Reviewer’s report

Title: Exploring comorbid use of marijuana, tobacco, and alcohol among 14 to 15-year-olds: Findings from a national survey on adolescent substance use

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Reviewer: Janet Hoek

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This is an interesting MS and the authors have examined a topic that is likely to increase in importance; they present a sound case for the health implications of studying co-morbid substance use, though it should perhaps be noted that use of both alcohol and tobacco has been extensively studied in adolescent and young adult populations. Nevertheless, examining marijuana use in association with alcohol and tobacco adds a new and interesting dimension. I have some comments and suggestions that I hope will be useful to them as they continue their work.

Suggested Revisions and Clarifications

1. The introduction could have a tighter structure and make a stronger case for examining all three substances. In some places, the authors provided many details while in others they provide a light overview of material and the introduction does not lead to focussed research questions. I suggest summarising the detailed information about NZ and Australian studies and using this evidence to support a wider research question about co-morbidity. Reframing the introduction so it had fewer specific details could enable the authors to focus on the public health question they wish to address (and that they outline on pages 3 and 4). If the authors feel the detail should be retained, I suggest dividing the introduction into two sections: the first could examine the public health question (and lead to the overall question of what are the patterns of co-morbidity) while the second could summarise what is currently known about determinants (and lead to the second research question of what are the determinants of co-morbidity). A final research question could explore whether determinants of co-morbidity differ for users of one, two or three of the substances examined. I hope these suggestions could create a tighter framework for the introduction and lead readers through to clear research questions.

2. The process to ensure consent is described in detail but I wondered what happened if children did not wish to tick the box indicating their consent to participate? To what extent was this a real choice for them (given children of this age often do not wish to opt out of a group situation)? I note that completed questionnaires were received from 82% of the sample, but assume the remaining 18% were likely to be incomplete forms rather than refusals? Some clarification would be helpful. The questionnaire was quite long (45 minutes) and required quite a lot of reading – was there any pre-testing to ensure children for whom
English is not a first language, or who had lower literacy skills, were also able to participate and provide good quality data?

3. It would be helpful to understand the reason for using past month use as opposed to other time frames as this short period would seem likely to reduce the potential sample. Was “green” one of the synonyms used for marijuana? This term seems used increasingly in New Zealand (and might be worth including in future surveys). I am not familiar with the social connectedness scale but assume various versions of this were tested to see whether the # could be improved? Dichotomising the index clearly reduces the variance – were other categories examined before deciding on dichotomising the variable?

4. Was the risky behaviour hierarchy based on harm to adolescents or harm to adults? I am not familiar with the data, but colleagues in psychology have expressed concerns about the use of marijuana by adolescents whose brains are still developing and I wonder whether a scale perhaps developed for adults can be assumed to apply to adolescents? Some clarification of the scale’s relevance to adolescents would be helpful.

5. The results are clearly described, but I would find it helpful if these were structured to correspond to specific research questions. At the moment, the results largely repeat details from the tables; if the authors used the findings to address specific questions, they could foreground key findings and help readers understand more easily the impact of their results.

6. For table 2, it would be helpful to insert significance details rather than CI (or perhaps as well as, if doing so does not make the table too cluttered). There are some very clear patterns that it would be interesting to discuss further (the SES, ethnicity, income, connectedness, and rule monitoring all have very clear patterns across all behaviours). If I have understood Table 3 correctly, it suggests that adolescents who smoke one substance are likely to smoke another and engage in binge drinking whereas those who engage in binge drinking are less likely to smoke either substance? Using the CI provided, this looks to be significant and merits some discussion. In many respects, Table 4 repeats findings that could be gleaned from Tables 2 and 3 – the authors could consider whether all tables are necessary.

7. I wonder if the discussion could explore the difference between binge drinking and smoking behaviours in more detail. The authors note that risk behaviours develop early, but binge drinking seems well-established by age 14-15 and so may merit a different approach. Given the debate over the purchase age of alcohol in NZ, it might be helpful to isolate this particular finding. I was not sure the conclusion that these behaviours should be examined collectively was fully supported by the data – the different prevalence levels could suggest otherwise.

8. Although I appreciate the authors cannot go too far beyond their data, I think it would be helpful to consider what interventions might be useful. I am not sure how easy it would be to encourage parents to monitor what their children purchase with pocket money or allowances, for example. If the authors suggest interventions (and I would encourage them to identify areas for intervention), I
would like to see some consideration of how an intervention might actually work. For example, are the authors suggesting messages or other interventions should target both tobacco and marijuana use? Similarly, I am not sure how easily interventions can be targeted to specific risk factors – if this approach worked, presumably the levels of behaviour identified would have been much lower. I think there are probably more systemic problems that may require policy changes and suggest the authors also have an opportunity to discuss these.

9. The discussion has a slightly random structure; again, I think linking it to a set of clear research questions would help segue from the results (what was found) to discussion (what it means) and conclusions (what should be done). Within the discussion, I suggest putting the research questions first, then discussing limitations and directions for future research.

10. Finally, I think the conclusions could be stronger. I think many NZ readers would be surprised at the levels of reported behaviour and, given the potential health implications, the authors could recommend more substantive actions. At present, the MS ends rather weakly and misses the opportunity to present some strong guidance to policy makers.

Minor Comments

1. I was not sure that the comment regarding the evidence of a correlational relationship noted on p.4 in fact supported a correlation as it seems equally possible to interpret the study summarised as suggesting causation?

2. In places, I felt the claims made needed some support; for example, on p.3, para 1, the authors claim that “all three substances are considered to be of greater harm that ‘class A’ drugs such as ecstasy and LSD” but no supporting references are provided. Similarly, the final sentence of the following para would also benefit from a supporting reference.

3. Although the writing quality is satisfactory, some sections suffer from prepositional overload and I think the MS would benefit from careful editing. Consider excising phrases such as “a range of” and replacing these with single adjectives such as “several”.

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

**Quality of written English**: Acceptable

**Statistical review**: No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests**: Although I do not have any financial competing interests I know two of the authors and declared this interest to the Editor and sought her feedback prior to accepting the review.