Reviewer's report

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

Version: Date: 8 May 2007

Reviewer: Joanna Stewart

Reviewer's report:

General

General comments

There have been a very large number of analyses done which overlap rather in their purpose, using different distributional assumptions. Apart from the difficulty of many non independent tests being performed, and the resulting large number of p values many of which are really reflecting the same thing, it is confusing for the reader. The many different approaches, with their different assumptions have resulted in over analysis and over-interpretation of the data.

Major recommendations

I would recommend the removal of the individual variable statistical testing – ie the p values from table 1. While it is useful to present the actual data to the reader – ie the percentages given in table 1, the variables in this table are very correlated and therefore the value of these analyses is limited. Also the assumptions used to test the single variable associations differ from those used in the multiple variable situation. The single variable tests were mainly chi square tests, assuming only categorical, non directional data. In the multi variable analyses many of the explanatory variables were treated as continuous variables and there was an assumed direction of the relationship. This change of assumptions is not appropriate. Two of the analyses presented in this table are also basically the same analysis (cultural events with health status). In summary, for many reasons, these univariate analyses, as reported, should be removed. The more valid information on the relationship of the confounding variables with health status is given in table 3. If it is considered important to test the associations of the demographic measures with attendance at cultural events then a multiple variable analysis should be reported. If the authors wish to report analyses of individual variables in order to comment on changes in observed relationships when confounding variables are included then these analyses need to be conducted using the same methods as used in the multiple variable analyses.

Table 3 should include the overall p value for each of these variables – ie the p value for the effect of age, gender, marital status, race etc as these cannot be inferred from the odds ratios and confidence intervals for the various levels of the variables.

The sentence on the separate analyses with different binary definition of activities attended in the first paragraph on page 9 should be removed. If you wish to verify the assumption that the association of number of events attended with health is in fact linear (on the logit scale) then you could run the analysis with this variable included as a categorical variable and examine the pattern of the estimates of the coefficients.

The reanalysis of the data treating health status, measured on a 4 point ordinal scale, as a normally distributed variable is not appropriate. Also, an assumption for calculating an estimate of the mediation effect is no possibility of an influence of the outcome variable on the mediating variable, which would not seem a reasonable assumption in this instance. With these limitations of the available data, it would be better to restrict interpretation to a more descriptive level which can be gained from examining the associations observed of health status with SES variables and cultural activities from the logistic regression analyses. It is over analysing and interpreting the available data to go further than this.

If it is considered that there is more information in the 4 health states than in the binary variable then ordinal logistic regression could be used.

Minor essential
The estimate of the odds ratio should be included before its CI at the top of page 9

Minor discretionary

Suggest the removal of the word ‘linear’ from the first sentence of the introduction

The reason for running 3 hierarchical logistic models for each of the outcomes is not really obvious or discussed in the paper. Also the interpretation is difficult by the time you have 7 different but very related outcomes. As you add variables to the model the p value of your explanatory variable is likely to decrease and just at what stage it happens to cross the value you are choosing to call significant for one outcome compared to another is somewhat arbitrary. You therefore need to be careful about how you interpret these 7 analyses and consider whether there is any real benefit of analysing the individual activities in isolation. Given your purpose is to investigate whether the attendance of cultural activities is related to health and whether this relationship remains when factors measuring SES are included I would have thought model I and III would have sufficed. (Was there a reason for the inclusion of subjective social class in model I?)

Unfortunately even longitudinal observational data will not be able to attribute causality.

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Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

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Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

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Discretionary Revisions (which the author can choose to ignore)