Author's response to reviews

Title: Incarceration as a Key Variable in Racial Disparities of Asthma Prevalence

Authors:

Emily A Wang (emily.wang@yale.edu)
Jeremy Green (jeremy.green@yale.edu)

Version: 2 Date: 11 March 2010

Author's response to reviews: see over
March 10, 2010

RE: MS # 1252227300287520

Dear Dr. Zauner,

Thank you for your review of our manuscript entitled “Incarceration as a Key Variable in Racial Disparities of Asthma Prevalence.” We appreciate your thoughtful suggestions, as well as those of the two reviewers and the Associate Editor’s, and have incorporated the issues raised in the revised manuscript. Below you will find a response to each of the reviewers, as well as the corresponding references in the revised manuscript.

Responses for Associate Editor/Editor

Comment 1. In addition to the reviewers' comments, our Associate Editor feels that the propensity score should be better introduced.

Response 1: Thank you for your suggestion. We have adjusted the Methods section to better introduce the propensity score.

Location: page 8, paragraph 2

Comment 2. Please also document in the manuscript whether the study has been approved by an appropriate ethical body, also documenting the full name of the committee that gave approval.

Response 2. All of the study participants gave informed consent, and the study received approval from the NYC Department of Health and Mental Hygiene Institutional Review Board. For this particular study, deidentified data were obtained from the NYC Department of Health and Mental Hygiene from the website http://www.nyc.gov/html/doh/html/hanes/datasets.shtml. We have included this information in the Methods section of the manuscript.

Location: page 4, paragraph 1

Comment 3. Please structure your abstract into four sections (background, methods, results, conclusions)
Response 3: We have structured the abstract into the four sections you have suggested.

Responses for Referee 1:

Comment 1: While the findings are potentially interesting without knowing the prevalence of asthma before incarceration it is impossible to determine if the prison environment contributes to the development or exacerbation of asthma or whether the same environmental factors that increase the risk of incarceration also increase the risk of asthma. Was no question regarding past medical history asked? Can this information be obtained? Are there other ways of obtaining this data?

Response 1: We agree that determining whether the prison environment causes the development or exacerbation of asthma or whether there are confounding environmental factors driving this relationship cannot be determined by this data. These are limitations of this data which we discussed in our limitations section. However, these data do indicate that there is an association between having a history of incarceration and asthma and generate additional hypotheses that should be further explored with a dataset that includes both environmental and neighborhood level variables.

Additionally, we agree that data on asthma prior to incarceration and past medical history could help to better understand the temporality of the relationship of interest. Unfortunately, this dataset does not contain information on medical history or asthma prevalence prior to incarceration. Moreover, we cannot obtain more information on participants for this study that was conducted in 2004--we have no way of contacting them nor can we be provided information to link it to other existing databases. While previous studies contain estimates of the prevalence of asthma for non-incarcerated compared to incarcerated populations, we do not know of any cohort studies which contain pre-incarceration estimates of asthma prevalence for a group of individuals who are then followed in and out of prison. To our knowledge, this is one of the only community-based datasets containing information on both asthma and past history of incarceration, which is why it was suitable for our research questions.

Comment 2: With respect to exacerbations a major issue not addressed is the likely poor compliance in patients with a history of incarceration. As the major problem in asthma is getting patients to take their medications regularly, and there is a body of published work regarding the poor compliance with medical therapy after release from jail (e.g. for tuberculosis, HIV and hypertension) this factor needs consideration and assessment. Attitudes towards medication compliance were apparently not assessed. Is this data obtainable from the survey conducted?

Response 2: We agree that this is a potential contributor to why patients with a history of incarceration have worse asthma outcomes, particularly upon released from prison. However, this information is not included in the NYC HANES. We have included another sentence in our discussion indicating that medication nonadherence is a potential mechanism by which having a history of incarceration might be associated with worse asthma outcomes, particularly upon release from prison.
Comment 3: Their conclusion that prisons augment racial disparity in healthcare is not justified by the data presented. Specifically there is no evidence that prisons cause asthma. Much more likely is that they are frequented by individuals from backgrounds predisposing them to asthma which is compounded by poor compliance with medical therapy both before and after incarceration. I do however agree that the period of incarceration should be used to focus on healthcare education and it is a missed opportunity to maximize health with potential significant long term improvements that can be gained.

Response 3: We agree with the referee that these data do not provide definitive evidence that prisons cause asthma. To do so, would require a randomization of individuals to incarceration which is neither feasible nor ethical. However, we believe that our data do establish an association between history of incarceration and asthma and that, by carefully adjusting for potential confounding factors that are available in our dataset, this association is less likely explained solely by the fact that individuals with both a history of incarceration and poor asthma outcomes are more likely to be of a racial/ethnic minority group, poor, smokers etc. The mechanisms behind the observed association remains to be studied—i.e. whether it is poor compliance before or after incarceration, increased stress upon release from prison, limited access or utilization of healthcare. Given this, we believe, as referee 2 has also indicated, that these data are useful to demonstrate how a history of incarceration may augment racial disparities observed in asthma.

Responses for Referee 2:

Comment 1: The first research question states that the study examines “the impact of having a history of incarceration on the prevalence of asthma, diabetes, and hypertension using both standard regression and propensity score matching techniques…” Yet, the paper’s primary focus, significant findings, and discussion of results all focus on the significantly higher asthma prevalence among persons ever incarcerated than in the population that has never been incarcerated. The authors are strongly encouraged to reframe the first research question and focus on asthma. This change would tighten the manuscript. The text summarizing Table 2 could include one sentence that notes that the propensity score analysis was applied to diabetes and hypertension, but the prevalence of these two conditions was not higher among formerly incarcerated individuals than among those who had never been incarcerated.

Response 1: At the outset of our study we hypothesized that asthma, diabetes, and hypertension would be associated with incarceration and found support for our hypothesis for only one of the three conditions. While we understand the referee’s point of tightening the paper by limiting it to one outcome, we believe that other researchers may then wonder why we chose to only focus on asthma outcomes, given that individuals with a history of incarceration have been shown to have higher rates of asthma, diabetes, and hypertension compared to the general population and that NYC HANES has measured all three outcomes. It is for this reason that we prefer to include these results in the study, but asthma outcomes will remain the focus of our paper (as indicated by the title).
Comment 2: The introduction could be better organized to focus on the following points. First, many people incarcerated in U.S. prisons come from poverty neighborhoods where they have had limited access to health care. Second, asthma is more prevalent in poor than in non-poor neighborhoods. Third, racial residential segregation disproportionately places African Americans in more impoverished neighborhoods than other racial/ethnic minority groups. Fourth, the jump in incarceration rates since the 1970s has disproportionately affected African Americans, especially low-income black men. One would expect that both inside and out of prison, African Americans would have a high prevalence of asthma.

Response 2: We thank the referee for her excellent suggestions. We have not taken this exact approach given that we are still interested in presenting all three outcomes (see response to question 1), but have reorganized our entire introduction to make these points more salient.

- There are racial disparities in incarceration
- Individuals with a history of incarceration have higher rates of chronic disease and there are number of possible hypotheses for these higher rates.
- There are racial disparities in asthma, diabetes, and hypertension.
- Given the confluence of racial disparities in incarceration and chronic diseases, how might incarceration affect racial disparities in chronic diseases?

One particular point that the referee has brought up is the impact of neighborhood level variables (for instance, racial segregation), as they impact both incarceration and asthma outcomes. Because NYC HANES data do not include neighborhood level variables, we have chosen not to focus our introduction on the effect of neighborhood on health outcomes. However, referee 2’s hypothesis definitely warrants future analysis using a dataset that has neighborhood level variables which we would like to pursue in the future.

Location: pages 1-2

Comment 3: Since the study presented has been completed, the authors should consider framing their research questions in the past tense rather than future tense.

Response 3: We agree and have rewritten the research questions in the past tense rather than in the future tense.

Location: page 2, paragraph 1

Comment 4: The description of the Sample and Setting (Methods section) should include a sentence that of the 1990 respondents, 92% had no history of incarceration and 8% were formerly incarcerated.

Response 4: We agree. We have moved this description from the Results section to the description of the Sample and Setting under the Methods section.

Location: page 4, paragraph 1.
Comment 5: If the paper focuses on asthma prevalence than the description of the variables only needs to list the questions used to measure the asthma outcome. The independent variables can be succinctly described.

Response 5: As outlined in our response to Referee 2’s comment 1, we think it is important to present our research findings for the three outcomes (asthma, hypertension, diabetes) which were defined a priori and would prefer not restrict the analysis to asthma. We rewrote the description of the independent variables to make them more succinct and kept our description of the incarceration measure since incarceration is the key independent variable of interest.

Location: page 5, paragraph 1

Comment 6: The description of the propensity score is well-done (Methods section). A citation is needed for the sentence that justifies why propensity scores produce better adjustments of baseline difference than a regression model controlling for confounders (two reasons are given).


Location: page 9, paragraph 1

Comment 7: For readers not familiar with propensity scores, one or two sentences on matching procedures would be helpful. Please add citations. See, for example, the paper presented at the 2006 Northeast SAS users group conference, Marcelo Coca-Perraillon, Matching with Propensity Scores to Reduce Bias in Observational Studies. Available on-line at: http://www.nesug.org/Proceedings/nesug06/an/da13.pdf.

Response 7: The revised manuscript includes further discussion of matching procedures along with these additional references.

Location: page 9, paragraph 2

Comment 8: If the paper focuses on asthma prevalence than the description of the logistic regression analysis should be modified (Methods section).

Response 8: Please see our response to comment 1 above. We believe that it is important to include all three outcomes in this study for reasons indicated above.
Comment 9: Table 1 is nicely laid out. Given a sample of 160 respondents in the formerly incarcerated group, the authors should collapse some of the multiple categories used for race/ethnicity and age. The 95% confidence intervals for variables such as Asian, other race, age 60+, cocaine user, shown in Table 3, are wide and unstable (Results).

Response 9: The goal of the study is to estimate the relationship between incarceration and health outcomes of interest, rather than to generate precise estimates of demographic characteristics of the respondents. Whether using propensity scores or regressions, we think that more refined categories of demographic variables are valuable because they help to better adjust for these covariates in statistical models. As a result, we prefer to keep the categories as is, since this helps to provide a more precise measure of associations between incarceration and health outcomes.

Comment 10: The findings of a higher prevalence of current asthma among formerly incarcerated respondents vs. never incarcerated respondents are not shown in Table 2 (Model 1: 12.7% vs. 6.2%; Model 5: 13.8% vs. 4.6%).

Response 10: Thank you for your suggestion. So as to not clutter the table, we have chosen to present only the difference in prevalence as opposed to the actual prevalence data for asthma, diabetes, and hypertension outcomes for each of the five models in the text. However, we have included the absolute data for the asthma outcomes in the text for all five models.

Location: page 11, paragraph 1

Comment 11: The first sentence of the paragraph that describes the results of the multivariable logistic regression states that “we used statistical mediation analysis…” This is redundant. The Methods section described the logistic regression as a mediation model to test if ever being incarcerated mediated the relationship between race/ethnicity and asthma. It would be helpful in explaining the results shown in Table 3 to explain why Model 2 showed evidence for mediation. The authors should test for the significance of the mediated effect.

Response 11: We revised the description in the first paragraph of the results section as requested. One statistical test to test for mediation is to examine the confidence intervals on the race and ethnicity coefficients across the models that include and do not include incarceration, and to see whether or not these confidence intervals overlap, if they do not overlap, then there is a statistically significant mediation effect. In our revised manuscript we also conduct a formal Sobel test to test for mediation. The z-statistic and p-value from this test are included in the revised manuscript.

Location: page 10, paragraph 1; page 12, paragraph 1.

Comment 12: The text for Table 3 could include one sentence that states the relationship of race/ethnicity on prior history of incarceration. Please add (data not shown).

Response 12: This is included in our revised manuscript.
Comment 13: It would have been helpful if Table 3 or accompanying text showed the adjusted odds ratio and 95% CI for history of incarceration included in Models 2 and 3.

Response 13: We have included these adjusted odds ratios in our tables.

Comment 14: The discussion section poses several explanations for the findings, including higher rates of smoking, substance abuse, domestic violence, and low SES. Only one citation is given and that article is based on a study conducted in India, which is not relevant to the current study. Additional citations are needed. Other possible explanations draw on the work of Wright et al. (citation #30). The multilevel framework for asthma epidemiology is based on individual- and neighborhood-level variables. The article does not mention correctional facilities. Additional citations are needed. Wright et al. have suggested an association between stress and asthma prevalence (citation #31). The article does not mention correctional facilities. Additional citations are needed.

Response 14: We have clarified this section so that it is clear that there are no studies, to our knowledge, that have explored how having a history of incarceration contributes directly to asthma outcomes. There are studies which show that former inmates are more likely to be of a racial/ethnic minority group, poor, smokers, use illicit drugs, have a history of domestic violence—and each of these risk factors are associated with worse asthma outcomes, which is where the citation from Wright et al. comes in. Wright et al.’s work also provides a framework for understanding the various risk factors for poor asthma outcomes—we are using this work as a launching point for exploring the hypothesis of how incarceration might affect asthma outcomes. To address the referee’s comments, we have included citations for each of these risk factors (racial/ethnic minority group, poor, smokers, use illicit drugs, have a history of domestic violence) that may place individuals with a history of incarceration at risk for worse asthma outcomes.

Comment 15: The possibility that the higher prevalence of asthma found in the ever incarcerated population may be attributed to school absenteeism and lower school performance because this group likely had asthma as children goes beyond the data and should be deleted.

Response 15: We agree with the referee and have deleted the sentence regarding school absenteeism from our revised manuscript.

Comment 16: The Discussion section raises an interesting point that epidemiologic studies of asthma should include an incarcerated population or a measure for incarceration status. How realistic is this suggestion? The Behavioral Risk Factor Surveillance System (BRFSS) is the primary database that states use to measure the health of their population. Is the suggestion that states add an optional incarceration module to the BRFSS? The cost of adding modules to the
BRFSS or implementing surveys like NYC HANES or the California Health Interview Survey is prohibitive for most cities and states and is unlikely to happen in the current economic climate.

Response 16: We have revised this discussion to make our recommendation more realistic. Since New York City was able to include incarceration measures in their health survey, it is entirely possible that other cities could do so as well, and ultimately we hope this information will become available in state and national surveys.
Location: page 14, paragraph 1.

Comment 17: Please consider other emerging challenges that warrant discussion, such as the impact of the current recession on reducing the safety net of health and social services in low income and high poverty communities. How are we going to meet the challenge of caring for the poor with chronic illnesses, including those with a history of incarceration?

Response 17: The referee’s point is an important one, but this is a large topic with a significant body of literature behind it and we feel that this is beyond the scope of our paper. We have however mentioned a number of successful models nationwide that transition individuals with chronic medical conditions from prison health care to community health care which employ local safety net and social services.
Location: page 15, paragraph 1.

Comment 18: Suggested citations for authors:


Response 18: We thank the referee for pointing us to these additional references and have included these citations in our background section.

Thank you for your consideration of our manuscript.

Sincerely,

Emily Wang