Author's response to reviews

Title: Analysis of five-year trends in self-reported language preference and issues of item non-response among Hispanic persons in a large cross-sectional health survey: implications for the measurement of an ethnic minority population

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Author's response to reviews: see over
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Jolayne Houtz
PHM Editorial Team
Population Health Metrics

Subject: MS: 5114669673369489, Analysis of five-year trends in self-reported language preference and issues of item non-response among Hispanic persons in a large cross-sectional health survey: implications for the measurement of an ethnic minority population.

Dear Ms. Houtz,

Thank you for the quick review of our manuscript. We have read the reviews of the referees and have made changes to the manuscript where possible. We are grateful for the referee’s insightful and thorough comments and believe that the changes we have made will make the manuscript more useful to readers. The responses to the referee’s are attached.

We believe that this work is important to the field of survey research and look forward to its publication in *Population Health Metrics*.

Sincerely,

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Response to Referees

Referee #1

We thank the referee for their kind comments regarding our manuscript and agree that this is an important manuscript highlighting trends in population growth and issues concerning health data for Hispanic persons in the United States by language preference.

Minor essential revision: The referee has asked that we elaborate in the Discussion section of the manuscript several hypotheses as to why differences between Spanish-speaking and English-Speaking Hispanic respondents are seen.

We have added an additional paragraph to the Discussion section of our manuscript addressing the differences found in our study. In this paragraph we have included hypotheses on these differences and reiterated the necessity for further research into these differences. The additional paragraph is hi-lighted in the manuscript and is included here:

We believe that the differences in item non-response and call attempts for survey completion found in this study might be explained by cultural differences between respondents choosing to complete the survey in Spanish and those choosing to complete the survey in English. The questions that were less likely to be answered by Spanish speaking respondents included general health, days of physical health not good, days of mental health not good, and diagnosis of diabetes. Three of these questions deal with self-perceived health status and it is possible that cultural beliefs within the Hispanic population, especially among those who are less acculturated (Spanish speaking), would affect responses to questions about self-perceptions of health. However, our finding that Hispanic respondents choosing to complete the survey in Spanish had a lower mean number of call attempts for survey completion was surprising. This difference may also be explained by further measures of acculturation, such as length of time in the country and country of origin, which are not included on the survey. Spanish-speaking respondents may choose to feel more associated with their host country by participating in a health survey, but may not fully understand some questions due to cultural context. These differences should be explored more fully and findings from this study provide preliminary information for debate and research on the topic. These findings also speak to the necessity of including more measures of acculturation in the BRFSS in order to better understand health outcomes and survey metrics for a growing minority ethnic population.
Referee # 2

We thank the referee for their comprehensive review. We have made changes to the manuscript where possible. Each comment is addressed below.

1. Discretionary revision: The use of the term acculturation in the discussion/conclusions is a bit vague…

In the Discussion section, examples of acculturation are provided as seen in the following paragraph:

*It is possible that further measures of acculturation such as length of time spent in the U.S. and country of origin may also have an effect on survey outcomes. These findings have significant implications for surveying the health of an ethnic/minority population and should be studied in data that collects this information.*

To further address this comment, we have added additional language to the discussion section which provides examples of acculturation. The additional language is hi-lighted in the manuscript and is included here:

*This difference may also be explained by further measures of acculturation, such as length of time in the country and country of origin, which are not included on the survey. Spanish-speaking respondents may choose to feel more associated with their host country by participating in a health survey, but may not fully understand some questions due to cultural context.*

2. Minor essential revision: The referee asserts that the use of the phrase “increasing the sample size would result in more precise findings” would be better stated as “increasing the sample size to reflect the proportion of Hispanics in the general population would increase the representativeness of the sample”.

We agree with the idea that the referee has presented and we contend that a larger sample size would produce more precise findings. Therefore, we have added additional language to the referenced sentence stating “Including additional measures of acculturation and increasing the sample size of Hispanic persons in the Behavioral Risk Factor Surveillance System would result in more precise and more representative findings that could be used to better target prevention and health care needs for this ethnic minority population”.

3. Minor essential revision: The referee states that the degree of change in the proportion of the Hispanic population in the U.S. is a more important aspect of increasing population rather than just increasing numbers.

We have summarized in the Introduction of the manuscript a statement from the U.S. Census Bureau stating “Projections by the U.S. Census Bureau suggest that by the year 2050, the number of Hispanic persons in the U.S. will more than double” [2]. In the first
paragraph of the Discussion section, we do note the degree of change in the population as an issue in the measurement of the Hispanic population in the U.S. “The initial analysis in this study illustrates both the scope and speed of changing Hispanic demographics in the U.S. and how those changing demographics relate to a national health survey”.

We further state in the Discussion section the aspect of the quickly increasing proportion of Hispanic persons in the U.S. compared to African-Americans and that this issue provides an opportunity for increasing the sample size of Hispanic persons in the federal health surveys. For more clarification, we have added a phrase to the paragraph that further asserts the increasing proportion of the U.S. population comprised of Hispanic persons.

The estimates initially presented in our analyses demonstrate that the rate at which the Hispanic population has grown has outpaced that of the other traditional minority population in the U.S., African-Americans and demonstrates the increasing proportion of the U.S population made up of Hispanic persons. At the same time, the numbers of self-identified Hispanics completing the BRFSS have lagged behind those in the African-American community. These facts create an opportunity for a large health survey to focus on a growing and increasingly important demographic segment of our country. This opportunity could be addressed through increased federal funding for larger sample sizes and for oversampling of Hispanic populations throughout the country. Future surveys might include more in-depth questions examining cultural differences related to health care, and potentially increase response rates to surveys among newly-immigrated and possibly less-acculturated populations.

4. Major compulsory revision: The referee states that there is no mention of demonstrated differences in health outcomes for the Hispanic population compared to other ethnic populations in the sentence: “Based on the demonstrated differences in health outcomes for the Hispanic population compared to other ethnic populations, and within the Hispanic population based on language preference, there have been renewed efforts to study health disparities in this underserved group [10]”. Therefore, we have added the references from previous paragraphs discussing differences in health outcomes for the Hispanic population to the sentence in question so as to more clearly identify sources for the statement.

Based on the demonstrated differences in health outcomes for the Hispanic population compared to other ethnic populations, and within the Hispanic population based on language preference [4 – 9], there have been renewed efforts to study health disparities in this underserved group [10].

5. Discretionary revision: The referee states that “I wonder if the outcomes measured in the study are better placed in the methods section of the paper”.

We believe the referee is correct in the placement of the outcomes measured in the study. We have moved the following paragraph from the Introduction to the Methods section:
Three survey outcomes from the BRFSS were studied. First, trends in the numbers of Spanish language surveys were determined over a 5-year period. These were compared both to trends in the numbers of surveys completed by various demographic groups and to demographic trends in the U.S. Second, differences in item non-response using a series of questions on health care access and health behaviors were examined based on language preference in an adult Hispanic population. Third, the number of attempts to complete a health telephone survey was examined based on language preference in the same adult Hispanic population.

Furthermore, we have included a description of the measured outcomes in the Statistical Analyses sub-section of the Methods section. We have also added clarification of these measures in the same section. They are as follows:

**Statistical Analyses**

All analyses of data using the BRFSS were conducted in SUDAAN [15] to account for the complex sampling design of the survey. We recorded the number of surveys completed each year by self-identified Hispanic persons, the number of surveys completed in Spanish by self-identified Hispanic persons, and the number of surveys completed by African-Americans and whites. We compared these to U.S. Census estimates for the Hispanic, African-American, and white populations 18 years of age and older, by year. Rates of change in percentages were calculated for each group over the 5-year period. Non-responses for questions in the five categories were stratified by language preference among self-identified Hispanics completing the survey. Differences in non-response rates, which are an indication of item appropriateness as well as survey completeness, between the two language groups were tested using Chi-square analyses for each question.

The number of call attempts to complete a survey were examined in two ways. The first was a comparison of the mean number of calls for each language preference. The difference in means was confirmed using a t-test. The second examination method utilized a linear regression model that looked at the influence of language preference on the number of call attempts while controlling for age and sex.

6. The referee states that “the paper would benefit from a short explanation of the study methods as to how they relate to the outcomes discussed in the paper. For instance, how were the study participants selected? Was data collected on country of birth? Regarding number of attempts to complete the survey – does this refer to the number of calls to make initial contact, calls purely to complete the questionnaire or both? Also, when were calls made? How many attempts were made before someone was deemed non-contactable?”

We have included language in the Methods section to better describe the BRFSS survey and to explain the selection of participants in the survey. The new language is hi-lighted below.
Data for this study were taken from 5 years (2003–2007) of the Behavioral Risk Factor Surveillance System (BRFSS) survey, a state-based, random-digit dialed telephone survey collecting data on health risk behaviors, preventive health practices, and health care access primarily related to chronic disease and injury. Survey calls are made on weekdays as well as weeknights and weekends ranging from 10:00 A.M. to 9:00 P.M. Up to fifteen call attempts are made to complete each survey [12] as well as from 5 years (2003–2007) of the U.S. Census [13].

7. Discretionary revision: The referee states that “…a sensible starting point for the paper is to demonstrate a difference between the outcomes for the overall Hispanic sample compared to the total sample and to the other major ethnic groups”.

We agree with the referee and plan to conduct this analysis in future work.

8. Minor compulsory revision: The referee states that “Even though the authors state that analyses are limited to Hispanics, they then proceed to describe the first analysis, a comparison between Hispanics, African-Americans and whites.

We have added language to the methods section which more clearly describes the population analyzed and the analyses conducted for that population.

Analysis of response rates and item non-response in the BRFSS were limited to persons identifying themselves as Hispanic. Median cooperation rates for the BRFSS survey by year were as follows: 2003, 74.8%; 2004, 74.3%; 2005, 75.1%; 2006, 74.5%; and 2007, 72.1% [14].

9. Minor compulsory revision: The referee states that there should be consistency in the reporting of results, some figures are rounded up to whole numbers, some reported to one decimal place.

Estimates from the BRFSS are commonly reported to the tenths decimal place. It would not be appropriate to round estimates from the BRFSS to a whole number, especially when making statistical comparisons. The numbers from the Census data are the numbers listed in their reports.

10. Major compulsory revision: The referee suggests that it would be interesting to know if the proportion of Hispanics consenting to take part increased with the introduction of the Spanish version of the survey in 2003.

We have looked at the proportion of respondents who have identified themselves as being Hispanic prior to 2003 and have seen no significant change from 2002 to 2003. We believe that an analysis of several years of data prior to 2003 for comparison would entail a new study. We will pursue this study in future work.
11. Major compulsory revision: The referee states that the calculations for number of surveys, reported in paragraph number one of the Results section are incorrect.

We thank the referee for finding this important error and we have recalculated the percentages reported in paragraph number one and have made the appropriate changes.

Over the period from 2003 to 2007, the number of Spanish-language BRFSS surveys completed by self-identified Hispanic persons increased by nearly 50%. From 2003 to 2007, the U.S. Census estimates for the U.S. Hispanic population increased by approximately 14% and the total number of self-identified Hispanic persons completing the BRFSS survey increased by 59.3%. During the same time period, the U.S. Census estimates for the African-American population increased by 6.7% and the total number of African-Americans responding to the BRFSS survey increased by 60.6% (Table 1).

12. Major compulsory revision: The referee states that the under-representation of Hispanic persons in the BRFSS is not emphasized in the results and that the reader is left to work this out for themselves.

We agree with the referee and have added language to the results section to highlight this point. Additions are highlighted in yellow.

Over the period from 2003 to 2007, the number of Spanish-language BRFSS surveys completed by self-identified Hispanic persons increased by nearly 50%. From 2003 to 2007, the U.S. Census estimates for the U.S. Hispanic population increased by approximately 14% and the total number of self-identified Hispanic persons completing the BRFSS survey increased by 59.3%. During the same time period, the U.S. Census estimates for the African-American population increased by 6.7% and the total number of African-Americans responding to the BRFSS survey increased by 60.6%. The increase in the Hispanic population in the U.S from 2003 to 2007 was nearly seven times greater than that of African-Americans. However, the numbers of BRFSS surveys completed by Hispanic persons was more than four times less than that of surveys completed by African-Americans (Table 1).

13. Major compulsory revision: The referee states that a comparison of being born in the USA or not, educational attainment and income by language preference may have an impact on the survey response.

We agree with the referee on this point. Unfortunately, origin of birth is not collected in the BRFSS. We have stated this as a limitation in the Discussion section of the manuscript. Further, in Table 2 of our manuscript, we demonstrated in our study population, that there was no significant difference (p = 0.1) between Hispanic persons choosing to complete the survey in Spanish and those choosing to complete the survey in English. Education is accepted as a proxy for education. Also, the BRFSS has nearly a 10% non-completion rate for income across all race and ethnicity measures. Therefore, income was not included in the analyses. Below is the paragraph demonstrating our call
for additional measures such as country of origin and length of time spent in the country to be added to the survey.

It is possible that further measures of acculturation such as length of time spent in the U.S. and country of origin may also have an effect on survey outcomes. These findings have significant implications for surveying the health of an ethnic/minority population and should be studied in data that collects this information. These implications include focusing on culturally appropriate questionnaire development for ethnic populations and assuring representative samples for minority populations.

14. Discretionary revision: The referee states that “The results of these analyses by language preference would be more meaningful if they were couched within the context of there being a difference between this sub-group, the other ethnic sub-groups and the overall study population”.

We decided to focus our study on differences between English speaking Hispanic persons and Spanish speaking Hispanic persons so as to have more of an equal cultural context (Hispanic heritage) for comparison of the language preference. We agree that comparing response rates across all ethnic and minority populations would be meaningful and plan to conduct this analysis in future work.

15. Discretionary revision: The referee asks if the differences in survey completion between Hispanic persons choosing to complete the survey in English and those choosing to complete the survey in Spanish meaningful.

We believe that are findings are meaningful. Our analyses have filled a gap in knowledge by documenting changes in population demographics in the U.S. and the numbers of surveys completed by different demographic segments in the U.S. for the world’s largest health telephone survey conducted in the U.S. To our knowledge, this work has not been completed before. Our analyses highlight changes in population demographics and opportunities for a U.S. federal health survey to adapt to those changes as well as differences in survey metrics for the largest and fastest growing ethnic minority in the United States.

16. Major compulsory revision: The referee states that the analysis would have been strengthened by inclusion of educational attainment, employment level and if possible being born in the USA or not.

Employment level and birth in the USA are not included in the survey. Responses to educational attainment and whether or not a respondent was employed were included in the analysis of item non-response. See Table 2.

17. Major compulsory revision: The referee states that the sentence “The analysis sheds light on how the BRFSS is capturing a representative sample of an ethnic minority
population by adapting to a cultural need within that population and conducting Spanish
language surveys” is difficult to draw a conclusion from without a comparison to the
proportion of Spanish participants before the introduction of the Spanish language
questionnaire.

We agree with the referee on this point. We have changed the above noted sentence to:

“This analysis further describes the trend in the numbers of Spanish-language surveys in
the BRFSS.”

18. Major compulsory revision: The referee states that the sentence “The Spanish
language survey was able to increase the amount of health care data collected, which is
necessary to study disparate outcomes for the Hispanic population in the United States.”
implies causality and was not demonstrated in these analyses.

We have changed the sentence to “The use of a Spanish-language questionnaire for this
survey may have contributed to an increase in the amount of health care data collected,
which is necessary to study disparate outcomes for the Hispanic population in the United
States, but was not specifically demonstrated in these analyses”.

19. Major compulsory revision: The referee asks a).how the authors have demonstrated
differences in health outcomes in this paper, and further ask b).as if the findings of these
analyses are what were expected, as well as c).what the findings of this survey mean from
the point of view of conducting surveys among the Hispanic community.

a. We have not specifically demonstrated differences in health outcomes in this paper.
Our sentence was referring to the body of literature that has previously demonstrated
differences in health outcomes for the Hispanic population. Therefore, we have removed
the phrase “not only affects health outcomes” from the sentence.

The sentence being questioned is: “The findings from our work have shown that language
preference, one measure of acculturation, affects not only health outcomes, but also
survey outcomes such as item non-response and number of contact attempts for survey
completion”.

The new sentence is:

“The findings from our work have shown that language preference, one measure of
acculturation, affects survey outcomes such as item non-response and number of contact
attempts for survey completion.”

b. Much of this work was exploratory and descriptive in nature. We did not go into this
study with a hypothesis as to the direction of outcomes. We were only looking to see if
differences existed. We did state in the Introduction of the paper that the point of the
study was to describe trends and issues related to the collection of language preference in
the BRFSS. No hypotheses were tested in these analyses.
“Therefore, this study set out to describe recent trends and issues in the collection of language preference among Hispanic persons in the U.S., using a large, telephone health survey in states that offered a Spanish-language version of the survey.”

c. We believe that the final paragraph of the Discussion section and the Conclusion section state the implications of the effect of language preference on the conduct of surveys among the Hispanic community. We have added language to the Discussion section that specifically details the implications of our findings. This addition is highlighted below.

Discussion

It is possible that further measures of acculturation such as length of time spent in the U.S. and country of origin may also have an effect on survey outcomes. These findings have significant implications for surveying the health of an ethnic/minority population and should be studied in data that collects this information. These implications include focusing on culturally appropriate questionnaire development for ethnic populations and assuring representative samples for minority populations.

Conclusion

Including additional measures of acculturation and increasing the sample size of Hispanic persons in the Behavioral Risk Factor Surveillance System would result in more precise and more representative findings that could be used to better target prevention and health care needs for this ethnic minority population. These changes in data collection would be beneficial for determining public health issues among the Hispanic/Latino community, a growing and increasingly important portion of the United States population.