

## PEER REVIEW HISTORY

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### ARTICLE DETAILS

<b>TITLE (PROVISIONAL)</b>	Social isolation and its psycho-social factors in mild lockdown for the COVID-19 pandemic: a cross-sectional survey of the Japanese population
<b>AUTHORS</b>	Sugaya, Nagisa; Yamamoto, Tetsuya; Suzuki, Naho; Uchiumi, Chigusa

### VERSION 1 – REVIEW

<b>REVIEWER</b>	James Lubben Boston College, Social Work
<b>REVIEW RETURNED</b>	22-Feb-2021

<b>GENERAL COMMENTS</b>	<p>Manuscript is very well written and generally easy to follow. However, I have the following specific suggested editorial changes:</p> <ol style="list-style-type: none"><li>1. I recommend changing “inhabitants” to “individuals”. For example, the following statement appears in the abstract “We collected data on 11,333 inhabitants ... living in the seven prefectures...” The following appears less awkward: “We collected data on 11,333 individuals...living in the seven prefectures...” Similarly, in the Methods (page 6) it states “inhabitants living in...” This statement reads better as follows: “individuals living in...”</li><li>2. The reference for the LSNS-6 scoring (page 8) is incomplete. Presently it cites the original ten-item LSNS (Lubben, 1988). Although the 1988 citation is helpful for knowing the origins of the six-item LSNS-6, it does not provide the proper scoring and social isolation cut-points for the LSNS-6 as used in the present study. The proper citation is as follows:  Lubben, JE, Blozik, E, Gillmann, G, Iliffe, S, Kruse, WR, Beck, JC, Stuck, AE. (2006). Performance of an Abbreviated Version of the Lubben Social Network Scale among Three European Community-Dwelling Older Adult Populations. <i>The Gerontologist</i>, 46(4):503–513 (2006). doi: 10.1093/geront/46.4.503.</li></ol>
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<b>REVIEWER</b>	Katie Robinson University of Limerick Faculty of Education and Health Sciences, School of Allied Health
<b>REVIEW RETURNED</b>	23-Feb-2021

<b>GENERAL COMMENTS</b>	<ul style="list-style-type: none"><li>• The abstract should clarify the date period for data collection.</li><li>• The research question is awkwardly phrased. This affects the abstract and the closing para of the introduction.</li><li>• Its not clear when the ‘previous national survey’ mentioned in the introduction was completed.</li></ul>
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	<ul style="list-style-type: none"> <li>• Typo line 37 (describing the UK study) page 1 of introduction.</li> <li>• In describing the study context, it would be useful to describe in a little more detail what the mild lockdown measures included. It is not clear if exercise outdoors was permitted, it is not clear if meeting other households outdoors was permitted, were universities and school all closed at the time of data collection etc ?</li> <li>• I would also suggest taking the description of mild lockdown at the start of the introduction and end of the introduction section and presenting this contextual information in one paragraph.</li> <li>• The introduction summarises studies on social isolation / loneliness during covid-19 but could include a high-level summary of the established literature on the predictors of social isolation/ loneliness and the health impacts of social isolation/ loneliness.</li> <li>• Without clearly conceptualising social isolation and loneliness the meaningfulness of the question is not clear – e.g. rationale for exploring if loneliness is associated with social isolation. It is perhaps unsurprising that loneliness is associated with social isolation. The association between personal &amp; sociodemographic characteristics and loneliness and isolation appears to be more meaningful and reflects recent research in this area . e.g. : <ul style="list-style-type: none"> <li>• Menec, V.H., Newall, N.E., Mackenzie, C.S., Shooshtari, S. and Nowicki, S., 2019. Examining individual and geographic factors associated with social isolation and loneliness using Canadian Longitudinal Study on Aging (CLSA) data. PloS one, 14(2), p.e0211143.</li> </ul> </li> <li>• Clarify that Macromill is a market research company and give explicit details on how participants were recruited by Macromill and how many were invited to participate in the study etc. This is important to understand to what extent this group represents the population of the chosen areas. Were participants incentivised / paid to participate ?</li> <li>• Page 7 line 46 – the point about ‘assumed susceptibility’ does not make sense.</li> <li>• In the introduction the findings from previous publications using this data set need to be described in more detail. The full citations of these papers are not needed on page 8.</li> <li>• On page 8 please describe the questionnaire items measuring SES etc.</li> <li>• When describing the ISNS-6 clarify if it is the abbreviated version used and clarify if the friends and family subscales were scored separately. It would be useful to provide a more comprehensive description of his measure in terms of what dimension of social isolation is being assessed – reference to this review paper might be helpful in situating the measure you used in the broader social isolation measurement literature: Zavaleta, D., Samuel, K. and Mills, C.T., 2017. Measures of social isolation. Social Indicators Research, 131(1), pp.367-391.</li> <li>• The lifestyle / coping behaviour items developed for use in the questionnaire need to be described in full.</li> <li>• ? no missing data at all for 11,000 participants on all items bar one ?</li> </ul>
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	<ul style="list-style-type: none"> <li>• Throughout the results section narrative text repeats tables almost line by line in places e.g. line 37 to 57 on page 11.</li> <li>• The discussion needs to situate the study findings in the context of the prior publication from this data set and not only covid-19 literature but the broader literature on social isolation / loneliness.</li> <li>• The omission of a questionnaire item on relationship status beyond marriage and household members is problematic given the study focus.</li> <li>• There is no consideration of the limitation of the online method of data collection and how this may affect representativeness of participants.</li> </ul>
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<b>REVIEWER</b>	Felice Iasevoli University of Naples Federico II
<b>REVIEW RETURNED</b>	23-Feb-2021

<b>GENERAL COMMENTS</b>	<p>Authors run an online survey on the Japanese population after one month from the beginning of a mild lockdown due to the COVID-19 pandemic in Japan. The survey collected a large body of information on different themes concerning the mental health of the general population during that difficult period. The present study was aimed at understanding the loneliness feelings in that population and their determinants.</p> <p>From a formal point of view, the study has nothing wrong. Nonetheless, the manuscript has several limitations that should be put in light and thoroughly discussed.</p> <ul style="list-style-type: none"> <li>- Surveys have been heavily used during lockdown for pragmatic reasons. However, they are biased tools to derive information about target populations and this should be acknowledged within the manuscript</li> <li>- Many other exclusion criteria should be taken into account. Among subjects putatively to be excluded I would mention: those who did not stay in lockdown for work or other reasons; those who were affected by covid. And so on. Were these people excluded or included? If they were included, how the bias given from their inclusion has been controlled? If the bias was not controlled for, this should be acknowledged and discussed</li> <li>- It looks like Authors have established the scope of the present work after having built up the database. This may be legitimate, however, Authors should clearly state that they conducted a secondary analysis and should provide the power analysis for these further analyses</li> <li>- Authors declared that 88000 subjects were contacted but only 11000 responded. Reasons for non-participation should be included, if known</li> <li>- it appears strange that both employment and unemployment are associated with greater loneliness. Maybe, Authors should reframe the categories in the work variable</li> </ul> <p>In general, the risk factors for social isolation during lockdown are those that are well-established in the general population even beyond lockdown. And in general, the information in the present study does not give a sense of novelty that may be of interest to the general audience. Authors should make some efforts to elucidate what does this study add to the general knowledge</p>
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## VERSION 1 – AUTHOR RESPONSE

Dear Dr. James Lubben (Reviewer 1):

We appreciate the instructive comments provided. We revised the manuscript according to your suggestions. The revised text is highlighted in red font.

Comment 1:

I recommend changing “inhabitants” to “individuals”. For example, the following statement appears in the abstract “We collected data on 11,333 inhabitants ... living in the seven prefectures...” The following appears less awkward: “We collected data on 11,333 individuals...living in the seven prefectures...” Similarly, in the Methods (page 6) it states “inhabitants living in...” This statement reads better as follows: “individuals living in...”

Response:

Based on your comment, we have replaced "inhabitant" with "individual." (Page 2, Line 9; Page 5, Line 35).

Comment 2:

The reference for the LSNS-6 scoring (page 8) is incomplete. Presently it cites the original ten-item LSNS (Lubben, 1988). Although the 1988 citation is helpful for knowing the origins of the six-item LSNS-6, it does not provide the proper scoring and social isolation cut-points for the LSNS-6 as used in the present study. The proper citation is as follows:

Lubben, JE, Blozik, E, Gillmann, G, Iliffe, S, Kruse, WR, Beck, JC, Stuck, AE. (2006). Performance of an Abbreviated Version of the Lubben Social Network Scale among Three European Community-Dwelling Older Adult Populations. *The Gerontologist*, 46(4):503–513 (2006). doi: 10.1093/geront/46.4.503.

Response:

Thank you for your suggestion. We have added “Lubben et al. (2006)” as reference 28.

Dear Dr. Katie Robinson (Reviewer 2):

Thank you for your constructive comments. We have revised the manuscript according to your suggestions. The revised text is indicated in red font.

Comment 1:

The abstract should clarify the date period for data collection.

Response:

Based on your comment, we have added the date period for data collection to the abstract as follows: “between 11 May and 12 May 2020” (Page 2, Line 11).

Comment 2:

The research question is awkwardly phrased. This affects the abstract and the closing para of the introduction.

Response:

We have rewritten the research question to make it simpler (Page 2, Lines 3–5, page 5, Lines 26–28):

Abstract: "This study investigated the sociodemographic, behavioral, and psychological characteristics of socially isolated individuals during the "mild lockdown" period of coronavirus disease 2019 in Japan."

Introduction: "the purpose of this study was to investigate the sociodemographic, behavioral, and psychological characteristics of socially isolated individuals during the "mild lockdown" period of COVID-19 in Japan."

Comment 3:

It's not clear when the 'previous national survey' mentioned in the introduction was completed.

Response:

We compared the results with previous national survey data from 2010, 2013, 2016, and 2019. We have added this information in accordance with your advice (Page 5, Line 20).

Comment:4

Typo line 37 (describing the UK study) page 1 of introduction.

Response:

We apologize for this error. We added "pandemic" (Page 4, Line 27).

Comment 5:

In describing the study context, it would be useful to describe in a little more detail what the mild lockdown measures included. It is not clear if exercise outdoors was permitted, it is not clear if meeting other households outdoors was permitted, were universities and school all closed at the time of data collection etc ?

Response:

Thank you for your important suggestion. The emergency declaration in Japan was a "request" by the government, and thus it did not prohibit people from going out or meeting other households. On the other hand, most, but not all, schools were closed, and online classes were held. We have added this information (Page 5, Lines 9–11).

Comment 6:

I would also suggest taking the description of mild lockdown at the start of the introduction and end of the introduction section and presenting this contextual information in one paragraph.

Response:

Thank you for your advice. We have moved the description of mild lockdown from the first paragraph to the third paragraph.

Comment 7:

The introduction summarizes studies on social isolation / loneliness during covid-19 but could include a high-level summary of the established literature on the predictors of social isolation/ loneliness and the health impacts of social isolation/ loneliness.

Without clearly conceptualizing social isolation and loneliness the meaningfulness of the question is not clear – e.g. rationale for exploring if loneliness is associated with social isolation. It is perhaps unsurprising that loneliness is associated with social isolation. The association between personal & sociodemographic characteristics and loneliness and isolation appears to be more meaningful and reflects recent research in this area . e.g. :

Menec, V.H., Newall, N.E., Mackenzie, C.S., Shooshtari, S. and Nowicki, S., 2019. Examining individual and geographic factors associated with social isolation and loneliness using Canadian Longitudinal Study on Aging (CLSA) data. *PloS one*, 14(2), p.e0211143.

Response:

We appreciate your important suggestions. We clearly defined social isolation and loneliness (Page 4, Lines 11–15) and added a summary of the literature on the predictors of social isolation and loneliness and their health impact (Page 4, Lines 16–21).

Comment 8:

Clarify that Macromill is a market research company and give explicit details on how participants were recruited by Macromill and how many were invited to participate in the study etc. This is important to understand to what extent this group represents the population of the chosen areas. Were participants incentivised / paid to participate ?

Response:

Based on your advice, we have rewritten the description of recruitment through Macromill Inc. as follows (Page 6, Lines 11–13):

“Through Macromill.inc. (Tokyo, Japan), a global marketing research company, approximately 80,000 registered people were recruited by e-mail, and data were collected from 11,333 people on an online platform (target sample was n = 11,000).”

Regarding the incentive, all participants received Macromill points for their participation, which are an original point service of Macromill, Inc., and participants can exchange these points for prizes or cash. We have added this information to the manuscript (Page 6, Lines 19–21).

Comment 9:

Page 7 line 46 – the point about ‘assumed susceptibility’ does not make sense.

Response:

We have reconsidered the necessity of the sentence and removed it.

Comment 10:

In the introduction, the findings from previous publications using this data set need to be described in more detail. The full citations of these papers are not needed on page 8.

Response:

We have added more information about our previous publication in the Introduction section (Page 5, Lines 17–23), and have deleted the full citations of our published papers on page 8.

Comment 11:

On page 8 please describe the questionnaire items measuring SES etc.

Response:

We have added more information about employment status and annual household status (Page 7, Lines 3–5). The details of the survey items are available on the open data platform. We have added this information to the manuscript (Page 7, Lines 5–6).

Comment 12:

When describing the ISNS-6 clarify if it is the abbreviated version used and clarify if the friends and family subscales were scored separately. It would be useful to provide a more comprehensive description of his measure in terms of what dimension of social isolation is being assessed – reference to this review paper might be helpful in situating the measure you used in the broader social

isolation measurement literature: Zavaleta, D., Samuel, K. and Mills, C.T., 2017. Measures of social isolation. *Social Indicators Research*, 131(1), pp.367-391.

Response:

Thank you for this useful reference. Based on your advice, we have added more information about LSNS-6 (Page 7, Lines 15–17).

Comment 13:

The lifestyle / coping behaviour items developed for use in the questionnaire need to be described in full.

Response:

All of the details of these items can be found in our published paper (Sugaya et al, 2020, *Scientific Data*). We have also added this to the manuscript (Page 8, Line 7~8).

Comment 14:

No missing data at all for 11,000 participants on all items bar one?

Response:

As for annual household income, 1707 participants answered that they did not know. Our description of this was inaccurate and has been corrected (Page 8, Line 30). Answers were provided by all participants for all other items because the questionnaire format created by Macromill, Inc. did not allow participants to proceed to the next page if there were items they had not answered. We have added this information to the Methods section (Page 6, Lines 18–19).

Comment 15:

Throughout the results section narrative text repeats tables almost line by line in places e.g. line 37 to 57 on page 11.

Response:

We have described the results of our multiple comparisons analyses, which we have not included in the table. However, we found it difficult to read because it was written in a lengthy manner. Thus, we have rewritten it to make it as simple as possible (Page 10, Line 15~20). Additionally, we have clearly indicated that these statements are the result of multiple comparison analyses (Page 9, Line 29; Page 9, Line 34; Page 10, Line 10).

Comment 16:

The discussion needs to situate the study findings in the context of the prior publication from this data set and not only covid-19 literature but the broader literature on social isolation / loneliness.

Response:

Based on your advice, we have cited some results from studies on social isolation before the COVID-19 pandemic in the Discussion section (Page 11, Line 16~23; Page 11, Line 26~32).

Comment 17:

The omission of a questionnaire item on relationship status beyond marriage and household members is problematic given the study focus.

Response:

Although we have described this as one of the limitations of this study, we did not investigate the number of family members living together. We have added the fact that we did not investigate relationship status as a limitation (Page 13, Lines 23–25).

Comment 18:

There is no consideration of the limitation of the online method of data collection and how this may affect representativeness of participants.

Response:

We collected the data for this study through an online survey and were not able to conduct random sampling, so we cannot guarantee the representativeness of the sample. Based on your suggestion, we have added this point as a limitation (Page 13, Lines 29–31).

Dear Dr. Felice Iasevoli (Reviewer 3):

Thank you for your important comments. We have revised the manuscript according to your suggestions. The revised text is highlighted in red font.

Comment 1:

Surveys have been heavily used during lockdown for pragmatic reasons. However, they are biased tools to derive information about target populations and this should be acknowledged within the manuscript.

Response:

As you pointed out, we collected the data for this study through an online survey and were not able to conduct random sampling, so we cannot guarantee the representativeness of the sample. Based on your suggestion, we have added this point as a limitation (Page 13, Lines 29–31).

Comment 2:

Many other exclusion criteria should be taken into account. Among subjects putatively to be excluded I would mention: those who did not stay in lockdown for work or other reasons; those who were affected by covid. And so on. Were these people excluded or included? If they were included, how the bias given from their inclusion has been controlled? If the bias was not controlled for, this should be acknowledged and discussed

Response:

We did not exclude people who did not stay in lockdown for any reason and people who were affected by COVID-19, and therefore could not adjust for their effect on the results of the present study. As you pointed out, this is an important limitation, and we have added this to the limitations section (Page 13, Lines 22–26).

Comment 3:

It looks like Authors have established the scope of the present work after having built up the database. This may be legitimate, however, Authors should clearly state that they conducted a secondary analysis and should provide the power analysis for these further analyses.

Response:

We have mentioned in the Methods section that this study is a reanalysis of data from our previous study, and we have now tried to emphasize this point further (Page 6, Line 27). Based on your advice, we have added the results of the power analysis in the Methods section (Page 8, Lines 19–23) and the Results section (Page 8, Lines 35–Page 9, Lines 2).

Comment 4:

Authors declared that 88000 subjects were contacted but only 11000 responded. Reasons for non-participation should be included, if known

Response:

We apologize for the lack of an explanation. Macromill, Inc. has 80,000 registered users, but we closed the survey when the number of participants who responded to our study reached approximately 11,000. Based on your advice, we have rewritten the description of recruitment through Macromill, Inc. as follows (Page 6, Lines 11–13):

“Through Macromill.inc. (Tokyo, Japan), a global marketing research company, approximately 80,000 registered people were recruited by e-mail, and data were collected from 11,333 people on an online platform (target sample was n = 11,000).”

Comment 5:

It appears strange that both employment and unemployment are associated with greater loneliness. Maybe, Authors should reframe the categories in the work variable.

Response:

As shown in Table 2, many participants in these two categories belonged to the LSNS low score group, but there was no significant association in the logistic regression analysis. This may be due to the fact that middle age (many employed people were between 39 and 64 years old) and low household income (many unemployed people were in the low-income bracket) are related to social isolation. We have added a discussion on this point (Page 12, Lines 12–16).

Comment 6:

In general, the risk factors for social isolation during lockdown are those that are well-established in the general population even beyond lockdown. And in general, the information in the present study does not give a sense of novelty that may be of interest to the general audience. Authors should make some efforts to elucidate what does this study add to the general knowledge.

Response:

Thank you for your important suggestion. During the unprecedented global crisis of the COVID-19 pandemic, this study explored in detail the factors that contributed to social isolation that became severe during the mild lockdown in Japan. Therefore, the situation is very different from the usual research on social isolation. We emphasize this point at the beginning of the conclusion (Page 14, Lines 1–3). Even if similar results are obtained in comparison with previous studies in general situations, it is necessary to consider them in light of the changes in the social situation caused by the pandemic. We have added a description of this point (Page 11, Lines 32–36).

#### VERSION 2 – REVIEW

<b>REVIEWER</b>	Felice Iasevoli University of Naples Federico II
<b>REVIEW RETURNED</b>	10-Apr-2021
<b>GENERAL COMMENTS</b>	The Authors were accurate, precise, and serious in responding to my queries. I am satisfied with the amendments made by them