were used for statistical analysis. Body weight z-scores were used as the measure for body sizes, and the outcomes were systolic (SBP) and diastolic (DBP) blood pressure measured in 2002. PLS regression was used to test the impact of birth weight z-scores, change in body weight z-scores during different stages of growth, and current body weight z-scores on SBP and DBP.

Results: For SBP, birth size had a small negative association and the change in z-scores between age 1 and 2 had a stronger positive association than the change between birth and age 1. Growth after age 8 had a much stronger association than early growth, but current body size had the largest association. For DBP, birth size had a small positive association, and early growth had small associations in females. Growth after age 8 had a much stronger association than early growth, but current body size still had the largest positive association. In contrast, early growth had stronger associations with DBP in males, whilst current body size still had the largest association.

Conclusion: PLS regression estimates the associations between birth sizes, changes in body sizes at different phases of lifecourse and current body sizes simultaneously, and therefore misinterpretation such as reversal paradox can be avoided. Results from PLS analysis suggested that current body size had the largest positive association with SBP and DBP, whilst birth size had small negative or positive associations with blood pressure. Later growth in childhood and adolescence had stronger associations with SBP than early growth before age 2, but the associations between growth in body sizes and DBP were more complex.

042 | THE PREFERENCE EFFECT IN AN UNBLINDED HEALTH PROMOTION INTERVENTION TRIAL: HOW IMPORTANT IS IT?

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Background: Maternal smoking is one of the few potentially preventable factors associated with miscarriage, complications of pregnancy, low birth weight, perinatal death and poorer long term growth, development and health of the child. Health promotion initiatives pose a particular challenge especially for disadvantaged women. The preference effect, whereby people support an intervention because it conforms with their own understanding of a behaviour or disease under study, is one such determinant and is especially relevant to unblinded trials.

Objective: To determine whether assignment to intervention or control group and smoking status affected participation in an unblinded intervention study, one of the aims of which was to identify the key determinants of sustained effective brief intervention for smoking cessation in pregnancy and post partum.

Participants: The sample comprised a cohort of 1000 disadvantaged pregnant smokers who were followed up at five time points—twice during pregnancy at the hospital, once directly after birth and at two subsequent public health nurse visits (3–4 and 7–9 months post partum).

Design: The methodology comprised a quasi-experimental historical cohort design as blinding was not feasible with a non-intervention group (500) recruited first. The intervention group was recruited following a washout period. Interviewer administered questionnaires were completed at each time point and reported quitting validated by urinary cotinine measurement once in pregnancy (visit 2) and once after (visit 4).

Results: The overall proportion of responder and non-responder women who reported being current smokers at the first ante-natal visit was similar, however differences emerged within the groups with a higher proportion of the intervention group who were current smokers (56.8%), being non-responders at visit 5, compared to the reference group (41.8%) ($p < 0.05$). Spontaneous quitters at the booking visit were also less likely to stay with the programme (61.4% vs. 38.6%, $p < 0.5$), with no difference in effect for intervention and reference groups ($p = 0.8$). Fall off in response was an important element of the programme with 46.8% of the intervention group taking part at visit 5 compared to 53.2% in the reference group ($p = 0.05$).

Conclusion: These findings indicate that smoking status and intervention arm each affected participation, which illustrates the importance of estimating such a preference effect in assessing an effective health promotion programme.

043 | THE (AB)USE OF SYMPTOM SCORES IN ASTHMA CLINICAL TRIALS: EVIDENCE FROM A SYSTEMATIC REVIEW

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Background: The utility of patients' self-reported asthma symptom scores in clinical trials has not been critically assessed. We investigated the types of symptom scores used in asthma clinical trials and how they are analysed and interpreted.

Methods: Systematic reviews conducted to inform asthma management guidance in England and Wales were used as an evidence base. These reviews identified 87 randomised controlled trials of the effectiveness and safety of inhaled corticosteroids and long-acting β-agonists, published during 1985 to 2006. From these trials we extracted and appraised information on the characteristics of the symptom scales employed, and the way the symptom scores were interpreted and analysed.

Results: Most (78) of the asthma randomised controlled trials (90%) reported the use of symptom scores, in all cases as secondary outcomes alongside measures of pulmonary function. Ten different numeric scales and 21 different classes of symptom combinations were identifiable among the 78 trials, which resulted in 44 unique symptom scoring scales. These scales could be further subdivided according to differences in the timing of symptom assessments and in the ways that the scores were coded. Only four (5%) of the trials used validated scales. Lung function and asthma severity typically worsen at night but in all of 11 trials that reported both day and night symptom scores, the scores were consistently lower at night, irrespective of the numerical scale, study design, and asthma interventions involved. Asthma symptom scores appeared to be ordinal measures and in most trials were analysed parametrically, without reference to any assumptions about the type of distribution or equality of the scale intervals. In the asthma trials, interpretation always focused on changes in scores and the statistical significance, rather than on actual symptoms and the significance to patients.

Conclusions: Symptom scores are widely used in asthma RCTs in conjunction with estimates of pulmonary function but they lack validation and are interpreted inconsistently and uncritically. The numerical interpretation of scores seems detached from considering the real importance of symptoms to patients. Due to the large number of unique scales in use, it is questionable whether symptom scores can be meaningfully compared across studies, as is routinely attempted in meta-analyses. Adoption of a smaller set of validated symptom scales in asthma clinical trials could assist meta-analyses, improve understanding of how numeric scores reflect patient experiences, and enable a more thorough evaluation of the quantitative properties of the scales that are used.

044 | AN ANALYSIS OF THE STRUCTURE OF THE COMPONENTS OF METABOLIC SYNDROME USING MATROIDS

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Background: Metabolic syndrome (MetS) has been shown to be a risk factor for many chronic diseases, but the components of MetS are still controversial. In recent literature, exploratory and confirmatory factor analyses have been used to test the latent structure amongst MetS components and regression modelling is used to test the relation between chronic diseases and MetS components. The MetS components such as BMI, blood pressure and lipids are in general correlated and clustered, and this poses a challenge for statistical modelling. Collinearity amongst these components can have serious implications in regression analysis if not identified and treated with care. Whilst some exploratory analysis, such as principle component analysis (PCA), can provide an effective insight into the structure of the data, the results are often difficult to interpret to the non-statistician and lack the descriptive detail to explain effectively the clustering of the variables.

Methods: The approach we propose draws on a number of ideas in combinatorial mathematics and cluster analysis to generate a group of dependent subsets. The group is transformed into a matroid to ensure that the subsets adhere to the basic axioms of linear dependence. This allows the structure to be displayed in clear hierarchical form and provides an immediate interpretation of the clustering of the MetS components. We consider data from a paper by Shen (2003) in the *American Journal of Epidemiology*.

Results: The matroid technique identifies similar groups of dependent components to the factor analysis approach in the paper. These included: (1) glucose, PC glucose, insulin, PC insulin; (2) BMI, waist/hip ratio; (3) systolic BP, diastolic BP and (4) HDL and triglycerides. However, the matroid method additionally illustrates the dependencies at multiple collinearity thresholds. It shows the strengths of these dependencies and others, along with their location in the overall structure of the components of MetS. This reveals a concise depiction of the dependencies that the original factor analysis could not provide.

Conclusions: Presenting linear dependencies as subsets rather than latent variables gives the practitioner a greater choice of which variables to remove for regression analysis. This allows for an informed decision to be made about the inclusion of variables using clinical knowledge, as well as statistical reasoning, to limit the effects of collinearity in regression.

Cancer II

045 | HELP-SEEKING BEHAVIOUR IN SMOKERS AND EX-SMOKERS WITH SYMPTOMS OF LUNG CANCER. THE APPLICATION OF AN INTEGRATED MODEL

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Introduction: Most patients with lung cancer in the UK are diagnosed when curative surgery is no longer an option and late