Reviewer's report

**Title:** An Ecological Analysis of Food Outlet Density and Prevalence of Type II Diabetes in South Carolina Counties

**Version:** 2  **Date:** 10 November 2015

**Reviewer:** Thomas J Songer

**Reviewer's report:**

This manuscript addresses the association between food availability (via food outlets per 1000 persons) and the prevalence of type 2 diabetes mellitus in an ecologic analysis.

The authors report no association between the environmental role of food availability via these outlets and diabetes prevalence. This finding has been noted in some prior reports, but the finding is also the opposite of reports in other publications. Despite a null finding, this report contributes meaningful information to the research on this topic.

Notably, the strength of the paper is the national data which forms the core of the ecologic assessment. The use of data to define food outlets from a government source increases the reliability and validity of the data when used in different counties. Further, this national data allows for greater reproducibility in future assessments. One limitation in the current literature is the variance in definition of food outlets. There are no gold standards in this area, and there is the potential for overlap between fast food, convenience, and grocery stores. While these limitations exist, the use of the national data sources in this report lends some strength to the evaluation in this regard.

Second, the authors have included important covariates in the analysis related to socio-economic standing and risk for diabetes. These enhance the assessment, and overcome the weakness that is often apparent in many ecologic assessments.

Third, another strength is the strong presentation of the background to the research question.

Minor weaknesses exist, notably the written perception that the authors are trying to explain away the null results in the discussion (lines 275-285) and conclusion.

Overall, this manuscript addresses a complex topic with appropriate rigor and assessment. It is not surprising to see a null result given the difficult nature of examining how community-wide environmental influences (in this case food outlets) may play a role in diabetes. Notably this topic is very difficult to assess as there are no gold standard definitions of these food outlets, and several prior reports have been limited by poor definitions. Also, there is considerable overlap between fast food, food from convenience stores, and food from grocery stores. Lastly, investigating food outlets is also difficult as the placement of food stores is
driven by some factor by potential for profitability and the food sold in stores can change to satisfy local interests and demand.

Overall, for the most part, this manuscript handles the complex issue quite well.

- Major Compulsory Revisions
  1. The authors may consider revision in the discussion and conclusion to eliminate potential confusion about the null findings.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

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

**Declaration of competing interests:**
I declare that I have no competing interests