Reviewer's report

Title: Impact of smoking and smoking cessation on overweight and obesity: Scotland-wide, cross-sectional study on 38,223 participants.

Version: 2 Date: 20 December 2012

Reviewer: Deborah Lycett

Reviewer's report:

Major Compulsory Revisions

1. I can see what the authors are aiming to achieve here with their method of logistic regression to determine the odds ratio of being overweight/obese or obese only according to smoking status. However because BMI categories are not a binary variable, this presents major problems which casts doubt on their methodology.

   a. By using logistic regression the authors have been forced to make an odd classification of 'overweight' which also includes all obese individuals, they then have done a separate analysis for those who are just obese.

   b. They have excluded all individuals with a BMI of less than 18 making a very large assumption that all these individuals would either have an eating disorder or be cachetic! This is not true, some healthy 16 year old males have a BMI range which begins below 17 (See paediatric BMI charts). In addition the whole analysis may be biased through this sweeping exclusion criteria. The sample is no longer representative of the population. Much better to include all BMI categories and adjust for the variables of mental health and illness that the authors make mention of.

More appropriate methodology would be to carry out one main analysis using ordinal regression to obtain odds ratios for being in increasingly higher BMI categories according to smoking status or use linear regression with BMI, uncategorised, as a continuous variable to obtain mean BMI according to smoking status. Interactions with age etc could then be investigated.

2. The authors interpret their findings as a message for young people, however the age inclusion criteria of >16 years needs to be justified, many smokers will include those younger than this.

3. The background does not mention key influential reviews in this field e.g. Klesges et al or explain how this study differs from the numerous cross sectional studies that have already been done. No mention is made of several prospective cohort studies that have already examined the association of age with weight gain in smokers and quitting smokers. The authors need to better review existing literature and explain how this study adds to it both in the background and the discussion.

4. In the background the authors write about weight being 'increased' but this is a cross sectional study where an increase has not been observed. Also they do not
explain clearly which categories they are comparing. They write about a 'protective effect' which is ambiguous as they do not explain they are referring to weight.

Minor Essential Revisions
1. In the results section 'smoking dose and duration' should the first table referred to be table 3 and not 2?
2. In the discussion section the authors write about 'dieting', this implies people going on a diet, but I think they mean they had no information on nutritional intake of the population. This is therefore ambiguous and needs clarifying.
3. Table 3 contains * but no footnotes

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:

DL has received hospitality from manufacturers of smoking cessation products (Pfizer Ltd). Her institution has received smoking cessation products for use in an RCT from J&J Ltd. She has received Slimming World membership vouchers for use in an RCT to prevent cessation related weight gain(CRWG). She has received expenses & consultancy fees from the NHS & HEIs for teaching about CRWG. She has received grant funding from UKCTCS & the NIHR-SPCR for research relating to CRWG.