PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	Socioeconomic Inequality in Functional Deficiencies and Chronic Diseases among Older Indian Adults: A Sex-stratified Cross-sectional Decomposition Analysis
AUTHORS	Singh, Lucky; Goel, Richa; Rai, Rajesh Kumar; Singh, Prashant Kumar

VERSION 1 – REVIEW

REVIEWER	Dr. Aarti Nagarkar Savitribai Phule Pune University, India
REVIEW RETURNED	16-Apr-2018

GENERAL COMMENTS	General comments Health of older adults is an important subject and the article attempts to identify vulnerable section of the population with ref. to specific disease burden. However, this data is collected almost a decade back 2007-08, pl. justify how relevant are the findings of this study , today? Why is this study should be undertaken ? importance, not explained adequately. Careful revision for language is required , many mistakes like page 3 line 13-14 'chronic health' ? Specific Comments 1. Title does not reflect major finding of the study, analysis focuses is on income inequality /poverty but the title doesnot mentions it hence misleading. 2.Abstract needs to be revised, method section 3.Research questions are not spelled out clearly. Why certain variables have been selected is also not justified adequately. 4.'Functional limitations' include only IADL activities not ADL (?) Why only IADL? is not explained adequately. Limitations of using only IADL items to measure Functional deficiency is also not discussed. 5.Entire Discussion section needs revision in the light of the findings. Certain sentences are not relevant for example page 12 line 42 onwards how are they relevant in the context of definition of IADL? 6.Authors write that 'the poor economic status, followed by rural residence and illiteracy contributed the highest in explaining overall inequality in chronic disease.' ....this is with regard to diagnosis or underdiagnosis of chronic condition ? pl. explain how is that disadvantage?

REVIEWER	Prince M. Amegbor Department of Geography and Planning, Queen's University, Kingston Ontario

REVIEW RETURNED	24-May-2018

GENERAL COMMENTS	The paper is clearly written and nicely structured. The statistical analysis is clearly explained and very competent. The findings and discussion relate well to the analysis. I will encourage the authors to be more reflective of the limitations of the study and the statistical approach used in the analysis. One major concern is the definition of no functional limitation or IADL. Grouping persons with no, mild and moderate difficulties in the same category is highly problematic; as such classification downplays the existence of a functional limitation. This problem may affect your results and the estimates of your decomposition analysis. My advice will be to categorizing all persons with some level of difficulty as 'difficulty' i.e as such and those with none or no difficulty as such. Note, not having a functional challenge is not the same as having a moderate or mild difficulty. I also notice in the methods section you stated "IADL is composed of five items that cover ...", however, the measures mentioned afterwards are more than 5 items. Kindly rectify this (invariably your analysis as well) or justify why 5 items were used out of the 8 listed items.

REVIEWER	Ian Fyffe Simon Fraser University, Canada
REVIEW RETURNED	02-Jul-2018

GENERAL COMMENTS	Statistically, this piece is sound. However, I would have liked to have seen the associations listed in the tables in the results section. For example, for the IADL associations for women it would be important to include the associations Muslim ($\beta = 0.51$, $p < .001$) and older age ($\beta = 0.55$, $p < .001$) since they are so much larger than the other associations. By mentioning associations of note, this would make for an easier transition from the results section to the discussion section. I also did not see the significance levels included in the tables. This could be easily improved by using the *, **, and *** method. There were a few small errors with the writing that could easily be fixed: "Examining disparities in socioeconomic status and its effect on health outcomes in less developing societies is [a] high priority on [the] global agenda." Page 4 "[The] majority of elderly women are deprived of economic security and [are] prone to receiving poor healthcare" Page 4 "A total sample [of] 3753 individuals (male: 1979; and female: 1774) aged 60 years and older were included." Page 5 "Guided by the existing literature, individual and household level binary (1 [or] 0) covariates that could explain maximum dimensions of inequality were considered. The covariates are sex of the respondent (male [or] female), current marital status (married [or] unmarried), social group (Scheduled

	Caste/Scheduled Tribe [or] Non-scheduled Caste/Tribe), religion (Muslim [or] Others), education of the respondent (illiterate [or] literate), economic status (poor [or] non-poor), residence (rural [or] urban) and tobacco use (never, and ever or current)." Page 6 "Economic groups (poor [or] non-poor) were derived from the household wealth index provided in the dataset, [by] using [the] WHO standard approach to estimat[e] income from [selected] indicator variables" Page 7

VERSION 1 – AUTHOR RESPONSE

Response to reviewer(s)

Reviewer # 1

Reviewer Name: Dr. Aarti Nagarkar
Institution and Country: SavitribaiPhule Pune University, India

General comments
Comment: Health of older adults is an important subject and the article attempts to identify vulnerable section of the population with ref. to specific disease burden.
However, this data is collected almost a decade back 2007-08, pl. justify how relevant are the findings of this study, today?
Response: The data were collected in 2007-08 but data were made available for use from 2014 onwards. As mentioned in the method section of the paper, WHO-SAGE is the unique survey conducted in India focuses on not only the subjective measures of health but included objective measures (based on diagnosis and symptoms) among older adults. No survey as such is available in India till now to capture wide range of information of older adults.

Comment: Why is this study should be undertaken ? importance, not explained adequately.
Response: We have further revised the manuscript highlighting need of this study.

Comment: Careful revision for language is required , many mistakes like page 3 line 13-14 'chronic health' ?
Response: We have got the manuscript copyedited before submission.

Specific Comments
Comment: Title does not reflect major finding of the study, analysis focuses is on income inequality /poverty but the title does not mentions it hence misleading.
Response: We have modified the title of the paper - *Socioeconomic inequality in functional deficiencies and chronic diseases among older Indian adults: a sex-stratified cross-sectional decomposition analysis*

Comment: Abstract needs to be revised, method section
Response: Incorporated.

Comment: Research objectives are not spelled out clearly. Why certain variables have been selected is also not justified adequately.
Response: We have added two specific research objectives in the revised manuscript**.** Also, rationale behind selecting independent variables has been incorporated in the revised manuscript.

Comment:'Functional limitations' include only IADL activities not ADL (?) Why only IADL? is not explained adequately. Limitations of using only IADL items to measure Functional deficiency are also not discussed.
Response: In the revised manuscript importance of examining IADL has been included with the limitation. All existing studies from India among older adults have examined ALD and very little attempts have been made to understand the IADL.
Studies have identified a hierarchical structure within the disablement process model from health to disability and concluded the first level of disability includes persons with mobility impairments only (Barberger-Gateau et al., 2000). The next level in the progression includes those with impairments in mobility plus a limitation in an IADL. Finally, level three includes those with mobility, IADL, and basic difficulties in daily activities (Barberger-Gateau et al., 2000; Fujiwara et al., 2003). Although, IADL may not assess the function limitation in very basic tasks such as sitting or standing for long period, bathing, dressing etc. but it provides basic understanding of onset of functional difficulties among older adults (Díaz-Venegas et al., 2016).

Comment: Entire Discussion section needs revision in the light of the findings. Certain sentences are not relevant for example page 12 line 42 onwards how are they relevant in the context of definition of IADL?
Response: Thank you. We have carefully revise the discussion keeping in mind the advice extended. Many irrelevant sentences have been removed.

Comment: Authors write that 'the poor economic status, followed by rural residence and illiteracy contributed the highest in explaining overall inequality in chronic disease.' ....this is with regard to diagnosis or underdiagnosis of chronic condition ? pl. explain how is that disadvantage?
Response: The purpose of decomposition analysis was to estimate how the selected determinants proportionally contribute to the overall inequality in chronic diseases. In this regard the results of decomposition analysis suggest that poor economic status, followed by rural residence and illiteracy contribute highest in explaining the wealth-based inequality in chronic disease.

Reviewer # 2

Reviewer Name: Prince M. Amegbor
Institution and Country: Department of Geography and Planning, Queen's University, Kingston Ontario

Comment: I will encourage the authors to be more reflective of the limitations of the study and the statistical approach used in the analysis.
Response: We have revised the strength and limitation section of the paper with added details related to methodological strength of the paper as well as limitations.

Comment: One major concern is the definition of no functional limitation or IADL. Grouping persons with no, mild and moderate difficulties in the same category are highly problematic; as such classification downplays the existence of a functional limitation. This problem may affect your results and the estimates of your decomposition analysis. My advice will be to categorizing all persons with some level of difficulty as 'difficulty' i.e as such and those with none or no difficulty as such. Note, not having a functional challenge is not the same as having a moderate or mild difficulty.
Response: We have followed the WHO-SAGE definition of no functional limitation or IADL. Please refer to the WHO-SAGE Report, page no. 250http://www.who.int/healthinfo/sage/en/

Comment: I also notice in the methods section you stated "IADL is composed of five items that cover ...", however, the measures mentioned afterwards are more than 5 items. Kindly rectify this (invariably your analysis as well) or justify why 5 items were used out of the 8 listed items.
Response: Thank you, it was a mistake. We have rectified it in the revised manuscript and provided the exact 5 questions that were asked in the survey and being used in present paper.

Reviewer # 3

Reviewer Name: Ian Fyffe
Institution and Country: Simon Fraser University, Canada

Comment: Statistically, this piece is sound. However, I would have liked to have seen the associations listed in the tables in the results section. For example, for the IADL associations for women it would be important to include the associations Muslim (β = 0.51, p < .001) and older age (β = 0.55, p < .001) since they are so much larger than the other associations. By mentioning associations of note, this would make for an easier transition from the results section to the discussion section.
Response: Thank you for your suggestion. We have modified the text and tables accordingly.

Comment: I also did not see the significance levels included in the tables. This could be easily improved by using the *, **, and *** method.
Response: We have added the significant levels in the modified manuscript.

Comment: "Examining disparities in socioeconomic status and its effect on health outcomes in less developing societies is [a] high priority on [the] global agenda." Page 4
Response: Thank you. We have gone through the manuscript again and rectified small language errors. Also, a professional English language editor has copyedited the revised manuscript.

Comment: "[The] majority of elderly women are deprived of economic security and [are] prone to receiving poor healthcare" Page 4
Response: Thank you. We have added in the revised manuscript.

Comment: "A total sample [of] 3753 individuals (male: 1979; and female: 1774) aged 60 years and older were included." Page 5
Response: Thank you. We have added in the revised manuscript.

Comment: "Guided by the existing literature, individual and household level binary (1 [or] 0) covariates that could explain maximum dimensions of inequality were considered. The covariates are sex of the respondent (male [or] female), current marital status (married [or] unmarried), social group (Scheduled Caste/Scheduled Tribe [or] Non-scheduled Caste/Tribe), religion (Muslim [or] Others), education of the respondent (illiterate [or] literate), economic status (poor [or] non-poor), residence (rural [or] urban) and tobacco use (never, and ever or current)." Page 6
Response: Thank you. We have added in the revised manuscript.

Comment: "Economic groups (poor [or] non-poor) were derived from the household wealth index provided in the dataset, [by] using [the] WHO standard approach to estimat[e] income from [selected] indicator variables" Page 7
Response: Thank you. We have added in the revised manuscript

VERSION 2 – REVIEW

REVIEWER	Aarti Nagarkar Savitribai Phule Pune University, India
REVIEW RETURNED	08-Oct-2018

GENERAL COMMENTS	Accepted

REVIEWER	Ian Fyffe Simon Fraser University, Canada
REVIEW RETURNED	09-Oct-2018

GENERAL COMMENTS	After the revisions, the only aspect of this paper that I see that needs to be clarified is Table 2. Table 2 is a little difficult to read

	and I believe that the layout needs to be changed. There was more than enough room for alterations. Other than that, I believe that this is an important area of research in an understudied population. As a gerontologist, I am happy to have been involved in reviewing your work.

VERSION 2 – AUTHOR RESPONSE

Reviewer # 3

Reviewer Name: Ian Fyffe

Institution and Country: Simon Fraser University, Canada

Please state any competing interests or state ‘None declared’: None declared

Comment: After the revisions, the only aspect of this paper that I see that needs to be clarified is Table 2. Table 2 is a little difficult to read and I believe that the layout needs to be changed. There was more than enough room for alterations.

Response: We have revised the Table as per the suggestion. The table has now been split so that it is readable to the viewers.

Comment: Other than that, I believe that this is an important area of research in an understudied population. As a gerontologist, I am happy to have been involved in reviewing your work.

Response: Thank you. We are grateful to receive your suggestions, which helped us to improve the paper.