PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	An ecological study of the association between mental illness with human development, income inequalities and unemployment across OECD countries
AUTHORS	Barbalat, Guillaume; Franck, Nicolas

VERSION 1 – REVIEW

REVIEWER	Joanna Mazur Institute of Mother and Child Poland
REVIEW RETURNED	09-Nov-2019

GENERAL COMMENTS	The weak point of the paper is the vague definition of dependent variables and source materials. GBD studies are usually based on quoting prevalence in thousands and put emphasis on indicators related to mortality, life expectancy and YLD. In the text of the article, in the methods, there is a general specification of prevalence, and in the tables a detailed one (%). There was no formula or information about whether the authors converted the indicators to a population or whether they had ready data. The mean calculated from 36 countries (Table 1) is an approximate measure because different countries have different populations (weights). Some indicators also require better definition. For example, do suicides include non-fatal self-harm? The reader would be interested in source data for 36 OECD countries, which can be added as supplementary material. Studies from the Lancet journal on GBD results contain attachments of 8,000 pages in size, but without individual data for countries. I suggest that you at least provide the internet address where the exact OECD countries data are plsced. The reference to item [5] seems to be a very general reference to the GBD project. This type of source material often lacks data for individual countries and the latest available data relates to different periods for each country. In 2018, it is unlikely to have data on actual prevalence of mental illness for 36 countries, standardised for age. At the country level, this type of data is made available with a long delay. Perhaps the indicators used in the paper concern 2017 based on the estimates and the GBD methodology adopted. The titles of the tables should always state that (or if) they are data for all 36 OECD countries (or less). Alternatively, you can enter the number of countries included in each indicator. Outliers are a separate issue. It is unclear whether such atypical country or countries have been identified for each indicator. The reader may be interested in which countries are atypical, which can be included in Table 1. Does the atypicality always result from a very high rate? It should also be clarified whether the data are calculated in relation to the entire population or adults.

	In general, the paper takes the form of short communication with very poor literature, which reduces its value. It is possible that the work was supposed to be a full-text article (there is no other information in the submission form). It seems to me that the introduction could be extended to further discuss the issue of mental health in the context of public health. Why is it worth focusing on rich countries? It was not explained in the introduction why it is worth analysing medical expenses as a covariate. Also in the discussion you could have more broadly referred to the so-called ecological fallacy, i.e. pitfalls associated with generalising aggregated ecological data per individual. These types of ecological analyses also hugely enrich the charts for selected indicators and correlations. To sum up, I suppose that the objectives of the paper are very much correct. The data source is very valuable. The description of the methodology is, however, in many points very imprecise. Moreover, more explanations should have been included in the titles and content of the tables. Supplementary literature is also recommended.

REVIEWER	Jl KIm Wonkwang University
REVIEW RETURNED	15-Nov-2019

GENERAL COMMENTS	bmjopen-2019-035055 - View Abstract 1. The title of the article is long. Keep it short. Title: An ecological study of the association between mental illness with human development, income inequalities and unemployment across OECD countries: considering the heterogeneity of mental issues and the interdependence of social effects 2. The OBJECTIVE of this research is unclear. Recent studies have demonstrated worsened mental health in relatively highly developed countries impacted by social inequalities and unemployment. Here, we investigate (1) whether mental health issues are differently or similarly affected by these social factors; and (2) whether their effects on mental health are related or unrelated to each other. 3. The DISCUSSION is too short. Please refer to the following paper. 3-1. Effects on inequality in life expectancy from a social ecology perspective. BMC Public Health (SCIE) 2018; 18:243. 3-2. Socio-ecological perspective of older age life expectancy: income, gender inequality, and financial crisis in Europe. Globalization and Health (SSCI) 2017; 13:58. 3-3. Country-level socioeconomic indicators associated with survival probability of becoming a centenarian among older European adults: gender inequality, male labor force participation, and proportions of women in parliaments. Journal of Biosocial Science (SSCI). 2017; 49(2) 239~250.

	3-4. Relationship Between the Remaining Years of Healthy Life Expectancy in Older Age and National Income Level, Educational Attainment, and Improved Water Quality. The International Journal of Aging and Human Development (SSCI) 2016; 83(4): 402-417. 3-5. Country-Level Socioeconomic Indicators Associated with Healthy Life Expectancy: Income, Urbanization, Schooling, and Internet Users: 2000–2012. Social Indicators Research (SSCI) 2016; 129(1): 391–402. 3-6. Social Structural Influences on Healthy Aging: Community-Level Socioeconomic Conditions and Survival Probability of Becoming a Centenarian for Those Aged 65 to 69 in South Korea. The International Journal of Aging and Human Development (SSCI) 2015; 81: 241-259. 3-7. Labor force participation and secondary education of gender inequality index (GII) associated with healthy life expectancy (HLE) at birth. International Journal for Equity in Health (SSCI) 2014; 13:106. 3-8. Factors affecting the survival probability of becoming a centenarian for those aged 70, based on the human mortality database: income, health expenditure, telephone, and sanitation. BMC Geriatrics (SSCI) 2014; 14:113. 3-9. Social factors associated with centenarian rate (CR) in 32 OECD countries. BMC International Health and Human Rights (SSCI) 2013; 13:16.

VERSION 1 – AUTHOR RESPONSE

Reviewer(s)' Comments to Author:

Reviewer: 1

Reviewer Name: Joanna Mazur
Institution and Country: Institute of Mother and Child Poland
Please state any competing interests or state ‘None declared’: none declared

Please leave your comments for the authors below

The weak point of the paper is the vague definition of dependent variables and source materials. GBD studies are usually based on quoting prevalence in thousands and put emphasis on indicators related to mortality, life expectancy and YLD. In the text of the article, in the methods, there is a general specification of prevalence, and in the tables a detailed one (%). There was no formula or information about whether the authors converted the indicators to a population or whether they had ready data.

Response: We have clarified the definition of prevalence in the new version of the manuscript p.8 (Methods section): “The GBD study 2017 defines prevalence as the proportion of people in a population who are a case of a disease, injury or sequela. All results in GBD refer to point prevalence.”

Then, at the beginning of p.9: “Extracted data did not necessitate any further transformation and was ready to be used.”

The mean calculated from 36 countries (Table 1) is an approximate measure because different countries have different populations (weights).

Response: We have added a column on **Table 1** (p.20) where averages are based on population-weighted mean.

Some indicators also require better definition. For example, do suicides include non-fatal self-harm?

Response: We have added p.8 (Methods section) that: “Note that suicide did not include non-fatal self-harm.”

The reader would be interested in source data for 36 OECD countries, which can be added as supplementary material. Studies from the Lancet journal on GBD results contain attachments of 8,000 pages in size, but without individual data for countries.

I suggest that you at least provide the internet address where the exact OECD countries data are plsced.

Response: We have followed the reviewer's suggestion and have mentioned p.9 (Methods section) that: “Source data for all 36 OECD countries can be found as a supplementary file (all_data.pdf).”

The reference to item [5] seems to be a very general reference to the GBD project. This type of source material often lacks data for individual countries and the latest available data relates to

different periods for each country. In 2018, it is unlikely to have data on actual prevalence of mental illness for 36 countries, standardised for age. At the country level, this type of data is made available with a long delay. Perhaps the indicators used in the paper concern 2017 based on the estimates and the GBD methodology adopted.

Response: We have responded to this point p.8 (Methods section): “Data from the GBD study 2017 was released in November 2018, and concern years 1990-2017.” Then (p.8): “Data was extracted for year 2017”.

The titles of the tables should always state that (or if) they are data for all 36 OECD countries (or less). Alternatively, you can enter the number of countries included in each indicator.

Response: We have added the number of countries included in each analysis (N=36) in each Table's title, both in the manuscript and in the Supplementary Material.

We have mentioned p.9 (Methods section) that: “There was no missing data.”

Outliers are a separate issue. It is unclear whether such atypical country or countries have been identified for each indicator. The reader may be interested in which countries are atypical, which can be included in Table 1. Does the atypicality always result from a very high rate?

Response: We have added a note p.9 that: “For each indicator (dependent and independent variables), atypical countries were defined as having a z-score greater than 3 or below -3 (**Table 1**).” For each indicator, atypical countries and their corresponding values have been reported in **Table 1** (p.20)**.**

It should also be clarified whether the data are calculated in relation to the entire population or adults.

Response: We have mentioned p.8 of the new version of the manuscript that “Data was calculated in relation to the entire population."

In general, the paper takes the form of short communication with very poor literature, which reduces its value. It is possible that the work was supposed to be a full-text article (there is no other information in the submission form). It seems to me that the introduction could be extended to further discuss the issue of mental health in the context of public health. Why is it worth focusing on rich countries? It was not explained in the introduction why it is worth analysing medical expenses as a covariate.

Response: Indeed, the article was originally written and submitted as a *Brief Report*.

We agree with the reviewer's suggestion and have significantly expanded our Introduction and Discussion. As requested, we have included a paragraph discussing the issue of mental health in the context of public health, another one explaining why it is worth focusing on rich countries, and one explaining why it is worth analysing medical expenses as a covariate. Please refer to the main text of the updated version of our manuscript for details.

Also in the discussion you could have more broadly referred to the so-called ecological fallacy, i.e. pitfalls associated with generalising aggregated ecological data per individual. These types of ecological analyses also hugely enrich the charts for selected indicators and correlations.

Response: We have mentioned ecological fallacy as a potential bias in the new version of the Discussion p.14: “A second potential limitation of this study is the so-called ecological fallacy, that is, making inferences on individual risk from analysis made on aggregate data [50]. Based on this study results, one cannot draw conclusions about the specific nature of individuals (e.g. their socio-economic status) who suffer from mental health issues. To solve this question, one would need to design a multilevel study where socio-economic status at the individual level and at the country level would be entered as two-level predictors.”

To sum up, I suppose that the objectives of the paper are very much correct. The data source is very valuable. The description of the methodology is, however, in many points very imprecise. Moreover, more explanations should have been included in the titles and content of the tables. Supplementary literature is also recommended.

Reviewer: 2

Reviewer Name: JI KIm
Institution and Country: Wonkwang University
Please state any competing interests or state ‘None declared’: None declared

Please leave your comments for the authors below
bmjopen-2019-035055 - View Abstract

1. The title of the article is long. Keep it short.

Title: An ecological study of the association between mental illness with human development, income inequalities and unemployment across OECD countries: considering the heterogeneity of mental issues and the interdependence of social effects.
Response: We have shortened the title of the article to "An ecological study of the association between mental illness with human development, income inequalities and unemployment across OECD countries".

2. The OBJECTIVE of this research is unclear.

Recent studies have demonstrated worsened mental health in relatively highly developed countries impacted by social inequalities and unemployment. Here, we investigate (1) whether mental health issues are differently or similarly affected by these social factors; and (2) whether their effects on mental health are related or unrelated to each other.
Response: As mentioned to reviewer #1, the article was originally written as a *Brief report*. In the new version of the manuscript, we have expanded significantly our Introduction and especially the objective of this research. Please refer to the main text of the updated version of our manuscript for details.

3. The DISCUSSION is too short. Please refer to the following paper.

3-1. Effects on inequality in life expectancy from a social ecology perspective. BMC Public Health (SCIE) 2018; 18:243.

3-2. Socio-ecological perspective of older age life expectancy: income, gender inequality, and financial crisis in Europe. Globalization and Health (SSCI) 2017; 13:58.

3-3. Country-level socioeconomic indicators associated with survival probability of becoming a centenarian among older European adults: gender inequality, male labor force participation, and proportions of women in parliaments. Journal of Biosocial Science (SSCI). 2017; 49(2) 239~250.

3-4. Relationship Between the Remaining Years of Healthy Life Expectancy in Older Age and National Income Level, Educational Attainment, and Improved Water Quality. The International Journal of Aging and Human Development (SSCI) 2016; 83(4): 402-417.

3-5. Country-Level Socioeconomic Indicators Associated with Healthy Life Expectancy: Income, Urbanization, Schooling, and Internet Users: 2000–2012. Social Indicators Research (SSCI) 2016; 129(1): 391–402.

3-6. Social Structural Influences on Healthy Aging: Community-Level Socioeconomic Conditions and Survival Probability of Becoming a Centenarian for Those Aged 65 to 69 in South Korea. The International Journal of Aging and Human Development (SSCI) 2015; 81: 241-259.

3-7. Labor force participation and secondary education of gender inequality index (GII) associated with healthy life expectancy (HLE) at birth. International Journal for Equity in Health (SSCI) 2014; 13:106.

3-8. Factors affecting the survival probability of becoming a centenarian for those aged 70, based on the human mortality database: income, health expenditure, telephone, and sanitation. BMC Geriatrics (SSCI) 2014; 14:113.

3-9. Social factors associated with centenarian rate (CR) in 32 OECD countries. BMC International Health and Human Rights (SSCI) 2013; 13:16.

Response: The Discussion has been significantly extended in the new version of the manuscript and a few of the papers mentioned by the reviewer have been included. Please refer to the main text for details.

VERSION 2 – REVIEW

REVIEWER	Joanna Mazur Institute of Mother and Child Poland
REVIEW RETURNED	31-Jan-2020

GENERAL COMMENTS	I feel satisfied with Authors responses and revised version of this manuscript. It wasn't my intention to force including source data in the main body of manuscript. So, I am a little concerned with the part attached in pdf file – paged 23 to 26. It's too technical layout. I rather expected clear link to data or similar information as a part of supplementary material.

REVIEWER	Kim, Jong In Wonkwang University
REVIEW RETURNED	24-Dec-2019

GENERAL COMMENTS	None

VERSION 2 – AUTHOR RESPONSE

Reviewer(s)' Comments to Author:

Reviewer: 1

Reviewer Name: Joanna Mazur
Institution and Country: Institute of Mother and Child Poland
Please state any competing interests or state ‘None declared’: none declared

Please leave your comments for the authors below
I feel satisfied with Authors responses and revised version of this manuscript. It wasn’t my intention to force including source data in the main body of manuscript. So, I am a little concerned with the part attached in pdf file – paged 23 to 26. It’s too technical layout. I rather expected clear link to data or similar information as a part of supplementary material.

Response:

We have removed the supplementary file and instead provided a link to the raw data