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ABSTRACT

Loneliness and Social Isolation: An Unequally Shared Burden in Europe*

Concerns about loneliness and social isolation are growing more than ever. With the COVID-19 pandemic entering its second year, there are fears that the toll on loneliness could have consequences long after the virus recedes. This study offers a comparative overview of the incidence and determinants of loneliness and social isolation in Europe in the pre-COVID-19 period. The empirical results indicate that 8.6% of the adult population in Europe suffer from frequent loneliness and 20.8% from social isolation, with eastern Europe recording the highest prevalence of both phenomena. Trends over time do not indicate any change in the incidence of social isolation following the widespread adoption of social media networks from 2010 onwards. The empirical analysis shows that favourable economic circumstances protect against loneliness and social isolation, while living alone and poor health constitute important loneliness risk factors. Although social isolation increases with age, the elderly do not report more frequent feelings of loneliness than other age groups, all other things being equal. The relative contributions of the different objective circumstances included in the empirical analysis — demographic characteristics, economic conditions, living arrangements, health status, religious beliefs and geographical location — to chronic loneliness and social isolation vary substantially.

JEL Classification: I12, I14, I18, I30, D60

Keywords: loneliness, social isolation, risk factors, Europe

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* The contents of this paper are the views of the authors and do not necessarily represent an official position of the European Commission.

1 Introduction

Concerns about loneliness are growing more than ever. Population ageing, the rising number of people living alone, global mobility, changes in working methods and the increased use of digital technologies for communication have led many to suggest that loneliness is becoming more prevalent. Since the outbreak of the COVID-19 pandemic, lockdowns, quarantines, curfews, distancing measures, the cancellation of community activities and events have magnified existing levels of loneliness and social isolation (Buecker et al., 2020). With the pandemic entering its second year, there are fears that the toll on loneliness could have consequences long after the virus recedes.

The impact of loneliness on individual well-being and social cohesion should not be underestimated. Loneliness has been compared to obesity and smoking in the mortality risks that it entails (Holt-Lunstad et al., 2015; Cacioppo and Patrick, 2008; Hertz, 2020). It is associated with physical and psychological health problems (Hawkley and Cacioppo, 2010). Lonely adults tend to suffer from higher levels of cortisol (the 'stress hormone'), raised blood pressure, impaired sleep and cardiovascular resistance compared with non-lonely individuals, both in stressful situations and when at rest (Hertz, 2020; Hawkley et al., 2010). Over time, this translates into chronic inflammation and higher morbidity and mortality rates. Loneliness is also associated with depressive symptoms (Cacioppo et al., 2006) and with unhealthy behaviours such as smoking and a lack of physical exercise. In an increasingly connected world, lonely and socially isolated people face the double penalty of poorer health and being stigmatised as socially awkward.

And feelings of loneliness and social isolation may themselves drive lonely individuals even further away from others, because loneliness affects behaviour (Cacioppo et al., 2017; Cacioppo and Patrick, 2008). Individuals suffering from loneliness and social isolation tend to display lower levels of empathy and feel more threatened by unexpected life situations compared with their non-lonely counterparts. As argued in Hertz (2020), these risks translate into higher levels of distrust, intolerance towards others and ultimately may provide the basis for political developments that pose a risk to social cohesion (Kory Floyd, 2017; Mayer and Perrineau, 1992).
Although discussions about loneliness are prominent in political debates, and a growing number of newspapers are now talking about a 'loneliness pandemic', cross-national evidence on the incidence of loneliness is still limited. The aim of this study is to fill this gap and to offer a comparative overview of the prevalence and determinants of loneliness

and social isolation in Europe. To the best of our knowledge, existing cross-national studies (Sundström et al., 2009; Fokkema et al., 2012; Yang and Victor, 2011; Barreto et al., 2021) do not cover the time frame, countries and set of risk factors that are included in the present study. In addition, while most of the existing studies focus on the elderly, the empirical analysis in this study is based on a representative sample of the general population.

The remainder of the paper is organised as follows. Section II defines loneliness. Section III describes the data and presents descriptive statistics, while Section IV sets out the empirical findings and discusses the drivers associated with loneliness and social isolation. Section V considers the limitations of the study and future research avenues, and offers some concluding remarks.

2 Defining and measuring loneliness

While there are different definitions of loneliness in the literature, there is general agreement that it is a subjective feeling referring to an unpleasant experience which derives from the low quality and/or quantity of a person's social network (Perlman and Peplau, 1984). Loneliness is thus a subjective feeling with negative connotations.[1] In other words, loneliness does not mean being alone but feeling alone (Perlman and Peplau, 1984; Andersson, 1998). It therefore differs from the objective condition of being socially isolated. A person with a lot of social contacts may still experience feelings of loneliness (Andersson, 1998; De Jong Gierveld et al., 2016). This tallies with Perlman and Peplau's finding that loneliness relates not just to the quantity of a person's social relationships, but also to the quality of these relationships. Loneliness is thus not only about having too few social contacts per se but about also the perception that these relationships are not satisfying enough.

The literature identifies several forms of loneliness. Transient loneliness involves occasional feelings of loneliness, while situational loneliness is triggered by specific events in life (such as the loss of a partner or moving to a new town), and chronic loneliness results from a lack of satisfactory relationships for extended time periods (Perlman and Peplau, 1984). It is this chronic loneliness that is particularly detrimental. Meanwhile, Weiss (1973)

[1] While the focus of this paper is on negative loneliness, there can also be positive loneliness associated with 'voluntary (mostly temporary) withdrawal from social contacts' (De Jong Gierveld et al., 2016). This can happen when a person decides, for instance, not to interact socially in order to dedicate time to meditation, reflection or artistic activities.

distinguishes between social and emotional loneliness. The latter stems from the lack of an intimate relationship (e.g. a romantic partner), while the former is associated with the perceived absence of a broad social network (e.g. friends, neighbours).[2] Feelings of anxiety and isolation occur with emotional loneliness, whereas social loneliness is connected with aimlessness and marginality.

Since loneliness is intrinsically a personal and subjective feeling, its measurement is not straightforward. It can be measured directly, by asking people about their subjective feelings of loneliness usually over a specified period of time (e.g. the past week or two weeks). Alternatively, indirect indicators, which explore specific determinants of loneliness, may be preferred. Surveys for indirect indicators do not employ the words 'lonely' or 'loneliness' but instead ask about feelings or facts related to loneliness.

Several scales of loneliness based on indirect indicators have been developed in recent decades, with the best known being the UCLA Loneliness Scale (Russell, 1996) and the De Jong Gierveld Loneliness Scale (De Jong Gierveld and Kamphuis, 1985). The UCLA Loneliness Scale is based on 20 questions on aspects such as the frequency of feeling a lack of companionship, or whether respondents feel left out or isolated from others. The De Jong Gierveld Loneliness Scale is composed of 11 questions linked to feelings such as whether respondents miss having close friends or people around them. This scale also covers questions aimed at measuring more objective circumstances, such as whether respondents have people they can trust completely or rely on in case of hardship. A specific feature of this scale is that it encompasses the concepts of emotional and social loneliness (as defined by Weiss, 1973) which are measured separately by two distinct subscales (De Jong Gierveld and Van Tilburg, 2006). There are also short versions of both the UCLA and De Jong Gierveld loneliness scales, with three and six questions respectively (Hughes et al., 2004; De Jong Gierveld and Kamphuis, 1985; De Jong Gierveld and Van Tilburg, 2006). The UCLA and De Jong Gierveld scales offer the advantage of having been tested scientifically, and therefore have greater validity and reliability than direct measures of loneliness (De Jong Gierveld et al., 2016). But at the same time, indirect questions may be influenced by the researchers' definition and understanding of loneliness, while direct, subjective measures solely reflect respondents' feelings.[3] The UCLA and De Jong Gierveld

[2]Emotional loneliness corresponds to the inadequate quality of social networks and social loneliness to an insufficient quantity of social contacts in Perlman and Peplau's definition.

[3]See Nicolaisen and Thorsen (2014) or DeJong Gierveld et al. (2016) for a discussion on the correlation between direct and indirect measures. See Penning et al (2014) for a comparison of the UCLA and De Jong Gierveld loneliness scales.

loneliness scales or their shorter versions cannot be used in this paper due to a lack of cross-country data.

This paper covers most of the EU countries and employs both a direct measure of loneliness (i.e. the subjective feeling of loneliness) as well as an objective indicator of social isolation (i.e. the frequency of meeting socially with friends, relatives or work colleagues). This offers the opportunity to compare the results across countries and shed further light on issues related to the definition and measurement of loneliness.

3 Loneliness and Social Isolation through the lens of the European Social Survey

3.1 Data

Our empirical analysis is based on data drawn from the biennial European Social Survey (ESS henceforth). The ESS is carried out every two years since 2002. It contains nationally representative samples of individuals aged 15 or older who are residents in private households, regardless of nationality, citizenship, or language.[4] The survey covers information on respondents' socio-economic and household characteristics as well as detailed information on trust in institutions, values, identity, health, well-being, various aspects of civic and political participation and declared attitude towards minority groups.

The 2006, 2010, 2012 and 2014 ESS waves include a direct question on loneliness whilst all waves (from 2002 to 2018) contain one indirect measure.[5] The wording of the direct question is the following: "[...] please tell me how much of the time during the past week you felt lonely?" with the possible answers being "None or almost none of the time", "Some of the time", "Most of the time", "All or almost all of the time". The indirect question goes as follows: "[...] how often do you meet socially with friends, relatives or work colleagues?", with possibilities of answering "Never", "Less than once a month", "Once a month", "Several times a month", "Once a week", "Several times a week", "Every day". From these two questions we derive two indicators - one on loneliness and one on social isolation. Following Yang and Victor (2011), we label respondents reporting to

[4] The country sample size per wave amounts to around 1,500 respondents.

[5] Some of the waves include additional indirect measures of loneliness such as having someone to discuss intimate and personal matters with (and about how many such people there are), feelings towards people in the local area or whether respondents have people in one's life that really care about them.

Table 1: Loneliness and Social Isolation: definitions

Indicator	Question	New Variable
Direct Question Frequent Loneliness	How much of the time during the past week you felt lonely? (1) None or almost none of the time, (2) Some of the time, (3) Most of the time, (4) All or almost all of the time. In the analysis, educational categories (1) and (2) have been merged.	Not lonely (1- 2) Lonely (3-4) *Year*: 2006, 2010, 2012, 2014
Indrect Question Social Isolation	How often do you meet socially with friends, relatives or work colleagues?. (1) Never, (2) Less than once a month, (3) Once a month, (4) Several times a month (5) Once a week, (6) Several times a week, (7) Every day	Socially Isolated (1-3) Not Socially Isolated (4-7) *Year*: 2002-2018

have felt lonely most of the time, almost all the time or all of the time in the past week as "frequently lonely", whereas, along the line of Saltkjel et al., (2013) and Mattila et al., (2017), "socially isolated" individuals are those stating that they meet socially at most once a month. We also check the sensitivity of the results when isolated respondents are those meeting socially less than once a month with friends, colleagues or relatives.

3.2 The prevalence of frequent loneliness and social isolation in Europe

Figure 1 depicts the prevalence of loneliness and social isolation in Europe (see also figures A1 and A2 in Appendix). Neither of these is uncommon.

Around 9% of Europeans[6] report to be frequently lonely. About every 10th citizen in Hungary, the Czech Republic, Italy, Poland, Belgium and Greece feels lonely. The lowest percentage of lonely people are found in the Netherlands and Denmark with just 3%, Finland with 4% and Germany, Ireland and Sweden with 5%.

Compared to feeling lonely, many more Europeans (20.8%) are socially isolated. Country variations for this measure are much higher than for subjective loneliness. More than 40% of Hungarians and Greeks do not meet more often than once a month socially. In

[6]At the time of the survey, the United Kingdom was still part of the European Union, hence British citizens are included in the analyses.

Lithuania, Estonia and Poland the figure approaches 35%. In contrast, social isolation is the lowest in the Netherlands, Denmark and Sweden with around 8% of individuals being socially isolated. It is important to keep in mind that these figures may be underestimated, given the negative social stigma associated with loneliness.

Loneliness and social isolation have a clear regional pattern (Figure 2). The lowest levels of loneliness are found in Northern Europe, followed by Western Europe (with the exception of France). In contrast, Eastern Europe has the highest share of lonely people, followed by Southern Europe. Western and Southern Europe are the regions with the lowest, whereas Eastern Europe records the highest proportion of socially isolated individuals. More variability is observed in Southern Europe, with Portugal displaying very low levels of social isolation (9%) whilst the opposite is found in Greece (43%).

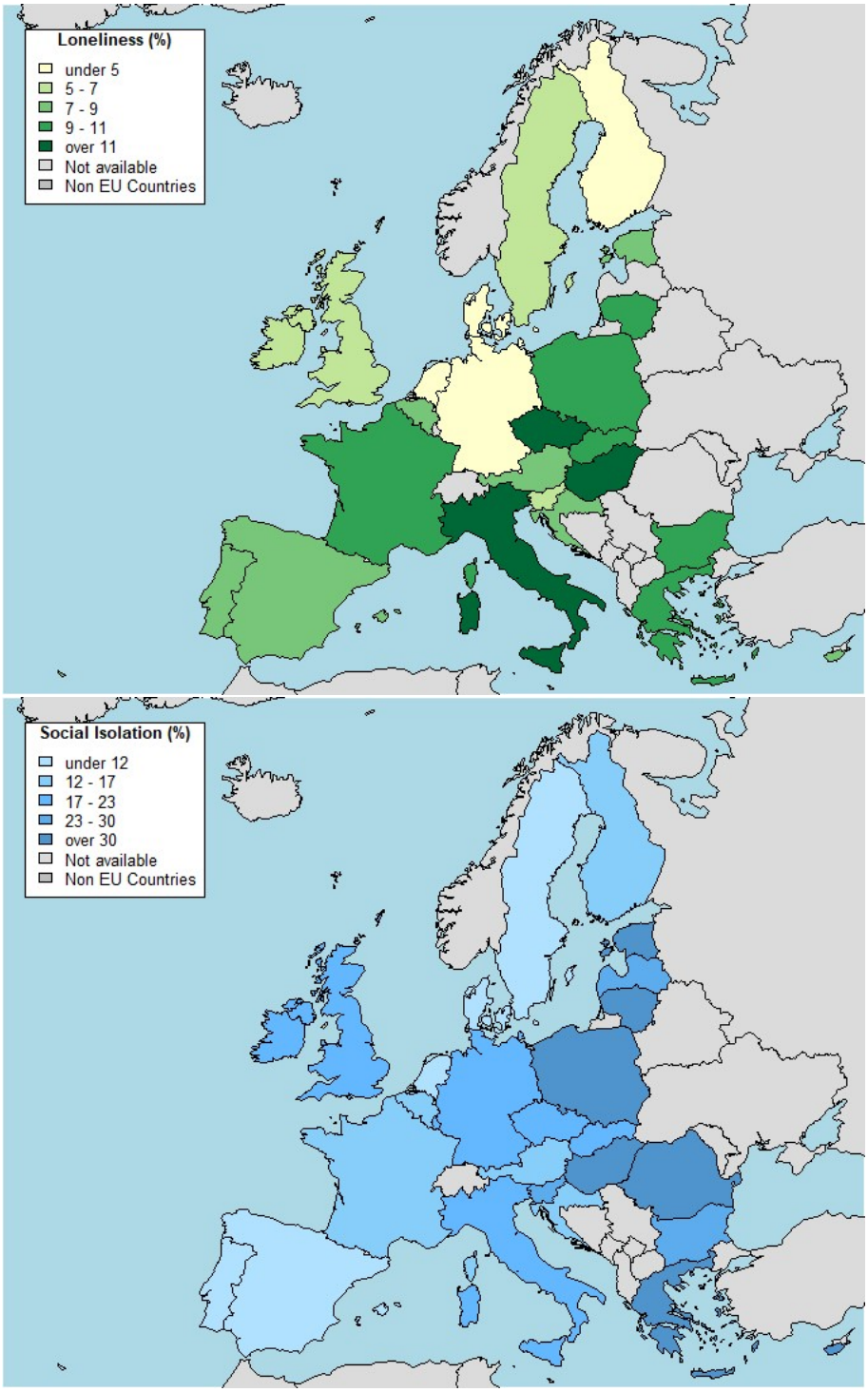
These results are in line with the existing literature. Yang and Victor (2011) provide the only study we are aware of that covers a substantial amount of EU member states. Using the third wave (2006) of the ESS and the information on self-reported loneliness, the authors also conclude that Eastern Europe and Southern Europe display higher levels of loneliness than those living in Northern and Western European countries.[7] Similarly, Sundström et al. (2009) and Fokkema et al. (2012) report that Central European and Mediterranean countries have higher prevalence of loneliness among adults aged 50 or over than Northern European countries.[8]

Although the regional patterns described above are undoubtedly partly explained by differences in individual circumstances across EU member states, they are equally shaped by a broader socio-cultural country context. In Southern and Eastern European countries family ties are strong and filial norms, such as co-residing of elderly parents with their adult children, used to be more prevalent than in Western or Northern Europe (Reher, 1998, Dykstra, 2009, De Jong Gierveld and Tesch-Römer, 2012). Expectations of social connectedness and hence potential dissatisfaction could therefore be higher in the former than in the latter group of countries (Sundström et al., 2009).

[7]The authors treat Baltic countries as belonging to Northern Europe. However, they conclude that these countries differ in loneliness from other Northern European countries (i.e. the prevalence is higher).

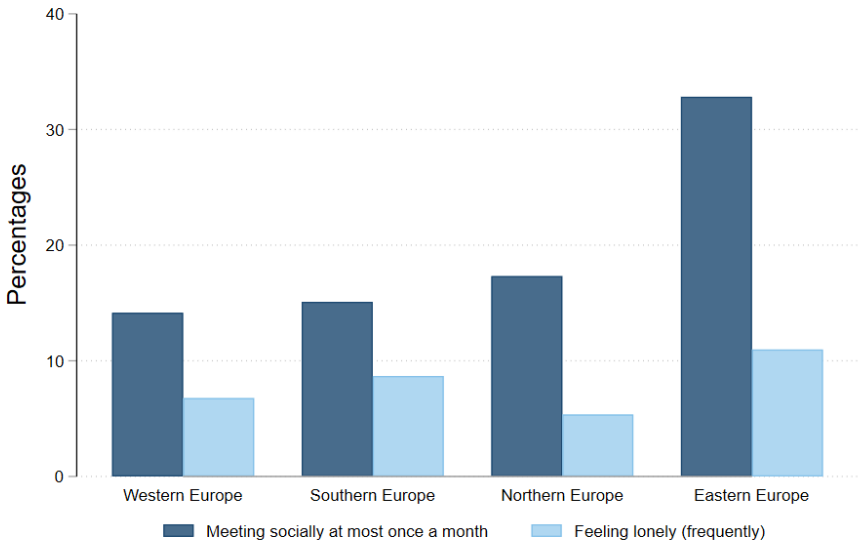
[8]Both studies rely on the Survey of Health, Ageing and Retirement in Europe (SHARE) which specifically targets the population aged 50 or over.

Figure 1: Prevalence of Loneliness (2006-2014) and Social Isolation (2002-2018)



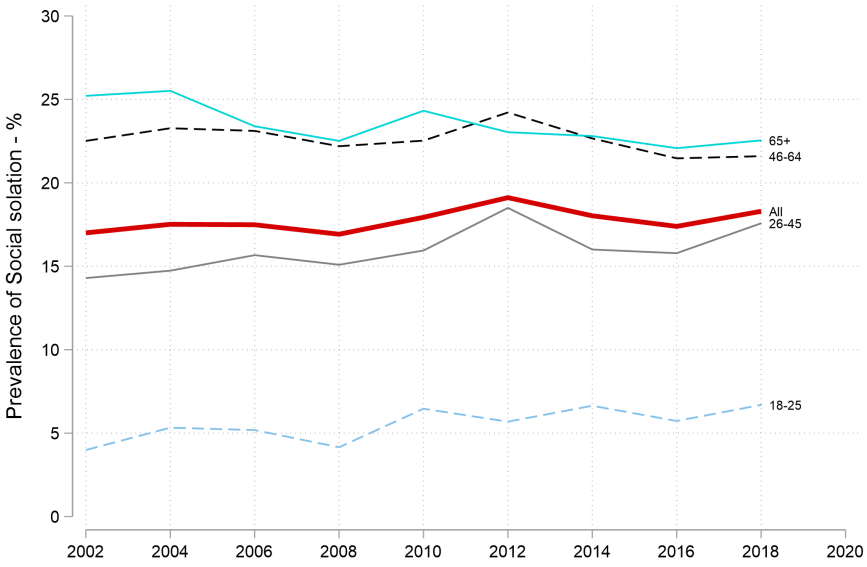
Note: The map on loneliness displays information for 23 EU countries plus the UK. LV, LU, MT and RO are the missing EU countries. Data on loneliness is available for 2006, 2010, 2012 and 2014 unless mentioned otherwise. Data availability: AT (2006 and 2014), BG, CY, CZ, SK (2006, 2010, 2012), EL and HR (2010), IT (2012), LT (2010, 2012, 2014).
The map on social isolation displays information for 26 EU countries plus the UK. MT is the missing EU country. Data on social isolation is available every two years from 2002 to 2018 unless mentioned otherwise. Data availability: AT (2002, 2004, 2006, 2014, 2014, 2018), BG, CY, SK (2006, 2008, 2010, 2012, 2018), CZ (2002, 2004, 2008, 2010, 2012, 2014, 2016, 2018), DK (2002, 2004, 2006, 2008, 2010, 2012, 2014) EE (2002 is missing), EL(2002, 2004, 2008, 2010), HR (2008, 2010, 2018), IT (2002, 2012, 2016, 2018), LT (2010, 2012, 2014, 2016, 2018), LU(2002, 2004), LV (2008, 2018), RO(2008), SK(2004, 2006, 2008, 2010, 2012, 2018).

Figure 2: Prevalence of Loneliness and Social Isolation in EU macro regions



Note: Social isolation is measured across the 9 waves of the ESS (2002-2018) whereas information on subjective loneliness is available in 2006, 2010, 2012 and 2014. Northern Europe includes Denmark, Finland, Ireland, Sweden and the United Kingdom; Western Europe is Austria, Belgium, France, Germany, and the Netherlands; Southern Europe is Cyprus, Greece, Italy, Portugal and Spain; Eastern Europe is Bulgaria, the Czech Republic, Croatia, Estonia, Hungary, Lithuania, Poland, Slovenia and Slovakia.

Figure 3: Prevalence of social isolation over time, by age – 2002-2018



Note: This graph is based on a subset of countries for which data are available for the nine waves of the ESS. The 13 countries are Belgium, Finland, France, Germany, Hungary, Ireland, the Netherlands, Poland, Portugal, Slovenia, Spain, Sweden, and the United Kingdom.

3.3 Social Isolation – change over time

Since 2010, the number of monthly active Facebook and YouTube users has dramatically increased from 500 million for both social media in 2010 to 1.9 billion for Facebook and 2.3 billion for YouTube in 2018 in the world. In Europe, the percentage of individuals participating in social networks rose from 36% in 2011 to 54% in 2019 while according to the OECD (2019), the 14-24 year-olds from the OECD-22 were spending around 4.37 hours per day on the internet in 2016. Existing evidence is controversial on whether the rather recent phenomenon of participation in social media increases loneliness or can substitute face-to-face contacts (Twenge et al, 2019; Pitman and Reich, 2016; Nowland et al, 2018).

Online interactions could, on the one hand, enhance existing relationships and even forge new ones ("stimulation" hypothesis), or on the other hand, substitute face-to-face exchanges ("displacement" assumption). Although there is a lively debate on the potential impact of social medial on loneliness, in particular among the youth, the evidence is rather inconclusive. As argued by Nowland et al (2018), social media effects might vary by age group as well as depend on the type (e.g. text versus image-based networks) and specific

use of social media technologies (e.g. passive versus active users).[9]

Figure 3 displays the time variations in social isolation for the full sample as well as by age groups. To be able to compare changes over time, we use data from the 13 countries for which we have information on social isolation for each of the 9 ESS waves. The figure shows that social isolation remained relatively stable over time. We note a slight increasing trend from 2008 for the full sample and most of the age groups. Yet, there is no significant change in social isolation following the widespread adoption of social media networks.
Unfortunately, we cannot properly examine time variations in loneliness, as the data on loneliness covers a much shorter time frame (2006-2014).

4 The profile of lonely and socially isolated individuals

4.1 Estimation method

We estimate the following equation to assess the determinants of loneliness and social isolation:

$$\mathbf{Y}_{\text{ict}} = \mathbf{X}_{\text{ict}}\beta + C_c + T_t + \epsilon_{\text{ict}}. \tag{1}$$

where y_{ict} measures frequent loneliness or social isolation for individual i living in country c at time t whilst $\boldsymbol{X_{ict}}$ is a vector of variables capturing the socio-economic status as well as the demographic and household characteristics of individual i. More specifically, $\boldsymbol{X_{ict}}$ includes information on gender, age, migrant and health status, household type (presence of children, marital status), the education level, labour market and occupational status of individual i, the financial situation of his/her household as well as information on the living area (rural, large cities). C_c and T_t are respectively country and year fixed effects. Table 2 describes each of the variables included in equation (1). Equation (1) is estimated with a logistic model on the full sample as well as separately by macro-region.[10]

[9] As explained by the authors, the relationship between loneliness and social media is bidirectional as loneliness affects the way individuals employ social media technologies. Jung and Sundar (2021) suggest that social medial could help the elderly to feel less isolation whereas Crenna-Jennings (2021) find that heavy social media use is associated with lower well-being among children and adolescents. Other recent studies include Allcott et al (2020) and Beyens et al (2020).

[10] Estimates based on linear probability models provide similar results.

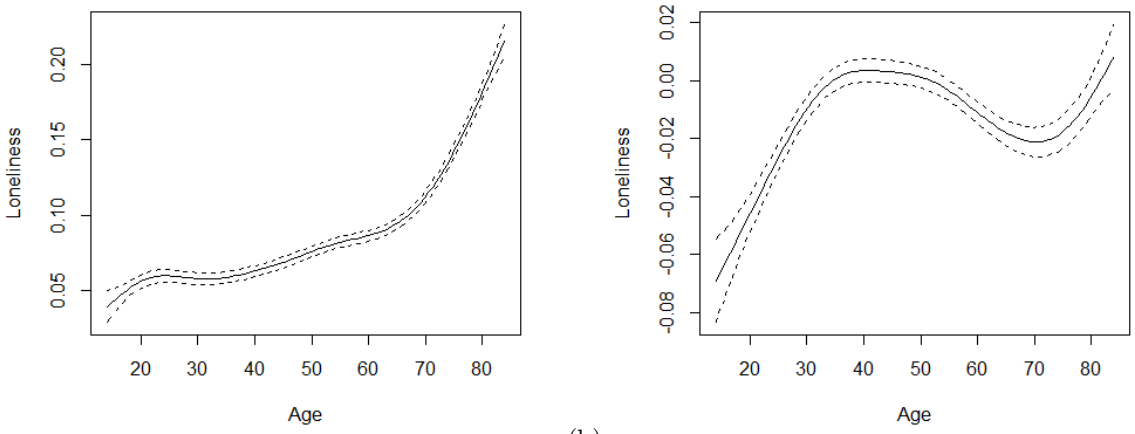
In the last part of the next section, we assess the relative importance of the covariates included in equation (1). This normally involves decomposing the variance, or, equivalently, its R-squared (Grömping, 2006 and 2015). Note that this implies that for the decomposition, equation (1) is estimated with a linear probability model. This is not problematic as estimates based on linear probability or logit models tend to provide similar results. More specifically, we examine the relative contribution of each variable on the right-hand side of equation (1) to the model's total explanatory power. The approach accounts for the dependence of partial R-squared on the order of entrance of covariates in equation (1) by averaging over all possible orders.

4.2 Empirical results

Columns 1 of Appendix Tables 4 and 5 display the estimates of equation (1) on the full sample when y_{ict} respectively measures frequent loneliness and social isolation. In order to ease the reading of the findings, a selected set of factors contributing to loneliness are also displayed in Figures 6 and 7. The "diamonds" depict the percentage point differences in terms of loneliness and social isolation between a person with the individual characteristics reported on the y-axis and their reference group reported in bold. The horizontal lines through these diamonds represent the 95% confidence intervals.

Both frequent loneliness and social isolation are related to individuals' demographic characteristics. The elderly suffer from far more social isolation than other age groups. Compared to those aged 18 to 25, adults aged 65 and over are 17 percentage points more likely not to engage often in social activities. This figure is above 28 percentage points in Eastern Europe and equal to 11 percentage points in Northern Europe. Family ties and varying cultures and closeness of friendships might drive regional variations (Sudström, 2009, Dykstra, 2009). Overall, social isolation appears to increase linearly with age. On the other hand, all other things being equal, frequent loneliness is not a specificity of the elderly. Although respondents aged 65 or more are 1 percentage point more likely to feel frequently lonely then young adults (18-25 years old), the confidence intervals associated with the point estimates of the three age category dummies (25-45, 46-64 and 65 + years old) overlap. Such result goes against previous research pointing out a U-shaped relationship in European countries (Yang & Victor, 2011; Dykstra, 2009, Luhmann and Hawkley, 2016). On the other hand, in a recent study covering 237 countries, islands and territories, Barreto et al (2021) report a negative association between loneliness and age. Yet, our finding can be explained if the expectation from the society is that loneliness is

Figure 4: Nonlinear relationship between Loneliness and Age



(a) (b)

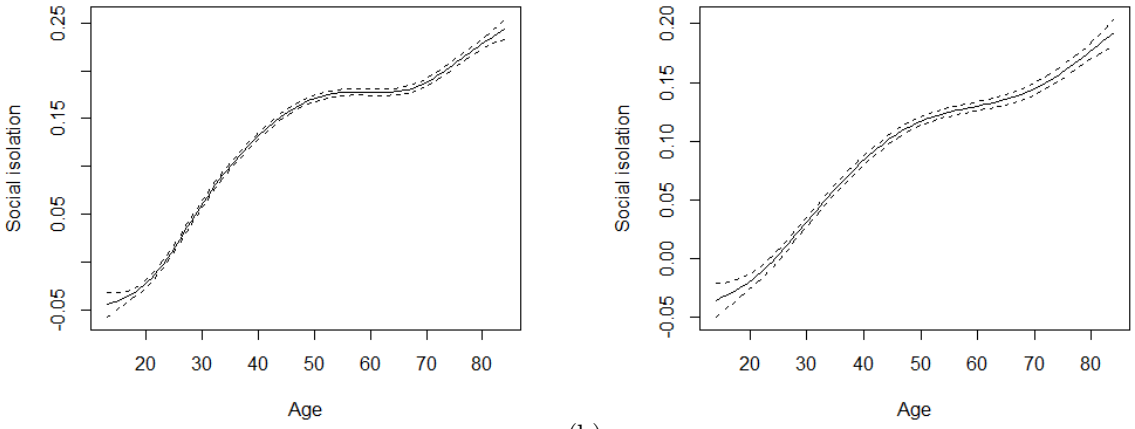
Note: The figure (a) on the left plots the unconditional relationships between loneliness and age. Instead of using age group dummies, we employ a smooth non-linear function. In the figure (b) on the right hand side , we account for the linear effect of the covariates included in equation (1).

particularly prevalent among the seniors (e.g. due to the loss of loved ones or the shrinking of social networks), and that the feeling of loneliness of a senior is determined by its relative evaluation with respect to its peer group. In that case, the elderly may not posit themselves as lonely even though they live in greater social isolation than other population groups. As shown in the Figures 4 and 5, the positive linear relationship between age and social isolation and the absence of it between age and loneliness is confirmed when age is entered nonlinearly in equation (1) whilst the other covariates remain the same as those presented in Tables 4-5.

As in Sundström et al. (2009), macro-regional estimates show that there is not a significant relationship between loneliness and age in Western and Northern European countries. Women appear to be slightly more prone to loneliness than men whilst there are no gender differences in terms of social isolation.[11] Interestingly, macro regional estimates indicate that there are no gender differences in loneliness neither in Southern nor in Northern Europe. Similarly, women tend to be more socially isolated than men in Eastern and Southern Europe whereas the opposite is observed in Western Europe: in other words, females report more loneliness but less social isolation than males in this region.

[11] See Luhmann and Hawkley, 2016 for a similar result on loneliness with German data.

Figure 5: Nonlinear relationship between Social Isolation and Age



(a) (b)

*Note:*The figure (a) on the left plots the unconditional relationship between social isolation and age. Instead of using age group dummies, we employ a smooth non-linear function. In the figure (b) on the right, we account for the linear effect of the covariates included in equation (1).

Frequent loneliness and social isolation are linked to family arrangements. Face-to-face connections with close family lower the incidence of loneliness. Single individuals have, on average, 8-percentage-point higher risk of being frequently lonely than individuals living with a partner, in spite of meeting socially more often. As shown in Fokkema et al (2009), living alone is key in triggering loneliness, and this despite the fact that new digital communication channels have widely facilitated contacts with people living outside the household. Not having children at home also significantly contributes to frequent feelings of loneliness, even though such people meet socially more often. Regional variations are substantial. Whereas individuals living without a partner face a 5-percentage-point higher risk of frequent loneliness in Northern Europe, this figure doubles in Eastern Europe. Not surprisingly, the widowed are also 4 percentage-point more likely to be lonelier. Although being widowed is also linked to a reduced frequency of social contacts, the magnitude of the effect is lower than what we observe for loneliness.

Favorable economic circumstances protect against frequent loneliness and social isolation. This is in line with the existing literature (e.g. Luhmann & Hawkley, 2016; Cohen-Mansfield et al., 2009; Savikko et al., 2005). More specifically, individuals reporting to live comfortably on present income have a 9-percentage-point lower chance of feeling lonely compared to their counterparts declaring that it is very difficult to live with cur-

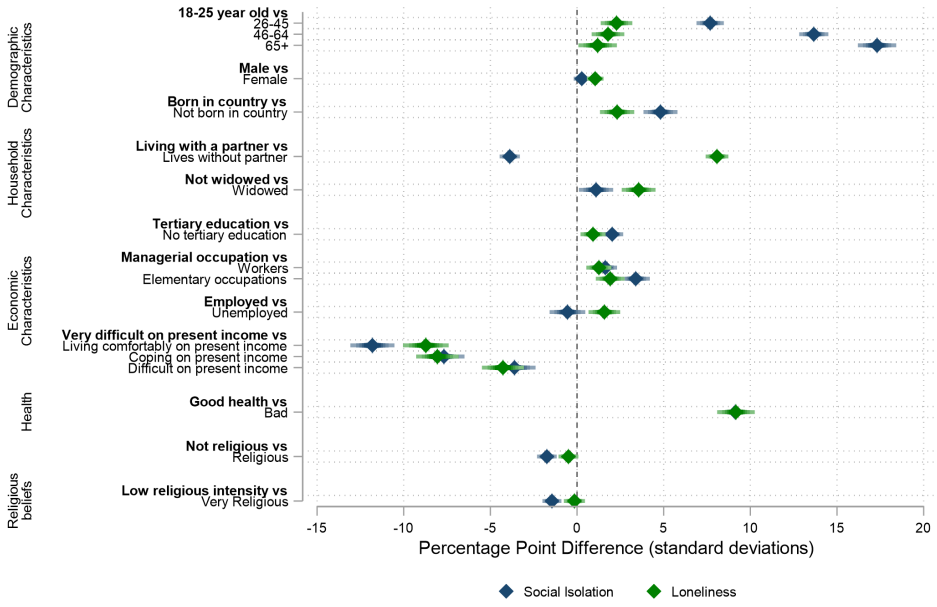
rent income. Similarly, the unemployed as well as those occupying elementary positions are each about 2 percentage points more likely to feel frequently lonely than respectively the employed respondents and those being managers or professionals. Education is also associated with less frequent loneliness. Macro-regional variations underline that loneliness results from the interplay of individual and environmental factors (Fokkema et al, 2009, Dykstra, 2009). Income is significantly more important in Eastern Europe than in Northern Europe in protecting against loneliness.

Engaging in social activities also requires adequate income. Respondents comfortable with present income are between 9 (Southern Europe) and 15 percentage points (Eastern Europe) less likely to be socially isolated than respondents stating that it is very difficult to rely on present income. Financial constraints lead to difficulties in maintaining one's social network. In addition, as one climbs the ladder of occupations (from no occupation to elementary positions, workers, technicians until managers and professionals) the probability of meeting socially with friends, relatives or work colleagues once a month or less decreases. Furthermore, education provides more opportunities to meet socially.

In line with previous literature (De Jong Gierveld and Van Tilburg, 2010; Sundström et al., 2009; Nicolaisen and Thorsen, 2014, Luhmann and Hawkley, 2016), poor health is highly associated with both loneliness and social isolation. Individuals with health issues are, all other things being equal, 9 percentage points more likely to be frequently lonely or socially isolated compared to their healthier counterparts. These figures are equivalent to an increase in frequent loneliness by 100% and in social isolation by 50%. Regional analysis shows that in Eastern Europe the difference between the unhealthy and healthy amounts to 11 percentage points for frequent loneliness, and in Northern Europe, 7 percentage points. This is to be expected, in particular if health problems are linked with reduced functional capacities. Health and social welfare systems may have a role to play in offering services to support lonely or socially isolated individuals with health issues.

Finally, on the full sample, religion seems to protect against loneliness to some extent and against social isolation, whereas differences in loneliness and social isolation between individuals in urban and rural areas are marginal. The former is probably due to the fact that attending religious services helps maintaining or even enhancing social ties between individuals who share common values and a sense of belonging to a similar community (Rote et al, 2013; Lim Putnam, 2010). We note, however, that the magnitude of the

Figure 6: Drivers of Loneliness and Social Isolation – full sample



*Note:*Figure based on the estimates reported in columns (1) of Tables 4-5 in the Appendix. The figure only displays a selected set of coefficients.

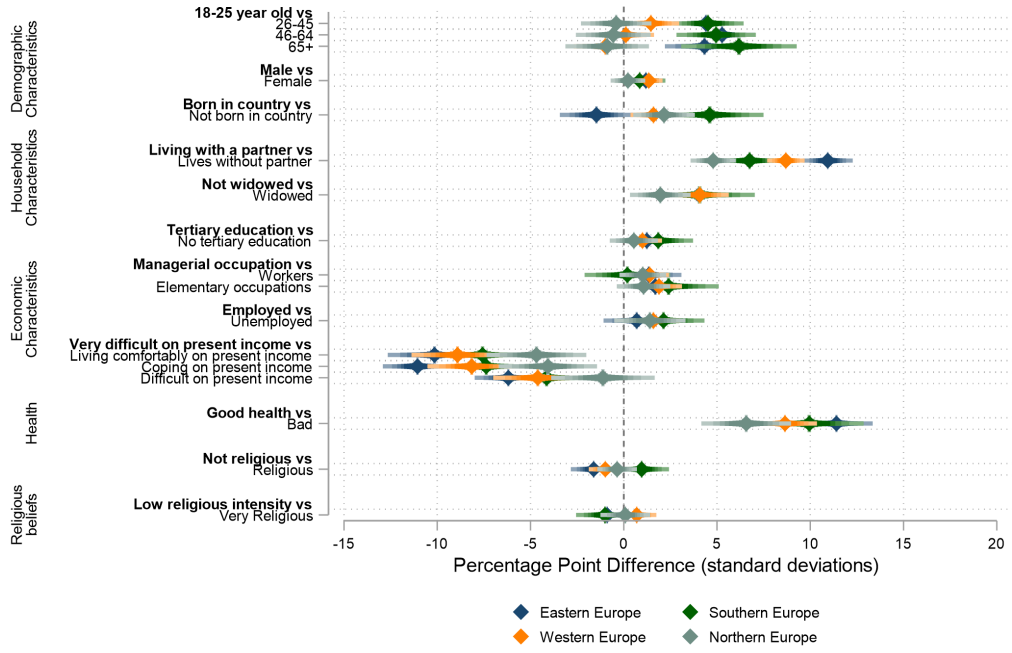
effect is very low and not uniform across macro-regions.

When we group the covariates included in equation (1) into 6 broad categories (socio-economic status, health status, demographic characteristics, household characteristics, religious beliefs and localization) in order to measure the relative contribution of each of them to the model's total explanatory power, some interesting patterns emerge. As shown in Figure 8, the household characteristics of the respondents contribute substantially to loneliness (37.6%) whereas, in comparison, they do not explain much of the explained variability of social isolation.

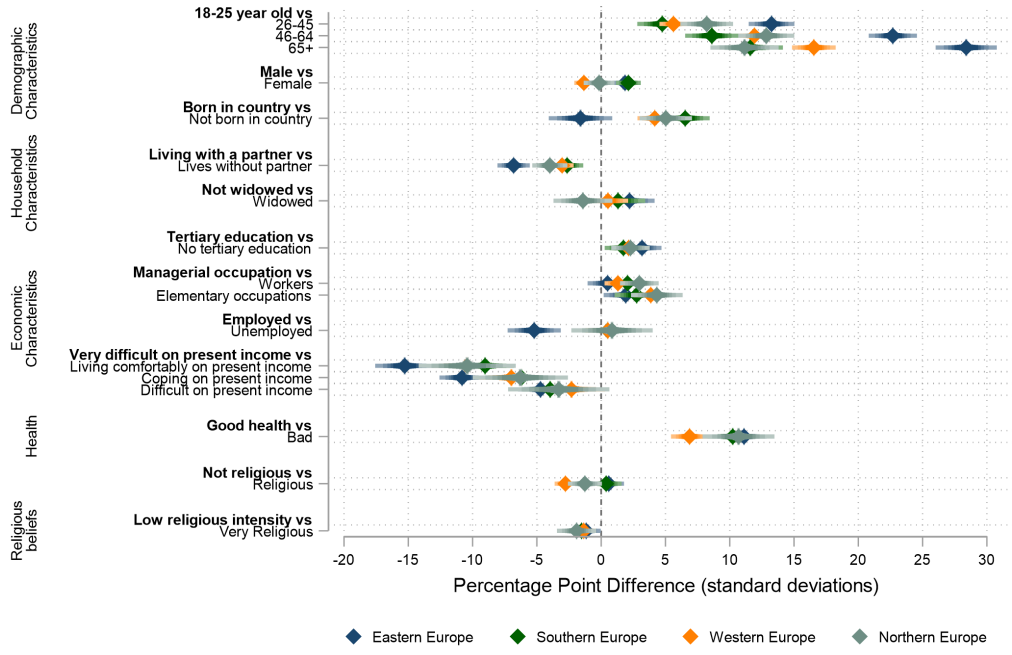
This is also confirmed for the macro regions except Northern Europe. Similarly, a comparatively large share of the variation in loneliness is driven by the health status of the respondents (24.6%). This is particularly striking in Northern Europe where we find that 35.5% of the R^2 in the loneliness equation is driven by differences in health status against 10.1% when y_{ict} measures social isolation. On the contrary, demographic characteristics explain twice as much variation across the sample in social isolation (10.3%) than in frequent loneliness (5%). This confirms what we already discussed earlier: ageing as well as the other demographics characteristics to a certain extent (gender, citizenship,

Figure 7: Drivers of Loneliness (top panel) and Social Isolation (bottom panel)

(a) Loneliness



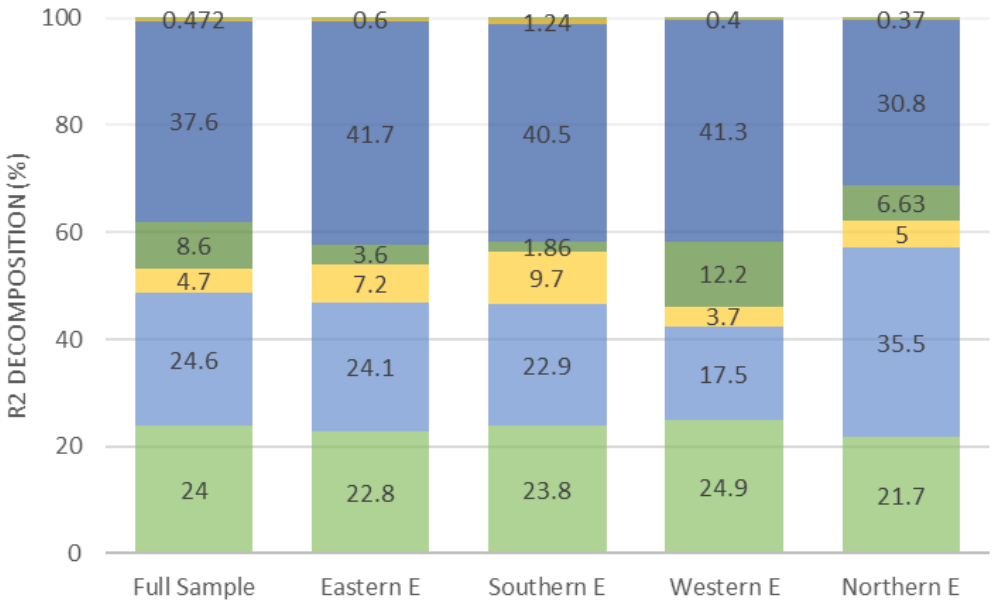
(b) Social Isolation



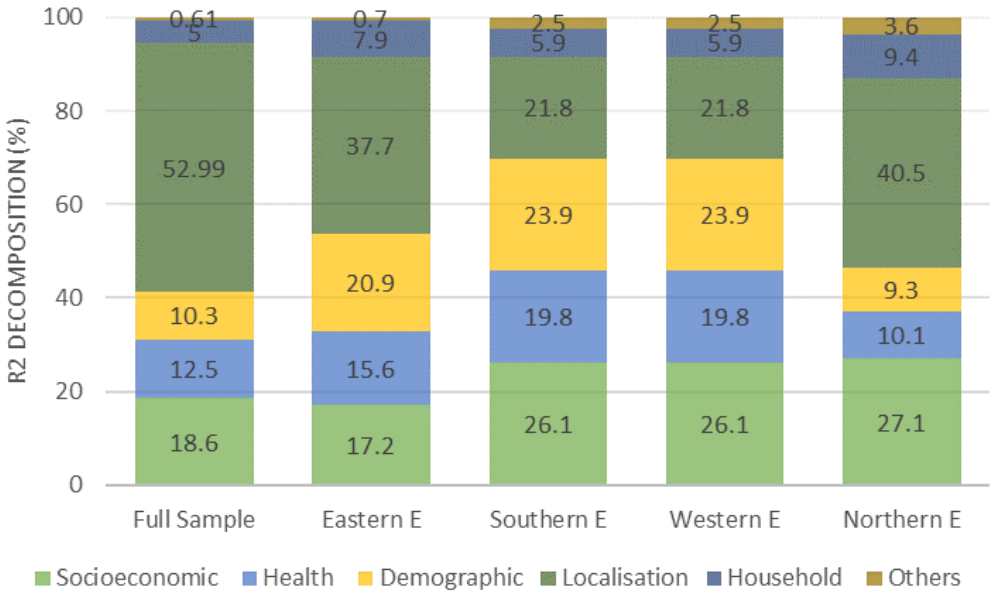
Note: The Figures are based on the estimates reported in columns (2-6) of Table 4 (top panel) and Table 5 (bottom panel) in the Appendix. The figures only displays a selected set of coefficients.

Figure 8: Relative importance of risk factors for Loneliness (top panel) and Social Isolation (bottom panel)

(a) Loneliness



(b) Social Isolation



Note: Each category includes the following covariates: (i) demographic characteristics (age, gender, citizenship), (ii) socioeconomic status (education, labour market status, occupation, income), (iii) household characteristics (living arrangements, marital status presence of children), (iv) health status, (v) localization (country fixed effects, living area indicator) and (vi) religious beliefs. Taken together the covariates explain about 11% of the total variance in loneliness and social isolation.

migration background) are associated with a number of challenges (poor health, income difficulties, loss of loved ones, shrinking network, etc.). Once this is accounted for, the demographic characteristics of the respondents do not matter much. Overall, the socio-economic characteristics of the respondents contribute to almost one fifth to one fourth of the explainable variance in frequent loneliness and social isolation. The socio-economic conditions matter in all macro EU regions.

Finally, the geographical location explains more than 50% of the explained variance of social isolation whilst it explains less than 10% of the R^2 in the loneliness equation. This highlights that a large part of the variability in social isolation is due to country-specific characteristics, i.e., social participation is largely shaped by the socio-cultural country context.

5 Conclusion

The purpose of this paper is to offer a comparative overview of the incidence and determinants of loneliness and social isolation in Europe in the pre-COVID-19 period. Data from the European Social Survey are used to investigate the risk factors for social isolation (over the 2002-2018 period) and loneliness (2006-2014).

The descriptive results indicate that 8.6% of the adult population in Europe suffer from frequent loneliness and 20.8% from social isolation, with eastern Europe recording the highest prevalence of both phenomena. No significant changes are observed in the incidence of social isolation over the period of the study.

The empirical analysis shows that favourable economic circumstances protect against loneliness and social isolation, while living alone and poor health constitute important loneliness risk factors. Although social isolation increases with age, the elderly do not report more frequent feelings of loneliness than other age groups, all other things being equal. The relative contributions of the set of objective circumstances included in the empirical analysis — demographic characteristics, socio-economic conditions, living arrangements, health status, religious beliefs and geographical location — to loneliness and social isolation vary substantially. Geographical location contributes to more than 50% of the explained variance in social isolation but less than 10% of the variability of loneliness. At the same time, the health status and household characteristics of respondents

contribute substantially to loneliness, but do not explain much of the variability of social isolation.

Data limitations precluded an investigation of the role of social media in protecting against or increasing the risk of social isolation and loneliness. However, this is certainly something that needs to be addressed in future pan-European studies on loneliness. Future research should also examine whether loneliness influences civic behaviour and, more broadly, attitudes towards others and general trust, two important components in the functioning of liberal democracies.

Social connections are critical in our daily lives. The distress experienced worldwide over the past year is, in part, driven by limitations on social interactions. The forced social distancing experienced since March 2020 and the economic effects of the pandemic are likely to have long-term consequences. A forthcoming study will evaluate the extent to which the current situation has exacerbated the problems of those who were already lonely and whether the composition of the population most at risk of social isolation and loneliness has changed during this unprecedented period.

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Appendix

Table 2: Construction of variables and summary statistics

Variable	Original question	Original answers	New categories
Tertiary education	What is the highest level of education you have successfully completed?	ISCED I (less than lower secondary) ISCED II (lower secondary) ISCED IIIb (lower tier upper secondary) ISCED IIIa (upper tier upper secondary) ISCED IV (advanced vocational, sub-degree)	No tertiary education (0)
		ISCED V1 (lower tertiary, BA level) ISCED V2 (higher tertiary, >=MA level)	Tertiary education (1)
Gender	Coded by interviewers	-	Male (0) Female (1)
Marital status	[…] Which one of the descriptions on this card describes your legal marital status now?	Legally married In a legally registered civil union Legally separated Legally divorced/civil union dissolved None of these (never married or in civil union)	Not widowed (0)
		Widowed/civil partner died	Widowed (1)
Living with children in household	Coded by interviewers	-	Living with children (0) Living without children (1)
Living with partner in household	Coded by interviewers	-	Living with partner (0) Living without partner (1)
Living area	Which phrase on this card best describes the area where you live?	A big city Suburbs or outskirts of a big city Town or small city	Urban (0)
		Country village Farm or home in countryside	Rural (1)
Migrant status	Were you born in [country]?	-	Not born in country (1)
Age group	And in what year were you born?	Age calculated based on year of birth	18-25 (1) 26-45 (2) 46-64 (3) 65+ (4)
Occupation group	What is/was the name or title of your main job? In your main job, what kind of work do/did you do most of the time? What training or qualifications are/were needed for the job?	Categories as given by ISCO-88 and ISCO-08	Managers and professionals (1) Technicians (2) Workers (3) Elementary Occupations (4) None (5)
Labour market status	And which of these descriptions best describes your situation (in the last seven days)?	Paid Work	Employed (1)
		Education	In education (2)
		Permanently sick or disabled Retired Housework, looking after children, others	Not in labour force (3)
		Unemployed, looking for job Unemployed, not looking for job	Unemployed (4)
		Community or military service	Not considered (-)
Household income	[…]Which of the descriptions on this card comes closest to how you feel131 about your household's income nowadays?	Living comfortably on present income	Living comfortably
		Coping on present income	Coping on present income
		Finding it difficult on present income	Finding it difficult on present income
		Finding it very difficult on present income	Finding it very difficult on present income
Health status	How is your health in general? Would you say it is ...	Very Good Good	Good (1)
		Fair	Fair (2)
		Bad Very Bad	Bad (3)
Religion	Do you consider yourself as belonging to any particular religion or denomination? If yes, which one?	Roman Catholic Protestant Eastern Orthodox Other Christian denomination Jewish Islamic Eastern religions Other non-Christian religions	Religous
		None	Not religious
Religious intensity	Regardless of whether you belong to a particular religion, how religious would you say you are?	0 (not religious at all) 1, 2, 3 ….10 (Very religious)	Religious intensity high (7-10)

Notes: For frequent loneliness ESS waves 5 (2010), 6 (2012), 7 (2014) and 9 (2018) are pooled together. For social isolation, all 9 ESS waves are pooled together

Table 3: Explanatory variables - summary statistics

	Shares
Age category	
18-25	0.12
26-45	0.34
46-64	0.33
65+	0.21
Gender – Female	0.52
Migrant status	
Not born in country	0.10
Education	
No tertiary education	0.77
Labour market status	
Employed	0.53
In education	0.06
Not in labour force	0.35
Unemployed	0.06
Occupation	
Managers and professionals	0.21
Technicians	0.15
Workers	0.38
Elementary occupations	0.20
None	0.06
Income	
Very difficult on present income	0.29
Living comfortably on present income	0.49
Coping on present income	0.17
Difficult on present income	0.05
Cohabitation status	
Lives without partner	0.36
Marital status	
Widowed	0.07
Cohabitation with children	
Lives without children	0.59
Self-reported health	
Good	0.64
Fair	0.27
Bad	0.09
Religion	
Religious	0.39
Religious intensity	
Very Religious	0.29
Living area	
Rural	0.36

Note: Country and time dummies are included in all estimates. These summary statistics are based on the sample used for estimating the risks factors associated with social isolation (2002-2018).

Table 4: Determinants of frequent loneliness

	Full Sample	Eastern E	Southern E	Western E	Northern E
Age category (Ref.: 18-25)					
26-45	0.02***	0.04***	0.05***	0.01*	-0.00
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
46-64	0.02***	0.05***	0.05***	0.00	-0.01
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
65+	0.01**	0.04***	0.06***	-0.01	-0.01
	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
Gender - Female	0.01***	0.01**	0.01	0.01***	0.00
	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)
Migrant status - Not born in country	0.02***	-0.01	0.05***	0.02**	0.02**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Education - No tertiary education	0.01**	0.01	0.02*	0.01*	0.01
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
Labour market status (Ref.: Employed)					
In education	-0.02***	-0.03***	-0.01	-0.03***	-0.00
	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
Not in labour force	0.01***	0.01	-0.01	0.02***	0.01**
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
Unemployed	0.02***	0.01	0.02*	0.02**	0.01
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
Occupation (Ref.: Managers and professionals)					
Technicians	-0.00	-0.01	-0.01	0.00	-0.00
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
Workers	0.01***	0.01	0.00	0.01***	0.01
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
Elementary occupations	0.02***	0.02*	0.02*	0.02***	0.01
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
None	0.02***	0.01	0.02	0.03***	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Income (Ref.: Very difficult on present income)					
Living comfortably on present income	-0.09***	-0.10***	-0.08***	-0.09***	-0.05***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Coping on present income	-0.08***	-0.11***	-0.07***	-0.08***	-0.04***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Difficult on present income	-0.04***	-0.06***	-0.04***	-0.05***	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Cohabitation status (Ref.: Lives with partner)					
Lives without partner	0.08***	0.11***	0.07***	0.09***	0.05***
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
Marital status (Ref.: Not widowed)					
Widowed	0.04***	0.04***	0.04***	0.04***	0.02**
	(0.00)	(0.01)	(0.02)	(0.01)	(0.01)
Cohabitation with children (Ref.: Living with children)					
Lives without children	0.01**	0.02***	0.01**	0.00	-0.01**
	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)
Self-reported health (Ref.: Good)					
Fair	0.03***	0.04***	0.02**	0.03***	0.03***
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)
Bad	0.09***	0.11***	0.10***	0.09***	0.07***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Religion (Ref.: Not religious)					
Religious	-0.00*	-0.02***	0.01	-0.01**	-0.00
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)
Religious intensity (Ref.: not religious or religious intensity low)					
Very Religious	-0.00	-0.01	-0.01	0.01	0.00
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
Living area (Ref.: Urban area)					
Rural	-0.00	0.00	0.01	-0.01**	-0.01*
	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)
N	127,544	45,833	18,027	33,546	30,138

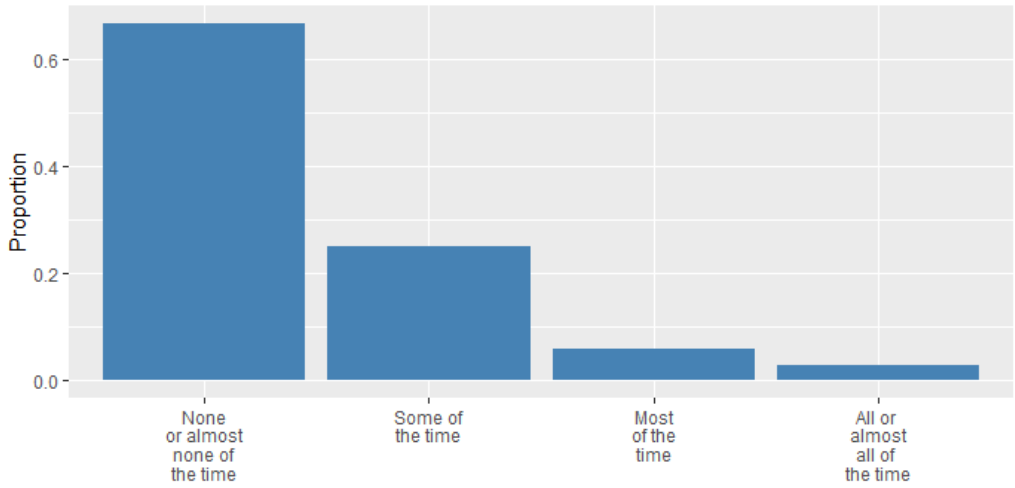
Note: European Social Survey – 2006, 2010, 2012 and 2014. Time and country fixed effects are included in all estimates..Standard errors in parentheses - * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Data weighted by post-stratification weights and population size weights.

Table 5: Determinants of social isolation

	Full Sample	Eastern E	Southern E	Western E	Northern E
Age category (Ref.: 18-25)					
26-45	0.08***	0.13***	0.05***	0.06***	0.08***
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
46-64	0.14***	0.23***	0.09***	0.12***	0.13***
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
65+	0.17***	0.28***	0.12***	0.17***	0.11***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Gender - Female	0.00	0.02***	0.02***	-0.01***	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
Migrant status Not born in country	0.05***	-0.02	0.07***	0.04***	0.05***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Education - No tertiary education	0.02***	0.03***	0.02**	0.02***	0.02***
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)
Labour market status (Ref.: Employed)					
In education	-0.07***	-0.18***	-0.05***	-0.05***	-0.05***
	(0.01)	(0.02)	(0.02)	(0.01)	(0.02)
Not in labour force	-0.02***	-0.03***	-0.01	-0.00	-0.04***
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
Unemployed	-0.01	-0.05***	0.01	0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
Occupation (Ref.: Managers and professionals)					
Technicians	-0.00	-0.00	-0.00	-0.00	0.01
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
Workers	0.02***	0.01	0.02**	0.01**	0.03***
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
Elementary occupations	0.03***	0.02**	0.03***	0.04***	0.04***
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
None	0.04***	0.04**	0.03**	0.05***	0.07***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
Income (Ref.: Very difficult on present income)					
Living comfortably on present income	-0.12***	-0.15***	-0.09***	-0.10***	-0.10***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
Coping on present income	-0.08***	-0.11***	-0.06***	-0.07***	-0.06***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
Difficult on present income	-0.04***	-0.05***	-0.04***	-0.02*	-0.03
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
Cohabitation with partner (Ref.: Living with partner)					
Lives without partner	-0.04***	-0.07***	-0.03***	-0.03***	-0.04***
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)
Marital status (Ref.: Not widowed)					
Widowed	0.01**	0.02**	0.01	0.01	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Cohabitation with children (Ref.: Living with children)					
Lives without children	-0.03***	-0.06***	-0.03***	-0.02***	-0.05***
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)
Self-reported health (Ref.: Good)					
Fair	0.04***	0.05***	0.04***	0.03***	0.06***
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)
Bad	0.09***	0.11***	0.10***	0.07***	0.11***
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
Religion (Ref.: Not religious)					
Religious	-0.02***	0.01	0.00	-0.03***	-0.01*
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)
Religious intensity (Ref.: not religious or religious intensity low)					
Very Religious	-0.01***	-0.01**	-0.02***	-0.01***	-0.02**
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)
Living area (Ref.: Urban area)					
Rural	-0.00	-0.01	0.00	-0.00	0.01
	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)
N	269,827	97,462	38,792	76,002	55,877

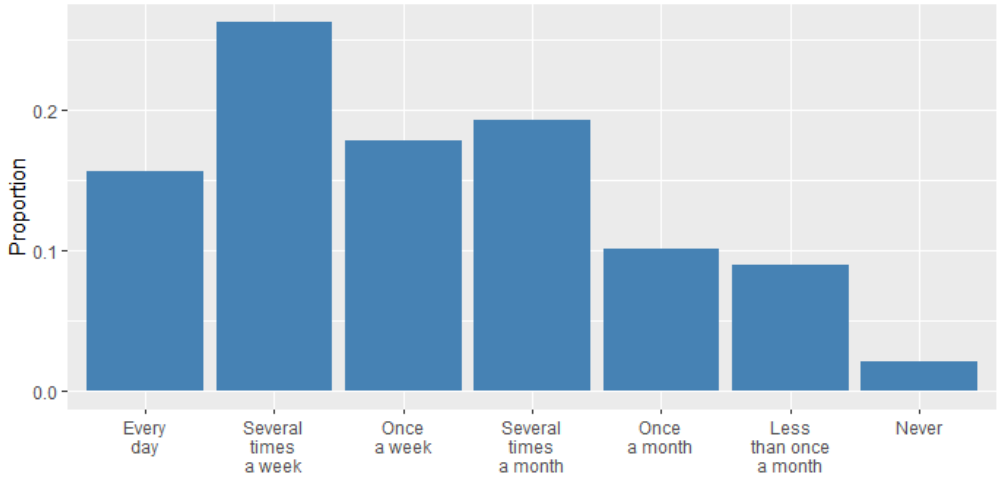
Note: European Social Survey – 2002-2018. Time and country fixed effects are included in all estimates.
Standard errors in parentheses - * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Data weighted by post-stratification weights and population size weights.

Figure A1: Feeling of loneliness - frequency



Note: European Social Survey – 2006, 2010, 2012 and 2014.

Figure A2: Meeting socially with friends, relatives or work colleagues - frequency



Note: European Social Survey – 2002-2018.

Appendix

Table 2: Construction of variables and summary statistics

Variable	Original question	Original answers	New categories
Tertiary education	What is the highest level of education you have successfully completed?	ISCED I (less than lower secondary) ISCED II (lower secondary) ISCED IIIb (lower tier upper secondary) ISCED IIIa (upper tier upper secondary) ISCED IV (advanced vocational, sub-degree)	No tertiary education (0)
		ISCED V1 (lower tertiary, BA level) ISCED V2 (higher tertiary, >=MA level)	Tertiary education (1)
Gender	Coded by interviewers	-	Male (0) Female (1)
Marital status	[…] Which one of the descriptions on this card describes your legal marital status now?	Legally married In a legally registered civil union Legally separated Legally divorced/civil union dissolved None of these (never married or in civil union)	Not widowed (0)
		Widowed/civil partner died	Widowed (1)
Living with children in household	Coded by interviewers	-	Living with children (0) Living without children (1)
Living with partner in household	Coded by interviewers	-	Living with partner (0) Living without partner (1)
Living area	Which phrase on this card best describes the area where you live?	A big city Suburbs or outskirts of a big city Town or small city	Urban (0)
		Country village Farm or home in countryside	Rural (1)
Migrant status	Were you born in [country]?	-	Not born in country (1)
Age group	And in what year were you born?	Age calculated based on year of birth	18-25 (1) 26-45 (2) 46-64 (3) 65+ (4)
Occupation group	What is/was the name or title of your main job? In your main job, what kind of work do/did you do most of the time? What training or qualifications are/were needed for the job?	Categories as given by ISCO-88 and ISCO-08	Managers and professionals (1) Technicians (2) Workers (3) Elementary Occupations (4) None (5)
Labour market status	And which of these descriptions best describes your situation (in the last seven days)?	Paid Work	Employed (1)
		Education	In education (2)
		Permanently sick or disabled Retired Housework, looking after children, others	Not in labour force (3)
		Unemployed, looking for job Unemployed, not looking for job	Unemployed (4)
		Community or military service	Not considered (-)
Household income	[…]Which of the descriptions on this card comes closest to how you feel131 about your household's income nowadays?	Living comfortably on present income	Living comfortably
		Coping on present income	Coping on present income
		Finding it difficult on present income	Finding it difficult on present income
		Finding it very difficult on present income	Finding it very difficult on present income
Health status	How is your health in general? Would you say it is ...	Very Good Good	Good (1)
		Fair	Fair (2)
		Bad Very Bad	Bad (3)
Religion	Do you consider yourself as belonging to any particular religion or denomination? If yes, which one?	Roman Catholic Protestant Eastern Orthodox Other Christian denomination Jewish Islamic Eastern religions Other non-Christian religions	Religous
		None	Not religious
Religious intensity	Regardless of whether you belong to a particular religion, how religious would you say you are?	0 (not religious at all) 1, 2, 3 ….10 (Very religious)	Religious intensity high (7-10)

Notes: For frequent loneliness ESS waves 5 (2010), 6 (2012), 7 (2014) and 9 (2018) are pooled together. For social isolation, all 9 ESS waves are pooled together

Table 3: Explanatory variables - summary statistics

	Shares
Age category	
18-25	0.12
26-45	0.34
46-64	0.33
65+	0.21
Gender – Female	0.52
Migrant status	
Not born in country	0.10
Education	
No tertiary education	0.77
Labour market status	
Employed	0.53
In education	0.06
Not in labour force	0.35
Unemployed	0.06
Occupation	
Managers and professionals	0.21
Technicians	0.15
Workers	0.38
Elementary occupations	0.20
None	0.06
Income	
Very difficult on present income	0.29
Living comfortably on present income	0.49
Coping on present income	0.17
Difficult on present income	0.05
Cohabitation status	
Lives without partner	0.36
Marital status	
Widowed	0.07
Cohabitation with children	
Lives without children	0.59
Self-reported health	
Good	0.64
Fair	0.27
Bad	0.09
Religion	
Religious	0.39
Religious intensity	
Very Religious	0.29
Living area	
Rural	0.36

Note: Country and time dummies are included in all estimates. These summary statistics are based on the sample used for estimating the risks factors associated with social isolation (2002-2018).

Table 4: Determinants of frequent loneliness

	Full Sample	Eastern E	Southern E	Western E	Northern E
Age category (Ref.: 18-25)					
26-45	0.02***	0.04***	0.05***	0.01*	-0.00
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
46-64	0.02***	0.05***	0.05***	0.00	-0.01
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
65+	0.01**	0.04***	0.06***	-0.01	-0.01
	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
Gender - Female	0.01***	0.01**	0.01	0.01***	0.00
	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)
Migrant status - Not born in country	0.02***	-0.01	0.05***	0.02**	0.02**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Education - No tertiary education	0.01**	0.01	0.02*	0.01*	0.01
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
Labour market status (Ref.: Employed)					
In education	-0.02***	-0.03***	-0.01	-0.03***	-0.00
	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
Not in labour force	0.01***	0.01	-0.01	0.02***	0.01**
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
Unemployed	0.02***	0.01	0.02*	0.02**	0.01
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
Occupation (Ref.: Managers and professionals)					
Technicians	-0.00	-0.01	-0.01	0.00	-0.00
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
Workers	0.01***	0.01	0.00	0.01***	0.01
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
Elementary occupations	0.02***	0.02*	0.02*	0.02***	0.01
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
None	0.02***	0.01	0.02	0.03***	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Income (Ref.: Very difficult on present income)					
Living comfortably on present income	-0.09***	-0.10***	-0.08***	-0.09***	-0.05***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Coping on present income	-0.08***	-0.11***	-0.07***	-0.08***	-0.04***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Difficult on present income	-0.04***	-0.06***	-0.04***	-0.05***	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Cohabitation status (Ref.: Lives with partner)					
Lives without partner	0.08***	0.11***	0.07***	0.09***	0.05***
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
Marital status (Ref.: Not widowed)					
Widowed	0.04***	0.04***	0.04***	0.04***	0.02**
	(0.00)	(0.01)	(0.02)	(0.01)	(0.01)
Cohabitation with children (Ref.: Living with children)					
Lives without children	0.01**	0.02***	0.01**	0.00	-0.01**
	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)
Self-reported health (Ref.: Good)					
Fair	0.03***	0.04***	0.02**	0.03***	0.03***
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)
Bad	0.09***	0.11***	0.10***	0.09***	0.07***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Religion (Ref.: Not religious)					
Religious	-0.00*	-0.02***	0.01	-0.01**	-0.00
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)
Religious intensity (Ref.: not religious or religious intensity low)					
Very Religious	-0.00	-0.01	-0.01	0.01	0.00
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
Living area (Ref.: Urban area)					
Rural	-0.00	0.00	0.01	-0.01**	-0.01*
	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)
N	127,544	45,833	18,027	33,546	30,138

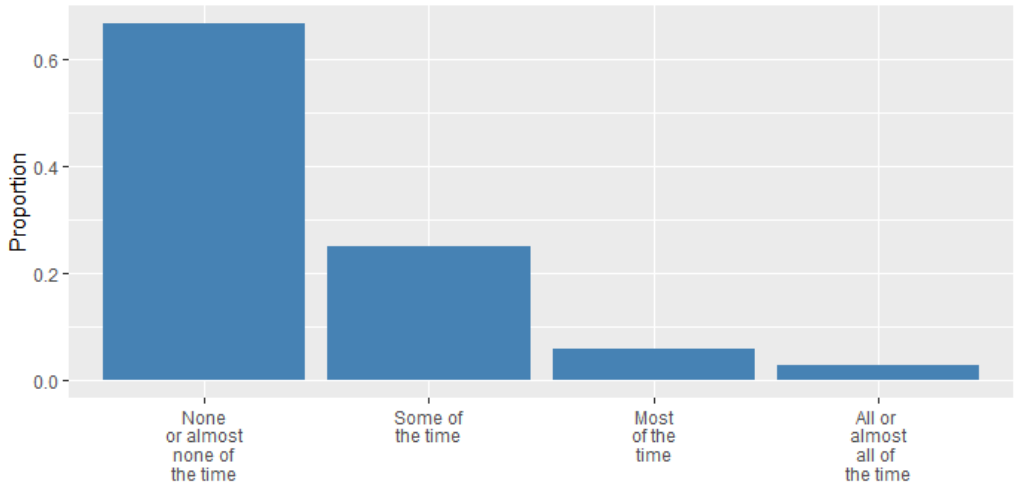
Note: European Social Survey – 2006, 2010, 2012 and 2014. Time and country fixed effects are included in all estimates..Standard errors in parentheses - * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Data weighted by post-stratification weights and population size weights.

Table 5: Determinants of social isolation

	Full Sample	Eastern E	Southern E	Western E	Northern E
Age category (Ref.: 18-25)					
26-45	0.08***	0.13***	0.05***	0.06***	0.08***
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
46-64	0.14***	0.23***	0.09***	0.12***	0.13***
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
65+	0.17***	0.28***	0.12***	0.17***	0.11***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Gender - Female	0.00	0.02***	0.02***	-0.01***	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
Migrant status Not born in country	0.05***	-0.02	0.07***	0.04***	0.05***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Education - No tertiary education	0.02***	0.03***	0.02**	0.02***	0.02***
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)
Labour market status (Ref.: Employed)					
In education	-0.07***	-0.18***	-0.05***	-0.05***	-0.05***
	(0.01)	(0.02)	(0.02)	(0.01)	(0.02)
Not in labour force	-0.02***	-0.03***	-0.01	-0.00	-0.04***
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
Unemployed	-0.01	-0.05***	0.01	0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
Occupation (Ref.: Managers and professionals)					
Technicians	-0.00	-0.00	-0.00	-0.00	0.01
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
Workers	0.02***	0.01	0.02**	0.01**	0.03***
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
Elementary occupations	0.03***	0.02**	0.03***	0.04***	0.04***
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
None	0.04***	0.04**	0.03**	0.05***	0.07***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
Income (Ref.: Very difficult on present income)					
Living comfortably on present income	-0.12***	-0.15***	-0.09***	-0.10***	-0.10***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
Coping on present income	-0.08***	-0.11***	-0.06***	-0.07***	-0.06***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
Difficult on present income	-0.04***	-0.05***	-0.04***	-0.02*	-0.03
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
Cohabitation with partner (Ref.: Living with partner)					
Lives without partner	-0.04***	-0.07***	-0.03***	-0.03***	-0.04***
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)
Marital status (Ref.: Not widowed)					
Widowed	0.01**	0.02**	0.01	0.01	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Cohabitation with children (Ref.: Living with children)					
Lives without children	-0.03***	-0.06***	-0.03***	-0.02***	-0.05***
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)
Self-reported health (Ref.: Good)					
Fair	0.04***	0.05***	0.04***	0.03***	0.06***
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)
Bad	0.09***	0.11***	0.10***	0.07***	0.11***
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
Religion (Ref.: Not religious)					
Religious	-0.02***	0.01	0.00	-0.03***	-0.01*
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)
Religious intensity (Ref.: not religious or religious intensity low)					
Very Religious	-0.01***	-0.01**	-0.02***	-0.01***	-0.02**
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)
Living area (Ref.: Urban area)					
Rural	-0.00	-0.01	0.00	-0.00	0.01
	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)
N	269,827	97,462	38,792	76,002	55,877

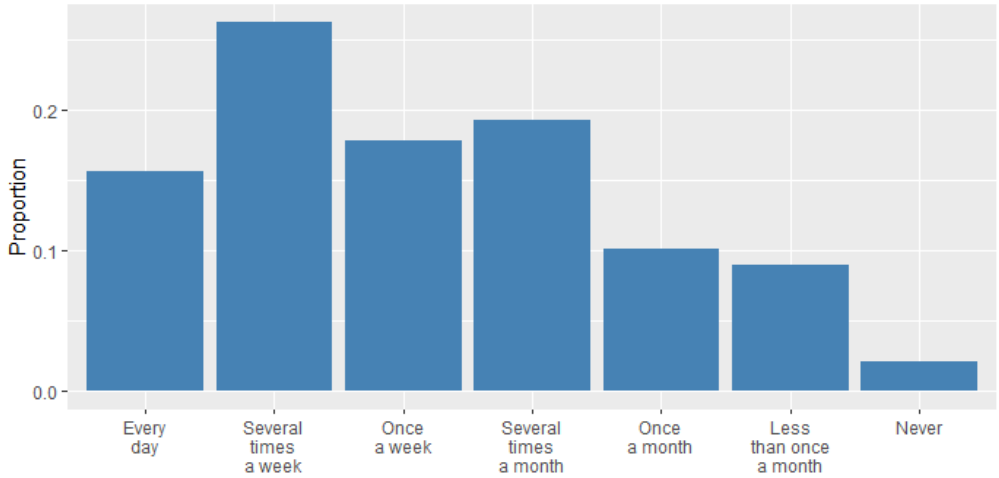
Note: European Social Survey – 2002-2018. Time and country fixed effects are included in all estimates.
Standard errors in parentheses - * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Data weighted by post-stratification weights and population size weights.

Figure A1: Feeling of loneliness - frequency



Note: European Social Survey – 2006, 2010, 2012 and 2014.

Figure A2: Meeting socially with friends, relatives or work colleagues - frequency



Note: European Social Survey – 2002-2018.