Author's response to reviews

Title: Smoking and mental illness: Results from population surveys in Australia and the United States

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Author's response to reviews: see over
We would like to thank the three reviewers for their helpful comments on the paper. We have revised the manuscript in line with the reviewers suggestions. We feel that the paper has been significantly improved thanks to the valuable feedback received from each of the reviewers. We have detailed below the specific changes that have been made to the manuscript in response to each of the individual points raised by the reviewers.

**Reviewer 1**

_The paper would benefit from greater attention to the co-occurrence of smoking and substance abuse_

We have added an additional table showing the proportions of the population with and without comorbid substance use disorders, and their corresponding smoking rates, by age group and sex

_Include more detailed analysis and discussion of the interaction between age, sex, mental illness, comorbid alcohol or drug abuse, and smoking_

The additional table shows that for both young males and young females, the proportions who smoke among those with either anxiety or affective disorders and a comorbid substance use disorder are high - over 50% in all cases. However this group represents only a small proportion of those young people with either anxiety or affective disorders. Nevertheless those with mental disorders and comorbid alcohol/drug use disorders present both clinical and public policy challenges and it will be necessary to address both smoking and other substance abuse together in this group. These results have been added into the results section, and their implications are discussed in the discussion.

**Reviewer 2**

_Minor revisions_

The stylistic changes suggested by the reviewer have been made as requested.

**Reviewer 3**

_Introduction: What odds ratio is being reported?_

The odds ratio was that of smoking comparing people with schizophrenia with people without schizophrenia. The group with the higher rate of smoking was people with schizophrenia. The text has been altered to remove the ambiguity and clarify this section.

_Provide a better rationale for the hypothesis of the study_

_Second hypothesis is unclear_

We agree that the second hypothesis was poorly worded and was essentially subservient to the first hypothesis anyway. We have removed the second hypothesis and restated the first hypothesis more clearly, to incorporate the salient features of both original statements.

_The term “mental illness” is not defined in the introduction_

The term “mental illness” was not specifically defined in the introduction as a range of different methods have been used to ascertain mental illness status among the literature cited. The definitions of mental illness specific to the current study are described in the methods section. To
avoid ambiguity in the introduction section we have added in a description of the method used to ascertain mental health status for each of the studies cited.

*Mention the names of the surveys used in the study at the end of the introduction*

The last paragraph has been amended to explicitly name the surveys used as source data for this study.

*Provide a theoretical rationale for the study’s hypothesis (eg the Hardening Theory of Tobacco Use)*

We have expanded the background section of the paper to describe the theoretical rationale for the study hypothesis. In particular we have described the data concerning the psychostimulant effects of nicotine, and the theories concerning the use of tobacco to self-medicate, the theory that nicotine use increases susceptibility to mental health problems, the comorbid risk behaviour theory and the theory of common antecedents.

We did not mention the hardening theory for several reasons: it has not been widely accepted, it is not supported by data, and even its proponents (eg Warner and Burns) acknowledge the proportion of smokers who would be classed as ‘hard-core’ is small. Moreover, the theory is not necessary to support the hypothesis of a relationship between mental illness and smoking and is counter-productive to addressing the issue. The idea that the people who continue to smoke despite decades of anti-smoking efforts must is some way be “hard-core” committed to smoking is predicated on the assumption that each person would have equal chance of responding to the anti-smoking campaigns. Perhaps some of those who continue to smoke aren’t so much “hard-core” - maybe they have other problems, such as mental health problems that affect their ability to quit. Certainly there is limited evidence in the literature that tobacco control has been focussed much on this large group.

The discussion section has been expanded to include this issue.

*Methodology: State what type of complex sample design was used*

The type of complex sample design has now been stated for each of the three surveys used.

*Note that the NHIS measures non-specific psychological distress and does not assess specific mental disorders*

The nature of the K6 scale as a measure of non-specific psychological distress has been clarified in the text.

*Provide a better description of how each survey measures current tobacco use. Why is this the only indicator of interest?*

The exact wording of the questions used to identify smoking status in each of the three surveys have been included in the text. While other indicators of tobacco use, such as use of chewing tobacco, may well be of interest the study was limited by the questions that were asked in each of the three surveys used.

*The formatting of the methods section towards the end needs to be re-worked*

The end of the methods section has been reformatted to remove the sentence only paragraphs.
What is the basis for using the K6 score as a continuous measure?

As noted by Kessler et al (2002), the K6 scale is a “dimensional scale of non-specific distress” that allows “a comparison of the severity distribution of non-specific distress among community cases”. While a cut-off of greater than 13 to define high levels of non-specific psychological distress has been used in the US National Survey of Drug Use and Health, other surveys have employed a larger number of cut-points or have used the continuous measure. The NSDUH cut-off has been designed to correspond with a level of severity requiring clinical treatment. Grouping the over 90% of the population that score 13 or under in one category would ignore the significant increasing trend in smoking rates across gradations of no, low, mild, moderate or severe psychological distress. As found in the data from the NCS-R and the NSMHWB, smoking rates are high in the larger group of people who meet ICD-10 criteria for mental disorders, even though approximately two-thirds of this group are not seen in clinical settings. An important implication of these data is the need to develop population-based strategies to address smoking in people with common mental disorders as clinically based interventions cannot help the majority of people with mental illness who are not seen in clinical settings.

We note that the association between the continuous K6 score and smoking status we report from the NHIS closely matches that reported from the NSDUH. This has been noted in the discussion.

The results section could be reworked to demonstrate some level of organization

The results section has been reworked into a new structure to present first the results from the Australian SMHWB, then the US NCS-R, followed by the comparison between the two, and finally the results pertaining to non-specific psychological distress from the NHIS. The section has also been organised with a series of descriptive sub-headings.

Is the comparison between average number of cigarettes smoked and level of psychological stress statistically significant?

Yes. The p-values for the linear and non-linear components of the regression have been included in the results section.

In the comparison for age group, be more specific

More specific detail has been added on these comparisons. Also p-values for each regression curve have been included in the text.

How are these findings different from what has already been published in the literature?

The findings from the NCS-R substantially replicate those from the NCS 10 years earlier, despite the significant investment in tobacco control efforts since 1992, and the overall population trend of gradual decreasing rates of smoking prevalence. The more recent data from Australia has not been previously reported. In addition the original NCS report did not look at age of smokers. Our results showing the particularly high proportion of younger smokers with mental disorders have not previously been reported. Given the substantial focus of tobacco control efforts on younger people we feel this is of particular public health relevance. The continued high prevalence of mental disorders among smokers, and conversely the high rates of smoking among people with common mental disorders (the majority of whom are not seen in institutional settings) is the main finding of the paper. We believe this is of particular public health relevance given the large investments in tobacco control and the lack of attention that has been given to the role of common mental disorders by tobacco control agencies and groups. These points have been described in the revised discussion.
Reduce the number of tables and figures

With the requests for additional information from other reviewers we have been unable to reduce the total number of tables and figures in the paper.

This section reads more like an introduction and is very lengthy and needs to be reduced

The length of this section has been substantially reduced. We have also added sub-headings to increase the readability of the section.

The information contained in this section would be very useful for a review paper

At the suggestion of the Editorial board we did not re-write the paper as a literature review.

It is important to know more about what their findings mean and whether or not the hypotheses of the study are supported

The discussion has been amended to explicitly state how the findings of the study support the initial hypothesis.