All the Lonely People:

Loneliness in Later Life

Technical Report: presentation of analytical methodology and results

Introduction

This technical report accompanies the report, *All the Lonely People: Loneliness in Later Life*, and presents full details of the analysis behind the results presented in the main report. The technical report is split into four parts:

- **Part A: Analysis of prevalence of loneliness amongst older people over time** – this part of the technical report describes the use of data from the English Longitudinal Study of Ageing (ELSA) to calculate the proportion of people aged 50 and over living in private households in England who are hardly or never lonely, lonely some of the time or often lonely between 2006/07 and 2016/17. This part also describes the proportion of people who are projected to be often lonely up to 2030/31.

- **Part B: Analysis of characteristics and circumstances associated with being often lonely amongst older people** – this part of the technical report describes the use of data from Wave 7 of the English Longitudinal Study of Ageing to calculate factors that are independently (i.e. controlling for all other appropriate factors) associated with being often lonely

- **Part C: Analysis of characteristics and circumstances associated with being often lonely amongst adults aged 16+** – this part of the technical report describes analysis of loneliness amongst adults in four waves of the Community Life Survey. This serves to review the finding from the ONS report, '*Loneliness – what characteristics and circumstances are associated with feeling lonely?*', that younger people aged 16 to 24 are significantly more likely to feel lonely often or always than those in older age groups

- **Part D: Analysis of the measure of prevalence using a single-item direct loneliness question and an indirect scale of loneliness** – this part of the technical report describes the use of data from Wave 7 of the English Longitudinal Study of Ageing to understand how estimates of the prevalence of loneliness differ by the type of question(s) asked

Stata 15SE is the statistical software used to analyse data from the English Longitudinal Study of Ageing and the Community Life Survey. Both surveys were accessed from the UK Data Service.

Part A: Analysis of loneliness over time

English Longitudinal Study of Ageing (ELSA)

The English Longitudinal Study of Ageing (ELSA) is a longitudinal panel study designed to be representative of people aged 50 years and over living in private households in England. The aim of ELSA is to better understand the social and economic conditions, and the health and well-being of older people. Eight waves of the survey have been published to date, and table A1 presents information on when each survey wave was collected.

Table A1: ELSA Survey Year

ELSA Wave	Survey Year
1	2002/03
2	2004/05
3	2006/07
4	2008/09
5	2010/11
6	2012/13
7	2014/15
8	2016/17

Loneliness over time

Our analysis of ELSA waves 3-8 allows us to calculate the prevalence of loneliness amongst older people in England over the ten years from 2006/07 to 2016/07. Table A2 presents the sample for each wave of the survey, the number of people surveyed and the number of people with a valid response to the single-item loneliness question, which asks respondents '*How often do you feel lonely?*'

Table A2: Survey Sample Size

ELSA Wave (Survey Year)	3 (2006/07)	4 (2008/09)	5 (2010/11)	6 (2012/13)	7 (2014/15)	8 (2016/17)
Survey Sample Size	9,771	11,050	10,273	10,601	9,666	8,445
Sample Size (valid responses to single-item loneliness question)	8,141	9,207	8,920	7,845	7,023	6,229
Invalid responses	17%	17%	13%	26%	27%	26%

Table A3 presents the proportion of people lonely by level of loneliness for each of the survey years between 2006/07 and 2016/17[1]. It also presents the standard errors, and the 95% confidence intervals. Figure A1 presents the same information in table A3 in a line graph. The prevalence of loneliness between 2006/07 and 2016/17 among people aged 50 and over living in private households in England has remained similar, with around two-thirds of these people feeling hardly or never lonely, one-quarter lonely some of the time and fewer than one-in-ten often lonely.

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[1] Appropriate cross-sectional weights were applied to each wave of the survey.

Table A3: Percentage of people aged 50 and over by level of loneliness

	Percentages	Standard Error	95% Confidence Interval
ELSA Wave 3 (2006/07)			
Hardly Lonely	67.3	0.6	(66.13 , 68.34)
Lonely some of the time	24.7	0.5	(23.65 , 25.69)
Often lonely	8.1	0.3	(7.48 , 8.76)
ELSA Wave 4 (2008/09)			
Hardly Lonely	67.3	0.6	(66.17 , 68.31)
Lonely some of the time	24.2	0.5	(23.26 , 25.22)
Often lonely	8.5	0.3	(7.9 , 9.19)
ELSA Wave 5 (2010/11)			
Hardly Lonely	67.1	0.6	(66.04 , 68.22)
Lonely some of the time	24.9	0.5	(23.86 , 25.86)
Often lonely	8.0	0.3	(7.39 , 8.68)
ELSA Wave 6 (2012/13)			
Hardly Lonely	66.5	0.6	(65.26 , 67.71)
Lonely some of the time	25.8	0.6	(24.69 , 26.98)
Often lonely	7.7	0.4	(7.03 , 8.39)
ELSA Wave 7 (2014/15)			
Hardly Lonely	70.1	0.7	(68.77 , 71.4)
Lonely some of the time	24.0	0.6	(22.79 , 25.27)
Often lonely	5.9	0.3	(5.28 , 6.56)
ELSA Wave 8 (2016/17)			
Hardly Lonely	69.0	0.8	(67.41 , 70.57)
Lonely some of the time	24.2	0.8	(22.79 , 25.73)
Often lonely	6.8	0.5	(5.92 , 7.7)

Note: all figures are percentages and rounded to 1 decimal place, except confidence intervals to 2 decimal places

Figure A1: Prevalence of loneliness over time for people aged 50 and over living in private households in England
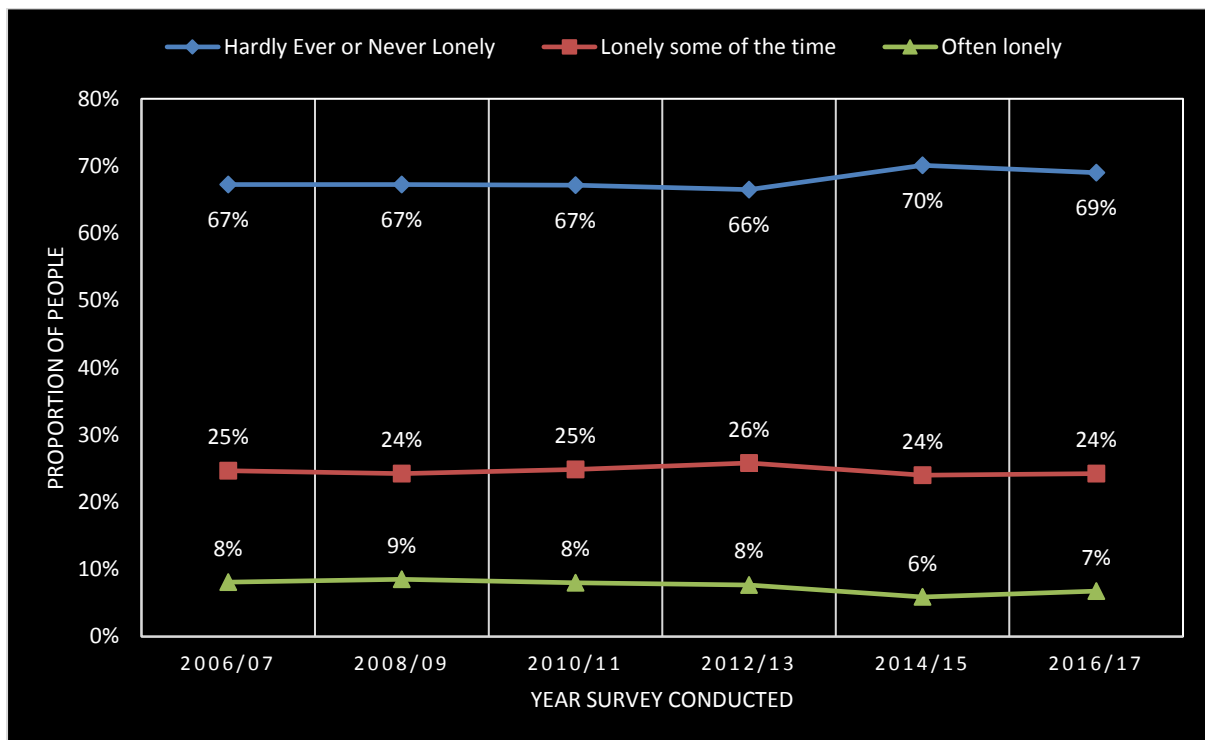
The confidence intervals around the estimated prevalence of loneliness given in table A3 do not always overlap, indicating that in certain years the prevalence has changed slightly. For example, in Wave 7 the proportion of participants who were hardly ever or never lonely was statistically significantly higher than the figure in the previous waves, and the proportion who were often lonely was lower. However, differences in prevalence are small and there is no sustained trend over time, leading to our interpretation that the prevalence of loneliness has remained similar from 2006/07 to 2016/17.

Loneliness in the future

The previous section has shown that the prevalence of loneliness has remained similar over the last decade. With the population of people aged 50 and over growing, the number of older people who often feel lonely may also grow. Figure A3 presents the number of people aged 50 and over who are projected to often feel lonely up to 2030/31.

Figure A3: Number of people aged 50 and over living in England projected to be feeling often lonely
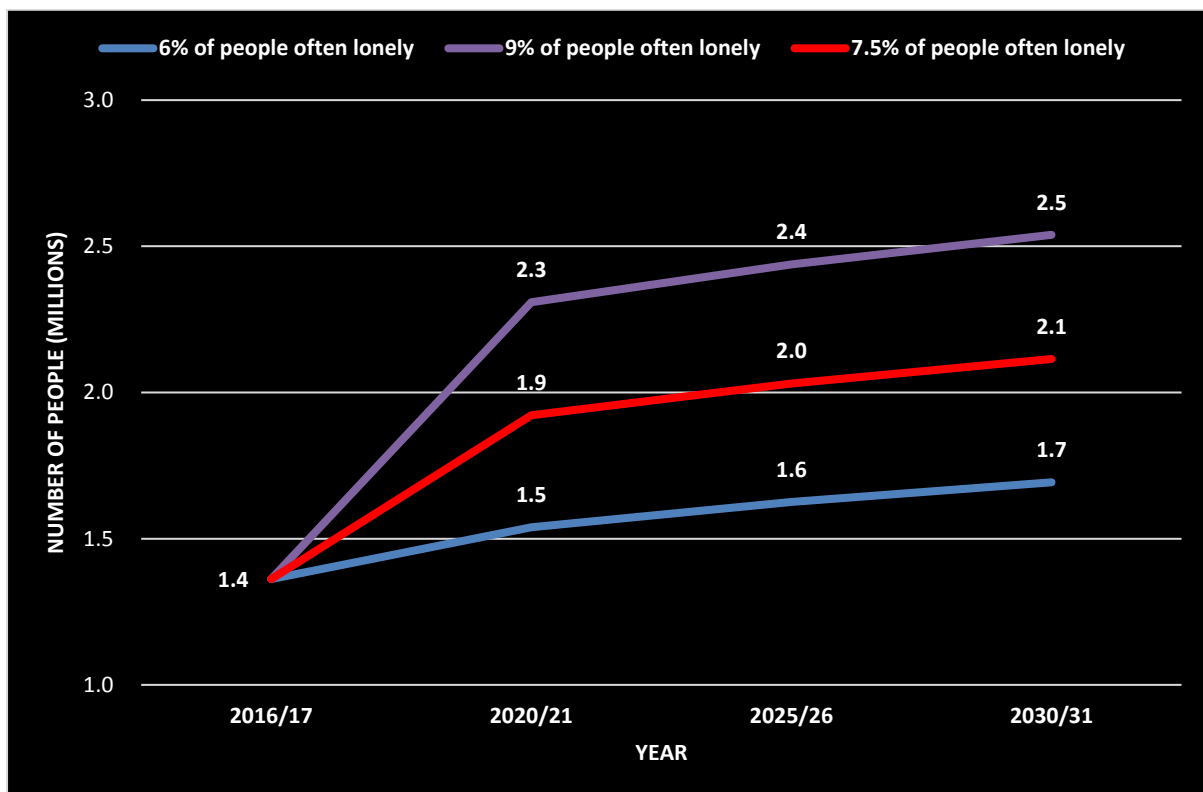

Figure A3 shows that if the prevalence of often feeling lonely among people aged 50 and over is:

- 9% (i.e. the highest observed prevalence in the ten years 2006/07 to 2016/17), the number of older people often feeling lonely is projected to rise to 2.3 million by 2020/21, 2.4 million by 2025/26 and 2.5 million by 2030/31

- 7.5% (i.e. the mean prevalence in the ten years 2006/07 to 2016/17) the number of older people often feeling lonely is projected to rise to 1.9 million by 2020/21, 2.0 million by 2025/26 and 2.1 million by 2030/31

- 6% (i.e. the lowest observed prevalence in the ten years 2006/07 to 2016/17) the number of older people often feeling lonely is projected to rise to 1.5m in 2020/21, 1.6 million in 2025/26 and 1.7 million in 2030/31

These projections of numbers of lonely older people are based on the Office for National Statistics (ONS) principle population projections for England, published in 2017, and presented in Table A4, to which we have applied assumed prevalence of people who will often feel lonely based on the observed prevalence in the 10 years between 2006/07 to 2016/17.

Table A4: ONS Principle Population Projections for numbers of people aged 50 & over in England

Financial Year	Population aged 50 and over	Number of people aged 50 and over who will often be lonely (millions)		
		assuming proportion often lonely each year:		
		6.0%	7.5%	9.0%
2016/17	20,148,342	1.36	1.36	1.36
2017/18	24,534,931	1.47	1.84	2.21
2018/19	24,921,339	1.50	1.87	2.24
2019/20	25,296,652	1.52	1.90	2.28
2020/21	25,655,173	1.54	1.92	2.31
2021/22	26,016,590	1.56	1.95	2.34
2022/23	26,341,343	1.58	1.97	2.37
2023/24	26,623,384	1.60	2.00	2.40
2024/25	26,869,497	1.61	2.01	2.42
2025/26	27,095,313	1.63	2.03	2.44
2026/27	27,300,197	1.64	2.05	2.46
2027/28	27,490,449	1.65	2.06	2.47
2028/29	27,696,825	1.66	2.08	2.49
2029/30	27,946,676	1.68	2.09	2.52
2030/31	28,215,093	1.69	2.11	2.54

Note: the figure for 2016/17 is the same across all scenarios because it is based on calculations from latest available survey result; it is not a projection. Projections start from from the financial year 2017/18

Source:https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/datasets/z1zippedpopulationprojectionsdatafilesuk; data file "*ONS uk_ppp_opendata2016*" (accessed on 7th August 2018). Calendar year data converted to financial years.

Part B: Analysis of factors associated with being often lonely

We have used multivariable logistic regression analysis to help us to understand which characteristics and circumstances are associated with people feeling lonely. This method allows us to estimate the relationship between loneliness and each characteristic or circumstance independently, holding the influence of other relevant characteristics and circumstances constant.

We have drawn our data for this analysis from wave 7 of the English Longitudinal Study of Ageing and have used, as our outcome variable of interest, the single-item loneliness question which asks respondents '*How often do you feel lonely*?' This question has three possible responses: hardly or never lonely, lonely some of the time and often lonely, and for the purposes of these analyses we have defined those who report feeling often lonely as lonely; with those who provide other responses defined as not lonely. The reason for this is that most people feel lonely at some point in their lives. It is when loneliness persists that it can have a negative impact on well-being and quality of life. The response often lonely can be considered to approximate these persistent feelings of loneliness.

Table B1 presents the explanatory variables that we considered in our analysis. These variables were chosen to include characteristics and circumstances which are both evidenced or considered to be associated with loneliness, and captured in surveys.

Table B1: Explanatory variables included in logistic regression

Characteristics	Health
Age	Self-rated health status
Gender	Activity of Daily Living status

Social Network & Support	Neighbourhood
Household Size	Belonging to area
Regularity of meeting someone	
Employment status	
Relationship Status	
Someone to open up to	

Control	Wealth
Can do the things I want	Net total non-house wealth
Family responsibilities prevent me doing what I want	Housing Ownership status
Money prevents me doing what I want	
Car access	

We ran a logistic regression including all these explanatory variables, and removed variables which were statistically non-significant at the 95% level. Where more than one variable was not statistically significant we removed the variable which had a conceptually similar alternative variable first. When removing variables we studied the impact of this on the coefficient estimates of the remaining variables to consider whether the variable should be included to avoid omitted variable bias. We continued this process until we had a final model, at which point, we tested the robustness of the model by adding variables back in.

Results

Table B2 presents our final model which shows of all the explanatory variables initially included, the ones that are statistically significantly associated with being (often) lonely. The results in table B2 show that people aged 50 and over living in private households in England were statistically significantly between:

- 2.1 times (95% CI 1.4 to 3.2) more likely to feel often lonely if they were **single, legally separated or divorced** compared with older people who are in a relationship

- 5.2 times (95% CI 3.2 to 8.2) more likely to feel often lonely if they are **widowed** compared with older people who are in a relationship

- 1.6 times (95% CI 1.1 to 2.4) more likely to feel often lonely if they **live alone** than older people who live with somebody

- 1.6 times (95% CI 1.1 to 2.4) more likely to feel often lonely if they are in **good health** compared with older people who are in excellent or good health

- 2.0 times (95% CI 1.3 to 3.1) more likely to feel often lonely if they are in **fair health** compared with older people who are in excellent or good health

- 3.6 times (95% CI 2.2 to 6.1) more likely to feel often lonely if they are in **poor health** compared with older people who are in excellent or good health

- 1.9 times (95% CI 1.4 to 2.5) more likely to feel lonely if they can only **partly open up to somebody when they need to talk** compared with older people who do have somebody to fully and completely open up to

- 5.5 times (95% CI 2.3 to 13.1 times) more likely to feel often lonely if they **do not have somebody to open up to when they need to talk** compared with older people who do have somebody to fully and completely open up to

- 1.7 times (95% CI 1.2 to 2.5) more likely to feel often lonely if they feel they are **sometimes able to do the things they want** compared with older people feel they can always do the things they want

- 3.5 times (95% CI 2.3 to 5.3) more likely to feel often lonely if they feel they are **not often able to do the things they want** compared with older people feel they can always do the things they want

- 3.0 times (95% CI 1.6 to 5.6) more likely to feel lonely if they feel they are **never able to do the things they want** compared with older people feel they can always do the things they want

- 1.8 times (95% CI 1.3 to 2.5 times) more likely to feel often lonely if they feel they **sometimes have family circumstances that prevent** them doing the things they want to do compared to older people who never feel this way

- 2.6 times (95% CI 1.5 to 4.3 times) more likely to feel often lonely if they feel they **often have family circumstances that prevent** them doing the things they want to do compared to older people who never feel this way

- 2.3 times (95% CI 1.6 to 3.5) more likely to feel often lonely if they feel they **often have money issues that prevent** them doing the things they want to do compared to older people who never feel this way

- 1.2 times (95% CI 1.1 and 1.3) more likely to feel often lonely **for each unit increase in not feeling part of the area**. The scale is 1 (I really feel part of the area) to 7 (I feel that I don't belong in this area) and therefore older people who do not feel part of their area (a score of 7) are 3 times more likely to feel often lonely compared to older people who feel really part of their area (a score of 1)[2].

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[2] The gap between a score of 7 and 1 is 6. The calculation is 1.2 to the power of six, reflecting a difference of six units between really feeling part of the area and not feeling part of the area, which gives an odd ratio of 3.0.

Table B2: Results of final logistic regression model

Dependent Variable - often lonely	Odds Ratio	Standard Error	P-value	95% Confidence Interval
Relationship Status (reference group: married or cohabiting)				
Widowed	5.2	1.2	0.00	(3.32 , 8.18)
Single, legally separated and divorced	2.1	0.4	0.00	(1.41 , 3.21)
Living alone (reference group: living alone)	1.6	0.3	0.02	(1.08 , 2.35)
Self-rated health (reference group: excellent or very good health)				
Good	1.6	0.3	0.01	(1.11 , 2.36)
Fair	2.0	0.4	0.00	(1.31 , 3.11)
Poor	3.6	1.0	0.00	(2.18 , 6.10)
Someone to open up to when need to talk (reference group: yes)				
Partly	1.9	0.3	0.00	(1.40 , 2.47)
No	5.5	2.4	0.00	(2.33 , 13.09)
Can do the things I want (reference group: always)				
Sometimes	1.7	0.3	0.00	(1.24 , 2.46)
Not often	3.5	0.8	0.00	(2.26 , 5.32)
Never	3.0	1.0	0.00	(1.58 , 5.63)
Family responsibilities prevents me doing what I want (reference group: never)				
Not often	1.2	0.2	0.34	(0.83 , 1.71)
Sometimes	1.8	0.3	0.00	(1.29 , 2.54)
Often	2.6	0.7	0.00	(1.54 , 4.32)
Money prevents me doing what I want (reference group: never)				
Not often	1.0	0.2	0.90	(0.66 , 1.44)
Sometimes	1.3	0.3	0.19	(0.88 , 1.90)
Often	2.3	0.5	0.00	(1.58 , 3.47)
Do not belong to area	1.2	0.1	0.00	(1.13 , 1.33)
Constant	0.0	0.0	0.00	(0.00 , 0.01)

Note: shaded p-value boxes are statistically significant at 95% level of significance; all figures rounded to 1 decimal place except p-values and confidence intervals to 2 decimal places

Table B3 presents the results of the full logistic regression model, including all the variables presented in table B1. It shows that the additional characteristics and circumstances – age, gender, (housing and non-housing) wealth, being in employment, and how often you meet up with somebody – are not associated with often being lonely for people aged 50 and over living in private households in England.

Table B3: Results of full logistic regression model

Dependent Variable - often lonely	Odds Ratio	Standard Error	P-value	95% Confidence Interval
Age (reference group: 55-54)				
55-59	1.2	0.4	0.50	(0.66 , 2.34)
60-64	1.4	0.4	0.24	(0.79 , 2.54)
65-69	0.9	0.3	0.69	(0.47 , 1.64)
70-74	1.3	0.4	0.45	(0.67 , 2.44)
75-79	1.0	0.4	0.94	(0.52 , 2.03)
80-84	0.9	0.4	0.88	(0.44 , 2.01)
85+	0.6	0.3	0.34	(0.26 , 1.58)
Gender (reference group: male)	1.3	0.2	0.16	(0.92 , 1.72)
Relationship Status (reference group: married or cohabiting)				
Widowed	5.1	1.3	0.00	(3.12 , 8.33)
Single, legally separated and divorced	2.2	0.5	0.00	(1.40 , 3.42)
Living alone (reference group: living alone)	1.4	0.3	0.09	(0.95 , 2.16)
Car access (reference group: no car access)	1.3	0.2	0.19	(0.88 , 1.86)
Employment status (reference group: Not in employment)	1.3	0.3	0.21	(0.85 , 2.07)
Net total non-housing wealth (reference group: highest quantile)				
4th-lowest quantile	1.4	0.4	0.27	(0.78 , 2.52)
3rd-lowest quantile	1.5	0.4	0.15	(0.86 , 2.68)
2nd-lowest quintile	1.6	0.5	0.12	(0.88 , 2.91)
Lowest quintile	1.2	0.4	0.56	(0.63 , 2.40)
Housing Ownership (reference group: owns house outright)				
Own with mortgage	0.8	0.2	0.47	(0.53 , 1.35)
not owning	1.0	0.2	0.92	(0.66 , 1.45)

Table B3: Results of full logistic regression model (continued)

Self-rated health (reference group: excellent or very good health)				
Good	1.4	0.3	0.10	(0.94 , 2.02)
Fair	1.5	0.3	0.08	(0.95 , 2.23)
Poor	2.4	0.7	0.00	(1.41 , 4.22)

Activity of Daily Living (reference group: no ADLs)				
	1.2	0.2	0.26	(0.87 , 1.73)

Meets someone (reference group: daily)				
Monthly	1.0	0.2	0.83	(0.69 , 1.57)
Occasionally	1.1	0.4	0.80	(0.55 , 2.17)
Hardly	1.1	0.4	0.77	(0.58 , 2.10)

Someone to open up to when need to talk (reference group: yes)				
Partly	2.0	0.3	0.00	(1.50 , 2.69)
No	4.4	2.1	0.00	(1.73 , 11.11)

Can do the things I want (reference group: always)				
Sometimes	2.0	0.4	0.00	(1.36 , 2.81)
Not often	4.1	1.0	0.00	(2.56 , 6.47)
Never	3.3	1.1	0.00	(1.69 , 6.44)

Family responsibilities prevents me doing what I want (reference group: never)				
Not often	1.1	0.2	0.46	(0.79 , 1.66)
Sometimes	1.8	0.3	0.00	(1.26 , 2.56)
Often	2.3	0.7	0.00	(1.36 , 4.05)

Money prevents me doing what I want (reference group: never)				
Not often	1.0	0.2	0.84	(0.65 , 1.42)
Sometimes	1.3	0.3	0.23	(0.85 , 1.96)
Often	2.4	0.5	0.00	(1.56 , 3.71)

Do not belong to area	1.2	0.1	0.00	(1.12 , 1.33)

Constant	0.0	0.0	0.00	(0.00 , 0.00)

Note: shaded p-value boxes are statistically significant at 95% level of significance; and all figures rounded to 1 decimal place except p-values and confidence intervals to 2 decimal places

Table B3 does show that, upon inclusion of these additional variables, being in good or fair health (compared to excellent or very good health) is not associated with being often lonely as it is in the final regression model. This is driven by the relationship between health and employment in this population.

Part C: Review of ONS Analysis of Community Life Survey 2016-17

The Office for National Statistics (ONS), on 10th April 2018, released a report presenting the characteristics and circumstances associated with loneliness in England[3]. The report included the finding that younger people were more likely than those in older age groups to report feeling lonely "often or always" and that, controlling for other factors, the likelihood of reporting feeling lonely more often tends to decrease with age. Since the publication of this report the idea that younger people are lonelier then older people has been expressed in a number of settings and may be becoming part of everyday discourse.

Community Life Survey:

The analysis within the ONS report on the characteristics and circumstances associated with loneliness in England is based on data from the 2016-17 Community Life Survey. The Community Life Survey is reported to be a nationally representative sample of adults (aged 16 years and over) in England. The survey is commissioned by the Cabinet Office, to provide statistics on issues that are related to encouraging social action and empowering communities.

The Community Life Survey was first administered in 2011 as a face-to-face interview, and is now an annual survey, which in 2016-17 changed the way it was carried out from a face-to-face interview to a primarily online survey. A limited option to complete a paper version of the survey was also available in 2016-17. The letter inviting households to complete the survey provided contact details to request a postal version for those unable to complete the survey online; and second reminders to households in deprived areas (as measured by the Index of Multiple Deprivation) were accompanied by a paper survey.

The decision to move to a primarily online survey followed a period of testing of the feasibility and impact of carrying out the survey online. The findings from the testing included the conclusion that the respondents to the online version of the survey would be different to those that would respond to a face-to-face interview, and that the

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[3] *Loneliness – What characteristics and circumstances are associated with feeling lonely? Analysis of characteristics and circumstances associated with loneliness in England using the Community Life Survey, 2016 to 2017, available at*
https://www.ons.gov.uk/peoplepopulationandcommunity/wellbeing/articles/lonelinesswhatcharacteristicsandcircumstancesareassociatedwithfeelinglonely/2018-04-10 (accessed on 13th April 2018)

difference in the demographics of respondents was not something that could be corrected for. The types of people who complete online surveys were therefore considered unlikely to be representative of the general population.

Furthermore the response rate for the 2016-17 CLS was considerably lower than for previous years. Table C1 shows the number of responses and response rate by year, and it is notable that although the number of completed surveys is higher for 2016-17 the response rate of 21% in 2016-17 is about a third of that in previous years.

Table C1: Survey Response Rates

	2013-14	2014-15	2015-16	2016-17
Interviews Conducted:	5,105	2,022	3,027	10,256
Representing response rate of:	61%	59%	61%	24%*

*This figure is the household response rate. Excluding the number of households assumed not to be residential the household response rate is 26.2%. Based on an assumption of the number of people in a household the overall person-level response rate is 20.8%. Of those who requested a postal survey the response rate was 55.9%, which is comparable to previous years.

Figure C2 presents the number of people by age who completed the 2016-17 Community Life Survey online and through a written survey (i.e. postal). The graph shows that the number completing the survey online decreases with age above 45 years, and people aged 75 and over being the only age group for whom completing the survey online is not the majority. This figure also shows that the proportion of surveys completed online decreases with age, accompanied by a dramatic decrease for people aged 75 and over. This further adds to the evidence that online surveys are at present unlikely to be seen as inviting for the older age group, which will influence the representativeness and generalisability of the results. Similar concerns about the mode of delivery of the 2016-17 wave of the CLS have been expressed by the Office for Statistics Regulation[4].

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[4] https://www.statisticsauthority.gov.uk/correspondence/assessment-of-community-life-survey-update/

Figure C2: 2016-17 Community Life Survey completion rate by mode of administration by age
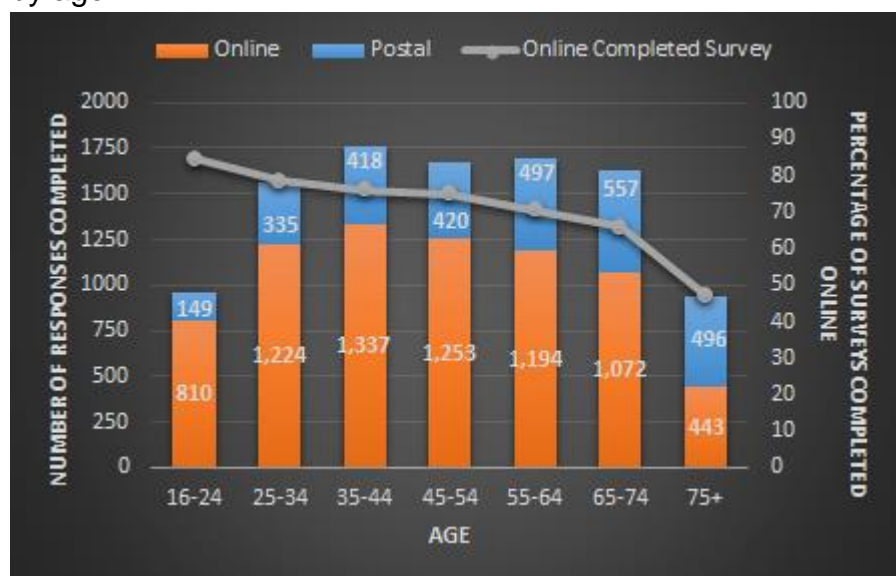
Loneliness by mode of administration:

The same loneliness question appearing in four consecutive years of the Community Life Survey provides the opportunity to investigate if the change in how the survey was carried out, moving to primarily online in 2016-17, influenced the profile of loneliness by age. Figure C3 presents four graphs that replicate the descriptive analysis carried out by ONS looking at how age is associated with loneliness. Table C1 provides the data behind these graphs. The first graph in Figure C3 (top left) is based on the 2016-17 Community Life Survey and is directly comparable to the graph presented in the ONS report. The value and confidence intervals differ very slightly from those reported in the ONS analysis but not materially to influence interpretation.

The remaining three graphs in Figure C3 show the same information for the years 2015-16 (top right), 2014-15 (bottom left) and 2013-14 (bottom right). It is noticeable that these three graphs look similar to each other, and differ from the graph showing the 2016-17 data.

Figure C3: Profile of loneliness by age
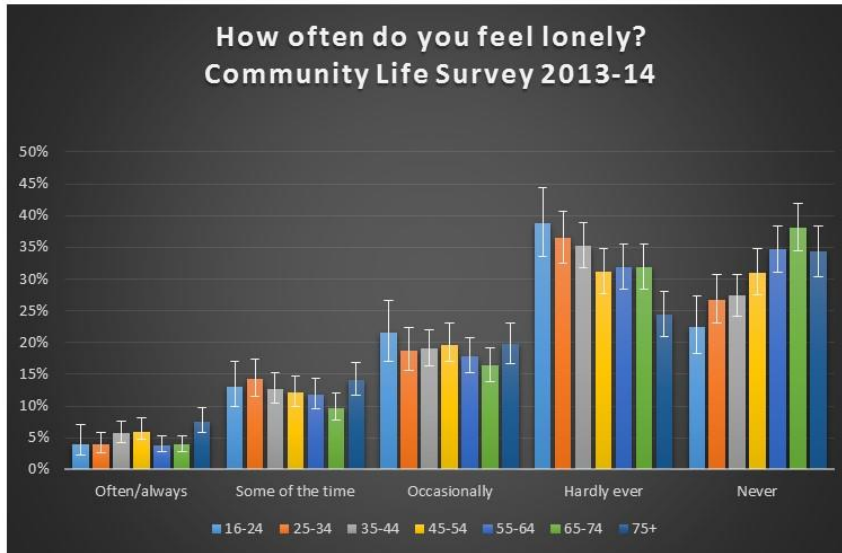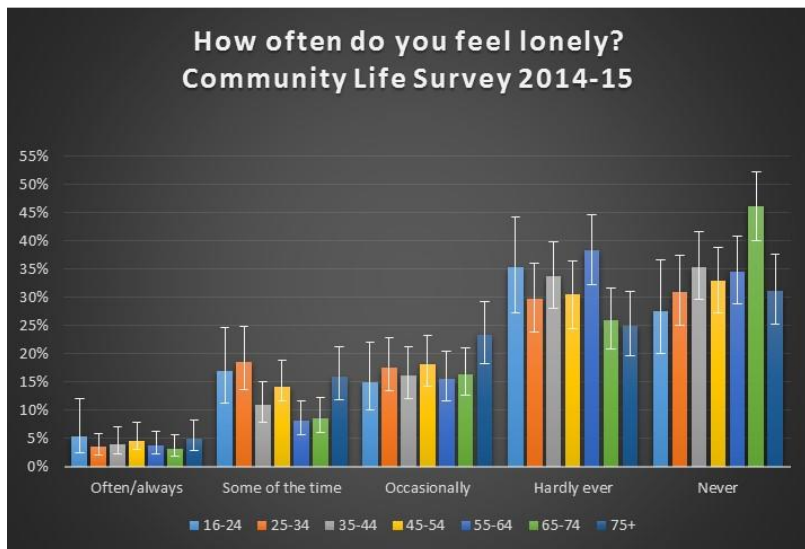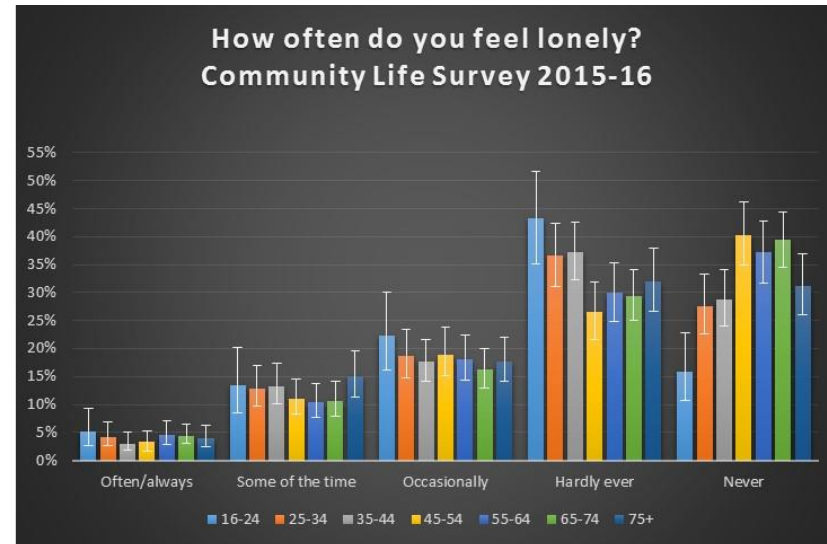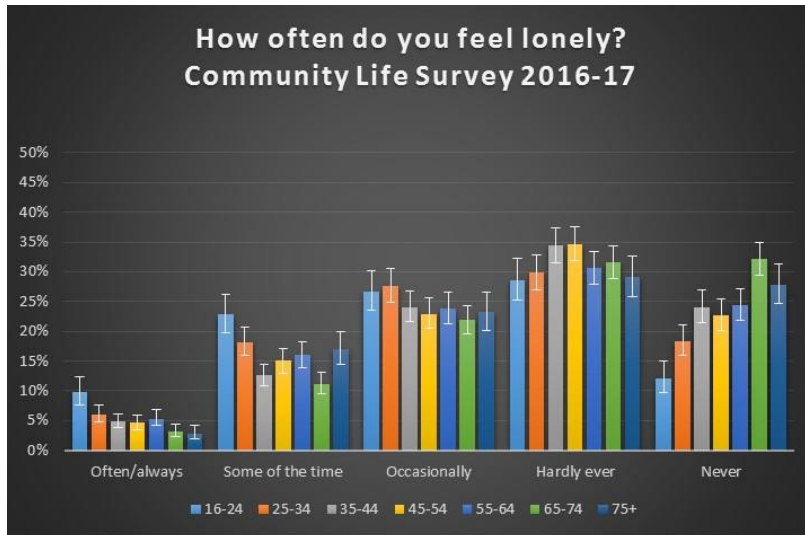
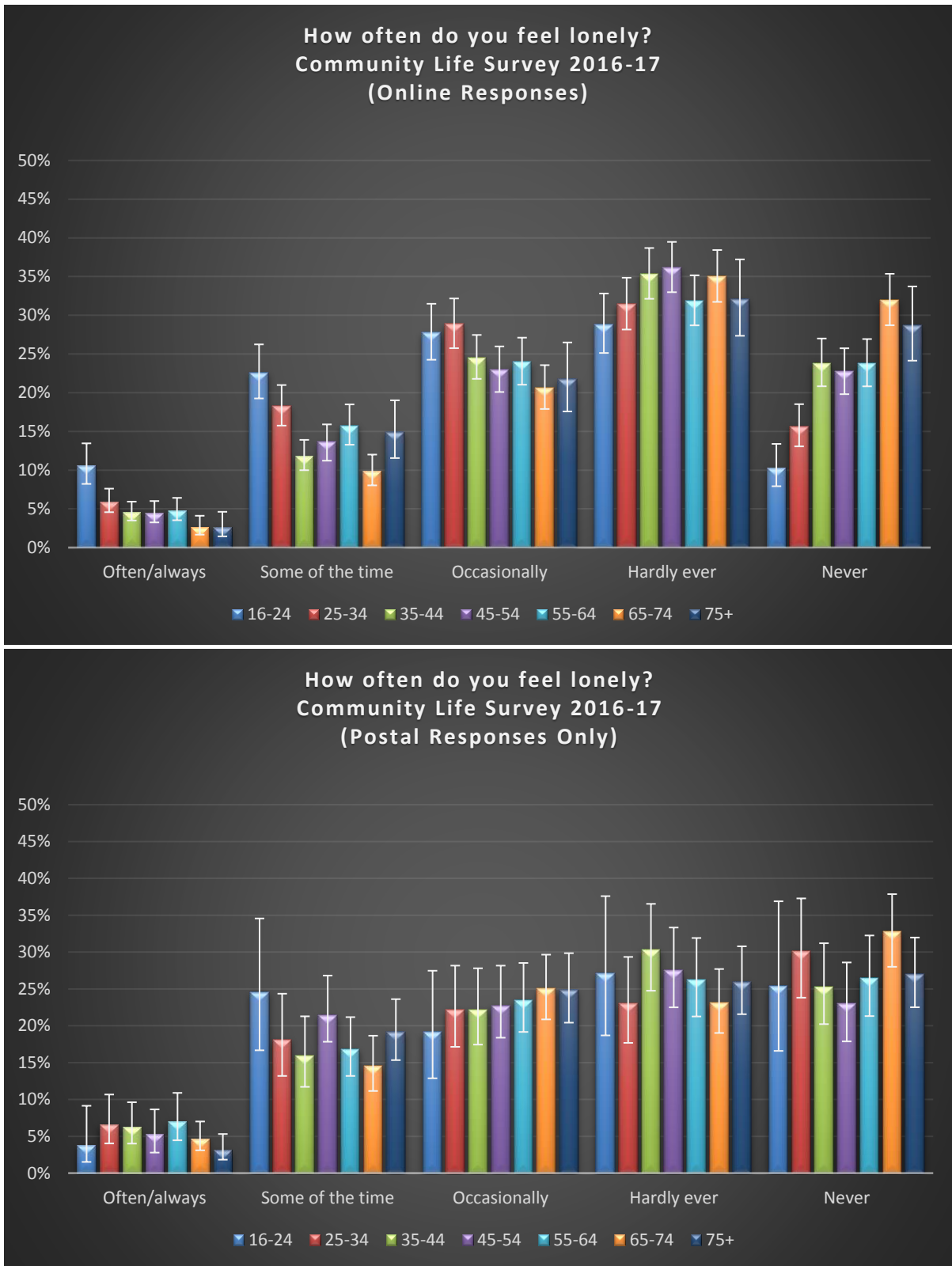Unlike the data from 2016-17, the data from the three preceding years do not suggest that younger people are more likely to feel often or always lonely than older age groups. The singular change from face-to-face interview in the previous years to primarily online for 2016-17, in combination with the low response rate and findings on the type of people completing online surveys from the initial testing, suggests that the finding that age was associated with loneliness in the 2016-17 data is due to those completing the online survey being less likely to be representative of the general population. This is particularly true for the older age groups, who had even lower rates of response to the 2016/17 CLS than their younger counterparts.

This conclusion is further supported by the difference in the association between age and self-reported loneliness that appears within the 2016-17 Community Life Survey. Figure C4 presents these findings, with the first graph (top) based on online responses to the 2016-17 Community Life Survey and the second graph (bottom) based on postal responses. It is noticeable that the relationship of loneliness with age in the online responses is similar to that seen in the full 2016-17 data (top left in figure 1). In contrast, the postal responses show no statistically significant association between age and loneliness, and is more similar to the graphs based on face-to-face surveys of previous years. This indicates that the association between age and loneliness observed in the 2016-17 survey is driven by online responses. Table C2 provides the data behind the graphs in figure C4.

Figure C4: Profile of loneliness by age by response mode

How often do you feel lonely?
Community Life Survey 2016-17
(Online Responses)

How often do you feel lonely?
Community Life Survey 2016-17
(Postal Responses Only)

Online surveys are a cheap and convenient way to increase sample size and get information from younger people who may be underrepresented in surveys administered by post or face-to-face because of their lack of engagement with such methods. However, online data collections are linked to lower response rates amongst all age groups than other data collection methods. As our analysis of the Community Life Survey shows, the use of online data collection and the consequent poor response rate, particularly amongst older people, can lead us to question the robustness of the conclusions drawn from analyses of such data. We question the recent discourse that younger people are more likely than older people to be often or always lonely. This finding is reflective of the fact that those who complete the online survey are less likely to be representative of the general population, especially the older age group. The Office of Statistics Regulation has raised similar concerns about the online method used for the 2016-17 Community Life Survey[5].

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[5] https://www.statisticsauthority.gov.uk/correspondence/assessment-of-community-life-survey-update/

Table C1: Data behind figure C3

	2013-14			2014-15			2015-16			2016-17		
	16-24			16-24			16-24			16-24		
	Percent	Lower confidence interval	Upper confidence interval	Percent	Lower confidence interval	Upper confidence interval	Percent	Lower confidence interval	Upper confidence interval	Percent	Lower confidence interval	Upper confidence interval
Often/always	4.0%	2.62%	5.82%	5.4%	1.97%	5.89%	5.1%	2.57%	6.79%	9.8%	7.67%	12.38%
Some of the time	13.1%	11.56%	17.31%	16.8%	13.53%	24.77%	13.4%	9.69%	16.90%	22.8%	19.69%	26.21%
Occasionally	21.5%	15.57%	22.36%	15.0%	13.33%	22.88%	22.4%	14.72%	23.52%	26.7%	23.55%	30.17%
Hardly ever	38.9%	32.41%	40.72%	35.2%	23.90%	36.06%	43.2%	31.07%	42.44%	28.6%	25.19%	32.33%
Never	22.5%	22.99%	30.76%	27.6%	25.02%	37.38%	15.9%	22.58%	33.33%	12.1%	9.62%	15.08%
	25-34			25-34			25-34			25-34		
	Percent	Lower confidence interval	Upper confidence interval	Percent	Lower confidence interval	Upper confidence interval	Percent	Lower confidence interval	Upper confidence interval	Percent	Lower confidence interval	Upper confidence interval
Often/always	3.9%	2.62%	5.82%	3.4%	1.97%	5.89%	4.2%	2.57%	6.79%	6.0%	4.81%	7.56%
Some of the time	14.2%	11.56%	17.31%	18.5%	13.53%	24.77%	12.9%	9.69%	16.90%	18.2%	15.95%	20.69%
Occasionally	18.7%	15.57%	22.36%	17.6%	13.33%	22.88%	18.7%	14.72%	23.52%	27.6%	24.87%	30.50%
Hardly ever	36.5%	32.41%	40.72%	29.6%	23.90%	36.06%	36.6%	31.07%	42.44%	29.8%	26.97%	32.85%
Never	26.7%	22.99%	30.76%	30.9%	25.02%	37.38%	27.6%	22.58%	33.33%	18.3%	15.89%	21.06%

Table C1: Data behind figure C3 (continued)

	35-44			35-44			35-44			35-44		
	Percent	Lower confidence interval	Upper confidence interval	Percent	Lower confidence interval	Upper confidence interval	Percent	Lower confidence interval	Upper confidence interval	Percent	Lower confidence interval	Upper confidence interval
Often/always	5.8%	4.32%	7.66%	4.0%	2.27%	6.91%	3.0%	1.78%	5.13%	4.9%	3.87%	6.10%
Some of the time	12.6%	10.39%	15.30%	10.8%	7.76%	14.94%	13.3%	10.01%	17.45%	12.6%	10.83%	14.49%
Occasionally	19.1%	16.38%	22.05%	16.1%	12.07%	21.12%	17.6%	14.18%	21.56%	24.1%	21.68%	26.69%
Hardly ever	35.2%	31.74%	38.80%	33.7%	28.04%	39.88%	37.3%	32.34%	42.59%	34.4%	31.60%	37.39%
Never	27.4%	24.23%	30.71%	35.4%	29.59%	41.63%	28.8%	23.96%	34.11%	24.1%	21.45%	26.87%
	45-54			45-54			45-54			45-54		
	Percent	Lower confidence interval	Upper confidence interval	Percent	Lower confidence interval	Upper confidence interval	Percent	Lower confidence interval	Upper confidence interval	Percent	Lower confidence interval	Upper confidence interval
Often/always	5.9%	4.28%	8.15%	4.5%	2.53%	7.88%	3.3%	2.11%	5.24%	4.7%	3.60%	5.98%
Some of the time	12.1%	9.90%	14.72%	14.1%	10.40%	18.72%	10.9%	8.17%	14.45%	15.1%	13.20%	17.13%
Occasionally	19.7%	16.71%	23.09%	18.1%	13.98%	23.11%	18.9%	14.78%	23.76%	23.0%	20.54%	25.56%
Hardly ever	31.2%	27.81%	34.86%	30.5%	25.25%	36.33%	26.6%	21.81%	31.95%	34.6%	31.73%	37.51%
Never	31.0%	27.55%	34.77%	32.8%	27.43%	38.76%	40.3%	34.61%	46.27%	22.8%	20.34%	25.41%
	55-64			55-64			55-64			55-64		
	Percent	Lower confidence interval	Upper confidence interval	Percent	Lower confidence interval	Upper confidence interval	Percent	Lower confidence interval	Upper confidence interval	Percent	Lower confidence interval	Upper confidence interval
Often/always	3.9%	2.83%	5.31%	3.7%	2.11%	6.28%	4.6%	2.92%	7.13%	5.3%	4.11%	6.76%
Some of the time	11.8%	9.56%	14.38%	8.1%	5.51%	11.63%	10.3%	7.71%	13.72%	16.0%	13.87%	18.29%
Occasionally	17.9%	15.27%	20.79%	15.5%	11.54%	20.44%	18.1%	14.37%	22.46%	23.8%	21.36%	26.52%
Hardly ever	31.9%	28.42%	35.53%	38.2%	32.13%	44.69%	29.9%	24.90%	35.39%	30.6%	27.87%	33.42%
Never	34.6%	31.11%	38.32%	34.6%	28.86%	40.81%	37.1%	31.74%	42.87%	24.4%	21.78%	27.12%

Table C1: Data behind figure C3 (continued)

	65-74			65-74			65-74			65-74		
	Percent	Lower confidence interval	Upper confidence interval	Percent	Lower confidence interval	Upper confidence interval	Percent	Lower confidence interval	Upper confidence interval	Percent	Lower confidence interval	Upper confidence interval
Often/always	3.9%	2.87%	5.31%	3.2%	1.76%	5.58%	4.4%	2.95%	6.54%	3.2%	2.35%	4.39%
Some of the time	9.8%	7.87%	12.02%	8.6%	6.00%	12.16%	10.6%	7.88%	14.20%	11.2%	9.52%	13.10%
Occasionally	16.3%	13.82%	19.21%	16.3%	12.54%	20.94%	16.2%	13.01%	20.05%	21.9%	19.57%	24.33%
Hardly ever	31.9%	28.43%	35.49%	25.9%	20.90%	31.65%	29.4%	25.07%	34.08%	31.6%	28.91%	34.34%
Never	38.2%	34.50%	41.94%	46.0%	40.05%	52.13%	39.4%	34.56%	44.38%	32.2%	29.47%	35.00%
	75+			75+			75+			75+		
	Percent	Lower confidence interval	Upper confidence interval	Percent	Lower confidence interval	Upper confidence interval	Percent	Lower confidence interval	Upper confidence interval	Percent	Lower confidence interval	Upper confidence interval
Often/always	7.5%	5.83%	9.69%	4.9%	2.85%	8.15%	4.0%	2.48%	6.26%	2.9%	1.93%	4.22%
Some of the time	14.1%	11.65%	16.91%	15.9%	11.73%	21.20%	15.0%	11.35%	19.60%	17.0%	14.35%	19.91%
Occasionally	19.7%	16.75%	23.11%	23.3%	18.26%	29.19%	17.7%	14.04%	22.09%	23.2%	20.13%	26.62%
Hardly ever	24.4%	20.99%	28.12%	24.9%	19.69%	31.02%	32.1%	26.70%	37.93%	29.1%	25.83%	32.62%
Never	34.3%	30.44%	38.31%	31.0%	25.13%	37.63%	31.3%	26.09%	36.95%	27.9%	24.62%	31.36%

Note: percentage figures rounded to 1 decimal place; confidence intervals to 2 decimal places

Table C2: Data behind figure C4

2016-17 (online responses)			2016-17 (postal responses)		
16-24			**16-24**		
Percentage	Lower confidence interval	Upper confidence interval	Percentage	Lower confidence interval	Upper confidence interval
10.6%	8.22%	13.46%	3.8%	1.52%	9.14%
22.6%	19.26%	26.24%	24.5%	16.67%	34.56%
27.7%	24.26%	31.49%	19.1%	12.87%	27.47%
28.8%	25.13%	32.81%	27.1%	18.69%	37.59%
10.3%	7.92%	13.39%	25.4%	16.59%	36.89%
25-34			**25-34**		
Percentage	Lower confidence interval	Upper confidence interval	Percentage	Lower confidence interval	Upper confidence interval
5.9%	4.57%	7.61%	6.61%	4.03%	10.7%
18.2%	15.75%	20.99%	18.11%	13.19%	24.4%
28.9%	25.75%	32.17%	22.16%	17.14%	28.2%
31.4%	28.16%	34.85%	23.00%	17.68%	29.3%
15.6%	13.07%	18.52%	30.12%	23.81%	37.3%
35-44			**35-44**		
Percentage	Lower confidence interval	Upper confidence interval	Percentage	Lower confidence interval	Upper confidence interval
4.6%	3.50%	5.93%	6.25%	4.01%	9.6%
11.8%	9.99%	13.91%	15.92%	11.71%	21.3%
24.5%	21.79%	27.46%	22.19%	17.44%	27.8%
35.3%	32.13%	38.69%	30.33%	24.75%	36.5%
23.8%	20.83%	27.00%	25.32%	20.22%	31.2%
45-54			**45-54**		
Percentage	Lower confidence interval	Upper confidence interval	Percentage	Lower confidence interval	Upper confidence interval
4.5%	3.34%	6.01%	5.35%	3.27%	8.7%
13.7%	11.68%	15.91%	21.44%	16.90%	26.8%
23.0%	20.27%	25.98%	22.73%	18.08%	28.2%
36.1%	32.89%	39.48%	27.48%	22.32%	33.3%
22.7%	19.98%	25.74%	22.99%	18.20%	28.6%

Table C2: Data behind figure C4 (continued)

55-64				55-64		
Percentage	Lower confidence interval	Upper confidence interval		Percentage	Lower confidence interval	Upper confidence interval
4.8%	3.53%	6.42%		7.02%	4.46%	10.9%
15.7%	13.28%	18.49%		16.80%	13.19%	21.2%
23.9%	21.03%	27.11%		23.51%	19.16%	28.5%
31.8%	28.70%	35.16%		26.24%	21.26%	31.9%
23.7%	20.82%	26.93%		26.42%	21.31%	32.3%

65-74				65-74		
Percentage	Lower confidence interval	Upper confidence interval		Percentage	Lower confidence interval	Upper confidence interval
2.6%	1.67%	4.11%		4.68%	3.10%	7.0%
9.8%	8.03%	12.01%		14.51%	11.15%	18.7%
20.6%	17.90%	23.56%		25.00%	20.86%	29.7%
35.0%	31.73%	38.43%		23.08%	19.02%	27.7%
31.9%	28.71%	35.36%		32.74%	28.00%	37.9%

75+				75+		
Percentage	Lower confidence interval	Upper confidence interval		Percentage	Lower confidence interval	Upper confidence interval
2.6%	1.45%	4.62%		3.14%	1.83%	5.3%
14.9%	11.56%	19.02%		19.14%	15.34%	23.6%
21.7%	17.58%	26.49%		24.84%	20.42%	29.9%
32.1%	27.35%	37.22%		25.91%	21.57%	30.8%
28.7%	24.14%	33.72%		26.98%	22.51%	32.0%

Note: percentage figures rounded to 1 decimal place; confidence intervals to 2 decimal places

Part D: Measuring Loneliness – Single-Item Question vs Indirect Scale

The English Longitudinal Study of Ageing (ELSA) survey estimates the prevalence of loneliness amongst people aged 50 and over living in private households in England using two measures: a single-item direct loneliness question which includes the word "lonely" and an indirect scale measure of loneliness which does not include this word.

The subjective nature of loneliness lends itself to the preference that people define what loneliness is for themselves when responding, and not for the question(s) to predefine what is meant by loneliness. For this reason, some researchers prefer to use the single-item loneliness scale to measure the prevalence of loneliness rather than scales that are intended to measure loneliness indirectly. Others, however, prefer to use a scale because it is felt that some people will not recognise or be uncomfortable explicitly stating that they are lonely.

The single-item direct loneliness question asked in ELSA is "*How often do you feel lonely?*" with the three responses "*Hardly ever or never*", "*Some of the time*" or "*Often*".

The indirect scale measure of loneliness asked in ELSA is the 3-item UCLA loneliness scale. This consists of the three questions:

"How often do you feel you lack companionship?"

"How often do you feel left out?"

"How often do you feel isolated from others?"

For each question there are the three responses: "Hardly ever or never", "Some of the time" or "Often". As a scale the responses to all three questions are summed together providing a composite score between 3 and 9, based on a response of "Hardly ever or never" equating to 1, "Some of the time" equating to 2 and "Often" equating to 3.

There are no established guidelines for interpreting the composite score of the 3-item UCLA loneliness scale. We believe that having thresholds for the composite score which are indicative of being *hardly ever or never lonely*, *lonely some of the time* and *often lonely* is most instructive. We define these thresholds as:

- Hardly ever or never lonely is a composite score of 3 or 4
- Lonely some of the time is a composite score of 5, 6 or 7

- Often lonely is a composite score of 8 or 9

These thresholds mean that people with a composite score of 8 or 9 either respond *often lonely* to all three questions or *often lonely* to two questions and *lonely some of the time* to one question – i.e. the majority of their responses is *often lonely.* Similarly people with a composite score of 3 or 4 either respond *hardly ever or never lonely* to all three questions or *hardly ever or never lonely* to two questions and *lonely some of the time* to one question – i.e. the majority of their responses is *hardly ever or never lonely.* The middle composite scores are therefore by default equated to being *lonely some of the time*.

Single-item direct loneliness question vs 3-item UCLA loneliness scale:

Table D1 shows a cross-tabulation of responses to the single-item direct loneliness question to the composite score of the UCLA 3-item loneliness scale, for people aged 50 and over in England completing Wave 7 of ELSA[6]. The table shows that of those who responded that they were:

- *hardly ever or never lonely* to the single-item direct loneliness question, 89.6% were classified as *hardly ever or never lonely,* 10.3% classified as *lonely some of the time* and 0.1% classified as *often lonely* using their responses to the 3-item UCLA loneliness scales

- *lonely some of the time* to the single-item direct loneliness question, 67.9% were classified as *lonely some of the time*, 29% classifies as *hardly ever or never lonely* and 3.1% classified as *often lonely* using their responses to the 3-item UCLA loneliness scales

- *often lonely* to the single-item direct loneliness question, 46.5% were classified as *often lonely*, 3.4% classified as *hardly ever or never lonely*, and 50.1% classified as *lonely some of the time* using their responses to the 3-item UCLA loneliness scales

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[6] Wave 7 has been chosen for consistency with the data used for the regression analysis. Using Wave 8 of ELSA leads to the same conclusions.

Table D1: Cross-tabulation of responses to single-item direct loneliness question to composite score of responses to 3-item UCLA loneliness scale

	How often do you lonely (3-item UCLA loneliness scale):		
	Hardly Ever or Never	Some of the time	Often
How often respondents feels lonely (single-item direct loneliness question):			
Hardly Ever or Never	89.6%	10.3%	0.1%
Some of the time	29.0%	67.9%	3.1%
Often	3.4%	50.1%	46.5%

Table D2 shows a cross-tabulation of responses to the composite score of the UCLA 3-item loneliness scale to the single-item direct loneliness question, for people aged 50 and over in England completing Wave 7 of ELSA[7]. The table shows that of those whose composite score from responses to the 3-item UCLA loneliness scale were classified as:

- *hardly ever or never lonely*, 90.4% responded as being *hardly ever or never lonely,* 9.3% *responded* as being *lonely some of the time* and 0.3% responded as being *often lonely* using their responses to the single-item direct loneliness scale

- *lonely some of the time*, 60.7% responded as being *lonely some of the time*, 28.8% responded as being *hardly ever or never lonely* and 10.6% responded as being *often lonely* using their responses to the single-item direct loneliness scale

- *often lonely*, 75.8% responded as being *lonely often*, 2.7% responded as being *hardly ever or never lonely* and 21.5% responded as being *lonely some of the time* using their responses to the single-item direct loneliness scale

Table D2: Cross-tabulation of composite score of responses to 3-item UCLA loneliness scale to single-item direct loneliness question

	How often do you lonely (single-item direct loneliness question):		
	Hardly Ever or Never	Some of the time	Often
How often do you lonely (3-item UCLA loneliness scale):			
Hardly Ever or Never	90.4%	9.3%	0.3%
Some of the time	28.8%	60.7%	10.6%
Often	2.7%	21.5%	75.8%

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[7] Wave 7 has been chosen for consistency with the data used for the regression analysis. Using Wave 8 of ELSA leads to the same conclusions.

This analysis shows that neither a single-item direct loneliness question nor an indirect measure of loneliness fully captures the prevalence of loneliness. For example, with only 47% of people who respond to being *often lonely* to the single-item loneliness question also categorised as *often lonely* when responding to the 3-item UCLA loneliness scale, more than half of those who are *often* lonely are not captured by an indirect scale measure of loneliness. Similarly with 76% of people categorised as being *often lonely* in their response to the 3-item UCLA loneliness scale also responding as being *often lonely* to the single-item direct loneliness question, 1 in 4 people who are *often* lonely are not captured by a direct measure of loneliness.

These findings extend to cross-tabulation with and by the individual questions that make up the 3-item UCLA scale, as shown by table D3 and D4. This indicates people feel lonely for other reasons than lack of companionship, feeling left out and isolated, and that these experiences do not necessary mean someone is lonely. This suggests that a single-item direct loneliness question or an indirect measure of loneliness, on they own, will underestimate the prevalence of loneliness.

Table D3: Cross-tabulation of responses to single-item direct loneliness question to each question of the 3-item UCLA loneliness scale

	How often do you lack companionship:		
	Hardly Ever or Never	Some of the time	Often
How often respondents feels lonely (single-item direct loneliness question):			
Hardly Ever or Never	88.1%	11.5%	0.3%
Some of the time	21.6%	71.2%	7.2%
Often	4.2%	34.1%	61.8%

	How often do you feel left out:		
	Hardly Ever or Never	Some of the time	Often
How often respondents feels lonely (single-item direct loneliness question):			
Hardly Ever or Never	84.2%	15.4%	0.4%
Some of the time	34.0%	60.7%	5.3%
Often	9.0%	47.6%	43.4%

	How often do you feel isolated:		
	Hardly Ever or Never	Some of the time	Often
How often respondents feels lonely (single-item direct loneliness question):			
Hardly Ever or Never	88.4%	11.1%	0.5%
Some of the time	38.9%	56.1%	5.0%
Often	8.1%	43.0%	48.8%

Table D4: Cross-tabulation of responses each question of the 3-item UCLA loneliness scale to single-item direct loneliness question

	How often respondents feels lonely (single-item direct loneliness question):		
	Hardly Ever or Never	Some of the time	Often
How often do you lack companionship (part of 3-item UCLA loneliness scale):			
Hardly Ever or Never	92.4%	7.3%	0.3%
Some of the time	31.0%	61.9%	7.1%
Often	4.3%	31.1%	64.6%

	How often respondents feels lonely (single-item direct loneliness question):		
	Hardly Ever or Never	Some of the time	Often
How often do you feel left out (part of 3-item UCLA loneliness scale):			
Hardly Ever or Never	87.9%	11.4%	0.7%
Some of the time	40.0%	50.6%	9.4%
Often	7.3%	31.6%	61.1%

	How often respondents feels lonely (single-item direct loneliness question):		
	Hardly Ever or Never	Some of the time	Often
How often do you feel isolated (part of 3-item UCLA loneliness scale):			
Hardly Ever or Never	87.1%	12.3%	0.6%
Some of the time	34.3%	55.5%	10.3%
Often	9.1%	27.1%	63.8%