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Title	Subjective social isolation or loneliness in older adults residing in social housing in Ontario: a cross-sectional study
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Reviewer 1	Dr. Aldo Mariotto
Institution	Azienda ULSS 19-Adria
General comments (author response in bold)	This paper concerns social isolation that is an interesting topic and a primary human sociological/health problem. The authors declare two aims: 1) to explore the rate of social isolation and 2) to explore the risk factors contributing towards social isolation in low income older adults in social housing. A huge amount of variables have been collected but there are some main problems about the significance of the risk factors. **Thank you; we agree that there were many variables collected. (N/A)** - [ ] First of all there is an endogeneity bias because a large amount of sociological literature suggests a causal effect of poverty on the risk of social isolation. **We agree that it is not possible to determine causality in this study and have acknowledged this in our limitations. (N/A)** - [ ] It is not clear how the choice of risk factors has been done. **We have answered this in Q6 above and altered the methods. (N/A)** - [ ] The association between risk factors and social isolation, as authors recognize, do not consent to ascertain the causality of the relationship. **We feel that this study provides a foundation that could highlight the need for longitudinal research in this hard-to-reach population. (N/A)** Moreover there is a problem of social desirability in declaring the status of social isolation that could have been overcome adopting the appropriate tests. **We acknowledge that there may be a social desirability bias that could be seen in attendees of the program, and in answering the screening questions. We also acknowledge that it would be difficult to administer these questions in any other way, given the nature of the population and their poor literacy overall. We also have acknowledged that individuals attending may have been less socially isolated. We have also discussed this more in the discussion under limitations. (see underlined text) (In the Limitations section of the Discussion: There may have also been social desirability bias, as participants may have underreported their experiences of social isolation. We acknowledge that it would be difficult to administer these questions in any other way, given the nature of the population and their poor literacy overall.41 Furthermore, participants might have previously met the paramedics who collected the data, potentially contributing to self-reporting bias. Finally, the sampling method may have increased the risk of self selection bias. Advertisements for CP@clinic were placed around the social housing buildings, and participants chose whether they attended the program. Consequently, individuals that elected to participate may have been healthier, less socially isolated and more mobile than the general population of low-income older**

	adults living in social housing. Nonetheless, this study represents the opportunity for valuable insight into a little-studied marginalized population.)
Reviewer 2	Dr. Kate Dupuis
Institution	Baycrest Health Sciences, University of Toronto, Toronto, Ont.
General comments (author response in bold)	The purpose of this study was to identify rates of social isolation amongst low-income seniors living in social housing, a particularly at-risk group. Some minor modifications, and a clearer understanding of whether these are the first data of their kind in Canada are needed. **We have added the fact that this data is new to Canada clearly to the discussion now, to highlight that there have not been any quantitative studies looking at older adults in social housing with respect to subjective social isolation. We have also used the adjective 'novel' in several appropriate places throughout the manuscript to highlight that this study is the first of its kind. (In the Discussion: This is the first quantitative study in Canada examining subjective social isolation in low-income older adults living in social housing; the results showed that one in five had subjective social isolation or loneliness. For those aged 65 and older, the rate of social isolation observed in this sample was nearly twice that reported in the general population (CCHS-Healthy Aging Survey).**[7]**)** Abstract: Interpretation- where is this comparison number ("over twice the rate…") coming from? You may want to add to background a line about how we have data about the general population and their rate of social isolation (xyz %), but that information for people in social housing is missing. Really drive home what is novel/unique about this paper. **We have changed the first sentence of the abstract to highlight this novelty. We have amended the abstract to describe this comparison in the results section, which will also clarify the source for the interpretation section. (In the Discussion: Background: Older adults face greater risk of social isolation, but the extent of social isolation among low-income older adults living in social housing is unknown. For those 65 and older, the rate of social isolation was nearly twice that observed in the general population (36.1% versus 19.6%; p<0.001). Interpretation: The high rate of social isolation in low-income older adults living in social housing compared to the general population is concerning.)** p. 4 line 23 maybe not particularly "important" but "relevant"? **We have switched the word and it now reads 'relevant'. (From the Introduction: Given the significant and increasing number of older adults in Ontario living in social housing, it is relevant for stakeholders to understand factors influencing their health, such as social isolation.)** I would move p. 4 line 23 starting "these health outcomes" to after your reference 14, and then provide a definition of social housing here. **We have now re-structured our introduction and have provided a definition of social housing. (From the introduction: Seniors aged 65 and over are the fastest growing age group in Ontario, projected to increase from 16.9% of**

the population in 2018 to 23.4% by 2046.1 Approximately 75,000 seniors live in social housing in Ontario (subsidized, rent-geared-to-income units), while 50,295 senior households were on waiting lists in 2015, representing a third of households waiting for social housing in Ontario.2 Social housing rental units are typically subsidized such that rent is 30% of household income and eligibility is determined upon a complete financial assessment. Given the significant and increasing number of older adults in Ontario living in social housing, it is relevant for stakeholders to understand factors influencing their health, such as social isolation.)

Are low-income older adults living in social housing even worse off/more at risk than low-income older adults living in their own home? 3rd PP on page 4, can you specify why the population you chose is so uniquely at-risk?
Low-income older adults are unlikely to own a home since this would be a significant financial asset.
For low-income older adults, the options for residences are typically limited to rental units (social housing or private rental), government funded care facilities, or residing with family members, which are all very different scenarios. (N/A)

p. 4 line 40, what is the gap? Any papers or is yours the first?
Our paper is the first quantitative study to examine subjective social isolation in older adults residing in social housing within Canada or similar jurisdictions (e.g. council housing in the UK, social housing in Australia). We have added a line to the background. (In the background:
While low income has been associated with subjective social isolation among the general population, few studies have focused on social isolation in low-income older adults,[20,21] and no quantitative studies with older adults in social housing were identified. The only qualitative study of low-income older adults living in social housing found that they typically have less social support and therefore face an even greater risk of social isolation.[22])

p.5 lines 15-16, is there a difference between designated seniors' or mixed family/seniors' social housing?
Designated seniors housing contain only those determined to be seniors according to the local housing authority's criteria, which is usually 55 years or older. Mixed family/seniors buildings contain seniors as well as parents with children (families). Some of the buildings were open to all tenant classifications, so we have revised this category to be "mixed-tenant buildings" to encompass all buildings that were not seniors-only.
We have added a clarification to the sentence in question. (In the Participant's section of the Methods: The designated seniors buildings had only tenants determined to be seniors according to the local housing authority's criteria; mixed-tenant buildings had non-senior residents as well.)

p. 5 line 22, data *were collected
We have made this correction. (In the Data Collection and Measures section of the Methods: After consent, data were collected by paramedics as part of the health-risk assessment screening...)

Statistical analysis- what variables were collapsed? Could this be in a Table?
We have added details about which variables were collapsed in the methods section.
BMI - overweight and obese together
Alcohol - drinker(all categories) vs. non drinker
Smoking status - current smoker vs not
Ethnicity - white vs all others
Chronic disease history - presence of at least one vs none (In the Statistical Analysis section of the Methods: To limit the number of variables in the regression models and to account for response options with small numbers, some variables were collapsed into fewer response categories (e.g. ethnicity, BMI categories, alcohol consumption, smoking status, presence of at least one chronic disease).)

p 8 line 39, what about people 65-84 years?
There was no significant difference in that category and the section was stating significant results only. However since we have updated the cutoffs, this has changed as well and we have reflected the results to indicate this. (In the Results: When all factors were analysed together in a multivariate regression, significant risk factors for social isolation were being 65-84 years of age compared to 55-64 years (adjusted odds ratio [AOR] = 1.00, 95% confidence 1.01-3.93); drinking alcohol (AOR = 2.45, 95%CI 1.09-5.54); having anxiety/depression (AOR = 6.05, 95%CI 3.65-10.03); and income insecurity (AOR = 2.10, 95%CI 1.24-3.53).)

Table 2 is very busy. Could you put the definitions (currently in row 1) of each group/sub-group as a note below the Table itself? Would it be beneficial to report only significant connections? Or highlight those in some way (bold/underlined) so that it's easier to scan through?
We have simplified Table 2 by only comparing two categories now (score <6 and score >= 6). We have also marked significant results in bold. (Please see Table 2.)

Any difference in results for pts in seniors' alone vs. mixed housing? Any reason to think there would be a difference?
We do not have this information (de-identified data does not include build) so we are unable to answer this question - it would be informative to examine in a future study. (N/A)

Limitations- is there any concern about using only a 3-item scale to measure social isolation?
This scale has been recommended by CAMH and is used by CCHS (see our point above in Q 8). This tool was part of an electronic medical record (EMR) used by paramedics for a community program and needed to be appropriate for this context. (N/A)

p.12 line 44 starting "Canada's aging population … " why is this? Just from basic statistics? Do people aging now have fewer savings/less well off than previous generations who were aging?

	We have tried to explain our point more clearly. (In the conclusion: Canada's aging population is expected to create a large number of low-income older adults living in social housing due to limited finances and increased debt when entering retirement.[31]) p. 12 line 51 addressing a gap in the evidence base- please make sure to specify above whether there are any existing data (in other countries?) on this topic **There are no existing quantitative studies examining social isolation of seniors in social housing in Canada or other high-income countries. We have now specified in the conclusion that this study addresses an international gap in the evidence base. (In the conclusion: While this study's strength is in addressing a gap in the international evidence base by assessing a hard-to-reach population, further longitudinal research is needed on the causal links between social isolation and negative health outcomes in this group.)**
Reviewer 3	Dr. Sasmita Kusumastuti
Institution	Kobenhavns Universitet Sundhedsvidenskabelige Fakultet
General comments (author response in bold)	While the paper is structured and well written, the added value of the study to current literature is questionable given the many studies available on this topic and that the study itself did not provide any new evidence. **We beg to differ since the study provides information on older adults residing in social housing, a hard-to-reach and often under researched population. This is new evidence for this population as there is a paucity of literature on social housing residents in general.** **We have edited a couple of sentences in the background to emphasize this novelty. (In the background: While low income has been associated with subjective social isolation among the general population, few studies have focused on social isolation in low-income older adults,[20,21] and no quantitative studies with older adults in social housing were identified. The only qualitative study of low-income older adults living in social housing found that they typically have less social support and therefore face an even greater risk of social isolation.[22])** Further, the study measures social isolation using UCLA loneliness scale. Social isolation and loneliness are two different concepts and while it can be related to a degree, measuring one concept using the other is simply incorrect. The authors wrote "Social isolation is the objective lack of social contacts or limitation in the frequency of interaction with social network members, including family, friends, and the larger community environment." and "Social isolation: The validated Three-Item UCLA Loneliness Scale was used to assess the participant's own perception of their social isolation, which differs from objective measures of social contacts." It is correct that social isolation is an objective concept, however in this study social isolation was only measured subjectively using self-reported UCLA loneliness scale that is a parameter to measure loneliness. **We agree that the concept of social isolation is a complex one. We have re-worked our introduction and re-framed the paper to focus on subjective social isolation or loneliness, as this is what the UCLA 3 item scale refers to. We have provided the relevant references for this. Additionally we have slightly changed the title to clarify this. (Title: Subjective social isolation or loneliness in older adults residing in social housing in Ontario: a cross-**

sectional study
In the Introduction:
Social isolation can be objectively defined as a lack of social contacts or limitation in the frequency of interaction with social network members, including family, friends, and the larger community environment.[3–6] Loneliness is the subjective or psychological embodiment of social isolation[3–7] and will be the focus of the current study.)

In the results, the study simply assumed that having high UCLA loneliness scores is the same as having potential for depression and while severe loneliness is associated with depression, the study did not measure any depression parameters as an outcome and therefore should refrain from claiming anything with depression in the results.
We have removed reference to depression/depressive symptoms throughout as we have re-analysed the results with a single cutoff only, which represents people with social isolation/loneliness above the cutoff recommended by CAMH.
Measuring Your Impact of Loneliness in Later Life [Internet]. Campaign to End Loneliness; [cited 2021 Mar 2]. Available from: https://www.campaigntoendloneliness.org/wp-content/uploads/Loneliness-Measurement-Guidance1.pdf
Scales to Measure Loneliness [Internet]. Project ECHO® Ontario Mental Health at CAMH and U of T. [cited 2021 Mar 2]. Available from: https://camh.echoontario.ca/COVID-Resources/scales-to-measure-loneliness/ (We have updated the methods, results, and discussion to reflect this change throughout.)

The risk factors considered seem to be taken mainly based on available data and not necessarily based on certain hypothesis, e.g. fall risk, high fat, fruit vegetable consumption, having a family doctor as risk factors for social isolation.
We have removed the variables that were not strongly hypothesis driven, and therefore rather than analysing all potential risk factors, we have focused on the risk factors with the strongest hypotheses from literature. We have included references for each of the included variables in the introduction and methods sections. (In the Introduction: Older adults are particularly vulnerable due to decreasing economic resources, reduced social networks, changes in household structure, and limitations in function and mobility.[9] Subjective social isolation has been associated with living alone10 and poor health behaviours, such as smoking3 and physical inactivity.[11,12] It has also been associated with an increased risk of cardiovascular disease, stroke, depression, dementia, and all-cause mortality.[5,13–15]
In the Methods: Information on physical activity,[11,12] alcohol use,[26,27] current smoking status,[3,28] income security,[11] and self-reported general health[11] were collected based on literature associating these factors with social isolation.)