Review of: "Associations between direct contact with the oil and worsened health indicators after Deepwater Horizon oil spill: Results from Gulf States Population Survey"

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Potential competing interests: No potential competing interests to declare.

Overall, the topic related to the health effects in populations exposed to oil spills is of great interest in public health, and particularly environmental health. This study provides a cross-sectional analysis of exposure to Gulf of Mexico oil spill exposure and some health indicators based on a telephone survey conducted within a period of 12 months after de spill.

The methods describe the type of questions included in the survey which included acute periods of time for self-rated health, self-rate quality of life, and suicidal thinking. However, chronic health diseases, anxiety and depression were based on health diagnosis with no specific limit of time which implies life prevalence for these health outcomes. Therefore, it is not adequate to analyze these health outcomes as timely related to the oil spill and conclude that DCO might be a risk factor for anxiety and depression as temporality is not clear in this analysis.

The methods also describe two different approaches to define confounding variables: an approach based on DAGs and the approach based on change in estimate. It is weird to say that DAGs were too complex to depict causal thinking and therefore a command in Stata was used to define confounding. Conceptually both approaches for conceptualizing and defining confounding are very different. In addition, one the change-in-estimate approach was selected, the % of change used (0.09%) is unusually low of this type of analysis and is not supported by the authors. Therefore, the definition of confounding variables is not clear. Similarly, the definition of mediatiors is not clear and probably not accurated as it is defined by data and not by relationships among variables in the specific context.

The results are presented in detailed along with supplementary material, but the text is long and repetitive. Table 1 present variables distributions by DCO exposure group but % are calculated based on total N for each variable rather than % within DCO group. Thus, the comparison between both DCO groups (exposed and non-exposed) is not possible as presented.

The co-occurrence of mental illness and poor physical health is briefly discussed in section 4.3., however the conclusion in the abstract uses words as co-occurring, co-existing and concurrent which are not clear about their meaning and are not clear after reading the full text. The conclusion in the abstract also suggests that the prevalence of SRH, QoL and phychiatric disordes was high AFTER the oil spill, which cannot be concluded using this data, at least not for anxiety and depression (measured as life-prevalence rather than recent diagnosis).

I recommend the authors to revise the whole document and support more clearly their approach for confounding and the temporal relationships among variables and DCO exposure based on the strict way as the variables were collected.