Author's response to reviews

Title: Are variations in rates of attending cultural activities associated with population health in the United States?

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Author’s response to reviews: see over
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Dear BMC Public Health Editors:

My colleagues and I were pleased to further revise our manuscript based on the reviewer’s thoughtful comments and would like to resubmit a revised version of our manuscript entitled “Are variations in rates of attending cultural activities associated with population health in the United States?” We feel that we were able to address all of Dr. Nicholson’s comments. Although we were unable to address Dr. Rosvall’s comments, simply because the data are unavailable to do so, we feel that her comments reflect weaknesses in the study design and therefore have modified the concluding paragraph to underscore these important issues. We feel that the manuscript is substantially improved, again, as a result of their comments. All text changes in the manuscript are highlighted.

In response to Amanda Nicholson’s comments we have made the following changes:

**Major Compulsory Revisions:**
N/A

**Minor Essential Revisions:**

Cultural activities index as dichotomous / categorical variable

Thanks for the additional clarification as I’m fairly sure I now understand your comment. As you suspected in your first review, the association between attending any activity versus none is not significant, after controlling for the covariates. Indeed this is the case if we look at any activity vs. none (N = 1,244; OR = 1.28; 95% CI: 0.89 – 1.85), 1 activity vs. none (N = 547; OR = 1.20; 95% CI: 0.79 – 1.84), 2 activities vs. none (N = 511; OR = 1.12; 95% CI: 0.66 – 1.91), or 3+ activities vs. none (N = 690; OR = 1.50; 95% CI: 0.90 – 2.51). We now indicate in the text (page nine, first paragraph) that “However, when we assessed the risk of reporting poor health using number of cultural events attended as a binary and categorical variable, we found that the odds ratios of poor health among people attending any activity vs. none, one activity vs. none, two activities vs. none, or three or more activities vs. none were not significantly different from one.”

Because by definition when we categorize a “continuous” measure we lose information, I am not sure that reporting these results strengthen the manuscript and therefore wonder if we should not report these results.

Mediator analysis & Figures

Methods page 6, paragraph 3

We have expanded the methods on page 6 to explicitly illustrate the mediator analysis methodology. In so doing, we also added in a new figure with clearly labeled paths (a, b, c, and c') and refer to new figure 1 in the description of the mediator analysis methodology. The revised text is highlighted in the manuscript on pages 6 and 7.

Results page 9, paragraph 3

You are correct – the Sobel test is a test of the mediation effect and does not test the effect of cultural activities on SRH. We have now modified the text on page 9, paragraph 3 and now state “The modified version of the Sobel test indicated that attendance at cultural activities mediated the relationship between SES and SRH regardless of whether the measure of SES was assessed independently (p < 0.001 for both) or conjointly (p = 0.04).” The revised text is highlighted in
the manuscript on the bottom of page 9 and top of page 10. Rather than adding the Sobel test to the figures, we simply report the percentage of the total effect that is mediated in the footnote.

Figures 1a, 1b, 1c
As you suggested, adding figure 1 and more detail to the methods section when we describe the mediator analysis methodology, has enabled us to include more of the results in figures 2a – 2c and shorten the footnotes. Although adding the adjustment variables did increase the length as well. However, overall, the footnotes now highlight the results rather than reiterate them at the same level of detail as presented in the results section. The revised text is highlighted.

Discussion
Page 9, paragraph 1
We agree with Dr. Nicholson that the text on page in paragraph 1 as previously written implied the presence of ceiling effects and have therefore deleted “up to a certain level” from the sentence as this was not our intention.

We have clarified the text on page 12, paragraph 3 (now page 13, first full paragraph). We have changed “more of each event” to “each type of event more frequently” and we have changed “it is likely” to “it is possible.”

**Discretionary Revisions:**
N/A
In response to Maria Rosvall’s comments we have made the following changes, indicated those that we are unable to make, and indicated why:

**Major Compulsory Revisions:**

1. We are in complete agreement with Dr. Rosvall. It is impossible to draw conclusions about the direction of causality and the lack of baseline data on morbidity is a serious problem. In response we can simply state that the results from this study do not inform us, nor are they intended to inform us, about the direction of causality. Rather they are intended to demonstrate an association that, because of its potential policy implications, merits further exploration using experimental and longitudinal methods. Therefore we open the discussion by stating “In interpreting these results it is important to consider the cross-sectional design, which prevents causal explanations.” However, we believe the results are of sufficient interest that they will inspire further research using longitudinal and experimental approaches.

2. We agree with Dr. Rosvall that some of the activities that were available for analysis may well be attended more frequently by higher SES groups. Indeed, the unadjusted associations between attending cultural activities and both household income and educational attainment presented in table 1 demonstrate this. Accordingly we have added the following sentence “In addition, several of the activities examined may be more frequently attended by individuals from higher SES groups as they are costly (e.g. opera, dance, and theatre), others may appeal to younger audiences (live music and movies), and yet others to people with specialized interests (art exhibits)” in the paragraph that addresses limitation of the data (first paragraph on page 13). And conclude the paragraph with the following “Also, examining a wider variety of cultural activities will enable us to determine if the SRH benefits are specific to the activities we examined, to individuals from higher SES groups, a combination of both the activities we examined and high SES, or neither.”

However, if attending cultural activities does mediate the SRH-SES relationship, as we observed when we examined activities that are primarily attended by higher SES groups, it is possible that widening participation in such activities could have tremendous public health benefits for people of lower SES; unless there is something that is more prevalent among people with high SES that allows more of them to realize such health benefits. We have also included the above statement on page 12 of the discussion, first full paragraph.

3. We agree with Dr. Rosvall that the theoretical framework regarding the mechanisms through which attending cultural activities influence health is under developed in this paper. However, as is frequently the case with new lines of scientific inquiry, we must first demonstrate that an association exists. Once the association has been established, the result serves as the background or impetus for future studies designed to understand the possible mechanisms. Therefore, in response to the valid issues that Dr. Rosvall raises, we have expanded the concluding paragraph.

In conclusion, we feel that we have addressed Drs. Nicholson’s and Rosvall’s points to the best of our abilities and therefore hope that you will consider publishing the revised manuscript.

Sincerely,

Anna Wilkinson, Alvin Tarlov, Lars Olov Bygren