Reviewer's report

Title: Individual and Social Determinants of Multiple Chronic Disease Behavioral Risk Factors Among Youth

Version: 1 Date: 6 September 2011

Reviewer: Russell Viner

Reviewer's report:

Reviewer's report: Comments

This is an important area and it is useful for the authors to have addressed it, especially considering a growing policy interest in multiple risk behaviours. As the authors state, much research in this area is not theoretically driven, so it is interesting to see the subject discussed from a theoretical perspective. However, there are some limitations to adopting a theory-based approach, as they often relate poorly to the real world. The use of ultimate, distal and proximal for various factors is highly dependent on the model, and often fails to recognize interactions between levels of influence. Some discussion of these limitations is warranted. Further, though the Triadic influence model is used to organise risk factors into categories, little is mentioned in regards to the expected relationship between each of the three levels of influence and risk behaviour. There seems to be little in regards to hypotheses regarding which categories will have the strongest link to risk behavior. Additionally, it would be useful to see more discussion regarding how the findings might relate to other theories of risk behaviour. For example, does this evidence support the hypotheses of the Triadic influence model and suggest the theory is a better explanation for risk behaviours than others?

More background information would also be helpful in determining what precisely is meant by chronic diseases, and the link between risk behaviours and chronic disease. Obviously, the authors were limited in regards to the risk behaviours that they could examine based on what was included in the survey data, but a wider exploration risk behavior in general, and multiple risk behaviour in particular, what it entails and what the key outcomes of interest are would be warranted.

The methods and analyses appear appropriate. The purpose of each Poisson model is difficult to discern and perhaps further explanation is needed. Most of the intended audience cannot be expected to have a firm grasp on the use of Poisson models. The authors should be commended for examining subjects lost to follow-up in terms of association with outcomes. However, there are some limitations in the summation of number of risk behaviours to generate a risk score. This necessarily entails a loss of data and it is unclear which risk behaviours characteristically comprise the overall risk score and whether different combinations of risk behaviours, even where absolute number of risks are equal, can be considered functionally equivalent.
The author’s main finding was that what they call distal social variables more strongly influenced MRB than individual factors, either ultimate or distal. They therefore conclude that interventions should potentially focus on these. This concords well with a large body of evidence regarding the importance of family and peer factors on risk behaviours in adolescents and the authors identify a number of relevant past literature that accords with their findings. Perhaps more discussion of the link with findings on existing intervention literature could be included. Do effective interventions tend to focus on what would be considered distal social variables? My impression is that they do, which supports the findings, and warrants discussion.

In sum, this is a relevant, and generally well written and researched article. Though I recommend several changes, I believe that the article is of great enough interest and the research conducted well enough, that wider dissemination of the work is warranted. Any amendments based on the suggestions above are at the authors discretion. However, the following are compulsory changes (except where noted as discretionary changes):

1) Typo: However, of all integrative theories, the Theory of Triadic Influence seems to be the most comprehensive one because not only it addresses determinants of different types, such as individual and social characteristics, but it also attempts to explain how different types of variables influence multiple behaviors. (background, par. 3). MER

2) Background par. 3: change contrary to “as opposed to” DR

3) More background regarding link between behaviours and chronic diseases would be helpful. What is being referred to as “chronic disease” here? MCR

4) In abstract it says data is collected biannually (twice a year). Do you mean biennially (every two years)? MER

5) Does the NLSCY include any other risk behaviours of interest? If so, what’s the justification for this group of risk behaviours? MCR

6) Justification for “ever smoking and drinking” rather than amount of use. (For other risk factors, justifications based on official guidelines or cutoffs are offered). MCR

7) Some further explanation for the 4 multivariate models and the specific purpose of each would be helpful. MCR

8) Descriptive findings, 2nd para: clarify time period when discussing prevalence increasing “over time”. MER

9) Would be useful to include correlations between risk behaviours. Relatedly, some description regarding the details of the multiple risk factor score would be helpful. For example, are there patterns regarding which risk behaviours are most likely to be present in those presenting with fewer than the maximum number of risk behaviours? DR

10) Should mention some limitations to using a risk factor score in limitations section. MCR.
MCR: Major Compulsory Revisions
MER: Minor Essential Revisions
DR: Discretionary Revisions

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

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

**Declaration of competing interests:**

I declare that I have no competing interests.