Reviewer's report

Title: Cigarette Smoking Prevalence in US Counties: 1996-2012

Version: 1 Date: 4 December 2013

Reviewer: Jennifer Ellis

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Major Compulsory Revisions

1. General comments: I find the analysis and writing here clear and very easy to follow. The methods employed are strong and highly valid. I appreciate the careful attention the authors have paid to documenting the technical aspects of their undertaking. I have two major issues that I have flagged in several places throughout the paper:

   a. Where the paper needs strengthening is in moving beyond a descriptive reporting of stratified prevalence trends. The paper needs to better aid the reader in interpreting the findings. I have made some detailed suggestions below in the hopes that the authors are willing to take on some of this strengthening. Although the paper undoubtedly presents unprecedented and important information, it would be much stronger if the information were presented with more context.

   b. One major concern I have about the findings is the issue I noted in the Results section, County-Level Total Cigarette Smoking Prevalence section – I will describe this more fully below, but if the authors have truly found that only 32% and 13% of counties have seen statistically significant declines in male and female smoking, respectively, then that is a major finding. I think it would be very helpful to know what proportion of the population is represented by the counties that have/have not seen a change. I think what the authors are seeing is that there are major disparities in national declines, possibly best illustrated by this unprecedented local-level data. If the authors conduct the analysis to show the proportion of the population represented by counties with a significant decline, I think they will find that a large but geographically concentrated proportion of the population shows declines, and a high proportion of counties representing a smaller piece of the population stays relatively flat. This is interesting and important to explain clearly.

2. Abstract:

   a. Background: would suggest rephrasing to “yet information above smoking prevalence and trends is not routinely available below the state-level, impeding local-level action.”

   b. Results: I don’t think it’s appropriate to include the 96.4% of counties with male decline and 79.7% of counties with female decline if many of these aren’t significant declines, as you state later. I would suggest instead mentioning the income-level differences more prominently.

   c. Conclusions: the conclusions here don’t say much that actually interprets the
results – as stated, they are primarily an extension of the results section of the abstract. Would suggest moving some of the material here up to the results section of the abstract and instead focus on some of the important points from your discussion section (county-level action, possible geographic and income disparities in enforcement, rates in poor-performing counties as high as some of the poorest-performing countries globally) to make the paper more compelling and useful.

3. Introduction: I would recommend adding another paragraph to talk about the tobacco control significance of the work here. You might talk about the fact that some of the most effective tobacco control policies (tax, smoke-free, some ad bans) are able to be adopted and enforced by country-level authority, so these findings can provide important guidance to local policy-makers. You might also talk about established disparities in implementation, such that even though state-level laws around smoke-free, for instance, exist, they are not always consistently implemented, and this information can provide some evidence as to where shoring up might be needed.

4. Results section: I generally found this section to be overly detailed. I think you could streamline the number of findings presented. In particular, the discussion of daily smoking prevalence also did not add much to the analysis, so this could be omitted if space is needed.

5. Results section, County-Level Total Cigarette Smoking Prevalence, fourth paragraph:
   a. I would omit the sentence, “Cigarette smoking prevalence declined…” if most of the changes referenced are not significant, as the next sentence implies. It doesn’t make sense to report “declines” if they don’t have significance. The next sentence, which states the proportion of counties with statistically significant declines is drastically different. If you feel strongly about mentioning the non-significant changes, you could say something like, “Only 32.6% of counties experienced a statistically significant decline for males and only 13.3% of counties for females. However, an additional XX% of counties showed non-significant declines for males and YY% for females.” I’m also concerned, as noted above, that you have presented these “declines” in the abstract, even though they aren’t statistically significant.
   b. Related, is it really true that only 33% of counties have seen declines in male smoking and only 13% of counties have seen declines in female smoking? If this is the case, it is alarming. It would mean that the vast majority of what we think of as declines in the US are actually only happening in something like 20% of the counties? You might talk a bit about what proportion of the US population is represented by the counties with a decline.

6. Discussion and conclusions, first paragraph:
   a. Small point, but I’m not sure these estimates can be considered “timely”.
   b. I would slightly rephrase second sentence to say something like, “…should allow for better planning for and evaluation of tobacco control policies and programs aimed at reducing…”
7. Discussion and conclusions, third paragraph: I think this paragraph (about the within-state differences) is probably the most important of the paper. I would strengthen this and make it more prominent, if possible. I would also suggest working some related mention of this in to the conclusion section of the abstract. Some points you may want to consider including for context to your findings (some of these are inter-related):

a. Many states do not have the means to assess country-level differences in smoking prevalence, which may result in missed opportunities to strengthen enforcement of existing state-level tobacco control policies or implementation of new policies.

b. In many states in the US, counties have the ability to adopt tobacco control policies, such as smoke-free laws and taxes. These data provide unique evidence supporting such action.

c. Tobacco industry marketing is increasing conducted at local levels, especially at point of sale (http://www.tobaccofreekids.org/research/factsheets/pdf/0075.pdf). Data provided in this analysis may provide states and counties with unprecedented information that measures the impact of such marketing activities.

8. Discussion and conclusions, fourth paragraph (previous studies...):

a. The evidence here about the income disparity is interesting and I think could be made a second main conclusion of the paper. Right now, it is mentioned here only in passing and could be made more prominent.

b. As I’ve mentioned several places above, I think you have probably discovered an interesting finding related to our generally accepted idea of “national declines” in smoking prevalence. You data show that these declines are not being experienced by an alarming proportion of counties, likely related to income level. I would make this point much more strongly in your discussion here.

c. Small point, but “prevention programs” isn’t really a common descriptor – I would use “tobacco control policies and programs” if possible.

d. Last sentence of this paragraph: I greatly appreciate your attempt to connect these findings to state or county actions, but I would slightly modify this sentence to include approaches other than quitlines. Smoke-free laws and tobacco taxes are also implementable at the state or county level and are much more important than quitlines. You can get some standard cites for effectiveness of these on the Campaign for Tobacco Free Kids website I noted above – just look at some of their factsheets.

9. Discussion and conclusions, fifth paragraph (Recent work...):

a. I would omit the first part of this paragraph. I appreciate that you are trying to put the US county-level variation in context by comparing it to inter-country variation globally, but the comparison doesn’t make such sense – the US counties have commonalities in which we would expect less variation that countries do not, so you are actually under-selling your point here. I don’t think the paper needs this point.

b. However, the second part of this paragraph makes some really interesting
points. The comparison of poor-performing US counties to poor-performing countries is fascinating and reminds me of the landmark McCord/Freeman Harlem/Bangladesh work done in the 1990s. A very interesting tool and I think you could make it much stronger here. It’s not very clear as written and could be simplified. It’s not very easy to follow the percentile comparison. You could do some sort of country ranking to make the comparison even more explicit, perhaps naming a few countries and counties as direct comparisons, if you think it is valid to do so, e.g., “Smoking prevalence among males in XX county is the same as country YY, the Nth highest rate in the world.” If you did this and felt that it was a strong comparison, I would work it in more prominently, as it could be a very useful mechanism for interpreting the findings.

10. Discussion and conclusions, fifth paragraph (These local…):

a. Small point, but should this read “These local, annual measurements…” instead of “These local and annual…”?

b. If this paragraph is meant to refer to further research that could be done, I would certainly suggest including the idea that someone should do an analysis of county progress triangulated with tobacco control policy progress. This would be a big undertaking, since as far as I know, no one systematically catalogues tobacco control activities at the country-level in the US (CTFK would know whether anyone knows this). Such an undertaking could be very useful to show (hopefully) the impact of tobacco control policies during this time, and also point to some specific disparities in enforcement where strong policies do exist. (In fact, if someone on your team has the time and interest to take this on, I would strongly encourage it.)

11. Discussion and conclusions, last paragraph (The 1990s…): I would rework this paragraph in its entirety. I applaud the authors for wrapping up the paper with a mention of context and why the findings are important, but the paragraph overall could be stronger.

a. The first sentence is not very specific, and I would recommend referring to the “burden of tobacco” or the “tobacco epidemic” rather than the “tobacco problem”, as this is the more commonly used phrasing.

b. The second sentence needs further thought. As your own national analysis shows, there have been considerable declines in national prevalence from 1996-2012 – 17% relative decline among males and 18% relative decline among females. As stated several times above, I think what you are finding here is that there are great disparities in these declines, with (I think) a large but geographically concentrated proportion of the population experiencing the decline, and a high proportion of geographic areas representing a smaller piece of the population staying relatively flat.

- Tables and figures: I did not think that Figures 4-6 visually added much to the paper, so these could be omitted if space were an issue.

**Level of interest:** An article of importance in its field

**Quality of written English:** Not suitable for publication unless extensively edited
Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

Declaration of competing interests:

I DECLARE THAT I HAVE NO COMPETING INTERESTS -JE