PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	The socioeconomic gradient in the developmental health of Canadian children with disabilities at school-entry: a cross-sectional study
AUTHORS	Zeraatkar, Dena; Duku, Eric; Bennett, Teresa; Guhn, Martin; Forer, Barry; Brownell, Marni; Janus, Magdalena

VERSION 1 – REVIEW

REVIEWER	Sharoon Hanook Forman Christian College (A Chartered University) Lahore Pakistan
REVIEW RETURNED	13-Jul-2019

GENERAL COMMENTS	This article discussed an important and interesting research question. I think with a little more effort and work this will be a valuable contribution to the literature relating to the association of SES with the developmental health of children with disabilities. However, I have found the following discrepancies. 1. when the author talks about "custom created neighborhood boundaries" it needs a little more clarification. 2. The rationale for converting left skewed data to right-skewed data by subtracting 11 is not clear. Moreover, the rationale for fitting three different models need to be discussed clearly, why an important variables SES is added in to the third model? Especially when the random effects are non-significant and are not included in the final model, this leads to a question that, is the Hierarchical Generalized Linear model an appropriate model choice? Probably a simpler model would have provided similar results. The use of Dummy variables is not clear. my best wishes are with the authors.

REVIEWER	Michael E. Msall University of Chicago Comer Children's Hospital Joseph P Kennedy Center of Intellectual and Neurodevelopmental Disabilities and Section of Developmental and Behavioral Pediatrics Chicago, Illinois 60637 USA
REVIEW RETURNED	02-Dec-2019

GENERAL COMMENTS	This data is very important. You used a non categorical approach to disability Please give examples of the most common categories so that readers across countries can understand the diversity of your cohort.

	In Table 1 you forgot to define SC. In your discussion please describe what supports are available to children with disability before they start age 5 school. Do these programs have waiting lists based on neighborhood SES?

VERSION 1 – AUTHOR RESPONSE

Reviewer 1: Sharoon Hanook
This article discussed an important and interesting research question. I think with a little more effort and work this will be a valuable contribution to the literature relating to the association of SES with the developmental health of children with disabilities. However, I have found the following discrepancies.
We thank Dr. Hanook for the thorough review of our manuscript and valuable comments. Our responses and corresponding revisions are below:

Reviewer comment	Response	Revision
when the author talks about "custom created neighborhood boundaries" it needs a little more clarification.	We agree and have added additional details.	Page 6: The EDI database has been linked to Canadian Census and Taxfiler data from 2006 and 2005, respectively, using custom-created neighborhood boundaries. Briefly, the neighborhood boundaries were defined using Statistics Canada's dissemination blocks and were created to contain a minimum of 50 and a maximum of 600 valid EDI records per neighbourhood. The criterion of having at least 50 EDI records per neighborhood was based on empirical data on EDI reliability. The custom-created neighborhood boundaries were based on existing administrative and geographic divisions and were created in consultation with provincial/territorial governments, to maximize their meaningfulness. Guhn et al. (2016) provide a more detailed description of the process for neighburhood boundary definition.[38]
The rationale for converting left skewed data to right-skewed data by subtracting 11 is not clear.	An assumption of the HGLM model with a gamma distribution is that the outcome data are right skewed. We have revised to further clarify this point.	Page 6: Given that EDI domain scores are skewed and restricted in range, and that children are clustered within neighborhoods and schools, the data were analyzed using hierarchical generalized linear

		modeling (HGLM). The fit of a range of distributions and link functions were assessed and it was found that the identify link and gamma distribution produced the best model fit. EDI data were transformed by subtraction from 11 to allow for the gamma distribution to accommodate the left skew.
Moreover, the rationale for fitting three different models need to be discussed clearly, why an important variables SES is added in to the third model? Especially when the random effects are non-significant and are not included in the final model, this leads to a question that, is the Hierarchical Generalized Linear model an appropriate model choice? Probably a simpler model would have provided similar results.	The main objective of this study was to assess whether neighborhood SES is associated with indicators of developmental health in children with disabilities. In the model containing neighborhood SES, we also adjusted for child-level characteristics to isolate the effects of neighborhood SES (i.e., adjust for potential child-level confounders). We attempted to use hierarchical ordinary linear regression but due to the highly skewed nature of EDI scores, the resultant residuals had a skewed distribution. Hierarchical generalized liner models allowed us to both accommodate the nested and skewed nature of EDI data. The nonsignificance of the random effects variables suggests that the effects of the predictors are consistent across neighborhoods, which is an issue that is independent of the appropriateness of the HGLM model.	Page 6: Given that EDI domain scores are skewed and restricted in range, and that children are clustered within neighborhoods and schools, the data were analyzed using hierarchical generalized linear modeling (HGLM). The fit of a range of distributions and link functions were assessed and it was found that the identify link and gamma distribution produced the best model fit. EDI data were transformed by subtraction from 11 to allow for the gamma distribution to accommodate the left skew. Page 7: First, an intercept-only model was constructed. Second, a model with child-level characteristics that have been found to be significant predictors of children's developmental health (i.e., age, sex, and English/French language learner status (EFSL)) as fixed-effects was constructed.[25 38] Additionally, year of data collection, province, and the interaction between the two were included as categorical variables to control for variations in data collection procedures across time points and provinces. Finally, to evaluate the association between neighborhood-level SES and children's developmental health, the SES index was added in the third model.

The use of Dummy variables is not clear.	Dummy variables or indicator variables were used to represent year of data collection, province, and the interaction between the two. We have revised to clarify.	Page 7: Additionally, year of data collection, province, and the interaction between the two were included as categorical variables to control for variations in data collection procedures across time points and provinces.

Reviewer 2: Michael E. Msall

We thank Dr. Msall for the thorough review of our manuscript and valuable comments. Our responses to the comments and corresponding revisions are below:

Reviewer comment	Response	Revision
You used a non categorical approach to disability Please give examples of the most common categories so that readers across countries can understand the diversity of your cohort.	We have revised to include the most common disabilities.	Page 5-6: Definitions of "special needs" are set by each province/territory,[36][37] but they are similar and generally include children with identified health problems, with or without formal medical diagnoses, that impede their ability to learn in a regular classroom. Children encompassed by this definition have a broad range of impairments, varying widely in both type (e.g., physical or mental) and severity (e.g., mild speech impairment to non-verbal). The most common disabilities in this population include learning disabilities and speech impairments, which is consistent with the prevalence of disabilities in children at school entry in developed countries.[38][39]
In Table 1 you forgot to define SC.	We have revised to define SC.	Table 1: SC=Social competence
In your discussion please describe what supports are available to children with disability before they start age 5 school. Do these programs have waiting lists based on neighborhood SES?	We have revised to include a discussion of this topic.	Page 13-14: It is important to consider the findings in context of the availability of support services for children with special needs in Canada prior to school entry. The strategies, programs, and accessibility vary by province/territory, and often within jurisdictions, as municipal and regional health units are often service providers, but generally access is easier for children with a specific diagnosis than for

		those with unspecified disorders.[54] While there are no detailed studies on the potential association of service availability or magnitude of waiting lists with neighbourhood SES per se, there could be at least two pathways to such relation. First, services tend to be located in large urban centres (with likely higher SES overall), where there are more professionals.[63] [64] Second, navigation of the care systems, especially for preschool children rests largely on the shoulders of parents: the ability to do so effectively is likely associated with their personal and economic resources and where they live. [65] [66]