Reviewer's report

Title: An exploration of the dynamic longitudinal relationship between mental health and alcohol consumption: a prospective cohort study

Version: 1 Date: 25 February 2014

Reviewer: Tim Stockwell

Reviewer's report:

General comments
I apologise for the delay in my review. I think this is a very well conceived study, addressing an excellent question by means of sophisticated analyses of a large longitudinal study with three measurement points five years apart. The writing is clear though I found the statistical and technical language of little obtuse at times. The conclusions are also clear and well argued though I have some questions about alternative interpretations I would like you to consider.

Major compulsory revisions
I have only two items to raise which I think belong in this category.

1. Implications of differential stability over time in key measures
I think it is important in this kind of analysis to think about the implications for the very different nature of the two key measures namely the SF-36 and number of alcohol units per week. I note that the SF-36 applies to a four-week period and the alcohol measure a one-week period before the assessment. I also note that there is substantially more variation in the measure of weekly intake than there is in the SF-36 measure. Presumably this also applies within as well as between individuals? I raise these differences since they may have implications for how a more static, slow-moving measure is able to predict changes over the ensuing five years than highly variable, erratic measure. I notice that the most variance appears to be explained by the final reciprocal model though this is not a significant improvement on the third one (i.e. mental health predicts alcohol consumption). I cannot help wondering considering all of this is whether this pattern of results would be exactly as expected if a) there is a fundamental reciprocal relationship between alcohol consumption and this broad measure of mental health status and b) one of the measures is more reliable and is an indicator of a more stable characteristic than the other. How would the analysis have looked if, for example, alcohol consumption had been reliably assessed over the previous 12 months whereas mental health status was over the last few days? Maybe the observed temporal dynamics would have reversed? Is it just possible that the reciprocal model that explained most variance would apply if more stable measures were utilised for the two variables of main interest?

2. I think you need to at the very least qualify your conclusions in the abstract and final section of the text that unequivocally mental-health drives alcohol consumption rather than vice versa. This may need qualifying as a consequence
of the comments above but also to make it clear that this conclusion may only hold for the bulk of individuals without an alcohol use disorder. Your suggestion in the discussion that there may be critical levels of alcohol consumption at which different types of dynamic relationships occur is well expressed. I think you should express this caveat clearly in the abstract and conclusion section. You should also place your conclusions within the context of a longitudinal study exclusively of well educated middle-aged people, mostly males. You should also note that different temporal dynamics/relationships may apply for different subsets of adverse mental health symptoms.

Minor essential revisions

1. You should indicate that the SF-36 applies to a four-week i.e. longer period than the last week diary for alcohol consumption.

2. In my opinion the key Table 2 would be easier to follow if it was divided into four, 1 for each model.

Discretionary revisions

There are older literatures addressing these questions using different research designs which I believe shed light and should not be forgotten. Experimental studies which have observed changes to mood during periods of heavy continuous drinking lasting days or weeks have documented increasing levels of anxiety and depression. Clinical studies have routinely shown how levels of anxiety and depression diminish when severely dependent drinkers achieve abstinence for a few weeks. Such studies are relatively easy to find and stress the need to think through carefully the implications of looking at the temporal relationships over different time periods i.e. interrelationships between alcohol use and mental health over days and weeks as opposed to over several years. I recommend a sentence or two referencing these literatures would be valuable in the discussion.

Quality of written English: Acceptable

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

Declaration of competing interests:

I declare that I have no competing interests