

## PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form ([see an example](#)) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below. Some articles will have been accepted based in part or entirely on reviews undertaken for other BMJ Group journals. These will be reproduced where possible.

### ARTICLE DETAILS

<b>TITLE (PROVISIONAL)</b>	Trends in Population Mental Health Before and After the 2008 Recession: A Repeat Cross-Sectional Analysis of the 1991-2010 Health Surveys of England
<b>AUTHORS</b>	Katikireddi, Srinivasa ; Niedzwiedz, Claire; Popham, Frank

### VERSION 1 - REVIEW

<b>REVIEWER</b>	Noriko Cable, PhD Senior Research Fellow Department of Epidemiology and Public Health University College London, United Kingdom Cometing interests: None
<b>REVIEW RETURNED</b>	23-Jul-2012

<b>THE STUDY</b>	I believe their interpretation of the findings will be validated if authors include household income in the model. In this way, authors can explain the non-significant effect of employment status on mental health during recession. (re-employed, but pay reduced)
<b>GENERAL COMMENTS</b>	The work is well designed and written. It has to be published with one minor revision. I suggest to include household income level in the model to see why employment status did not explain the impact of recessions on mental health. It may be due to reduced pay with re-employment. This will add further discussion about economical aspects of recession in relation to menal health.

<b>REVIEWER</b>	Amanda Sacker Professor of Quantitative Social Science Institute for Social and Economic Research (ISER) University of Essex UK  I have no competing interests
<b>REVIEW RETURNED</b>	25-Jul-2012

<b>THE STUDY</b>	<p>The State Pension Age for women was 60 for most years of the study. Even since the changes to the State Pension age which are currently being rolled out, the vast majority of women have retired by 60. So working age for women is usually defined as &lt;60 years. Would the results be affected if a gendered definition of working age were used instead?</p> <p>The HSE has focused on specific population groups in some years, such as ethnic minority groups or young adults. No mention is made of whether the HSE sampling weights (supplied for all years) were used in the analysis. Prevalence of GHQ caseness could be affected</p>
------------------	---

	in years when sub-populations have been oversampled.
<b>RESULTS &amp; CONCLUSIONS</b>	<p>I was intrigued by the increases in GHQ prevalence in years other than those potentially affected by recession and why the magnitude of the differences were at least as large or even larger than 2009/10. A quick review of the HSE documentation uncovered the fact that in 1999, 2002 and 2009 (all years with peaks), the GHQ items were the first questions in the self-completion questionnaire whereas in the other years, the GHQ followed other questions. How can we be sure that the increase in GHQ prevalence attributed to the recession is not just an artifact of the questionnaire design?</p> <p>The limitations from using cross-sectional data are acknowledged in the discussion but the language in the paper still has a causal interpretation. This is evident in the title which uses the term "effects of the recession". I would recommend toning down the causal language throughout the manuscript.</p>
<b>REPORTING &amp; ETHICS</b>	I did not notice any statement on research ethics and the Health Survey for England.
<b>GENERAL COMMENTS</b>	I note that errors in the GHQ scores for the data supplied to the Data Archive were reported and corrected in August 2011. Were the data used in the analysis downloaded before of after this problem was identified?

<b>REVIEWER</b>	Tarani Chandola Professor, head of Social Statistics University of Manchester No conflicting interests
<b>REVIEW RETURNED</b>	01-Aug-2012

<b>THE STUDY</b>	The key limitation of the paper is not mentioned, which is the lack of a measure of the main exposure- "the recession". Instead the authors use period/year as a proxy measure of the recession, but Table 1 clearly shows that there was only a small increase in the unemployment rate from 2008 onwards. It would have been better had they been able to extend the analysis to more recent years (2011?) when unemployment was greater. Also, other features of the recession that could have an impact on mental health, such as temporary employment, work stressors are not examined, so this should be listed as limitations.
<b>RESULTS &amp; CONCLUSIONS</b>	<p>I would have preferred some greater, in depth analysis of the data in the following ways:</p> <ol style="list-style-type: none"> <li>1. Examine regional differences- the analysis presents data for England as a whole, but there were strong regional differences in the impact of the recession, which should correlate with changes in population mental health at the regional level.</li> <li>2. Include the data from 1991 onwards in Table 2 (rather than just the statistics from 2005 onwards). This way the paper can report on the population mental health effects from the 1991 recession when unemployment was much higher.</li> <li>3. Include sector of employment in the analysis. This could be derived from the occupational code in the HSE. This is an important dimension, particularly as private sector employees (predominantly male) suffered the most in the early years of the 2008-11 recession, whereas public sector workers (predominantly female) suffered more in the later years (which are not well captured by the analysis only going up to 2010). This could account for the apparent gender equalisation during the recession.</li> </ol>
<b>GENERAL COMMENTS</b>	This is a an interesting and timely paper that is well written. If the

	authors could address some of my comments, that could make the paper stronger.
--	--

### VERSION 1 – AUTHOR RESPONSE

Reviewer: Noriko Cable, PhD  
 Senior Research Fellow  
 Department of Epidemiology and Public Health  
 University College London, United Kingdom  
 Competing interests: None

I believe their interpretation of the findings will be validated if authors include household income in the model. In this way, authors can explain the non-significant effect of employment status on mental health during recession. (re-employed, but pay reduced)

The work is well designed and written. It has to be published with one minor revision. I suggest to include household income level in the model to see why employment status did not explain the impact of recessions on mental health. It may be due to reduced pay with re-employment. This will add further discussion about economical aspects of recession in relation to mental health.

We have added income into the model in an exploratory analysis (made available as a supplemental table). Equivalised household income (categorised into quintiles or as a continuous variable), while negatively associated with GHQ caseness, does not help account for the observed recent changes over time. We have also added some consideration of this finding into the discussion.

Reviewer: Amanda Sacker  
 Professor of Quantitative Social Science  
 Institute for Social and Economic Research (ISER)  
 University of Essex  
 UK

I have no competing interests

The State Pension Age for women was 60 for most years of the study. Even since the changes to the State Pension age which are currently being rolled out, the vast majority of women have retired by 60. So working age for women is usually defined as <60 years. Would the results be affected if a gendered definition of working age were used instead?

We have re-analysed the data with a gendered working age definition of 25-59 years and the results were similar. We have added text in the methods section to explain that this sensitivity analysis has been conducted (pg6, para2).

The HSE has focused on specific population groups in some years, such as ethnic minority groups or young adults. No mention is made of whether the HSE sampling weights (supplied for all years) were used in the analysis. Prevalence of GHQ caseness could be affected in years when sub-populations have been oversampled.

We have used the general population sample data (and weights for non-response when available) for all analyses. In years when some population subgroups have been oversampled, general population datasets (provided within the ESDS Data Archive) have been used. We have clarified the point about using general population data (with appropriate weights) in the methods section of the text (pg6, para2).

I was intrigued by the increases in GHQ prevalence in years other than those potentially affected by recession and why the magnitude of the differences were at least as large or even larger than 2009/10. A quick review of the HSE documentation uncovered the fact that in 1999, 2002 and 2009 (all years with peaks), the GHQ items were the first questions in the self-completion questionnaire whereas in the other years, the GHQ followed other questions. How can we be sure that the increase in GHQ prevalence attributed to the recession is not just an artifact of the questionnaire design?

This is an important potential explanation and we raise it as a limitation in the discussion section (pg9, para3). However, we suspect it would be unlikely to account for the overall increases in prevalence in men that are seen for both 2009 and 2010.

The limitations from using cross-sectional data are acknowledged in the discussion but the language in the paper still has a causal interpretation. This is evident in the title which uses the term "effects of the recession". I would recommend toning down the causal language throughout the manuscript.

We have revised the language throughout the manuscript as recommended and amended the title to "Trends in Population Mental Health Before and After the 2008 Recession: A Repeat Cross-Sectional Analysis of the 1991-2010 Health Surveys of England".

I did not notice any statement on research ethics and the Health Survey for England.

A statement on research ethics is included on the first page of the manuscript. An acknowledgement for the Health Surveys for England is included in the acknowledgements section.

I note that errors in the GHQ scores for the data supplied to the Data Archive were reported and corrected in August 2011. Were the data used in the analysis downloaded before or after this problem was identified?

The data were downloaded after this problem was identified.

Reviewer: Tarani Chandola  
Professor, head of Social Statistics  
University of Manchester  
No conflicting interests

The key limitation of the paper is not mentioned, which is the lack of a measure of the main exposure-"the recession". Instead the authors use period/year as a proxy measure of the recession, but Table 1 clearly shows that there was only a small increase in the unemployment rate from 2008 onwards. It would have been better had they been able to extend the analysis to more recent years (2011?) when unemployment was greater. Also, other features of the recession that could have an impact on mental health, such as temporary employment, work stressors are not examined, so this should be listed as limitations.

We have added some text to the discussion in response to these points (pg9, para3). Unfortunately, the 2010 data was only released a few months ago (April 2012) and the 2011 data will not be made publicly available for almost a year. We hope to pursue this work further, as more data becomes available.

I would have preferred some greater, in depth analysis of the data in the following ways:

1. Examine regional differences- the analysis presents data for England as a whole, but there were strong regional differences in the impact of the recession, which should correlate with changes in

population mental health at the regional level.

We have conducted the analysis by government office regions (9 areas) and also re-categorised into three areas (north, midlands, south). Unemployment trends within the HSE data do not differ that strongly and we have therefore found it difficult to relate trends in GHQ by region to employment status. While detailed analysis in this area would be useful, we think it would not be possible to investigate this issue adequately within the current paper. In addition, the relatively small samples for each region mean that this analysis is underpowered when using the data currently available. We therefore hope to pursue such analysis more in the future.

2. Include the data from 1991 onwards in Table 2 (rather than just the statistics from 2005 onwards). This way the paper can report on the population mental health effects from the 1991 recession when unemployment was much higher.

In our previous submission, we included results for all years as a web-only appendix. We believe that including the results as an appendix may be more appropriate because Table 2 (as currently laid out) allows easy comparison of models. However, due to the size of the tables for all years, presentation of results for all years requires very long tables which are more difficult for readers to compare models. We therefore think it is helpful to provide the full results (as an appendix) but a more reader-friendly set of results as Table 2. We have flagged up the results in the appendix on the legend for Table2 and in the text.

3. Include sector of employment in the analysis. This could be derived from the occupational code in the HSE. This is an important dimension, particularly as private sector employees (predominantly male) suffered the most in the early years of the 2008-11 recession, whereas public sector workers (predominantly female) suffered more in the later years (which are not well captured by the analysis only going up to 2010). This could account for the apparent gender equalisation during the recession.

This is an interesting and timely paper that is well written. If the authors could address some of my comments, that could make the paper stronger.

We have carried out further analysis to explore this possibility. Unfortunately, the coding of occupational code is not consistent across HSE years. We have therefore conducted analysis for the years 2008-10 inclusive (which have comparable coding across the datasets), with employees coded into private sector and public sector categories. The limited data available make this analysis relatively uninformative but as yet, employment sector differences do not account for the gender equalisation. However, we would hope to return to explore this issue further once more data are available and we are in a position to more robustly investigate this important dimension.

#### VERSION 2 – REVIEW

<b>REVIEWER</b>	Tarani Chandola Professor and Head of Social Statistics University of Manchester
<b>REVIEW RETURNED</b>	27-Aug-2012

- The reviewer completed the checklist but made no further comments.