Reviewer's report

Title: Associations between climate variability, unemployment and suicide in Australia: a multicity study

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Reviewer: Eberhard A. Deisenhammer

Reviewer's report:

The authors report on the associations between a variety of monthly mean meteorological variables, unemployment and suicide numbers in 8 Australian cities and find several (inter-) relations. The topic in general has been studied before, but results are inconclusive and thus further studies are warranted.

Major issues:

• There are many discrepancies between the Results section and Tab. 2: Delta T - female suicide rate relation for Canberra; humidity in Darwin; rainfall in Melbourne; Results section: "to a lesser extent for females" in Sydney (line 141) is not true according to Tab. 2. The sentences in lines 160 and 164 appear to be incorrect. Also, lines 168/169 would suggest a clear relationship of Delta T and suicide rate in Melbourne which, however, exists for males only. Line 198 – also for males only. I recommend to recheck the data profoundly and match the discussion with actual results!

• In general, when studying meteorological effects on suicide risk the use of daily data may be a better choice than monthly means. If such a calculation is not possible (even when combining the data from all cities) this should be explained and listed as a limitation.

• A combined presentation would also reduce the likelihood that readers may be irritated by the so greatly varying patterns of associations which obviously cannot be explained sufficiently. Lines 222-224 indicate the way...

• It is not clear throughout the paper whether suicide rates or numbers have been used. If numbers ("cases" in Tab. 1), the potential change in population numbers (over 20 years!) should be accounted for in some way. If rates (much more appropriate), the calculation method should be made clear in the Methods section (per 100,000 per month?). "Cases" in Tab. 1 then should be replaced by rates. In the Abstract, Tab. 2 and other sections it only says "suicide" or "s. data".

Minor issues:

• Abstract: "higher" temperature should probably read "increasing". Even if there is a conflict with a potential word limit, the meteorological variables studied should all be mentioned (probably best in the results section instead of "other m. v.").

• In Tab. 1 information on the significance of differences between the cities may be added (if authors choose to stay with the separated presentation).
• Line 148: New paragraph.
• Lines 206/207: Data from which city are similar to Melbourne?
• Since the direction of the interaction of Delta T and unemployment cannot be determined, lines 228-229 should read "... effect between..." (not on). An explanation for and/or discussion of this interaction is lacking.
• Some recent studies on the topic are missing, e.g. Yang et al. (JAD 2011), Tsai and Cho (JAD 2011), Dixon et al. (Int J Biometeorology 2007). An overview on previous research is given in Deisenhammer (Acta Psychiatr Scand 2003). The Vyssoki et al. 2012 study may be replaced by the more recent and detailed one from 2014 (JAMA Psychiatry).

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'