
# The Silent Epidemic of Loneliness: An Analysis of The Impact of COVID-19 On Ethnic Groups.

Student ID: 680011126

BSc Sociology and Criminology
Supervisor: Dr Alexey Bessudnov
2021

*

## Abstract

Taking into consideration the theories, literature and empirical studies surrounding loneliness, this paper explores whether there are any differences in the levels of loneliness during the COVID-19 pandemic, among ethnic groups. This was examined using a binary variable to illustrate the presence or absence of loneliness, while controlling for factors such as sex, age, whether they were born in the U.K. and household size. Utilising secondary survey data, this research performs regression analysis using linear probability models, with the application of weighting and adjustments for standard errors. Results reveal that Pakistani's were the ethnic group most likely to report being lonely in comparison to White British. With the inclusion of control variables, females, those aged 17-29 and those with a household size of 9-12 members are more likely to report being lonely. Corresponding with previous literature, this study highlights some of the challenges that ethnic groups must overcome to tackle loneliness, including stigma and discrimination. Findings stress the importance of having policies in place to effectively and efficiently support ethnic groups, especially for years after COVID-19.

## Acknowledgements

I would like to extend my sincerest gratitude to my supervisor, Dr Alexey Bessudnov, for his invaluable guidance, support and patience during my undergraduate dissertation study. Their immense knowledge and copious experience have encouraged me throughout my academic journey. I have been incredibly fortunate to work with such an esteemed academic and without his feedback, this dissertation would not have been achievable.

I would also like to thank all the professors who have taught me during my time at the University of Exeter, all have made my experience here unforgettable. The lessons that I have learnt will remain with me for the continuation of my academic career and daily life.

I am indebted to my parents, Geoff and Vicky, for their endless love, encouragement and support during the COVID-19 pandemic. Thank you for giving me the strength and positivity to endure even during the most difficult times. I would not be where I am today without you both.

## Contents

# 1. Introduction

As of January 2021, around 66.6% of the world use mobile phones, 59.5% use the internet, and more than 53% are social media users (Kemp, 2021). As a society, we have never been more socially connected, yet this is an era of increasing loneliness. In 2019, 45% of adults felt often, sometimes or occasionally lonely in England, which equates to over 25 million people (Office for National Statistics, 2018); thus, concerns have been raised surrounding this 'loneliness epidemic' (Easton, 2018).

The experience of loneliness cannot be deduced to a singular explanation as it's a complex social phenomenon. However, there are certain predictors which increase the likelihood of being at risk of loneliness. One study categorised young people, women, those who are single or widowed, those with poor health, those with little trust in their local area and those with a lack of sense of belonging as being most at risk (Office for National Statistics, 2018). On the contrary, the National Academies of Sciences, Engineering and Medicine (2020) classified older people, immigrants, LGBT populations and minorities as the most at risk of loneliness.

COVID-19 emerged at the end of 2019 and is still a prominent but harrowing aspect of our lives in 2021. It not only transformed the daily lives of individuals across the world, but it remains unforeseeable the true impact this pandemic has had on our future. Devasting products of this pandemic include but are certainly not limited to unemployment, furlough, and family members passing away without being surrounded by loved ones. On the 15th of February 2021, there had been 2.4 million deaths and 108.8 million confirmed cases globally (The Visual and Data Journalism Team, 2021). Moreover, the added strain of being classified 'clinically vulnerable' makes contracting the virus more deadly.

Introducing social distancing and 'stay at home' policies were fundamental in suppressing such a transmissional virus, but this lack of social contact is likely to lead to mental health and psychological implications. Those vulnerable and at risk of experiencing loneliness are likely to suffer these effects greatly, as they faced this phenomenon before the pandemic (Rokach, 2019, cited in Miller, 2020). However, the lockdown restrictions may mean that new groups are identified as being at risk. Therefore, this lack of insight increases the significance of empirically testing COVID-19 impacts to improve health services' policies and support those who need it.

The theoretical framework surrounding why individuals experience loneliness ranges from individual factors to great societal forces, which this paper shall acknowledge. However, there are deficiencies in theories that apply to a global health pandemic; hence, efforts will be made to apply these through the lens of COVID-19. This paper aims to address the disproportionate gap in the literature surrounding certain groups; thus, the scope is concentrated to explore loneliness amongst ethnic groups. A small number of studies focus on the impact of the pandemic on gender and age, but ethnicity has been neglected while remaining ever important. Broader forces potentially encourage isolation amongst ethnic groups, such as institutional racism (Giddens and Sutton, 2017), structural racism amongst health inequalities (Gee and Fore, 2017) and segmented assimilation amongst second-generation immigrants (Portes and Zhou, 1993). However, White British people may be at greater risk of being lonely due to the more substantial social and family ties among certain ethnic groups. To investigate this topic thoroughly, control variables of sex, age, whether they were born in the UK, and household size will be held constant to increase the robustness of any relationship established.

In chapter 2, an in-depth discussion unpacks the theories of loneliness and their application to COVID-19, alongside the impact that technology has. Following on, existing empirical studies are addressed to critically assess the strengths and weaknesses of the studies, while addressing the gaps in the literature. Chapter 3 highlights the methodological choices of this empirical study using secondary survey data and sample weights. Chapter 4 presents the research results, whilst chapter 5 offers an analysis and discussion of the results with the application of literature. Chapter 6 addresses the limitations associated with the methodological choices of this empirical study, while providing recommendations on what direction future research could take. To conclude, vital components of this study are identified to summarise how loneliness effects ethnic groups, while offering instances where this is applicable to COVID-19 policies.

# 2. Literature Review

## 2.1 Theories

There are varying components to the term loneliness, dependent on the stance one takes. Formally, lonely is defined as being "sad because alone" (In The Collins Shorter Dictionary and Thesaurus, 1995; pg. 444) or "having no companionship or society; unaccompanied, solitary, lone" (In OED Online, 2021). However, analytically, these definitions oversimplify this social phenomenon, which is damaging, as this results in a misunderstanding or errors in our knowledge. More appropriately, this paper acknowledges that the concept of loneliness reflects the *subjective* experience of an observed inconsistency between the actual levels and desired levels of social interaction (Victor et al., 2005; Lim et al., 2020).

The founding and well-respected evolutionary theory of loneliness (Cacioppo et al., 2006) builds upon the idea that we have persisted as a species due to social protection. It is stated that experiences of loneliness can trigger an alarm within us, encouraging us to reunite social ties. For example, this can be with family or friends where the triggering emotion of the alarm is a prolonged sense of uncertainty. This pain of loneliness is what motivates us to cooperate, survive, reproduce and protect as a community. However, if this reconnection is not satisfied, this can lead to sustained feelings of loneliness, causing significant social distress. While social distress is deemed detrimental, there is a beneficial aspect to social animals as it acts as an incentive to resolve this unpleasant state. These emotional responses are applicable at a biological level, including ethnicity, gender and age.

Contextually, the stay at home and social distancing measures due to COVID-19 fundamentally aim to limit all social contact. The crucial reconnection outlined by evolutionary theory becomes difficult when restrictions increase in severity. Thereby, if this reconnection is deprived, loneliness will become a severe widespread social issue over the continuum of the pandemic. In that case, this will have prolonged unintended consequences on levels of distress, which will be deeply embedded and difficult to improve (Luchetti et al., 2020). This perspective remains the focal theoretical framework for this paper.

Regarding ethnic composition, this may lead to two contrasting relationships. Firstly, social values surrounding family tend to be especially strong regarding ethnic household

compositions. Prior research found that the average family size in England, Scotland and Wales were 1.9 for Chinese, 2.2 for White British, 2.6 for Indian, 3.2 for Pakistani and 3.6 for Bangladeshi (Platt, 2010). Thus, lockdown restrictions may have a lesser effect on those with large family structures, such as Bangladeshi and Pakistani, as they tend to live together or at least nearby.

Alternatively, Social connections are among the most crucial and fundamental factors that influence people's happiness and health (Waldinger, 2015). Chopik (2017) argues friendships become increasingly vital to one's health and happiness, but these friendships are more important than family relationships in older adults. To further this understanding in the context of ethnicity, Black Africans, Pakistanis and Bangladeshis are the top three ethnic groups most likely to have 0-1 close friends (Finney, Kapadia and Peters, 2015). Therefore, in the context of evolutionary theory and reconnections, those most vulnerable to loneliness may be impacted by whether family or friendship social ties are more valuable as a support network, during COVID-19.

Weiss (1973, cited in Perlman & Paplau, 1982) takes an interactionist approach to discuss to what extent social relationships supply an individual with a sense of worth. Loneliness is a product of when an individual's interactions inadequately fulfil social requirements. This can be separated into two categories: social and emotional isolation, which may overlap. Weiss (1974) conceptualised the former as the absence of individual relationships with friends, family or society, while the latter refers to a state where one feels emotionally disconnected, regardless of the quality of one's network. A principal element of this theory is that Weiss believed different relationships meet different needs; hence, loneliness would be a product of the inadequate satisfaction by these social provisions. These different provisions were attachment, social integration, nurturance, a reassurance of worth, reliable alliance and guidance. Critically, Weiss is a prominent figure in the interactionist approach. In summary, loneliness is caused by a combination of personal and situational factors.

On the contrary, some may disagree as it is plausible that loneliness is the product of social forces outside an individual's control. American sociologist Slater acknowledged that social institutions potentially reproduce loneliness. Slater (1979) believed that all individuals have a desire for community, engagement and dependence. This acts as an underlying basic need. However, social institutions, such as schools, support values that promote individualism.

American society places a greater status and value on personal success through competitions, which contradicts the underlying basic needs and desires. In summary, this competitive lifestyle may have short-term satisfaction, but it evolves into a very disconnected life. Slater viewed loneliness as normative.

Weiss (1974) and Slater (1979) wrote around the 70's which means while remaining relevant to the question, it is debatable whether the outdated models are still relevant in contemporary society. Focusing on Slater, the currency of his theory may take two approaches. In the time of COVID-19, social institutions which promote individualistic characteristics and competition may be ignored due to the prolonged closures. As a society, we have had to work as a collective to stop the spread of the virus, meaning an extensive number of sacrifices were made. It is probable that we have all learnt a degree of empathy, from providing aid to neighbours who were isolating, supporting our social networks through challenging times to clapping weekly as a nation in support of carers and NHS heroes.

On the contrary, some individuals have been significantly more disadvantaged during the pandemic. For example, those who have lost their job or those clinically vulnerable who could not work due to self-isolation represent instances where competitive behaviour can increase. Fight or flight responses are likely to emerge, where people will engage in competitive and individualistic behaviour to ensure survival. Thus, this may result in less empathy and more personal success. During the pandemic the majority have taken an empathetic stance, but it is plausible that we will not see the full effect until after COVID-19, when social institutions and daily lives return to normality. In summary, while these theories may lack the currency in contemporary society, there are aspects which can be applied to the COVID-19 pandemic.

### 2.2 Technology

In the field of loneliness, it is beneficial to discuss technology and its impact, as more individuals are substituting their real-life connections with ones online. Research surrounding the link between technology and loneliness remains contradicting, but it appears that the actual difference in experiences varies with age. Choprik (2016) found increasing technology use in older adults was linked to lower levels of loneliness, better self-rated health, fewer chronic illnesses and depressive symptoms. Hunt et al. (2018) take an opposing stance and found decreased technology use in young adults between 18-22 reduced feelings of loneliness.

While the direction of the relationships remains debatable, it is clear that it is altering the methods we use to form meaningful interactions. Arguably, those who substitute online connections for real ones may experience a deterioration in loneliness compared to those who use it to supplement face-to-face relationships (Novotney, 2019).

Furthermore, Wilson (2018) investigated the impact of daily technology use on the wellbeing of older adults, using a mixed methods approach for a rich data collection process. The survey was completed once a month and used psychological scales and socio-economic measures to document any changes. An event-based diary, coded thematically, was used daily to note any influences that increased or decreased technology use.

Numerous conclusions were drawn from this study. She found that the more a device is used, the more emotionally attached users become, which is stronger if the device is interactive or essential to the participant. If the participant was more emotionally attached to their technology, they were less socially connected to their surroundings. Thus, the COVID-19 pandemic forced greater technology use, which may be detrimental to the reconnection proposed by the evolutionary theory standpoint, as an attachment to our devices estranges us from our surroundings. Additionally, it was found that there was a positive relationship between frequency of use and perceptions of self-worth. Alternatively, if a device was challenging to use, this had harmful effects on self-esteem.

The methodological limitations associated with Wilson's (2018) study have influenced the approach of this paper. All statistical analysis is affected by sample size; larger sample sizes enhance the credibility and robustness of the significance drawn from relationships. The author acknowledged this and suggested drawing a large sample size to improve the precision of estimates on the effect size. Additionally, there was an uneven distribution of sex with 21 females and 11 males. Women tend to make up a more significant proportion of technology users (Tankovska, 2018), thereby feeling the effects of loneliness more. Therefore, careful consideration will be taken into the sample size of ethnic groups and the proportions of participants to ensure the population parameters are representative.

One of the most notable changes in response to the COVID-19 pandemic was the transition to staying at home, naturally meaning all education and jobs moved online. In April 2020, 46.6% of people in employment did some work at home, with 86% of these stating it was due

to the pandemic (Office for National Statistics, 2020a). The digital revolution has long existed, but the COVID-19 crisis only increased the acceleration and urgency for such transformations. For example, a global survey of executives found companies have accelerated the digitalisation of interactions and internal operations by three to four years (McKinsey, 2020). However, from an evaluating perspective, this estimate has the potential to be biased, to remain competitive in the business and economic industry, innovative practices have to be developed. Thereby, social desirability bias means companies may over-report the digitalisation process, to remain at the top of the market.

Similar pictures are seen with education, as on the 6th of January 2021, schools were closed due to the pandemic, affecting 15,401,612 learners in the U.K. and Northern Ireland (United Nations, Educational, Scientific and Cultural Organisation, 2021). Policymakers have long discussed the notion of a digital divide within the U.K., which is the disparities between those who have access to information and communications technology and those who do not. In 2017, Bangladeshi had the greatest percentage of non-internet users at 12.8%, while Chinese had the smallest at 1.7% (Office for National Statistics, 2019).

The COVID-19 pandemic, for the most part, has only driven a larger wedge in the digital divide gap, where not every student and employee has access to the right equipment to aid their work. It is worthy to comment on technology within a global pandemic as it may impact loneliness in two directions. Firstly, the increased use of technology may decrease loneliness as families, friends, co-workers can connect in a new social space within seconds, regardless of distance. On the opposing, levels of loneliness may rise as there is an awareness of the lack of face-to-face contact and some individuals do not have the technological, naturally resulting in poorer psychological and cognitive health.

### 2.3 Empirical Studies: Loneliness

The most notable empirical study in the sociological field of ethnicity and loneliness was conducted by the British Red Cross and Co-op (2019). It investigates the experience of

loneliness among people from BAME[1] backgrounds within the U.K. The motivation behind the study was due to the lack of exploration into how loneliness impacts BAME individuals.

Participants were drawn from a pool using various research methods, including 952 survey responses, with 69% being from BAME backgrounds. 22 interviews and focus groups were conducted with people from BAME backgrounds. 42 interviews were conducted with BAME and White British people experiencing loneliness risks from grief, health conditions or both. A further 40 interviews were used with representatives from loneliness and BAME support groups, alongside 201 loneliness service maps. While the authority and credentials are high, there is one implication that may arise from the sample participants. The majority of participants were from BAME background. This is likely to affect the balance of the estimates and not be representative of the general U.K. population, which should be acknowledged.

Four topical areas were used to conclude: discrimination, sense of belonging, coping and stigma. 74% of White British participants had not experienced racism at work or in a local area, in comparison to 49% of Pakistanis, 46% of Indians, 37% of Black Caribbean, 36% of Mixed, 36% of other BAME and 31% of Black Africans. In other words, this study concludes that White British individuals are the least likely to experience racism at work or in the local area, while Black Africans are the most likely. 67% of those who felt they did not belong in their neighbourhood stated they felt always or often lonely, compared to 16% who strongly felt they belong. Of those who felt they always or often felt lonely, 63% did not know where to turn to when they felt lonely. Turning to stigma, 43% of White British agreed they would never admit to feeling lonely, in comparison to 64% of Pakistanis, 46% of Indians, 44% of other BAME, 38% of Mixed, 37% of White other, 35% of Black African and 34% of Black Caribbean. Therefore, in this study, Pakistanis were the most likely to never admit to feeling lonely while Black Caribbean are the least likely.

This research has a great importance by delving into the causes of loneliness and the struggles to overcome it. In summary, it highlights how individuals from ethnic minorities face a greater risk of experiencing factors that potentially cause loneliness. While also facing great barriers in accessing community help to gain a sense of belonging. It is essential to recognise the policy implications this research brings forth, as it is clear there are disparities in accessing

[1] Participants: 17% chose not to declare their ethnicity. Respondents were given 18 ethnic categories but were given the option to self-describe. The final BAME category refers to the following groups: White other, Indian, Pakistani, Black Caribbean, Mixed, Black African, other BAME and Gypsy, Roma and Irish Traveller.

support to tackle loneliness among ethnic minority groups. This encourages future policies to improve the absence of inclusive services, especially given the current global pandemic circumstances. Due to this fact, this paper will attempt to address the gap in the literature by taking the findings as a foundation while applying the context of COVID-19. This will improve the robustness of whether the relationships between loneliness and ethnic groups remain consistent, or whether new ethnic groups are bought to light as being the most at risk of loneliness.

Equally, a more recent study was conducted to explore the predictors for those at risk of experiencing loneliness during the COVID-19 pandemic. Bu, Steptoe and Fancourt (2020) recognised the extensive existing research on discrete groups at risk of loneliness but were motivated to assess the impact of lockdown on producing new groups at risk. This study compares sociodemographic factors before and during the COVID-19 pandemic through cross-cohort analysis.

The participants were drawn from two sampling pools. For data pre-pandemic, these researchers used the Understanding Society: U.K. Household Longitudinal Study (UKHLS) wave 9. Specifically, participants were 18 years or over, which left a total sample of 31,064. Data during the pandemic was drawn from the UCL COVID-19 Social Study, a panel study consisting of psychological and social experiences. More than 50,000 over eighteen-year-old observations were collected. The sampling technique was not random but stratified using snowballing, targeted recruitment and partnerships with third sectors on vulnerable people. The chosen covariates were age, gender, ethnicity, education, low income, employment status, living status and area of living.

The analysis used linear regression models for the two datasets: while using survey weights. In summary, young adults, students, people living alone, people with lower education or income, women, ethnic minority groups and urban residents all had a higher risk of being lonely both before and during the pandemic. Additionally, those at risk of being lonely before the pandemic experienced an increase in the risk, represented by the high coefficients.

A strength of this study is the cross-cohort comparison using two large samples, with appropriate weights, as well as the inclusion of a wide variety of sociodemographic characteristics. By contrast, the weakness is that the data was from two different samples, meaning there is no comparison of the same individuals. Having different participants

subsequently means it is not apparent whether experiences of loneliness differed between pre-pandemic and during the pandemic for each individual. Likewise, the COVID-19 Social Study was non-random; hence the results lack representation and conclusions drawn lack accuracy. Specific individuals potentially are more inclined to participate in this study, such as those who are already experiencing a great deal of loneliness.

This research displays the importance of studying loneliness, especially in COVID-19, as new groups with increased risk factors may emerge. While extensive categories were used as predictors, this is beneficial as it allows for a greater degree of forecasting on estimating the dependent variable. These researchers propose future researchers focus on the literature gap, pursuing the different trajectories of loneliness through the lockdown. This paper will recognise these suggestions; by applying survey weights and similar control variables of sex and age. Meanwhile, building upon these findings to include additional control variables of whether they were born in the U.K. and household size. Similarly, this research will address the gap in the literature by using the same sample of participants for the dataset before the pandemic and during the pandemic to assess valid changes.

In essence, the British Red Cross and Co-op study (2019) illustrates the benefits of using survey data to access a substantial sample size, alongside the paramount importance contextual factors on individual loneliness have on future policies. Bu, Steptoe and Fancourt (2020) research reinforces the significance of using survey data, specifically secondary data, on obtaining a large sample size. Moreover, they denote the importance of sampling methods on the accuracy of the conclusions drawn, which will be commented on further into this paper. Considering the studies above, the strengths, weaknesses, and suggestions will guide the methodological choices and justifications in this dissertation. Loneliness clearly reflects the social aspect of our species; hence, sociologists should engage in this topic area by theoretically and empirically testing the social impact COVID-19 has had.

## 3. Research Design and Methodology

The literature discussed above isolates factors that influence the experiences of loneliness. For clarification reasons, this research aims to gain knowledge surrounding the experiences of loneliness amongst different ethnic groups during the COVID-19 pandemic. To achieve this, an empirical analysis was performed using secondary data in the form of a survey. The

advantages of using secondary data are that it is cost, and time-efficient, high-quality data is produced, and smaller subgroups can be analysed on a larger scale (Bryman, 2016). Moreover, this paper aims to contribute to the field of sociology by discussing the impact a global pandemic has had on ethnic groups, alongside the control variables presented, which may influence the statistical significance of this relationship.

Thus, the main research question at hand is, "is there a relationship between ethnicity and being lonely during the COVID-19 pandemic?". The sub-question which will be approached is "are there any changes in the levels of loneliness before the COVID-19 pandemic in comparison to during among ethnic groups?". Therefore, the null hypothesis states that while holding the control variables constant, there is no relationship between ethnicity and loneliness during the COVID-19 pandemic. The alternative hypothesis states that while holding the control variables constant, there is a relationship between ethnicity and loneliness during the COVID-19 pandemic.

### 3.1 Survey

The nature of the research objectives means quantitative observations from a large body of people were required; thus, the most efficient method was to use secondary survey data from the Understanding Society: COVID-19 study (University of Essex, Institute for Social and Economic Research, 2021). This is a "panel study on the experiences and reactions of the U.K. population to the COVID-19 pandemic" (Institute for Social and Economic Research, 2021; pg 2). This secondary data has a vast number of observations within the sample, which increase representativeness, generalisability and validity (Smith, 2008; Smith et al., 2011). As of March 2021, there are seven waves, the first four covering April 2020 to July 2020, with the remaining being fielded every two months. There have been three national lockdowns which came into force by the Prime Minister on the 26th of March, 5th of November and 6th of January (Haddon, Sasse, Tetlow, 2021). It seems logical to use wave 4 (July 2020) as the question was asked about the experiences of loneliness in the previous four weeks, which was still peak pandemic in June. Additionally, this is the only wave available where we had been in a national lockdown for a continuum of months. The questionnaires were discharged as a web survey.

To satisfy the sub-question of comparing experiences of loneliness before the pandemic and during the pandemic, the main UKHLS will be used (University of Essex, Institute for Social and Economic Research, 2020). This a panel survey with yearly interviews, usually conducted face-to-face in respondents' homes by trained interviewers or through their online survey (Institute for Social and Economic Research, 2020). To bridge the gap, interim data has been made available, combining year 2 of wave 10 and year 1 of wave 11. 92% of interviews are from 2019, and 8% being from the first months of 2020 (IBID). They do not contain all respondents who completed the mainstage interviews in 2019 but those who have responded to the COVID-19 study and their households. Critically, this dataset was completed within a short time frame, which means possible data issues are present, but attempts have been made to minimise this. However, this dataset was the best option for the sub-question at hand as it minimised the time differences before and after COVID-19.

### 3.2 Sample and Participants

According to the COVID-19 study user guide, to be eligible, households must have participated in at least one of the last two data collection waves in the mainstage data and be 16 or over in April 2020 (Institute for Social and Economic Research, 2021). The sampling technique for the COVID-19 dataset is probability samples of postal addresses. For England, Wales and Scotland, they are clustered and stratified but unclustered systematic random samples for Northern Ireland. The user guide states the final sample[2] was 13,754, before cleaning and recording the data for this analysis. The mainstage dataset uses similar sampling techniques where the combined sample equates to 33,382 observations (Institute for Social and Economic Research, 2020).

### 3.3 Dependent and Independent Variable

The variable used to measure loneliness is *sclonely_cv* which is asked as "In the last 4 weeks, how often did you feel lonely?". The answers are either "hardly ever or never", "some of the time", or "often". Taking a social science perspective, binary variables are advantageous for social scientists to engage whether a social phenomenon is present. They are a technique to quantify the presence or absence of a quality, behaviour or characteristic (Liao, 1994;

[2] Those who offered full or partial interviews.

Gujarati & Porter, 2009). Thus, the loneliness variable has been aggregated to 1 and 0, where 1 indicates loneliness (combined "some of the time" and "often) and 0 indicates no loneliness ("hardly ever or never").

The variable used to measure ethnicity is *racel_dv* which is split into 18 different classifications. For a more specific scope, this will be reduced to 8, which are as followed: "White British", "Chinese", "Bangladeshi", "Pakistani", "Indian", "Caribbean", "African" and "Mixed".

### 3.4 Control variables

Acknowledging Bu, Steptoe and Fancourt's (2020) findings, control variables will be held constant to improve the precision of the estimates in the dependent variable. Sex (male/female) and age (4 categories; 17-29, 30-49, 50-69 and 70+) will be used in replication of the studies discussed in prior literature. Further controls will be included, consisting of whether they were born in the U.K. (yes/no) and household size (1-4 members, 5-8 members or 9-12 members). After recoding, creating and removing N.A variables, there are 12,420 observations in the unweighted sample.

### 3.5 Analysis

Critically, using an unweighted sample does not reflect the true population structure of the U.K. as some groups may be over or under-represented in the sample. Consequently, estimates may be biased. However, applying survey weights "adjusts for unequal selection probabilities, differential nonresponse and potential sampling errors" (Institute for Social and Economic Research, 2020; p.g.43). According to the user guide, this is achieved through the clustering variable primary sampling unit (psu),the stratification variable (strata) and the survey weight. The weighted sample will be used to calculate descriptive statistics, present confidence levels, and produce regression models for the wave 4 dataset.

When deciding the statistical analysis for a binary dependent variable, certain factors should be addressed. One technique is a linear probability model, a regression model where the dependent variable is treated as a probability the outcome equals to 1. Critically evaluating both side of the debate, the disadvantages of this technique are based on the violated assumptions, including heteroskedastic errors, probabilities which are greater than 1 or less

than 0 and non-linearity (Horrace and Oaxaca, 2006). However, advantages include ease and direct interpretation of the coefficients (Gomila, 2019). The debate surrounding the use is multifaceted; however, some scholars verify the use of linear probability models (Gujarati and Porter; 2009, Gomila; 2019; Wooldridge, 2020). Bellemare (2018) suggests using robust standard errors to account for heteroskedasticity and argues that unless the research aims to forecast the dependent variable, then having a model that computes predicted probabilities outside the interval of 0 and 1 is not an issue. All the scholars above have a high degree of accuracy in their claims, are mostly impartial and have credentials which make them trustworthy. Thus, taking all of this into consideration and acknowledging the claims made, the linear probability model shall be used with caution.

To support this decision, measures will be initiated to improve robustness of conclusions. Specifically focusing on heteroskedastic errors, the COVID-19 user guide states that in order to estimate standard errors correctly, the clustering variable primary sampling unit and stratification variable should be enforced (Institute for Social and Economic Research, 2021). This can be achieved using the *srvy*r package and the appropriate variables provided by the COVID-19 dataset. Furthermore, it is vital to ensure that the robust standard errors are provided in the linear probability models, thus, the *svyglm* function shall be used as it returns robust standard errors which attempt to correct heteroskedasticity (Lumley, 2020; Long, 2020; Wiley, 2020).

### 3.6 Ethics

To ensure that ethical and legal responsibilities are enforced fully, the Understanding Society protocols are thoroughly scrutinised by multiple research ethics committees (Institute for Social and Economic Research, 2021). Ethics approval was permitted by the University of Essex Ethics Committee for the mainstage and COVID-19 web and telephone surveys (ETH1920-1271)

# 4. Results

## 4.1 Comparing Loneliness Levels Before and During COVID-19.

**Table 1**

| *Race* | *% Not Lonely(Before)* | *% Lonely(Before)* | *% Not Lonely(During)* | *% Lonely(During)* |
|---|---|---|---|---|
| White British | 65.72% | 34.28% | 67.35% | 32.65% |
| Chinese | 63.93% | 36.07% | 59.02% | 40.98% |
| Bangladeshi | 47.5% | 52.5% | 53.75% | 46.25% |
| Pakistani | 49.02% | 50.98% | 43.63% | 56.37% |
| Indian | 55.87% | 44.13% | 57.02% | 42.98% |
| Caribbean | 42.97% | 57.03% | 56.25% | 43.75% |
| African | 52.63% | 47.37% | 60.53% | 39.47% |
| Mixed | 49.51% | 50.49% | 53.43% | 46.57% |

Table 1 presents the percentage of people who were lonely and who were not lonely before and during the COVID-19 pandemic. As loneliness has been aggregated into a binary variable, presenting the percentages are the most appropriate descriptive statistic.

Looking at percentages before the COVID-19 pandemic, Bangladeshi (52.5%), Pakistani (50.98%), Caribbean (57.03%), and Mixed (50.49%) ethnic groups all had a more significant percentage of people who were lonely than those who were not. White British (65.7%), Chinese (63.93%), Indian (55.87%) and African (52.63%) ethnic groups all had a vast percentage of people who were not lonely before the pandemic. On the contrary, Pakistani (56.37%) were the only ethnic group where the majority were lonely during the pandemic. All other ethnic group had a larger percentage who were not lonely during the pandemic.

Furthering the discussion, it is beneficial to compare the changes in loneliness before and during the pandemic. White British (-1.63%), Bangladeshi (-6.25%), Indian (-1.15%), Caribbean (-13.38%), African (-7.9%) and Mixed (-3.92%) all saw a decrease in the

percentage of people who were lonely before compared to during the pandemic. Chinese (4.91%) and Pakistani (5.39%) were the only ethnic groups who saw an increase in the percentage of lonely people before compared to during the pandemic. Overall, these descriptive statistics suggest that Chinese and Pakistani's were the ethnic groups who were impacted by the COVID-19 regarding reporting loneliness, as the levels rose from before to during the pandemic.

It is worthy to note that using an unweighted sample means there are disparities in the valid population parameters of these ethnic groups. Thus, caution should be taken when drawing robust conclusions as they are not representative of the population but are useful for a baseline forecasting. Therefore, the application of survey weights aids the formulation of reliable and valid statements regarding population features (Meinck, 2020; cited in Wagemaker, 2020).

### 4.2 Descriptive Statistics- wave 4 COVID-19

**Table 2**

| *Race* | *Number of Lonely Observations* | *Proportion Lonely(%)* | *Proportion Lonely Lower CI(%)* | *Proportion Lonely Upper CI(%)* |
|---|---|---|---|---|
| White British | 3611.13 | 0.377 (37.7%) | 0.359 (35.9%) | 0.396 (39.6%) |
| Chinese | 10.10 | 0.305 (30.5%) | 0.125 (12.5%) | 0.572 (57.2%) |
| Bangladeshi | 53.45 | 0.467 (46.7%) | 0.302 (30.2%) | 0.638 (63.8%) |
| Pakistani | 75.98 | 0.614 (61.4%) | 0.418 (41.8%) | 0.779 (77.9%) |
| Indian | 107.63 | 0.487 (48.7%) | 0.380 (38%) | 0.596 (59.6%) |
| Caribbean | 36.79 | 0.470 (47%) | 0.207 (20.7%) | 0.750 (75%) |
| African | 46.61 | 0.498 (49.8%) | 0.273 (27.3%) | 0.724 (72.4%) |
| Mixed | 65.60 | 0.393 (39.3%) | 0.254 (25.4%) | 0.551 (55.1%) |

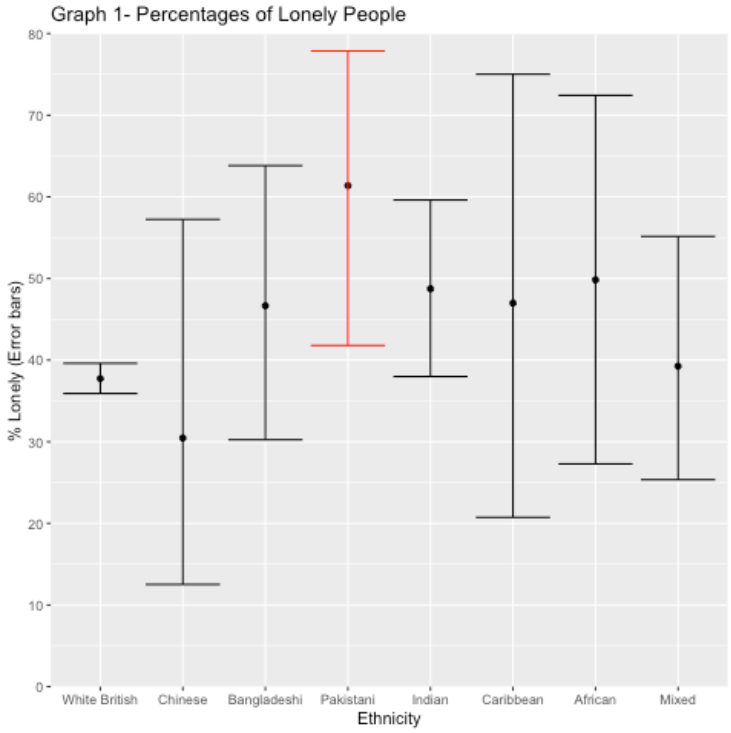
Table 2 highlights various descriptive statistics using a weighted sample for the proportion of lonely people during COVID-19, alongside the correct confidence intervals. Reproducing the direction of the relationship from table 1, 61.4% of Pakistani's were lonely; translating that they were the only ethnic group where the majority, more than half, felt lonely. However, the confidence interval indicates that the true value lies between 41.8% and 77.9%, with a 95% degree of certainty. The ethnic groups African and Indian fall incredibly close to the majority margin of being lonely. The former at 49.8% and the latter at 48.7%. 30.5% of Chinese felt lonely, which was the ethnic group with the smallest proportion. There is a 95% probability that the true population parameter lies between 12.5% and 57.2%. White British were the second group with the lowest percentage of lonely people at 37.7%, with a lower confidence interval of 35.9% and 39.6%. In comparison to White British, Chinese is the only ethnic group which had a smaller proportion of people who were lonely.

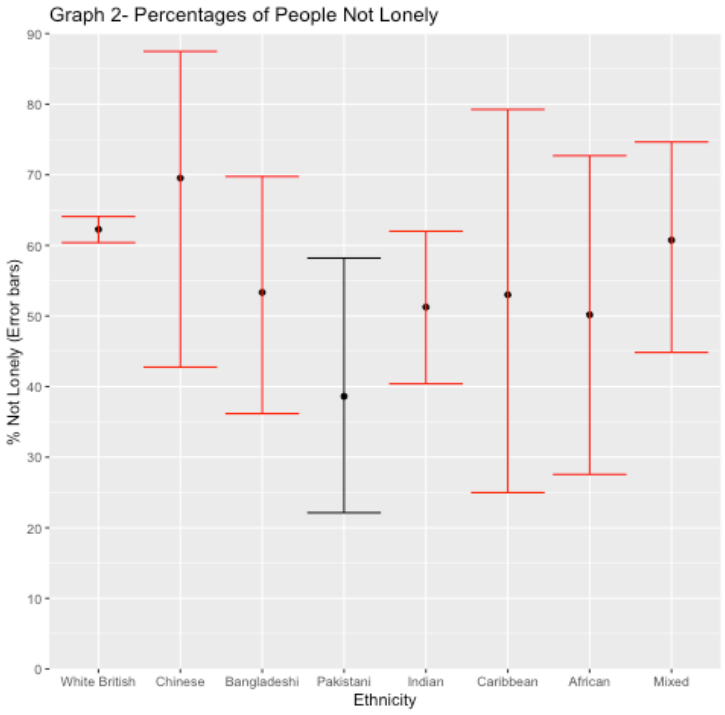
**Table 3**

| *Race* | *Number of Not Lonely Observations* | *Proportion Not Lonely(%)* | *Proportion Not Lonely Lower CI(%)* | *Proportion Not Lonely Upper CI(%)* |
|---|---|---|---|---|
| White British | 5956.83 | 0.623 (62.3%) | 0.604 (60.4%) | 0.641 (64.1%) |
| Chinese | 23.08 | 0.696 (69.6%) | 0.428 (42.8%) | 0.875 (87.5%) |
| Bangladeshi | 61.11 | 0.533 (53.3%) | 0.362 (36.2%) | 0.698 (69.8%) |
| Pakistani | 47.79 | 0.386 (38.6%) | 0.221 (22.1%) | 0.582 (58.2%) |
| Indian | 113.19 | 0.513 (51.3%) | 0.404 (40.4%) | 0.620 (62%) |
| Caribbean | 41.49 | 0.530 (53%) | 0.250 (25%) | 0.793 (79.3%) |
| African | 46.94 | 0.502 (50.2%) | 0.276 (27.6%) | 0.727 (72.7%) |
| Mixed | 101.50 | 0.607 (60.7%) | 0.448 (44.8%) | 0.747 (74.7%) |

Further reviewing the information, table 3 depicts various descriptive statistics using a weighted sample for the proportion of people who were not lonely during COVID-19, alongside the appropriate confidence interval. White British, Chinese, Bangladeshi, Indian, Caribbean, African and Mixed ethnic groups all had a substantial number of individuals who were not lonely; suggesting the majority did not report the effects of loneliness from the pandemic. The ethnic group Chinese had the largest percentage of people who were not lonely at 69.6%, but it can be said that with a 95% degree of certainty that the true value falls between 42.8% and 87.5%. White British falls shortly after this, with 62.3% reporting they were not lonely during the pandemic, with a narrow 95% certainty that the actual parameter is between 60.4% and 64.1%. Thus, the combination of these descriptive statistics indicate that Pakistanis were the most likely to report being lonely, while Chinese were the least. To further comprehend these statistics, it is beneficial to use graphical exploration to depict the spread of the confidence levels visually.

### 4.3 Graphical Exploration- wave 4 COVID-19






Graph 1 shows the percentage of lonely people by ethnic group, alongside the appropriate error bars. Graph 2 depicts the same information but using the rates of people who were not lonely. The coloured bars represent the ethnic groups where the majority, over half of observations, fall under the category of either being lonely or not.

Examining both graphs, for White British, the error bar is incredibly narrow with a scope of 3.7% between the lower and upper confidence interval. This is due to the larger sample size of 3611.13 for the outcome lonely and 5956.83 for the outcome of not being lonely. This larger sample size aids the formulation of a greater precision in the estimation. Caribbean (54.3%), African (45.1%) and Chinese (44.7%) have the most extensive error bar parameters, which is a possible reflection of their small sample size or variation within responses. A broader interval translates that the uncertainty is more distinguishable. Therefore, to enhance the understanding of loneliness and ethnicity, regression analysis is a robust method to identify the statistical significance of these observations and whether they are observed by chance.

### 4.4 Linear Probability Models

**Model 1**

| | *Dependent Variable* |
|---|---|
| | Lonely |
| Intercept | 0.377*** |
| | (0.010) |
| *Ethnicity: Ref (White British)* | |
| Chinese | -0.073 |
| | (0.079) |
| Bangladeshi | 0.089 |
| | (0.075) |
| Pakistani | 0.236*** |
| | (0.089) |
| Indian | 0.110** |
| | (0.055) |
| Caribbean | 0.093 |
| | (0.145) |
| African | 0.121 |
| | (0.118) |
| Mixed | 0.015 |
| | (0.077) |
| *N* | 12,420 |
| Log Likelihood | -Inf.000 |
| Akaike Inf. Crit. | Inf.000 |
| *Notes:* | ***Significant at the 1 percent level. |
| | **Significant at the 5 percent level. |
| | *Significant at the 10 percent level. |

Model 1 presented above is a linear probability model using a weighted sample. The intercept is 0.377, representing the probability that the binary outcome will equal 1 for White British, which is statistically significant at a 99% confidence level. The ethnic groups *Chinese, Bangladeshi, Caribbean, African* and *Mixed* failed to hold any statistical significance at a 95% confidence level. Thus, there is a lack of data to insinuate any probabilistic relationship between these ethnic groups and loneliness. Nevertheless, the coefficient for Pakistani is 0.236, which is statistically significant at a 99% confidence level. In other words, compared to White British, the probability of being lonely increases by 0.236 or 23.6%.

Similarly, the coefficient for Indian is 0.11, which is statistically significant at a 95% confidence level. Namely, Indians are 11 percentage points more likely to report being lonely than White British. Thus, regarding statistical significance, Pakistani has the most considerable point increase compared to White British, suggesting they are the most likely to report being lonely. Indian is the only other ethnic group that holds at the 95% confidence level. To strengthen the internal validity, the addition of control variables will assess whether this effect is consistent while controlling for the influence of extraneous variables.

**Model 2**

| | *Dependent Variable* | |
|---|---|---|
| | Lonely | |
| | *survey-weighted normal* | *OLS* |
| | (1) | (2) |
| Intercept | 0.505*** | 0.458*** |
| | (0.031) | (0.016) |
| *Ethnicity: Ref(White British)* | | |
| Chinese | -0.044 | 0.068 |
| | (0.083) | (0.061) |
| Bangladeshi | 0.074 | 0.118** |
| | (0.067) | (0.048) |
| Pakistani | 0.191** | 0.189*** |
| | (0.082) | (0.034) |
| Indian | 0.112* | 0.078*** |
| | (0.067) | (0.027) |
| Caribbean | 0.094 | 0.088** |
| | (0.142) | (0.040) |
| African | 0.132 | 0.050 |
| | (0.124) | (0.044) |
| Mixed | -0.022 | 0.083*** |
| | (0.073) | (0.032) |
| *Sex: Ref (Male)* | | |
| Female | 0.134*** | 0.122*** |
| | (0.016) | (0.008) |
| *Age: Ref (17-29)* | | |
| 30-49 | -0.143*** | -0.152*** |
| | (0.031) | (0.016) |

| | | |
|---|---|---|
| 50-69 | -0.254*** | -0.230*** |
| | (0.030) | (0.016) |
| 70+ | -0.293*** | -0.272*** |
| | (0.036) | (0.017) |
| *Born: Ref (In the U.K.)* | | |
| Not UK | -0.043 | 0.002 |
| | (0.040) | (0.020) |
| *Household size: Ref (1-4 Members)* | | |
| 5-8 Members | -0.077*** | -0.058*** |
| | (0.028) | (0.016) |
| 9-12 Members | 0.343*** | 0.210 |
| | (0.120) | (0.129) |
| *N* | 12,420 | 12,420 |
| $R^2$ | | 0.053 |
| Adjusted $R^2$ | | 0.051 |
| Log Likelihood | -Inf.000 | |
| Akaike Inf. Crit. | Inf.000 | |
| Residual Std. Error | | 0.461 (df = 12405) |
| F Statistic | | 49.100*** (df = 14; 12405) |
| *Notes:* | | ***Significant at the 1 percent level. |
| | | **Significant at the 5 percent level. |
| | | *Significant at the 10 percent level. |

**Table 4**

| | 2.5 % | 97.5 % |
|---|---|---|
| (Intercept) | 0.444 | 0.565 |
| Pakistani | 0.030 | 0.352 |
| Female | 0.102 | 0.166 |
| Age: 30-49 | -0.205 | -0.082 |
| Age :50-69 | -0.312 | -0.195 |
| Age :70+ | -0.363 | -0.223 |
| Household size: 5-8 members | -0.132 | -0.021 |
| Household size: 9-12 members | 0.108 | 0.578 |

Presented above are two linear probability models with control variables, using a weighted and unweighted sample. Alongside this, table 4 presents the 95% confidence intervals for the variables which held statistical significance.

*Ethnicity*

In model 2, the variables *Chinese, Bangladeshi, Indian, Caribbean, African* and *Mixed* insufficiently held any statistical significance at a 95% confidence level. *Pakistani* was the only ethnic group that had a coefficient statistically significant at a 95% confidence level. Given all variables are held constant, the probability of Pakistanis being lonely increases by 0.191 or 19.1% compared to White British. There is a slight decrease in the coefficient from model 1 to model 2, which suggests that control variables were minor drivers for change. In the unweighted sample, *Bangladeshi*, *Pakistani, Indian, Caribbean* and *mixed* all had statistically significant coefficients at a 95% confidence level. All of which are positive, suggesting an increase in the probability of being lonely compared to White British.

The confidence interval for Pakistani is 0.030 and 0.352, emphasising a 95% chance that the valid population parameter falls between these values. Additionally, the p-value is 0.0205, which is less than the alpha level of 0.05, which translates that the observed relationship is unlikely due to chance. The interval does not contain the null hypothesis value of 0, and the p-value is less than 0.05; thus, we can reject the null hypothesis. The accepted alternative hypothesis states that while holding all other variables constant, there is a relationship between being Pakistani and experiencing loneliness during the COVID-19 pandemic.

*Sex*

In model 2, while holding all other variable constant, the probability of females being lonely increases by 0.134/13.4% compared to Males. This slightly decreases using the unweighted sample to 0.123/12.3% but both estimates are statistically significant at a 99% confidence level.

*Age*

Compared to those ages *17-29*, all other age categories see a decrease in the probability of being lonely, which holds statistical significance at a 99% confidence level. Those aged 30-49 have a decreased likelihood of being lonely by 0.143 or 14.3 percentage points. Those aged 50-69 have a decreased probability by 0.254 or 25.4%, and those aged 70+ by 0.293 or 29.3

percentage points. Therefore, these estimates suggest the likelihood of them being lonely is reduced in comparison to younger people. Compared to the unweighted model, the coefficients change slightly, but the statistical significance and negative direction of the coefficients are consistent.

*Born in the U.K.*

In both model 2 and 3, the variable *Not born in the U.K.* held no statistical significance, underlining that this had no impact on loneliness during Covid-19.

*Household size*

However, holding all other variables constant, having a household size of 5-8 members decreases the probability of loneliness by -0.077 or 7.7% compared to a household size of 1-4 members. The coefficient slightly decreases to -0.058 or 5.8% in the unweighted sample, but both coefficients are statistically significant at a 99% confidence level. On the contrary, having a household size of 9-12 members increases the probability of being lonely by 0.343 or 34.3 percentage points compared to the reference category, which is highly statistically significant. In the unweighted sample, the coefficient decreases to 0.210 but fails to hold statistical significance.

## 5. Analysis & Discussion

### 5.1 Ethnicity

Taking everything into account, the vast majority of results coincided with the information provided by previous empirical studies and literature. Overall, when holding variables constant, Pakistani was the only ethnic group that produced a coefficient significant at a 95% confidence level. This ethnic group had the largest coefficient and percentage point increase of 19.1 in comparison to White British; suggesting they were the most likely to report being lonely during COVID-19. Thus, the first part of this discussion will focus on the reasoning surrounding the linear probability model producing this result.

There is substantial use in comparing the results of the British Red Cross and Co-op study (2019) to see if there is a replication. Narrowing the scope on specific ethnic groups, the

analysis found that Pakistanis were one of the groups who faced the most stigma surrounding loneliness and 70% of Pakistani's worried about what others thought about their feelings of loneliness. More interestingly, Pakistani's were the least likely (64%) to admit to feeling lonely; yet this research found that they reported being the loneliest during the COVID-19 pandemic. To further delve into this finding, there is significant use in providing contextual factors which potentially influence this result.

Income has remained a consistent predictor of isolation and sense of belonging; low-income people experience increased isolation and a decreased sense of belonging (Heritage et al., 2008; Stewart et al., 2009; Macdonald, Nixon & Deacon, 2018). There are disparities in the opportunities available amongst individuals, which contribute to feelings of loneliness, such as lower levels of mobility, digital exclusion and a reduced capacity to join in leisure activities (Griffiths, 2017). In the context of ethnicity, in 2019, Black, Bangladeshi and Pakistani people had the most considerable unemployment rate amongst all ethnic groups (GOV.UK, 2021). In the same year, Pakistanis had the most expansive positive pay game, meaning they earned 15.5% less than White British employees (Office for National Statistics, 2020b). As low household income and unemployment rates are an existing risk factor for loneliness and social isolation, this may be exacerbated by the COVID-19 pandemic (LGA & ADPH, 2020).

Another factor supporting how the pandemic has increasingly challenged ethnic groups is that they are the most likely to work in sectors affected by lockdown. For example, in 2018, Pakistani and Bangladeshi had the highest percentage of workers in the distribution, hotels and restaurant sector (GOV.UK, 2020a) and who were self-employed (GOV.UK, 2020b). Thus, Pakistanis were more likely to be furloughed or lose their job, leading to economic hardship.

The COVID-19 pandemic has turned society upside down, which means there are new risks for predicting loneliness which may be a direct product of the pandemic. This includes economic and furlough measures placed due to lockdown measures. Cheryl Lloyd (Nuffield Foundation, 2020) commented that Black, Asian, and minority ethnic groups are experiencing worse mental health due to the pandemic, highlighting existing inequalities in mental health. Social connections are among the most crucial and fundamental factors influencing happiness and health (Waldinger, 2015). Revisiting Finney, Kapadia and Peters (2015) findings, Pakistanis are the second most likely group to have 0 to 1 friend, and the least

likely to have friendships outside their neighbourhood. Applying evolutionary theory, those with minimal friendship social connections and networks are likely to have a decreased opportunity to satisfy the reconnection process; hence, Pakistanis are the ones to report greater loneliness.

Additionally, some ethnic groups have a higher mortality rate from COVID-19 (Nuffield Foundation, 2020; Neil & Meehan, 2020). Bangladeshi and Pakistani males are 1.8 times more likely to have a COVID-19 related death than white males; and 1.6 for females (Office for National Statistics, 2020c). Evaluating this finding, according to the Office for National Statistics (2020c) a strength is that the rate of linkage to deaths using the census keys is high (90%) which makes it representative when assessing the risk of death in that population. By contrast, they further note that the limitation is that the design does not measure emigration since the census in 2011 which possibly could lead to bias and an underestimation of mortality risk. Therefore, this indicates that despite being a highly credible source, the mortality rates should be taken cautiously as they do not represent the absolute value due to study design implications.

Furthermore, some 'front-line' jobs during the pandemic meant that some individuals were in contact and exposed to infection more, increasing the risk of death. For example, ethnic minorities form 21% of the NHS workforce but make up 63% of healthcare workers who died of COVID-19 (UK Research and Innovation, 2020). Alternatively, Bangladeshis and Pakistanis are more likely to work in the transport industry than any other ethnic group (Office for National Statistics, 2020c), which was an essential role during a global pandemic. Other factors such as illness, disability, geographical location, local deprivation, rural or urban living, house ownership, socioeconomic class and overcrowding further contribute to the excess risk of death from COVID-19 for ethnic minorities, in comparison to White British (UK Research and Innovation, 2020). For example, 8% of Pakistani households are classified as overcrowded, which was the second highest percentage for ethnic groups (GOV.UK, 2020c). Thus, ethnic minority communities have been disproportionately affected by the virus concerning mortality, which will likely produce deeply embedded traumatic experiences and loneliness (LGA &ADPH, 2020).

### 5.2 Sex

In compliance with previous literature (Office for National Statistics, 2018; Bu, Steptoe and Fancourt, 2020), this paper noted a relationship between sex and reporting loneliness. In comparison to men, women are 13.4 percentage points more likely to report being lonely. Likewise, Etheridge and Spantig (2020) reported that women had higher levels of loneliness than men after the onset of the pandemic. They argue that the reasoning behind this finding relates to social factors. Specifically, having an extensive social network before the pandemic is strongly associated with a decline in well-being after the pandemic began. Women reported having a considerable number of close friends than males, hence why they may feel the adverse effects of the pandemic to a greater extent. Additionally, gender differences in caring responsibilities and family-related time use contribute to this.

However, this finding should be addressed from a critical perspective, as scholars are divided on the conclusions drawn on the relationship between sex and loneliness. Maes et al. (2019) address that males are potentially more likely to experience loneliness as females replace family time with solid values of peer group friendships, whereas males spend increasing time alone. It is questionable whether the findings portrayed above are drawn from the factor that women acknowledge the experiences of loneliness more due to the relaxation of labels attached to expressing emotions. There are disparities in how emotion is socialised among boys and girls, which often correlates to how a culture views masculinity and femininity. Emotions such as sadness are often viewed differently when expressed by men and women, with an increase in negative judgement for the former. This could be a factor as to why women are almost twice as likely to ask for help as men (Juvrud & Rennels, 2017) and why there is an underreporting of male depression and other mental health issues (de Boise & Hearn, 2017).

Barreto et al. (2021) found that males reported more loneliness than women and concluded that to fully understand the causal effect between sex and loneliness, men need to be given particular safe conditions to speak about loneliness. This awareness of the role of sex on loneliness has policy implications when assessing the most effective methods mental health facilities can offer, which is fundamental in the context of a global pandemic. Therefore, caution should be taken on the conclusions one draws; namely, this finding indicates a relationship between reporting loneliness but not necessarily the experiences of it.

### 5.3 Age

This research replicates the findings presented by existing literature that younger people are affected by loneliness more than older people (Bu, Steptoe and Fancourt, 2020; Office for National Statistics, 2018). The increase in coefficients with age suggests the probability of being lonely decreases with age, which scholars have argued is the case as older people become more resilient to loneliness (Office for National Statistics, 2018; Vahia, Jeste and Reynolds, 2020). Barreto et al. (2021) further concluded that young people reported more loneliness than middle-aged individuals, while Etheridge and Spantig (2020) determine that this is the same with the inclusion of gender differences.

Siva (2020) proposes that the reason for this finding is that young children and adults experience a range of transitions in life, including moving from primary to secondary school, moving to university and moving back home after graduating. Furthermore, friends are a fundamental aspect of developing an individual's identity, and this lack of support is likely to contribute to feelings of loneliness or long-term mental health issues (Mental Health Foundation, 2021). The introduction of social distancing and stay at home rules is likely to exacerbate factors that already promote loneliness in young people. For example, university students are likely to suffer from loneliness due to homesickness or a sense of not belonging (Weissbourd, Batanova and Torres, 2021). These researchers continued to argue school students are likely to feel disconnected from their social groups, and those transiting from family relations to friendship relationships are likely to lose those critical connections, that shelter individuals from loneliness.

### 5.4 Household size

The statistical analysis found that having a household size of 5-8 members is likely to decrease the probability of being lonely by 7.7% compared to a household size of 1-4 members. By contrast, having a household size of 9-12 members is likely to increase loneliness by 34.3 percentage points. Duplicating the British Red Cross and Co-op study (2019), it was established that those who lived with four or more other people were at high risk of being lonely; challenging the idea that a large household can protect one from loneliness.

In the dataset, 13 observations had a family size of 9-12 members, 6 of which were Pakistanis who were more likely to report being lonely. In line with Platt's conclusion (2010), Bangladeshi, Pakistani, and Indians have the largest average family size in England, Scotland and Wales. When looking at the composition of households, it is not rare to have a large family structure in ethnic groups, especially Asian families. Bangladeshi and Pakistanis are the most consistent ethnic groups to adopt outmoded values, particularly in the size of families and the labour market (Berthoud, 2000). Overall, family structures amongst ethnic groups are a probabilistic factor as to why having a household size of 9-12 members increases the likelihood of being lonely. Additionally, Davidson and Rossall (2015) found that older people in large households are more like to report loneliness. Thus, future research should look at incorporating interaction terms, such as age and household size.

## 6. Limitations to this research

Certain implications arise from the methodological decisions of this paper, which constrain the robustness of results. Due to the cross-sectional design focusing on a specific point in time, no causal claim can be produced. Throughout the COVID-19 pandemic, as there have been three national lockdowns, the way people cope, and loneliness levels are highly likely to fluctuate depending on certain periods. For example, people are likely to struggle more when in a national lockdown in comparison to the relaxation of the rules. Thus, the results in this study represent wave 4,which may differ in the waves before and after this period. To improve this causal inference, future researchers should aim to use longitudinal data to improve the internal validity and test whether there is a relationship between ethnicity and loneliness over an extensive period during the COVID-19 pandemic. Furthermore, while this study addressed new control variables which are missing from previous literature, different control variables should be incorporated in future studies to expand on what impacts loneliness. For example, income differs among ethnic groups and is a significant predictor but was not included in this analysis; the incorporation of interaction terms between ethnicity and sociodemographic will only solidify our understanding of the relationship.

Regarding statistical analysis, as noted prior in the methodology section, the limitations of using a linear probability model include heteroskedastic errors, non-linearity and probabilities that are greater than 1 or less than 0 (Horrace and Oaxaca, 2006). While attempts were made

to correct these violated assumptions, such as producing robust standard errors for heteroskedasticity, further regression models should be used to solidify the findings of this paper. Logistic regression has been very successfully implemented in the social science sector (Ramosacaj, Hasani and Dumi, 2015) and differs from linear probability models as it uses a non-linear function. Linear probability model estimates can be biased and inconsistent; thus, to improve the robustness of results, a logistic model should be used in future research to compare the estimates and standard errors.

## 7. Concluding Remarks

This paper aimed to address two core research questions. Firstly, is there a relationship between ethnicity and being lonely during the COVID-19 pandemic? In summary, Pakistani was the only ethnic group that had a statistically significant relationship to reporting being lonely. Secondly, are there any changes in the levels of loneliness before the COVID-19 pandemic in comparison to during among ethnic groups? Overall, Pakistanis and Chinese were the only ethnic groups who saw an increase in the proportion of people who were lonely before to during the pandemic, while all others saw a decrease.

Using the secondary survey data and a weighted sample, this empirical study has established that loneliness was a severe public health problem before the pandemic, which is only like to be amplified with lockdowns and social distancing measures. The literature presented depicts the reasoning behind the relationship between being Pakistani and reporting loneliness, which includes but is certainly not limited to stigma, discrimination, income, employment sector, social networks and mortality rates.

This research has addressed major gaps in the sociological field of ethnicity and loneliness in the sphere of a global health pandemic. Loneliness is a silent killer, which denotes the importance of research that attempts to unpack the effects of COVID-19. The social science research field of loneliness among ethnic groups is minimal; thus, further clarification should be denoted to improve the efficiency of solutions to this problem. Future studies should take a longitudinal approach alongside applying more precise and varying sociodemographic and socioeconomic control variables. This will aid any emerging patterns which vary across time, while improving the internal validity by establishing a more precise causal inference.

Time, resources and efforts should be concentrated to ensuring everyone receives the support they need to tackle loneliness; for the duration and years which follow the COVID-19 pandemic. The Government and policymakers have a duty to work with partners, to remove structural barriers to services, such as affordability. This paper suggests one key aspect which should be addressed is the stigmatisation of loneliness, which naturally diminishes quality of life. Ethic groups should have equal access to personalised support; to dimmish the unconscious bias, language barriers, discrimination, cultural naivety and insensitivity of healthcare providers. The silent epidemic of loneliness means as a society, we must support each other in the healing process in the years that follow the COVID-19 pandemic, while remembering the sacrifices we have made and the loved ones we have lost.

# Bibliography


Barreto, M., Victor, C., Hammond, C., Eccles, A., Richins, M. & Qualter, P (2021). Loneliness around the world: Age, gender, and cultural differences in loneliness. *Personality and Individual Differences*, 169(110066).

Bellemare, M (2018). Causal Inference with Observational Data: Lecture 6- Nonstandard Dependent Variables. University of Copenhagen, delivered May 2018

Berthoud, R (2000). "Family formation in multi-cultural Britain: three patterns of diversity," ISER Working Paper Series 2000-34, Institute for Social and Economic Research.

British Red Cross and Co-op (2019) Barriers to Belonging: An exploration among people from Black, Asian and Minority Ethnic backgrounds. Available at < https://www.redcross.org.uk/about-us/what-we-do/we-speak-up-for-change/barriers-to-belonging>

Bryman, A (2016). *Social Research Methods*. 5th ed. New York: Oxford University Press.

Bu, F., Steptoe, A. & Fancourt, D (2020). Who is lonely in lockdown? Cross-cohort analyses of predictors of loneliness before and during the COVID-19 pandemic. Public Health, [online] 186. Available at: <https://www.sciencedirect.com/science/article/pii/S0033350620302742>

Cacioppo, J. T., Hawkley, L. C., Ernst, J. M., Burleson, M., Berntson, G. G., Nouriani, B., & Spiegel, D. (2006). Loneliness within a nomological net: An evolutionary perspective. Journal of Research in Personality, 40. http://dx.doi.org/10.1016/j.jrp.2005.11.007

Chopik, W. (2016) The Benefits of Social Technology Use Among Older Adults Are Mediated by Reduced Loneliness. Cyberpsychology, Behavior, and Social Networking, 19(9).doi:10.1017/S0144686X16001537

Chopik, W (2017). Associations among relational values, support, health, and well-being across the adult lifespan. *Personal Relationships*, 24.

Davidson, S & Rossall, P (2015) Evidence Review: Loneliness in Later Life. White Pap. Available from: https://www.ageuk.org.uk/globalassets/age-uk/documents/reports-and-publications/reports-and-briefings/health%2D%2Dwellbeing/rb_june15_lonelines_in_later_life_evidence_review.pdf.

de Boise, S. & Hearn, J. (2017) 'Are men getting more emotional? Critical sociological perspectives on men, masculinities and emotions', *The Sociological Review*, 65(4), pp. 779–796. doi: 10.1177/0038026116686500.

Easton, M (2018). How should we tackle the loneliness epidemic?. [online] BBC. Available at: <https://www.bbc.co.uk/news/uk-42887932>

Etheridge, B & Spantig, L (2020.) "The gender gap in mental well-being during the Covid-19 outbreak: evidence from the UK," ISER Working Paper Series 2020-08, Institute for Social and Economic Research.

Finney, N., Kapadia, D & Peters, S (2015). *How are poverty, ethnicity and social networks related?*. [online] Joseph Rowntree Foundation. Available at: https://www.jrf.org.uk/report/how-are-poverty-ethnicity-and-social-networks-related

Gee, G. C., & Ford, C. L. (2011). Structural Racism and Health Inequalities: Old Issues, New Directions. Du Bois Review: social science research on race, 8(1), 115-132 https://doi.org/10.1017/S1742058X11000130

Giddens, A. & Sutton, P (2017). Sociology. 8th ed. Cambridge: Polity Press.

Gomila, Robin. (2019). Logistic or Linear? Estimating Causal Effects of Binary Outcomes Using Regression Analysis. 10.31234/osf.io/4gmbv.

GOV.UK (2020a). *Employment by Sector*. [online] Available at: <https://www.ethnicity-facts-figures.service.gov.uk/work-pay-and-benefits/employment/employment-by-sector/latest> [Accessed 13 April 2021].

GOV.UK (2020b). *Self-employment*. [online] Available at: <https://www.ethnicity-facts-figures.service.gov.uk/work-pay-and-benefits/employment/self-employment/latest> [Accessed 13 April 2021].

GOV.UK (2020c) *Overcrowded households*. [online] Available at: <https://www.ethnicity-facts-figures.service.gov.uk/housing/housing-conditions/overcrowded-households/latest> [Accessed 13 April 2021].

GOV.UK (2021). *Unemployment*. [online] Available at: <https://www.ethnicity-facts-figures.service.gov.uk/work-pay-and-benefits/unemployment-and-economic-inactivity/unemployment/latest> [Accessed 13 April 2021].

Griffiths, H (2017). *Social Isolation and Loneliness In the UK: With a focus on the use of technology to tackle these conditions*. [ebook] IOTUK. Available at: <https://iotuk.org.uk/wp-content/uploads/2017/04/Social-Isolation-and-Loneliness-Landscape-UK.pdf.> [Accessed 12 April 2021].

Gujarati, D. & Porter, D (2009). *Basic Econometrics*. 5th ed. Singapore: McGraw-Hill International.

Haddon, C., Sasse, T. & Tetlow, G. (2021). *Lifting lockdown in 2021 The next phase of the government's coronavirus strategy*. [ebook] Institute for Government. Available at: <https://www.instituteforgovernment.org.uk/sites/default/files/timeline-lockdown-web.pdf> [Accessed 15 April 2021].

Heritage, Z., Wilkinson, R., Grimaud, O & Pickett, K. (2008). Impact of social ties on self-reported health in France: Is everyone affected equally? BMC Public Health, 8(243)

Horrace, W. and Oaxaca, R (2006) Results on the bias and inconsistency of ordinary least squares for the linear probability model. *Economics Letters*, 90(3).

Hunt, M., Marx, R., Lipson, C. & Young, J (2018). No More FOMO: Limiting Social Media Decreases Loneliness and Depression. Journal of Social and Clinical Psychology, 37(10).

Institute for Social and Economic Research (2020), Understanding Society: Waves 1-10, 2009-2019 and Harmonised BHPS: Waves 1-18, 1991-2009, User Guide, 29 October 2020, Colchester: University of Essex.

Institute for Social and Economic Research (2021) Understanding Society COVID-19 User Guide. Version 7.0, March 2021. Colchester: University of Essex.

Juvrud, J & Rennels, J.L (2017). "I Don't Need Help": Gender Differences in how Gender Stereotypes Predict Help-Seeking. *Sex Roles*, 76. https://doi.org/10.1007/s11199-016-0653-7

Kemp, S (2021). Digital 2021: Global Overview Report. [online] Datareportal. Available at: <https://datareportal.com/reports/digital-2021-global-overview-report>

Liao, T.F (1994). Introduction. In: *Interpreting Probability Models*, Quantitative Applications in the Social Sciences. Thousand Oaks, CA: SAGE Publications, Inc. Available at: <http://www.doi.org.uoelibrary.idm.oclc.org/10.4135/9781412984577> [Accessed 17 Apr 2021]

Lim, M.H., Eres, R. & Vasan, S. (2020) Understanding loneliness in the twenty-first century: an update on correlates, risk factors, and potential solutions. *Soc Psychiatry Psychiatr Epidemiol* ,55. https://doi.org/10.1007/s00127-020-01889-7

Lonely (1995). In: *The Collins Shorter Dictionary and Thesaurus*. 1st ed. Wrotham: HarperCollins. p. 444

"Lonely, adj".(2021) In: *OED Online*. Oxford; Oxford University Press [Accessed 25th April]. Available at: www.oed.com/view/Entry/109971.

Long, J (2020). *Tools for summarizing and visualizing regression models*. [online] jtools 2.1.0. Available at: <https://jtools.jacob-long.com/articles/summ.html> [Accessed 26 April 2021].

Luchetti, M., Lee, J. H., Aschwanden, D., Sesker, A., Strickhouser, J. E., Terracciano, A., & Sutin, A. R. (2020). The trajectory of loneliness in response to COVID-19. American Psychologist, 75(7), 897–908. https://doi.org/10.1037/amp0000690

Lumley T (2020). "survey: analysis of complex survey samples." R package version 4.0. Available at: < https://cran.r-project.org/web/packages/survey/survey.pdf>

Macdonald SJ, Nixon J & Deacon L. (2018) 'Loneliness in the city': examining socio-economics, loneliness and poor health in the North East of England. Public Health; 165. doi: 10.1016/j.puhe.2018.09.003. Epub 2018 Oct 27. PMID: 30384033.

Maes, M., Qualter, P., Vanhalst, J., Van den Noortgate, W., & Goossens, L. (2019) Gender Differences in Loneliness Across the Lifespan: A Meta-Analysis. *European Journal of Personality,* 33(6): https://doi.org/10.1002/per.2220.

McKinsey (2020). How COVID-19 has pushed companies over the technology tipping point—and transformed business forever. [online] Available at: <https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/how-covid-19-has-pushed-companies-over-the-technology-tipping-point-and-transformed-business-forever>

Mental Health Foundation (2021). *Loneliness in young people: research briefing.* [online] Available at: <https://www.mentalhealth.org.uk/campaigns/unlock-loneliness/research-briefing> [Accessed 24 April 2021].

Miller, E (2020). Loneliness in the Era of Covid-19. Frontiers in Psychology, [online] 11. Available at: <https://www.frontiersin.org/article/10.3389/fpsyg.2020.02219>

National Academies of Sciences, Engineering and Medicine (2020). Social Isolation and Loneliness in Older Adults: Opportunities for the Health Care System. Washington, DC: The National Academies Press https://doi.org/10.17226/25663external%20icon.

Neil, C. & Meehan, M (2020). *Understanding COVID-19 and ethnicity*. [online] Public Health Agency. Available at: <https://www.publichealth.hscni.net/node/5305> [Accessed 13 April 2021].

Novotney, A ( 2019). The link between loneliness and technology. Monitor on Psychology, [online] 50(5). Available at: <http://www.apa.org/monitor/2019/05/ce-corner-sidebar>

Nuffield Foundation (2020). *Women and ethnic minorities have found the pandemic psychologically more challenging.* [online] Available at: <https://www.nuffieldfoundation.org/news/women-ethnic-minorities-found-pandemic-psychologically-more-challenging> [Accessed 13 April 2021].

Office for National Statistics (2018). Loneliness- What Characteristics and Circumstances are associated with feeling lonely? . [online] Available at: < https://www.ons.gov.uk/peoplepopulationandcommunity/wellbeing/articles/lonelinesswhatcharacteristicsandcircumstancesareassociatedwithfeelinglonely/2018-04-10 > [Accessed 25th April 2021].

Office for National Statistics (2019). Exploring the UK's digital divide. [online] Available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/householdcharacteristics/homeinternetandsocialmediausage/articles/exploringtheuksdigitaldivide/2019-03-04#how-does-internet-usage-vary-for-different-ethnic-groups>

Office for National Statistics (2020a). Coronavirus and homeworking in the UK: April 2020. Available at: https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/bulletins/coronavirusandhomeworkingintheuk/april2020

Office for National Statistics (2020b). *Ethnicity pay gaps: 2019*. [online] Available at: <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/articles/ethnicitypaygapsingreatbritain/2019#ethnicity-breakdowns> [Accessed 13 April 2021].

Office for National Statistics (2020c). *Coronavirus (COVID-19) related deaths by ethnic group, England and Wales: 2 March 2020 to 10 April 2020*. [online] Available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/articles/coronavirusrelateddeathsbyethnicgroupenglandandwales/latest> [Accessed 13 April 2021].

Perlman, D & Peplau, L (1982). Theoretical approaches to loneliness. Loneliness: A Sourcebook of Current Theory, Research and Therapy. 123-134.

Platt, L (2010). Ethnicity and Family Relationships Within and Between Ethnic Groups: An analysis using the Labour Force Survey, Equality and Human Rights Commission (EHRC), Institute for Social & Economic Research, University of Essex,

Portes, A., & Zhou, M. (1993). The New Second Generation: Segmented Assimilation and Its Variants. The Annals of the American Academy of Political and Social Science, 530, 74-96. http://www.jstor.org/stable/1047678

Ramosacaj, M., Hasani, V., & Dumi, A. (2015). Application of Logistic Regression in the Study of Students' Performance Level (Case Study of Vlora University). *Journal Of Educational And Social Research, 5*(3), 239. Retrieved from https://www.mcser.org/journal/index.php/jesr/article/view/7722

Siva N. (2020). Loneliness in children and young people in the UK. *The Lancet. Child & Adolescent Health*, *4*(8), 567–568. https://doi.org/10.1016/S2352-4642(20)30213-3

Slater, P (1976) The Pursuit of Loneliness. Boston; Beacon Press

Smith, A. K., Ayanian, J. Z., Covinsky, K. E., Landon, B. E., McCarthy, E. P., Wee, C. C., & Steinman, M. A. (2011). Conducting high-value secondary dataset analysis: An introductory guide and resources. Journal of General Internal Medicine, 28(8), 920- 929. doi:10.1007/s11606-010-1621-5

Smith, E. (2008). Using secondary data in educational and social research. New York, NY: McGraw-Hill Education.

Stewart, M,. Makwarimba, E,. Reutter, L.I,. Veenstra, G,. Raphael, D & Love, R (2009) Poverty, Sense of Belonging and Experiences of Social Isolation, Journal of Poverty, 13:2, 173-195, DOI: 10.1080/10875540902841762

Tankovska, H (2018). Penetration of social networks in the United Kingdom (UK) 2018, by gender. [online] Statistica. Available at: https://www.statista.com/statistics/611848/penetration-of-social-networks-in-the-united-kingdom-by-gender/

The Local Government Association (LGA) & Association of Directors of Public Health (ADPH) (2020). *Loneliness, social isolation and COVID-19*. Available at: < https://www.ccht.org.uk/media/nzzblwy4/isolation-and-loneliness-full-report.pdf>

The Visual and Data Journalism Team (2021). Covid map: Coronavirus cases, deaths, vaccinations by country. [online] BBC. Available at: <https://www.bbc.co.uk/news/world-51235105>

UK Research and Innovation (2020). *Why do people from ethnic minorities suffer more from COVID-19?*. [online] Available at: <https://coronavirusexplained.ukri.org/en/article/cad0011/#:~:text=According%20to%20the%20ONS%2C%20factors,as%20compared%20to%20White%20people.> [Accessed 13 April 2021].

United Nations Educational, Scientific and Cultural Organisation, UNESCO (2021). Education: From disruption to recovery. [online] Available at: <https://en.unesco.org/covid19/educationresponse>

University of Essex, Institute for Social and Economic Research (2020). Understanding Society: Waves 1-10, 2009-2019 and Harmonised BHPS: Waves 1-18, 1991-2009. [data collection]. 13th Edition. UK Data Service. SN: 6614, http://doi.org/10.5255/UKDA-SN-6614-14.

University of Essex, Institute for Social and Economic Research. (2021). Understanding Society: COVID-19 Study, 2020-2021. [data collection]. 8th Edition. UK Data Service. SN: 8644, 10.5255/UKDA-SN-8644-8.

Vahia, I.V,. Jeste, D.V & Reynolds, C.F (2020) Older Adults and the Mental Health Effects of COVID-19. *JAMA; 324(22)* doi:10.1001/jama.2020.21753

Victor, C.R., Scrambler, S.J., Bowling, A & Bond, J (2005) The prevalence of, and risk factors for, loneliness in later life: A survey of older people in Great Britain. *Ageing and Society,* 25(6)

Wagemaker, H. (2020) Reliability and Validity of International Large-Scale Assessment. IEA Research for Education (A Series of In-depth Analyses Based on Data of the International Association for the Evaluation of Educational Achievement (IEA)), vol 10 [online]. Springer, Cham. https://doi.org/10.1007/978-3-030-53081-5_7

Waldinger, R (2015) *What makes a good life? Lessons from the longest study on happiness*. TED Available at: https://www.ted.com/talks/robert_waldinger_what_makes_a_good_life_lessons_from_the_longest_study_on_happiness

Weiss, R. S. (1974). The provisions of social relationships. In Z. Rubin (Ed.), Doing unto others (pp. 17-26). Englewood Cliffs, NJ: Prentice-Hall

Weissbourd, R., Batanova, M., Lovison, V. & Torres, E (2021). *Loneliness in America: How the Pandemic Has Deepened an Epidemic of Loneliness and What We Can Do About It.* [online] The

Making Caring Common team- Harvard Graduate School of Education. Available at: <https://mcc.gse.harvard.edu/reports/loneliness-in-america> [Accessed 24 April 2021].

Wiley, J (2020). *Generalized Linear Models 2*. [ebook] Monash University. Available at: <http://joshuawiley.com/MonashHonoursStatistics/GLM2.html> [Accessed 26 April 2021].

Wilson, C (2018). Is it love or loneliness? Exploring the impact of everyday digital technology use on the wellbeing of older adults. Ageing and Society, 38(7),1307-1331

Wooldridge, J (2020). *Introductory Econometrics: A Modern Approach*. 7th ed. United States of America: Cengage Learning.