Paper analysis

1) The epidemiological study design used in this paper was quasi-experimental longitudinal study design. One of the key features of this study design is that participants do not undergo random assignment to groups and it is typically used to understand the effect of an intervention on a specific population. In this paper, participants were chosen based on whether they had undergone housing improvements or not without random assignment. Another key feature is that quasi-experimental research is based on pre-post testing where tests are performed before any data is collected. In this study, housing improvements were already provided to certain participants, following which data was collected.

2) Based on the aims, the research hypotheses would be as follows:

i. People having a housing improvement will be more likely to reduce or give up smoking.
ii. The tendency to give up smoking in people who have had housing improvements will be linked to a corresponding improvement in mental health status and/or decrease in stress subsequent to the housing improvement.

3) In this study, the study factor is having a housing improvement. The data related to the study factor, i.e. the housing improvements, was obtained from GoWell, which is a study of certain deprived communities in the Glasgow area which underwent changes in housing through a 10 to 15 year period. Fourteen neighbourhoods were selected for the study and data was collected in two waves in the years 2006 and 2008. Data was collected from participants in 2008 regarding any housing improvements over the last two years.

4) The outcome factor is the smoking status and the mental health status of the participants. During both waves of data collection in 2006 and 2008, participants were asked to state their smoking status and their responses were categorized as smoker or non-smoker. The participants who stated that they were smokers were asked if they intended to quit and their responses were categorized as yes or no. The mental health status of the participants was assessed using the mental health scale of the SF-12v2 Health Survey. The participants were also asked if they had consulted a doctor regarding anxiety, depression, or stress during the past year or experienced any of these symptoms during the past year.

5) According to the data given in Table 2, there is a significant association between the study factor and the outcome factor. When comparing the intention to quit smoking between participants in 2006 and 2008 belonging to groups that had had housing improvements or not, 52% of people who had had housing improvement expressed the intention to quit smoking compared to 36% of people who had not received a housing improvement. Thus, people who

had housing improvement were two times more likely to quit smoking compared to people who hadn't received housing improvement.

6) It is possible that selection bias could have been introduced in the study as participants were selected based on record linkage between two cross-sectional studies. Participants were chosen retrospectively after both the surveys had been completed and this could have eliminated important information linking the study factor and the outcome factor. For more complete information, surveying a majority of the people that received housing improvement was necessary as a larger sample would provide deeper insights into the study objectives.

7) Information bias is likely in this study due to several factors. Housing improvements considered in this study may vary to a greater or lesser degree for individual participants and this may have an effect on smoking tendencies. Also, self-reported or tested mental health statuses of participants may be due to several different reasons other than lack of housing improvements. As per the authors, the mental health assessment considered mental health status over the past four weeks whereas people who self-reported mental health imbalances reported their experiences over the past year. This can lead to a misrepresentation of mental health status of the participants.

8) The authors have analyzed a much larger group of participants as compared to other studies that has given them the opportunity to identify and adjust for confounding variables. As per the authors, the confounding variables identified were sociodemographic factors such as gender, age, ethnicity, and educational status. Apart from these, the type of house and whether the participant rented or owned the house were also considered confounding variables. With regards to Table 2, the confounding variables have not altered the statistically significant association between the study factor and the outcome factor. The reason may be attributed to the large sample size that has managed to include representations from different sociodemographic backgrounds.

9) As per the results in Table 3, the authors have not answered their second research question concerning the relationship between an improvement in mental health and the intention to quit smoking. The authors have found that mental health based on formal assessments is negatively linked to the intention to quit smoking for people who have had housing improvement. However, this result is not statistically significant and requires a larger sample size to confirm the phenomenon. Regarding self-reported symptoms of anxiety and depression and consulting a doctor about these symptoms, this was strongly associated with the intention to quit smoking independent of having a housing improvement. Hence, the authors have not been able to prove if having a housing improvement results in improved mental health which, in turn, motivates an individual to quit smoking.

10) The reason for high smoking rates in the study population may be indirectly or partially linked to not receiving a housing improvement. The participants in the study belonged to deprived neighbourhoods living in a compromised and low-income situation. They were obviously stressed about not being able to make ends meet, not earning enough, and not being able to afford things such as a house or their children's education. All these factors together might account for the increased smoking rates in this population.

11) A total of 3 Bradford Hill criteria are applicable in this study. The first one is Strength where the intention to quit smoking (effect) is observed in at least half the tested population. The second one is Temporality where the intention to quit smoking (effect) is observed to be higher after receiving a housing improvement (cause). The third one is Plausibility where an improvement in life circumstances is proposed to be a plausible mechanism between the cause and effect.

12) These results may be generalized to people living in any disadvantaged area in a low-income situation. People who smoke heavily due to life stresses may benefit by seeing an improvement in their lives to give them hope about their future.