The Editor, BMC Public Health

Dear Editor,

Thank you for your input and that of the reviewers in this manuscript. Our research uses smokefree law data and the US Census to answer an important question: Are there inequalities in the populations covered by smokefree public space policies?

We have now made revisions to address these comments, point by point in the response letter to the reviewers. In addition, we addressed your comments below.

Editor Comments:

Comment 1

Pg 1, Line 23: In the second paragraph, possibly after the first sentence, provide a definition of inequalities with appropriate citation.

Our response:

‘These impacts are distributed unequally, with consequent inequities. For this work, we adapt a definition of inequalities as ‘the different availability of resources to which individuals and groups have access to’ (Moore et al., 2014)’
Comment 2

Pg 1, Lines 40-43: Your citation for smoking prevalence is a bit outdated. You may want to see the following:

https://www.cdc.gov/mmwr/volumes/65/wr/mm6544a2.htm (National rates by different demographic factors)

https://www.cdc.gov/mmwr/volumes/65/wr/mm6539a1.htm (State specific rates)

Also, you may want to modify the sentence to read something like: “Geographically, the southeastern states of West Virginia and Kentucky had the highest prevalence of cigarettes smoking among adults 18 years and older in the United States at 26.7 and 26.2 percent, respectively (Nguyen, et al., 2016)”

Our response: Thanks for the two new 2016 references, which we have used. The suggested text has been incorporated into the manuscript:

‘A range of studies have found evidence of inequities in tobacco smoking and secondhand smoke (SHS) exposure (Barnett et al, 2009; Jamal et al, 2016; Nguyen et al 2016), with minorities generally experiencing higher risks related to tobacco.’

‘Geographically, in the United States in 2015 the Midwest had the highest prevalence of cigarettes smoking among adults 18 years and older at 18.7%, above the national prevalence of 15.1%, and the southeastern states of West Virginia and Kentucky had prevalences of 26.7 and 26.2 percent, respectively (Nguyen, et al., 2016).’ (p.2, para 1)

Comment 3

Pg 1, Line 51-54: This sentence is not quite clear. Perhaps re-word to “To denormalize smoking is to reduce its acceptability and normality, thereby promoting quitting and preventing initiation”…or something to this effect

Our response: This sentence has been clarified in the manuscript:

“To denormalize smoking is to reduce its social acceptability and the perception of it as a normal activity, thereby promoting quitting and preventing initiation (Pierce et al, 2012)” (p.2, para 2)
Reviewer #1 Comments

We appreciate the positive and helpful comments.

Comment One

First, given the established causal linkages between secondhand smoke exposure and various chronic diseases and childhood lung development and chronic conditions, the authors may wish to frame this as a social justice issue and refer to inequities rather than inequalities.

Our response: Thanks very much for this insight. We have changed our language as suggested to reflect the different circumstances experienced, and the lack of justice received by many groups with respect to healthy public spaces. See additions in paragraphs 2, and 3 of the Introduction:

‘A range of studies have found evidence of inequities in tobacco smoking and secondhand smoke (SHS) exposure (Barnett et al, 2009; Jamal et al, 2016; Nguyen et al 2016), with minorities generally experiencing higher risks related to tobacco. …

These inequities in smoking prevalences by ethnicity, socioeconomic status, and geography suggest drastically different tobacco related risks within America, dependent on circumstances and experience. To counter this, more widespread policies to cover vulnerable populations are needed.’ (pp.1-2)

‘Smoking can be made to seem more normal due to advertisements and efforts by the tobacco industry, which spent $9 billion on advertising in 2014, largely aimed at ethnic minorities (CDC, 2016).’ (p.2)

Comment 2

Second, the points made in the introduction pertaining to denormalization refer primarily to denormalization of smoking behaviour and secondhand smoke exposure per se (starting at line 48, page 1). Brief mention of the important role of tobacco industry denormalization should also be considered.

Our response: The normalization force of the tobacco has now been included, as well as the disproportional marketing to minorities.

‘Many factors influence the normality of smoking, both positively and negatively. Smoking can be made to seem more normal due to advertisements and efforts by the tobacco industry, which spent $9 billion on advertising in 2014, and was largely aimed at racial minorities (CDC, 2016). Of importance to the current study, smoking can also be denormalized by intelligent indoor and outdoor smokefree space policies.’ (p.2)
Third, the first research question refers appropriately to "the proportion of the population covered..." (line 58, page 2). Please consider adding this phrase to the abstract.

Our response: Thanks very much for this suggestion. We have added the phrase to the abstract 2nd sentence (as italicized here):

‘We evaluated demographic differences in the proportion of the population covered by smokefree policies enacted in the United States prior to 2014, for both adults and children.’

Fourth, there is reference to "accounting for non-independence by state" (lines 12-13, page 3). It would be helpful to specify or elaborate on this. Does it refer to dependent living arrangements, or perhaps pre-emptive/enabling legislative factors, or relevance of "home rule" in some localities?

Our response: This referred to similarities in adoption between zip codes within the same state. For simplicity, we have removed the words.

Fifth, at line 29, page 3, reference to "seven types of restrictions" or "seven groups of restrictions" might be more appropriate than "groups of types".

Our response: This recommendation has been incorporated into the manuscript:

‘In total, seven groups of restriction were studied: playgrounds, school grounds, both playgrounds and school grounds, indoor areas of restaurants, indoor areas of workplaces, indoor ‘public spaces generally’, and ‘any of these policies’.’ (p. 4)

Sixth, one might wonder why the authors did not specify interaction terms in the logistic regression models. Given that (a) there are stark regional differences, (b) ethnic heterogeneity appears associated with a higher likelihood of clean air coverage, (c) a higher proportion of Black Americans resident is associated with more progressive policies, and (d) there are many
good examples of progressive tobacco control activism and policy in the US southeast and elsewhere in America (cf. Figure 1 and 2), interaction terms may shed some light of possible socio-political mechanisms for successful attainment of such policies. If the interaction terms in such a model do not indicate effects, this too would be interesting to readers and a comment could be made.

Our Response: We have now tested for significant interaction effects for heterogeneity*region. Because ethnic heterogeneity is a continuous variable, including it in an interaction term makes interpretation difficult. Therefore, we first converted this variable into high/low binary terms, using the mean as a cutoff.

We then fitted a new regression, including the ethnic heterogeneity and interaction effects with the region variable. We added text:

‘Thus, our final model included the following independent variables: education, high/low ethnic heterogeneity, percentage white, income, and region, as well as an interaction term between ethnic heterogeneity and region. We accounted for non-independence in zip code policy status within state clusters by fitting a hierarchical regression model including random effects at the state level. All statistical analyses were conducted using Stata v14 software.’ (p. 5)

This inclusion of interaction terms between ethnic heterogeneity and region was statistically significant at the p = 0.004 level. We have the following near the end of the Results (p.7):

‘We also found that the effect of high ethnic heterogeneity differed significantly (p=0.004) by region, but was consistently positively associated with having a policy. For example, the ratio of odds of having a policy in zip codes with high versus low heterogeneity was highest in Alaska/Hawaii (OR 7.8), followed by the Midwest (OR 4.93), followed by the Southwest and Southeast (OR 2.4 and 2.3, respectively), Northeast (OR 1.7) and the West (OR 1.6).’ (p. 7)

We have also added the following text in the Discussion:

‘The effect of ethnic heterogeneity was significantly different by region, but was consistent in that more heterogeneous zip codes had higher odds of coverage in every region. Ethnic heterogeneity played the largest role in Alaska and Hawaii. Of the lower 48 states, the Midwest showed the largest effect of ethnic heterogeneity, with diverse zip codes almost five times as likely of having a policy. Ethnic heterogeneity showed the least effect in the West, however diverse zip codes were still 60% more likely to have policies.’ (p. 8)

Comment 7

Seventh, in the paragraph starting at line 11 of page 6, MOR is described as directly comparable to ORs from the model. One might question the public health utility and statistical relevance of a
median increase of .000028 fold. I will concede that this reviewer may not understand this particular statistic as applied here and suggest that the other reviewers' comments hold more weight in this regard. However, losing this paragraph and reference to MOR would not greatly reduce the value of this paper.

Our response: As suggested, we removed the relevant sentence in the Methods (p.5) and the paragraph at the end of the Results (p.7), which provided the opportunity to add text to frame the issue of smokefree spaces historically, areas of success, etc (as suggested by Reviewer 1, Comment 8)

Comment 8

Eighth, it may be useful in the discussion to speculate on the historical reasons for success in some localities (liberal-conservative policies, social democratic norms, influence of tobacco growing and manufacturers in certain regions, effects of state-level pre-emptive legislation, local champions for child protection etc.), as well as nationally and state-wide capacity building efforts to support them (e.g. efforts by US National Cancer Institute, Centers for Disease Control and Prevention, Robert Wood Johnson Foundation Smoke-Free States Initiative, Campaign for Tobacco-Free Kids, American Legacy Foundation/Truth Initiative, etc.). Identifying areas for further research here would be welcome in your discussion.

Our response: Thanks very much for this suggestion. This is a welcome expansion of the paper, and the next step in research. Text has been added in the ‘Research Implications’ section of the Discussion (p.9):

‘Research Implications

Considering the inequities observed in this study, the forces which impact policy adoption are an important next step to research. Successful adoption of policies is likely due in part to differing political climates between areas, as well as efforts by both the tobacco industry and by smokefree advocates (Rayens et al, 2012; Satterlund et al, 2011; Tung et al, 2014). Our speculation is that smokefree advocate organizations have a greater relative impact in cities compared to tobacco marketing. Visually, policy adoption also appears to be more common in cities than rural areas. Urban areas are also known to lean towards voting for Democrats, have more robust public health systems, and generally be more accepting of government oversight and legislature (Hood et al, 2014; Harris et al, 2013; Rosenblatt et al, 2002). Future research could explore relationships between population density and policy adoption.
Policy Implications

In order to continue facilitating declines in smoking, policies must address the low level of coverage in places frequented by youth. Considering the impact these policies have on the perceptions of smoking which children develop, as well as the low existing level of coverage nationally, policies aimed at protecting children in playgrounds would have a large impact on smoking trends, now and into the future.’

Reviewer #2

Comment 1:

Although significant differences in coverage of smokefree policies were found among the four variables, the findings lacked of novelty. The authors used secondary analyses that extend or replicate published findings without adding substantial knowledge. In other words, the study reported already known knowledge that is predictable.

Our response: The new aspects of our research include:

• The types of indoor and outdoor smokefree area national USA policy coverage data used by the only three analyses of such data. In contrast to Bayer and Bachynski, 20131 and Hood et al, 2014,2 who used smokefree parks data, we used data for playgrounds, school grounds, indoor areas of restaurants, indoor areas of workplaces, and indoor ‘public spaces generally’. In contrast to Gonzales et al, 2013,3 who used data for indoor workplaces, restaurant, and bar laws, we also used outdoor policy data. This is the first such study using both indoor and outdoor policy data, the first to use such a wide range and number of area types

• This is also the first to use data specifically relevant to the exposure of children to smoking, which allowed us to analyze the low level of protection for playgrounds and school grounds specifically frequented by children, where the prevention of smoking is crucial to prevent the normalization of smoking at a young age.

• The use of data at the zip code level, in contrast to county level data used by previous authors. Zip code data was recommended by Gonzales et al as a needed progression in such research:

• ‘the demographic distribution of people by race would be better accounted for by a zip code level analysis as opposed to a county-level analysis aggregated up from local and down from state data.’3
Comment 2

The findings have no clinical and theoretical implications for the other researchers in the same field.

Our response: See added sections in Discussion, ‘Policy Implications’ and ‘Research Implications’. The literature that we provide, and our research shows the disadvantages faced by children (particularly minority children), when growing up around smoking in public spaces, and the corresponding effects on the perceived acceptability of smoking. This research will be of relevance to researchers and the policy community studying inequalities and the adoption of smokefree policies.

Comment 3

Although some public health researchers did emphasize the importance of health inequalities on public health, the findings that are of interest to a very narrow or specialized audience that study smoking policies.

Our response: Because of the very large impacts of smoking in the USA and elsewhere, differences in policy coverage have consequent importance. The inequalities found in this paper describe existing conditions which American citizens exposed to, and impact their likelihood of smoking. While other papers have documented inequalities in tobacco marketing and exposure to smoke, our paper analyzes:

• the coverage of policies, describing inequalities in coverage for different sects of the American population, who should have equal protection from their government
• differences in exposure for children in the places that they frequent most, and in which they develop a sense of their surrounding community and acceptable behavior

These have major implications to inequalities in livelihood and community health, as well as for the perception of smoking for children.

Comment 4

The article may be simply a small extension of a different paper. The work is seemed to be a part of a larger study, chopped up to make as many articles as possible.

Our response: This article describes the main forms of smokefree space legislation, and seeks to comprehensively lay out differences in coverage as they stand in the United States now. It has not been split from any larger project, and is not submitted elsewhere in any form.
Comment 5

The used measurements were incomprehensive that made it marginal interest of the field of smoking policies.

Our response: The mean odds ratio has been removed from the manuscript, due to its low applicability. This provided the opportunity and space to place the study in a broader context (Reviewer 2, Comment 7).

Our remaining measures describe the odds that certain sections of the American people would have coverage, based on their demographic characteristics. These demographic differences are useful for understanding the attention paid to certain groups within the United States, while other groups go largely ignored, which is one of the core areas of research for creating meaningful policies.

Comment 6

The study is not exciting and fresh.

Our response: See our response to comment 1 by this reviewer above.

Comment 7

Although the topic of the study is important, it did not place in a broader context.

Our response: The first five paragraphs of the Introduction provide considerable health, equity, impact, policy and research context for smokefree outdoor policies. For further context, we have added text to the discussion under ‘Research Implications’ and ‘Policy Implications’, see response to Reviewer 1, Comment 8.

Comment 8

There were numerous reasons to influence the coverage of smokefree space policies except of ethnicity, region, income and education.

Our response:

Our aim was to investigate ‘inequalities in coverage by ethnicity, socioeconomic status, educational attainment, and region’. While we found predictors of policy coverage, the paper
was not an investigation into the causes of coverage differences. Our discussion touches on the causes (p.7):

‘These large regional discrepancies help to explain some of the differences in coverage by ethnicity, considering that more African Americans live in the Southeast, compared to other regions of the United States. Lower levels of coverage in the Southeastern United States are also likely related, in part, to the economic geography of tobacco; the largest tobacco producing states are all in the Southeast.’

We agree that the causes of such coverage differences is a vital area of research, and have added text in the discussion about such future research, under the ‘Research Implications’ section. Our research, which is more comprehensive and at the zip code level, is the first step to studying the causes of adoption within jurisdictions.

References

