Differences in Social Isolation among European Elderly

University of Groningen

Faculty of Spatial Sciences

8 February 2024

Name: Daan van der Meulen

Studentnumber: S4537629

Supervisors: Mr. Vogt and Ms. Bister

Abstract

In the present era, marked by the increasing challenges of global aging, the imperative to comprehend social isolation among older adults is notably pronounced, particularly within the European context. The emergence of social isolation as a pertinent concept is underscored by its prevalence, affecting 20 to 34 percent of the elderly population in various European regions. This growing phenomenon necessitates heightened research attention due to its significance in addressing the multifaceted challenges associated with an aging demographic. Therefore, this study investigates the nuanced dynamics of social isolation among European adults aged sixty-five or older in an European context. In pursuit of this primary objective, the research delves into discerning variations in demographic, socio-economic and geographic features for different regions in Europe. Performing a linear regression analysis, including a constructed social isolation index made out of social isolation predictors as the dependent variable. The outcomes of this inquiry reveal significant patterns: a higher propensity for social isolation among elderly females, an escalating trend in social isolation with advancing age, an elevated social isolation prevalence among retirees, heightened social isolation rates in urban locales, and a contrasting lower incidence of social isolation in Southern European regions attributable to cultural factors. These findings contribute to a deeper comprehension of social isolation in the European context, thereby furnishing valuable insights for future research initiatives and offering a foundation for policymakers aiming to mitigate social isolation among the elderly in Europe.

Introduction

In 2021, the World Health Organization launched an advocacy brief about social isolation and loneliness among older people, showing the growing trend of social isolation of older people in different places in the world (World Health Organization, 2021). For example, a review of twenty-five studies is showing an increase of social isolation in China between 1995 and 2011, with now a third of the older population living in social isolation (World Health Organization, 2021). In the United States, approximately between a third to half middle-aged people are experiencing loneliness (World Health Organization, 2021). In Europe, a report was launched after the covid-19 pandemic with a doubling amount of lonely elderly in Europe, however the pandemic is over, its effects are still visible in European countries (European Commission, 2021). In October 2021, the World Health Organization launched an article about social isolation rates across Europe, with a third of the European population feeling socially isolated and 20 to 34 percent of de older European population feeling lonely. Consequently, the European union starts a new project funded by the EU Cohesion Policy to get people out social isolation (Velez, 2023). Social isolation that is highly correlated with the ageing of people, especially in the realm of life course transitions. Life course transitions in older age, characterized by events such as the loss of significant others through death, on average, result in elevated rates of social isolation. The implications of these transitions are anticipated to pose challenges in the foreseeable future. In 2050, the proportion of individuals aged 65 and older in Europe is expected to rise to 30%, compared to the current 20% (European Commission, 2021). Among the myriad issues confronting an aging global population, the imperative of sustaining robust and nurturing social networks in the later stages of life assumes pronounced importance. The tangible manifestation of inadequacies in such formidable and supportive social bonds is encapsulated by the term "social isolation". Hence, anticipations posit that social isolation will precipitate heightened challenges in the imminent future, like various negative health outcomes, such as cardiovascular disorders, functional decline and mental disorders and even death (Beridze et al., 2020). Initially neglected, the WHO now acknowledges the impact of social isolation on mortality,

placing it on par with recognized risk factors such as smoking, obesity, and physical inactivity. In its healthy aging agenda, the WHO elevates the significance of social isolation, signaling a proactive response to a previously overlooked aspect of public health. In addition to its emphasis on physical health, the World Health Organization actively acknowledges and addresses mental health concerns, encompassing issues such as cognitive decline, dementia, anxiety, and suicide, reflecting a comprehensive and integrated approach to global well-being. The exacerbation of social isolation and its adverse consequences during the recent COVID-19 pandemic underscores the imperative for acquiring relevant information to effectively address these outcomes in future public health endeavors. In contemporary academic research, there is an intensified focus on studying social isolation, yet the literature notably lacks comprehensive exploration of variations within European regions. In Europe, with completely different welfare and support systems within Europe and a markedly intricate tapestry of diverse regions, encompassing both rural and urban areas, social isolation may differ greatly. Studying these different social isolation rates for Europe are enhancing the understanding of the concept of social isolation in Europe, which provide information for further research to mitigate or reduce social isolation in Europe for older adults. This research aims to find out the difference of social isolation between older adults in Europe, therefore the main question is: What are the differences in social isolation of older adults (≥65) in Europe? Furthermore, three sub questions: Which personal characteristics influence social isolation rates? what are the differences in social isolation rates across European countries? and what are the differences of social isolation between rural and urban areas?. In relation to the personal characteristics, gender, age, education, household income, type of area and retirement status are tested and the European countries that are used in the study are divided into three different regions, northern European countries (Denmark and Sweden), central European countries (Austria, Belgium, France, Germany, Netherlands and Switzerland) and southern European countries (Italy, Spain and Greece).

Structure of thesis

This thesis is structured to commence with an elucidation of the research problem, anchored by clearly delineated research questions. Subsequently, a comprehensive literature review and theoretical framework, underscored by a conceptual framework, are presented to contextualize the study within existing scholarly discourse. Following this, the formulation of hypotheses, accompanied by plausible expectations, is expounded upon, setting the stage for the ensuing methodology that delineates the approach adopted for data analysis. The subsequent section of the thesis outlines and interprets the results derived from this analytical methodology. Finally, a nuanced conclusion is proffered, which not only summarizes the key findings but also contemplates the limitations inherent in the study. This structured narrative offers a cohesive and rigorous exploration of the research problem, contributing to the broader academic conversation, and is complemented by a meticulously curated reference list to substantiate the scholarly underpinnings of the thesis.

Theoretical Framework

The European population is ageing rapidly, the World Health Organization (2023) advocates for healthier lifestyles ensuring well-being in advanced years. Mental health will be a bigger problem than ever with one of the issues being social isolation or loneliness. This paper is researching the strength of social isolation in European regions. Social isolation can be seen as an objective measure indicating an individual's limited connections or relationships with others, encompassing family, friends and neighbours (Cotterell et al., 2018). Social isolation is not confused with loneliness, these concepts are often perceived as the same concepts. Social isolation is a result of a lack of support from friends, family and connections. On the contrary, loneliness can be articulated as a pervasive feeling of discontentment that an individual experiences within their social circle. This sentiment may

stem from a disparity between the existing relationships an individual maintains and the desired relationships they aspire to cultivate (Peplau & Perlman, 1979). Nevertheless, are both concepts correlated to each other, social isolation and loneliness have indicated a moderate to weak association in various studies (Cornwell & Waite, 2009; Steptoe et al., 2013). Both social isolation and loneliness exert notable impacts on the mental and physical well-being of older adults, underscoring their significance as imperative subjects warranting scholarly investigation. (Xia & Li, 2018). Hence, the importance of both concepts, this paper focusses only on the concept of social isolation due to the difficulty of researching loneliness, which needs a high number of in-depth interviews to give valuable answers that do justice to the research. Social Isolation can be investigated with a variety in objective measures that are published by research data centers. There are different central theory's concerning the issue of social isolation. In this paper, social exchange theory and social support theory are most prominent. First, the social exchange theory focuses on the idea that individuals engage in social interactions based on expectation of receiving awards and minimizing costs. Social isolation may occur when the perceived costs of social interaction outweigh the benefits, leading individuals to withdraw from social connections (Homan, 1958). In relation to social isolation, this means that the perceived costs of social interactions will be higher than the benefits, leading to social isolation. Secondly, social support theory focuses on the role of social support networks in buffering against the negative effects of stress and isolation. Lack of adequate social support can contribute to social isolation and its associated negative consequences (Rubinstein et al., 1994). During the latter part of life, there is an increase in variation of the amount of social support due to important life course events, for example the death of a spouse (Rubinstein et al. 1994). Therefore, social support can have a major influence on social isolation. Deriving from these theory's, extensive research about the topic has shown that there are various predictors for social isolation among older adults. In the study of Cotterell et al. (2018) four groups of predictors are defined, social isolation at the individual level like living alone or having no children, at the relationship level such as the frequency of contact with family and friends, at the community level for instance limited opportunities or low income and social disadvantages and at last at the societal level namely discrimination or marginalization. The study of Vozikaki et al. (2018) showing another approach to social isolation with two different functions. On the one hand, the structural aspect of social isolation, which entails more of the familial side of social isolation. Studying factors as living arrangements, marital status and family-relationships. On the other hand, the functional aspect of social isolation, focusing more on the social connections of an individual, with factors as social disconnectedness, in doing activities and a lack of social transactions (Vozikaki et al., 2018). Besides, other academic work reveal the relationships between mental and physical health and social isolation and loneliness. Victor and Bowling (2012) demonstrate the connection of an increase in chronic illness and social isolation, whereas Bosworth & Schaie (1997) the relationship between the rise in healthcare utilization as physician visits and the consumption of medication and loneliness display.

In researching social isolation, the amalgamation of pertinent concepts from the existing literature is orchestrated to formulate predictors, thereby establishing a comprehensive social isolation index as can be seen in figure 1. This index, in turn, holds the potential to furnish invaluable insights into the nuanced dynamics of how social isolation rates exert differential impacts on individuals across diverse demographic profiles, socio-economic strata, and varied European geographic settings. In scrutinizing disparities among participant groups, this study retrospectively examines the predictors, recognizing their inherent variability across diverse participant cohorts.

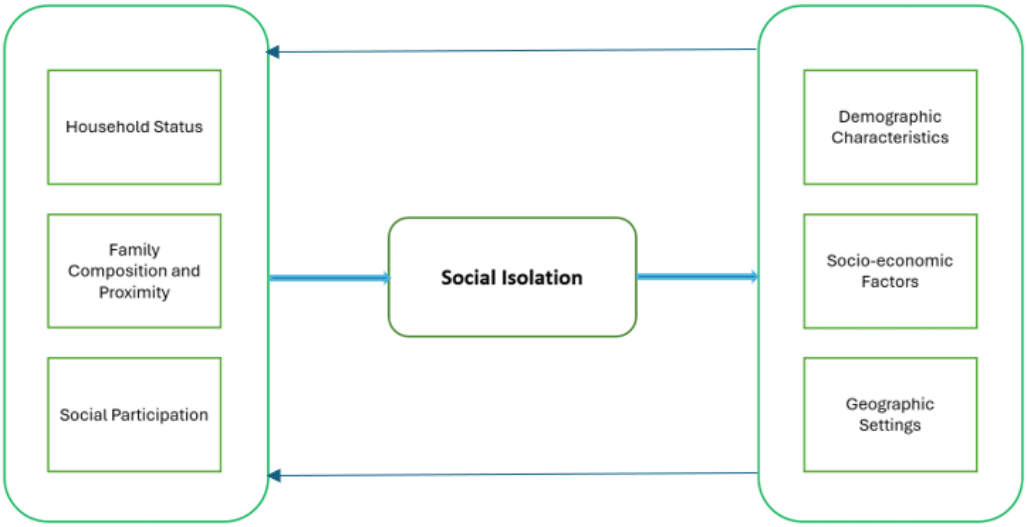
The predictors of social isolation are divided into three concepts, starting with predictors connected to the household status of people. At first, living arrangements delineate the relational dynamics between individuals and their partners, predicated upon the pivotal consideration of whether

cohabitation or spatial separation characterizes their shared domesticity. Secondly, Marital status is a socio-legal classification that denotes an individual's current formalized relationship status within the context of marriage, encompassing categories such as single, married, divorced, or widowed. Marital status is frequently used in similar papers about social isolation, for example likewise the social support theory, predicting the loss or bereavement on social isolation rates (Coyle et al., 2012). This paper centers its attention predominantly on the binary categorization of individuals with regard to their marital status, specifically emphasizing whether individuals are presently in a state of matrimony or remain unmarried. Furthermore, the concept of family composition and proximity are important as social isolation indicators. The concepts of children and siblings inherently carry their own implications. The numerical magnitude of offspring and siblings within an individual's familial framework can significantly contribute to the likelihood of social isolation (Beridze et al., 2020). In research, Furthermore, the spatial proximity of adult children, denoting the physical closeness of their residence in relation to their parents, emerges as a salient factor with potential ramifications on social isolation. Lastly, the participation in social activities can mitigate social isolation by fostering interpersonal connections, enhancing social support networks (Rubinstein et al., 1994). In the context of social isolation, an underlying predictor of paramount significance is the frequency of social interactions with individuals beyond one's immediate family. This determinant is consistently emphasized in the findings of three seminal research papers, which underscore the integral role played by social activities in understanding and addressing the multifaceted issue of social isolation (De Koning et al., 2017; Ejiri et al., 2018; Adams et al., 1989). The amalgamation of social isolation indicators coalesces into a comprehensive social isolation index, offering a structured framework for the examination of demographic attributes such as gender and age, socio-economic feature as educational attainment and residential location and European regional distinctions as different geographic settings. This reciprocal analysis facilitates a nuanced exploration, enabling a comprehensive understanding of the interplay between social isolation indicators and various features within a cohesive analytical framework. In predicting the effects of social isolation concerning gender, the analysis is limited to binary male and female classifications, despite the existence of a more diverse range of gender identities that have not been integrated into the data collection process of the utilized secondary data. Gender, a fundamental socio-cultural construct, plays a pivotal role in influencing individuals' social experiences and connections. Gender-related factors, such as societal norms, gender roles, and disparities in access to resources, can lead to differential experiences of social isolation between genders. Incorporating gender as a variable enables a comprehensive analysis of how gender-related dynamics contribute to variations in social isolation. Existing research is showing a negative trend for females towards males in social isolation rates, which is especially caused in changes of living arrangements and marital status (Umberson et al., 2022). Besides, age, a fundamental demographic characteristic, is known to exert a substantial influence on an individual's propensity for social isolation due to life stage transitions, changing social roles, and evolving social needs. Concerning the aging process, it is hypothesized that participants advancing in age may exhibit increased susceptibility to social isolation, due to lower activity levels and changes in household status (Taylor, 2022). Educational attainment, on the other hand, represents a crucial socio-economic factor that can shape one's social interactions by influencing employment opportunities, access to information, and participation in community activities. The study conducted by Vozikaki et al. (2018) reveals an inverse correlation, indicating that individuals with lower educational attainment exhibit a discernible negative trend, characterized by elevated levels of social isolation, diminished social participation, and fewer interpersonal partnerships. Lastly, geographic settings refer to different European regions, combining both the rural urban divide and different geographical and cultural regions in Europe. The delineation of urban and rural areas within the context of this study adheres to the prevailing European Union classification, where urban areas

are characterized as predominantly urban, while rural areas are defined as predominantly not urban. There are a view examples in academic research showing the difference of rural and urban areas in terms of social isolation or loneliness. The paper of Abshire et al. (2022) concludes that there is no evidence of a distinction between rural and urban social isolation rates in Washington State. In contrast, Havens et al. (2010) found out that there were significant different outcomes with respect to their geographical location in Manitoba. For example, a decline in cognitive and functional health in rural areas and only a decline in functional health for urban areas.

Furthermore, the study employs a regional categorization of European regions, partitioning them into northern Europe, central Europe, and southern Europe, with the primary objective of facilitating comparative analyses of social isolation rates among distinct European regions characterized by diverse economic structures, cultural values, and political systems. In northern Europe, higher levels of social isolation compared to southern Europe may stem from the stronger familial structures in the latter, where close intergenerational relationships are culturally prioritized, as noted by Tosi (2017). The integration of these predictors alongside participants' background characteristics is anticipated to elucidate distinctions in their patterns of social isolation, thereby addressing the research inquiries posed in this study.

Figure 1. Conceptual model Differences of Social isolation of European adults ≥65



Hypothesis/expectations

First of all,

1. Being women increases the risk to suffer to from social isolation at older ages

As a cause that women are more often living without partner and are divorced/widowed. Women live longer and therefore have a higher chance of surviving their partner (Umberson et al., 2022).

2. As participants age, the likelihood of experiencing social isolation in later life increases

Participants that get older are suspected to be more vulnerable for social isolation. Which is delineated by life events that augment susceptibility to social isolation and loneliness, encompassing the loss of a spouse, relatives, and intimate friends, geographic relocations, as well as assuming the role of a caregiver for both a spouse and relatives (Taylor, 2022).

3. A higher propensity toward social isolation is expected among older adults with lower levels of education

Consequently, this association is discerned through metrics such as social participation, partnership status, and the quantification of close interpersonal connections (Vozikaki et al., 2018).

4. Existing research showing not many differences, so it might be expected to see less differences in this paper as well.
5. Northern Europe tending to experience higher levels of social isolation compared to Southern Europe

This phenomenon may be attributed to the robust familial frameworks observed in southern European nations, wherein close and immediate intergenerational relationships are prevalent and held in high esteem by the elderly population. Within these societies, adult offspring grapple with pronounced cultural expectations that underscore the preservation of intimate life-course connections and sustained interactions with their parents (Tosi, 2017).

Methodology

Plan of analyses

Central research question:

What are the differences in social isolation of older adults (≥65) in Europe?

Sub questions:

1. Which personal characteristics influence social isolation rates?
2. What are the differences in social isolation rates across European countries?
3. What are the differences of social isolation between rural and urban areas?

The primary research question delves into the issue of social isolation among older adults, focusing on a specific demographic and geographic context. The use of quantitative methods, including secondary data analysis, is chosen due to the challenge of obtaining a large sample size with qualitative methods. This approach aligns with the established precedent in previous studies on social isolation. The sub-questions provide a more nuanced exploration. First, by considering personal characteristics, the study recognizes the diversity among older adults, enabling the identification of tailored interventions. Second, examining differences across European countries acknowledges the potential impact of cultural and economic factors. Lastly, recognizing distinctions between rural and urban areas adds a spatial dimension to the analysis, acknowledging the influence of environmental settings on social isolation.
In addressing the research questions, the determination of social isolation measurement holds significance. Building upon methodologies observed in analogous studies, where social isolation was either singularly recognized or encompassed in a composite index, this study adopts a comparable approach. Drawing inspiration from the literature, a self-constructed social isolation index is formulated, incorporating six established predictors. This index, explicitly devised for this study, serves as the dependent variable in the subsequent analysis. In the analysis involving personal characteristics and geographical settings as multiple independent variables, missing values in the dataset are deleted, after a multiple linear regression technique (Statistical Package for Social Sciences (SPSS) version 8.0) is utilized to ascertain their respective impacts on the constructed social isolation index. In the end, the findings are displayed in a correlation table, illustrating the associations among social isolation predictors and the independent variables. Additionally, a

regression table presents the magnitude of relationships between independent variables and the social isolation index, providing answers to the constructed research questions.

Dataset

Given the nature of our study, we chose to use existing data rather than collect new information for several practical reasons. There are many databases that track the aging process over time, and they provide access to large and diverse datasets that can give us a better understanding of social isolation among older people in Europe. These databases are attractive because they are cost-effective, ethically sound, reduce potential biases in data collection, and have reliable surveys already in place. Collecting new data from scratch can be expensive and time-consuming, especially for a study like ours, which deals with sensitive topics. The available secondary data sources comprise surveys that have been carried out by reputable institutions, providing a level of confidence in the reliability and accuracy of the data.

We have opted to conduct our research using the SHARE dataset, which is the basis for 'EasySHARE.' SHARE is a well-recognized survey program that started in 2004 and was designed to explore various aspects of the lives of people aged 50 and older across Europe. The multidisciplinary approach of SHARE enabled the detailed exploration of various aspects of the living conditions of middle-aged and older European adults, covering health, socio-economic factors, familial relationships and other domains for more than 85000 participants in 19 European countries. SHARE is unique because it allows us to compare data across different countries, which is especially important for our research to compare the social isolation for different regions in Europe. The latest version is the Easyshare 2020 dataset, which covers data collected between 2004 and 2020 across eight waves. It simplifies the data by combining information from all respondents and waves into one dataset, making it easier to work with. It also improves data quality by addressing issues like missing values.

The data was gathered through used the so-called computer assisted personal interviews (CAPI) added by self-conducted paper and pencil surveys in several European countries. The dataset ensured the representativeness of its samples at a national level by tailoring its sampling methods to each country’s unique resources. These methods included a range of approaches, such as stratified-simple, random sampling or multistage sampling in countries where national population or regional/local registers were accessible and single or multistage sampling in countries where telephone directories were used. In ensuring the privacy and confidentiality of the participants, SHARE must comply with the rules set by the General Data Protection Regulation of the European Union (Börsch -Supan et al., 2013). The rules entail obtaining informed consent, allowing voluntary participation, respecting participants' autonomy through the right to withdraw, ensuring secure data management, and safeguarding the anonymity of those involved in the study.

The SHARE dataset is carefully prepared to ensure data quality, covering all stages of data creation, from initial sampling to translation, fieldwork, and data processing. This meticulous approach to data handling follows stringent quality standards, as documented by Börsch-Supan et al. (2013).

Researchers wishing to access this valuable dataset are required to sign a data access agreement and adhere to SHARE's robust data security and protection policies, as elaborated upon by Börsch-Supan et al. (2013) in their work. As part of the access application, researchers must provide personal details and furnish information regarding their research project. SHARE maintains a commitment to safeguarding participant confidentiality and anonymity through robust data protection policies. Additionally, researchers themselves take proactive steps in ensuring data security. Specifically, they securely store the data in an encrypted folder, with exclusive access granted to the researcher and their project supervisor. This security protocol remains in effect throughout the research process, and

the data is permanently deleted when it is no longer required following the conclusion and evaluation of the research project.

The strict rules ensure that SHARE its access provisions align with the standards set forth in the European Charter for Access to Research Infrastructures. Additionally, SHARE adheres to global research ethics principles, including the Respect Code of Practice for Socio-Economic Research, Ethics Council of the Max Planck Society and the Declaration of Helsinki.

Operalization

The sample drawn from the Easyshare dataset comprises all pertinent information necessary to address the research questions. To maximize the informativeness of the data, all waves, with the exception of wave 3, are included. The exclusion of wave 3 is attributed to the absence of social isolation predictors such as marital status and geographical proximity of children in that particular wave. In addition, European adults aged higher than 65 are used for the sample, as a reason that 65 is the average retirement age of countries in the European union. In the dataset, some countries have missing values for some categories, consequently eleven countries in Europe have all data for the factors used in this study. The countries are divided into different European regions based on their geographical position, Denmark and Sweden for northern Europe. Austria, Belgium, France, Germany, Netherlands and Switzerland for central Europe and Greece, Italy and Spain for Southern Europe. This structure to divide all countries into regions is chosen, because it is easier to compare different regions instead of all countries. In the end, this results in a sample with 64095 cases.

A fundamental aspect of identifying social isolation in older individuals involves examining their lack of social connections and the absence of support networks. This approach aligns with a commonly accepted definition of social isolation as “an objective measurable state of having minimal contact with other people, such as family, friends or the wider community” (Cattan, 2002).

This paper assessed crucial elements related to the structural and functional aspects of social isolation in older individuals. Specifically, examining the structural dimension of social isolation by looking at factors like partnership (socially isolated if they are unpartnered), marital status (social isolated if they are unmarried), the number of children (less children tend to be more socially isolated) and the geographical proximity between older adults and their children (children that live within 1 km from their parents).

The functional dimension of social isolation was evaluated by considering social disconnectedness, which was determined by the absence of participation in social or productive activities (doing less vigorous activities monthly), as well as the scarcity of social exchanges. These exchanges were measured by the infrequency or absence of any form of functional assistance or support between older parents and their children (less social support from children in a month). Nevertheless, in the dataset a lot of data is missing for the social support from adult children to their parents, so this measure is excluded in the data analyses. In achieving a broader scope for the isolation index, the presence of siblings is taken into account, this means that if adults aged 65 or higher have siblings or not, because siblings can also provide valuable help or support.

In relation to these determinants, an index of social isolation is made. Consisting of points that were given to a participant if they lived unpartnered, were unmarried, had no children, had no siblings, did not live with their children and social disconnectedness, leading to a scale from zero to six. In relation to this threshold, it is easier to compare social isolation across different characteristics and countries.

Besides, the self-made social isolation index is treated as a dependent metric variable in order to do a linear regression technique for the data analysis. The social isolation indicators were made into dummy variables in which they were clustered from one to six into a new variable, the social isolation index. The social isolation index was analyzed according to the demographic factors as gender (binary, female = 1 and male= 0), age (metric), education (metric), area of location (binary) (urban or rural, urban = 1 and rural = 0), retirement status (binary, retired = 1) and regions from north to south (binary), with central Europe as the reference category.

Besides, the different features were examined as potential contributors to social isolation. In controlling these variables for a distinction between rural and urban areas, two groups were made. In the first group placing the respondents who live in considerably predominant urban areas, defined by SHARE as a big city or suburbs/outskirts of a city. In the second group, the group respondents who live in considerably predominant rural areas, defined by SHARE as a rural area or a village. Concerning missing data in the dataset, the demographic characteristic of household income is not taken into account.

Results

The socio-demographic characteristics of the participants are shown in table 1. Slightly more females participated in this survey than males (53,6% versus 46,4%). The mean age is 74,16 years (st. dev: 6,58, range 70-100). Among the 65095 older adults surveyed, the mean level of education, quantified in years, was determined to be 9,67 (st. dev: 4,59) and the predominant portion of the study cohort, compromising 83% was retired. Furthermore, almost half of the participants came from central European countries, one third from southern European countries and almost 20% from northern European countries as divided in the methodological section.

Table 1. Descriptive statistics of easySHARE data (n = 64095)

Variables	Categories	n	Percent (%)/ Mean ± SD	Min-Max
Age (years)		64095	74,16 ± 6,58	70-100
Gender	Females	34318	53.6	
	Males	29741	46.4	
Education (in years)		64095	9,76 ± 4,59	0-35
Retirement Status	Retired	53199	83.0	
	Not Retired	10896	16.9	
European Region	North	12093	18.9	
	Central	31924	49.8	
	South	20042	31.3	
Area of Location	Rural	74497	74.1	
	Urban	16562	25.9	

In elucidating the findings, an in-depth exploration is conducted through the utilization of table 2, wherein the correlations between social isolation factors and socio-demographic variables are systematically examined. At first, gender shows a higher tendency for women to be socially isolated in

table 3., in table 2 it can be seen that there is a positive correlation with regard to marital status (unmarried = 1) and living arrangements (without partner = 1), implying that women are more often unmarried and living without partner than man, which can be a cause for a higher social isolation. In similar studies this tendency is presented, likewise the paper of the Institute of Medicine of the National Academies (2014) showing that women are more likely to be widowed or divorced at an older age and therefore experiencing more often a lack of social support in later ages, which lead to an increasing social isolation rate. In addition, females also have a propensity to do fewer social activities (no activities =1) than man. Delving further into the statistical analysis of age, a logical outcome manifest. Likewise, the papers from Havens et al. (2004) and Kobayashi et al. (2009), European elderly showing a growing trend of social isolation when getting older. As individuals advance in age, there is a discernible decline in both the extent of their social support networks and the frequency of their social exchanges. Marital status and living arrangements showing a higher chance of elderly that are unmarried and living alone when they are older, probably caused by a higher chance of death of their partner at an older age. For siblings the same reasoning can be applied, participants at and older age have simply a higher chance of losing siblings. Pertaining to social activities, a positive direction is conveying that older adults will do fewer social activities. If adults get older, it becomes harder to participate in social activities, potentially increasing the social isolation. In relation to the theory, their costs of participating in social activities will just overweight the benefits of participating, which create a lack of social exchanges. Years of education is insignificant as shown in table 3., so these variables can be seen as not usable. Retirement (retired= 1) is indicating a small negative direction for marital status, living arrangements and social activities. Thus, European adults that are retired, are more often married and living with a partner and doing more activities. The study of Kobayashi et al.(2021) showing a similar trend of older adults that increase their activities after retirement in Japan. Furthermore, urban areas tend to be more socially isolated than rural areas, there is very little evidence about the reasons behind this result in the correlations. In relation to the correlations, adults in urban areas are slightly more likely to be unmarried, living without partner and have less siblings. Besides, the geographical proximity of children (living within 1 km) is higher for rural areas. In other studies, likewise the study from Henning-Smith et al. (2019), rural areas tend to be less socially isolated, because they can more rely on social support from their family. Finally, when looking into the European regions it stands out that northern European countries (central as well) have a higher tendency of children living further away than one kilometer and southern European countries showing an opposite tendency of children living often closer than one kilometer away. This discovery supports earlier research indicating that people from southern Europe tend to have more frequent contact with their parents compared to those from northern Europe (Tomassini et al., 2004). This difference may be attributed to the stronger emphasis on close family ties in southern European countries, where the elderly value and prioritize proximity to their adult children (Dykstra, 2009). Northern and central European countries are less married and partnered than southern Europe. Nonetheless, are participants from northern and central European countries doing more social activities than participants from southern European countries, which is also shown at the paper from Vozikaki et al. (2018).

Table 2. Correlations Factors of the Social isolation index with demographic characteristics

Correlations

		marital status	Living arrangements	children	siblings	Geographical proximity of Children	Social activities
Social_Isolation	Pearson Correlation	,766**	,767**	,009*	,323**	,363**	,483**
	Sig. (2-tailed)	0,000	0,000	0,019	0,000	0,000	0,000
Gender: female=1, male=0	Pearson Correlation	,276**	,298**	-0,005	,013**	-,013**	,099**
	Sig. (2-tailed)	0,000	0,000	0,170	0,001	0,001	0,000
Age at interview (in years)	Pearson Correlation	,232**	,263**	-,011**	,201**	-,037**	,262**
	Sig. (2-tailed)	0,000	0,000	0,006	0,000	0,000	0,000
Years of education	Pearson Correlation	-,061**	-,078**	,008*	-0,007	,208**	-,147**
	Sig. (2-tailed)	0,000	0,000	0,033	0,085	0,000	0,000
retirement	Pearson Correlation	-,052**	-,067**	0,001	-0,004	,099**	-,055**
	Sig. (2-tailed)	0,000	0,000	0,754	0,357	0,000	0,000
UrbanRural	Pearson Correlation	,037**	,039**	0,005	,031**	,053**	-,009*
	Sig. (2-tailed)	0,000	0,000	0,167	0,000	0,000	0,027
North	Pearson Correlation	,022**	-0,006	-0,001	-0,007	,209**	-,093**
	Sig. (2-tailed)	0,000	0,114	0,797	0,091	0,000	0,000
Central	Pearson Correlation	,035**	,030**	0,002	-,009*	,125**	-,027**
	Sig. (2-tailed)	0,000	0,000	0,540	0,025	0,000	0,000
South	Pearson Correlation	-,056**	-,028**	-0,002	,015**	-,311**	,108**
	Sig. (2-tailed)	0,000	0,000	0,658	0,000	0,000	0,000

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Table 3. presents the linear regression coefficients illustrating the relationship between social isolation and the various demographic factors, providing valuable insights into the nuanced associations within the studied population. First of all, the dummy variable gender with Female as 1, seems to have a positive tendency towards social isolation and females, which means that females are more often socially isolated than males. In relation to age, there is a weak relationship (0,328) between age and the social isolation index, however there is a significant change in the social isolation index if participants are older (0,060). The increase of 0,06 of the social isolation index, indicates that ageing is an important factor for social isolation. This paper cannot say anything about the relationship between education (in years) and social isolation because the relationship is insignificant, this can be caused due to the methodology of this paper. The social isolation index might miss certain aspects, which makes it too small to indicate a relationship with education in years. Besides, the dummy variable retirement (retired = 1) showing a very small positive relationship, who's not evident. Nevertheless, a positive relationship is expected, meaning that retired participants are more socially isolated than a participator that is still working. Furthermore, for the European regions, northern Europe is showing a small positive association and southern Europe a stronger negative tendency. In relation to the hypothesis this seems to be correct, in which cultural values are dominant. Southern European countries have more often closer family ties than Scandinavian countries. Central Europe was excluded in the statistical analyses, ascribed to the way in all the regions are categorized in dummy variables. Hence, it seems correct that northern regions tend to be more socially isolated and southern regions less socially isolated. Lastly, the difference between urban and rural areas resulted in a positive relationship (urban = 1), signifying that adults above 65

tend to be more socially isolated in urban areas like cities and suburbs of cities than in rural areas as small and big villages.

Table 3. Regression Coefficients Social Isolation related to Socio-demographic and Geographical Factors

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Variables	B	Std. Error	Beta		
Gender, Female= 1 Male= 0	0,615	0,009	0,253	67,116	0,000
Age (years)	0,061	0,001	0,33	91,246	0,000
Education (in years)	-0,003	0,001	-0,002	-0,41	0,682
Retirement, Retired= 1 Not Retired= 0	0,056	0,012	0,017	4,473	0,000
Northern Europe	0,042	0,012	0,014	3,586	0,000
Central Europe (Reference category)					1,000
Southern Europe	-0,306	0,011	-0,117	-28,478	0,000
Area, Urban= 1 Rural= 0	0,149	0,01	0,054	15,036	0,000

Discussion and Conclusion

This paper investigates the variations in social isolation among European individuals aged sixty-five or older. The findings reveal a notable gender disparity, wherein females exhibit a higher propensity for social isolation compared to males, particularly evident in the context of marital status, living arrangements, and social activities, all exhibiting a discernible negative trend. In relation to the theory, women are more often widowed or divorced in their later life, which causes higher social isolation rates (Institute of Medicine of the National Academies, 2014). Additionally, within the life-course perspective, age demonstrates an adverse association with social isolation rates (Rubinstein et al. 1994). As European older adults age, a discernible pattern emerges wherein a greater proportion resides alone, thus missing social support from their partners as Coyle et al. (2012) described in his paper. Besides, engaging in fewer social activities than in their earlier years, because the cost of going to the activities become too high likewise the social exchange theory (Homan, 1958). The examination of retirement status reveals a noteworthy elevation in social isolation among retired participants, possibly attributed to the geographical dispersion of their adult children who frequently reside farther away compared to non-retired counterparts. Paradoxically, retirees also exhibit an augmentation in marital status, living arrangements, and social activities, seemingly divergent from the anticipated outcome suggesting increased social isolation among retired individuals. The decision to retire seems to have a more significant influence on social isolation rates than the observed changes in activities, marital status, and living arrangements (Kobayashi et al. 2021). Additionally, the connection between retirement and social isolation is quite weak, which raises concerns about potential distortions in the results. In juxtaposing rural areas with urban counterparts, participants residing in rural locales exhibit a modestly lower prevalence of social isolation. This demographic subset appears to manifest a higher incidence of sibling relationships, a greater likelihood of cohabitation with a spouse, and an increased prevalence of marital status. Similar to other studies,

Empirical evidence suggests a higher level of social support within families residing in rural areas when compared to those in urban environments (Vozikaki et al.,2018). Upon examination of European regions, it becomes evident that Southern European locales tend to manifest lower levels of social isolation, a phenomenon ascribed to cultural values wherein adult children commonly reside in close proximity to or cohabit with their parents (Dykstra, 2009). Furthermore, Southern Europe exhibits heightened familial social cohesion, establishing a positive correlation with diminished instances of social isolation. Conversely, Northern and Central European regions yield comparable outcomes marked by elevated rates of social isolation.

The way in which the data is analyzed, can cause potential limitations. At first, simplification of complex concepts: Social isolation is a multifaceted and complex concept that may not be fully captured by the specific factors used in the index. In addition, the threshold of more than four factors to categorize participants as socially isolated may lack a strong theoretical or empirical basis. It might oversimplify the diversity of experiences related to social isolation. However, the measures are grounded in objective criteria, such as livening arrangements, marital status, parent-child contact and participation in social activities. This objectivity reduces the potential for subjective bias in assessing social isolation. Besides, creating an index with a range from one to six allows for a quantification of social isolation, enabling statistical analysis and comparing across groups.

Despite acknowledged limitations, this study's insights provide valuable contributions to understanding social isolation in Europe. The exploration of regional variations, considering diverse welfare systems and the urban-rural tapestry, reveals significant variations in social isolation rates. This understanding is pivotal for crafting informed interventions targeting older adults in Europe. Recognition of regional nuances is imperative for developing effective strategies and policies to address the unique challenges of social isolation in this diverse landscape. This knowledge establishes a foundation for future research and offers guidance to policymakers in fostering social well-being across varied demographics and European geographical settings.

References

Abshire, D.A., Graves, J.M., Amiri, S. and Williams-Gilbert, W. (2022), Differences in Loneliness Across the Rural-Urban Continuum Among Adults Living in Washington State. *The Journal of Rural Health*, 38, pp. 187-193.

Adams, J.P., Kaufman, A.V., Dressler, W.W. (1989). Predictors of social isolation in older southern adults: A cross-racial analysis. *Journal of Applied Gerontology*, 8(*3*), 365-381.

Beridze G., Ayala A., Ribeiro O., Fernández-Mayoralas G., Rodríguez-Blázquez C., Rodríguez-Rodríguez V., Rojo-Pérez F., Forjaz M. J. and Calderón-Larrañaga A. (2020). Are Loneliness and Social Isolation Associated with Quality of Life in Older Adults? Insights from Northern and Southern Europe. *International Journal of Environmental Research and Public Health*, 17(*22*).

Bosworth, H., & Schaie, K. (1997). Relationship of social environment, social network, and health outcomes in the Seattle longitudinal study: Two analytical approaches. *Journals of Gerontology,* 52, pp. 197–205.

Cattan, M. (2002). Supporting older people to overcome social isolation and loneliness. *Help the Aged.*

Cornwell, E. Y., & Waite, L. J. (2009). Measuring social isolation among older adults using multiple indicators from the NSHAP study. *Journal of Gerontology: Social Sciences,*64(*1*), 38–46.

Cotterell N.,Buffel, T.,Phillipson C. (2018). Preventing social isolation in older people. *Maturitas*, 113, pp. 80-84.

Coyle, C.E. & Dugan, E. (2012). Social isolation, loneliness and health among older adults. *Journal of Aging and Health*, 24(*8*), 1346-1363.

Dykstra, P.A.(2009). Older adult loneliness: myths and realities. *Eur J Ageing*, 6, 91–100.

Ejiri, M., Kawai, H., Fujiwara, Y., Ihara, K., Hirano, H., Kojima, M. & Obuchi, S. (2018). Predictors of social isolation among older people living in urban area: a prospective study. *Japanese Journal of Public Health*, 65 (*3*), 125-133.

European Commission (2021). New report: Loneliness doubles in Europe during the pandemic. Retrieved from: New report: Loneliness doubles in Europe during the pandemic (europa.eu) (Accessed: 29 september 2023).

European Commission (2021). De gevolgen van de demografische veranderingen in Europa. Retrieved from: De gevolgen van de demografische veranderingen in Europa - Europese Commissie (Accessed: 7 february 2024)

Eurostat (2020). Rural development: Methodology. Retrieved from: Methodology - Rural development - Eurostat (europa.eu) (Accessed: 28 September 2023).

Galperin, B.L., Bennett, R.J. & Aquino, K. (2011). Status Differentiation and the Protean Self: Social-Cognitive Model of Unethical Behavior in Organizations. *J Bus Ethics*, 98, 407-424.

Haslam, C., Cruwys, T., Milne, M., Kan, C.-H., & Haslam, S. A. (2016). Group Ties Protect Cognitive Health by Promoting Social Identification and Social Support. *Journal of Aging and Health*, *28*(2), 244-266.

Havens, B., Hall, M., Sylvestre, G. and Jivan, T. (2004) "Social Isolation and Loneliness: Differences between Older Rural and Urban Manitobans," *Canadian Journal on Aging / La Revue canadienne du vieillissement*, Cambridge University Press, 23(2), pp. 129–140.

Henning-Smith, C., Moscovice, I. and Kozhimannil, K. (2019), Differences in Social Isolation and Its Relationship to Health by Rurality. The Journal of Rural Health, 35: 540-549.

Homans, C. (1958). Social Behavior as Exchange. *American Journal of Sociology*, 63(*6*), 597-606.

IBM Corp. Released 2021. IBM SPSS Statistics for Windows, Version 28.0. Armonk, NY: IBM Corp (Accessed: 10 November – 23 December 2023)

Institute of Medicine of the National Academies (IOM). (2014). *Capturing social and behavioral domains in electronic health records: Phase 1*. Washington DC: The National Academies Press.

Kobayashi, K.M., Cloutier-Fisher, D. & Roth, M. (2009). Making meaningful connections: a profile of social isolation and health among older adults in small town and small city, British Columbia. *Journal of Aging and Health*, 21(*2)*, 374-397.

Kobayashi, E., Sugawara, I., Fukaya, T., Okamoto, S., & Liang, J. (2022). Retirement and Social Activities in Japan: Does Age Moderate the Association? Research on Aging, 44(2), 144-155.

Koning de, J.L., Stathi, A. & Richards, S. (2017). Predictors of loneliness and different types of social isolation of rural-living older adults in the United Kingdom. *Ageing and society*, 37(*10*), 2012-2043.

Maslow, A. H. (1943). A theory of human motivation. *Psychological Review*, 50(*4*), 370.

Peplau, L. A., & Perlman, D. (1979). Blueprint for a social psychological theory of loneliness. In M. Cook & G. Wilson (Eds.), *Love and attraction*, 101–110.

Rubinstein, R.L., Lubben, J.E., Mintzer, J.E. (1994). Social isolation and social support: an applied perspective. *Journal of Applied Gerontology*, 13(*1*), 58-72.

Steptoe A., Shankar A., Demakakos P., and Wardle J.(2013). "Social Isolation, Loneliness, and All-Cause Mortality in Older Men and Women." *Proceedings of the National Academy of Sciences of the United States of America* 110(*15*), 5797–801.

Taylor, H.O. Social Isolation's Influence on Loneliness Among Older Adults. *Clin Soc Work J* 48, 140–151 (2020).

Tomassini, C., Glaser, K., Wolf, D.A., Broese van groenou, M.I., Grundy E. (2004). Living arrangements among older people: An overview of trends in Europe and the USA. *Popul Trends*, 115,24–34.

Tosi, M. (2017). Leaving-home transition and later parent-child relationships: Proximity and contact in Italy. *Eur Soc*, 19, 69– 90 .

Umberson, D., Lin, Z., & Cha, H. (2022). Gender and Social Isolation across the Life Course. Journal of Health and Social Behavior, 63(3), 319-335.

Victor, C. R. and Bowling, A.(2012) . A longitudinal analysis of loneliness among older people in Great Britain. *Journal of Psychology*, 146(*3*), pp. 313-31.

Vozikaki, M.; Papadaki, A.; Linardakis, M.; Philalithis, A. (2018). Social isolation and well-being among older adults in Europe, *Archives of Hellenic Medicine*, 35(*4*), 506-519.

Velez, A. Tackling social isolation: Northern Europe steps up to the challenge. Euronews. Retrieved from: Tackling social isolation: Northern Europe steps up to the challenge | Euronews. (Accessed 5 January, 2024).

World Health Organization (2021). Social Isolation among older people: advocacy brief. Geneva.

Xia, N., Li, H. (2018). Loneliness, Social Isolation and Cardiovascular Health. *Antioxidants & Redox Signaling,* 28(*9*), 837-851.