PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (**http://bmjopen.bmj.com/site/about/resources/checklist.pdf**) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

ARTICLE DETAILS

TITLE (PROVISIONAL)	Use of out-of-hours primary care in affluent and deprived neighbourhoods during reforms in long-term care: an observational study from 2013 to 2016
AUTHORS	Jansen, Tessa; Verheij, Robert A; Schellevis, Francois; Kunst, Anton

VERSION 1 – REVIEW

REVIEWER	Shona Kelly Sheffield Hallam University United Kingdom
REVIEW RETURNED	19-Oct-2018

GENERAL COMMENTS	This is an excellent piece of research on the thorny problem of OOH services. My comments are mostly about clarity I have a couple of suggestions. 1. The sentence starting on p5l4 contradicts the first sentence in the discussion. I presume the new LTC system assumes people will take up their own care? 2. p5l26 - I would think that there would be differences by life-course age groupings with the spillover. I was going to suggest some post-project work dividing this massive cohort into age groupings a rerunning the analysis on subgroups such as the elderly or children under 5. Sometimes things are clearer without the rest of the population cluttering up the analysis. 3. Did you find any support for the assumptions at the bottom of page 5? 4. The first paragraph of methods belongs at the end of the introduction. 5. Figure 1 clearly shows a distinct difference between very low and all the rest but the numbers in table 2 suggest a more graded relationship across all the Neighbourhood SES categories. Can you explain this to me? 6. 4 years is indeed to few for tread analysis - could you use quarterly data or does the seasonal effect swamp out any differences?

REVIEWER	Rosemary McKenzie The University of Melbourne Australia
REVIEW RETURNED	04-Nov-2018

GENERAL COMMENTS	Overall the manuscript addresses an important topic which is worthy of investigation now and in years ahead, the question of the extent to which major Long Term Care (LTC) policy changes in The Netherlands are affecting people of different socio-economic means, using Out of Hours (OoH) Primary Care Service (PCS) use as the main indicator. While the study did not demonstrate an association between changes in OoH use and socio-economic status, it did

	show an increase in OoH use since the introduction of the LTC reforms. However, it mentions but does not investigate in any detail whether significant changes in OoH PCS organisation may have produced the changes identified. Further research is justified in this area, and I believe the authors could go a step further in recommending further research and evaluation in this field as well as the recommendation of further investigation of the impact of LTC reform on vulnerable populations. Comments specific to the check list above, follow. Abstract : Appropriate structure, clearly written but some awkwardness of expression should be addressed. For example, in Results, line 26 p2 "overall OoH PCS use increased with 6%" should read "by 6%" (and % increases throughout the manuscript should be similarly expressed) and lines 29-30 p2-3 "The trend in increasing OoH PCS use developed practically similar" should be re-written to improve flow and reader comprehension. Statistical analysis: I am not a statistical expert and whilst the results appear to be arrived at using robust analytic methods, further review by a statistician is recommended. References: While the references are up to date and appropriate regarding Long Term Care (LTC) some additional references regarding longer term trends in Out of Hours care in The Netherlands would be useful, for example, 1 Smits M, Rutten M, Keizer E, Wensing M, Westert G, Giesen P. The Development and Performance of After-Hours Primary Care in the Netherlands: a Narrative Review. Annals Int Med. 2017; 166(10). Presentation of the references needs careful editing. Many references are not presented in consistent format (use of abbreviation of Journal names and use of capitalisation of Journal names varies throughout the reference list) Standard of written English: While generally very good, there are a number of instances of awkward expression that should be addressed throughout the manuscript. Note typographical error "car" instead of "care" line 14 p5. Also note ambiguity of expression on page 5 line 4, "The reforms departed from ...." however the article and associated references suggest that the reforms did not depart from but in fact adopted the assumption "that people are willing to and able to take up an active role in managing their health and healthcare needs."

REVIEWER	Gunter Laux Department for General Medicine and Health Services Research Universitätsklinikum Heidelberg Im Neuenheimer Feld 130.3 D-69120 Heidelberg West Germany
REVIEW RETURNED	04-Nov-2018

GENERAL COMMENTS	This is a very interesting und vital manuscript on a reform in health care provision (here: long term care) and potential effects on health care utilisation patterns (here: utilisation of out-of-hours health care services). The paper is well written and structured. The methods are scientifically sound. Strengths and limitations are clearly addressed. In principle, the manuscript should be accepted for publication in BMJ Open. However, there are three main issues, that should be addressed within a final manuscript:

	1. Of course, the reform - concerning a whole country - does not allow for the construction of a control group in the Netherlands. However, you should find and cite some international studies, where there was no reform concerning long term care and where health care utilisation patterns in OOHC were rather stable within 3-5 years. Even if these studies are not directly comparable to the Netherlands situation, it will appear more evident that the observed changes in OOHC utilisation are causally linked to the LTC reform. 2. In our studies on OOHC, morbidity was expectedly the strongest predictor for OOHC utilization. Please state why you did not adjust for morbidity, or why it was not possible with the underlying data. 3. Please convince the reader, that there was no shift in morbidity in 2015/16 in the Netherlands (e. g. flu epidemics). Minor issues: a) When did the reform start exactly? January 1st 2015? b) Abstract, line 14: “socioeconomic” instead of “social” c) Page 5, line 14: “care” instead of “car” d) Page 6, line 20: “if” instead of “of”

VERSION 1 – AUTHOR RESPONSE

Reviewer 1:
Reviewer Name: Shona Kelly

This is an excellent piece of research on the thorny problem of OOH services. My comments are mostly about clarity I have a couple of suggestions.
Author response:
We thank prof. Shona Kelly for her compliments and efforts to review our manuscript.

1. The sentence starting on p5l4 contradicts the first sentence in the discussion. I presume the new LTC system assumes people will take up their own care?
Author response:
1. Indeed the new LTC system assumes people were able to take up their own care and can rely on informal care provided by their social network. We restructured the sentence on p.5/l.4: “The reforms were issued under the assumption that people were willing and able to take up a more active role in managing their health and healthcare needs, and for instance mobilise their social network to provide care”.

2. p5l26 - I would think that there would be differences by life-course age groupings with the spill over. I was going to suggest some post-project work dividing this massive cohort into age groupings a rerunning the analysis on subgroups such as the elderly or children under 5. Sometimes things are clearer without the rest of the population cluttering up the analysis.
Author response:
Although young children make up the biggest age group in terms of utilisation of out-of-hours primary care, we did not expect the long-term care reforms to specifically affect this age-group, as less than 1% of children in this age-group received long-term residential care before the reforms were issued.
1. We therefore did not perform subgroup analysis for young children. However, we did perform a subgroup analysis for the age group 75 years and older. We did not report these findings, since they were similar to the whole group analysis. To address this comment, we added the following in the Results section: “Additionally, we conducted a post-hoc subgroup analysis to explore whether outcomes as reported in table 3 differed for the age group of 75 years and older. We did not find

actual differences between the whole group analysis and the subgroup of 75 years and older, as is depicted in table 4 (in online appendix)." (p.11/l.25-28). We additionally added a table in the appendix (table 4) replicating table 3 in the main text, but for the population >75 years.

3. Did you find any support for the assumptions at the bottom of page 5?
Author response:
These assumptions were that the urgency of an OOH PCS contact, the moment the contact took place, and the type of contact (i.e. telephone consultation, consultation, or home visit) reflected the acuteness of the health problem. We did not have evidence to support these assumptions. We therefore rephrased our assumptions at the end of the Introduction: "Differences in trends may indicate changes in the (perceived) severity of the health problem and need to contact an OOH PCS. For instance, a large portion of contacts with an OOH PCS is not urgent from a medical perspective and may reflect more patient-related motives, such as worry and need for information 28 29. Supposedly, these motives come into play more often in contacts during the early evening and daytime in the weekend, whereas people during the night more likely contact an OOH PCS due to medically acute health problems." (p. 5/l.28-34, p. 6/l. 1).

4. The first paragraph of methods belongs at the end of the introduction.

Author response:
We moved this part of the Methods to the Introduction section. (p. 6/l. 6-16)

5. Figure 1 clearly shows a distinct difference between very low and all the rest but the numbers in table 2 suggest a more graded relationship across all the Neighbourhood SES categories. Can you explain this to me?
Author response:
In table 2, in our view, the coefficients of the very low SES neighbourhoods differ substantially from those of the other neighbourhoods. We do agree, however that the differences between the lowest SES neighbourhoods and the other neighbourhoods in figure 1 are more pronounced. This is caused by the interaction term year*SES that was added in the models to predict the mean OOH PCS use outcomes, as are reported in figure 1. Although not statistically significant, the interaction that was added to predict mean OOH PCS use in each of the years appeared to lead to a somewhat different pattern per SES-group over the years. Table 2 reports the outcomes without this interaction term. For comparison (for the reviewer, not included in the appendix of the manuscript), we made a graph following from the analysis underlying table 2. The regression analysis for the total number of OOH PCS contacts was used to predict the mean number of contacts per year, per SES-group. This graph shows a similar line compared to the first graph in figure 1."

6. 4 years is indeed too few for tread analysis - could you use quarterly data or does the seasonal effect swamp out any differences?
Author response:
Although four years is indeed a short time period to analyse trends, we expected effects on the short-term following the reforms. Although we were unable to analyse whether changes are lasting, dividing the data to quarterly fractions does not resolve this limitation. Moreover, the seasonal fluctuations within the years introduce additional complications in the interpretation of the changes.

Reviewer 2:
Reviewer Name: Rosemary McKenzie

Overall the manuscript addresses an important topic which is worthy of investigation now and in years ahead, the question of the extent to which major Long Term Care (LTC) policy changes in The Netherlands are affecting people of different socio-economic means, using Out of Hours (OoH)

Primary Care Service (PCS) use as the main indicator. While the study did not demonstrate an association between changes in OoH use and socio-economic status, it did show an increase in OoH use since the introduction of the LTC reforms. However, it mentions but does not investigate in any detail whether significant changes in OoH PCS organisation may have produced the changes identified. Further research is justified in this area, and

I believe the authors could go a step further in recommending further research and evaluation in this field as well as the recommendation of further investigation of the impact of LTC reform on vulnerable populations.
Author response:
We thank prof. Rosemary McKenzie for her compliments and efforts to review our manuscript.
We added the following sentence in the discussion: “Since sustainable LTC is an important issue in numerous countries 6, future research is justified to monitor the impact of reforms on equitable access to LTC 7. Moreover, healthcare reforms should focus not only the effects on the direct objectives of the reforms, but also consider unintended effects such as spill over effects, specifically among vulnerable populations. Considering the general increased use of OOH PCSs, future research should focus on how to organise out-of-hours primary care to yield sustainable care provision, for instance by integrating emergency care and primary care services 8.
”. (p. 17/l. 9-12)

2. Abstract : Appropriate structure, clearly written but some awkwardness of expression should be addressed. For example, in Results, line 26 p2 "overall OoH PCS use increased with 6%" should read "by 6%" (and % increases throughout the manuscript should be similarly expressed) and lines 29-30 p2-3 "The trend in increasing OoH PCS use developed practically similar" should be re-written to improve flow and reader comprehension.
Author response:
We changed the expressions and typographical errors accordingly.

3. References: While the references are up to date and appropriate regarding Long Term Care (LTC) some additional references regarding longer term trends in Out of Hours care in The Netherlands would be useful, for example, 1 Smits M, Rutten M, Keizer E, Wensing M, Westert G, Giesen P. The Development and Performance of After-Hours Primary Care in the Netherlands: a Narrative Review. Annals Int Med. 2017; 166(10). Presentation of the references needs careful editing. Many references are not presented in consistent format (use of abbreviation of Journal names and use of capitalisation of Journal names varies throughout the reference list)
Author response:
We already cited the suggested reference from Smits et al (2017) in the introduction and the discussion of the original manuscript.
We have edited the references according to the BMJ format.

4. Standard of written English: While generally very good, there are a number of instances of awkward expression that should be addressed throughout the manuscript. Note typographical error "car" instead of "care" line 14 p5. Also note ambiguity of expression on page 5 line 4, "The reforms departed from ...." however the article and associated references suggest that the reforms did not depart from but in fact adopted the assumption "that people are willing to and able to take up an active role in managing their health and healthcare needs."
Author response:
We have edited the manuscript to comply with the reviewers’ typographical and grammatical suggestions.

Reviewer 3:
Reviewer Name: Gunter Laux

This is a very interesting und vital manuscript on a reform in health care provision (here: long term care) and potential effects on health care utilisation patterns (here: utilisation of out-of-hours health care services).
The paper is well written and structured. The methods are scientifically sound. Strengths and limitations are clearly addressed.
In principle, the manuscript should be accepted for publication in BMJ Open.
Author response:
We thank prof. Gunter Laux for his compliments and efforts to review our manuscript.
However, there are three main issues, that should be addressed within a final manuscript:
1. Of course, the reform - concerning a whole country - does not allow for the construction of a control group in the Netherlands. However, you should find and cite some international studies, where there was no reform concerning long term care and where health care utilisation patterns in OOHC were rather stable within 3-5 years. Even if these studies are not directly comparable to the Netherlands situation, it will appear more evident that the observed changes in OOHC utilisation are causally linked to the LTC reform.
Author response:
We searched for studies on trends in OOH services use, however to the best of our knowledge there are no such studies.
We preferably would have conducted similar analyses for a country with comparable data of out-of-hours primary care use, and without LTC reforms. However, we did not have comparable data. We added a sentence in the discussion addressing this issue as a limitation of the study: “To determine whether OOH PCS use changed due to the LTC reforms, we ideally would have added to the analysis a control country with a similar OOH PCS system but no LTC reforms. However, it was not feasible within the scope of this study to conduct such a country control-group comparison.”. (p.15/l.12-14)

2. In our studies on OOHC, morbidity was expectedly the strongest predictor for OOHC utilization. Please state why you did not adjust for morbidity, or why it was not possible with the underlying data.
Author response:
In our data, information about morbidity is available for each contact, recorded using the International Classification of Primary Care, version 1 (ICPC v1). This information pertains to the OOH PCS contact itself only. However, to be able to control for morbidity, we would have needed data about the underlying morbidity of people who did contact an OOH PCS, and people who did not. We did not have such data for the whole population who possibly could have contacted an OOH PCS, and therefore controlling for morbidity was not possible.

3. Please convince the reader, that there was no shift in morbidity in 2015/16 in the Netherlands (e. g. flu epidemics).
Author response:
We added the following in the Discussion: “Furthermore, seasonal influenza epidemics possibly explains some of the variation in healthcare utilisation over time. For acute respiratory infections and influenza like illness, the consultation rates in general practice were higher in the influenza season 2014/2015 compared to the season 2015/2016 11. Likely, the number of contacts with an OOH PCS was affected by the seasonal influenza epidemic as well. ”. (p. 15/l. 28-34)

VERSION 2 – REVIEW

REVIEWER	Professor Shona Kelly Sheffield Hallam University UK
REVIEW RETURNED	10-Jan-2019

GENERAL COMMENTS	Thank you for addressing all of my questions. In my opinion the

	paper is ready for publication and I look forward to referencing it in my work.

REVIEWER	Prof. Dr. Gunter Laux Dept. of General Practice and Health Services Research University Hospital Heidelberg Heidelberg, West Germany
REVIEW RETURNED	11-Dec-2018

GENERAL COMMENTS	My issues concerning the first draft were properly addressed.