Department for Transport

Ipsos

Quantifying the relationship between loneliness and transport

October 2023

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Executive Summary

Ipsos was commissioned by the Department for Transport (DfT) to conduct a programme of research to investigate the relationships between loneliness, social connections, access to and use of transport. Phase 1 involved a basic quantitative survey and in-depth qualitative research. Phase 2 made use of a more extensive survey and statistical analysis techniques.

Loneliness was measured by the Phase 2 survey using the approach recommended by the Office for National Statistics (ONS). 'Direct' loneliness was based on a single, direct question to respondents while 'indirect' loneliness - the focus of this report - was derived from three questions measuring social connectedness, relational connectedness, and self-perceived isolation.

Loneliness was understood by participants in Phase 1 to be centred around the 'quality' and 'quantity' of social connections. The Phase 2 survey and statistical analysis showed that younger people were more likely to be 'indirectly' lonely, as were those with health conditions, those who live alone, those in social housing and with educational attainment at GCSE level or lower.

Although these groups were more likely to be lonely, this is best considered as a propensity towards loneliness rather than a definitive causal link. The logistic regression model showed that loneliness was heavily dependent on individuals' specific circumstances.

Many factors tend towards loneliness and the intersection of these is important. For example, those with a health condition that impacted their daily activities a little, were less likely to be lonely if they used public transport. However, those with health conditions that impacted their daily activities a lot were as likely to be lonely regardless of whether they used public transport. However, this latter group was the exception to the rule - most of those who were lonely were not experiencing-transport related loneliness.

This suggests natural limits to transport's capacity to influence loneliness but also the potential value in improving its accessibility for people experiencing difficulties. While not a top-of-mind solution to loneliness, transport was seen by people as playing an important enabling role; participants were clear that not having access to convenient transport would significantly impair social lives and connectedness.

Further research, using the Phase 2 survey dataset and other sources, is required to explore the specific needs of different groups of people - users and non-users of public transport - and the barriers they face to using the transport network. This will help to investigate the most important dimensions of accessibility, to identify the scope to improve services, to motivate and facilitate use. Such evidence will support efforts to boost inclusivity and enhance the experience of those travelling in England but will be insufficient on their own to tackle cultural and socio-economic causes of loneliness.

Background and methodology

Background

Ipsos was commissioned by Department for Transport (DfT) to conduct a programme of research to investigate the relationships between loneliness, social connections, and access to and use of transport. Phase 1 involved a short quantitative survey to capture the incidence of people who self-identify as lonely as a precursor to in-depth qualitative research. Phase 2 made use of a more extensive survey and statistical analytical techniques.

The overall aim was to develop an evidence base about the relationship between loneliness and transport and the potential role for transport as a way of tackling loneliness. This study will complement and supplement findings from the evaluation of DfT's Tackling Loneliness with Transport Fund which also aims to develop the evidence base for how transport could help to alleviate loneliness.

DfT's fund offers grant funding to the public and charity sectors to pilot transport related schemes that aim to reduce loneliness. The pilots will be measured and evaluated, enabling DfT to understand more about how transport can be used to help reduce loneliness. DfT will share findings with organisations within and outside government encouraging local authorities, third sector organisations and charities to consider the role of transport in tackling loneliness.[1]

Loneliness refers to social loneliness, emotional loneliness, and existential loneliness. It is different to both social exclusion and isolation and has been linked to poor physical and mental health. Feeling lonely most or all of the time, can have serious impact on wellbeing.[2]

In 2022, Transport for the North published research which estimated that 3.3 million people in the North of England live in areas where there is a risk of social exclusion which they defined as "being unable to access opportunities, key services and community life…." as a result of limitations in transport. Transport-related social exclusion was found to disproportionately affect people with disabilities and long-term health conditions, and to occur in areas with high car-dependency".[3] However, whilst there is evidence surrounding social exclusion, there is a lack of evidence regarding the relationship between transport and loneliness.

According to previous desk research for DfT, "Transport policies can play an integral role in addressing health and wellbeing disparities…[they] cannot, however, effectively address these disparities in isolation".[4] Another study for DfT showed that "Transport access plays a minor role

[1] https://www.gov.uk/government/publications/tackling-loneliness-with-transport-fund
[2] https://whatworkswellbeing.org/category/loneliness/
[3] https://transportforthenorth.com/reports/transport-related-social-exclusion-in-the-north-of-england/
[4] https://www.gov.uk/government/publications/transport-health-and-wellbeing

for the measures of personal wellbeing…"[5] These studies were both undertaken before the COVID-19 pandemic; the programme of research described in this report was conducted during 2021-23.

Measuring loneliness

Loneliness was measured in both Phase 1 and Phase 2 using the recommended approach by the Office for National Statistics (ONS),[6] which is comprised of four questions, shown in Table 1. The first three questions are derived from the University of California, Los Angeles (UCLA) three-item loneliness scale. This measures loneliness as a multi-dimensional concept (social connectedness, relational connectedness, and self-perceived isolation), with higher scores on the scale indicating higher levels of loneliness. The fourth question was a direct question about how often the participant feels lonely. All four questions were included in the survey, supplemented by further questions about more general wellbeing.

For almost all the commentary about loneliness in this Phase 2 report, the 'indirect' measure of loneliness (based on summing the three UCLA loneliness scale questions) rather than the 'direct' measure of loneliness was used. This was done because people do not always self-identify as lonely but also because use of the 'indirect' measure allowed the use a larger sample size thereby improving the statistical models that could be built.

Table 1: Measures of loneliness

Measures	Items	Response categories
The three-item UCLA Loneliness scale – 1	How often do you feel that you lack companionship?	Hardly ever or never, Some of the time, Often
The three-item UCLA Loneliness scale – 2	How often do you feel left out?	Hardly ever or never, Some of the time, Often
The three-item UCLA Loneliness scale – 3	How often do you feel isolated from others?	Hardly ever or never, Some of the time, Often
The 'direct' measure of Loneliness	How often do you feel lonely?	Often/always, Some of the time, Occasionally, Hardly ever, Never

Tables 2, 3 and 4 below list a selection of sub-groups of interest based on past research exploring loneliness and particular challenges accessing transport as well as the project's research objectives. It provides their definition and the achieved base size for each (further information about achieved sample sizes is included in the Appendices).

Respondents were given the option to skip questions if they did not want to answer. Those respondents whose indirect loneliness score was between 1-2 due to skipping questions were recoded as ‘prefer not to say’.

[5] https://www.gov.uk/government/publications/access-to-transport-and-life-opportunities

[6] https://www.ons.gov.uk/peoplepopulationandcommunity/wellbeing/methodologies/measuringlonelinessguidanceforuseofthenationalindicatorsonsurveys#recommended-measures-for-adults

Table 2: Key groups - loneliness, definitions and base sizes

Group	Definitions	Base size (unweighted)
'Direct' lonely	All those who self-identified as lonely (often / always lonely)	187
'Indirect' lonely - High	Those who scored 8 to 9 in the UCLA loneliness scale of 'indirect' loneliness	245
'Indirect' lonely - Medium	Those who scored 5 to 7 in the UCLA loneliness scale of 'indirect' loneliness	1,093
'Indirect' lonely - Low	Those who scored 3 to 4 in the UCLA loneliness scale of 'indirect' loneliness	1,694

Table 3: Key groups - disability, definitions and base sizes

Group	Definitions	Base size (unweighted)
Mental health condition	Anyone who said they had a mental health condition lasting 12 months or more	240
Physical condition	Anyone who said they had any of the following conditions: vision, hearing, mobility, dexterity, stamina or breathing or fatigue	581
Neurological condition	Anyone who said they had any of the following conditions: learning or understanding or concentrating, memory or socially or behaviourally.	149

Table 4: Key groups - transport use, definitions and base sizes

Group	Definitions	Base size (unweighted)
Public transport user	All who have used a form of public transport (bus, coach, train, tram and underground rail/metro) in the previous four weeks	1,745
Non-public transport user	All who have not used public transport (bus, coach, train, tram and underground rail/metro) in the previous four weeks	1,338

Phase 1 research

In 2021, Ipsos conducted a nationally representative quantitative survey among 1,897 participants across England. It was conducted via the online Ipsos i:omnibus panel between 19th and 23rd November. In addition to demographic and classification questions, eight specific questions covered the following topics:

1. Loneliness and social contact
2. Travel patterns and modes

3. Attitudes towards travel

The findings from the survey informed the design of sampling for qualitative research which involved the recruitment of 20 participants. Recruitment targeted those who self-identified as being lonely (referred to as 'directly lonely' in this report) and in accordance with a mix of other key demographics. The objective was to ensure participants reflected the range and diversity of the different types of people who experience loneliness.

Initial telephone interviews of 30-45 minutes were conducted in December 2021 to establish participants' circumstances and captured relevant background. They were asked to keep a two-week online diary during January 2022 using an app - Ipsos AppLife. Research tasks were used to capture the perceived impact transport had on participants' lives - on their health, social connections, work, and wellbeing. Participants took part in one-hour interviews during February and March 2022. Ipsos researchers used diary responses as stimulus for a more detailed discussion exploring feelings about loneliness, transport, and travel, and the interaction of these.

Using the insights generated by the Phase 1 research and previous research, DfT developed the following hypothesis to be tested further in Phase 2: “Transport will help people who are lonely, or at risk of feeling lonely, by undertaking or allowing them to undertake activities that increase opportunities for social connections and interactions. As a result, their feelings of loneliness will reduce in the longer term.”

There were several associated research questions requiring further investigation:

1. What are the characteristics of those who are identified as lonely (referred to as the 'indirectly lonely' throughout this report) and those who do not feel lonely, and do they have higher or lower propensities to travel?

2. Which barriers (identified in Phase 1) are more or less prevalent among different groups and geographies?

3. What is the nature and strength of the relationship between those who are 'indirectly lonely' (and those who are not) with social connections and wellbeing measurements alongside socio-demographic and other characteristics?

Phase 2 research

Phase 2 required a more robust and inclusive methodology for quantifying loneliness and its association with transport because the Phase 1 survey used a short questionnaire with sampling confined to online panellists aged 75 or younger.

For Phase 2, data collection was conducted via the Ipsos KnowledgePanel, a random probability survey panel which recruits panellists who are offline as well as online. KnowledgePanel does not use a quota approach; instead, a sample of invited panellists is stratified (divided into groups based on specific characteristics) to correct for biases, for example the propensity for some sub-groups to be less likely to respond to the survey than others, and to ensure it is representative of the different sub-groups.

A total of 5,455 panellists aged 16+ and living in England were selected and invited to take part in the 20-minute survey. Of these, 3,097 respondents completed the survey during 2-8 March 2023, a response rate of 57%. Further information about the achieved sample profile can be found in the Appendices.

The dataset generated by the survey allowed use of sophisticated analytical techniques to investigate the key demographic and attitudinal factors associated with loneliness. It did this by constructing four statistical models (detailed in the Appendices).

These allowed us to consider several variables and their influence on loneliness. While they could not tell us about direct causality (i.e., what variables/factors were a cause of loneliness), they provided a powerful method for understanding the impact of different factors on loneliness.

Interpretation of findings

Findings from survey research might not sum to 100% due to computer rounding. This is also the reason why combinations may not match the sum of constituent percentages, e.g., the percentage 'agree' matching the percentage who 'strongly agree' and 'tend to agree'.

Results are subject to some unmeasurable biases including recall bias which occurs when participants do not remember previous events or experiences accurately or omit details, as well as associated factors like social desirability bias (e.g., when reporting non-compliant driving behaviours) where people will respond in the way they think they ought to. The survey measures perceptions whether they accord with reality or not.

The qualitative data from Phase 1 presented in this report is intended to demonstrate the range and diversity of the views and experiences of the participants recruited, and not to be a statistically representative sample of the wider population. Qualitative research is illustrative, detailed, and exploratory. It offers insight into the perceptions, feelings, and behaviours of people. Evidence in this report is based on participants' perceptions. Throughout, the report refers to participants and provides supporting evidence through verbatim comments, which have not been directly attributed to protect anonymity.

Report structure

The remainder of this report covers the following:

1. Loneliness - what is it, who is lonely and why?
2. Transport and loneliness - how are they related?
3. Conclusions - what next?
4. Appendices

A summary of the key findings is included at the beginning of each chapter. These also feature in the Executive Summary.

Loneliness - what is it, who is lonely and why?

This chapter uses insights generated by the Phase 1 qualitative research to describe people's perceptions of the nature and causes of loneliness, as well as Phase 2 survey findings to further explore the incidence of 'indirect' loneliness among different population groups.

- Loneliness was understood by participants in the Phase 1 qualitative research to be centred around the **'quality' and 'quantity' of social connections.**
- It was strongly associated with older age groups, but the Phase 2 survey found these groups no more likely to be lonely than other age groups in either a 'direct' or 'indirect' way. Instead, **younger people were more likely to be lonely**, **as were those with health conditions, those who live alone, those in social housing, and those with educational attainment at GCSE level or lower.**
- This analysis underlines that **loneliness is dependent on individual and personal circumstances**. Although some socio-demographic groups were more likely to be lonely (either 'directly' or 'indirectly') than others, this is best considered as a propensity towards loneliness. **There are several factors that tend towards loneliness and the intersection of these is important.**

What is loneliness?

The qualitative research in Phase 1 highlighted mixed feelings about how best to describe and define loneliness. Common themes centred around the 'quality' and 'quantity' of social connections. **Participants grounded their conception and articulation of loneliness in their own experiences and perceptions**. **A core element of loneliness was thought to be an absence of good quality, deeper and meaningful social connections**. Participants thought it was entirely possible to feel 'lonely in a crowded room' if that room wasn't filled with people, they felt close to:

“Loneliness means not being able to be with or speak to people you are most connected to. I think we can still feel lonely even if we interact with other people, if we aren’t very close to these people.”

Female, 23, South East

For older participants, the absence of meaningful relationships often stemmed from the death of a loved one, from an adult child or children moving away, or health problems which could act as a barrier to social interaction. **There was an emphasis on the importance of the quality of social connections.** Participants mentioned a lack of day-to-day ‘human contact’ as a main driver behind feelings of loneliness. Some described their loneliness as being the lack of informal and spontaneous social interactions - including those within an office environment - which were removed due to COVID-19 restrictions present at the time of Phase 1 fieldwork. Feelings of loneliness were heightened when people felt that they were physically alone.

Participants who were the primary caregivers of young children also described their lack of adult interaction. This group mentioned that most of their time was spent on child-rearing which meant that they often missed out on social activities because of difficulties arranging childcare. Participants who were friends of primary caregivers also mentioned inadvertently ‘drifting away’ from friends with young children who they also felt they increasingly lacked things in common with.

"… it’s usually just me and my kids, their dad works a lot. So, I’m generally on my own. Watching TV, something funny might happen the kids don’t get it and I have no-one to turn to share the joke.”

Female, 34, London

Phase 1 research also found a perception amongst those taking part that loneliness was common in Britain. The country was perceived to be atypically insular because Britons considered it unusual to engage in conversation with strangers in public places. Reflecting a widely held view of older age groups being more vulnerable to loneliness, there was also a sense that elderly people were disregarded and ignored in Britain particularly in comparison to other cultures which had an established tradition of caring for older family members.

“When [my friends were] younger they travelled around Asia, Thailand and places like that, Bali, and they were saying they can really notice the stark contrast with how in the West we tend not to look after our parents too much. Not on the level that they do in Asia. There's a real commitment within the Asian communities.”

Male, 51, South West

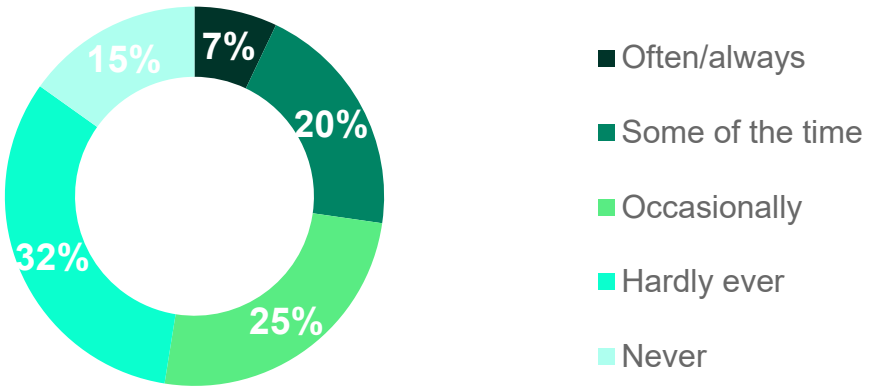
Who is lonely?

Because loneliness is subjective, identifying individuals who are lonely and assessing the extent of their loneliness relies on self-reporting among survey respondents. The Phase 2 survey measured loneliness using the approach recommended by the Office for National Statistics (ONS),

comprising four questions. The survey also included questions designed to capture the more general wellbeing of participants.

As shown in Figure 1A, **7% said that they feel lonely often/always** – directly lonely. When responding to the indirect questions about loneliness around two in five (44%) said that they lack companionship some of the time to often and just under half (48%) feel left out some of the time to often and feel isolated from others some of the time to often (48%).

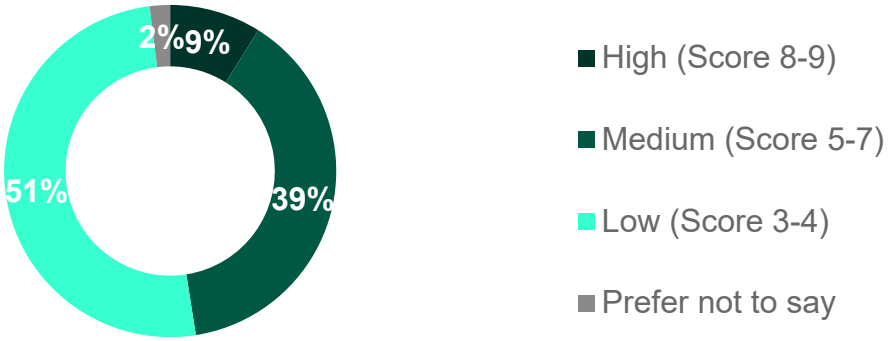
Figure 1A: 'Direct' loneliness



Source: Ipsos/DfT, 2 March – 8 March 2023; F6: How often do you feel lonely? Base: 3,097 adults in England.

There were differences in the number of people who were ‘directly’ lonely versus ‘indirectly lonely’. Figure 1B shows that there are more who are indirectly lonely compared to those who are often/ always lonely (9% vs 7%). Most people (51%) score ‘low’ in the indirect loneliness scale.

Figure 1B: ‘Indirect’ Loneliness



Source: Ipsos/DfT, 2 March – 8 March 2023; F3/F4/F5: How often do you feel that you lack companionship? How often do you feel left out? How often do you feel isolated from others? Base: 3,097 adults in England.

According to the most recent DCMS Community Life Survey which ran from October 2021 to September 2022, people aged 16-34 are more likely to say they feel lonely often/always - 'directly lonely' - than every other age group, and this pattern also applied to 'indirect' loneliness. This was also the case for respondents with a limiting long-term illness or disability compared to those with

no limiting long-term illness or disability.[7] Table 5 presents a disaggregation of 'direct' loneliness as measured by the DfT survey, presenting the incidence of each group feeling lonely (direct loneliness) at least sometimes and those feeling lonely often or always and significant differences.

Table 5: Key demographics and 'direct' loneliness – significant differences compared to overall population.

Demographic	% Feel lonely often / always (vs 7% among all adults)	% Net: that feel lonely sometimes to often / always (vs 27% among all adults)
Gender	8% of females	30% of females
Age	14% of 16-24-year-old females 12% of 35-44-year-old females	48% of 16-24-year-olds 34% of 25-35-year-olds
Region	11% in the East Midlands * no significant differences in urban / rural	34% in the West Midlands * no significant differences in urban / rural
Ethnicity	* no significant differences	35% of ethnic minorities (excluding White minorities)
Sexuality	14% of LGB+	45% of LGB+
Disability / health condition	10% of those with any disability / health condition 11% of those with physical disabilities 24% of those with mental disabilities 19% of those with neurological disabilities	35% of those with any disability / health condition 33% of those with physical disabilities 60% of those with mental disabilities 52% of those with neurological disabilities
Education	8% of non-graduates	29% of non-graduates
Tenure	16% of those who rent from a council or housing association	40% of those who rent from a council or housing association
Living Situation	11% of those who live alone	37% of those who live alone
Household income / IMD	9% of those in households earning under £26,000 per annum 9% in the most deprived quintile of areas[8]	34% in the most deprived quintile of areas

Source: Ipsos/DfT, 2 March – 8 March 2023; F6: How often do you feel lonely? Base: 3,097 adults in England.

There are some differences in profile between those who are 'indirectly' lonely and those who are 'directly' lonely (44% of those who are 'indirectly' lonely self-identify as 'directly' lonely). However, where there are differences - with some groups tending to be more or less lonely than others - it does not necessarily mean that the factors shown are important in explaining loneliness, something that is explored further in the section which follows.

Table 6 presents a disaggregation of 'indirect' loneliness as measured by the DfT survey, presenting the incidence of each group feeling high indirect loneliness and medium indirect loneliness.

[7] https://www.gov.uk/government/statistics/community-life-survey-202122/community-life-survey-202122-wellbeing-and-loneliness

[8] Analysis based on the Index of Multiple Deprivation (based on respondent postcode)

Table 6: Key demographics and 'indirect' loneliness – significant differences compared to overall.

Demographic	% 'indirect' loneliness high (vs 9% among all adults)	% 'indirect' loneliness medium (vs 39% among all adults)
Gender	No significant differences	41% of all females
Age	11% of 35-44-year-olds	59% of 16-24-year-olds
Region	12% in the West Midlands	40% of those from urban areas
Ethnicity	13% of ethnic minorities (excluding White minorities)	No significant differences
Sexuality	15% LGB+	49% LGB+
Disability / health condition / caring	14% of those with any disability / health condition 14% of those with physical disabilities 30% of those with mental disabilities 30% of those with neurological disabilities 13% of carers	44% of those with any disability / health condition 47% of those with mental disabilities 50% of those with neurological disabilities
Education	10% of non-graduates	No significant differences
Tenure	24% of those who rent from a council or housing association	45% rent from a private landlord
Living Situation	15% of those who live alone	48% of those who live alone
Household income / IMD	12% of those in households earning under £26,000 per annum 13% in the most deprived quintile of areas	43% of those in households earning under £26,000 per annum 44% in the most deprived quintile of areas

Source: Ipsos/DfT, 2 March – 8 March 2023; F6: How often do you feel lonely? Base: 3,097 adults in England.

What matters?

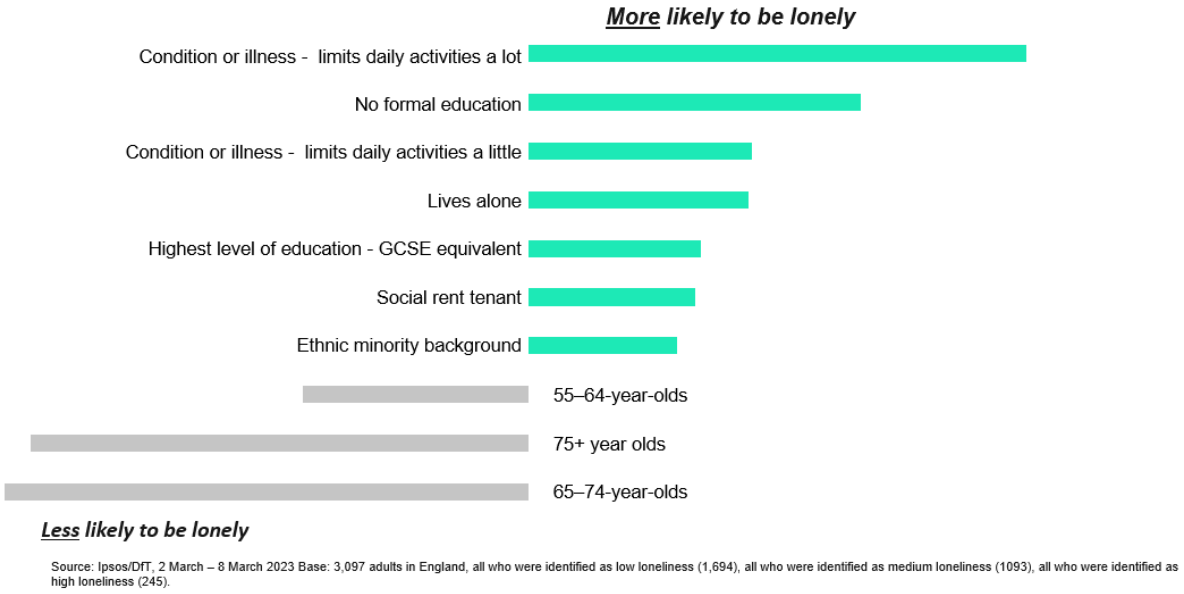
A statistical model (logistic regression) was used to explore the relationship between the various socio-demographic factors and 'indirect' loneliness.[9] Some of the socio-demographic characteristics are both associated with each other as well as with indirect loneliness, for example people in more rural areas were more likely to have a car in their household. The model shows how each characteristic affects indirect loneliness in isolation of other characteristics, i.e., over and above any relationship with indirect loneliness that is shared through other socio-demographic characteristics. The model allows us to understand, for example, the importance of age in isolation to gender on an individual's level of 'indirect loneliness'. Figure 2 shows the variables found to have a strong relationship with loneliness - that is the extent of loneliness experienced by people

[9] Ipsos/DfT used the 'indirect' measure of loneliness (based on summing the three UCLA loneliness scale questions) rather than the 'direct' measure of loneliness. This was done due to increase the base size (fewer self-identity as lonely) and therefore improve the statistical model.

was different according to a person's classification for the socio-demographic group characteristic. The chart does not include variables which the statistical model found were not significantly associated with 'indirect' loneliness including gender, having access to car(s) in household and region. Indirect loneliness was, on average, about the same[10] in each class of a group, e.g., males and females.

Disability, age and education had the strongest relationship with 'indirect' loneliness. Those who were older were less likely to be 'indirectly' lonely.[11] These findings complement previous research by the ONS, however ONS research found that caring responsibilities and gender had a significant relationship with loneliness. This could be due to the model using a binary variable (indirectly lonely vs not lonely).

Figure 2: Logistic regression model - 'indirect' loneliness by socio-demographic variables



Source: Ipsos/DfT, 2 March – 8 March 2023 Base: 3,097 adults in England, all who were identified as low loneliness (1,694), all who were identified as medium loneliness (1093), all who were identified as high loneliness (245).

Are there differences by age?

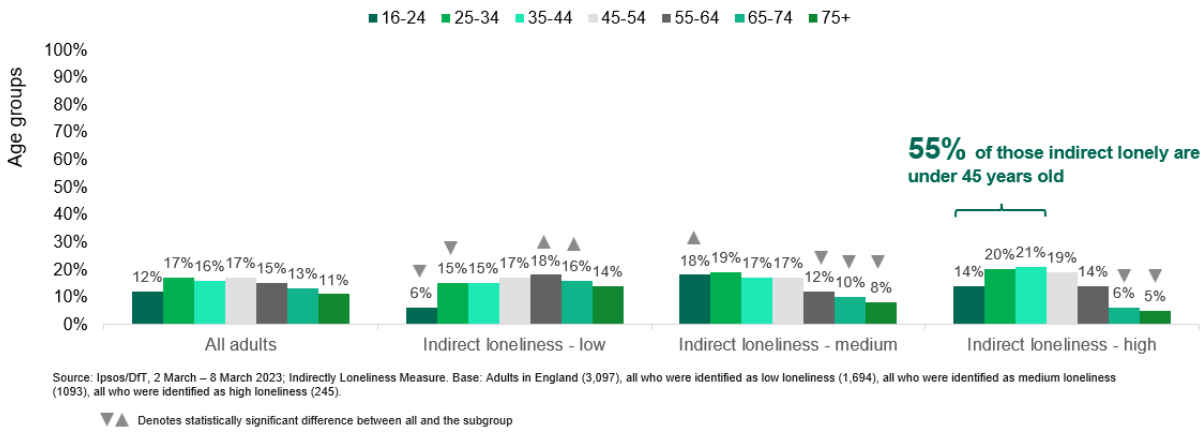
Phase 1's qualitative research found that older participants were more likely to lack meaningful relationships as this group were more likely to have experienced the death of a loved one or an adult child or children moving away. However, the **Phase 2 survey and statistical analysis indicated that younger groups rather than older ones were more likely to experience loneliness** when controlling for other variables.

Figure 3 shows the age profile of those who were 'indirectly' lonely. **More than half (55%) of the group with 'high' indirect loneliness were under the age of 45.**

[10] More technically, the difference in loneliness was not statistically significantly different between the classes of a characteristic.

[11] The ONS logistic model also showed that loneliness decreased with age and increased with disability. However, ONS found a couple of variables significant with loneliness - caring responsibilities increased loneliness and gender. See Section 4: https://www.ons.gov.uk/peoplepopulationandcommunity/wellbeing/articles/lonelinesswhatcharacteristicsandcircumstancesareassociatedwithfeelinglonely/2018-04-10.

Figure 3: 'Indirect' loneliness - by age



Younger people were more likely to be 'directly' lonely. Just over one in ten (12%) 16-24-year-olds were often/always lonely, a higher proportion compared to all adults (7%). One in ten (10%) of this youngest age group were 'indirectly' lonely. 16-24-year-olds were more likely to feel some loneliness - three in five (59%) were 'medium' on the loneliness scale - compared to three in ten (30%) of those aged over 55.

Those aged 65 or over were significantly less likely to be 'directly' lonely. Six in ten (60%) 65-74-year-olds reported feeling lonely hardly ever to never with almost a quarter (22%) of this group reporting that they never feel lonely (compared to 15% of all adults). A further quarter (23%) of 75+ year olds also reported never feeling lonely.

Those older than 55 also scored low on the 'indirect' measure of loneliness. More than six in ten (60%) of 55-65-year-olds and 63% of 65-74-year-olds scored just 3-4 on 'indirect' loneliness compared with just over half of all adults (51%). A similar proportion (65%) of those aged 75 or older also scored low.

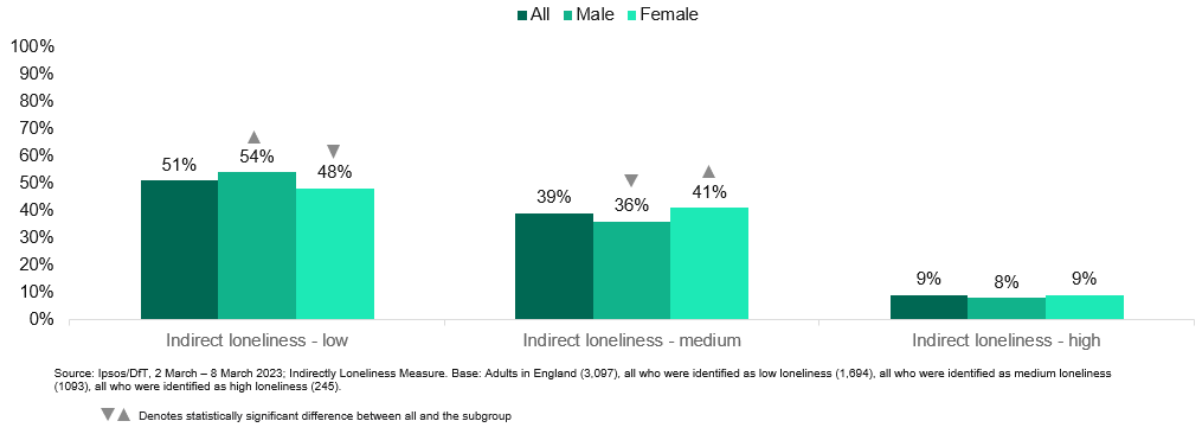
Around one in ten 65-74-year-olds (9%) and 75+ year-olds (11%) did not leave the home for 5-7 of the last seven days: higher than the 7% among all adults. Three in ten 65-74-year-olds (31%) and four in ten 75+ year-olds (39%) did not leave the house for 2-4 of the last seven days (vs 26% overall). Reflecting a much higher incidence of retirement, older age groups were also much less likely to have travelled to an office or workplace in the last seven days. A quarter (25%) of all adults travelled to work 5-7 days in the last seven days compared to 5% of 65-74-year-olds and 1% of those 75 and over.

While older groups largely lack the day-to-day interactions often provided by employment, they were more likely to speak to a neighbour or someone who lived nearby compared to younger age groups. However, younger age groups were more likely to speak with a family member or friend they don't live with by phone, online, or by social media. Just under half (47%) of those aged 65-74 did this on 5-7 of the previous seven days as did a similar proportion (48%) of 75+ year-olds, compared to 58% of 16-24-year-olds and 56% of 25-34-year-olds. Older people were more likely than all adults to take part in a hobby, pastime, or other interest involving other people, and to have done something as an unpaid volunteer.

Are there differences by gender?

Women were significantly more likely to self-identify as lonely in response to the 'direct' measure of loneliness. Three in ten women (30%) were 'directly' lonely sometimes to often/always compared to fewer than a quarter (24%) of men.

Figure 4: 'Indirect' loneliness by gender



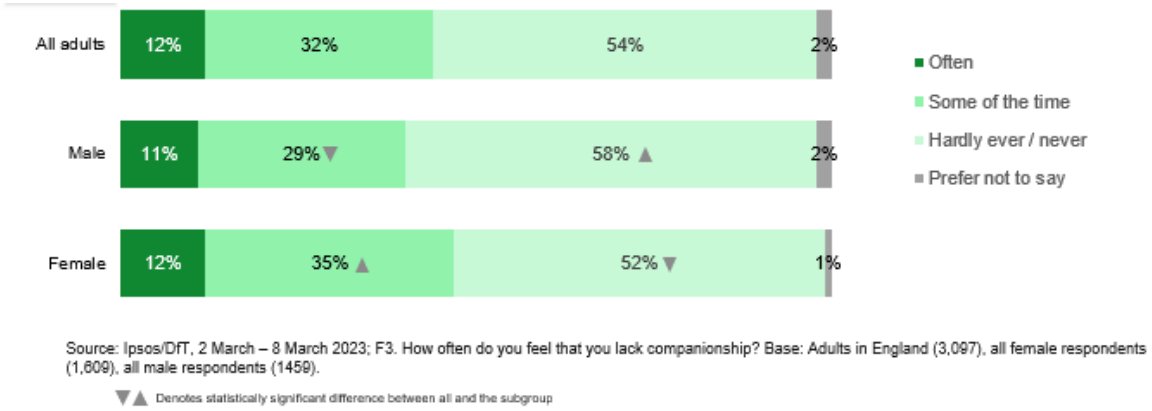
Men also scored lower on 'indirect' measures of loneliness - more than half (54%) rated 3-4 compared to just under half (48%) of women. Conversely, a higher proportion of women had a medium score of 5-7 than men - 41% compared to 36%. But there were no significant differences in men and women on scoring 'high' (8-9) in indirect loneliness (8% of men are indirectly lonely compared to 9% of women).

The statistical model showed that after controlling for other socio-demographic factors, women were no more likely to be 'indirectly' lonely than men. The model cannot, however, fully explain the intersection between socio-demographics, gender and loneliness and ONS research (2018) on loneliness found that women tend to be more 'directly' lonely than men.[12]

Women were, though, more likely than men to lack companionship, as shown in Figure 5. More than a third reported feeling that they lack companionship some of the time (35%) in comparison to just under three in ten men (29%). Women were also significantly more likely to report feeling isolated from others some of the time; just under four in ten (39%), in comparison with just over a third of men (34%).

[12]https://www.ons.gov.uk/peoplepopulationandcommunity/wellbeing/articles/lonelinesswhatcharacteristicsandcircumstancesareassociatedwithfeelinglonely/2018-04-10

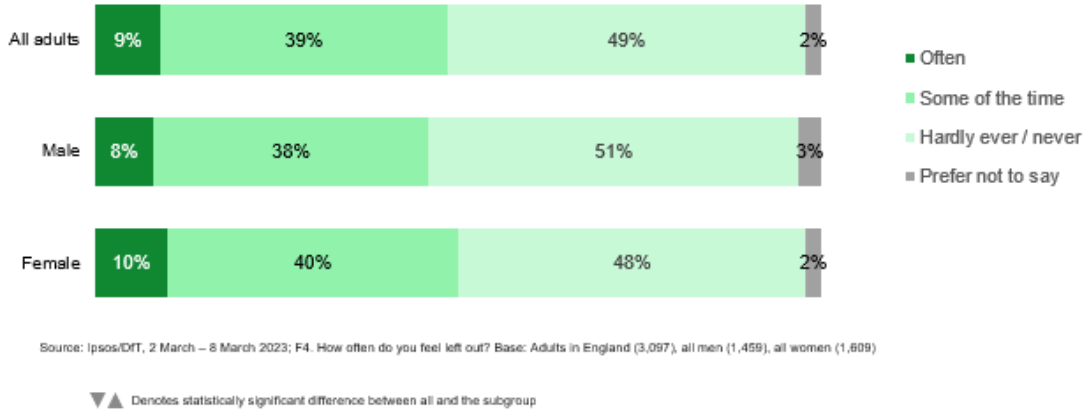
Figure 5: Lack of companionship - by gender



Source: Ipsos/DfT, 2 March – 8 March 2023; F3. How often do you feel that you lack companionship? Base: Adults in England (3,097), all female respondents (1,609), all male respondents (1459).

▼▲ Denotes statistically significant difference between all and the subgroup

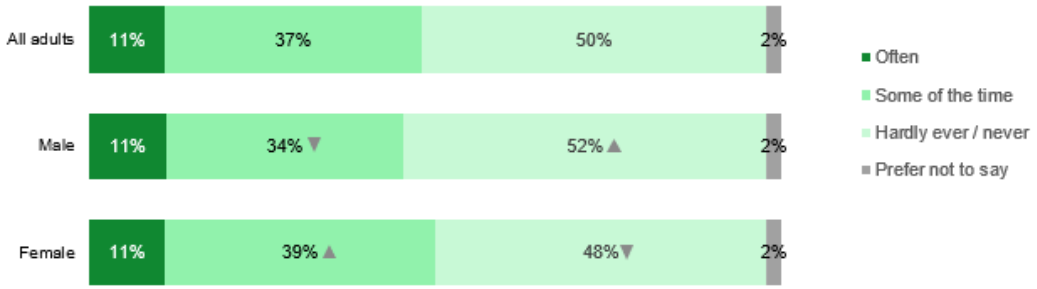
Figure 6: Feel left out – by gender



Source: Ipsos/DfT, 2 March – 8 March 2023; F4. How often do you feel left out? Base: Adults in England (3,097), all men (1,459), all women (1,609)

▼▲ Denotes statistically significant difference between all and the subgroup

Figure 7: Isolated from others – by gender



Source: Ipsos/DfT, 2 March – 8 March 2023; F5. How often do you feel isolated from others? Base: Adults in England (3,097), all men (1,459), all women (1,609)

▼▲ Denotes statistically significant difference between all and the subgroup

As with age, there were significant differences in travel behaviours between women and men. For example, three in ten men (29%) and two in ten women (21%) had travelled to a workplace or office 5-7 days in the past seven days. Women were also less likely to have travelled to or from somewhere in the evening after 6pm (30% of women had not travelled after 6pm compared to 21% of men).

The survey found women significantly more likely than men to say that they do not feel safe when travelling - for example, two-thirds of women (66%) report fearing harassment when travelling on public transport after dark compared to four in ten men (39%).

These findings align with those of the Phase 1 qualitative research which found how safety concerns were seen as barrier to participants' confidence in engaging in social interaction, particularly among women. Participants said that they felt fearful and on edge when walking alone or waiting at bus stops in the dark, especially in remote areas, and caused some avoidance of routes and forgoing of social activities at darker times of the day.

"As a female, it's often quite a worry if I do go out late, and usually find myself relying on others to drive me or taking taxis. Generally, I avoid staying out too late, or try to leave a bit earlier so I can make the last train. Sometimes this means having to leave as early as 10pm."

Female, 23, South East

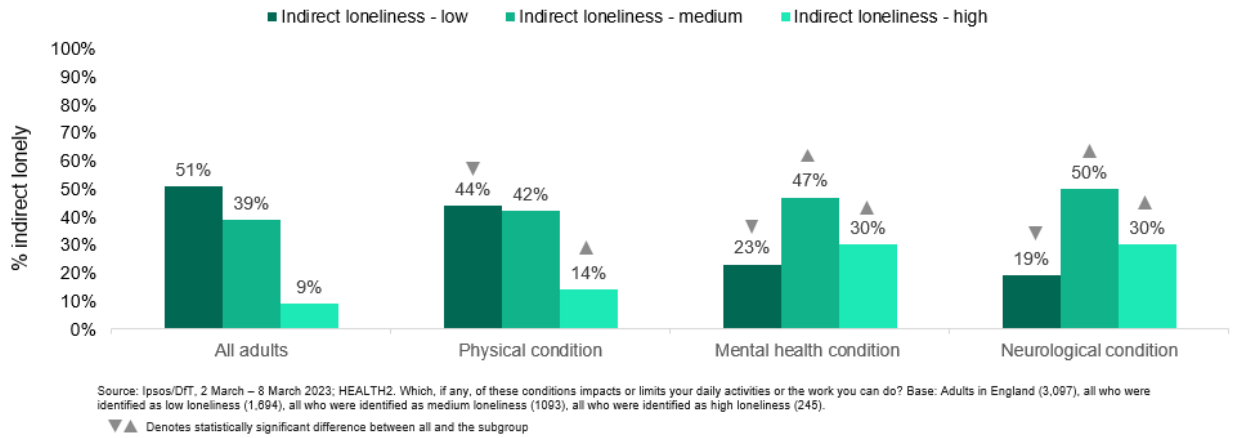
Are there differences according to health conditions?

The survey and the statistical model indicated that those with long-term health conditions or illnesses were at an increased risk of experiencing loneliness. More than a third (35%) of those with a health condition or illness reported feeling lonely ('direct' loneliness) at least sometimes compared with slightly more than around a quarter of all adults (27%).

Figure 8 shows how those with health conditions were more likely to be 'indirectly' lonely. It breaks down loneliness by type of condition but there are a range of conditions that are not covered due to small base and/or people giving 'other' as an option, and people can experience a broad range of health conditions or illnesses.

Those with physical health conditions were more likely to experience high levels of loneliness compared to adults as a whole, but those with mental health conditions and neurological conditions were even more likely to experience higher levels of loneliness (neurological conditions were defined as those related to as memory, learning/understanding or social or behavioural conditions). A high proportion of those with mental and neurological conditions felt they often lack companionship - 30% and 36% respectively compared to 12% of all adults. They were also more likely to feel that they are often left out and were isolated from others. **These patterns in 'indirect' loneliness were in stark contrast to those without health conditions as only a very small minority (6%) of this group were 'indirectly' lonely.**

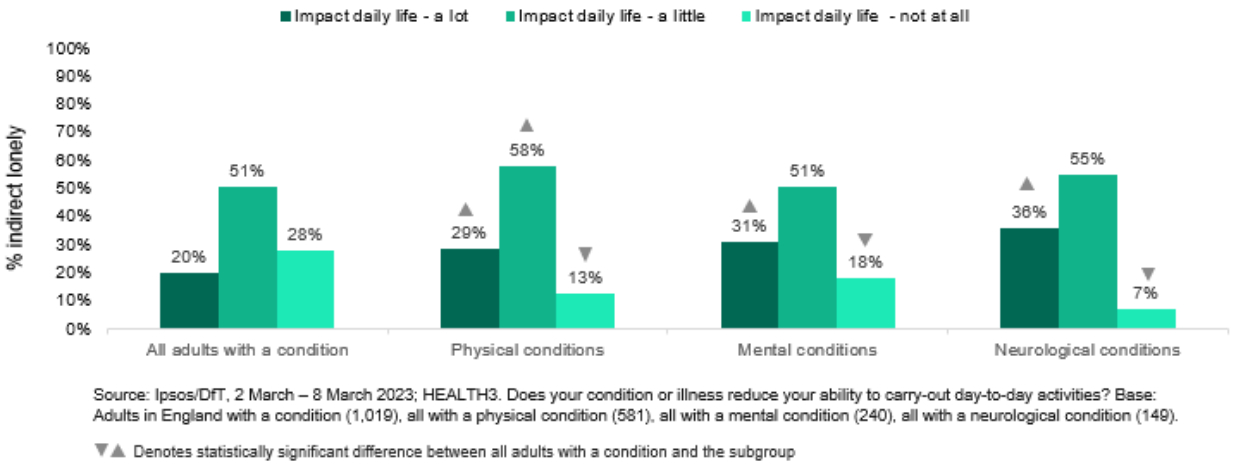
Figure 8: Loneliness - by type of condition



Those with conditions were significantly more likely than the overall population, and those without any disabilities, to have not left the house for 5-7 of the previous seven days. More than one in ten did not do so, including 15% of those with a physical condition, 13% of those with a mental condition and 18% of those with a neurological condition. This is in comparison to 7% of the overall population. A further one in three (34%) of those with a condition of any kind did not leave home for 2-4 days of the last seven compared to a quarter of all adults (26%).

The type of condition that people were experiencing was linked to the frequency of leaving the house. As depicted in figure 9, those with physical, mental, and neurological conditions were more likely to have a condition that impacts their daily life a lot/a little (although the survey did not explore the ways in which lives were impacted).

Figure 9: Conditions impact on daily life



The model showed that loneliness was heavily dependent on individuals' specific circumstances. Disability and long-term health conditions were strong factors and mattered regardless of age, having an equal influence in each age group. Those whose reported that their conditions limited their daily activities 'a lot' were much more likely to be indirectly lonely than those in good health or with less impactful conditions. **However, even having a condition which**

had 'a little' impact on daily activities was associated with increased loneliness.

What else matters?

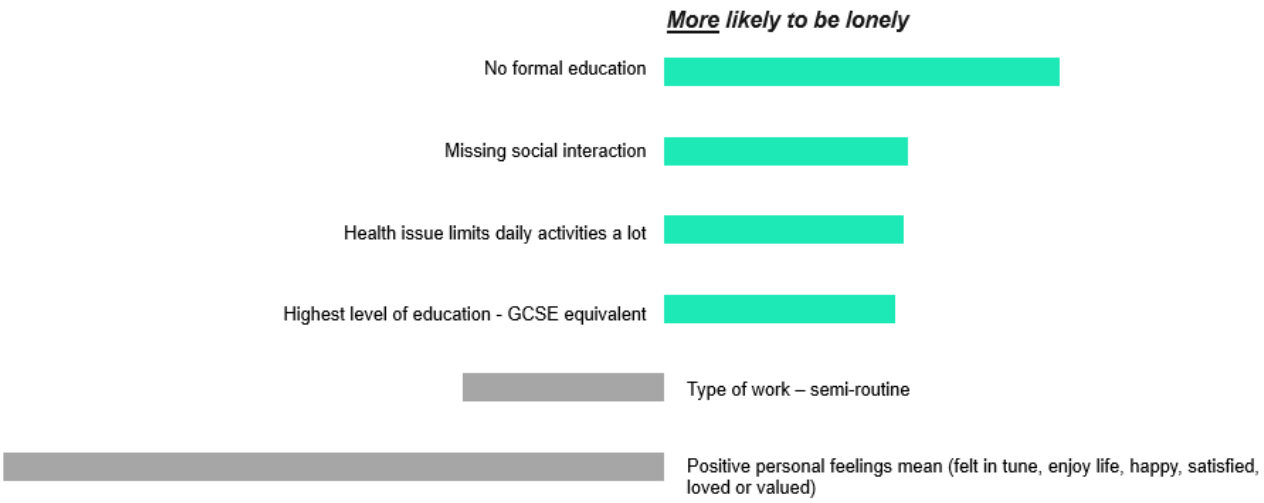
According to the statistical model, people who live alone are much more likely to be lonely. Almost a quarter (23%) of those who were 'indirectly' lonely lived alone. Older people were more likely to live alone than younger people; a quarter of those who live alone are aged 75 or over, just 6% are 16-24-year-olds. Younger people, though, comprise more than half (52%) of those who are not living as a couple, often living in shared, rental accommodation.

Those with caring responsibilities for individuals older than 16 also appeared to be at increased risk of loneliness. Although this group did not report 'direct' loneliness any more than adults overall, they were more likely to score highly on the 'indirect' measures. More than one in ten (13%) were indirectly lonely - compared to 9% overall. This was mainly due to a lack of companionship where more than one in ten (16%) of carers were often lacking in companionship compared to 12% overall.

Around one in ten carers did not leave the house for 5-7 of the previous seven days and were significantly less likely to have travelled to an office on any of the last seven days. The Phase 1 qualitative research also highlighted issues around primary caregivers of young children often missing out on social activities because of their responsibilities. This further underlines the different circumstances of caregivers as well as variation in the nature of loneliness.

Another version of the model was used to review the impact of attitudes towards life, wellbeing and the local area and their relationship with indirect loneliness. **Those who have felt that they miss social interactions in the last month were more likely to be lonely while those who enjoyed life or reported being happier were less likely to be lonely**, indicating a strong association between loneliness and wellbeing. As shown by its absence in Figure 10, attitudes towards the local area were not strongly associated with loneliness.

Figure 10: Loneliness - by attitudes towards life/local area



Source: Ipsos/DfT, 2 March – 8 March 2023 Base: 3,097 adults in England, all who were identified as low loneliness (1,694), all who were identified as medium loneliness (1093), all who were identified as high loneliness (245).

Summary of Chapter 1

- Loneliness is a **highly subjective** and **complex** concept that is influenced by a wide range of factors such as demographics and health.
- This chapter has highlighted some factors were more associated with feelings of loneliness than others, health conditions that impact daily life, age, level of education and housing tenure, it is difficult to identify causal links between these factors and loneliness.
- There was a strong link between loneliness and wellbeing – if people stated that they were happy then they were less likely to be lonely.

Transport and loneliness - how are they related?

The previous chapter considered how people perceived of the nature and the factors associated with loneliness and described variations in the incidence of 'indirect' loneliness. This chapter explores the relationship between loneliness and transport in more depth.

- Participants in the Phase 1 qualitative research considered social interactions to be key to alleviating loneliness. **Transport was seen as playing an enabling role in this, allowing people to achieve and maintain connectedness.**
- **People's individual socio-demographic circumstances including their age and their health condition had a stronger relationship with loneliness than use/non-use of public transport**. Mode use and the frequency of that use only had a weak association with loneliness.
- However, those who have a condition which impacts their daily activities a little and who did not use public transport in the previous four weeks were more likely to be 'indirectly' lonely than those who did use public transport. **This group could be experiencing transport-related loneliness.** Although it is unclear whether their needs are being insufficiently met which means they cannot travel, or their condition prevents them from travelling.
- Autonomy and having control over travel, whether by public or by private travel modes, was highly valued by participants. The statistical model showed that there was an association between having a drivers' licence, driving a car, and being less likely to be lonely.

How does transport fit in?

Transport was viewed by participants in the Phase 1 qualitative research as something valuable because it facilitated social contact. **However, the role of transport in alleviating loneliness**

was not something top-of-mind for people. They did, though, think that not having access to convenient transport would impair social lives and connectedness. Interaction with neighbours, colleagues, even strangers, were all made possible by transport which consequently played a role in mitigating the risk of loneliness:

> **"Not having access to reliable or regular transport would definitely separate me from friends and social activities, massively."**

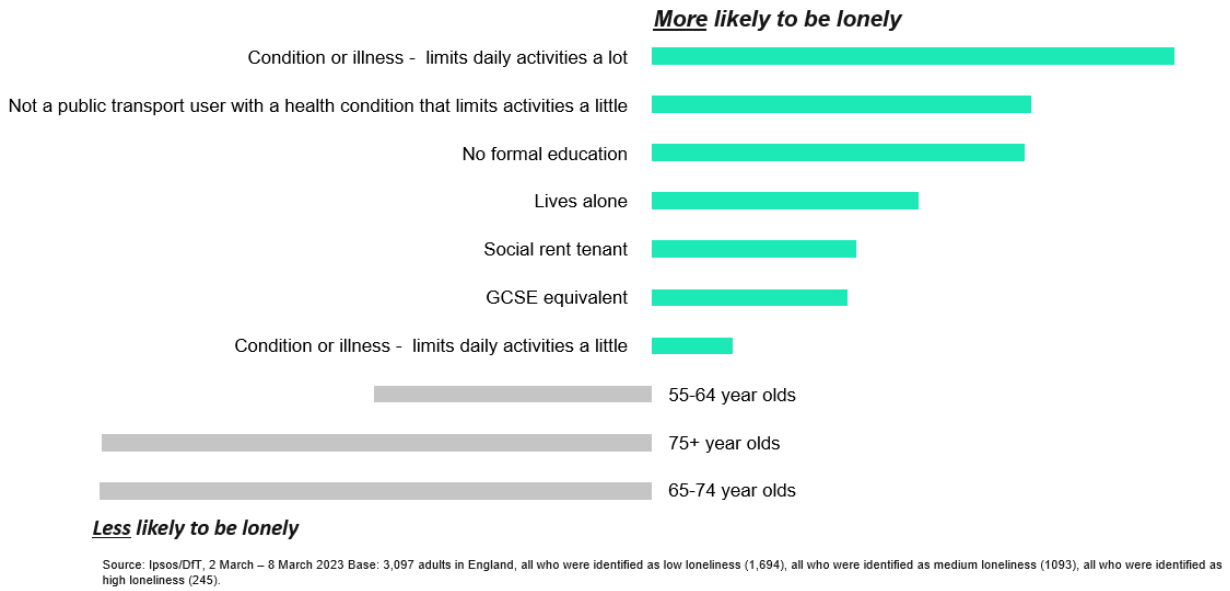
Male, 65, South East

Participants shared their thoughts about how transport and loneliness could be connected, drawing on their own personal experiences and circumstances. For example, participants who lived in urban areas valued living near public transport and mentioned that easy access was something they had considered prior to moving into their area. Those in rural areas relied heavily on cars and felt that it would be difficult to see friends and family without their own private mode of transport.

Statistical analysis investigated the relationship between public transport and loneliness, controlling for socio-demographic variables. As shown in Figure 11, people's individual circumstances and characteristics - for example, their age, educational attainment, and whether they live alone - had a stronger correlation with loneliness than their use of public transport. Older people were less likely than younger age groups to be lonely even after other socio-demographic characteristics were controlled for although it is not possible to rule out factors associated with being older being important, such as living alone and having no formal qualifications.

As well as underlining the influence of socio-demographic variables, the model established an important link between transport and loneliness, but this was confined to certain groups of individuals. For example, people with health conditions which did not affect their daily lives were just as likely to be lonely as those who did not have a condition. The model showed that transport was not an important reason in terms of whether or not this group felt lonely, but it was more influential for those whose health condition impact their day-to-day activities 'a little'. If individuals in this group did not use public transport, they were more likely to be lonely. Access to private transport such as owning a car did not have an impact on how lonely someone whose health conditions impacted their day-to-day activities a little. Having a driver's licence was influential for those who had health conditions which limited their day-to-day activities a little. Suggesting it is not access to a car but rather the ability to drive it (or use other forms of transport) which reduces loneliness. For more information on this model please see the logistic regression 4 in the Appendix. However, irrespective of transport behaviour, the group most likely to be lonely were people whose health condition impacted their daily activities 'a lot'.

Figure 11: The link between transport use and 'indirect' loneliness



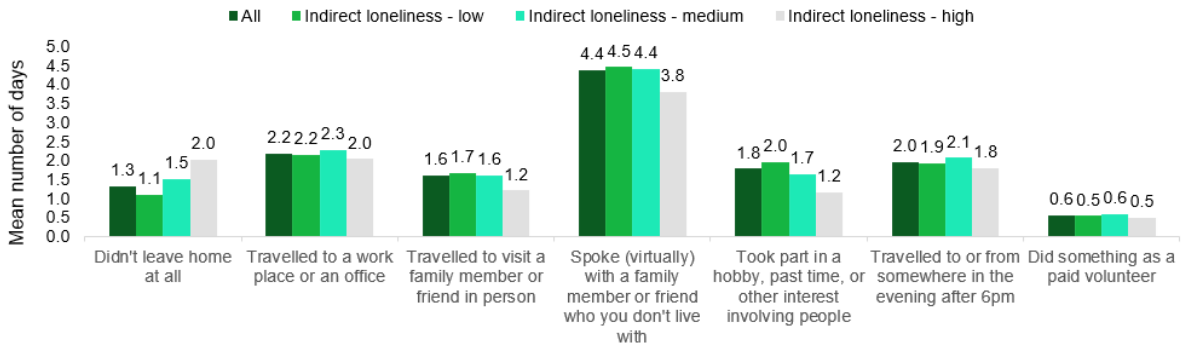
Source: Ipsos/DfT, 2 March – 8 March 2023 Base: 3,097 adults in England, all who were identified as low loneliness (1,694), all who were identified as medium loneliness (1093), all who were identified as high loneliness (245).

Social connectedness and making journeys

People who were 'indirectly' lonely were just as likely to travel in the last seven days compared to all adults but were less likely to take part in social activities (Table 1). For example, they were just as likely to travel to work or to travel somewhere after 6pm, as shown in Figure 12. They were, though, less likely to travel to visit a family member or friend in person. This pattern was not confined to travel - they were also less likely to speak online to friends and family and to take part in a hobby.

To understand social connectedness, respondents were asked how many days of the last seven they had done any of the following, Figure 12 shows the average response among the different loneliness groups. Those who were indirectly lonely were only marginally less likely to take part in some activities (such as travelling to work, or somewhere after 6pm) but were much less likely to take part in a hobby or travel to visit friends / family.

Figure 12: Loneliness and social connectedness



Source: Ipsos/DfT, 2 March – 8 March 2023; D1. Thinking about the last 7 days, on how many of those days, if any, did you do the following? Base: 3,097 adults in England, all who were identified as low loneliness (1,694), all who were identified as medium loneliness (1093), all who were identified as high loneliness (245).

Regardless of 'indirect' loneliness, most people left their house at least once in the previous seven days - 93% of those 'indirectly' lonely did this, compared to 96% of all adults. A very small group of those 'indirectly' lonely (4%) did not leave their house at all in the last seven days.

Most people (80%) travelled for essentials such as food or groceries in the previous four weeks. The main difference came in terms of travel for leisure purposes. While a very high proportion of those 'indirectly' lonely travelled for leisure purposes - 82% - this was significantly lower than 90% of all adults. Only 16% of those who did not travel for leisure purposes were also 'indirectly' lonely, double the proportion (8%) of those who were ‘indirectly’ lonely that did travel for this reason. Moreover, eight in ten (81%) of those who did not travel for leisure were low or medium on the loneliness scale.

Table 8 demonstrates that those who were **indirectly lonely were less likely to travel for social reasons** but were just as likely to travel for running for errands, for example, compared to all adults.

Table 8: Analysis of the differences in journey purpose between all adults and those who are lonely

% Travelled for this purpose in last 4 weeks	All adults (n3097)	Those who were 'indirectly' lonely - high on scale (n245)	+/- point difference vs. all adults, asterisks denote if difference is significant
Shopping for food/grocery items	80%	74%	-6*
Visiting friends/relatives	69%	51%	-18*
Going to a pub/bar/restaurant	51%	31%	-20*
Travelling (commuting) to place of work	48%	40%	-8*
Shopping for non-food/grocery items such as buying books, music, clothes, holidays, or insurance	46%	38%	-8
Travelling to medical, hospital or dentist appointments	44%	38%	-6
For recreation/keeping fit including going to a place to walk/cycle, going to a gym/playing sport	43%	35%	-8*
Travelling to access services (e.g., hairdressers, libraries, estate agents and banks)	38%	29%	-9*

Travelling to access entertainment/arts such as cinema, theatre, gallery, museum, sporting events, music events and concerts	38%	23%	-15*
To go on a day trip somewhere	37%	25%	-12*
Giving lifts to friends and family for other reasons (not to school/a place of education)	29%	19%	-10*
Running errands for people (e.g., going out for food/shopping on behalf of others)	24%	24%	0
Picking up or dropping off child(ren) at school/place of education/nursery etc.	22%	21%	-1
Caring for family or friends	19%	22%	3
Business travel (excluding travelling/commuting to your usual place of work)	15%	13%	-2
To go on holiday	14%	8%	-6*
Travelling to education yourself (as pupil/student)	9%	10%	+1

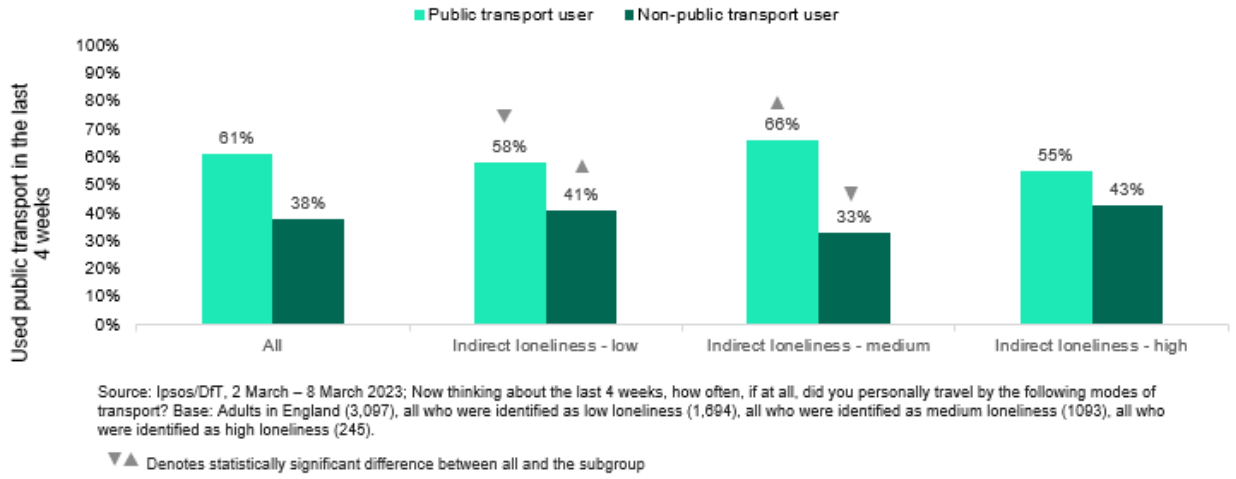
Source: Ipsos / DfT Base: 3,097 adults in England, all who were classified as indirectly lonely (245), 2 March – 8 March 2023.
C3. Thinking again about the last 4 weeks, for which of these reasons, if any, have you made a journey of any kind?

Transport-related loneliness

Use of public transport

As shown in Figure 13, more than half (55%) of those classified as high on the 'indirectly' lonely scale used public transport in the previous four weeks, while around four in ten (43%) said they did not travel this way. This was broadly similar to patterns present among all adults and those classified as low on the scale.

Figure 13: Use of public transport/non-use by loneliness



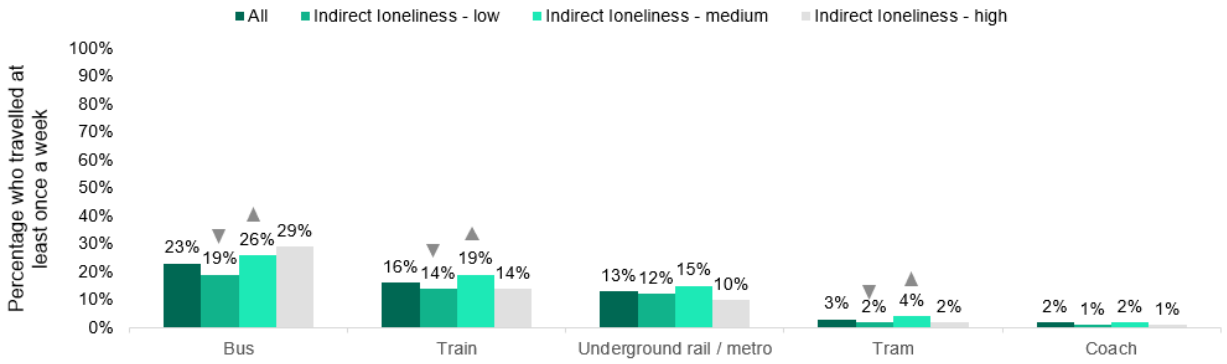
Source: Ipsos/DfT, 2 March – 8 March 2023; Now thinking about the last 4 weeks, how often, if at all, did you personally travel by the following modes of transport? Base: Adults in England (3,097), all who were identified as low loneliness (1,694), all who were identified as medium loneliness (1093), all who were identified as high loneliness (245).

▼▲ Denotes statistically significant difference between all and the subgroup

Differences in the use of public transport were shaped more by age than by loneliness. For example, younger age groups were more likely to have travelled by bus in the past 4 weeks - 41% of 16-24-year-olds travelled this way at least once a week compared to between 15% and 26% among all other age groups. As bus usage was higher amongst younger people, and younger people are more likely to be classified as lonely, loneliness was higher amongst bus users, shown in Figure 14. Older people were less likely to travel by train than other age groups, regardless of their level of loneliness.

More frequent users of public transport - travelling by bus and by train - were just as likely to be lonely as less frequent users. Lonely people were more likely to travel by train five days a week, reflecting their younger composition, but were just as likely as others to have not travelled by train.

Figure 14: Use of public transport modes (and coaches) by loneliness



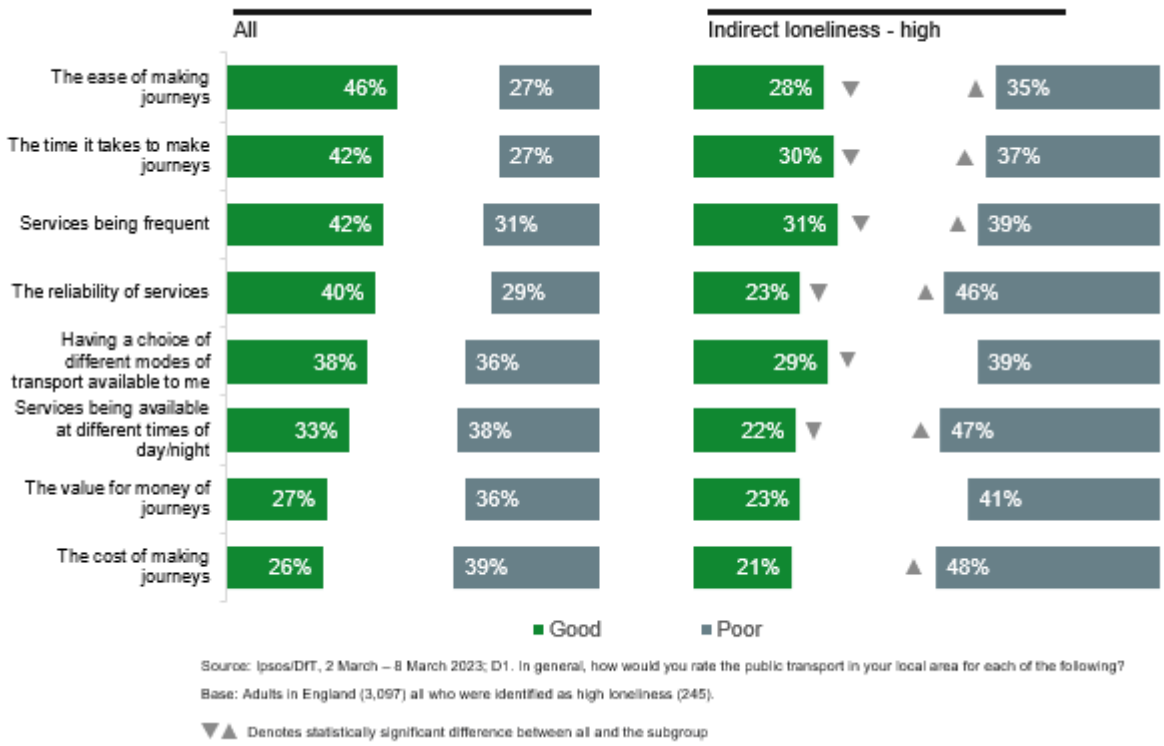
Source: Ipsos/DfT, 2 March – 8 March 2023; C2: Still thinking about the last 4 weeks, how often, if at all, did you personally travel by these modes of transport? Base: Adults in England (3,097), all who were identified as low loneliness (1,694), all who were identified as medium loneliness (1093), all who were identified as high loneliness (245).

▼▲ Denotes statistically significant difference between all and the subgroup

Those who were 'indirectly' lonely were more critical of local public transport than all adults. Figure 15 shows that they were less positive and more critical about almost all elements of their local public transport, the exception being value for money. It should be noted here, though, that non-

public transport users were generally more critical of local public transport and the base size of the 'indirectly' lonely group is small. Still, the differences are statistically significant and **public transport users who were 'indirectly' lonely were less positive than those who were not.**[13]

Figure 15: Ratings of local public transport



Autonomy and access to a car

The Phase 1 qualitative research found that participants framed how they felt about the journeys they were able to make in terms of the amount of "freedom" they had. For those of working age, driving a car was considered liberating, giving owners a personal choice over where, when, and with who they travel. A case study from the qualitative research highlighted the potential for a loss of autonomy to affect lives.

> **"I always think travelling in the car is probably the easiest and the least lonely – you have a choice of whether you want someone there with you. I could rearrange my diary and go, 'well, you're off on Friday. Do you want to come with me and we'll go and do Scotland?"**

Female, 45, North West

[13] Base size numbers are too small to further breakdown attitudes by health and public transport usage within the lonely group.

Case study

This participant is 47 years old and lives in a house-share in the East Midlands. He works as a home tutor and most of his work is now online, but he also goes into a college to help out.

He used to always drive but is currently using taxis and relying on lifts due to his current physical condition which affects his mobility. This means he feels as though he has lost the freedom, he previously took for granted. When asked 'What does loneliness mean to you?', he explained how his disability made him feel.

"Loneliness to me means isolation and also how independent you are…I've lost my independence because of this disability. I have to rely on friends and family more, I'm more reliant on public transport and taxis, I can't just get in my car and drive anymore."

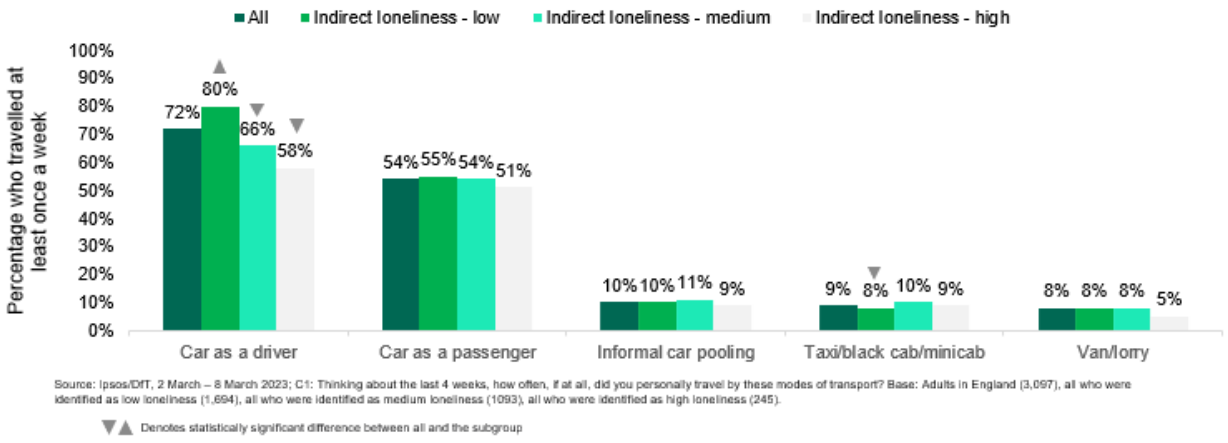
He described feeling grateful for this tight-knit family and caring community for their practical support, but ultimately believed that getting back into his car would be the only way to improve his mood.

"For me just getting in my own car and going somewhere, going on the sat nav and finding the nearest car park, that would be something that I want back… I don't want to stay at home and get depressed."

The analysis at Phase 2 points to the importance of being able to drive a car and the autonomy this gives beyond above simply having a car in the household or being able to travel as a passenger in a car. Possessing a licence also had a stronger relationship with loneliness than having a car in the household.

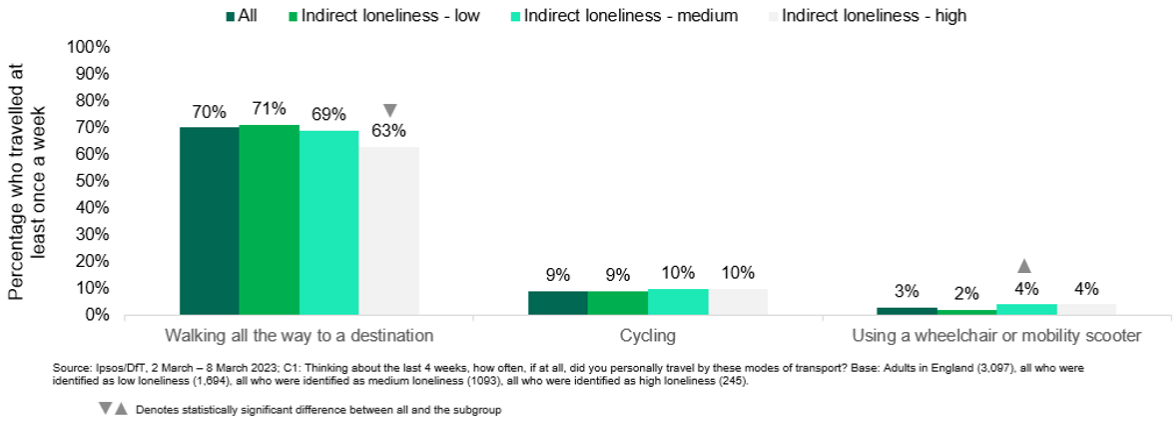
Levels of access were similar across the loneliness scale but, as shown in Figure 16, driving a car had a stronger relationship with loneliness than being driven as a passenger and using informal car-pooling. Eight in ten (80%) of those who were classified as not being lonely had driven a car in the previous four weeks, a statistically significant difference compared to the equivalent six in ten (58%) of those who were high on the loneliness scale. By contrast, there were no differences across the loneliness scale in terms of travelling by car as a passenger or by informal car-pooling.

Figure 16: Car use by loneliness



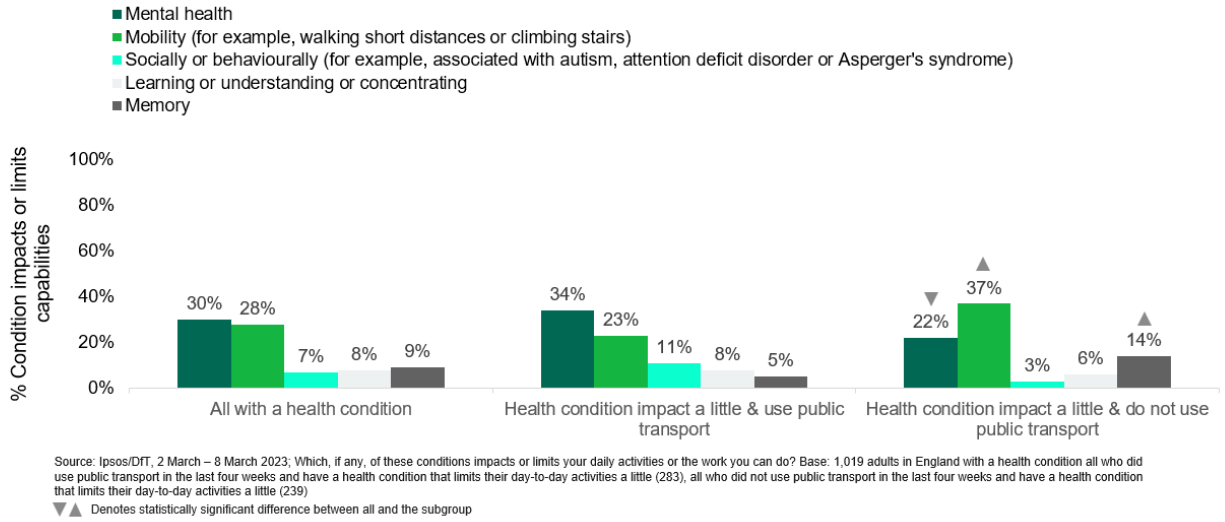
Among those who were 'indirectly' lonely, six in ten (63%) had walked all the way to a destination in the last four weeks. Not being as likely to travel this way was unique to those who were lonely, reflecting the high proportion who had a condition or illness that impacted their everyday activities.

Figure 17: Walking and other modes of transport and loneliness



Those who did not use public transport and who conditions impacted their daily lives a little were more likely to experience mobility issues or memory issues. Figure 18 shows that the profile of those who do not use public transport and have a condition that impacts them a little bit in their day to day is significantly different from those who do use public transport.[14]

Figure 18: Breakdown of health conditions by public transport use



As the statistical model showed, **the majority of those who were experiencing loneliness were not experiencing transport-related loneliness. This suggests a limited role for transport in alleviating loneliness.**[15]

Those who were potentially experiencing a form of loneliness associated with transport had conditions or illnesses that were limiting their daily activities a little. For those who had conditions

[14] These findings are limited by the quantitative nature of this work and the modelling as without discussing someone's exact needs it is difficult to determine exactly why they are not using public transport.

[15] Base size numbers are too small to go into further detail about what was influencing transport use amongst these groups.

or illnesses that impacted their life a lot, access to public transport had minimal impact on their loneliness; they were as lonely as their counterparts not using public transport. However, a person whose condition impacted a little on daily activities potentially had more chance of being lonely than a person whose daily activities were limited a lot if they did not use public transport and had no driving licence.

Summary of Chapter 2

- Transport was viewed as an enabler of social connectedness in the qualitative research.
- People's socio-demographic characteristics had a stronger association with loneliness than their transport-use. People who were lonely were just as likely to travel but were less likely to do so for leisure reasons.
- The majority of those experiencing loneliness are not experiencing transport related loneliness and **the role of transport in relieving loneliness is limited**.
- There is a group that could be experiencing transport related loneliness (those with health conditions that impact their day-to-day life a little).

Conclusions - what next?

The qualitative research conducted for this project found a perceived link between transport and social connectedness. Participants felt that being able to get from one place to another easily makes a considerable difference, helping them to access work and leisure activities and opportunities, to forge and sustain relationships. These were considered as vital ingredients of individual wellbeing.

Conversely, it was felt that inaccessible or inadequate transport would significantly hinder social (and economic) connectedness. However, the qualitative research also showed that people did not readily associate transport with policies designed to alleviate feelings of loneliness - it was not a top-of-mind solution. Similarly, the statistical model indicated that loneliness was most likely to be associated with a person's characteristics and circumstances other than transport. The only group where there was some association between loneliness and perceptions and usage of transport was people whose health condition impacted their daily activities a little. The majority of those who were lonely (based on the ONS ‘indirect’ measure) were not experiencing loneliness related to transport.

The model showed that loneliness was heavily dependent on individuals’ specific circumstances. Disability and long-term health conditions were a strong factor and cut across age, influencing each age group. Those whose conditions limited their daily activities 'a lot' were much more likely to be lonely than other people in good health or with less impactful conditions but having a condition which had 'a little' impact was also associated with increased loneliness. Further modelling indicated that health conditions with little impact on daily activities was more influential amongst non-public transport users.

Where does transport feature? People without a disability or health condition and those whose health condition did not impact daily activities, were no more or less likely to be lonely if they used public transport or not. For most people, loneliness was also unaffected by possession of a driving licence, with the exception of people with a health condition which impacts their daily lives a little. Moreover, while people with health conditions were less likely to use public transport than others, doing this - or possessing a driving licence - did not alleviate their propensity to be lonely.

Our model did, however, find some correlation between health conditions, transport, and loneliness. Specifically, a person whose condition impacted 'a little' on daily activities, potentially had more chance of being lonely than a person whose daily activities were limited 'a lot' if they did not use public transport and had no driving licence.

The best conclusion that can be drawn is that disability and health conditions are likely to have a causal effect on the use of public and private transport for some groups of people. This, in turn, is likely to be both a cause and effect of loneliness - that is, some people are lonely because they are unable to access transport and make social connections, while others don’t use transport because of lower need including a lack of social connections which is likely to be associated with loneliness.

In response, the focus will naturally turn to public transport because those whose daily activities are limited by disability or health condition are significantly less likely to own a car. They account for four in ten (42%) of those who do not own a car, but they also make up a third (34%) of those who do not use public transport.

In summary, on this evidence there isn't one factor driving loneliness but a collection of factors and the intersection of these is important. Transport is a relatively weak factor, but it does feature more strongly for some groups. In particular, there appears to be a degree of transport-related loneliness for those with health conditions which limit their daily activities a 'little'. The implication is that, for this group perhaps, transport is not impossible but may be very challenging.

This evidence supports the hypothesis that improvements to transport ought to help people who are lonely, or at risk of feeling lonely, by allowing them to undertake activities that increase opportunities for social connections and interactions. However, based on this research it is possible to add the important qualification that improvements would likely help some of those experiencing loneliness.

Transport can contribute to endeavours to tackle loneliness but ought to operate alongside other initiatives within a wider strategy. As past research has shown, there are many factors influencing the use of transport including convenience, cost, availability and accessibility. Further research would helpfully explore the specific transport needs of those groups identified through the analysis as being most at risk of transport-related loneliness, and the projects funded by DfT will provide additional opportunities to understand the impact of practical interventions.

Appendices

Appendix 1: Phase 1 research sample

A survey was conducted to establish prevalence of incidence in the population this was undertaken via the Ipsos Omnibus Survey, with 1,897 participants across England – fieldwork for the survey took place between 19 to 23 November 2021.

The qualitative data was conducted via initial interviews with participants in December 2021 and an app-based diaries in January 2022 and follow-up quantitative interviews in February and March 2022.

Table A.1 breaks down the sampling profile for the qualitative research.

Table A.1: Qualitative research sample profile

Sampling profile		Achieved	Sampling rationale
Gender	Female	11	Sampling for range to aid comparison between groups
	Male	9	
Age	18 - 24	4	Sampling for range to aid comparison between groups. Excluded 16-17-year-olds for ethical reasons and ensured representation from 75+ as the Omnibus survey only included people aged up to 75 years
	25 - 44	7	
	45 - 64	5	
	65 +	4	
Social grade	AB	0	Skewed towards lower socio-economic grades as self-reported loneliness was comparatively lower among AB participants in the quantitative survey.
	C1	6	
	C2	5	
	DE	9	
Ethnicity	Minority Ethnic Groups (ensure mix of Asian / Asian British, Black / Black British, Mixed / Other)	7	Skewed as self-reported loneliness was comparatively higher among ethnic minority group participants in the quantitative survey.
	White British / Other White	13	
Region	North	5	Sampling for range to aid comparison between regions.
	Midlands and East	6	
	South	9	
Urban/ Rural	Rural	5	
	Urban / Suburban	15	
Living situation	Living alone	6	Skewed as self-reported loneliness was comparatively higher among people living alone and unrelated adults sharing the same household. There was no minimum quota for multiple families sharing the same household as these had high levels of self-reported loneliness but with too small of a base size to be statistically significant.
	Two adults who are married, cohabiting or in a civil partnership only, with no children	5	
	Parents/single parent living with their children	3	
	Two or more unrelated adults sharing the same household	5	
	Two or more families sharing the same household	1	

Sampling profile		Achieved	Sampling rationale
Long term condition	Yes[16] (ensure mix of mental health conditions, physical conditions, and disabilities)	7	Skewed as self-reported loneliness was comparatively higher among quantitative survey participants with a long-term condition or disability.
	No	13	
Ease travelling	Strongly Agree /Tend to Agree	8	Sampling for range to aid comparison between groups with different experiences of travel.
	Neither agree nor disagree	6	
	Tend to disagree /Strongly Disagree	6	
Loneliness score (see Table 1 above)	High	15	Skewed towards higher levels of self-reported lonely participants in order to answer the substantive research questions.
	Medium	5	
	Low	0	

[16] The quantitative survey asked a 'yes/no' question on 'Longstanding condition or disability' but this cannot be disaggregated further by the type of condition, including mental health.

Appendix 2: Phase 2 research sample

The survey data has been collected by the Ipsos UK KnowledgePanel, an online random probability panel which provides gold standard insights into the UK population, by providing bigger sample sizes via the most rigorous research methods.

Ipsos stratified KnowledgePanel sample to account for over-/under-representation of groups and geographies within the composition of the panel as well as different response rates, before inviting panel members to take part. Ipsos invited 5,455 panellists in England aged 16+, stratified by education. A representative sample of 3,097 adults was achieved between 2-8 March 2023.

The data was weighted by age, gender, region, Index of Multiple Deprivation quintiles, education, ethnicity and number of adults in the household in order to reflect the profile of the adult population in England.

A summary of unweighted and weighted sample profiles is shown in Table A.2 below.

Survey results are presented as percentages. Unless otherwise indicated, results from the sample survey are based on all respondents. Where figures in this report do not add up to 100%, this is the result of computer rounding or multiple responses. An asterisk (*) indicates a score less than 0.5%, but greater than zero.

All surveys are subject to a range of potential sources of error. At a 95% confidence interval, a base size of 3,097 (all adults) is subject to a range of +/ 1.1 points for a finding of 10%, and +/- 1.8 points for a finding of 50%. A base size of 245 (those ‘indirectly’ lonely) is subject to a range of +/ 3.8 points for a finding of 10%, and +/- 6.3 points for a finding of 50%.

Commentary focuses on statistically significant differences between sub-groups in the same category (e.g., different age groups) based on a 95% confidence interval although lack of reference to other groups and geographies does not mean there are not statistically significant differences. Data tables are available on request.

Table A.2: Groups – unweighted and weighted sample sizes

Group	Base size (unweighted)	Base size (weighted)
Men	1,459	1,477
Women	1,609	1,589
16-24	114	367
25-34	285	524
35-44	406	493
45-54	534	526
55-64	744	470
65-74	706	388
75+	308	329
White	2,788	2,636
Ethnic minority	259	407
Health condition	1,019	951
Carer	311	291
Graduates	980	948

No formal qualifications	137	128
North England	878	859
Midlands	621	589
South England	1,598	1,649
'Direct' lonely (self-identified as lonely - often / always lonely)	187	213
'Indirect' lonely – High (scored 8 to 9 in the UCLA loneliness scale)	245	266

Appendix 3: Logistic regression models

Logistic regression is a statistical analysis technique which explores the relationship between an outcome variable or a variable or outcome of interest (in this case, loneliness) and an explanatory variable, or other independent variables.

As binary logistic regression requires a binary variable (one with just two answer options), the indirect loneliness scale was recoded into one and zero (one being high indirect loneliness and zero being medium or low loneliness). Those respondents whose loneliness score was between 1-2 due to skipping questions were removed from the model and were recoded as 'prefer not to say'.

Ipsos produced four models, the first analysing a wide range of socio-demographic variables to understand loneliness, the second adding in the elements around social connectedness and views of the local area, the third including use of public transport, the impact of disabilities and the fourth analysing the use of car and the impact of having a driving licence. This reflected the exploratory nature of the analysis; a wide range of variables were included to give the fullest possible understanding of the relationship between different attitudes and satisfaction with the local area.

People scoring 'high' on the indirect loneliness scale were distinguished from those scoring 'low' or 'medium' to create a binary variable with '1' indicating lonely and '0' indicating not lonely. This variable was included in the logistic regression models as the outcome variable, along with a suite of socio-demographic characteristics used as predictor variables to assess which were associated with potentially increasing or decreasing the chance of loneliness.

Regression models make use of categorical predictor variables which have a reference point against which other categories making up a variable are compared. For example, gender is made up of male and female categories and males are included in the reference group with an effect calculated for females. Thus, the model coefficient (mainly the SE column in the tables below) for women informs the extent to which women were more or less likely to be lonely than men.

Logistic regression reports its results in the form of log odds rather than probabilities. When the probability of something occurring is 50%, its log odds are reported as 0. Anything that is less likely to happen (i.e., it has a probability of below 50%) will have a negative log odds score, while a probability of greater than 50% will show a positive value.

The explanatory power of a logistic regression can be measured by what is known as a "pseudo R-squared" measure. These provide an idea of how much of the variation in the model is explained by the explanatory factors used in the analysis, and how much is likely to be due to measures outside those included though a score from zero (none of the variation is explained by the chosen variables) to one (the variables explain all of the variation). The Cox-snell and Nagelkerke scores are below suggesting that the models have a reasonable amount of explanatory power.

Table A.3: Explanatory Power analysis by logistic regression

Model	Cox - Snell (Maximum of 0.75)	Nagelkerke (Maximum 1)
Logistic regression model 1 - Loneliness and socio-demographic variables	0.087	0.203
Logistic regression model 2 - Wellbeing and loneliness	0.209	0.487
Logistic regression model 3 - Transport (public/private) and loneliness	0.078	0.183

Logistic regression model 4 - car use and loneliness	0.081	0.19

Logistic regression model (1) - Loneliness and socio-demographic variables

Factors that are significant are highlighted in dark grey and show up in the significant column at 0. Factors that are almost significant are highlighted in lighter grey. Those with a minus figure in the S.E. column are less likely to be indirectly lonely.

	Odds	Log Odds (B)	Standard Error	T-statistic	Sig.
Female	1.05	0.04	0.21	0.22	0.83
25-34	0.76	-0.28	0.45	-0.61	0.54
35-44	1.15	0.14	0.43	0.32	0.75
45-54	0.87	-0.14	0.43	-0.34	0.73
55-64	0.43	-0.84	0.44	-1.89	0.06
65-74	**0.14**	**-1.95**	**0.50**	**-3.90**	**0.00**
75+	**0.16**	**-1.85**	**0.58**	**-3.18**	**0.00**
Ethnic Minority Background	1.74	0.55	0.31	1.79	0.07
No children in household	1.17	0.16	0.26	0.60	0.55
Health issue or condition - limits daily activities a lot	**6.32**	**1.84**	**0.26**	**7.11**	**0.00**
Health or condition - issue limits daily activities a little	**2.28**	**0.83**	**0.23**	**3.67**	**0.00**
Health issue or condition - limits daily activities not at all	1.55	0.44	0.32	1.37	0.17
Social tent tenant	1.85	0.62	0.27	2.31	0.02
Lives alone	2.26	0.81	0.26	3.12	0.00
In work	1.48	0.39	0.25	1.54	0.12
Intermediate occupations	0.70	-0.36	0.29	-1.22	0.22
Small employers/own account	0.81	-0.21	0.41	-0.51	0.61
Lower supervisory/technical	1.66	0.51	0.34	1.52	0.13
Semi/routine	0.68	-0.38	0.30	-1.26	0.21
Unemployed/never worked	1.24	0.22	0.45	0.48	0.63
Own/access 1 car in the household	1.18	0.17	0.26	0.64	0.52

Own/access 2 cars in the household	0.86	-0.15	0.33	-0.45	0.65
Education - GCSE or equivalent	1.89	0.64	0.23	2.81	0.00
Education - No formal education	3.42	1.23	0.37	3.34	0.00
Rural	1.09	0.08	0.25	0.33	0.74
ONS Supergroup – Business education and heritage centres	1.24	0.21	0.44	0.48	0.63
ONS Supergroup – Countryside Living	1.82	0.60	0.41	1.47	0.14
ONS Supergroup – Ethnically diverse metropolitan Living	1.80	0.59	0.47	1.24	0.22
ONS Supergroup- London Cosmopolitan	0.59	-0.53	0.68	-0.78	0.44
ONS Supergroup – Services and Industrial legacy	1.78	0.57	0.42	1.36	0.17
ONS Supergroup – Town and Country Living	1.48	0.39	0.39	1.00	0.32
ONS – Supergroup Urban Settlements	1.23	0.20	0.41	0.49	0.62
Index Multiple Deprivations	0.98	-0.02	0.08	-0.25	0.80

The second regression model was based on the model above on the socio-demographic characteristics and loneliness and Ipsos inputted wellbeing questions and attitudes towards the local area.

Factors that are significant are highlighted in dark grey and show up in the significant column at 0. Factors that are almost significant are highlighted in lighter grey.

Logistic regression model (2) - Wellbeing and loneliness

	Odds	Log odds (B)	Standard Error	T-statistic	Sig.
Female	1.08	0.07	0.23	0.31	0.75
25-34	1.28	0.25	0.60	0.41	0.68
35-44	1.76	0.56	0.54	1.04	0.30
45-54	1.62	0.48	0.54	0.89	0.38
55-64	0.97	-0.03	0.58	-0.04	0.96
65-74	0.42	-0.86	0.64	-1.35	0.18
75+	0.72	-0.33	0.82	-0.41	0.68
Ethnic Minority Background	2.22	0.80	0.40	1.98	0.05
No children in household	0.95	-0.05	0.29	-0.18	0.85
Health issue or condition - limits daily activities a lot	2.27	0.82	0.37	2.22	0.03
Health or condition - issue limits daily activities a little	1.27	0.24	0.28	0.84	0.40
Health issue or condition - limits daily activities not at all	1.18	0.16	0.40	0.40	0.69
Social tent tenant	1.21	0.19	0.33	0.58	0.56
Lives alone	1.69	0.53	0.27	1.93	0.05[17]
In work	1.42	0.35	0.28	1.25	0.21
Intermediate occupations	0.51	-0.67	0.36	-1.89	0.06
Small employers/own account	0.58	-0.55	0.54	-1.01	0.31
Lower supervisory/technical	1.17	0.16	0.41	0.38	0.70
Semi/routine	0.50	-0.69	0.33	-2.12	0.03
Unemployed/never worked	0.91	-0.10	0.50	-0.20	0.84

[17] The cut off value for being considered significant is 0.05, this figure is slightly higher due to rounding and so is not flagged as significant.

Full time student	1.18	0.17	0.76	0.22	0.83
Own / Access 1 car in the household	1.03	0.03	0.28	0.11	0.91
Own / Access 2 cars in the household	0.76	-0.28	0.37	-0.75	0.45
Education - GCSE or equivalent	2.20	0.79	0.28	2.84	0.00
Education - No formal education	3.88	1.36	0.47	2.90	0.00
Rural	1.13	0.12	0.32	0.37	0.71
ONS Supergroup – Business education and heritage centres	1.52	0.42	0.52	0.81	0.42
ONS Supergroup – Countryside Living	2.46	0.90	0.47	1.90	0.06
ONS Supergroup – Ethnically diverse metropolitan Living	1.30	0.26	0.59	0.44	0.66
ONS Supergroup-London Cosmopolitan	0.35	-1.04	0.94	-1.11	0.27
ONS Supergroup – Services and Industrial legacy	1.38	0.32	0.50	0.64	0.52
ONS Supergroup – Town and Country Living	1.42	0.35	0.52	0.68	0.50
ONS – Supergroup Urban Settlements	1.05	0.05	0.50	0.10	0.92
Index Multiple Deprivations	1.04	0.04	0.11	0.37	0.71
Wellbeing mean (satisfaction with life today, things you to are worthwhile, happy you felt yesterday)	1.00	0.00	0.08	-0.03	0.98
Anxious: How anxious someone felt yesterday	1.05	0.05	0.05	0.96	0.34
Missing social interaction	2.30	0.83	0.12	6.95	0.00
Positive personal feelings mean (felt in tune, enjoy life, happy, satisfied, loved or valued)	0.10	-2.27	0.29	-7.92	0.00

Views towards the local area mean (proud to live in, opportunities, recommend place to live, people work together, people from different backgrounds get on)	1.09	0.08	0.16	0.53	0.60

A third model specifically explored the impact of public transport use on loneliness. This model took into account the socio-demographic elements explored in the first model.

Factors that are significant are highlighted in dark grey and show up in the significant column at 0. Factors that are almost significant are highlighted in lighter grey.

Logistic Regression Model (3) - Transport (public/private) and loneliness

	Odds	Log odds	Standard Error	T-statistic	Sig.
25-34	0.69	-0.37	0.41	-0.90	0.37
35-44	0.93	-0.08	0.40	-0.19	0.85
45-54	0.68	-0.39	0.40	-0.97	0.33
55-64	0.39	-0.93	0.40	-2.35	0.02
65-74	**0.16**	**-1.86**	**0.43**	**-4.33**	**0.00**
75+	**0.16**	**-1.85**	**0.53**	**-3.47**	**0.00**
Health issue or condition - limits daily activities a lot	**5.81**	**1.76**	**0.39**	**4.51**	**0.00**
Health or condition - issue limits daily activities a little	1.31	0.27	0.33	0.82	0.41
Health issue or condition - limits daily activities not at all	1.36	0.31	0.46	0.67	0.50
Social tenant	**1.99**	**0.69**	**0.24**	**2.81**	**0.00**
Lives alone	**2.45**	**0.90**	**0.22**	**4.08**	**0.00**
Education - GCSE or equivalent	**1.94**	**0.66**	**0.23**	**2.92**	**0.00**
Education - No formal education	**3.50**	**1.25**	**0.39**	**3.24**	**0.00**
Non-public transport user	0.84	-0.17	0.27	-0.62	0.53
Non-public transport user with health issue or condition - limits daily activities a lot	1.52	0.42	0.50	0.84	0.40

Non-public transport user with health issue or condition - limits daily activities a little	3.58	1.28	0.48	2.66	0.01
Non-public transport user with no health issues or conditions	1.42	0.35	0.64	0.54	0.59

A fourth model explored the interaction between having access to a car, a driving licence and public transport. It was used to explore the relationship between people with health issues, their use of public transport and possession of a driver's licence. Preliminary investigations suggested that possession of a driving licence was more informative than the number of cars in a household (presumably reflecting potential independent use of a car where available). This model controlled for significant effects identified in the first regression model. This means that the relationships between health, use of public transport and possession of a driving licence are influential over and above the impact of any other influential socio-demographic characteristics on loneliness.

Factors that are significant are highlighted in dark grey and show up in the significant column at 0. Factors that are almost significant are highlighted in lighter grey.

Logistic Regression (4) - Driving licence possession and loneliness.

	Odds	Log odd (B)	Standard Error	T-statistic	Sig.
25-34	0.66	-0.41	0.42	-0.98	0.33
35-44	0.89	-0.11	0.41	-0.28	0.78
45-54	0.66	-0.42	0.41	-1.04	0.30
55-64	**0.38**	**-0.98**	**0.41**	**-2.40**	**0.02**
65-74	**0.15**	**-1.88**	**0.44**	**-4.30**	**0.00**
75+	**0.15**	**-1.91**	**0.55**	**-3.50**	**0.00**
Health issue or condition - limits daily activities a lot	**11.15**	**2.41**	**0.70**	**3.46**	**0.00**
Health issue or condition - limits daily activities a little	**3.84**	**1.34**	**0.66**	**2.05**	**0.04**
Health issue or condition - limits daily activities not at all	1.78	0.58	1.28	0.45	0.65
Social tenant	**2.05**	**0.72**	**0.24**	**2.94**	**0.00**
Lives alone	**2.49**	**0.91**	**0.23**	**3.97**	**0.00**
Education - GCSE or equivalent	**1.93**	**0.66**	**0.23**	**2.91**	**0.00**
Education - No formal education	**3.51**	**1.26**	**0.40**	**3.13**	**0.00**
Has a driving licence	1.78	0.58	0.55	1.05	0.29
Own / Access to a car in the household	1.05	0.05	0.29	0.17	0.86
Has driving licence and health issue or condition - limits daily activities a lot	0.44	-0.81	0.72	-1.13	0.26
Has a driving licence and condition - limits daily activities a little	**0.23**	**-1.45**	**0.70**	**-2.09**	**0.04**

Has driving licence with health issue or condition - limits daily activities not at all	0.75	-0.29	1.37	-0.21	0.83
Non-public transport user	0.81	-0.22	0.2	-0.79	0.43
Non-public transport user with health issue or condition - limits daily activities a lot	1.66	0.51	0.50	1.02	0.31
Non-public transport user with health issue or condition - limits daily activities a little	**4.53**	**1.51**	**0.48**	**3.12**	**0.00**
Non-public transport user with no health issues or conditions - limits daily activities not at all	1.40	0.34	0.66	0.52	0.61

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