Author's response to reviews

Title: The Burden of Chronic Diseases in a Rural North Florida Sample

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Author's response to reviews: see over
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Mr. Victorino Silvestre on behalf of
Dr. Anne Taylor
Editor Biomedical Public Health
e-mail: editorial@biomedcentral.com
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Dear Dr. Taylor:

RE: MS: 6434620168906442
The Burden of Chronic Diseases in a Rural North Florida Sample Henrietta L Logan, Yi Guo, Virginia J Dodd, Keith Muller and Joseph Riley III

Thank you for the careful review of our manuscript. We have considered each of the comments of the two reviewers and have addressed each within the text of the manuscript. We also provide a detailed summary following each comment below.

Reviewer 1
This study analyzes survey data for a rural Florida region to identify the prevalence of diabetes, cardiovascular disease, cancer, and arthritis as well as related risk factors. The introduction would benefit from a much sharper focus on what is already known about the prevalence and risk factors for the selected chronic conditions in rural areas of the US, and why the study region is of particular interest.

Response: Thank you. We heartily agree, and using new references from the Rural Healthy People Campaign has sharpened the focus of this report. We have also pointed out how difficult it is to obtain baseline information from national data sets because of the small numbers and confidentiality limitations [pp 4-5]. We also believe we have emphasized the importance of regional data on these chronic diseases.

The lengthy description of how the Healthy People campaign has evolved over time, for example, can be shortened considerably, and findings from the Rural Healthy People initiative would be relevant to include.

Response: Thank you for this valuable suggestion. Reading the Rural Healthy People initiative and the supporting documents in detail was very helpful in revising this work. This reviewer will find reference to the documents scattered throughout the manuscript. The evolution of the Healthy People campaign has been shortened and the need to focus on rural health and rural residents has been increased.

References 14, 15, and 34 are new references from the suggested work.

The introduction also indicates in a single sentence that depressive symptoms are of interest as a risk factor, and more background and justification for why the authors focus on this factor specifically should be provided.
Response: We have added the following text plus two references, Chapman 2005 and Moussavi 2007, justifying depressive symptoms as a risk factor. The text now reads, “Our rationale for including a measure of depressive symptomology is the emerging importance of depression as a contributor to disease burden and as a public health problem. Increasing the understanding of the relationship between depressive disorders and chronic disease by providing reliable baseline data appears vital to public health assessment and the delivery of interventions throughout the rural health care system.” We have also added reference 44 to support our finding on depressive symptoms among a rural sample.

A major issue in the current way the findings are discussed is language that appears to infer directional causality from cross-sectional survey data. For example, the following sentence as written implies that depressive symptoms lead to or predict chronic conditions: “Depressive symptoms emerged as significant predictors for cardiovascular disease, arthritis, and diabetes. (p.13)” It might plausibly be assumed instead that these results suggest that people with chronic illness are at risk of developing depressive symptoms as a result of dealing with their chronic conditions. Sorting between these two alternatives is not possible with the data at hand.

Response: Thank you for pointing out the inference of causality. That was not our intent. The text has been revised as follows:

Depressive symptoms emerged as significant predictors within the cardiovascular disease, arthritis, and diabetes statistical models. This is not to imply causality but it might plausibly be assumed that these results suggest that people with chronic illness are at risk for developing depressive symptoms as a result of dealing with their chronic conditions. Moreover, recent reviews show that depressive symptomology at 12 months post myocardial infarction predicted mortality. Sorting between explanations of causality is not possible with the data at hand. However, since 85% of MHPSAs (Mental Health Provider Shortage Area) are rural, and approximately one third of rural U.S. counties lack any health professionals equipped to address mental health issues, it is of concern whether most of those reporting depressive symptoms were receiving care.

Some references are incomplete, such as reference 6, which lists as the author “Health ACoM.” This sort of error often results when reference manager software incorrectly downloads to the author fields, and can be remedied by manually editing the reference once it has been downloaded into the database.

Response: Thank you for the observation. These incomplete references have been corrected.

Level of interest: An article of limited interest

Quality of written English: Not suitable for publication unless extensively edited

Statistical review: No, the manuscript does not need to be seen by a statistician.
Reviewer 2

Major Compulsory Revisions:

1. The authors indicate that a complex sampling design was used to collect the data. The analysis claimed to use "survey sample weighted" analyses but did not identify
   a. how the weights were constructed, b. whether they adjusted for the oversampling of blacks and males and c. whether a statistical software package that can appropriately account for such a complex design was used.

   Response: We agree with the reviewer that more information on sampling weights is needed. We added the following sentences to the statistical analysis section:

   To compute sampling weights, the residents were divided into 18 strata defined by three dimensions: census block groups classified by percentage of African American (3 levels: 30+%, 20–29%, below 20%), gender, and race. Sampling weights were then calculated for the strata using population data for Florida from the 2000 US Census to account for the oversampling of Blacks and men.

   Survey procedure PROC SURVEYLOGISTIC of SAS version 9.3 (SAS Institute, Cary, NC) was used for the analysis. We specified stratification and weights using the STRATA and WEIGHT statements.

2. Were there questions on the survey related to access to care, having a current physician, regular screening or exams, having insurance coverage asked? Please expand the analysis if these were included. If not, please explain why not.

   Response: An important set of questions. We did not collect information on access to care, regular screening or exams, or having insurance coverage. Although it might have been useful to have done so, we were focusing on obtaining a rough estimate of disease prevalence rather than characterizing access issues in this community. In the future we will do so, if possible. We did ask the participants whether they had “a personal doctor.” The exact wording of the question was “A personal doctor is the one you would see if you need a check-up, want advice about a health problem, or get sick or hurt. Do you have a personal doctor?” A table of disease by having a personal doctor is shown below. The association, while interesting, is probably due to the wording of the question; therefore, we did not include this variable in the models.
<table>
<thead>
<tr>
<th></th>
<th>No</th>
<th>Yes</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cancer</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal doctor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>9.9%</td>
<td>4.0%</td>
<td>0.0008</td>
</tr>
<tr>
<td>Yes</td>
<td>90.1%</td>
<td>96.0%</td>
<td></td>
</tr>
<tr>
<td><strong>Diabetes</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal doctor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>10.6%</td>
<td>2.3%</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Yes</td>
<td>89.4%</td>
<td>97.7%</td>
<td></td>
</tr>
<tr>
<td><strong>Arthritis</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal doctor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>11.7%</td>
<td>4.7%</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Yes</td>
<td>88.3%</td>
<td>95.3%</td>
<td></td>
</tr>
<tr>
<td><strong>Cardiovascular disease</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal doctor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>9.7%</td>
<td>4.4%</td>
<td>0.0075</td>
</tr>
<tr>
<td>Yes</td>
<td>90.3%</td>
<td>95.6%</td>
<td></td>
</tr>
</tbody>
</table>

3. Other missing potential covariates/confounders include weight, BMI, internet access, number of people in household, marital status. Were these included?

Response: Thank you. We did not collect information on these variables in the survey.

4. How did the authors account for missing data?

Response: About 3% of the participants had missing answers. They were excluded from the analyses.

5. Were mediators and moderators tested? How?

Response: We did not perform more complicated analyses, including mediation analysis. The goal of this manuscript is to report the prevalence of major chronic diseases in a rural sample and provide a grand
view of what psychosocial factors are associated with having the diseases. Differential effects by gender and race were tested by including interactions involving gender and race in the regression models.
6. Authors do not consider the potential for sampling bias due to the use of random digit dialing of landlines. The high prevalence of diabetes, depression etc. could be due mainly to the ability to reach a sicker, more impoverished sample.

Response: We agree with the reviewer that there is a potential sampling bias. This potential problem is now recognized in the limitation section in Discussion and reference 45 has been added.

7. The authors do not indicate that their comparisons to state and CDC data where age and/or race adjusted. They should be.

Response: All prevalence rates are now age-adjusted to the 2000 US population.

8. Authors need to better define the continuous variables of financial security (0-2) and health literacy (0-3) for the reader. These appear to be coming from categorical questions. Also when defining, explain how missing data was dealt with.

Response: We expanded the last paragraph of the description of variables to include calculations of the scales.

9. The second paragraph on Cardiovascular Disease on page 11 seems a gross generalization. How does it relate to the [31] citation?

Response: We apologize if we overstated the case. Citation 32 (formally citation 31) is an example of using churches to deliver programs that targeted AA women and improved cardiovascular-related health outcomes.

Nonetheless we have removed the paragraph as it is not central to our discussion.

10. The authors need to better define the prevalence of cancer - any?, 1st? recurrence? currently in treatment?...

Response: The Seattle Index of Comorbidities uses the following question: “Has a doctor or a nurse ever told you had cancer (other than skin cancer)?” Due to the length of the survey, we did not probe further, so the response is very general.

Minor Essential Revisions:
1. page 5 The number of physicians/10,000 for rural whites is necessary for a comparison.

Response: We agree that if we talk about rural Blacks we should also present data about rural whites. In reading the literature we have chosen to remove the statement altogether. Rural minorities often have very different access to transportation and other discretionary resources. Implying that the number of physicians per racial group in rural communities is the key factor in access seems disingenuous and potentially misleading. Moreover, suggesting that immediate availability to nearby physicians is an equal burden for all groups lacks evidence. After extensive reading of the literature, we have chosen to eliminate the statement rather than attempting to present all possible caveats to interpretation of such facts.
2. page 7 line 15 spacing - there's no space between ".Education"

Response: We added a space in front of education.

3. page 12 prevalence of arthritis is exactly the same for the sample and the US - one of them must be incorrect.

Response: Thank you for finding this typo. The corrected numbers are now provided in the manuscript.

4. Table 2 - better defined prevalence - is this a %? per 10,000...100,000?

Response: We added a footnote to Table 2 to indicate prevalence values are percentages (%).