SILVER EMPOWERMENT

A QUANTITATIVE PICTURE OF LONELINESS AMONG ELDERLY IN BELGIUM AND EUROPE

dr. Jasper De Witte
Prof. dr. Tine Van Regenmortel

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Project management: Prof. dr. Tine Van Regenmortel

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Abstract

Loneliness has an enormous impact on the quality of life of elderly. It can be defined as the unpleasant feeling that occurs when a person's network of social relationships is experienced to be deficient in some important way, either quantitatively or qualitatively. Based on the analysis of the most recent data of the Survey of Health, Ageing and Retirement in Europe (SHARE), we present a broad quantitative picture of loneliness in Belgium and Europe. We find that 22% of the Belgian elderly and 27% of the European elderly (65+ years) feel lonely in 2017. Moreover, loneliness is distributed unequally among different groups of elderly. While in Belgium, loneliness is related to age, household size, depression, cognitive functioning, network size and network satisfaction, on the European level we can complete this list by immigrant generation, geographical region, having children, self-perceived health, mobility limitations and the number of activities . Hence, if we want to tackle loneliness among elderly in Belgium and Europe, we need to take these domains into consideration.

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Executive summary

Feelings of loneliness have an enormous negative impact on the quality of life of elderly. Loneliness can be defined as *'the unpleasant feeling that occurs when a person's network of social relationships is experienced to be deficient in some important way, either quantitatively or qualitatively'*. The relevance of this subject is not only shown by the prevalence rates of loneliness among elderly in Europe (which ranges between 11% and 54% in 2017), but also by societal evolutions such as ageing and the process of individualisation which results in declining informal support networks.

In this respect, research indicates that there are multiple ways to alleviate feelings of loneliness. Besides psychological-based strategies through which elderly learn to 'accept a discrepancy between their existing and desired relations' or 'lower their expectations with respect to the social network', elderly can also improve their social network and enhance their participation. With respect to the latter it is essential to gain sufficient knowledge into which barriers impede elderly from constructing satisfying social networks and participating to society: lacking social skills, health limitations, financial difficulties, ... The literature finds for example that people with a migration background have higher loneliness levels due to migration-related characteristics such as language barriers, difficulties integrating into a new culture, constructing new social relations and their specific cultural, historical and social context. From this we find that policymakers who want to tackle loneliness must have sufficient understanding of which characteristics correlate with this phenomenon. However, at the moment there are relatively little recent statistics on loneliness in Belgium and Europe available and 'evidence on the demographic, health and social patterns of loneliness remains limited' (Vozikaki, Papadaki, Linardakis, & Philalithis, 2018, p. 614). Therefore, in this research report, we present a broad quantitative picture of the prevalence of loneliness among elderly in Belgium and Europe, and devote specific attention to the link between loneliness and migration. This focus on vulnerable elderly fits the general objective of the be.Source Chair perfectly, namely to gain insight into how we can strengthen elderly living in precarious circumstances, and how we can improve their connection to their surroundings and society so that they can experience a higher quality of life.

Based on the Survey of Health, Ageing and Retirement in Europe (SHARE), we find that about 22% of the Belgian elderly (65+) and 27% of the European elderly feel lonely in 2017. Whereas in Europe we observe a small increase from 26% to 27% in the period 2013-2017, in Belgium the prevalence of loneliness decreased (from 25% to 22% in the same period). Nevertheless, this is alarming: an extrapolation of those numbers imply that almost 500,000 Belgian elderly and about 28 million elderly in the EU-28 feel lonely in 2020. This would amount to almost 700,000 Belgian elderly and more than 40 million elderly in the EU-28 in 2050.

Further, we find that the prevalence of loneliness is distributed unequally among different groups of elderly in Belgium and Europe. Indeed, loneliness levels are higher among women, 'older', divorced and widowed elderly, elderly without children, who live alone and who have a lower education level. Moreover, loneliness is related to a worse physical and mental health situation and in general also to less financial means. Next, we find that the prevalence of loneliness also correlates with participation and social network characteristics: loneliness is associated with less activities, being less satisfied with the activities one undertakes, having less trust in others, a lower feeling of mastery, a small network size, network members living remote, a low contact frequency with network members, and less closeness to the network members. Hereby, it is important that elderly have at

least one network member who lives nearby, with whom they have a lot of contact and with whom they are close.

On the European level we find that in 2017 loneliness levels are higher in eastern and southern Europe (36%) than in central (21%) and northern Europe (20%), which is contrary to our expectations based on our views of 'anomie' in northern countries and 'gemeinschaft' in southern countries. Therefore, we hypothesize that the expectations with regard to the social network vary between European regions. Further, we observe that in 2017 the discrepancy of the loneliness levels between various categories is often greater in eastern and southern Europe than in central Europe (and in lesser degree northern Europe): for example, the difference between men and women in both northern and central Europe is 4 percent points, while this amounts to 16 percent points in eastern and southern Europe. Although this might partly be explained by men in eastern and southern Europe having more difficulties admitting feelings of loneliness than in northern and central Europe, we also hypothesize that these discrepancies are explained by more important inequalities in eastern and southern Europe concerning the factors that explain feelings of loneliness such as social security, financial means, work situation, health, social network characteristics, ...

When we study the link between loneliness and migration, we find that the prevalence of loneliness is higher among ethnic minorities than majorities. Indeed, in Belgium and most other European countries, elderly who were born in the country of the interview are significantly less lonely than those who were not born in the country of the interview. Next, although in Belgium we see that in 2015 the prevalence of loneliness among native elderly (50+) is lower than those from the second and then first generation, we find no significant difference between first and second generation immigrants. Nevertheless, this observation means that the effect of migration-related factors continue until the second generation. And although in northern and central Europe we observe significant differences with regard to the prevalence of loneliness according to generational status, it is the second generation who has the lowest loneliness levels and not the natives (what we would expect). Moreover, in eastern and southern Europe we do not find any significant differences with regard to the prevalence of loneliness according to generational status. Last, we observe no clear and significant differences in 2015 with respect to loneliness levels according to the length of residence or the age when first generation immigrants moved to the host country, nor between people from other EU countries and those from countries outside the EU.

Based on a number of regression analyses, we find no significant differences regarding loneliness according to generational status in Belgium. However, we find that in Europe first generation immigrants are significantly lonelier than natives. Next, the effect of age on loneliness remains unclear since in Belgium older elderly are less lonely but in Europe they are lonelier than 'younger' elderly. Gender does not seem to have an effect on loneliness (both in Belgium and Europe), once controlled for other variables. Further, elderly who live together are significantly less lonely than those who live alone, just like elderly who have one or more children (although the latter is only significant in Europe). Next, one of the more important protective factors against loneliness is health. Hereby, depression is most strongly associated to loneliness, followed by a memory learning test, self-perceived health and the number of mobility limitations. Whilst these factors are all significant on the European level, only depression and scoring 'poor' on the memory learning test are significant in Belgium. Further, lower loneliness levels are associated with undertaking more activities, a larger social network, and more network satisfaction, and lastly, we find that the differences between the European regions remain significant in our regression analyses.

Based on our findings, we formulate a number of policy recommendations to alleviate loneliness in Belgium and Europe:

1. Counteract depression (through affordable psychological support).
2. Enhance participation and enlarge the social network size and network satisfaction (by taking away contextual barriers and by stimulating the 'power of giving').

3. Elderly should prepare better for future adversities (e.g. decease of partner, going to nursing home).
4. We need tailor-made policy measures which take into account regional and personal characteristics to tackle loneliness.
5. Strengthen synergetic collaboration between organisations.
6. More research is needed about loneliness in old age.

Introduction

In our first research report *'Loneliness and social isolation among elderly. An empowerment perspective'* (De Witte & Van Regenmortel, 2019a), we ascertain that loneliness has an enormous impact on the quality of life of elderly. Loneliness refers to the unpleasant feeling that occurs when a person's network of social relationships is experienced to be deficient in some important way, either quantitatively or qualitatively. From the literature, we find that there are multiple ways to alleviate feelings of loneliness. Besides psychological-based strategies, people can also try to improve their social networks and enhance participation by taking away the barriers that impede them from constructing satisfying social networks and participating to society: health limitations, financial difficulties, lacking social skills, ... In this respect, the international literature indicates that the prevalence of loneliness is higher among elderly with a migration background due to various migration-related factors: language barriers, difficulties integrating into a new culture, constructing new social relations and their specific cultural, historical and social context. Therefore, in this research report we devote specific attention to elderly with a migration background. In doing so, the focus of this research report falls within the general objective of the be.Source Chair, namely to focus on vulnerable groups in our society.

Until today, there are relatively little nationally representative numbers available on loneliness in Belgium and Europe, and the various factors that are associated to this phenomenon. This is certainly the case with respect to the link between loneliness and migration-related factors. Therefore, in this research paper we try to gain insight into this phenomenon by presenting a quantitative picture of loneliness in both Belgium and Europe. Hereby, we not only give a broad picture of the prevalence of loneliness, but also give specific attention to the link between loneliness and migration. Based on an analysis of the factors that relate to the prevalence of loneliness, we subsequently formulate a number of policy recommendations that aim to alleviate feelings of loneliness in Belgium and Europe.

1 | Loneliness and migration: a theoretical framework

In our first research report *'Loneliness and social isolation among elderly. An empowerment perspective'* (De Witte & Van Regenmortel, 2019a) we find that feelings of loneliness among elderly have an enormous impact on various other life domains and quality of life in general. Moreover, international research shows that (older) people with a migration background are more often confronted with feelings of loneliness due to multiple migration-related factors. The importance of this subject is amplified by demographical trends such as ageing and the diversity of our elderly population.

In the first paragraph of this chapter, we discuss two important social evolutions in Belgium and Europe that are related to loneliness among elderly: demographical evolutions and the declining informal support for elderly. In the second paragraph, we treat the concept of loneliness. Hereby, we define this concept, discuss various factors that are related to loneliness, and discuss the importance of resilience to alleviate feelings of loneliness. In the third paragraph, we discuss the relation between loneliness and migration. Hereby, we first present some theories that explain why the prevalence of loneliness is higher among people with a migration background. Next, we discuss the possible impact of culture on loneliness, and the specific adversities and resources that characterise people with a migration background. Last, we list a number of specific migration-related factors which are found to be associated with loneliness, and discuss the link between migration and loneliness in Belgium.

1.1 Social evolutions related to loneliness

In this paragraph, we discuss two important social evolutions that amplify the relevance of loneliness among elderly: demographic evolutions (such as ageing) and the process of individualisation, which results in a declining informal support network.

1.1.1 Demographical evolutions in the elderly population

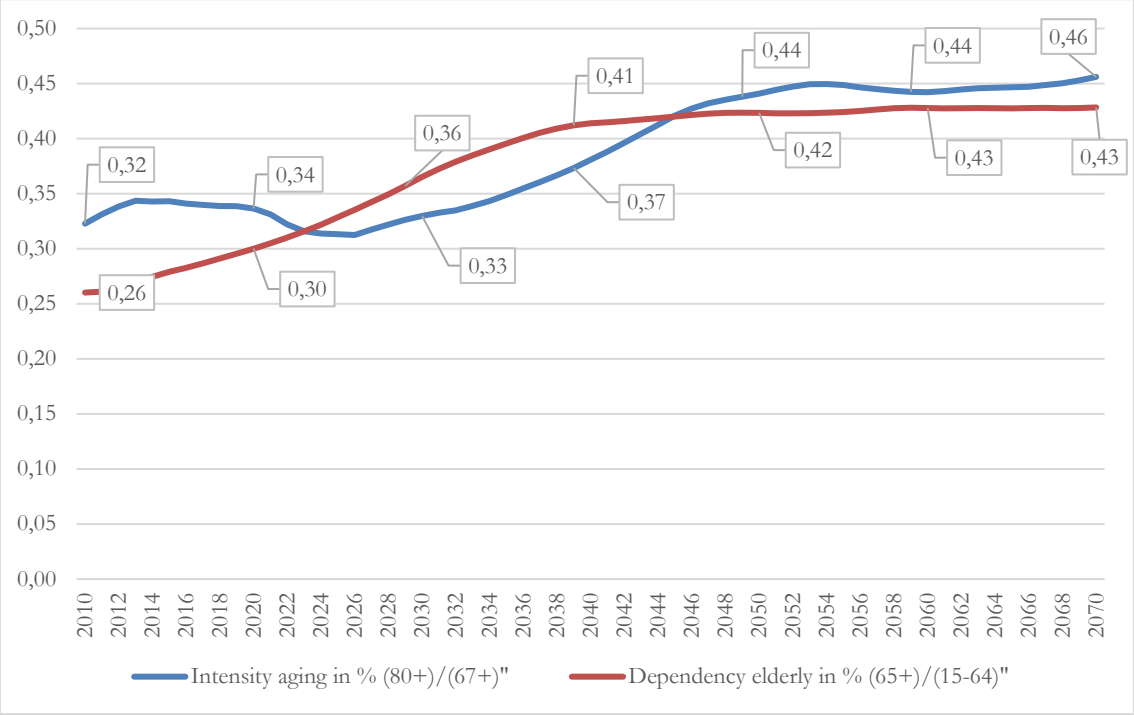
Both Europe and Belgium are characterised by an ageing population, of which the two main causes are the low fertility and increasing life expectancy (Börsch-Supan, Brandt, Hunkler, Kneip, Korbmacher, Malter, Schaan, Stuck, & Zuber, 2013). Indeed, the proportion of elderly and 'old' elderly in the total population increases. In 2060 about 30% of the total European population will consist of people of 65 years or older, and 12% will consist of people of 80 years and older (Niedzwiedz, Richardson, Tunstall, Shortt, Mitchell, & Pearce, 2016). Figure 1.1 shows a similar trend for Belgium: while in 2020 there are about 2.2 million elderly of 65 years or older and 330,000 elderly of 85 years and older, this increases to respectively 3.3 million and 830,000 in 2070. Further, Figure 1.2 demonstrates that the proportion of Belgians of 65 years or older in the total 'active' population (between 15 and 64 years) increases from 0.30% in 2020 to 0.43% in 2070. In line with this, we find that the proportion of 'old' elderly (of 80 years or older) in the total population of elderly (67 years or older) increases from 0.34% in 2020 to 0.46% in 2070. This shows that not only the absolute number but also the proportion of (old) elderly in the total population increases, which implies that more and more people will be dependent on 'the active population', which will pose

challenges for the welfare states across Europe. Hence, it is essential to gain more understanding in the impact of ageing on society in general.

Figure 1.1 **Prognoses of the elderly population in Belgium (2010-2071)**

Source De Witte (2020b)

Figure 1.2 **Prognoses of the intensity of aging and the dependency of elderly in Belgium (2010-2071)**



Source De Witte (2020c)

1.1.2 Declining informal support

Our first research report *'Loneliness and social isolation among elderly. An empowerment perspective'* (De Witte & Van Regenmortel, 2019a) made clear how the process of individualisation has negatively impacts the available informal support for elderly: family structures evolve, people live further from each other, networks become smaller and less divers, and family and neighborhood relationships are less evident (Machielse, 2016; A. Machielse, 2015). Furthermore, changes in the social structures (e.g. the increased labour participation of women) also lead to a decrease in the availability of informal support (de Koker, Jacobs, Lodewijckx, & Vanderleyden, 2007). In this respect, research shows that the social network of elderly became less divers and that elderly increasingly have only vertical contacts due to a strong focus on the nuclear family (Cantillon, Van den Bosch, & Lefebure, 2007).

These changes in the social network of elderly make it more complicated for them to sustain a supportive social network, which is already difficult given numerous age-related adversities such as a deteriorating health. As a result, elderly become even more vulnerable in this respect, which is problematic because everybody needs social capital to realise goals that give meaning to life.

1.2 Loneliness

In this paragraph, we go deeper into the concept of loneliness. Hereby, we first define loneliness and social isolation. Based on the available scientific literature, we subsequently discuss various factors that are related to loneliness and social isolation. Third, we discuss the motivational theory of life-span development and the importance of resilience to alleviate feelings of loneliness.

1.2.1 Loneliness and social isolation defined

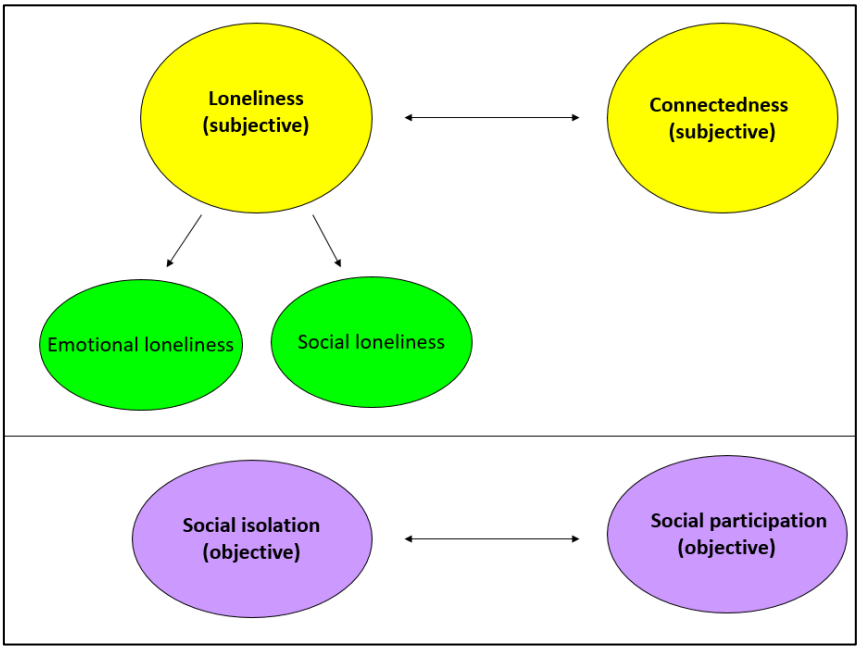
Loneliness can be *defined* as the unpleasant feeling that occurs when a person's network of social relationships is experienced to be deficient in some important way, either quantitatively or qualitatively (De Jong Gierveld & Van Tilburg, 2008, p. 5). Hence, loneliness concerns a subjective evaluation of social relations that refers to the difference between the quantity and/or quality of the existent social relations and the desired relations (Vandenbroucke, Lebrun, Vermeulen, Declercq, Maggi, Delye, & Gosset, 2012). Social connectedness as opposed to loneliness (De Jong Gierveld & Van Tilburg, 2008) refers to *'a positive subjective evaluation of the extent to which one has meaningful, close, and constructive relationships with other individuals, groups, or society indicated by: (1) feelings of caring about others and feeling cared about by others, such as love, companionship or affection and (2) a feeling of belonging to a group or community'* (O'Rourke, Collins, & Sidani, 2018, p. 2).

We can further make a distinction between emotional and social loneliness, which are both strongly associated to certain types of social relations (Heylen, 2010). While emotional loneliness refers to the feeling that occurs due to an experienced lack of a meaningful, intimate and exclusive relationship such as with a partner or a close friend, social loneliness refers to the feeling that occurs due to a lack of an adequate, broad social network of friends and acquaintances (Machielse, 2016; Ten Bruggencate, Luijkx, & Sturm, 2018) or a lack of feelings of social integration (Heylen, 2010). This distinction is important because it allows to determine effective intervention strategies to alleviate feelings of loneliness. Indeed, emotional and social loneliness are distinct phenomenons, which both need a tailored response.

Further, social relations can be placed on a continuum between social isolation and social participation, based on objective indicators that deal with the size, frequency, structure and functioning of social relations. In this respect, social isolation refers to the lack or almost complete absence of relations with other people (De Jong Gierveld & Van Tilburg, 2008). In this respect, it is important to mention that although there is a significant correlation between the objective characteristics of social networks and the subjective evaluation of those networks (when one is alone, the risk of feeling lonely

is high) (Gardiner, Geldenhuys, & Gott, 2018), this is not a one-to-one relationship. Figure 1.3 summarises this conceptual framework.

Figure 1.3 Conceptualisation of loneliness and social isolation



Source (De Witte & Van Regenmortel, 2019a)

1.2.2 Factors related to loneliness and social participation

In our first research report *'Loneliness and social isolation among elderly. An empowerment perspective'* (De Witte & Van Regenmortel, 2019a), we discuss in detail which factors on the individual, relational and societal level are associated with loneliness and social isolation. Here, we resume the most noticeable ascertainments.

On the individual level, loneliness relates to lacking social capabilities, self-confidence and coping capabilities (Fokkema & Van Tilburg, 2007). Moreover, loneliness is associated with specific expectations concerning the social network. Research shows for example that 'old' elderly with poor self-assessed health attach less importance to the number of their social contacts. Indeed, in order to minimise negative feelings, they seem to adjust their expectations to their limited possibilities to sustain a social network (Heylen, 2010). Second, loneliness is related to physical and mental health problems (e.g. depression). While on the one hand health problems make it more difficult to sustain a social network (Fokkema, De Jong Gierveld, & Dykstra, 2012), on the other hand loneliness also affects health. Indeed, research indicates that loneliness has similar effects on health as other more known risk factors such as drinking and smoking. *'Potential mechanisms underlying the health implications of loneliness in this population include the inducement of physiological, behavioural and psychological changes, such as increased stress-related responses, elevated blood pressure, cardiovascular activation, sleep disturbance and functional decline'* (Vozikaki et al., 2018, p. 614). Third, loneliness is related to wealth and income (Fokkema & Van Tilburg, 2007): people with less financial resources also have less possibilities to participate (Vozikaki et al., 2018). Fourth, although loneliness seems to be related to gender (Vandenbroucke et al., 2012), research is inconclusive in this respect. While some research states that women are more often confronted with loneliness than men (which might be explained by women expressing feelings of loneliness more easily) (Niedzwiedz et al., 2016; Vozikaki et al., 2018), other research states the opposite, namely that men are more lonely (because women in general have bigger and more divers

social networks) (van Campen, Vonk, & van Tilburg, 2018). fifth, loneliness is related to age, an association which is mainly explained by multiple age-related loss experiences (e.g. children leaving the parental home, death of partner, health problem, ...), which affect social networks and feelings of loneliness (Heylen & Mortelmans, 2007). In this respect, age is presumably also related to different expectations with regard to social networks. Indeed, research finds for example that 'old' elderly are less prone to *social* loneliness, which might be explained by them attaching more importance to the quality of their contacts rather than the quantity (Heylen, 2010). Sixth, loneliness depends on where people live. Research shows that the prevalence of loneliness is higher among people who live in a city than among people who live in rural areas. This could be explained by elderly feeling less safe in big cities and activities in cities being more often directed towards younger people. Last, research states that the prevalence of loneliness is higher when people move (van Campen et al., 2018), have a lower education level, are widowed, divorced or separated, and when they do not have children (Vandenbroucke et al., 2012).

On the relational level, loneliness is strongly related to social participation and the social network (Fokkema & Van Tilburg, 2007). In accordance with the deficit theory, which states that situational factors cause loneliness and people need social contact to avoid loneliness, research finds that the number of relationships directly affects social loneliness, independent of the perceived deficiencies and people's preferences. Moreover, it has indirect effects through the level of satisfaction with social relationships and the appraisal of the number of good friends. This implies that (socially) lonely people benefit from an increase in the quantity of their social relations (Heylen, 2010). With respect to the social network, not only the extent of the network, but also the diversity and contact frequency are important protective factors against loneliness (Pasteels, Heylen, & Mortelmans, 2014). In this respect, we find that the diversity of the social network of elderly in Belgium declined in the period 1985-2001, just like the contact frequency of bonding social relationships (Heylen & Mortelmans, 2007).

On the societal level, various characteristics seem to be related to the prevalence of loneliness: negative stereotyping, changing family structures (Fokkema & Van Tilburg, 2007), culture and societal expectations, wealth (Vandenbroucke et al., 2012), social security schemes (Fokkema et al., 2012), the amount of formal participation, ... The importance of these characteristics is demonstrated by the differences of the prevalence of loneliness between European countries (Arsenijevic & Groot, 2018).

1.2.3 The motivational theory of life-span development and the importance of resilience to alleviate feelings of loneliness

1.2.3.1 The key to successful aging: adapting to one's environment

Successful aging refers to the *'generalised capacity to respond with resilience to challenges from one's mind, body and environment'* (Fuller-Iglesias, Sellars, & Antonucci, 2008, pp. 183-184). We speak of successful aging when a person is able to adapt to various challenges posed during one's life, through which his capacity to reach his personal goals in domains he places high value on is maximised (Hochhalter, Smith, & Ory, 2011).[1] According to the 'motivational theory of life-span development', striving to realise personal goals gives meaning to life, and development is the outcome of actions to realise specific goals (Greve & Staudinger, 2006). Which specific goals and domains are deemed important, is subjective (Hochhalter et al., 2011). In this respect, resilience is essential to select goals, make competent decisions, realise those goals, overcome resistance, and if necessary revise goals and strategies (Greve & Staudinger, 2006). Both development and resilience continue during the whole lifespan and

1 It is said that successful aging is enhanced by *'a positive attitude, coping with change, accepting limitations that cannot be overcome, being secure and stable long term [...] practicing spiritual beliefs and receiving spiritual blessing, and staying engaged both socially and cognitively'* (Hochhalter et al., 2011), p. 18-19).

occur in a specific cultural, historical and social context which influences those processes (Fuller-Iglesias et al., 2008). From this, we find that when people feel lonely, they seem to lack resilience through which they do not realise specific goals with respect to social relationships that they deem important.

1.2.3.2 Ways to alleviate feelings of loneliness

According to Fokkema & van Tilburg (2007) there are three ways to alleviate loneliness. First, it is possible to enhance the existing relations to the level of the desired relations by creating new relationships or by ameliorating existing relations ('network development') (Fokkema & Van Tilburg, 2007). In this respect, social skill training and psycho-education could be appropriate because they can improve for example conversational ability and body language. *'The hypothesis is that such practical advice and information will better equip the individual to form meaningful relationships and have better skills to prioritise and maintain over time'* (Mann, Bone, Lloyd-Evans, Frerichs, Pinfold, Ma, Wang, & Johnson, 2017, p. 631). When the cause of the loneliness is related to personal characteristics, improving those characteristics and social skills could be a useful strategy (Van der Zwet & Van de Maat, 2016). When the cause of the loneliness lays rather in changes in the social network (due to a move, divorce, ...), other approaches are probably more effective such as partaking in social activities and creating more contacts. Second, lonely elderly could try 'lowering standards', which refers to adjusting unrealistic desires concerning social relations. Third, elderly can learn to 'deal with feelings of loneliness' by accepting, relativising, denying or through distraction (Fokkema & Van Tilburg, 2007).

1.2.3.3 The motivational theory of life-span development

The above mentioned strategies to alleviate feelings of loneliness are strongly related to the 'Motivational theory of life-span development', which distinguishes between primary control capacity (i.e. *'individuals' ability to influence important outcomes in their environment'*) and secondary control capacity (i.e. *'internal, most notably motivational processes to minimise losses to maintain and expand existing levels of primary control'*) (Janssen, Abma, & Van Regenmortel, 2012, p. 351). During the life course, it is said that striving for primary control is a constant and universal motive. However, sometimes it is necessary to adjust goals and expectations to bring oneself in line with environmental forces, for example by disengaging from goals that are no longer achievable and by selecting more realistic goals (by adjusting expectations, values and attributions) (Janssen et al., 2012). So, through primary control processes people try to realise specific goals they put forward. Secondary control processes come to the foreground when people are no longer able to realise specific goals (for example due to important losses of social capital). In that case they apply psychological processes through which they adjust goals, expectations, preferences, ... to their specific context (Van Tilburg, 2005).

1.2.3.4 The importance of resilience to realise goals and alleviate loneliness

Resilience is essential for 'successful aging' and to alleviate loneliness (Rew, Taylor-Seehafer, Thomas, & Yockey, 2001), and can be defined as *'patterns and processes of positive adaptation and development in the context of significant threats to an individual's life or function'* (Janssen, 2013, p. 21). It includes the *'adaptive processes and the dynamic interplay between the pursuit of personal (developmental) goals and the (developmental) adjustment of these goals to constraints, losses, or changes in action and developmental resources'* (Greve & Staudinger, 2006, p. 798). From this definition, we extract a number of important elements. First, resilience contains adversities (which are inherently subjective) that can be found on various domains (physical, psychological, social, ...). Second, people have various (interrelated) sources of strength that give rise to resilience, and which can be found on the individual/psychological, interactional and contextual domain (De Witte & Van Regenmortel, 2019b). Third, resilience refers to specific (primary and secondary) control processes that help people realise goals and deal with adversities. So, when people feel lonely, they lack resilience through which they are not able to realise specific goals with

respect to social relationships that they deem important. This in turn is determined by the complex interplay of their sources of strength, adversities and coping capacities and strategies.

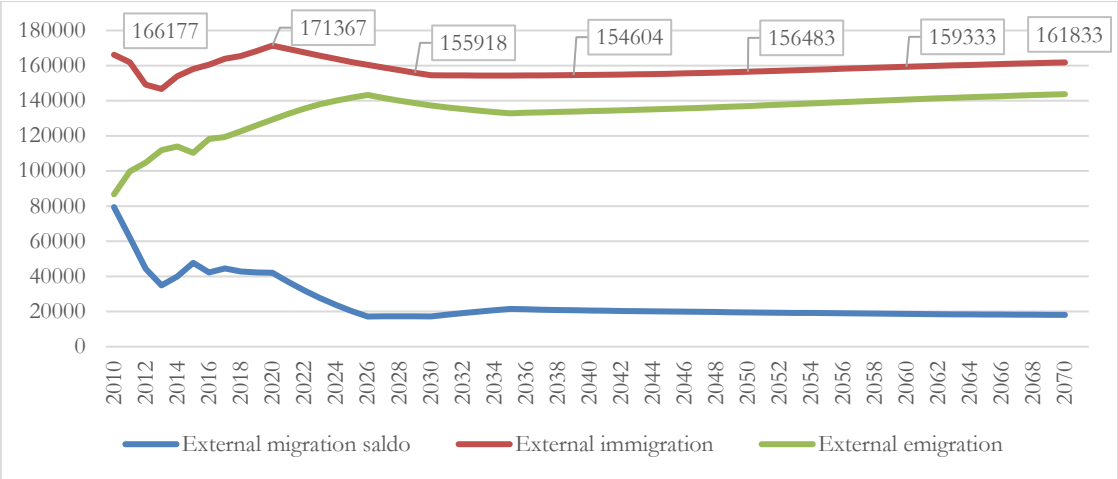
In this respect, we find that the possibilities to use primary control strategies diminish with old age because the latter often goes together with increasing adversities (e.g. death of a partner, chronic illness) and diminishing resources. Indeed, the coping mechanisms change with age: adaptive processes that do not actively solve but rather 'dissolve' the problem become more promising: *'adaptations of the system of personal values and preferences, reinterpretations of stressful problem situations, changes in perspective and deliberate (downwards) comparisons are typical examples of processes that contribute to resolving the actual/ought discrepancy'* (Greve & Staudinger, 2006, p. 818). By adjusting expectations and values, elderly can disengage from goals that are no longer attainable (due to environmental, health, ... factors), and select goals that are more realistic to achieve (Greve & Staudinger, 2006).

Further, these resilience processes are not only dependent on (old) age, but also on the specific cultural, historical and social context. As a result, we can hypothesise that the specific situation of people with a migration background will have a significant impact on their resilience and therefore also on the prevalence of loneliness: *'[...] comprehensive research on resilience and aging would benefit from an examination and inclusion of cultural and ethnic perspectives relevant to older people. It shows the heterogeneity in resilience of older people as well as the cultural and ethnic perspectives in what older people will need addressed to be resilient in their lives'* (Yee-Melichar, 2011, p. 133).

1.3 Loneliness of people with a migration background

Many Western countries are confronted with an increasingly divers elderly population with respect to ethnicity and culture (Wu & Penning, 2015). Figure 1.4 shows for example that more than 150,000 people are prognosed to immigrate to Belgium on a yearly basis in the period 2020-2070, which is an important indicator for the diversity of our general (elderly) population. As a result of these immigration patterns, it is important to gain more insight into the possibilities and challenges our increasingly diverse elderly population poses for service delivery and policy. Indeed, *'health and human service providers who interact with an older person must adjust their responses to that individual by taking into consideration the persons' level of resilience, culture and ethnicity'* (Yee-Melichar, 2011, p. 133).[2]

Figure 1.4 Prognoses of the migration saldo in Belgium (2010-2071)



Source (De Witte, 2020b)

2 This refers to the idea of 'ethnic ethics' which is the belief that different practices fit aging elderly according to their specific culture (Yee-Melichar, in Resnick, Gwyther & Roberto, 2011).

In this respect, the scientific literature finds that the prevalence of both emotional and social loneliness is higher among elderly with a migration background than among people without a migration background (Ten Kate, Bilecen, & Steverink, 2020; Vancluysen & Van Craen, 2010; Wu & Penning, 2015), which can be explained by the effect of various migration-related factors and their specific cultural, historical and social context on loneliness. Therefore, it is relevant to gain more insight into the implications of immigration on loneliness in later life (Wu & Penning, 2015). Indeed, *'[...] there are few explicitly comparative studies that have examined variations across the broad range of minority populations of elders in terms of loneliness (or social engagement more broadly) [...]'* (Victor, Burholt, & Martin, 2012, p. 73). *'More research [...] is needed in order to better understand the diverse aging population and their current resilience and future needs'* (Yee-Melichar, 2011, p. 144).

1.3.1 Theories about loneliness and migration

Various theories and perspectives aim to explain the association between loneliness and migration. First, the 'similarity-attraction theory' and the 'social identity theory' both state that people are more attracted to those who have the same ethnic background (Vancluysen & Van Craen, 2010), competence, leisure enjoyments, socioeconomic status and gender. Indeed, *'when a parallel is found between individual's demographics, personality, social status, values and beliefs, a similarity attraction is formed. The similarity-attraction paradigm suggests similar personal attributes between individuals directly relates to their interpersonal attraction and forms positive expectations for future'* (Wells & Aicher, 2013, p. 4). Hence, from this follows the hypothesis that the prevalence of loneliness is higher among ethnic minorities because in the host country they come in a lesser degree into contact with others from the same ethnic background. In line with this, ethnic minorities who are strongly attached to their ethnic group and who have a lot of co-ethnic friends in the host country, may be characterised by a lower prevalence of loneliness (Vancluysen & Van Craen, 2010).

A second explanation of the higher prevalence of loneliness among people with a migration background may be due to the so-called 'double absence', namely the absence of social networks to which they belong(ed) in their country of origin, and the absence of new social networks in the host country. As a result, ethnic minorities may experience a double exclusion by being considered foreigners by the inhabitants in the country of origin and by the inhabitants in the host country (Vancluysen & Van Craen, 2010).

A third perspective is based on psycho-social stress models that take into account the specific adversities, resources and coping mechanisms of people with a migration background (Wu & Penning, 2015). This perspective relates closely to the concept of resilience. In this respect, research indicates that ethnic minorities have more adversities and less resources on various (demographic, socioeconomic, health) domains, which may result in a higher prevalence of loneliness (Visser & El Fakiri, 2016). Also, qualitative studies indicate that the specific culture affects the perceptions concerning loneliness and the coping strategies of people with a migration background (Dong, Chang, Wong, & Simon, 2012).

Last, a life course perspective conceptualises aging as *'a consequence of social and temporal processes that differentiate individuals within and between cohorts. More specifically, it suggests that the historical circumstances encountered earlier in life shape the life experiences of different groups, and may do so differently by age'* (Wu & Penning, 2015, p. 67). According to this perspective, the specific historical circumstances encountered earlier in life determine life experiences and the implications of immigration on for example loneliness. This perspective encompasses factors such as the timing and duration of life course transitions, when people migrated, the duration of the residence, pre- and post-immigration experiences, ethnic, racial and cultural circumstances, generational status, ... (Wu & Penning, 2015). In sum, it is important to take into account the personal experiences of immigrants from earlier life stages, because later life is determined by those experiences (Yee-Melichar, 2011).

1.3.2 Towards an explanation

Some research finds that people with a migration background report higher levels of loneliness than people without a migration background, and that this is not attributable to demographic, socio-economic and health factors (Wu & Penning, 2015). Immigrants leave former relationships behind and are confronted with a new reality and culture where different norms, values, languages and customs apply. Based on the scientific literature, we discern a number of factors that might explain why the prevalence of loneliness is higher among people with a migration background.

1.3.2.1 Culture and integration

First, research finds that culture significantly affects loneliness through its impact on resilience (Becker & Newsom, 2005; Consedine, Magai, & Conway, 2004; Hinton, 2002; Siriwardhana, Ali, Roberts, & Stewart, 2014; Ungar, 2008). In this respect, culture can be defined as *'a shared, learned, symbolic system of values, beliefs, and attitudes that shapes and influences perception and behaviour [...]'* (Lewis, 2008). More specifically, culture affects resilience through its impact on adversities, resources and the patterns of positive adaptation to adversity and the aging process in general (Consedine et al., 2004; Earvolino-Ramirez, 2007). In this respect, cultural belief systems, values and traditions determine which developmental goals and desires are put forward, which abilities and skills are appreciated (Yee-Melichar, 2011), and how people mobilise internal and external resources. Moreover, culture determines general ideas and values (Tummala-Narra, 2007) concerning resilience, health and illness (Kwong, Du, & Xu, 2015), aging, loss, dependency (Consedine et al., 2004; Tummala-Narra, 2007), and healthy development. Indeed, specific norms and values concerning family, social engagement and social relationships seem to play a role with respect to loneliness (Dong et al., 2012; Victor et al., 2012). Research indicates for example that adjustment difficulties differ between immigrant groups and depend on discrimination and how different the host country is. This may also be related to differences in satisfaction with family life and the perceived absence of satisfying intergenerational relationships with family: *'the importance attributed to such relationships may be informed by traditional family values, resulting in loneliness and emotional distress when expectations regarding family support were not met'* (Wu & Penning, 2015, pp. 69-70). Indeed, although some ethnic minorities emphasise the importance of family relationships, those family members are not always able to adhere to these expectations (Dong et al., 2012). In addition, the way people perceive and experience the ageing process is determined by various societal processes such as negative stereotyping and discrimination, digitalisation and evolving family structures.

> *'Culture relates to the meaning of life of a group of people, it relates to how they live and work (skills), what they hold as right and important for them (values) and it also goes with faith and religion. Culture is a vital part of the identity. Identity is a central part of our personality; it may be seen as the core [...]. If you take the culture from a people, you take their identity, and hence their strength – the resilient factors. If people are stripped of what gives them strength, they become vulnerable, because they do not automatically gain those cultural strengths that the majority culture has acquired over generations'* (Yee-Melichar, 2011, p. 137).

The impact of culture on loneliness is indicated by the differences in the prevalence of loneliness between various European countries: in 2013 the prevalence of loneliness among elderly of 65 years or older ranged between 10% in Denmark and 33% in Italy (25% in Belgium) (Arsenijevic & Groot, 2018).[3] Further, adults in southern and central European countries are found to be lonelier than their peers in northern and western European countries (Fokkema et al., 2012). This is in contrast to what we would expect based on our simplified views of 'anomie' in northern countries and 'gemeinschaft' in southern countries: *'Co-residence and culture-bound indicators of intimacy and community, assumed to prevent*

3 These numbers are based on SHARE data which include following countries: the Netherlands, Austria, Belgium, Germany, Denmark, Italy, France, Sweden, Spain and Switzerland) (Arsenijevic & Groot, 2018).

loneliness, are clearly more common in Southern European countries' (Sundström, Fransson, Malmberg, & Davey, 2009, p. 267). Indeed, since northern countries were the first to go through household atomisation and solitary living, we would expect loneliness to be highest in those countries. Since this is not the case, it could be hypothesised that expectations have been adjusted in the northern countries accordingly to the changed actual living arrangements, and that expectations in the south with respect to social interactions are higher (Sundström et al., 2009). With respect to the relationship between the individual and the community, in individualistic cultures more importance is given to personal autonomy and self-expression than in collectivistic oriented cultures which rather emphasise the interdependence of people and relationships with family and community (Tummala-Narra, 2007). The increasing life expectancy, changing characteristics of the family structure and trends in familial support systems vary between countries, through which it can be expected that *'differences in the composition and functioning of the familial system (exchange of instrument support, e.g., as related to coresident living arrangements), the connected cultural values and norms, and the socioeconomic characteristics of countries continue to differently affect the social embeddedness in varying countries of Europe'* (Fokkema et al., 2012, p. 205). According to some research people in southern countries endorse for example more strongly the 'norms of filial obligation' (Fokkema et al., 2012), and express higher expectations with regard to family support for ageing parents and lower expectations for institutionalised care than people in northern countries (Sundström et al., 2009). Further, research has shown that cultural heritage determines the manner in which people express and cope with respect to loneliness. Indeed, *'state, regional, and community provisions shape the conditions for individual older adults to participate in the community and to be involved in social activities with kin and nonkin network members and consequently lead to varying country-level outcomes'* (Fokkema et al., 2012), p. 203). Last, culture and ethnicity determine role expectations, self-care strategies, lower service utilisation patterns, responses to treatments, preferences for care, provider behaviours, help seeking behaviour, caregiver burden (Hinton, 2002), and access to social support networks (Consedine et al., 2004; Tummala-Narra, 2007).

Further, research finds that there is a correlation between social participation and the *socio-cultural environment*. First, there is more formal social participation in northern European countries than in southern countries. This could be linked to the fact that in northern countries individualistic values and norms are central and thus looser contacts and formal social participation could be more important, whereas in southern countries familial and more traditional values are central and thus informal bonds are presumably a more important form of social participation. Further, the *institutional context* is also a determinant of social participation: northern welfare states for example enhance possibilities to participate socially (by providing more financial means and more leisure time), while southern states support voluntary organisations in a lesser degree. Next, *cultural differences* with respect the role of participation are important. Indeed, in countries where formal social participation is deemed more important (Northern, individualised countries) the relation between social participation and well-being is found to be stronger than in southern (family oriented) countries where less emphasis is laid on social participation. Indeed, elderly who do not participate feel more often socially excluded in northern countries than in family oriented countries. While there is a significant association between social participation and a higher quality of life in north European countries, this correlation is not found in southern countries, which implies that the role of social participation in 'successful ageing' depends on the country (Heylen & Mortelmans, 2009).

Since the specific culture affects resilience and loneliness, the level of integration in the host country presumably also affects the prevalence of loneliness among people with a migration background. Integration at the individual level refers to *'learning a new culture, an acquisition of rights, access to positions and statuses, a building of personal relations to members of the receiving society and a formation of feelings of belonging and identification towards the society'* (Heckmann, 2005, p. 18), and at the societal level it refers to behaviour and attitudes of the majority group and its institutions regarding ethnic minorities (Vancluysen & Van Craen, 2010). We find that the (social) integration of immigrants to the host culture is a long-term psychological adjustment process in which the first years involve mainly around housing,

employment, language acquisition, care for family members and other expressions of 'route searching'. In this respect, immigrants experience conflicting cultural values between the origin culture and the receiving cultures and may have more difficulties developing social networks that cross ethnic groups (Dolberg, Shiovitz-Ezra, & Ayalon, 2016).

1.3.2.2 Adversities

Based on the scientific literature, we discern various adversities that are more often present among ethnic minorities and immigrants: cultural dislocation, acculturative processes (e.g. learning a new language, contending with the contradictions between cultural values concerning family), discrimination (Wu & Penning, 2015), a lack of knowledge of services (Boneham, Williams, Copeland, McKibbin, Wilson, Scott, & Saunders, 1997), language barriers, losses in social networks and social status, and migration stress (i.e. *'stress that results from handling such survival issues as employment and financial problems, losses, cultural differences and unmet high expectations'*) (Keung Wong, Li, & Song, 2007, p. 133). Further, immigrants are more often confronted with health problems, poverty, family conflicts (Dolberg et al., 2016), and social and economic difficulties (Wu & Penning, 2015). With respect to health problems, research indicates that the increased prevalence of psychotic disorders of migrants in France works through until the second generation for a single psychotic episode, and that even until the third generation for a recurrent psychotic disorder (Amad, Guardia, Salleron, Thomas, Roelandt, & Vaiva, 2013). Last, some research indicates that third wave immigrants are characterised by a higher prevalence of loneliness and alienation, which might be due to the financial and medical burden of caring for their elderly parents who not always have the same legal rights to benefits (Yee-Melichar, 2011).

1.3.2.3 Resources

Research shows that the available resources can differ between ethnic minorities and natives: the time spend with family (McCubbin & McCubbin, 1988), family support and cohesion, external support networks (Kwong et al., 2015), the emphasis on close relationships with extended kinship, and more connectedness to social institutions such as family, church and social support systems (Yee-Melichar, 2011). Next, spirituality (and spiritual resilience) is also often found to be more present among minority groups (Allen, Haley, Harris, Fowler, & Pruthi, 2011; Becker & Newsom, 2005; Consedine et al., 2004). And since spirituality can replace some needs fulfilled by the social network, it can therefore also be linked to social connectedness (Consedine et al., 2004). Another (more general) protective factor with respect to resilience is being positive and optimistic about migration (Fu Keung Wong & Song, 2008). Research also finds that following factors specifically contribute to the resilience of ethnic minorities: external support networks (e.g. from family, friends, neighbours, ...), abilities (e.g. physical and mental strength, temperament and emotional stability, intellect and appearance) and skills (internal support such as communication skills, social and emotional skills) and meaning, values and faith (existential support such as perception of values and attitudes) (Yee-Melichar, 2011). Last, it is unclear if still having traditional cultural values is protective or not. Some researchers say that this is not a protective factor because cultural expectations with respect to family togetherness are often difficult to realise in the host country: *'Treas suggests that the view that "the warm embrace of family life affords special protection to older immigrants is a myth" and that "cultural expectations for family togetherness are difficult to achieve in American society." '* (Wu & Penning, 2015, p. 67). However, other researchers pose that traditional values may facilitate coping (Wu & Penning, 2015): *'immigrants and people from minority cultures who master the rules and norms of their new culture without abandoning their own language, values and social support seem more resilient than those who just keep their own culture and cannot acclimate to their new culture or those who become highly acculturated'* (Yee-Melichar, 2011, p. 137). In this respect, elderly find their cultural identity for example important to maintain status and social support within their community (Yee-Melichar, 2011).

1.3.3 Migration-related factors that relate to loneliness

In this paragraph, we describe a number of migration-related factors that are related to loneliness: generational status and the moment when people migrated, length of residence, racial and ethnic characteristics and age cohorts.

1.3.3.1 Generational status and the moment when people migrated

Generational status as a life course factor has a significant effect on immigration-related experiences. Indeed, not only the first, but also following generations experience the implications of migration: *'Perhaps first-generation immigrant parents' feelings of not belonging in the host society are communicated to and internalised by their children as well'* (Wu & Penning, 2015, p. 87).

Hereby, not only the generational status but also the moment when first generation immigrants migrated is important. Indeed, people who immigrate in later life are particularly vulnerable because they might be 'too old to be socialised' through institutions such as the school and workplace. As a result, their adaptation and acculturation is slower and more problematic, and they face greater challenges with fewer resources and less possibilities to integrate and develop close relationships, which might result in increased loneliness. In this respect, the experiences of immigrants who arrived as young children (i.e. 1.5-generation immigrants) are said to differ significantly from first generation immigrants who were not only born but also socialised in another country and therefore more disadvantaged. *'[...] 1.5-generation immigrants and second generation [immigrants] [...] will have to be socialised to the culture and language of the host country and are likely to be less disadvantaged while third-generation [immigrants] [...] (i.e. native-born children of native-born parents and immigrant grandparents) are thought to differ little from the majority native population'* (Wu & Penning, 2015, p. 68). In line with this, research finds that first generation immigrants have higher levels of loneliness than third generation immigrants, which demonstrates that people with a migration background do not form a homogenous group and that researchers should go beyond an immigrant versus non-immigrant dichotomy (Wu & Penning, 2015).

1.3.3.2 Length of residence

Length of residence within the host country is also important because a longer residence goes together with a better knowledge of the language, norms and behaviours of the host country and less participation in immigrant cultural activities. Indeed, it may relate to more integration in the culture of the host country and less integration in the original culture. In this respect, research finds that loneliness declines with increasing years of residence for those who had a shorter length of residence but increases with years of residence for those who had a longer length of residence: *'[...] loneliness levels may decrease with years of residence for those with a shorter length of residence in Canada; while the converse appears to be true for those with a longer length of residence'* (Wu & Penning, 2015, p. 80). This implies that with respect to loneliness, immigrants do worse than non-immigrants during early years of residence, but that this disadvantage declines over time (Wu & Penning, 2015). Other research found that although former Soviet Union immigrants in Israel were lonelier than native veteran Israeli, the immigrants became less lonely over time while the natives remained at their original level of loneliness. This may be explained by long-term psychological adjustment processes and by a specific characteristic of that large and strong immigrant group in Israel, which might serve as protective factors against loneliness. The study found that immigration was not a risk factor for negative changes concerning loneliness over time, but rather a positive factor. Following variables were found to be predicting for changes in loneliness over time: baseline loneliness scores, immigration status (remains despite controlling variables), age, years of education, gender, marital status, mental health, self-reported health status and depressive symptoms (Dolberg et al., 2016). Hence, it is plausible that the loneliness peak was immediately after the migration years due to various migration adversities, which increases the risk of loneliness. Indeed, *'the intensive nature of the first few years after immigration might harden immigrants' attempts to construct new social networks. These years usually evolve around concerns for housing, employment, language acquisition, care for family members and other expressions of route searching in various areas of life'*

(Dolberg et al., 2016, p. 288). Subsequently, it may require a long period in the host country before economic and social adjustment may lead to reduced loneliness, and before migration-adversities become less important. *'The longitudinal findings of the present study suggest a more complex picture, which may reflect different processes involved in changes in loneliness among older immigrants over time'* (Dolberg et al., 2016, p. 294).

1.3.3.3 Racial and ethnic characteristics

Ethnic and racial factors also seem to influence loneliness, certainly among first-generation immigrants. Research finds for example that older immigrants from visible minority groups report greater loneliness than older immigrants from non-visible minority groups. *'Cross-cultural comparative studies have reported differences in the prevalence and intensity of loneliness and in associations between loneliness and other factors among older adults across cultures'* (Wu & Penning, 2015, p. 69).

1.3.3.4 Age cohorts

Last, there may be differences concerning the prevalence of loneliness between age cohorts, but the direction of these relationships is not clear. In this respect, research finds that immigration-related factors differ across age-cohorts: immigrant experience has virtually no impact among the oldest-old, which may suggest that the effect of these factors is overridden by other factors that determine loneliness among the 'old' elderly such as number of children, gender, employment and health status. *'Immigration related variables appeared less consequential for loneliness in the oldest-old (aged 80+) than in younger elderly age groups'* (Wu & Penning, 2015, p. 64). *'This suggests that the factors that influence loneliness in the latest life stages may reflect the more restricted physical and social life space that often occurs at this point in the life course. In other words, at a time in life when social interactions are likely to be much more circumscribed (confined to the home environment and one's most proximate social ties), what matters are day-to-day health concerns and having someone close by rather than broader economic considerations or factors that denote access to broader social relationships outside the household'* (Wu & Penning, 2015, p. 88). Another explanation might be that older elderly find other things more important and choose different life goals because they are more aware of their mortality. Further, interaction effects between age and migration status were also ascertained, since age was not significant among non-immigrants (Wu & Penning, 2015).

1.3.4 Loneliness and migration in Belgium

A study based on a representative survey in two Belgian municipalities (Vancluysen & Van Craen, 2010) showed that there are significant differences in loneliness between ethnic groups, namely between people from Flemish, Moroccan and Turkish descent. This research further showed that loneliness is also related to the level of integration, the extent of attachment of an individual to his or her own ethnic group, ethnic identity and ethnic media consumption.

The loneliness score is highest among people from Turkish, than Moroccan and last Flemish descent. Further, loneliness among ethnic minorities is associated with length of residence, age, level of education and gender: these four variables predicted 15% of the variance in loneliness. Ethnic background, occupational situation and relationship status were no significant predictors of loneliness. Further, integration-related variables explained 22% of the variance in loneliness: majority language proficiency, majority identity, number of friends in the majority group, perceived discrimination. Last, attachment variables explained 12% of the variance in loneliness: number of co-ethnic friends, frequency of contact with family in the country of origin, ethnic identity, frequency of chatting with co-ethnic neighbours and consumption of ethnic media (Vancluysen & Van Craen, 2010).

This research found that better integration in the host country (a good command of majority language, strong identification with majority group, having many friends in the majority group, and the level of experienced discrimination) is associated with reduced feelings of loneliness. So integration both at individual and societal level leads to less loneliness. In addition, a stronger attachment of

ethnic minority group members to their ethnic community (more friends in their own community, more contact with family members in their countries of origin, chatting more frequently with their co-ethnic neighbours) reduces feelings of loneliness, as far as social contacts are concerned. Further they found that the stronger the ethnic identity and the more consumption of ethnic media, the higher the prevalence of loneliness. In this respect, the researchers state that the experience of the inferior position in Belgian society by ethnic minorities may be higher among those with a strong ethnic identity, which may increase feelings of loneliness. All together, the strongest predictors for loneliness were: majority language proficiency, the number of co-ethnic friends, the strength of majority identity and the level of perceived discrimination (Vancluysen & Van Craen, 2010).

In short, loneliness is reduced by integration in the receiving society and intra-ethnic social contacts. This stresses the importance of both bridging and bonding social capital for loneliness. Moreover, a high level of bonding social capital does not hamper the amount of bridging social capital: *'minority group members well endowed with bonding social capital also acquire bridging social capital. Hence, both types of social capital mutually reinforce each other in a positive sense and are essential in alleviating loneliness'* (Vancluysen & Van Craen, 2010, p. 447).

1.4 Conclusion

Scientific research has repeatedly demonstrated that feelings of loneliness have an important impact on the quality of life of elderly. The relevance of this subject is not only shown by the prevalence rates of loneliness, but also by various demographical evolutions (e.g. ageing and migration) and the process of individualisation which led to a declining informal support network.

Based on the literature, we find that there are multiple ways to alleviate feelings of loneliness: improving social relations to the desired level, and psychological strategies (e.g. accepting a discrepancy between the existing and desired relations or lowering the expectations with respect to the social network). In sum, it comes down to the 'resilience' of elderly since people need resilience in order to fulfil social needs (and thus to alleviate feelings of loneliness). Resilience refers to a complex interplay of (age-related) adversities, strengths and control processes, which make it possible to realise social needs (and other subjective life goals). Hereby, research shows that numerous factors on the individual, relational and societal level are related to loneliness and resilience: health, financial situation, mobility problems, age, the social network, social security schemes, culture, ... Depending on the specific context, these factors can imply adversities or strengths (e.g. a good health relates to less loneliness, while health problems relate to more loneliness). In this respect, the literature indicates that people with a migration background are characterised by higher levels of loneliness, and that this might be related to various migration-related characteristics such as language barriers, difficulties integrating into a new culture, constructing new social relations and their specific cultural, historical and social context.

As a result, in order to determine which intervention strategies are best suited to alleviate feelings of loneliness, it is essential to gain more insight into the factors that are associated with loneliness and resilience, and the factors that impede people from participating and from constructing satisfying social networks. Due to a lack of nationally representative numbers concerning loneliness and its link with migration-related factors, in this research report we gain insight into this phenomenon by presenting a quantitative picture of loneliness in both Belgium and Europe. Hereby we not only gain more understanding of the factors that are associated with loneliness, but also specifically study the link between loneliness and migration.

2 | Method

In this chapter, we discuss the methodology we used to gain more insight into loneliness among Belgian and European elderly, and its relation with migration. After discussing the research goal and relevance, we treat the main research questions and hypotheses we aim to answer, and discuss the SHARE-data base.

2.1 Research goal and relevance

In this paper, we gain more insight into the prevalence of loneliness among elderly in Belgium and Europe. This is relevant because there are little recent statistics on loneliness available and because *'evidence on the demographic, health and social patterns of loneliness remains limited'* (Vozikaki et al., 2018, p. 614). In this respect, we not only present a general picture of the prevalence of loneliness (and the factors that are associated with this), but we also specifically focus on the relation between loneliness and migration. This research objective fits perfectly in the general research question of the be.Source Chair, namely to gain insight into how we can strengthen elderly living in precarious circumstances, and how we can improve their connection to their surroundings and society so that they can experience a higher quality of life.

> 'Despite the need to enhance our knowledge regarding the implications of immigration, limited research attention has been paid to this issue. This includes a lack of national studies as well as of research comparing immigrants and non-immigrants. Most studies focus on immigrants only. In addition, the homogeneity of immigrant groups is often assumed, with little research addressing the implications of sources of within-group diversity (e.g. late-life versus earlier-life immigrants, first versus subsequent generations, racial/ethnic differences). Whether and how such factors operate differently in conjunction with age is also unclear' (Wu & Penning, 2015, p. 65).

Hereby, we need to consider various aspects. First, more knowledge is needed about the implications of migration for loneliness that goes further than the simple dichotomy (immigrant versus non-immigrant) based on nativity. Indeed, the immigrant population is a heterogeneous one, which is presumably characterised by a complexity of immigrant experiences. *'In particular, little attention has been directed to the impact of factors that might differentiate individuals within the immigrant population'* (Wu & Penning, 2015, p. 64). Hence, it is important to take into account the cultural variation that goes further than the distinction between ethnic majorities and ethnic minorities (Consedine et al., 2004). Second, there is a need for more nationally representative research: *'Existing studies suggest that loneliness may well be an issue for older immigrants; yet it is difficult to draw general conclusions based almost exclusively on studies of small, non-representative and selected samples of immigrants only'* (Wu & Penning, 2015, pp. 70-71). *'To date, however, empirical evidence supporting assertions regarding the greater loneliness of older immigrants comes primarily from qualitative studies of specific groups. Direct comparative studies, including comparisons of immigrants and non-immigrants, are limited [...], especially those drawing on large nationally representative study samples'* (Wu & Penning, 2015, p. 66).

2.2 Research questions and hypotheses

Our first research question:

1. **Does the prevalence of loneliness differ between ethnic minority and majority groups in Belgium and Europe as a whole?**

Based on the scientific literature we hypothesise that the prevalence of loneliness is higher among ethnic minorities (people with a migration background) than majorities (people without a migration background).

Our second research question:

2. **Is the prevalence of loneliness related to generational status?**

Hereby, we hypothesise that the prevalence of loneliness is highest among first generation immigrants, followed by 1.5-generation immigrants (people who moved to the host country when they were younger than 13 years old), second generation immigrants, and natives (i.e. people who are born in Belgium and of which both parents were born in Belgium).

Our third research question:

3. **Are there within-group differences with respect to the prevalence of loneliness among ethnic minority groups?**

In this respect, we make a distinction between people according to their own or their parents' country of origin: people with no migration background, people with a migration background from other EU-countries, and people with a migration background from countries outside the EU. In this respect, we hypothesise that there are within-group differences, whereby the prevalence of loneliness among people with a migration background from countries outside the EU is higher than that of people with a migration background from other EU-countries.

Our fourth research question:

4. **Is the prevalence of loneliness among people with a migration background related to the age they had when they migrated?**

Hereby, we hypothesise that the prevalence of loneliness of people who were young when they migrated is less high than of people who were older when they migrated.

Our fifth research question:

5. **Is the prevalence of loneliness among people with a migration background related to the length of residence in the host country?**

Hereby, we hypothesise that a longer length of residence in the host country is related to a lower prevalence of loneliness. In this respect, the scientific literature indicates that the prevalence of loneliness declines with increasing years of residence for those with a shorter length of residence, but increases with years of residence for those who had a longer length of residence (Wu & Penning, 2015).

2.3 The Survey of Health, Ageing and Retirement in Europe (SHARE)

'The broad range of individual, household and social network information from vast ranges of contexts with different cultures, histories and policies over time makes the SHARE data extremely valuable and a stand-alone example in the world of social science surveys' (Börsch-Supan et al., 2013, p. 999).

In order to answer our research questions and to explore our hypotheses, we make use of the Survey of Health Ageing and Retirement in Europe (SHARE). This is a cross-national and interdisciplinary survey, which is conducted by 20 European countries and Israel. At this moment, the SHARE-data have been collected on seven different occasions between 2004 and 2017, and about 110,000 community-dwelling Europeans of 50 years or older have participated to this survey (Dolberg et al., 2016). The result is a database which consists of (longitudinal) micro data about various important life domains such as health, socio-economic status and social networks. *'The ultimate goal is to provide high-quality micro-level panel data of economic, social and health factors that accompany and influence ageing processes at the individual and societal levels'* (Börsch-Supan et al., 2013, p. 993). These data are available free of charge to the scientific community (Börsch-Supan et al., 2013).

The target population consists of people of 50 years or older (and their partners) who have their regular domicile in the respective country. *'A person is excluded if she or he is incarcerated, hospitalised or out of the country during the entire survey period, unable to speak the country's language(s) or has moved to an unknown address'* (Börsch-Supan et al., 2013, p. 993). If a respondent died, end-of-life interviews were conducted with a proxy in order to collect information regarding the respondent's last year of life. Those proxy interviews are also conducted when a respondent is not able to give an interview (e.g. due to health reasons). The SHARE database contains longitudinal data: all respondents who were interviewed in any previous wave are part of the longitudinal sample, and are traced and reinterviewed if they moved within the country.

The interviews are performed by a computer-assisted personal interviewing (CAPI) method. Further, the data are ex-ante harmonised and all aspects (sampling, translation, fieldwork, data processing, ...) are done according to strict quality standards. Furthermore, SHARE provides weights ('sampling design weights') to compensate for unequal selection probabilities of the various sample units, in order to realise unbiased estimators of population parameters of interest. *'SHARE's main strategy to cope with potential selection bias generated by unit nonresponse and panel attrition is the provision of ex-post calibrated weights following the procedure of Deville and Särndal'* (Börsch-Supan et al., 2013, p. 998).

Within the course of 2019 we filled out the application form, an individual registration whereby we agreed to the 'SHARE Conditions of Use', after which we were allowed to make use of the SHARE data.

3 | Results

In this chapter, we present our research findings, which are based on cross-sectional analyses of the SHARE-data that were collected in 2013, 2015 and 2017. In the first paragraph, we provide a broad picture of the prevalence of loneliness among Belgian elderly, and the factors that are related to loneliness. In the second paragraph, we perform similar analyses on the European level. In the third paragraph we gain insight into the relation between loneliness and migration on both the Belgian and European level, which is important since *'only a limited number of studies to date have investigated loneliness among ethnic minority groups'* (Vancluysen & Van Craen, 2010, p. 437). Hereby, we perform cross-sectional analyses that give a clear oversight of the correlation between loneliness and migration-related characteristics. In the fourth paragraph, we carry out a number of regression analyses that make it possible to determine the correlation between various factors and loneliness, while controlling for other variables. This helps us to better understand the complexity of the concept 'loneliness' and to find explanations.

With respect to our analyses, we indicate every time the statistical significance through the chi-square tests in order to compare the prevalence of loneliness according to various (demographic factors, health, social network, ...) characteristics. Further, we apply the Calibrated cross-sectional individual weights, which *'assign a calibrated weight to each 50+ respondent that depends on the underlying sampling design weight and the individual-specific set of calibration variables'*. They *'are computed separately by country to reproduce the size of the national target populations in each wave of the study. In each country and wave, the set of calibration margins reflects the size of the target population across 8 gender-age groups (i.e. males and females in the age groups [50-59], [60-69], [70-79], [80+] and across NUTS1 regional areas. [...] Calibration margins about the size of target population of each wave are taken from the EUROSTAT regional database'* (SHARE, 2018, p. 37). The analyses of significance are performed on the data without weight factor because the latter makes the absolute numbers bigger through which almost all the analyses become significant. Next, when certain response categories contain less than 20 absolute answers we do not include them into the analyses since such low numbers negatively affect the representativity of the research results. Last, for more information about how we created the variables 'loneliness', 'migration generation' and 'migration region', see Appendix 1.

3.1 The prevalence of loneliness in Belgium

In this paragraph we provide a broad picture of the prevalence of loneliness among Belgian elderly of 65 years or older (in 2013, 2015 and 2017), and the factors that are associated with this phenomenon.[4]

3.1.1 Background variables

Table 3.1 shows that one out of four Belgians of 65 years or older feels lonely in 2013 and 2015, and that this decreased significantly to 22% in 2017. Other research also showed that the prevalence of loneliness in Flanders decreased in the period 1985-2001, which may be attributable to changing expectations of elderly towards more autonomy and other types of relations (Heylen & Mortelmans,

4 In the seventh wave (2017) significantly less respondents participated to the survey in comparison to previous waves, through which it is not possible to perform all analyses on this wave.

2007). Further, women are more often confronted with feelings of loneliness than men (respectively 26% and 15% in 2017), and people in the older age group (85 years or older) more often feel lonely (30%) than people in the age group between 65 and 74 years old (18%). This is in accordance with other scientific research (Vozikaki et al., 2018). Further in this paper (see paragraph 3.3), we will see that the relation between gender and loneliness is not significant when we control for other variables (such as health, socioeconomic status, marital status, ...), and can thus be explained by those variables. With respect to age, we find that older people are more prone to various age-related factors that result in higher prevalence of loneliness(Niedzwiedz et al., 2016).

Next, we see that the marital status is strongly related to loneliness: while only 16% of the people who are married or have a (registered) partnership feel lonely in 2017, this increases to about one out of three people who never got married or are widowed. We also ascertain that people who are relatively recently widowed or divorced (between 0 and 10 years) are significantly more often lonely (43% in 2015) than people who are widowed or divorced for a longer period (more than 10 years) (33% in 2015). Age-related losses such as widowhood presumably strongly affect the social network and therefore also feelings of loneliness (Vozikaki et al., 2018). In line with this, we find that when there is no partner in the household elderly are more often lonely (35% in 2017) than when there is a partner in the household (14%), and that people who live alone are significantly more often lonely than people who live together with other people.

Further, Belgian elderly without siblings are slightly more lonely in 2013 and 2015 than elderly with siblings (not significant), but not in 2017. In line with this, we find that Belgian elderly who have one or more siblings alive are less often lonely than elderly without siblings alive. While 29% of the Belgian elderly without siblings alive feels lonely in 2015, this decreases to 24% for those with one sibling alive. Further, elderly without children are significantly more often lonely (32% in 2015) than elderly with one or more children (between 21% and 26% depending on the number of children). In this respect, having children (or not) has a far greater effect on loneliness than specific the number of children one has. Table 3.2 shows that the same seems to be valid for the relation between loneliness and having grandchildren (which off course also relates to having children).

Table 3.1 Loneliness among Belgian elderly (65+) (in %) according to background variables (part 1)

	2013 (1)	N	2015 (2)	N	2017 (3)	N
	***		***		***	
Total	24.6 [3]	2,744	24.7 [3]	2,912	21.6 [1,2]	1,260
Gender	***		***		***	
Men	19.8	1,228	19.9	1,315	15.2	558
Women	28.2	1,516	28.5	1,597	26.4	702
Age groups	***		***		***	
65-74	21.6	1,458	22.0	1,578	18.0	651
75-84	25.8	957	25.8	963	22.9	422
84 +	32.4	329	32.0	371	29.7	187
Marital status	***		***		***	
Married or registered partnership	17.3	1,783	17.8	1,826	15.6	826
Never married	39.1	120	32.7	133	34.4	59
Divorced	37.8	195	34.9	260	29.7	88
Widowed	37.5	646	37.3	693	33.0	287
Years divorced	ns		ns		ns	
0-10	-	-	44.1	30	-	-
> 10	37.8	170	34.4	227	28.8	84
Years widowed	***		***		ns	
0-10	45.1	275	43.3	287	35.9	109
> 10	32.1	365	32.5	399	30.6	184
Years divorced or widowed	***		***		ns	
0-10	44.5	296	43.3	317	36.5	115
> 10	33.7	535	33.1	626	30.1	268
Partner in household	***		***		***	
No	38.3	974	37.2	1,110	34.9	466
Yes	16.7	1,770	16.8	1,802	13.5	794
Household size	***		***		***	
1	39.5	882	39.1	997	35.3	430
2	17.1	1,712	17.1	1,754	14.9	770
3 +	19.9	150	17.4	161	6.7	60
Ever had any siblings?	ns		ns		ns	
Yes	24.3	2185	24.3	2,342	21.5	1,116
No	26.2	413	27.4	411	21.8	139
How many siblings alive?	***		*		ns	
0	29.9	387	29.2	394	25.5	160
1	25.5	710	23.5	726	20.7	342
2	19.9	446	21.4	518	21.1	239
3 +	22.9	797	23.7	864	20.7	403
Number of children	***		***		ns	
0	35.7	322	32.0	337	27.1	142
1	24.1	547	25.7	586	18.0	252
2	24.4	842	23.6	970	21.1	454
3	22.2	563	24.0	577	20.0	232
4 +	21.1	470	21.1	442	25.4	180

[1, 2, 3] This number differs significantly from column 1, 2 and/or 3 (alpha = 0.05).

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.

Source De Witte (2020c)

Subsequently, we find that elderly who live in a nursing home more often feel lonely (42% in 2017) than people in private households (21%). With respect to the educational level, we see that people with a lower educational level are more often lonely than people with a higher educational level. Also, people who gave the interview in French seem to be more often lonely (28% in 2017) than people who gave it in Dutch (19%). This concurs with previous research (Vandenbroucke et al., 2012). Last, loneliness seems to be strongly related to income: in general, people with a higher net household income are less lonely than people with a lower net household income. This is in accordance with other scientific research (Vozikaki et al., 2018). In this respect, people with less income or wealth not only have less financial possibilities to participate to society, but they also have more physical and mental health problems and are more often widowed which is related to feelings of loneliness (Niedzwiedz et al., 2016). However, from Figure 3.1 we interestingly deduct that the prevalence of loneliness decreases with increasing income until a certain threshold where the prevalence of loneliness again increases. Indeed, Table 3.2 shows that in 2015 loneliness decreases with increasing income until the sixth decile where it stays more or less stable until the ninth decile (between 17% and 20% in 2015). However, in the tenth and last decile loneliness scores are higher than that of the previous deciles (24%). The same can roughly be found in 2013 (although the numbers are a little bit more volatile), but not in 2017. Nevertheless, this also concurs with other research that studied the link between loneliness and wealth (Niedzwiedz et al., 2016). Moreover, these results also seem to concur with the research concerning happiness where it was also interestingly found that happiness (which of course is not the same as loneliness) increases with increasing income, until the highest income groups where happiness again starts to decrease (Annemans, 2018).

Table 3.2 Loneliness among Belgian elderly (65+) (in %) according to background variables (part 2)

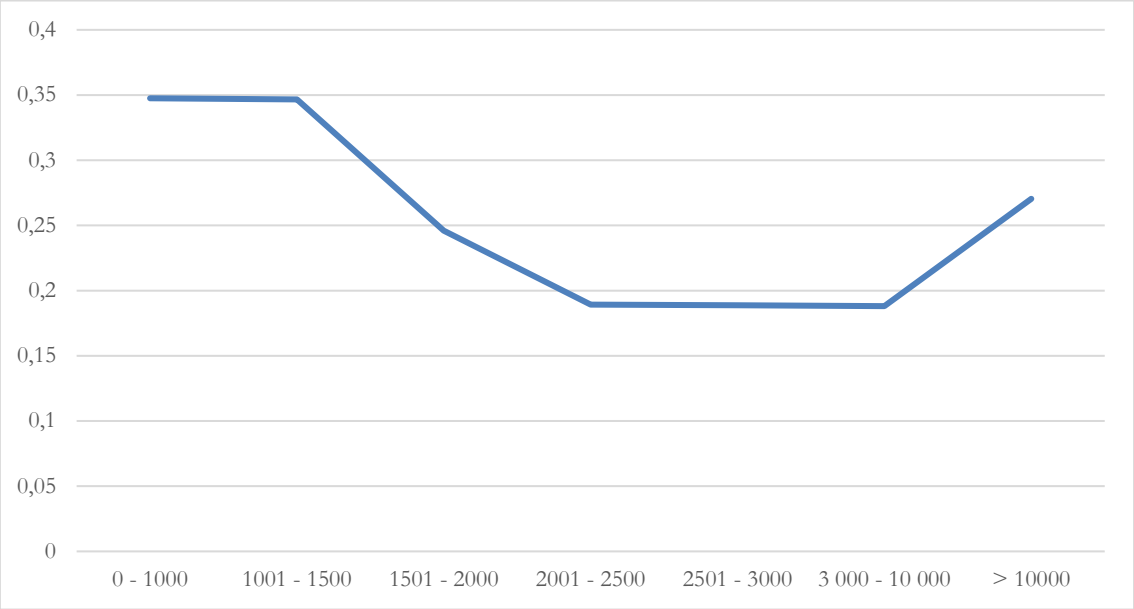
	2013	N	2015	N	2017	N
Number of grandchildren	***		**		ns	
0	31.4	523	29.6	583	21.8	227
1	24.2	219	24.6	251	19.9	110
2	24.9	415	23.3	448	23.6	199
3	21.8	333	23.1	345	28.1	138
4 +	22.7	1,254	23.4	1285	19.7	586
Interview conducted in household type	***		***		***	
Private household	24.0	2,661	24.3	2,823	20.9	1223
Nursing home	43.7	83	37.6	89	42.2	37
Education level (ISCED-97)	***		***		**	
Pre-primary	30.5	64	36.1	69	-	-
Primary	29.2	619	27.3	587	27.9	255
Lower secondary	24.6	624	26.8	654	21.0	288
Upper secondary	23.4	644	24.1	682	20.5	330
First stage of tertiary	21.4	775	20.9	895	17.8	376
Current employment status *	***		**		ns	
Retired	23.3	2,225	24.4	2,427	20.2	1,084
Employed or self-employed	25.9	42	3.9	45	-	-
Homemaker	24.7	338	25.8	303	26.8	110
Unemployed, permanently sick or disabled, other	43.9	56	23.7	48	25.4	20
Language of questionnaire	***		***		***	
French	29.6	1,368	30.2	1,364	27.7	409
Flemish	21.0	1,376	20.6	1,548	18.9	851
Total monthly net household income (in euro's)	***		***		***	
0-1,000	36.3	151	34.8	136	35.1	58
1,001-1,500	31.8	610	34.7	591	32.7	261
1,501-2,000	23.3	698	24.6	688	26.6	337
2,001-2,500	21.0	299	18.9	374	16.1	159
2,501-3,000	21.2	381	18.9	411	13.5	231
3,000-10,000	16.5	411	18.8	569	8.1	214
>10,000	24.4	194	27.0	143	-	-
Total monthly net household income (deciles)	***		***		***	
First decile	35.2	272	39.9	286	36.7	124
Second decile	31.5	276	35.6	296	32.7	120
Third decile	29.8	292	25.9	293	25.5	133
Fourth decile	24.4	250	23.1	289	26.6	108
Fifth decile	19.0	209	23.1	287	25.8	102
Sixth decile	24.1	328	17.9	249	23.1	168
Seventh decile	23.3	315	19.6	300	9.4	122
Eight decile	16.4	267	19.2	305	20.4	102
Ninth decile	15.3	263	17.0	314	8.4	158
Tenth decile	23.5	272	24.2	293	9.5	123

* The percentages of various categories in wave 5 and 6 are extremely different. Since we find no logical explanation for this, we will not conclude anything from this variable.

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.

Source De Witte (2020c)

Figure 3.1 **Loneliness among Belgian elderly (65+) (in %) according to total monthly net household income (in euro's) in 2015**



Source De Witte (2020c)

3.1.2 Physical health

From Tables 3.3 and 3.4 we deduct that loneliness is strongly related to physical health, which is in accordance with other scientific research (Vozikaki et al., 2018). While only two out of ten elderly with an excellent self-perceived health feel lonely in 2017, this amounts to more than half of the elderly who indicate that they have a poor health. In line with this, only one out of ten elderly with the lowest level of frailty feel lonely, which increases to six out of ten elderly with the highest level of frailty.

Further, we see that people with chronic health problems are significantly more often lonely (29% in 2017) than people without chronic health problems (15%), and that the prevalence of loneliness significantly increases with the number of chronic diseases. While 8% of the elderly with no chronic diseases feels lonely, this amounts to 40% among those with five or more chronic diseases. The same ascertainment is made for the relation between loneliness and the number of limitations with respect to ADL, IADL and mobility: the more limitations, the higher the prevalence of loneliness.

The Global Activity Limitation Indicator (Table 3.4) shows us that people who are limited in basic activities because of health problems are characterised by a higher prevalence of loneliness. Next, we find that the quality of eyesight and hearing is also significantly related to the prevalence of loneliness: in 2015 elderly with an excellent eyesight at a distance are half as often lonely (20%) as people with a poor eyesight (40%). Further, we see that elderly who take at least five different drugs, have troubles with pain and need help to do activities are significantly more often lonely than elderly who do not. Last, the degree in which the offered help with activities suffices to fulfil the needs is also related to the prevalence of loneliness: while 30% of the elderly who find that the help is 'all the time' sufficient feel lonely in 2015, this amounts to 41% among elderly who state that the help is only 'sometimes' sufficient. This last indicator demonstrates that by helping elderly to do activities (for which they need due to physical health problems) is an important way to alleviate feelings of loneliness.

Table 3.3 Loneliness among Belgian elderly (65+) (in %) according to physical health (part 1)

	2013	N	2015	N	2017	N
Self-perceived health (US-scale) [1]	***		***		***	
Excellent	11.6	151	11.6	140	17.3	62
Very good	14.4	452	13.8	483	11.4	224
Good	21.2	1,225	21.0	1,390	17.4	578
Fair	32.7	753	35.8	755	30.0	330
Poor	53.1	163	53.7	144	53.8	66
Level of frailty [2]	***		***		***	
0 (low frailty)	16.3	1,431	14.9	1,430	11.8	587
1	28.1	741	27.8	838	22.7	393
2	38.5	360	36.6	401	36.1	179
3	43.8	159	49.1	182	40.0	73
4 (high frailty)	45.6	52	60.2	59	61.2	28
Chronic health problems	***		***		***	
Yes	30.7	1,408	30.5	1,488	28.5	630
No	18.1	1336	18.7	1,423	14.7	629
Number of chronic diseases [3]	***		***		***	
0	17.1	423	15.1	401	8.4	163
1	19.2	682	19.6	718	16.1	314
2	24.2	701	21.9	705	20.3	319
3	28.5	461	28.0	533	26.4	217
4	32.3	251	29.7	293	30.2	137
5+	40.4	226	48.9	262	40.3	110
ADL (number of limitations) [4]	***		***		***	
0	20.8	2,181	20.8	2,334	18.0	1,024
1	36.0	302	34.9	335	35.8	148
2	42.4	122	47.2	130	34.8	44
3+	42.9	139	46.3	113	40.4	44
IADL (number of limitations) [5]	***		***		***	
0	19.8	2,006	19.3	2,064	15.4	899
1	31.0	340	36.0	361	33.2	145
2	35.1	151	34.7	170	26.3	65
3+	46.3	247	40.4	317	43.1	151
Number of mobility limitations [6]	***		***		***	
0	14.0	1,036	16.2	1,079	12.1	498
1	21.4	456	19.5	496	20.2	214
2	28.6	331	25.8	387	23.6	142
3	31.5	236	29.7	318	24.2	116
4	32.3	199	30.7	181	32.0	85
5	38.6	139	36.4	127	34.0	60
6+	40.5	347	45.7	324	39.2	145

[1] This is based on following question: 'Overall, you would say that your health is ...', with five response options: excellent, very good, good, fair and poor.

[2] This is based on the presence of four indicators: bothered by falling down, fear of falling down, dizziness, faints or blackouts and fatigue.

[3] This is based on the presence of following diseases: heart attack, high blood pressure or hypertension, high blood cholesterol, stroke, diabetes or high blood sugar, chronic lung disease, cancer, stomach or duodenal ulcer, peptic ulcer, Parkinson disease, cataracts, hip fracture or femoral fracture, other fractures, alzheimer's disease, dementia, senility, other affective/emotional disorders, rheumatoid arthritis, osteoarthritis/other rheumatism, kidney disease: ever diagnosed/currently having.

[4] ADL's are basic daily activities an individual must undertake on one's own or with the help of another. Items included in this category include difficulty dressing, walking, bathing, eating, getting in or out of bed and using the toilet.

[5] IADL's refer to skills that require skilled physical abilities as well as cognitive skills. Items in this category include difficulty using a map, preparing a hot meal, shopping for groceries, making telephone calls, taking medications, doing work around the house or garden.

[6] This refers to limitations with respect to walking 100 metres, sitting two hours, getting up from chair, climbing several flights of stairs, climbing one flight of stairs, stooping, kneeling or crouching, reaching or extending arms above shoulder, pulling or pushing large objects, lifting or carrying weights over 5 kilos, picking up a small coin from a table.

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.

Source De Witte (2020c)

Table 3.4 Loneliness among Belgian elderly (65+) (in %) according to physical health (part 2)

	2013	N	2015	N	2017	N
*Global Activity Limitation Indicator **	***		***		***	
Severely limited	41.9	541	42.2	515	37.8	206
Limited, but not severely limited	25.8	936	27.1	1,042	27.1	428
Not limited	16.2	1,267	16.2	1,353	12.3	626
Eyesight at a distance	***		***		**	
Excellent	16.5	598	20.0	598	16.8	278
Very good	19.6	877	21.7	995	18.8	415
Good	28.5	913	26.6	959	25.3	432
Fair	39.3	252	34.0	268	30.0	95
Poor	42.9	103	39.9	91	22.3	40
Eyesight reading	***		***		**	
Excellent	15.7	457	19.3	504	15.5	258
Very good	18.8	865	21.2	1,008	20.8	433
Good	28.0	923	25.4	999	25.0	410
Fair	32.1	291	39.3	260	21.1	104
Poor	42.9	208	36.9	141	30.7	55
Hearing	***		***		*	
Excellent	19.6	333	22.7	301	18.0	145
Very good	18.4	635	21.2	730	20.3	302
Good	24.2	1,071	24.2	1,232	20.4	501
Fair	32.7	586	30.0	540	24.6	268
Poor	35.3	119	33.2	109	37.6	44
Do you take at least 5 different drugs daily?	/	/	***		***	
Yes			33.7	951	33.4	404
No			21.2	1,650	17.1	737
Troubles with pain?	***		***		***	
Yes	31.5	1,172	31.7	1,325	28.3	535
No	19.4	1,571	19.0	1,587	16.7	724
Does need help with activities?	/	/	***		***	
Yes			33.0	1,013	30.5	452
No			25.9	899	22.0	345
Does help with activities meet needs?	/	/	**		**	
All the time			30.4	694	26.9	354
Usually			38.0	259	41.3	78
Sometimes			41.3	50	-	-
Hardly ever			-	-	-	-

* This refers to following question: 'For at least the past six months, to what extent have you been limited because of a health problem in activities people usually do?'

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.

Source De Witte (2020c)

3.1.3 Mental health and emotional wellbeing

From Table 3.5 we deduct that loneliness and mental health and emotional wellbeing are also strongly related to one another. Indeed, with respect to quality of life we find that while one out of ten elderly who scores high on the CASP-scale feel lonely in 2017, this amounts to two out of three elderly who score relatively low on this scale.[5] This indicates that loneliness is strongly related to having control, autonomy, self-realisation and pleasure (which are the four factors that make up the subscales for the

5 CASP-12 is the revised 12-item version of CASP-19, which is a theoretically grounded measure of quality of life in older age. It is composed of four subscales, the initials of which make up the acronym: control, autonomy, self-realisation and pleasure.

CASP-indicator). Further, depression is also related to loneliness. While only 15% of the elderly who score low on the depression scale are lonely in 2015, this increases to three out of four elderly who score high on this scale. In line with this, we find that people with a high life satisfaction feel less often lonely (20% in 2015) than people with a low life satisfaction (72%). The same ascertainment can be made with respect to various other indicators of mental health and emotional wellbeing such as looking back on life with happiness, looking forward to each day, finding that life has meaning, feeling full of energy, finding that life is full of opportunities and finding that the future looks good. This shows that importance to give sufficient attention to these mental health and emotional well-being factors, when studying the concept of loneliness.

Table 3.5 Loneliness among Belgian elderly (65+) (in %) according to mental health and emotional wellbeing

	2013	N	2015	N	2017	N
CASP-12 scale	***		***		***	
12-20 (low quality of life)	-	-	-	-	-	-
21-29	60.9	264	66.1	227	65.0	81
31-39	32.0	1,078	35.1	1,075	32.7	446
40-48 (high quality of life)	10.1	1,265	10.2	1,472	8.8	684
*Euro-Depression scale **	***		***		***	
0-3 (not depressed)	15.8	1,936	15.0	2,063	12.4	906
4-8	44.6	764	47.8	820	43.5	341
9-12 (very depressed)	72.3	44	75.7	29	-	-
How satisfied with life?	***		***		***	
0-3 (not satisfied)	88.0	44	71.9	33	-	-
4-6	57.1	351	57.4	307	54.8	123
7-10 (satisfied)	18.9	2,349	20.4	2,572	17.7	1,126
Look back on life with happiness	***		***		***	
Often	19.2	1,608	18.4	1,718	16.1	768
Sometimes	31.4	760	30.9	820	28.4	363
Rarely	39.2	236	42.0	256	37.7	84
Never	31.9	140	40.2	118	34.3	45
How often do you look forward to each day?	***		***		***	
Often	16.6	1,324	17.7	1,995	14.7	865
Sometimes	30.5	609	38.2	529	39.1	230
Rarely	34.9	414	46.7	216	40.5	79
Never	34.0	367	35.2	137	28.2	77
How often do you feel your life has meaning?	***		***		***	
Often	15.9	1,789	16.0	1,879	14.6	859
Sometimes	34.0	570	35.3	674	34.2	267
Rarely	56.6	214	52.5	217	44.1	81
Never	50.3	126	52.4	102	40.0	40
How often do you feel full of energy?	***		***		***	
Often	14.8	1,170	14.1	1,276	11.2	545
Sometimes	26.0	974	26.1	1,049	25.0	458
Rarely	36.2	447	41.4	440	37.3	180
Never	52.7	137	54.4	130	38.7	72
How often do you feel that life is full of opportunities?	***		***		***	
Often	14.0	1,237	15.2	1,370	14.2	665
Sometimes	27.7	948	27.0	1,019	26.1	412
Rarely	43.9	338	43.6	382	40.4	130
Never	42.3	123	61.0	100	38.3	42
How often do you feel that the future looks good for you?	***		***		***	
Often	11.6	1,063	12.2	1,179	12.4	519
Sometimes	23.9	959	24.3	1,038	20.1	470
Rarely	41.4	467	43.7	476	43.4	173
Never	54.9	225	57.1	180	42.6	84

* This scale is based on the presence of following characteristics: depression, pessimism, suicidality, guilt, sleep, interest, irritability, appetite, fatigue, concentration, enjoyment, tearfulness.

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.

Source De Witte (2020c)

3.1.4 Cognitive functioning

Tables 3.6 and 3.7 offer evidence to state that loneliness is associated with cognitive functioning. Indeed, while 17% of the elderly with excellent reading and writing skills are lonely in 2017, this rises to four out of ten elderly with poor reading and writing skills. We can formulate the same conclusion with respect to other indicators for cognitive functioning: orientation in time, fluency, numeracy, memory and word learning. In this respect, it could be interesting to further investigate whether this correlation between cognitive functioning and loneliness is mediated by the social network.

Table 3.6 Loneliness among Belgian elderly (65+) (in %) according to cognitive functioning (part 1)

	2013	N	2015	N	2017	N
Reading skills	***		***		***	
Excellent	21.5	837	20.0	962	17.1	345
Very good	23.2	845	24.4	911	17.0	406
Good	26.2	809	27.6	821	24.6	388
Fair	35.1	184	30.5	158	40.1	75
Poor	32.6	69	51.9	60	39.5	46
Writing skills	***		***		***	
Excellent	21.1	672	20.1	773	17.0	290
Very good	20.6	767	22.3	837	16.2	354
Good	27.8	865	26.4	886	22.5	393
Fair	27.0	309	31.2	298	30.2	148
Poor	39.5	131	42.6	118	41.6	75
Orientation in time test			***			
0 (low score)	-	-	43.9	28	30.7	23
1	-	-	53.0	24	-	-
2	35.8	40	32.8	71	20.5	30
3	26.7	421	24.9	387	25.0	162
4 (high score)	23.7	2,259	23.9	2,402	20.8	1,028
Fluency test	***		***		***	
0-9 (low score)	34.9	187	38.2	168	33.7	86
10-19	26.6	1,424	27.2	1,422	23.2	557
20-29	19.9	981	20.6	1,118	18.8	488
> 29 (high score)	21.4	152	17.5	204	15.7	129
Numeracy test	***		***		*	
0 (low score)	41.8	122	41.3	131	29.3	41
1	28.7	413	29.8	427	26.3	166
2	26.1	927	25.9	953	24.2	393
3	20.1	957	22.0	1,048	18.0	451
4 (high score)	21.0	325	16.5	353	18.6	209
Numeracy test 2	***		***		**	
0 (low score)	45.9	28	36.8	33	23.6	22
1	34.0	117	37.1	123	32.2	49
2	25.9	101	26.6	101	30.5	50
3	26.9	263	32.4	242	27.0	113
4	23.7	456	25.3	464	25.2	171
5 (high score)	23.4	1,779	22.4	1,949	18.9	855
Memory test	***		***		***	
Excellent	15.0	106	18.9	132	16.2	49
Very good	17.4	421	19.2	490	18.7	182
Good	22.4	1,390	22.4	1,522	19.2	710
Fair	30.0	675	30.6	650	27.5	277
Poor	47.2	152	51.1	118	41.8	42

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

Table 3.7 Loneliness among Belgian elderly (65+) (in %) according to cognitive functioning (part 2)

	2013	N	2015	N	2017	N
Word learning test	****		***		***	
0-5 (low score)	26.8	1,657	28.0	1,643	24.0	704
6-10 (high score)	19.9	1,043	19.7	1,222	17.1	520
Word learning test 2	***		***		ns	
0-5 (low score)	24.5	1,930	25.7	2,031	21.7	854
6-10 (high score)	18.4	455	18.1	554	17.6	249

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

3.1.5 Health care

Table 3.8 shows that loneliness also significantly relates to staying in a hospital, the number of doctor contacts, the number of received professional services and if elderly stayed one or more nights in a nursing home during the last year. This correlation can presumably be explained by the relation between loneliness and physical and mental health.

Table 3.8 Loneliness among Belgian elderly (65+) (in %) according to health care

	2013	N	2015	N	2017	N
Stayed in a hospital overnight last year?	***		***		***	
Yes	30.8	528	29.5	579	28.1	233
No	23.1	2,216	23.5	2,333	20.1	1,027
Number of doctor contacts last year	***		***		***	
0	19.6	123	23.3	110	18.5	46
1-10	21.2	1,739	20.8	1,930	18.0	859
11-20	31.3	675	31.2	649	29.2	285
21-30	35.9	111	41.3	138	32.4	40
30+	30.2	96	38.2	85	40.1	30
Number of professional services received *	***		***		***	
0	20.9	1,973	20.5	2,050	17.3	888
1	31.2	504	31.1	566	27.0	235
2	43.6	145	40.8	126	34.8	60
3	33.0	73	39.4	51	43.4	27
4	22.9	40	53.3	23	-	-
Did you stay overnight in a nursing home last year?	***		***		***	
Yes	43.7	83	37.6	89	42.2	37
No	24.0	2,661	24.3	2,823	20.9	1,223

* This refers to help with personal care in own home, with domestic tasks in own home, meals-on-wheels and help with other activities.
χ^2-test: *p<0.1; **p<0.05; ***p<0.01 [for the year 2015].
Source De Witte (2020c)

3.1.6 Financial situation

From Table 3.9 we can clearly establish a correlation between the prevalence of loneliness and the financial situation of elderly in Belgium. First, we see that people who postpone visits to the doctor or dentist because of the cost, household respondents with more difficulties making ends meet, household respondents who cannot pay unexpected expenses or household respondents who put up with feeling cold in order to save heating, clearly more often feel lonely. Indeed, we find that 42% of

the elderly who did not go to the doctor during the previous year because of its cost feel lonely in 2015, while this is only 25% for elderly who did not do this. In line with this, elderly who postpone visits to the dentists are more often lonely (53% in 2015) than elderly who do not do this (24%). Next, while one out of five household respondents who can easily make ends meet feel lonely in 2015, this increases to one out of three household respondents who make ends meet with great difficulty. Next, in 2015 the prevalence of loneliness is higher among household respondents who could not pay an unexpected expense (33%) or who put up with feeling cold to save heating (46%) in comparison with household respondents who did not do this (both 26%).

Further, we find that the more money elderly have on their bank accounts the lower their loneliness scores: while one out of three elderly who have less than 1,000 euro's on their bank account feel lonely in 2015, this is only 18% for those with more than 100,000 euro's on their bank account. Last, it is often said that measuring well-being by income-based poverty is a poor indicator because it is an imperfect proxy of material conditions and does not always reflect well on a number of important aspects of well-being. *'This may be particularly important in the case of older individuals, given the importance of such issues as health, disability and social interactions in later life. Substantial body of research has indicated that due to exit out of the labour market, deteriorating health and limits on the ability to participate in social life, older individuals are at high risk of deprivation in the material and social domains'* (Myck, Oczkowska, & Duda, 2015, p. 29). As a result, SHARE included comprehensive indicators for social and material deprivation, which are both strongly related to loneliness. While 19% of the least materially deprived elderly feel lonely in 2013, this amounts to half of the elderly who are the most materially deprived. This discrepancy is even greater with respect to social deprivation: while 12% of the least socially deprived elderly feel lonely in 2013, this is almost seven out of ten elderly who are the most socially deprived.

Table 3.9 Loneliness among Belgian elderly (65+) (in %) according to financial situation

	2013	N	2015	N	2017	N
Didn't see doctor last year because of costs?	***		***			
Yes	68.9	49	42.4	44		
No	23.9	2,691	24.5	2,861		
Postponing visits to the dentist last year?	***		***		ns	
Yes	43.6	60	52.6	80	33.4	23
No	26.2	1,788	23.9	2,829	21.3	1,235
Is household able to make ends meet? [1]	***		***		***	
With great difficulty	39.5	159	34.8	148	38.3	79
With some difficulty	34.7	451	31.7	537	27.9	213
Fairly easily	23.1	793	25.4	846	20.2	339
Easily	19.0	1,258	19.3	1,292	16.6	592
Could household pay an unexpected expense? [1]	***		***		***	
Yes	24.3	1,534	25.6	1,625	21.1	744
No	38.9	305	33.0	414	40.4	142
Households putting up with feeling cold to save heating last year? [1]	***		***		**	
Yes	43.4	122	45.7	109	38.0	33
No	25.7	1,727	26.0	1,941	23.6	857
How much money on bank accounts? (in euro)	***		***		*	
0-1,000	34.1	436	33.3	483	28.9	149
1,001-10,000	25.9	780	27.8	877	21.8	406
10,001-100,000	22.0	1,205	20.8	1,250	20.3	554
100,000 +	19.5	323	18.9	302	18.7	151
Material deprivation [2]	***					
0 (Least)	19.3	1,840				
1	27.8	261				
2	36.7	193				
3	50.8	98				
4	39.7	63				
5 (Most)	50.0	44				
Social deprivation [3]	***					
0 (Least)	12.0	830				
1	14.4	790				
2	24.4	299				
3	49.4	266				
4	64.3	157				
5 (Most)	68.8	56				
Severe deprivation [4]	***					
Yes	62.5	2,229				
No	20.4	142				

1 This information was only asked to the so-called 'household respondents' (and not to both partners when a couple was interviewed).
2 This variable is an aggregate measure of material conditions, based on 11 items that refer to two broad domains: the failure in the affordability of basic needs and financial difficulties.
3 This is an index for measuring social deprivation, based on 15 items.
4 This is a single two-dimensional indicator that identifies those with high levels of deprivation in each dimension. The threshold is the 75th percentile of the total distribution of each deprivation index. Individuals with deprivation measures placing them above the threshold in both dimensions are classified as being 'severely deprived'.

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

3.1.7 Housing

Table 3.10 presents the relation between loneliness and a number of housing related indicators. First, we find that homeowners are less often lonely (18% in 2017) than elderly who rent their home (38%). Next, we see that elderly who live in a nursing home or in housing complexes with elderly services are more lonely in 2015 (32%) and those who live in a building with flats (30%), and or who live in a family house (23%) or farm house (15%). Surprisingly, we do not find a significant difference with respect to the prevalence of loneliness according to the area where one lives (city, town). Nevertheless, elderly who live in a city do seem to be a little bit more often lonely than elderly who live in a small town. Further, we do not find a significant correlation between loneliness and how many years household respondents live in their present accommodation, and if they changed their residence since the last interview. Further, we see that household respondents who live in public housing are more often lonely (48% in 2017) than those who do not (37%), although this difference is neither significant.

Last, we see that the way household respondents interpret their neighbours and neighbourhood is related to feelings of loneliness. Indeed, household respondents who live in households who strongly agree that they feel part of the area where they live are significantly less lonely (19%) than people who disagree with this statement (43%). In addition, household respondents who strongly agree that vandalism/crime is a big problem in their area are more often lonely (32% in 2013) than those who strongly disagree (24% in 2013). Last, household respondents who have the feeling that people in their neighbourhood would help them if they were in trouble are less often lonely in 2015 (20%) than those who do not (42%).

Table 3.10 Loneliness among Belgian elderly (65+) (in %) according to housing situation

	2013	N	2015	N	2017	N
Statute	***		***		***	
Owner	23,1	2,073	21,8	2,206	18,1	992
Tenant	29,0	477	35,6	480	38,1	176
Rent free	19,2	111	24,5	137	15,6	55
Type of building	***		***		***	
Farm house	17,5	58	14,5	89	-	-
Family house	22,9	2,083	23,2	2,198	19,4	1,012
Building with flats	28,6	455	30,0	456	26,1	159
Housing complex with elderly services or nursing home	40,1	95	31,6	109	42,9	48
In which area does one live?	ns		ns		ns	
Big city	26,1	306	27,7	336	25,4	81
Suburbs or outskirts of a big city	25,8	387	25,3	385	23,7	166
Large town	24,7	355	23,9	402	24,1	115
Small town	22,8	917	22,3	1,067	18,1	501
Rural area or village	24,5	714	25,8	644	23,2	373
How many years in present accommodation? [1]	ns		ns		ns	
0-10	29,6	157	33,5	137	42,8	44
11-30	30,7	133	28,4	97	24,5	23
> 30	26,4	232	22,7	200	28,1	44
Changed residence since last interview? [1]	ns		ns			
Yes	28,6	164	25,9	191		
No	26,0	1,376	26,9	1,615		
Public housing? [1]	ns		ns		ns	
Yes	36,8	133	41,0	140	47,7	51
No	29,9	243	37,8	249	36,6	100
Feeling part of the area? [1]	***		**			
Strongly agree	22,3	876	19,4	162		
Agree	26,5	706	24,6	152		
Disagree	38,9	168	43,0	35		
Strongly disagree	48,0	92	-	-		
Vandalism/crime is a big problem in this area [1]	**		ns			
Strongly agree	31,5	112	-	-		
Agree	30,0	252	27,2	65		
Disagree	29,8	587	25,8	149		
Strongly disagree	23,5	894	22,9	132		
If I were in trouble, people in this area would help me [1]	***		***			
Strongly agree	23,5	749	19,5	126		
Agree	27,4	829	22,5	183		
Disagree	29,2	185	41,8	37		
Strongly disagree	47,7	62	-	-		

[1] This information was only asked to the so-called 'household respondents' (and not to both partners when a couple was interviewed).

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.

Source De Witte (2020c)

3.1.8 Social participation

Tables 3.11 and 3.12 show that loneliness is strongly related to (social) participation. In this respect, we first see that the more activities elderly undertake, the less lonely they are. While only 14% of the

elderly who did six of the seven mentioned activities during the preceding year feel lonely in 2017, this amounts to 29% for those who did none of the activities. This is also the case for all the distinctive activities: voluntary or charity work, attending an educational or training course, going to a sport social or other kind of club, taking part in a political or community-related organisation, reading books, magazines or newspapers, doing word or number games and playing cards or games such as chess. Elderly who have done those activities during the preceding year, feel less often lonely than those who did not do them. Further, we conclude that the more satisfied the elderly are with those activities, the less often they are lonely. In line with this, we find that while 22% of the elderly who are most satisfied with not doing none of those activities feels lonely, this amounts to 64% for elderly who are not satisfied with not doing none of those activities.

Next, Table 3.12 shows that elderly who feel that their age often prevents them from doing things are significantly lonelier in 2017 (43%) than those who state that their age never prevents them from doing things (13%). Also, we observe that elderly who have the feeling that what happens is often out of their control (low feeling of mastery) are more often lonely (48% in 2017) than those who find this never to be the case (10%). In line with this, we find that elderly are more often lonely if they have the feeling that they cannot do the things they want to do. Further, elderly who state that a shortage of money often prevents them from doing things they want to do are more lonely (52% in 2017) than elderly who indicate that this is never the case (18%).

Last, Table 3.13 gives more insight into if elderly are satisfied with doing none of the seven activities mentioned earlier. Hereby, we see that elderly of 85 years or older are significantly less satisfied with doing none of the activities in 2017 than elderly between 65 and 74 years old (respectively 90% and 97% are satisfied with doing none of the activities). We further observe that this also relates to having mobility problems. In this respect, we see that while 84% of the elderly with six or more mobility problems are satisfied with doing none of the activities in 2017, this amounts to 98% of the elderly with no mobility problems. In sum, it is clear that mobility problems result in elderly doing fewer activities while they would still like to do various activities.

Table 3.11 Loneliness among Belgian elderly (65+) (in %) according to social participation (part 1)

	2013	N	2015	N	2017	N
Number of activities last year	***		***		**	
0	35.7	244	36.9	212	28.6	72
1	27.5	626	27.3	613	23.8	273
2	25.6	713	25.2	736	24.3	302
3	17.9	544	21.6	666	17.7	277
4	19.1	297	18.6	377	14.4	169
5	18.7	161	19.3	156	19.7	91
6	6.5	59	13.4	57	14.4	28
Have you done voluntary or charity work last year?	***	660	***	741	**	335
Yes	17.4	1,992	19.2	2,068	15.8	887
No	26.0		26.0		22.7	
Have you attended an educational or training course last year?	ns		ns		ns	
Yes	22.5	293	21.1	333	16.6	154
No	24.1	2,359	24.7	2,476	21.4	1,068
Have you gone to a sport, social or other kind of club last year?	***		***		ns	
Yes	20.0	627	19.9	735	19.9	336
No	25.1	2,025	25.8	2,074	21.2	886
Have you taken part in a political or community-related organisation last year?	***		**		*	
Yes	17.2	256	19.6	304	15.1	167
No	24.6	2,396	24.8	2,505	21.8	1,055
Did you read books, magazines or newspapers?	***		***		**	
Yes	22.2	2,158	22.7	2,341	19.6	1,015
No	31.3	494	31.9	468	27.0	207
Did you do word or number games?	***		**			
Yes	21.0	1,133	22.4	1,365	19.8	668
No	26.1	1,519	26.0	1,444	22.1	554
Did you play cards or games such as chess	***		**		**	
Yes	18.9	848	21.6	904	17.9	406
No	26.2	1,804	25.5	1,905	22.3	816
Satisfaction with the activities named	***		***		***	
0-3 (not satisfied)	-	-	-	-	-	-
4-6	45.6	135	46.2	123	55.2	41
7-10 (satisfied)	20.8	2,247	21.8	2,466	18.9	1,105
Satisfaction with doing none of the activities	***		***		***	
0-3 (not satisfied)	49.4	42	63.9	27	-	-
4-6	48.3	190	49.4	180	53.0	48
7-10 (satisfied)	21.6	2,429	22.2	2,616	19.3	1,162

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

Table 3.12 Loneliness among Belgian elderly (65+) (in %) according to social participation (part 2)

	2013	N	2015	N	2017	N
How often does age prevents you from doing things?	***		***		***	
Often	40.8	547	40.4	580	43.2	243
Sometimes	24.3	1,080	25.5	1,129	20.1	515
Rarely	17.2	527	15.9	641	11.4	275
Never	14.4	574	15.4	541	13.1	223
What happens is out of your control?	***		***		***	
Often	44.3	408	49.4	301	47.7	140
Sometimes	28.9	830	33.4	826	29.8	377
Rarely	18.5	737	19.1	935	14.4	372
Never	14.7	740	13.0	815	10.4	359
How often you think you can do the things you want to do?	***		***		***	
Often	16.6	1,413	16.7	1,578	14.8	663
Sometimes	28.3	800	30.9	798	26.7	373
Rarely	39.1	373	38.7	373	38.3	150
Never	40.5	143	39.1	138	21.5	64
How often does a shortage of money stop you from doing things you want to do?	***		***		***	
Often	46.1	268	42.4	289	52.3	94
Sometimes	27.1	556	29.0	602	25.0	216
Rarely	25.6	514	25.2	581	18.2	243
Never	19.6	1,389	19.1	1,417	18.0	697

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

Table 3.13 Prevalence of elderly (65+) (in %) who are satisfied with doing no activities, according to age group and number of mobility problems

	2013	N	2015	N	2017	N
Age group	***		***		***	
65-74	92,9	1,346	94,3	1,477	96,7	628
75-84	90,8	839	91,9	857	94,1	388
84 +	85,7	244	88,8	282	90,4	146
Number of mobility problems	***		***		***	
0	96,1	986	94,4	1,032	97,5	484
1	94,2	426	94,4	464	96,6	204
2	91,4	297	94,8	360	96,5	133
3	87,7	202	91,3	283	95,9	107
4	87,8	169	90,4	156	95,8	79
5	88,6	116	88,4	101	84,9	48
6+	77,6	233	79,2	220	83,9	107

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

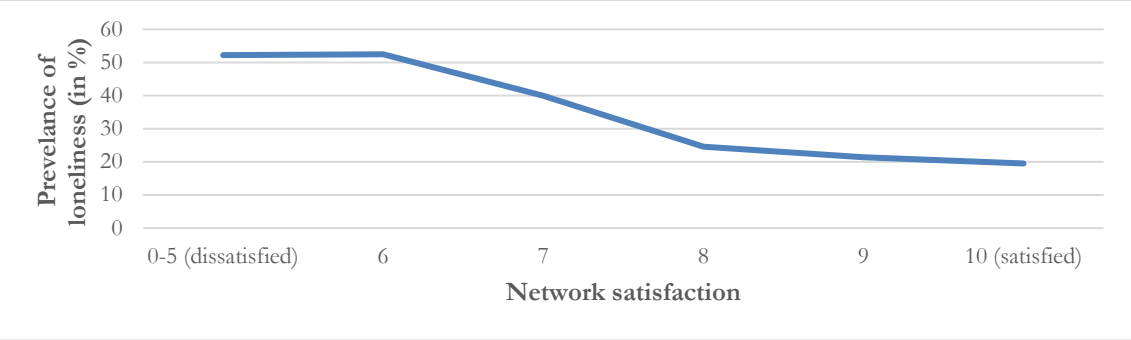
3.1.9 Social network

Based on Figure 3.2, we find that the prevalence of loneliness among elderly is strongly related to network satisfaction. The more satisfied elderly are with their social network, the lower the prevalence of loneliness. Figure 3.3 demonstrates that the degree to which elderly are socially connected is also

related to the prevalence of loneliness: while 27% of the elderly who score low on the social connectedness scale feel lonely (in 2015), this decreases to 13% for those who score high. This is a clear indication of the importance of the objective characteristics of the social network with respect to the prevalence of loneliness.

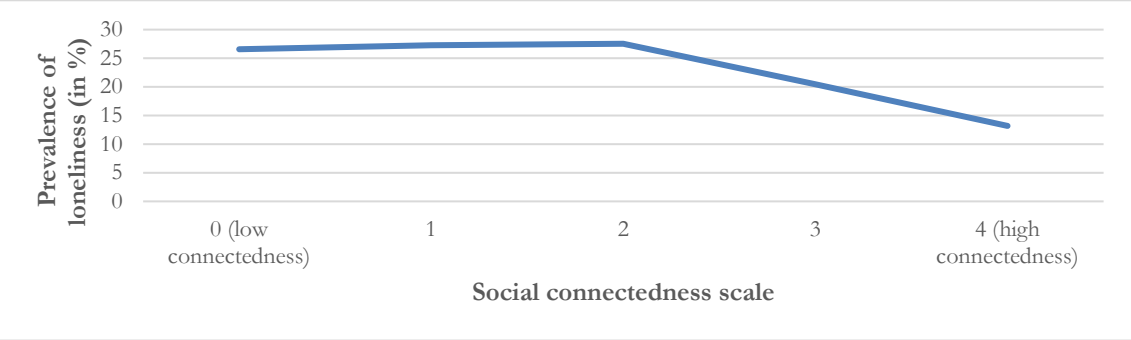
Table 3.14 shows that the size of the social network relates closely to the prevalence of loneliness among Belgian elderly. While 27% of the respondents with nobody in their social network state that they are lonely in 2015, this amounts to 18% for those who have seven persons in their personal network. Further, we see that elderly who lost between three and seven network members since the last 'wave' are more lonely (23% in 2015) than people who gained three to seven network members (18%) (this difference is not significant). Further, we see no clear trend with respect to the relation between loneliness and the number of lost or new network members. However, we do see that the more elderly have network members that continue, the lower the prevalence of loneliness: while almost one out of three elderly with no continued network members feels lonely in 2015, this decreases to about one out of ten elderly with five continued network members. Therefore, it seems that both the size of the network and the stability of the social network are important factors which relate to loneliness.

Figure 3.2 **Loneliness among Belgian elderly (65+) (in %) according to network satisfaction in 2015**



N = 2,552.
Source De Witte (2020c)

Figure 3.3 **Loneliness among Belgian elderly (65+) (in %) according to social connectedness in 2015***



* The social connectedness scale is a summary scale of social network data, which incorporates the five main characteristics of the social network into one composite measure in order to capture the key facets of social networks resources within a single indicator: network size, proximity, contact frequency, support and diversity. The underlying assumption is that having more social network mem¬bers in each category is representative of stronger network resources.
N = 2,484.
Source De Witte (2020c)

Table 3.14 Loneliness among Belgian elderly (65+) (in %) according to the size and changes in the social network in 2015

	2015	N
Social network size	***	
0	26.6	95
1	27.5	520
2	26.5	615
3	27.9	541
4	20.4	365
5	19.8	200
6	14.3	127
7	17.8	106
Change in number of network members since wave 4	ns	
-3 to -7	23.4	161
-2 to +2	24.8	1,679
+3 to +7	18.1	169
Number of lost network members since wave 4	ns	
0	20.2	504
1	27.4	642
2	24.2	414
3	23.9	216
4	27.0	97
5	26.0	42
6	15.5	21
Number of new network members since wave 4	ns	
0	21.1	484
1	26.2	624
2	27.0	408
3	23.2	245
4	18.3	93
5	21.9	57
6	10.8	20
Number of continued network members since wave 4	***	
0	32.5	392
1	23.6	771
2	23.2	437
3	18.2	225
4	18.7	79
5	11.7	26

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

Based on Table 3.15 we find that when the spouse is in the social network of elderly, the latter are significantly less often lonely (15% in 2015) than when this is not the case (23%. Further, we see that the more family members, the more women and the more men in a social network, the significantly lower the prevalence of loneliness (which is presumably simply explained by the network size, rather than the type of persons in the network). Next, we see that the prevalence of loneliness is higher when there are formal helpers in the social network (46% in 2015) than when this is not the case (24%). This can be presumably be explained by the higher care needs and thus frailty and/or health problems of those respondents. With respect to the number of children, siblings, parents and friends, we find no significant difference concerning the prevalence of loneliness.

Table 3.15 Loneliness among Belgian elderly (65+) (in %) according to the type of network members in 2015

	2015	N
Spouse in social network	***	
Yes	15.1	1,205
No	23.0	457
Family members in social network	***	
0	35.0	231
1	25.7	791
2	25.0	667
3	23.6	429
4	16.3	210
5	19.8	88
6	5.5	39
Number of women in network	**	
0	25.3	293
1	27.9	875
2	23.3	606
3	20.9	355
4	18.5	169
5	20.3	51
Number of men in social network	**	
0	24.3	756
1	27.8	883
2	22.7	444
3	18.6	207
4	16.2	52
5	10.5	20
Formal helpers in social network	***	
0	23.8	2,373
1	45.7	87
Children in social network	ns	
0	23.3	778
1	25.2	764
2	20.4	436
3	26.4	163
4	21.0	58
Siblings in social network	ns	
0	22.2	1,357
1	26.9	365
2	26.3	85
3	30.2	13
Parents in social network	ns	
0	23.6	133
1	27.9	28
Friends in social network	ns	
0	24.6	1,523
1	26.2	537
2	21.5	218
3	26.5	134
4	20.0	40

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

Based on Table 3.16 we find that the distance between where the network members and the elderly live, is related to the prevalence of loneliness of the latter. Indeed, the more network members live within a range of 5 km (or 1 km), the lower the prevalence of loneliness: while only 15% of the Belgian elderly who have five network members that live within a range of 5 km feel lonely, this increases to 38% for those who have no network members that live within a range of 5 km. Further, we ascertain that the proximity of the closest network member is also an important predictor for the prevalence of loneliness: whereas only 15% of the elderly who state that their closest network member lives in the same household (often the partner) feels lonely in 2015, this amounts to 43% of those elderly whose closest network member lives within a range of 25 km and 100 km from them.

Table 3.16 Loneliness among Belgian elderly (65+) (in %) according to the distance to network members in 2015

	2015	N
Number of network members who live within 5km	***	
0	37.6	340
1	23.0	958
2	27.2	589
3	17.4	315
4	14.5	120
5	15.0	49
Number of network members who live within 1km	***	
0	35.4	711
1	21.6	1,130
2	17.9	366
3	16.7	132
4	16.1	38
Proximity of closest network member	***	
In the same household	15.2	1,149
In the same building	25.7	58
Less than 1 km away	31.8	472
Between 1 and 5 km away	33.4	371
Between 5 and 25 km away	36.7	262
Between 25 and 100 km away	43.2	58

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

Table 3.17 shows us that loneliness is also closely related to the contact intensity with the network members. In this respect, we see that the more elderly have network members with who they have (at least) weekly contact, the lower the prevalence of loneliness. While 44% of the elderly who have no network members with who they have at least weekly contact feel lonely (in 2015), this decreases significantly to 14% of the elderly who have seven network members with who they have weekly contact. Further, the more contact elderly have with the child they have the most contact with, the lower the prevalence of loneliness. Indeed, while 23% of the elderly who have daily contact with at least one of their children feel lonely, this increases to more than half of the elderly who have less than once a month contact with the child they have the most contact with. In line with this, we see that when elderly have daily contact with their most closest network member they are significantly less often lonely (19% in 2015) than when they have 'several times a week' to 'every two weeks' contact with their closes network member (more than one out of three). This is an indication that it is very important for elderly to have at least one close confidant with who they speak very often. Last,

we see that the higher the mean number of contacts with the network members, the lower the prevalence of loneliness. Indeed, while only 19% of the elderly who have on average daily to several times a week contact with their network members feel lonely, this increases to 44% for elderly who on average have about once a month to less than once a month contact with their network members.

Table 3.17 Loneliness among Belgian elderly (65+) (in %) according to contact intensity with network members in 2015

	2015	N
Number of network members with weekly contact	***	
0	43.8	84
1	27.4	727
2	25.6	694
3	21.2	489
4	19.3	252
5	20.1	146
6	14.9	58
7	14.4	21
Most contact with at least one child	***	
Daily	22.5	800
Several times a week	24.4	829
About once a week	27.2	374
About every two weeks	27.7	78
About once a month	41.3	40
Less than once a month	58.4	29
Never	55.5	32
Contact with most closest network member	***	
Daily	19.3	1,689
Several times a week	34.3	475
About once a week	36.5	223
About every two weeks	39.9	54
Mean number of contacts with network members	***	
Daily - several times a week	18.5	900
Several times a week - about once a week	25.6	863
About once a week - about every two weeks	28.1	534
About every two weeks - about once a month	36.9	135
About once a month - less than once a month	43.8	26

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

Based on Table 3.18, we find that loneliness is related to the emotional closeness of elderly with their network members. Indeed, while 30% of the elderly who are on average 'very close' with their network members feel lonely (in 2015), this decreases to 23% of the elderly who are 'extremely close' with their network members. In this respect, we see that the closeness of elderly with their closest network member is also very important: while 22% of the elderly who are extremely close to their closest network member feel lonely, this increases to 45% of the elderly who indicate being 'somewhat close' to their closes network member. Again, this seems to show that it is very important to have at least one person with who elderly are very close with respect to loneliness. Last, we see that the more people elderly have in their network with who they are very or extremely close, the lower the prevalence of loneliness. While 47% of the elderly who have nobody in their network with who they are very or extremely close feel lonely, this decreases to 17% of the elderly who have seven people in their network with who they are very or extremely close. Again, we see that the difference

between having zero and one network members with who elderly are very or extremely close is more important than the exact number of network members with who elderly are very or extremely close.

Table 3.18 Loneliness among Belgian elderly (65+) (in %) according to emotional connectedness with network members in 2015

	2015	N
Mean emotional closeness with network members	***	
Very close	30.0	617
Extremely close	23.3	1,331
Emotional closeness with closest network member	***	
Somewhat close	44.7	132
Very close	25.9	893
Extremely close	21.7	1,439
Number of network members that are very or extremely close	***	
0	46.6	140
1	26.6	702
2	26.0	639
3	23.1	491
4	17.1	257
5	16.3	142
6	8.3	60
7	16.9	41

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

Table 3.19 presents some indicators that give insight into the relation between the prevalence of loneliness and social support. In this respect, we see that elderly who receive help with personal care and/or practical chores from people (inside or outside the own household) are more often lonely than those who do not, and that the prevalence of loneliness increases with an increased number of people elderly receive help from. This is probably related to their higher care needs and thus frailty.

Further, we find that 29% of the elderly who helped household members with personal care and practical chores feel lonely (in 2015), which is significantly higher than those who did not help household members (17%). This might be an indication that when one's partner needs a lot of assistance, elderly may feel lonely when taking care of them ('burden of giving'?). In this respect, we see this is not the case when elderly give help to people outside the own household: elderly who give help to people outside the own household are less lonely (23% in 2015) than elderly who do not (26%). In this respect, we see that the more people outside the own household elderly give help to, the lower the prevalence of loneliness (~ 'the power of giving'). Indeed, 26% of the elderly who help nobody outside the own household feel lonely, in comparison to 15% of the elderly who help three other persons. Last, we also see that household respondents who looked after their grandchildren the preceding year feel less often lonely (20%) than elderly who did not (31%), which may be simply explained by the fact they have (grand) children.

Table 3.19 Loneliness among Belgian elderly (65+) (in %) according to social support in 2015

	2015	N
Received help from household member(s) with personal care and practical chores?	ns	
Yes	35.4	125
No	29.5	376
Received help from family members, friends or neighbours outside household with personal care and practical chores?	***	
Yes	34.8	727
No	21.2	2,183
From how many people received help with personal care and practical chores?	***	
0	21.3	2,184
1	32.8	428
2	35.3	189
3	41.1	111
Given help with personal care and practical chores to household members?	***	
Yes	28.7	220
No	17.3	1,758
Given help with personal care and practical domestic care to people outside the household last year?	ns	
Yes	22.7	859
No	25.5	2,051
Given help to how many others outside the household?	*	
0	25.5	2,053
1	25.0	579
2	19.9	191
3	14.5	89
Looked after grandchildren last year? [1]	***	
Yes	19.7	729
No	31.1	956

[1] This information was only asked to the so-called 'household respondents' (and not to both partners when a couple was interviewed)

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.

Source De Witte (2020c)

3.1.10 (Risk) behaviour, trust in others, skills and expectations

Table 3.20 shows us that elderly who drink at least one alcoholic beverage a week are less lonely (18% in 2017) than elderly who do not (29%). This could perhaps be explained by the fact that drinking an alcoholic beverage is often a social happening and thus presumes social contact. Hereby, we find no difference according to how many alcoholic beverages elderly drink. Next, we deduct that elderly who often engage in vigorous or moderate physical activity are less lonely than elderly who do not: this is again presumably related to their better health situation. Last, we see that elderly who pray more often are also lonelier than those who do not pray (or pray less often). Indeed, while three out of ten elderly who pray more than once a day feel lonely, this decreases to two out of ten elderly who never pray. This could perhaps be explained by elderly who pray a lot also having more vulnerabilities (social isolation, health problems, ...), which in turn relate to loneliness.

Table 3.20 Loneliness among Belgian elderly (65+) (in %) according to (risk) behaviour

	2013	N	2015	N	2017	N
Drank 1 alcoholic beverage or more last week			***		***	
Yes			21.4	1,944	17.6	820
No			31.1	968	28.7	440
Number of alcoholic drinks last week			ns		ns	
1-10			21.3	1,384	17.9	632
11-20			21.6	323	17.3	109
> 20			20.6	219	14.2	72
How often do you engage in sports or vigorous physical activity?	***		***		**	
More than once a week	19.2	498	19.5	645	16.0	306
Once a week	19.5	339	24.3	334	20.1	144
One to three times a month	17.8	208	16.1	217	16.2	75
Hardly ever, or never	27.9	1,699	27.7	1,716	24.7	734
How often do you engage in moderate physical activity?	***		***		***	
More than once a week	20.9	1,636	21.8	1,766	18.0	780
Once a week	20.8	388	21.7	456	22.3	193
One to three times a month	25.9	196	24.5	181	23.6	67
Hardly ever, or never	37.8	524	36.6	508	32.3	220
Praying	**		ns			
More than once a day	27.9	262	30.3	31		
Once daily	27.0	552	34.0	76		
A couple of times a week	25.7	241	23.9	20		
Once a week	20.0	235	23.3	31		
Less than once a week	26.5	322	21.8	51		
Never	22.2	1,116	20.2	154		

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

Based on Table 3.21 we find that loneliness is related to the degree in which elderly trust other people. Whereas only 15% of the elderly who have a lot of trust in others feel lonely, this increases to 42% of the elderly with little trust in others (in 2015). Next, we see that computer skills and loneliness are closely related to one another: while only 9% of the elderly who state they have excellent computer skills are lonely, this increases to 31% of the elderly who never used a computer. In this respect, cautiousness is important because age could well be a mediating factor. Last, we find that elderly who think they have a high chance to live another 10 years are far less often lonely (15% in 2015) than elderly who think they have a very low or no chance to live another 10 years (31%).

Table 3.21 Loneliness among Belgian elderly (65+) (in %) according to trust, skills and expectations

	2013	N	2015	N	2017	N
Trust in other people	***		***			
0-3 (low)	34.3	491	41.9	75		
4-6	24.1	1,081	24.8	152		
7-10 (high)	20.1	1,130	15.0	140		
Self-rated computer skills	***		***		***	
Excellent	7.7	57	9.3	54	6.6	31
Very good	9.5	128	16.6	186	12.2	103
Good	17.2	469	16.8	514	16.1	252
Fair	21.5	493	21.7	638	17.5	264
Poor	27.7	500	28.7	475	25.7	210
Never used a computer	29.8	1,096	30.5	1,043	28.7	399
Life expectancy to live another 10 years			***			
1 (No chance)			30.8	405		
2			38.0	115		
3			30.9	125		
4			31.2	114		
5			23.8	637		
6			27.1	190		
7			25.7	337		
8			18.8	522		
9			19.0	246		
10 (Absolutely certain)			15.0	202		

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

3.1.11 Intermediate conclusion

Based on the previous paragraphs, we find that about one out of four Belgian elderly feels lonely in 2013 and 2015 and that this significantly decreased to about one out of five in 2017. Further, we observe that the prevalence of loneliness is not equally divided between different groups in society: the prevalence of loneliness is significantly higher among people with a worse (physical and mental) health situation, with lower levels of cognitive functioning, who use health care more often, who have less financial means, who participate more and have a bigger and more diverse social network. With respect to the latter, it seems important to have a high contact frequency and emotional closeness with at least one network member.

However, it is important to be cautious when interpreting these results and when trying to explain loneliness, because those correlations were not controlled for by other factors that may explain these links. As a result, some additional statistical analyses are presented in paragraph 3.4 where we do control for (possible) intermediate variables, in order to gain more insight into the explanations of the prevalence of loneliness among different groups.

3.2 The prevalence of loneliness in Europe

In this paragraph we present a picture of the prevalence of loneliness among European elderly of 65 years or older (in 2013, 2015 and 2017), and the factors that are associated with this phenomenon. Hereby we divide the European countries that participated to all of the three most recent waves of the SHARE-survey into three regions, based on their geography: northern (Sweden, Denmark),

central (Austria, Belgium, Germany, France, and Switzerland), and eastern and southern Europe (Czech Republic, Spain, and Italy).[6]

3.2.1 Background variables

Based on Table 3.22 we find that 27% of the Europeans of 65 years and older feel lonely in 2017, which is a small but significant increase since 2013 (when about 26% of the European elderly felt lonely). This might be explained by a number of factors such as more delayed marriages, dual-career-families and single-residence households, or lower fertility rates and longer periods in which people live as widow(er) (Masi, Chen, Hawkley, & Cacioppo, 2011). Nevertheless, cautiousness is needed since other research clearly shows that research is inconclusive with respect to evolutions concerning loneliness: there is no clear increase or decrease of loneliness in Europe in the period after the Second World War (van Campen et al., 2018)

Further, we see that the prevalence of loneliness is significantly lower in northern and central Europe (respectively 20% and 21% in 2017), in comparison with eastern and southern Europe (36% in 2017). This ascertainment concurs with other scientific research which suggest the explanation might lay in different cultural expectations with respect to activities and social networks which facilitate loneliness (Vozikaki et al., 2018). When looking at another loneliness-indicator, we see that about one out of ten Europeans often feels lonely, two out of ten feel lonely some of the time, and seven out of ten hardly ever or never feel lonely. In this respect, we again observe regional differences: while about 5% to 6% of the elderly in northern or central Europe often feel lonely, this is the case for 14% of the elderly in eastern and southern Europe.

In Table 3.23, we present the prevalence of loneliness of all the distinct European countries (also the countries that did not participate to all three most recent SHARE-waves). Hereby, we see that in 2017 the prevalence of loneliness is lowest in Austria and Germany (both 11%), followed by Denmark (14%), and highest in Greece (54%), followed by Italy (42%) and Poland (32%). In Belgium about 22% feels lonely in 2017, which is lower than the European mean, but higher than the mean of northern and central Europe. However, while the prevalence of loneliness increased in Europe in the period 2013-2017 (from 26% to 27%), in Belgium it decreased in the same period from 25% to 22%.

6 This is based on the division used by Vozikaki et al. (2018).

Table 3.22 Loneliness among European elderly (65+) (in %)

	2013 (1)	N	2015 (2)	N	2017 (3)	N
	***		***		***	
Total Europe	25.8 [2,3]	26,135	26.5 [1]	24,696	27.2 [1]	8,771
Northern Europe	17.5	4,849	18.9	4,602	19.8	1,896
Central Europe	21.0	11,871	20.9	11,134	20.5	3,852
Eastern and southern Europe	34.0	9,415	36.1	8,963	35.6	3,023
Total Europe [4]	***		***		***	
Often	10.1	1,818	8.6	1,613	9.5	638
Some of the time	20.3	4,746	22.0	4,903	22.1	1,681
Hardly ever or never	69.6	19,566	69.4	18,177	68.4	6,448
Northern Europe	***		***		***	
Often	5.3	182	4.2	149	5.3	82
Some of the time	18.7	742	20.0	747	19.4	300
Hardly ever or never	76.0	3,923	76.2	3,704	75.3	1,514
Central Europe	***		***		***	
Often	8.0	773	6.9	690	6.5	226
Some of the time	18.3	1,972	18.6	1,967	20.5	692
Hardly ever or never	73.8	9,125	74.4	8,477	73.0	2,931
Eastern and southern Europe	***		***		***	
Often	14.0	863	11.7	774	13.5	330
Some of the time	23.6	2,032	27.4	2,189	24.3	689
Hardly ever or never	62.5	6,518	60.9	5,996	62.3	2,003

[1, 2, 3] This number differs significantly from column 1, 2 and/or 3 (alpha = 0.05).

[4] This variable refers to the question 'How much of the time do you feel lonely?' with following response categories: often, some of the time and hardly ever or never. We present this because it gives more insight into the extent of loneliness (since it is not a dichotomous variable).

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.

Source De Witte (2020c)

Table 3.23 Loneliness among European elderly (65+) (in %) according to country

	2013 (1)	N	2015 (2)	N	2017 (3)	N
	***		***		***	
Austria	16.4	2,384	14.0	2,052	10.9	416
Germany	20.2	2,640	19.0	2,306	10.9	687
Sweden	20.0	2,893	23.0	2,763	24.1	963
Netherlands	15.4	2,208	-	-	-	-
Spain	23.7	3,679	26.1	3,144	28.9	1,005
Italy	40.2	2,640	42.5	2,864	41.8	1,279
France	16.8	2,435	24.6	2,158	24.0	877
Denmark	13.0	1,956	11.6	1,839	14.1	933
Greece	-	-	58.6	2,531	53.9	1,417
Switzerland	13.3	1,668	15.8	1,706	15.9	612
Belgium	24.6	2,744	24.7	2,912	21.6	1,260
Czech Republic	35.2	3,096	35.5	2,952	27.4	739
Poland	-	-	36.0	892	31.7	853
Luxembourg	24.8	683	24.8	706	-	-
Portugal	-	-	33.6	891	-	-
Slovenia	22.8	1,535	24.1	2,283	-	-
Estonia	33.3	3,341	31.9	3,088	-	-
Croatia	-	-	37.0	1,133	-	-

[1, 2, 3] This number differs significantly from column 1, 2 and/or 3 (alpha = 0.05).
χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

Table 3.24 shows that in Europe - just like in Belgium - women are significantly more often confronted with feelings of loneliness than men: while 31% of the European women feels lonely in 2017, this is 22% among European men. And although this is also the case in the three distinct regions, we find that this discrepancy between men and women is significantly higher in eastern and southern Europe in comparison with Northern and central Europe. Indeed, the difference between men and women in both northern and central Europe is 4 percent points in 2017, while this amounts to 16 percent points in eastern and southern Europe. And whereas about 22% of the women in northern and central Europe feel lonely in 2017, this amounts to 42% in eastern and southern Europe. This might suggest that in eastern and southern Europe there are more important inequalities between men and women concerning the factors that explain feelings of loneliness such as social security, finances, work situation, health, social network, ... Another explanation might be that the stigma for men in eastern and southern Europe to admit they feel lonely has a bigger impact than in northern and central Europe. In Belgium the difference between men and women concerning the prevalence of loneliness (11 percent points) is higher than in central Europe in 2017.

Table 3.24 Loneliness among European elderly (65+) (in %) according to gender

	2013	N	2015	N	2017	N
Total Europe	***		***		***	
Men	20.0	11,992	20.5	11,299	21.8	3,847
Women	30.2	14,143	31.3	13,397	31.2	4,924
Northern Europe	***		***		*	
Men	13.9	2,320	15.7	2,154	17.4	826
Women	20.6	2,529	21.7	2,448	21.6	1,070
Central Europe	***		***		***	
Men	16.8	5,392	16.2	5,085	18.4	1,708
Women	24.1	6,479	24.6	6,049	22.1	2,144
Eastern and southern Europe	***		***		***	
Men	25.4	4,280	27.6	4,060	26.3	1,313
Women	40.4	5,135	42.8	4,900	42.4	1,710

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

Next, we find that in Europe age is strongly related to feelings of loneliness, with older age associated to higher levels of loneliness. Indeed, while 21% of the Europeans of 65-74 years old feel lonely in 2017, this amounts to 39% for Europeans of 85 years or older. This difference can be found in all three European regions. However, again we find that the difference in percent points between the age groups (65-74 and 85+) is more important in eastern and southern Europe than in northern and central Europe. While in central Europe this difference is 9 percent points in 2017, this amounts to 27 percent points in eastern and southern Europe (northern Europe lays in between with a difference of 21 percent points, and in Belgium this difference is 12 percent points). Therefore, while more than half of the elderly of 85 years or older feel lonely in eastern and southern Europe, this is only the case for one out of four elderly in central Europe.

Table 3.25 Loneliness among European elderly (65+) (in %) according to age group

	2013	N	2015	N	2017	N
Total Europe	***		***		***	
65-74	20.2	14,998	21.4	13,920	20.6	4,554
75-84	29.8	8,587	30.1	8,307	31.7	3,100
85+	36.7	2,550	37.8	2,469	38.6	1,117
North Europe	***		***		***	
65-74	13.7	2,959	14.6	2,698	13.6	1,021
75-84	18.8	1,451	21.5	1,444	22.7	629
85+	32.4	439	33.0	460	34.6	246
Central Europe	***		***		***	
65-74	17.3	6,716	17.2	6,140	17.3	2,017
75-84	22.9	3,902	23.0	3,757	22.7	1,316
85+	29.2	1,253	30.0	1,237	26.4	519
Eastern and southern Europe	***		***		***	
65-74	25.4	5,323	28.8	5,082	25.4	1,516
75-84	40.9	3,234	41.7	3,106	42.3	1,155
85+	51.4	858	52.4	772	52.5	352

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

Table 3.26 shows that in all regions Europeans who are married or have a registered partnership are significantly less lonely than those who were never married or who are widowed (and in lesser degree those who are divorced). Indeed, while 20% of the married Europeans feel lonely in 2017, this amounts to 26% for those who are divorced, 38% for those who never got married and 40% for widowed Europeans. Hereby, we see that in almost all distinct regions married Europeans are the least lonely and widowed Europeans the most, and that people who never got married are lonelier than those who got divorced. In this respect, it seems possible that people who got divorced are less lonely than those who are widowed because a divorce is often a choice that follows from marital problems. In this respect, again we find that the difference between married and widowed Europeans is more important in eastern and southern Europe than in northern and central Europe. This difference is about 9 percent points in central Europe in 2017, and 31 percent points in eastern and southern Europe. While one out of four widowed elderly in central Europe feel lonely in 2017, this amounts to 56% of those in eastern and southern Europe (in Belgium this is 33%).

Table 3.26 Loneliness among European elderly (65+) (in %) according to marital status

	2013	N	2015	N	2017	N
Total Europe	***		***		***	
Married or registered partnership	18.7	17,779	20.1	16,632	20.4	5,841
Never married	33.1	1,145	35.4	1,086	38.2	447
Divorced	29.0	1,795	25.7	1,870	26.3	627
Widowed	39.1	5,416	39.9	5,108	40.4	1,856
Northern Europe	***		***		***	
Married or registered partnership	11.2	3,432	13.0	3,186	12.9	1,246
Never married	19.8	207	28.8	198	25.5	101
Divorced	23.9	452	23.1	466	23.9	194
Widowed	30.8	758	29.9	752	31.7	355
Central Europe	***		***		***	
Married or registered partnership	15.6	7,747	16.2	7,184	16.4	2,456
Never married	26.9	577	26.5	552	30.9	227
Divorced	28.0	945	23.4	978	25.5	319
Widowed	29.1	2,602	29.8	2,420	25.7	850
Eastern and southern Europe	***		***		***	
Married or registered partnership	23.8	6,600	26.5	6,262	25.5	2,139
Never married	41.5	361	46.9	336	47.7	119
Divorced	37.6	398	37.2	426	30.8	114
Widowed	54.9	2,056	55.8	1,936	56.3	651

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

Table 3.27 shows that when there is no partner in the household European elderly are significantly more often lonely (40% in 2017) than when there is a partner in the household (18%). Once again, the difference of the prevalence of loneliness between both groups is higher in eastern and southern Europe than in central and northern Europe.

Table 3.27 Loneliness among European elderly (65+) (in %) according to if there is a partner in the household

	2013	N	2015	N	2017	N
Total Europe	***		***		***	
Yes	17.0	17,767	18.4	16,638	17.8	5,675
No	38.2	8,368	38.4	8,058	39.7	3,096
North Europe	***		***		***	
Yes	9.2	3,466	11.3	3,228	9.8	1,211
No	29.3	1,383	29.5	1,374	30.2	685
Central Europe	***		***		***	
Yes	14.7	7,781	14.9	7,216	14.4	2,409
No	29.6	4,090	29.6	3,918	28.7	1,443
Eastern and southern Europe	***		***		***	
Yes	21.2	6,520	24.6	6,194	22.4	2,055
No	52.5	2,895	53.0	2,766	53.7	968

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

In line with the previous, Table 3.28 shows that household size is strongly related to loneliness in Europe. Indeed, while 21% of the people in a household of two persons or more feels lonely in 2017, this amounts to 39% of people in a single-household. Although we find this to be true in all the different European regions, again the difference in prevalence of loneliness between single households and households of two persons is higher in eastern and southern Europe than in northern and central Europe: in eastern and southern Europe the difference is 27 percent points in 2017, while it is 20 percent points in northern Europe and 17 percent points in central Europe. In Belgium this difference is 20 percent points.

Table 3.28 Loneliness among European elderly (65+) (in %) according to household size

	2013	N	2015	N	2017	N
Total Europe	***		***		***	
1	38.1	7,178	38.7	6,912	38.7	2,668
2	18.7	16,372	19.4	15,405	20.9	5,290
>3	21.1	2,585	23.6	2,379	21.1	813
North Europe	***		***		***	
1	29.6	1,334	29.7	1,327	30.3	668
2	9.3	3,415	11.5	3,172	10.0	1,196
>3	12.3	100	11.8	103	15.0	32
Central Europe	***		***		***	
1	30.4	3,677	30.5	3,517	28.8	1,306
2	15.2	7,458	15.1	6,930	15.6	2,326
>3	14.3	736	16.2	687	12.2	220
Eastern and southern Europe	***		***		***	
1	54.1	2,167	55.6	2,068	55.0	694
2	26.1	5,499	27.8	5,303	28.5	1,768
>3	23.8	1,749	27.3	1,589	24.6	561

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

Based on Table 3.29 we find that Europeans without children are significantly more often lonely than Europeans with one or more children. While 35% of the Europeans without children felt lonely in 2017, this is between 26% and 29% for Europeans with one or more children. While having at least

one child is an important factor, we find that the exact number of children one has is much less important for the prevalence of loneliness. And once again, the difference (in percent points) is greater in eastern and southern Europe than in northern and central Europe. Indeed, the difference between people without children and with one child is 2 percent points in central Europe, 7 percent points in northern Europe and 17 percent points in eastern and southern Europe.

Table 3.29 Loneliness among European elderly (65+) (in %) according to number of children

	2013	N	2015	N	2017	N
Total Europe	***		***		***	
0	34.6	2,481	35.8	2,344	35.0	822
1	27.3	4,531	27.4	4,316	26.3	1,474
2	23.5	9,968	23.9	9,726	24.9	3,495
3	23.3	5,389	25.3	5,051	27.1	1,832
4+	25.8	3,766	26.9	3,259	28.6	1,148
North Europe	***		***		**	
0	24.3	353	30.5	319	28.4	150
1	19.8	646	21.2	633	21.2	272
2	15.3	2,052	16.6	1,952	16.0	825
3	17.3	1,093	16.5	1,079	22.0	428
4+	18.0	705	20.9	619	21.0	221
Central Europe	***		***		ns	
0	28.4	1,360	26.8	1,217	23.4	448
1	23.0	2,291	23.4	2,095	21.9	712
2	19.4	4,061	19.0	4,059	18.0	1,419
3	18.3	2,408	19.5	2,245	23.3	763
4+	19.3	1,751	20.1	1,518	18.5	510
Eastern and southern Europe	***		***		***	
0	45.0	768	48.7	808	49.6	224
1	36.2	1,594	34.7	1,588	32.4	490
2	30.2	3,855	32.5	3,715	33.4	1,251
3	31.8	1,888	36.1	1,727	32.5	641
4+	35.2	1,310	37.4	1,122	39.7	417

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

Next, Table 3.30 shows that Europeans who live in a nursing home are significantly more often lonely (39% in 2017) than those who do not (27%). This is the case in all the distinct regions in Europe.

Table 3.30 Loneliness among European elderly (65+) (in %) according to living in a nursing home

	2013	N	2015	N	2017	N
Total Europe	***		***		***	
Not in nursing home	25.5	25,727	26.4	24,374	27.0	8,623
In nursing home	41.0	408	40.8	322	39.0	148
North Europe	***		***		***	
Not in nursing home	17.1	4,784	18.6	4,551	19.0	1,864
In nursing home	44.4	65	45.3	51	60.4	32
Central Europe	***		***		***	
Not in nursing home	20.7	11,645	20.7	10,942	20.2	3,768
In nursing home	33.8	226	34.1	192	34.9	84
Eastern and southern Europe	***		***		ns	
Not in nursing home	33.7	9,298	36.0	8,881	35.6	2,991
In nursing home	68.8	117	63.9	79	44.5	32

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

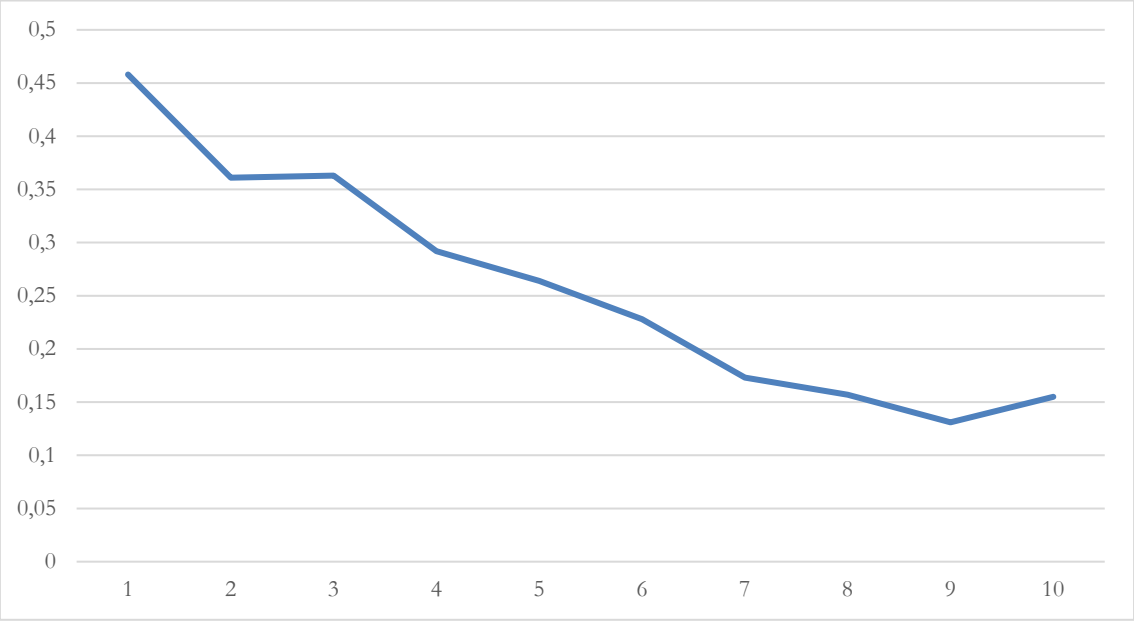
Table 3.31 depicts the relation between loneliness and the total monthly net household income in Europe. In general, the prevalence of loneliness among Europeans with a low income is higher than that of Europeans with a high income. However, as is the case in Belgium, we find that although the prevalence of loneliness decreases with an increasing income, at a certain threshold the prevalence of loneliness again starts to augment. From Figure 3.5 we find that Europeans whose income level is in the last decile, are more lonely in comparison with those in the ninth (and eight) decile: while 13% of the Europeans in the ninth income decile feel lonely in 2017, this again rises to 20% of the people in the tenth income decile. This seems to be the case in all the distinct European regions. This ascertainment concurs with the analysis of the relation between happiness and income in other research projects (Annemans, 2018).

Table 3.31 Loneliness among European elderly (65+) (in %) according to total monthly household net income (in euro's)

	2013	N	2015	N	2017	N
Total Europe	***		***		***	
First decile	42.4	2,524	45.8	2,380	47.0	865
Second decile	36.2	2,603	36.1	2,520	37.8	888
Third decile	31.4	2,645	36.3	2,485	32.7	876
Fourth decile	27.1	2,779	29.2	2,594	24.0	927
Fifth decile	23.6	2,469	26.4	2,366	26.5	833
Sixth decile	20.0	2,658	22.8	2,602	23.0	867
Seventh decile	15.5	2,606	17.3	2,392	21.5	852
Eight decile	16.2	2,806	15.7	2,411	17.1	890
Ninth decile	16.5	2,430	13.1	2,411	13.0	895
Tenth decile	22.3	2,615	15.5	2,535	20.0	878
Total Europe	***		***		***	
0-1,000	38.1	5,637	40.4	5,337	42.4	1,596
1,001-1,500	29.4	4,282	32.7	4,033	30.2	1,496
1,501-2,000	23.2	4,509	26.0	4,311	26.2	1,625
2,001-2,500	18.9	2,452	20.0	2,541	20.5	958
2,501-3,000	14.9	2,729	15.4	2,735	19.8	1,067
3,000-10,000	17.2	5,141	13.7	4,919	15.2	1,914
>10,000	23.5	1,385	18.9	820	31.3	115
North Europe	***		***		***	
0-1,000	42.3	77	52.1	98	48.1	49
1,001-1,500	29.7	612	29.8	644	33.0	268
1,501-2,000	24.4	665	25.0	556	29.1	266
2,001-2,500	17.5	807	17.3	810	20.9	310
2,501-3,000	10.5	84	14.4	754	10.2	291
3,000-10,000	8.9	1,745	9.8	1,616	7.9	684
>10,000	16.5	139	12.4	124	15.6	28
Central Europe	***		***		***	
0-1,000	31.2	1,197	29.4	962	28.6	266
1,001-1,500	28.1	1,788	29.5	1,596	27.7	553
1,501-2,000	21.6	2,467	24.1	2,210	23.5	779
2,001-2,500	17.2	1,237	19.1	1,309	19.9	501
2,501-3,000	12.7	1,510	13.4	1,540	18.4	624
3,000-10,000	14.0	2,703	12.6	2,896	12.8	1,075
>10,000	18.9	969	16.9	621	16.3	54
Eastern and southern Europe	***		***		***	
0-1,000	42.1	4,363	46.1	4,277	46.9	1,281
1,001-1,500	30.8	1,882	36.3	1,793	31.6	675
1,501-2,000	26.2	1,377	28.8	1,545	28.8	580
2,001-2,500	24.6	408	23.7	422	21.6	147
2,501-3,000	23.3	415	22.0	441	26.6	152
3,000-10,000	33.7	693	24.5	407	32.3	155
>10,000	35.6	277	36.0	75	48.2	33

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

Figure 3.4 **Loneliness among European elderly (65+) (in %) according to total monthly net household income (in deciles)**



Source De Witte (2020c)

3.2.2 Health and emotional wellbeing

Table 3.32 shows that loneliness is strongly related to (self-perceived) health: whereas 16% of the Europeans with an excellent self-perceived health feel lonely in 2017, this amounts to 47% of those with a poor health. In this respect, again we see that the difference of the loneliness scores in the two most extreme categories (excellent and poor health), is lower in central Europe than in eastern and southern Europe. We also see that while about one out of three central Europeans with a poor health feels lonely in 2017, this is almost six out of ten in eastern and southern Europe. We can make the same ascertainment based on Table 3.33: quality of life (CASP-scale) and loneliness are significantly related to one another with a higher quality of life being associated with lower loneliness scores.

Table 3.32 Loneliness among European elderly (65+) (in %) according to self-perceived health (US-scale)

	2013	N	2015	N	2017	N
Total Europe	***		***		***	
Excellent	12.4	1,707	14.4	1,508	15.5	520
Very good	11.2	4,012	13.7	4,076	13.9	1,491
Good	18.5	9,710	19.4	9,455	20.2	3,407
Fair	30.0	7,717	33.6	7,419	34.4	2,532
Poor	48.8	2,989	48.1	2,238	47.2	821
North Europe	***		***		***	
Excellent	7.7	797	9.8	627	9.6	251
Very good	9.9	1,253	12.0	1,267	8.3	518
Good	18.1	1,460	18.6	1,442	19.4	580
Fair	24.9	1,038	28.0	1,015	28.7	427
Poor	40.8	301	37.9	251	56.1	120
Central Europe	***		***		***	
Excellent	10.3	617	12.6	579	14.1	176
Very good	8.5	1,863	9.7	1,806	11.6	662
Good	15.1	4,881	15.8	4,740	16.7	1,671
Fair	26.0	3,410	26.4	3,165	25.8	1,036
Poor	39.7	1,100	38.8	844	34.9	307
Eastern and southern Europe	***		***		***	
Excellent	18.3	293	19.5	302	20.4	93
Very good	16.6	896	21.1	1,003	19.2	311
Good	24.4	3,369	25.8	3,273	25.2	1,156
Fair	36.0	3,269	43.7	3,239	42.5	1,069
Poor	58.5	1,588	60.7	1,143	56.6	394

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

Table 3.33 Loneliness among European elderly (65+) (in %) according to CASP-scale

	2013	N	2015	N	2017	N
Total Europe	***		***		***	
21-29 (low quality of life)	61.5	2,717	64.9	2,289	64.6	870
31-39	27.9	10,026	32.0	9,611	33.2	3,306
40-48 (high quality of life)	9.2	11,920	9.7	11,756	9.0	4,199
North Europe	***		***		***	
21-29 (low quality of life)	60.9	152	63.9	134	64.8	78
31-39	28.8	1,398	33.3	1,334	33.5	561
40-48 (high quality of life)	8.1	3,045	8.6	2,939	7.9	1,170
Central Europe	***		***		***	
21-29 (low quality of life)	59.4	858	59.3	685	66.6	225
31-39	27.3	4,021	28.7	3,806	29.5	1,304
40-48 (high quality of life)	9.1	6,514	9.4	6,228	8.2	2,167
Eastern and southern Europe	***		***		***	
21-29 (low quality of life)	62.6	1,707	68.1	1,470	63.9	567
31-39	28.5	4,607	35.7	4,471	36.3	1,441
40-48 (high quality of life)	9.7	2,361	11.1	2,589	10.8	862

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

Table 3.34 shows that loneliness and depression strongly correlate: while 17% of the Europeans with a low score on the depression scale feel lonely, this increases to 75% for those with a high score on the depression scale. This correlation is present in all four regions. In this respect, we see that the difference with respect to the prevalence of loneliness between the two extreme categories (not depressed and very depressed) is very similar between central and Eastern and Southern Europe (respectively a difference of 52 and 56 percent points in 2017). Next, Table 3.35 shows comparable results with respect to the link between loneliness and life satisfaction. While 21% of the Europeans who are most satisfied with their life feel lonely in 2017, this amounts to 74% among those who are the least satisfied with their life. This is also the case for the distinct regions.

Table 3.34 Loneliness among European elderly (65+) (in %) according to the Euro-Depression scale

	2013	N	2015	N	2017	N
Total Europe	***		***		***	
0-3 (not depressed)	15.3	18,999	16.3	18,289	16.8	6,347
4-8	44.8	6,586	47.4	6,007	46.5	2,259
9-12 (very depressed)	77.1	550	79.8	400	75.1	165
Northern Europe	***		***		***	
0-3 (not depressed)	12.2	3,995	14.2	3,824	14.4	1,543
4-8	39.3	833	39.9	760	42.3	343
9-12 (very depressed)	75.5	21	-	-	-	-
Central Europe	***		***		***	
0-3 (not depressed)	12.9	8,712	12.6	8,232	13.7	2,849
4-8	38.5	3,008	40.4	2,806	36.9	968
9-12 (very depressed)	69.2	151	79.4	96	65.9	35
Eastern and southern Europe	***		***		***	
0-3 (not depressed)	19.8	6,292	22.9	6,233	21.3	1,955
4-8	53.1	2,745	57.6	2,441	55.4	948
9-12 (very depressed	80.6	378	79.9	286	77.3	120

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

Table 3.35 Loneliness among European elderly (65+) (in %) according to life satisfaction

	2013	N	2015	N	2017	N
Total Europe	***		***		***	
0-3 (not satisfied)	70.2	631	66.0	386	73.6	161
4-6	43.4	4,731	50.2	3,485	47.6	1,339
7-10 (satisfied)	18.7	20,773	20.3	20,825	20.6	7,271
North Europe	***		***		***	
0-3 (not satisfied)	56.4	45	61.3	37	56.5	24
4-6	46.5	396	53.6	285	54.2	150
7-10 (satisfied)	14.1	4,408	15.9	4,280	15.9	1,722
Central Europe	***		***		***	
0-3 (not satisfied)	63.7	197	58.1	130	72.7	45
4-6	36.8	2,043	42.3	1,447	39.4	493
7-10 (satisfied)	15.1	9,631	15.8	9,557	15.2	3,314
Eastern and southern Europe	***		***		***	
0-3 (not satisfied)	74.5	389	71.0	219	75.0	92
4-6	52.8	2,292	60.5	1,753	54.5	696
7-10 (satisfied)	25.0	6,734	28.2	6,988	27.9	2,235

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

3.2.3 Social participation and social network

Table 3.36 shows that there is a significant correlation between the prevalence of loneliness and the number of social activities elderly have done during the preceding year: loneliness decreases as the number of activities increases. While 44% of the Europeans with no activities feel lonely in 2017, this decreases to 17% for those with five activities. Again, in central Europe the difference in the prevalence of loneliness between those with none and those with many activities is smaller than in eastern and southern Europe. Indeed, whereas in central Europe there is a difference of 13 percent points between people with none and people with five activities in 2017, this difference is about 25 percent points in eastern and southern Europe (and about 23 percent points in northern Europe). Based on Table 3.37, we come to a similar conclusion with respect to the relation between loneliness and satisfaction with the activities elderly undertake: Europeans who are not satisfied with their social activities are significantly lonelier than Europeans who are satisfied.

Table 3.36 Loneliness among European elderly (65+) (in %) according to the number of activities last year

	2013	N	2015	N	2017	N
Total Europe	***		***		***	
0	40.8	4,082	43.1	3,660	44.4	1,339
1	27.2	5,643	27.5	4,953	27.2	1,641
2	22.8	6,249	23.7	5,965	22.4	2,056
3	18.0	5,315	19.4	5,206	20.6	1,812
4	14.2	2,798	14.9	2,926	15.7	1,102
5	15.4	1,228	17.3	1,233	17.4	503
6	13.3	345	17.8	366	10.3	136
7	22.1	63	19.2	65	3.6	34
North Europe	***		***		***	
0	35.3	137	30.4	124	32.9	37
1	20.2	668	25.7	561	29.6	175
2	19.3	1,224	20.9	1,067	22.1	431
3	14.5	1,381	17.7	1,266	19.2	540
4	13.9	902	14.4	945	13.1	421
5	12.5	366	13.3	443	10.4	189
6	16.9	89	7.4	119	16.2	57
7	-	-	12.9	26	-	-
Central Europe	***		***		***	
0	35.2	900	32.7	739	30.8	241
1	25.1	2,375	26.0	2,065	24.4	685
2	21.6	3,024	20.9	2,856	20.7	970
3	16.3	2,799	17.2	2,781	18.7	943
4	12.0	1,541	13.8	1,576	13.5	565
5	14.5	727	17.6	676	17.7	271
6	12.8	234	18.2	216	10.2	74
7	21.7	41	21.9	33	-	-
Eastern and southern Europe	***		***		***	
0	42.8	3,045	46.2	2,797	47.2	1,061
1	29.8	2,600	29.3	2,327	29.2	781
2	26.4	2,001	30.3	2,042	25.4	655
3	25.0	1,135	28.9	1,159	26.5	329
4	26.8	355	22.5	405	28.8	116
5	23.4	135	20.5	114	22.2	43
6	16.6	22	27.8	31	-	-

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

Table 3.37 Loneliness among European elderly (65+) (in %) according to satisfaction with activities

	2013	N	2015	N	2017	N
Total Europe	***		***		***	
0-3 (not satisfied)	43.1	189	54.4	97	67.9	36
4-6	36.9	2,268	38.1	1,623	39.0	546
7-10 (satisfied)	19.0	19,073	20.1	18,878	19.7	6,669
North Europe	***		***		***	
0-3 (not satisfied)	36.2	19	-	-	-	-
4-6	37.7	267	36.4	188	45.8	82
7-10 (satisfied)	14.8	4,330	17.2	4,203	17.0	1,727
Central Europe	***		***		***	
0-3 (not satisfied)	42.2	86	56.0	46	-	-
4-6	33.2	1,102	35.6	747	38.1	246
7-10 (satisfied)	16.8	9,506	17.6	9,361	16.8	3,258
Eastern and southern Europe	***		***		***	
0-3 (not satisfied)	44.6	84	52.0	37	-	-
4-6	44.8	899	43.2	688	40.0	218
7-10 (satisfied)	24.9	5,237	27.0	5,314	25.6	1,684

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

Table 3.38 shows us that loneliness is strongly related to the satisfaction with the social network: while 25% of the Europeans who are satisfied with their network feel lonely in 2015, this increases to 57% for those who are not satisfied. This can be seen in the three distinct regions, but again the difference of the prevalence of loneliness of people who are satisfied with their network and those who are not, is greater in eastern and southern Europe than in central Europe (respectively 42 and 34 percent points). So, when the social network is deemed insufficient, people in eastern and southern Europe feel significantly more often lonely (76%) than people in central Europe (45%).

Table 3.38 Loneliness among European elderly (65+) (in %) according to social network satisfaction

	2015	N
Total Europe	***	
0-3 (not satisfied)	57.0	135
4-6	45.3	838
7-10 (satisfied)	24.6	22,724
North Europe	***	
0-3 (not satisfied)	51.3	22
4-6	50.0	114
7-10 (satisfied)	17.7	4,413
Central Europe	***	
0-3 (not satisfied)	45.1	55
4-6	39.8	407
7-10 (satisfied)	19.5	10,236
Eastern and southern Europe	***	
0-3 (not satisfied)	75.7	58
4-6	56.7	317
7-10 (satisfied)	34.0	8,075

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

Last, from Table 3.39 we find that when Europeans are more socially connected they are less lonely than Europeans who are not socially connected. Whereas 20% of the Europeans who feel very connected with other feel lonely, this amounts to 38% among Europeans with low social connectedness. Again, the difference of the prevalence of loneliness between people with low and high connectedness is higher in eastern and southern Europe (26 percent points) than in central Europe (11 percent points).

Table 3.39 Loneliness among European elderly (65+) (in %) according to social connectedness scale

	2015	N
Total Europe	***	
0 (low connectedness)	38.4	659
1	31.7	5,537
2	26.0	10,450
3	19.7	5,159
4 (high connectedness)	20.4	945
North Europe	***	
0 (low connectedness)	36.1	99
1	17.9	964
2	20.1	2,065
3	16.2	1,107
4 (high connectedness)	13.7	164
Central Europe	***	
0 (low connectedness)	29.1	251
1	23.9	2,041
2	22.1	4,745
3	16.2	2,695
4 (high connectedness)	18.3	535
Eastern and southern Europe	***	
0 (low connectedness)	51.4	309
1	41.1	2,532
2	33.9	3,640
3	29.1	1,357
4 (high connectedness)	25.7	246

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

3.2.4 Housing status

Table 3.40 shows that European homeowners are significantly less lonely (26% in 2017) than tenants (29%). Here as well, the difference between owners and tenants is greater in eastern and southern Europe than in central Europe (respectively 15 and 5 percent points in 2017).

Table 3.40 Loneliness among European elderly (65+) (in %) according to housing status

	2013	N	2015	N	2017	N
Total Europe	***		***		***	
Owner	24.2	19,441	25.3	18,379	26.1	6,704
Tenant	29.0	4,596	29.4	4,286	28.5	1,372
Rent free	29.8	1,690	29.9	1,709	34.7	547
North Europe	***		***		***	
Owner	15.6	3,714	16.8	3,538	16.6	1,426
Tenant	21.5	1,036	23.9	985	25.5	428
Rent free	21.5	34	21.4	28	-	-
Central Europe	***		***		***	
Owner	18.5	7,851	19.0	7,349	19.0	2,696
Tenant	26.2	2,765	25.1	2,567	24.3	755
Rent free	21.1	1,029	21.8	1,026	20.0	317
Eastern and southern Europe	***		***		***	
Owner	31.6	7,876	33.7	7,492	33.5	2,582
Tenant	44.8	795	52.6	734	48.1	189
Rent free	48.2	627	48.8	655	55.6	220

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

3.2.5 Trust in others and political stance

Table 3.41 presents the relation between the trust Europeans have in other people and the prevalence of loneliness. While 23% of the Europeans with a lot of trust in others feel lonely in 2015, this increases to 57% of those with little trust in other people.

Table 3.41 Loneliness among European elderly (65+) (in %) according to trust in other people

	2013	N	2015	N	2017	N
Total Europe	***		***		*	
0-3 (low)	32.2	4,095	56.9	204	28.8	26
4-6	25.9	10,581	40.1	509	30.4	107
7-10 (high)	21.3	11,099	23.1	489	19.6	95
North Europe	***					
0-3 (low)	27.9	307				
4-6	21.3	1,263				
7-10 (high)	14.5	3,224				
Central Europe	***		***			
0-3 (low)	27.5	2,063	28.3	87		
4-6	20.6	5,072	24.6	205		
7-10 (high)	16.8	4,618	16.0	193		
Eastern and southern Europe	***		***			
0-3 (low)	39.5	1,725	64.0	114		
4-6	34.3	4,246	45.3	285		
7-10 (high)	29.5	3,257	26.1	223		

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

Last, Table 3.42 shows that people who pray more are also more often lonely. While 25% of the Europeans who never pray indicate that they feel lonely in 2015, this increases to 52% of the Europeans who pray more than once a day. This might be due to people praying more when they have a

lot of difficulties or vulnerabilities (social isolation, health problems, ...), which in turn may be to a higher prevalence of loneliness.

Table 3.42 Loneliness among European elderly (65+) (in %) according to frequency of praying

	2013	N	2015	N
Total Europe	***		***	
More than once a day	36.6	2,689	51.9	157
Once daily	27.5	5,238	44.4	280
A couple of times a week	26.4	2,020	35.9	93
Once a week	25.1	1,790	38.4	102
Less than once a week	20.2	3,571	20.8	160
Never	22.2	10,550	24.6	405
North Europe	***			
More than once a day	23.1	232		
Once daily	20.3	586		
A couple of times a week	23.5	203		
Once a week	15.9	198		
Less than once a week	16.7	824		
Never	16.2	2,749		
Central Europe	***		**	
More than once a day	26.6	1,198	37.2	40
Once daily	20.0	2,549	28.4	98
A couple of times a week	21.2	1,065	11.2	26
Once a week	20.9	961	27.0	40
Less than once a week	19.1	1,684	9.4	71
Never	20.3	4,306	20.0	204
Eastern and southern Europe	***		***	
More than once a day	45.4	1,259	53.8	114
Once daily	36.2	2,103	47.5	168
A couple of times a week	33.2	752	39.7	65
Once a week	31.4	631	41.0	60
Less than once a week	23.0	1,063	26.1	75
Never	28.5	3,495	30.1	140

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

3.2.6 Intermediate conclusion

In the previous paragraphs, we find that the prevalence of loneliness in Europe - in contrast to our analyses for Belgium - has slightly increased in de period 2013-2017 from 26% to 27%. Furthermore, we observe considerable differences between northern and central Europe and eastern and southern Europe. Indeed, the prevalence of loneliness is far greater in eastern and southern Europe (36% in 2017) than in central (21%) and northern (20%) Europe. Further, we found - similar to our analyses for Belgium - that the prevalence of loneliness is unequally distributed among the different groups in society, according to various factors such as age, gender, marital status, household situation, number of children, health and wellbeing, social participation and the social network characteristics. Also, we observe that the discrepancy between various categories (e.g. men and women) is greater in eastern and southern Europe than in central (and in lesser degree northern) Europe. An explanation for this might be that there are more important inequalities in eastern and southern Europe with respect to the factors that relate to loneliness (e.g. health, gender, social security, income, ...). Further research could do some additional analyses in order to explain these regional differences.

3.3 The relation between loneliness and migration

In this paragraph, we investigate the relation between loneliness and migration among elderly in Belgium and Europe. Hereby, we focus on elderly of 65 years or older, but also perform various analyses for elderly of 50 years or older in order to enlarge the number of respondents. In this respect, it is important to bear in mind that the respondents of SHARE speak at least one of the national languages, which is an important indicator for integration. Hence, the impact of migration on loneliness through the lack of knowledge of the national language cannot be investigated through the SHARE database.

3.3.1 Loneliness and migration in Belgium

With respect to the relation between loneliness and migration in Belgium (Table 3.43), we find that elderly of 65 years or older who were born in Belgium feel less lonely than those who were not born in Belgium (respectively 25% and 29% in 2015).

Based on the indicator '*Immigrant generation (type II)*' we also find that that Belgian natives of 65 years or older are less lonely than people with a migration background (from the second, 1.5 or first generation). Although in 2013 this difference is significant for both the second and first generation, in 2015 this is only significant with respect to elderly from the second generation (and in 2017 only with respect to elderly from the first generation). Nevertheless, this ascertainment concurs with our hypothesis that people with a migration background are lonelier than natives. Further, we ascertain that in 2013 the prevalence of loneliness of people from the second generation (31%) is almost as high as that from first generation immigrants (33%), and even higher in 2015 (respectively 32% and 29%). However, in 2017 it is lower (respectively 27% and 35%), but not significant. This seems to indicate that the impact of having a migration background on feelings of loneliness works through until the second generation. And with respect to evolutions concerning the prevalence of loneliness of elderly with a migration background in Belgium, we find not clear in- or decrease in the period 2013-2017.

However, based on the indicator '*Immigrant generation*', we do not find a significant difference between first, 1.5th or second generation with respect to the prevalence of loneliness. This does not concur with what we expected, namely that the prevalence of loneliness decreases with increasing generational status.

Further, there does not seem to be a significant relation between loneliness and the region people with a migration background originally come from (a country that is part of the EU or countries outside the EU). In 2013, immigrants from countries that are part of the EU are as often lonely (32%) as elderly from countries outside the EU (respectively 32% and 31%). In 2015, we even find that elderly with a migration background from other EU countries are often lonely (31%) than those from countries outside the EU (28%) (this difference is not significant). This does not concur with our hypothesis, namely that people with a migration background from countries outside the EU would be lonelier than those from other EU countries.

Since the indicators concerning the age when first generation immigrants moved to Belgium and the length of residence in Belgium are seldom significant, and furthermore seem to be quite volatile, we will not conclude anything from them.

Table 3.43 Loneliness among Belgian elderly (65+) (in %) according to various migration related characteristics

	2013	N	2015	N	2017	N
Born in Belgium?	***		ns		*	
Yes	24.1	2,529	24.5	2,705	21.2	1,202
No	32.8	209	28.9	200	30.7	57
Immigrant generation	***		**		ns	
Natives	23.5 [2, 4]	2,342	23.5 [2]	2,343	21.0	1,067
2nd generation	31.3 [1]	179	32.0 [1]	197	26.6	75
1.5 generation	32.8	46	32.0	48	-	-
1st generation	32.9 [1]	128	28.4	120	33.5	32
Immigrant generation (Type II)	***		**		ns	
Natives	23.5 [2, 3]	2,342	23.5 [2]	2,343	21.0 [3]	1,067
2nd generation	31.3 [1]	179	32.0 [1]	197	26.6	75
1st generation	32.9 [1]	174	29.4	168	34.6 [1]	43
Migration region	***		**		*	
Belgium	23.5 [2]	2,342	23.5 [2]	2,343	21.0	1,067
EU (not Belgium)	31.9 [1]	307	31.0 [1]	320	28.7	103
Not EU	31.3	45	27.9	44	-	-
Age when moved to Belgium (1st generation)	**		ns			
0-17	35.7	87	28.9	82		
18-30	37.1	76	27.4	75		
> 30	20.7	46	30.1	42		
Length of residence in Belgium (in years)	ns		ns			
21-40	19.2	24	27.5	20		
> 40	35.0	168	27.9	163		

[1, 2, 3, 4] This number differs significantly from response categories I, II, III and/or IV of the same variable (alpha = 0.05).

Between 2013 and 2017 there are no significant differences for none of the categories (apart from the category 'born in Belgium = Yes').

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.

Source De Witte (2020c)

When we perform the same analyses for people of 50 years or older (Table 3.44), we see that those who were born in Belgium are significantly less often lonely (24% in 2015) than those who were not born in Belgium (31%). In line with this, we find that Belgians of 50 years or older with no migration background are significantly less lonely than people with a migration background (both in 2013 and 2015). Further, we again conclude that elderly from the second generation feel significantly more often lonely than Belgians without a migration background (both in 2013 and 2015). Furthermore, we observe that elderly from the second generation are - in line with our expectations - less often lonely than those from the first generation (respectively 28% and 29% in 2013, and 26% and 31% in 2015). However, this difference is not significant. Last, with respect to the region of origin of elderly with a migration background, we find - in line with our hypothesis - that in 2013 and 2015 Belgians with a migration background from countries outside the EU are more lonely (respectively 31% and 35%) than people with a migration background from other countries within the EU (respectively 28% and 26%). However, again this difference is not significant.

Table 3.44 Loneliness among Belgian elderly (50+) (in %) according to various migration related characteristics

	2013	N	2015	N	2017	N
Born in Belgium?	***		***		ns	
Yes	22.0	4,916	23.6	5,042	20.4	1,458
No	28.4	542	30.9	518	25.0	75
Immigrant generation	***		***		ns	
Natives	21.5 [2, 3, 4]	4,484	23.0 [2; 3, 4]	4,324	20.0	1,284
2nd generation	28.2 [1]	413	25.5 [1]	417	24.1	94
1.5 generation	28.6 [1]	127	36.4 [1]	126	-	-
1st generation	29.3 [1]	331	28.7 [1]	309	25.7	42
Immigrant generation (type II)	***		***		ns	
Natives	21.5 [2, 3]	4,484	23.0 [2, 3]	4,324	20.0	1,284
2nd generation	28.2 [1]	413	25.5 [1]	417	24.1	94
1st generation	29.2 [1]	458	30.5 [1]	435	27.9	58
Migration region	***		***		ns	
Belgium	21.5 [2, 3]	4,484	23.0 [2]	4,324	20.0	1,284
EU (not Belgium)	28.3 [1]	697	26.3 [1]	685	24.2	132
Not EU	30.6 [1]	170	34.5	165	-	-
Age when moved to Belgium (1st generation)	ns		ns			
0-17	29.5	232	31.4	222		
18-30	30.5	182	27.6	174		
> 30	24.5	128	33.0	121		
Length of residence in Belgium (in years)	ns		*			
0-20	26.6	78	36.3	80		
21-40	23.0	153	24.7	132		
> 40	31.9	311	30.8	305		

[1, 2, 3, 4] This number differs significantly from response categories I, II, III and/or IV of the same variable in the same year (alpha = 0.05).

Between 2013 and 2017 there are no significant differences for none of the categories (alpha = 0.05).

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.

Source De Witte (2020c)

3.3.2 Loneliness and migration in Europe

From Table 3.45 we find that Europeans of 65 years or older who were born in the country of the interview - which can roughly be seen as an indicator for not having a migration background - are more lonely than those who were not born in the country of the interview (in both 2013 and 2015), and have about the same loneliness levels in 2017. Based on the scientific literature, we would have expected the inverse, namely that people with a migration background are lonelier than those without a migration background. Therefore, we also performed the same analyses whereby we divided all European countries into three geographical regions: northern, central and eastern and southern Europe. Hereby, we observe great regional differences. Indeed, both in northern and central Europe we find that elderly who were born in the country of the interview are significantly less lonely than those who were not (in 2013, 2015 and 2017), which concurs with our hypothesis. While 19% of the northern European elderly who were born in the country of the interview feel lonely in 2017, this increases to 30% for those who were not born in the country of the interview (in Central Europe this is respectively 20% and 26%). However, in eastern and southern Europe, we observe the inverse, namely that elderly who were born in the country of the interview were lonelier than those who were not. Indeed, while 36% of the people who were born in the country of the interview feel lonely in 2017, this is 33% of those who were not (although this difference is not significant).

Table 3.45 Loneliness among European elderly (65+) (in %) according to if citizens are born in country of interview

	2013	N	2015	N	2017	N
Total Europe	**		ns		ns	
Born in country of interview	26.0	24,100	26.9	22,903	27.2	8,219
Not born in country of interview	23.8	1,905	22.2	1,702	26.5	546
Northern Europe	***		***		**	
Born in country of interview	17.1	4,532	18.5	4,320	19.2	1,796
Not born in country of interview	24.8	294	25.8	264	29.8	100
Central Europe	***		*		***	
Born in country of interview	20.6	10,492	20.9	9,912	19.8	3,466
Not born in country of interview	23.3	1,329	21.2	1,193	25.5	383
Eastern and southern Europe	ns		ns		ns	
Born in country of interview	34.1	9,076	36.2	8,671	35.7	2,957
Not born in country of interview	28.1	282	32.2	245	33.1	63

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

When we perform the same analyses for people of 50 years or older (Table 3.46), we come to the same conclusion. Indeed, in both northern and central Europe, elderly who were born in the country of the interview are less lonely than those who were not, but - contrary to what we would expect - the inverse seems to be the case in eastern and southern Europe.

In Tables 3.47 and 3.48, we present these results for all the distinct countries (also the countries who did not participate to all three most recent SHARE-waves). We observe that in almost all countries elderly of 50 years or older who were not born in the country of the interview feel lonelier in 2015 than those who were born in the country of the interview. Hence, our hypothesis seems to be supported by these data for most European countries. Only in Spain is the prevalence of loneliness among elderly who were born in Spain higher than of those who were not born in Spain. This ascertainment deserves further attention. In Italy, Slovenia and Estonia these percentages are about the same for both groups.

Table 3.46 Loneliness among European elderly (50+) (in %) according to if citizens are born in country of interview

	2013	N	2015	N	2017	N
Total Europe	***		***		ns	
Born in country of interview	22.5	43,180	23.6	38,182	25.8	9,909
Not born in country of interview	23.4	3,778	24.1	3,078	26.2	661
North Europe	***		***		*	
Born in country of interview	14.0	7,905	15.2	6,959	17.2	2,189
Not born in country of interview	24.8	543	23.9	448	24.9	123
Central Europe	***		***		***	
Born in country of interview	19.3	19,813	20.1	17,258	19.0	4,220
Not born in country of interview	23.9	2,616	24.2	2,140	25.9	457
Eastern and southern Europe	ns		ns		ns	
Born in country of interview	28.1	15,462	29.5	13,965	33.9	3,500
Not born in country of interview	19.4	619	23.4	490	29.5	81

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

Table 3.47 Loneliness among European elderly (50+) (in %) according to if citizens are born in country of interview (part 1)

	2013	N	2015	N	2017	N
Austria (11)	***		*		ns	
Born in country of interview	12.6	3,760	12.5	2,853	9.7	427
Not born in country of interview	19.5	339	18.7	250	13.3	33
Germany (12)	***		***		ns	
Born in country of interview	19.2	4,791	18.5	3,714	16.7	708
Not born in country of interview	23.8	760	22.4	550	23.4	113
Sweden (13)	***		***		ns	
Born in country of interview	16.0	4,061	18.3	3,476	21.2	972
Not born in country of interview	24.8	386	25.3	315	28.3	77
Netherlands (14)	**					
Born in country of interview	18.4	3,770	-	-	-	-
Not born in country of interview	28.6	238	-	-	-	-
Spain (15)	**		ns		ns	
Born in country of interview	18.2	5,898	19.8	4,752	27.0	1,172
Not born in country of interview	12.4	313	12.9	218	38.2	25
Italy (16)	ns		ns		*	
Born in country of interview	33.8	4,470	35.6	4,837	39.8	1,490
Not born in country of interview	27.1	65	35.5	74	20.0	22
France (17)	*		*		*	
Born in country of interview	20.7	3,893	23.6	3,372	21.9	988
Not born in country of interview	24.5	460	27.7	364	28.3	132
Denmark (18)	***		***		ns	
Born in country of interview	10.6	3,844	10.1	3,483	12.7	1,217
Not born in country of interview	24.5	157	18.0	133	16.1	46
Greece (19)			*		ns	
Born in country of interview	-	-	50.9	4,527	48.5	1,823
Not born in country of interview	-	-	57.0	137	55.2	38
Switzerland (20)	***		***		***	
Born in country of interview	10.9	2,453	13.0	2,277	12.2	639
Not born in country of interview	19.9	515	21.8	458	30.5	104
Belgium (23)	***		***		ns	
Born in country of interview	22.0	4,916	23.6	5,042	20.4	1,458
Not born in country of interview	28.4	542	30.9	518	25.0	75
Czech Republic (28)	**		**		ns	
Born in country of interview	33.0	5,094	31.9	4,376	27.7	838
Not born in country of interview	38.6	241	37.7	198	23.6	34
Poland (29)			ns		ns	
Born in country of interview	-	-	30.4	1,660	29.3	1,088
Not born in country of interview	-	-	40.1	34	34.0	30
Luxembourg (31)	***		**			
Born in country of interview	21.3	1,025	20.0	1,013	-	-
Not born in country of interview	28.8	544	24.9	502	-	-

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

Table 3.48 Loneliness among European elderly (50+) (in %) according to if citizens are born in country of interview (part 2)

	2013	N	2015	N	2017	N
Portugal (33)			ns			
Born in country of interview	-	-	26.7	1,459	-	-
Not born in country of interview	-	-	64.0	34	-	-
Slovenia (34)	ns		ns			
Born in country of interview	17.9	2,570	21.4	3,572	-	-
Not born in country of interview	20.1	313	21.3	444	-	-
Estonia (35)	ns		ns			
Born in country of interview	28.0	4,160	27.9	3,975	-	-
Not born in country of interview	30.8	1,315	27.9	1,165	-	-
Croatia (47)			ns			
Born in country of interview	-	-	30.7	1,959	-	-
Not born in country of interview	-	-	32.0	435	-	-

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

Table 3.49 shows us the relation between the prevalence of loneliness and various migration-related characteristics of Europeans of 65 years or older. In this respect, we find - contrary to what we expected - that the prevalence of loneliness of native elderly is higher than of the second generation and of the first generation (in 2013, 2015 and 2017). However, further we will see that this is strongly related to the specific country. Furthermore, we do not find clear in- or decreases of the prevalence of loneliness of European elderly with a migration background in the period 2013-2017.

Next, when we look at the region where people with a migration background originally come from, we find that although in 2013 those who come from countries outside the EU are more often lonely than those who come from other EU-countries (respectively 26% and 22%), this difference is not significant and not present in 2015 and 2017. Again, this is the inverse of what we would have expected based on the literature. Furthermore, we observe that elderly without a migration background (who originally come from the country of residence) are more lonely than those who come from other countries that are part of the EU, and (except for 2013) also more lonely than people who come from countries outside the EU. Last, the age when first generation immigrants moved to the host country does not significantly relate to the prevalence of loneliness, nor to the length of residence in the host country.

When we perform the same analyses for all Europeans of 50 years or older (Table 3.50), we do find that people from the first generation are significantly lonelier than those of the second generation and natives (in 2013, 2015 and 2017). This is in line with what we would expect based on the scientific literature. We further find - just like for the elderly of 65 years and older - that the prevalence of loneliness of people from the second generation is lower than that of natives in 2015 and 2017 (although this is not the case in 2013). This is does not concur with what we would expect based on the literature. With respect to the migration region, now we do find - in line with our expectations - that people with a migration background who come from countries outside the EU feel more often lonely than those who come from other EU-countries (and this in 2013, 2015 and 2017). In this respect, we further observe that people with a migration background who come from another EU-country feel less lonely than natives. Also, for the Europeans of 50 years or older, loneliness does not significantly relate to the age migrants moved to the host country, nor to the length of residence in the host country.

Table 3.49 Loneliness among European elderly (65+) (in %) according to various migration related characteristics

	2013	N	2015	N	2017	N
Immigrant generation	**		*		ns	
Natives	25.9	224,49	26.4	20,114	27.0	7,229
2nd generation	22.2	1,252	20.3	1,135	21.6	428
1.5 generation	19.4	394	26.7	349	22.8	102
1st generation	27.6	1,199	23.4	1,102	27.8	359
Immigrant generation (Type II)	***		ns		ns	
Natives	25.9	22,449	26.4	20,114	27.0	7,229
2nd generation	22.2	1,252	20.3	1,135	21.6	428
1st generation	25.3	1,593	24.3	1,451	26.5	461
Migration region	ns		ns		ns	
Country of residence	25.8	22,304	26.5	19,986	27.0	7,172
EU (not country of residence)	21.8	2,084	21.5	1,907	23.1	621
Not EU	25.9	583	21.9	530	22.5	216
Age when moved to country (1st generation)	ns		ns		ns	
0-17	20.5	517	28.0	451	32.1	136
18-30	22.9	644	23.1	620	23.9	220
> 30	34.9	426	20.5	374	22.9	103
Length of residence in country (1st generation in years)	ns		ns		ns	
0-20	38.1	140	21.4	119	12.6	20
21-40	24.3	240	16.5	215	18.0	76
40-60	26.3	734	26.7	681	34.1	224
60-100	20.8	479	25.2	436	23.8	140

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

Table 3.50 Loneliness among European elderly (50+) (in %) according to various migration related characteristics

	2013	N	2015	N	2017	N
Immigrant generation	***		***		ns	
Natives	22.2	39,831	23.2	33,448	25.6	8,699
2nd generation	23.2	2,580	21.3	2,138	21.2	528
1.5 generation	18.1	703	27.3	588	26.5	125
1st generation	26.9	2,602	25.4	2,110	26.6	435
Immigrant generation (Type II)	***		***		*	
Natives	22.2	39,831	23.2	33,448	25.6	8,699
2nd generation	23.2	2,580	21.3	2,138	21.2	528
1st generation	24.9	3,305	25.8	2,698	26.6	560
Migration region	***		***		ns	
Country of residence	22.3	39,547	23.2	33,204	25.6	8,628
EU (not country of residence)	22.2	4,046	21.8	3,340	22.8	752
Not EU	26.4	1,547	26.0	1,268	24.0	280
Age when moved to country (1st generation)	ns		ns		ns	
0-17	19.3	931	27.1	764	33.6	167
18-30	26.7	1,298	25.8	1,115	22.8	256
>30	28.3	1,064	24.7	811	22.4	135
Length of residence in country (in years)	ns		ns		ns	
0-20	25.0	557	23.2	377	20.8	35
21-40	30.4	1,066	26.9	848	17.1	118
40-60	22.3	1,183	25.9	1,025	32.9	261
60-100	20.2	499	26.0	448	26.2	145

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

When we divide the European countries into three regions, we see that the prevalence of loneliness of first generation immigrants is significantly higher than that of the second generation and natives in both northern and central Europe (Table 3.51). However, in eastern and southern Europe, this does not seem to be the case: first generation immigrants are less lonely in this region (not significantly) than natives (in 2013, 2015 and 2017). Further, the prevalence of loneliness of the second generation is lower than that of natives in northern Europe and in eastern and southern Europe, while in central Europe the prevalence is about the same for the second and natives.

Table 3.51 Loneliness among European elderly (65+) (in %) according to immigrant generation (type II)

	2013	N	2015	N	2017	N
Total Europe	***		ns		ns	
Natives	25.9	22,449	26.4	20,114	27.0	7,229
2nd generation	22.2	1,252	20.3	1,135	21.6	428
1st generation	25.3	1,593	24.3	1,451	26.5	461
Northern Europe	***		***		*	
Natives	17.2	4,331	18.0	3,946	18.9	1,649
2nd generation	14.3	178	15.9	148	15.3	61
1st generation	25.5	277	26.5	248	30.9	89
Central Europe	***		**		***	
Natives	20.2	9,742	20.4	8,664	19.3	3,004
2nd generation	22.3	849	19.7	781	20.2	301
1st generation	25.7	1,077	23.7	993	26.3	321
Eastern and southern Europe	ns		ns		ns	
Natives	34.2	8,376	35.7	7,504	35.5	2,576
2nd generation	23.9	225	27.4	206	34.9	66
1st generation	21.1	239	30.7	210	25.8	51

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

Last, based on Table 3.52, we see that in northern Europe, people without a migration background are the least lonely, and that there is no important difference with respect to the prevalence of loneliness according to the country of origin (a country that is part of the EU or a country outside the EU) of people with a migration background. In central Europe, elderly whose country of origin is outside the EU are significantly more lonely (27% in 2013) than people with a migration background who come from another EU-country (22%). Nevertheless, this difference is almost completely absent in 2015 and 2017. In eastern and southern Europe, the difference between people whose country of origin is another EU-country or outside the EU is not significant.

Table 3.52 Loneliness among European elderly (65+) (in %) according to migration region

	2013	N	2015	N	2017	N
Total Europe	ns		ns		ns	
Country of residence	25.8	22,304	26.5	19,986	27.0	7,172
EU (not country of residence)	21.8	2,084	21.5	1,907	23.1	621
Not EU	25.9	583	21.9	530	22.5	216
Northern Europe	***		ns		ns	
Country of residence	17.2	4,314	18.0	3,930	18.9	1,638
EU (not country of residence)	21.7	319	23.6	281	25.0	96
Not EU	21.1	130	20.1	113	23.5	52
Central Europe	***		*		ns	
Country of residence	20.1	9,644	20.5	8,577	19.4	2,968
EU (not country of residence)	21.9	1,468	20.7	1,366	22.1	447
Not EU	26.8	336	21.5	306	22.0	136
Eastern and southern Europe	ns		ns		ns	
Country of residence	34.2	8,346	35.7	7,479	35.4	2,566
EU (not country of residence)	20.4	297	28.9	260	30.8	78
Not EU	21.9	117	25.5	111	25.4	28

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

3.3.3 Intermediate conclusion

With respect to the link between loneliness and migration, we first analyse the correlation between loneliness and being born in the country of the interview or not (which can be seen as an indicator for having a migration background). Hereby, we observe - in line with our expectations - that in Belgium and most distinct European countries elderly who were born in the country of the interview are less lonely than those who were not. Hence, our hypothesis seems to be supported by these data for most distinct European countries. However, when we look at this indicator on the European level, we see that Europeans of 65 years or older who were born in the country of the interview are more lonely than those who were not born in the country of the interview (in both 2013 and 2015). This is due to great differences between European regions. Indeed, while elderly in both northern and central Europe who were born in the country of the interview are significantly less lonely than those who were not, this is not the case in eastern and southern Europe (which is mainly due to Spain, where the prevalence of loneliness of elderly who were born in Spain is higher than of those who were not born in Spain).

Second, we analysed the correlation between loneliness and immigrant generation. Hereby we see - in line with our hypothesis - that native elderly of 65 years or older in Belgium are significantly less lonely than elderly from the first or second generation. This clearly shows that the impact of having a migration background on feelings of loneliness works through until the second generation in Belgium. Further, while we expected that the prevalence of loneliness would decrease with increasing generational status, we do not find an important and significant difference between the first, 1.5th or second generation with respect to the prevalence of loneliness in Belgium. In Europe, we find that the prevalence of loneliness of first generation immigrants is significantly higher than that of the second generation and natives in both northern and central Europe, but not in eastern and southern Europe. In northern Europe and eastern and southern Europe we see that elderly from the second generation are even less lonely than natives. In central Europe, the prevalence of loneliness is about the same for the second generation and natives.

Third, in Belgium we do not find an important and significant difference concerning the prevalence of loneliness between elderly of 65 years or older who have migration roots in another country of the EU or in a country outside the EU. This does not concur with our hypothesis, namely that people with a migration background from countries outside the EU would be lonelier than those from other EU countries. However, when we analyse this correlation for all Belgians of 50 years or older in 2013 and 2015, we do find - in line with our hypothesis - that elderly with a migration background from countries outside the EU are more lonely than those who come from other countries within the EU. In Europe, we find - in line with our expectations - that elderly of 50 years or older who originally come from a country outside the EU are lonelier than those who have roots in another country that is part of the EU. Hereby, we interestingly observe that elderly who come from another EU-country feel less lonely than those without a migration background. In this respect, in northern Europe we find that people without a migration background are the least lonely, and that there is no important and significant difference with respect to the prevalence of loneliness according to the region of origin. In central Europe, elderly whose country of origin is not a part of the EU are significantly lonelier in 2013 than those who come from another EU-country, but this difference is almost completely absent in 2015 and 2017. Last, although in eastern and southern Europe the prevalence of loneliness of elderly whose country of origin is another EU-country is higher than that of elderly whose country of origin does not form part of the EU (in both 2015 and 2017), this difference is not significant.

3.4 Towards an explanation

In this paragraph, we apply regression analyses to investigate the relation of various (migration-related) factors with loneliness on both Belgian and European level, while controlling for other variables. After discussing the method of analysis (i.e. logistic regression analysis), we present our research results for Belgium and Europe.

3.4.1 Logistic regression analyses

In order to determine which factors might explain feelings of loneliness, we need to apply regression analyses that allow to control for other relevant variables. The importance of this can be simply demonstrated: when we find for example that women are significantly lonelier than men (see paragraph 3.1.1), this could be (partly) explained by the fact that women are in general older than men, and that it not gender but rather age-related factors that explain the higher prevalence of loneliness among women. Therefore, it is essential to investigate the correlation between gender and loneliness, *while controlling for age*. By controlling for other variables, these analyses take into account the possible values of the control variable(s).

Since our dependent variable 'loneliness' is binary (i.e. it only contains two values: lonely or not lonely), we need to apply multiple logistic regression analyses to determine which factors explain feelings of loneliness on the individual level. The results of logistic regression do not present percentages, but so-called *odds-ratio's*. The latter refers to the chance to belong to a certain group in comparison with another group (e.g. the chance of women to feel lonely in comparison to men), whereby a value lower than 1 means a smaller chance on loneliness and a value higher than 1 a bigger chance (Mortelmans, 2010). In sum, we will present (adjusted) odds ratio's with various (socio-demographic, ...) variables as covariates. When presenting our analyses we will always indicate the significance level in the tables (indicated by asterisks), which refers to the chance that the survey-results are the result of coincidence: the lower this chance, the more significant the result.

3.4.2 Loneliness among Belgian elderly explained

3.4.2.1 Logistic regression assumptions

Although logistic regression analyses do not require various of the key assumptions that must be fulfilled in order to make use of linear and general linear models (e.g. a linear relation between the dependent and independent variables or a normal distribution of the error terms), certain assumptions however must be fulfilled.

First, binary logistic regression requires that the dependent variable is binary (which is the case as explained in the previous paragraph). Second, the observations must be independent from each other (which is also the case since they do not come from matched data or repeated measurements). Third, there may not be a high multicollinearity among the independent variables. Multicollinearity means *'that the variables of interest are highly correlated, and high correlations should not be present among variables of interest'* (D. Schreiber-Gregory & Jackson, 2017, p. 13). In this respect, we performed correlation analyses, which showed that the variables 'social network size' and the 'social connectedness scale' show high multicollinearity (0.92). As a result, we do not use the social connectedness scale in our regression model. After leaving out this scale, there was no high correlation among the independent variables (high means higher than 0.8). Next, we looked at the variance of inflation (VIF) and condition indices (with a VIF higher than 10 indicating multicollinearity). In this respect, no variables have a tolerance lower than 0.10 (which is the cut-off value), and no VIF of 10 or higher. Hence, there does not seem to be multicollinearity with respect to our data. The fourth assumption of logistic regression is the assumption of linearity of the independent variables and the log odds. To verify this assumption we performed a logistic regression analysis with our variables and their interaction terms

(the cross product of each independent variable and its natural logarithm) to the logistic model. Since none of the interaction terms were significant ($p<0.05$), there is linearity between those variables and the log odds. The fifth and last assumption of logistic regression is that of a large sample size. *'A general guideline is that you need a minimum of 10 cases with the least frequent outcome for each independent variable in your model. For example, if you have 5 independent variables and the expected probability of your least frequent outcome is 0.1, then you would need a minimum sample of 500 (10-5/0.1)'* (Schreiber-Gregory & Bader, 2018, p. 5). Indeed, the rule is $N = 10*k/p$ (where k refers to the number of independent variables and p refers to the smallest of the proportions of negative or positive cases in the population) (MEDCALC, 2020). When we assess this assumption for our final model with 14 variables and $p = 0.24$ (553/2,327), we need 583 or more observations (10*14/0.24). Since our sample size consists of 2,327 observations, we also meet this last requirement.

3.4.2.2 The impact of various factors on loneliness in Belgium

In Table 3.53 we present the logistic regression analyses we used to detect variables that explain feelings of loneliness among Belgian elderly of 65 years or older in 2015. In this respect, we analysed four models to assess the correlation of various factors with loneliness (under control of the other factors in the model). In the first model, we included a number of sociodemographic variables: immigrant generation, age, gender and net household income (in deciles). In the second model, we added following sociodemographic variables: household size, having one or more children or not and education level. In the third model, we inserted four health-related variables: the self-perceived health (US-scale), the number of mobility limitations, the Euro Depression scale and a memory-learning test. In the fourth model, we included variables concerning the social network: the number of activities, the size of the social network and the satisfaction with the social network. As we can deduct from the table, while the first model only explained 4% of the variance in loneliness (Pseudo R of Nagelkerke), this increased to 31% for the last model, which is satisfactory.

When we assess the final model, we find that age, household size, depression, social network size and network satisfaction remain significantly related to loneliness (and limitedly also the sixth income decile and people who scored 'poor' on the memory test). The link between depression and loneliness through regression has also been shown in previous research based on cross-country data (Vozikaki et al., 2018). With respect to the factors that influence loneliness, we see that when elderly are older they are a little bit less lonely, when they live together with one or more other persons they are significantly less lonely, when they score high on the depression scale they are more lonely, the bigger the social network the less lonely elderly are, and the more satisfied with their social network the less lonely they are. In addition, elderly who score poor on the memory test are also significantly lonelier than those who score 'good' on this test. This implies that all the other factors of the final model are not significantly related to loneliness: immigrant generation, gender, net household income (except the sixth income decile), having children, education level, self-perceived health, the number of mobility limitations, memory learning test (except for elderly who score 'poor'), and the number of activities done during the last year.

With respect to immigrant generation, we observe that the second immigrant generation is significantly related to loneliness in model 1 and model 2 (with having migration roots resulting in a higher prevalence of loneliness), but that this difference becomes smaller and is no longer significant from model three onwards (when we inserted health-related variables). This implies that health and immigrant generation are presumably related to one another, and that health explains a part of the variation in the prevalence of loneliness according to different immigrant generations. In order to verify this, we analysed the relation between health and immigrant generation. Based on Tables 3.54 and 3.55, we find that immigrant generation is significantly related to self-perceived health (US-scale), the number of mobility limitation and the euro-depression scale (but not to the memory-learning test). While 30% of the natives has a fair or poor health in 2015, this amounts to 40% for second-generation migrants (it is also 30% for first generation migrants). And, whereas 21% of the natives has four or

more mobility limitations in 2015, this increases to 29% among second generation immigrants and 23% for first generation immigrants. Also, while 27% of the natives are characterised by a Euro-Depression scale between 4 and 12, this increases to 36% for second-generation migrants and 32% for first generation migrants. Last, although not significant, we see that there is also a difference with respect to the memory-learning test: whereas 26% of the natives did fairly or poorly, this rises to 30% for second-generation migrants and 28% for first generation migrants. Hence, we can conclude that the impact of immigrant (second) generation disappears when we control for health-related variables and that it is rather health that correlates to loneliness.

With respect to age we find that in our final model the older elderly are a little bit less lonely than the younger elderly, which concurs with the socio-emotional selectivity theory which states that older elderly find the quality of contacts more important and are more satisfied with their social relationships, and therefore have a lower risk of *social* loneliness (Heylen, 2010). Furthermore, we see that while in model 1 and 2 older elderly were found to be more lonely, this changed from model 3 onwards (when we added the health-related variables), which again seems to imply that the health situation is a mediating factor in this respect.

Next, as with immigrant generation, we see that although gender has a significant effect in model 1 and 2 (with women being more lonely than men), we find that this effect becomes smaller when we insert household size, having children and educational level (in model 2) and is no longer significant when we insert the health variables (in model 3). The latter implies that gender and health are related to one another. Based on Table 3.56 we see that this is indeed the case: women's health is in general worse than men's health. However, since the latter is certainly also partly explained by the fact that women are more often older, in Table 3.57 we present the relation between gender and health according to three age groups. From this table, we find that even within a specific age group the health of women is worse than that of men. Indeed, while the life expectancy of women is about 5,5 years higher than for men, the gender difference with respect to healthy life-years is only 0,1 years in 2013. Hence, *'future years will likely see a greater number of elderly individuals, particularly women, living alone and experiencing multiple health conditions'* (Niedzwiedz et al., 2016, p. 24). Further, we also find that it is not gender as such, but rather the factors related to being a woman that result in a higher prevalence of loneliness:

> *'Women tend to live longer than their spouses and partners, and hence they are more likely to go through widowhood and get older in solitude, conditions that potentially make them more prone to psychological distress and loneliness due to subsequent losses in previous supportive exchanges that are meaningful for later-life health and well-being. The above gender-linked differences might also be in part due to men's unwillingness to admit to feeling lonely, whereas it seems more socially accepted for women to express their emotional states'* (Vozikaki et al., 2018, p. 621).

> *'These differences are largely explained by health status, living arrangements and socioeconomic position'* (Niedzwiedz et al., 2016, p. 25).

Table 3.53 Logistic regression: Belgian elderly (65+) in 2015, with not being lonely as the reference category (in adjusted log odds)

	Model 1	Model 2	Model 3	Model 4
Immigrant generation (natives = ref.)				
2nd generation	1.606 ***	1.604 ***	1.294	1.338
1.5 generation	1.426	1.429	1.331	1.179
1st generation	1.309	1.405	1.336	1.227
Age	1.02***	1.002	0.985**	0.98 ***
Gender (Men = ref.)				
Women	1.583 ***	1.294 ***	0.941	1.029
Net household income (Decile 1 = ref.)				
Decile 2	1.047	0.839	1.081	0.883
Decile 3	1.28	1.057	1.167	0.932
Decile 4	1.241	1.01	1.114	0.886
Decile 5	1.215	0.892	1.127	0.87
Decile 6	0.765	0.779	0.763	0.629*
Decile 7	1.002	0.911	1.21	0.951
Decile 8	0.893	0.851	1.062	0.926
Decile 9	0.725 *	0.744	0.806	0.686
Decile 10	1.181	0.923	1.003	0.772
Household size (1 = ref.)				
> 1		0.356 ***	0.351 ***	0.341 ***
Having a child/children (No = ref.)				
Yes		0.859	0.878	0.867
ISCED-97 (Upper secondary = ref.)				
Pre-primary		1.236	0.752	0.718
Primary		1.089	0.908	0.94
Lower secondary		1.14	1.009	1.027
Post-secondary		1.15	1.594	2.962
First stage of tertiary		0.883	0.961	0.993
Second stage of tertiary		1.336	1.449	3.572
Self-perceived health (US-scale) (Good = ref.)				
Excellent			0.678	0.732
Very good			0.791	0.845
Fair			1.15	1.094
Poor			1.401	1.376
Number of mobility limitations			1.038	1.039
Euro Depression scale			1.502 ***	1.508 ***
Memory test (good = ref.)				
Excellent			0.907	0.831
Very good			0.969	1.026
Fair			1.083	1.055
Poor			2.193***	2.216***
Number of activities				0.954
Social network size				0.937*
Social network satisfaction				0.787***
N	2,740	2,740	2,740	2,327
Pseudo R (Nagelkerke)	0.04	0.10	0.30	0.31

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

Table 3.54 Loneliness among Belgian elderly (65+) (in %) according to migration generation and background variables, health, social network and participation in 2015 (part 1)

	Natives	N	Second generation	N	First generation	N
Age groups **						
65-74	50.9	1,242	60.8	124	55.1	116
75-84	34.8	792	28.3	53	34.6	65
84 +	14.4	309	10.9	20	10.3	19
Gender						
Men	44.3	1,066	46.7	92	43.4	87
Women	55.7	1,277	53.3	105	56.6	113
Total monthly net household income (in euro's) **						
0-1,000	4.8	107	1.5	3	5.9	11
1,001-1,500	20.8	478	20.1	39	18.3	34
1,501-2,000	24.3	554	25.3	49	18.6	38
2,001-2,500	12.8	302	13.2	26	13.2	27
2,501-3,000	14.4	346	12.9	25	12.2	25
3,000-10,000	18.6	453	18.9	38	23.5	49
>10,000	4.3	103	8.1	17	8.3	16
Household size						
1	34.1	792	35.0	68	31.0	61
2	60.8	1,426	58.6	116	62.2	124
3 +	5.1	125	6.4	13	6.8	15
Number of children						
0	11.7	274	12.1	24	9.3	18
1	20.1	481	20.3	41	14.7	31
2	32.9	771	34.5	67	38.3	75
3	20.0	468	18.7	37	18.3	36
4 +	15.3	349	14.3	28	19.5	40
Education level (ISCED-97) ***						
Pre-primary	2.0	48	0.9	2	7.9	16
Primary	20.9	472	21.1	41	22.0	42
Lower secondary	22.9	533	22.4	44	12.3	25
Upper secondary	24.1	564	22.7	44	19.2	38
Post-secondary	0.3	8	0.5	1	0.9	2
First stage of tertiary	29.3	707	31.9	64	36.7	75
Second stage of tertiary	0.5	11	0.5	1	1.0	2
Self-perceived health (US-scale) *						
Excellent	4.9	112	4.5	9	4.6	9
Very good	16.6	395	17.5	34	18.3	35
Good	48.9	1,135	38.1	74	46.8	95
Fair	25.5	597	32.7	65	23.5	47
Poor	4.2	104	7.2	15	6.8	14

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

Table 3.55 Loneliness among Belgian elderly (65+) (in %) according to migration generation and background variables, health, social network and participation in 2015 (part 2)

	Natives	N	Second generation	N	First generation	N
Number of mobility limitations **						
0	37.5	882	37.0	73	33.0	65
1	16.8	401	14.8	29	16.2	32
2	12.7	304	10.8	22	20.7	42
3	11.7	273	8.7	17	7.6	17
4	6.1	142	7.9	16	4.9	10
5	4.3	96	7.2	14	4.8	9
6+	10.9	245	13.7	26	12.8	25
*Euro-Depression scale****						
0-3 (not depressed)	72.7	1,694	63.6	126	68.4	135
4-8	26.4	627	33.5	65	31.6	65
9-12 (very depressed)	0.9	22	2.9	6	0.0	0
Memory test						
Excellent	4.2	105	5.6	11	4.7	10
Very good	16.7	393	14.6	29	18.6	37
Good	53.2	1,242	50.1	98	49.1	96
Fair	22.1	515	26.4	53	21.4	44
Poor	3.8	88	3.3	6	6.3	13
Number of activities last year						
0	7.4	167	6.0	11	10.3	19
1	21.4	480	26.5	52	21.3	41
2	25.6	582	24.2	48	28.2	57
3	23.8	545	24.8	47	20.2	38
4	13.5	314	11.3	23	14.0	27
5	5.6	129	5.4	11	6.1	12
6	2.4	53	1.9	4	0.0	0
7	0.3	6	0.0	0	0.0	0
Social network size						
0	3.4	74	2.7	5	3.4	6
1	19.1	398	22.3	38	25.1	44
2	24.6	508	25.1	43	20.9	36
3	20.8	429	19.8	34	19.8	35
4	13.9	281	18.0	29	16.0	28
5	8.3	169	7.0	12	3.5	6
6	5.5	111	1.7	3	6.5	11
7	4.5	87	3.4	6	4.8	9
Social network satisfaction						
0-3 (dissatisfied)	0.6	14	0.0	0	0.7	1
4-6	2.3	48	4.2	7	3.4	6
7-10 (satisfied)	97.1	1,983	95.8	160	95.9	166

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

Table 3.56 Loneliness among Belgian elderly (65+) (in %) according to gender and health variables in 2015

	Men	N	Women	N
Self-perceived health (US-scale) ***				
Excellent	5.5	70	4.3	70
Very good	19.7	258	13.7	225
Good	47.6	619	48.8	771
Fair	22.5	303	28.6	452
Poor	4.8	65	4.6	79
Number of mobility limitations ***				
0	49.8	648	26.8	431
1	17.7	232	16.3	264
2	11.8	160	13.9	227
3	8.2	107	13.1	211
4	3.9	53	8.1	128
5	2.8	36	6.0	91
6+	6.0	79	16.0	245
Euro-Depression scale ***				
0-3 (not depressed)	79.3	1,033	65.1	1,030
4-8	20.4	278	33.4	542
9-12 (very depressed)	0.3	4	1.5	25
Memory test ***				
Excellent	5.9	80	3.1	52
Very good	17.5	231	16.1	259
Good	52.0	679	52.9	843
Fair	21.4	282	23.2	368
Poor	3.2	43	4.7	75

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

Table 3.57 Loneliness among Belgian elderly (65+) (in %) according to gender and health variables in 2015

	65-74		75-84		85+	
	Men	Women	Men	Women	Men	Women
	*				**	
Self-perceived health (US-scale) Fair or poor health	23.2	24.4	31.2	37.8	35.9	49.5
	***		***		***	
4 or more mobility limitations	8.1	16.1	14.3	35.5	29.7	60.2
	***		***		**	
Euro-D scale between4 and 12	17.5	32.3	23.8	36.4	28.1	39.4
	***					
Fair or Poor memory test	19.7	22.6	28.9	30.9	36.3	37.3

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

3.4.3 Loneliness among European elderly explained

3.4.3.1 Logistic regression assumptions

In this paragraph, we test the assumptions that must be met in order to make use of logistic regression, for our data on the EU level. The first two assumptions are fulfilled: the dependent variable is binary and the observations are independent from each other (since they do not come from matched data or repeated measurements). Third, there may not be a high multicollinearity among the independent variables. Based on correlation analyses, we found that the variables 'social network size' and the 'social connectedness scale' show high multicollinearity (0.92). As a result, we do not use the social connectedness scale in our regression model. After leaving out the 'social network scale', there were no high correlations among the independent numeric variables (with high meaning higher than 0.8). Subsequently, we look at the variance of inflation (VIF) and condition indices, and again find that no variables have a tolerance lower than 0.10 and no VIF of 10 or higher. As a result, there does not seem to be multicollinearity in these data (after leaving out the social connectedness scale). To verify the fourth assumption, namely linearity of the independent variables and the log odds, we performed a logistic regression analysis with the numeric independent variables and their interaction terms to the logistic model. Hereby, we found that no interaction terms were significant ($p<0.05$), and therefore there is linearity between the variables and the log odds. The last assumption of the large sample size is also met since the rule is $N = 10*k/p$ (where k refers to the number of independent variables and p refers to the smallest of the proportions of negative or positive cases in the population) (MEDCALC, 2020). In our final model with 14 variables, this would mean we need at least 68 observations (10*15/0.22). Since our sample size consists of more than 20 000 observations, we largely meet this last requirement.

3.4.3.2 The impact of various factors on loneliness in Europe

In Table 3.58 we present the logistic regression analyses we used to detect variables that explain feelings of loneliness among European elderly of 65 years or older in 2015. In this respect, we analysed four models to assess the correlation of various factors with loneliness (under control of the other factors). In the first model, we included a number of sociodemographic variables: immigrant generation, region, age, gender and net household income (in deciles). In the second model, we added following sociodemographic variables: household size, having one or more children or not and education level. In the third model, we inserted four health-related variables: the self-perceived health (US-scale), the number of mobility limitations, the Euro Depression scale and a memory-learning test. In the final model, we included variables concerning the social network: the number of activities, the size of the social network and the satisfaction with the social network. As we can deduct from the table, while the first model only explains 8% of the variance in loneliness (Pseudo R of Nagelkerke), this increases to 30% for the last model, which is satisfactory.

When we look at the final model, we observe that most variables are significantly related to feelings of loneliness: (first) immigrant generation, region, age, the two highest income deciles, household size, having children or not, self-perceived health, the number of mobility limitations, depression, a memory test, the number of activities the elderly have undertaken the previous year, the social network size and the satisfaction with the social network. The only variables which are completely not significant are gender and educational level (except for the first response category).

First, we find that first generation immigrants are significantly lonelier than natives. In this respect, we see that this effect decreases a little bit when we include both health-related variables (model 3) and social network variables (model 4). The latter is an indication that first generation immigrants have specific health- and social network characteristics that relate to a higher prevalence of loneliness. This concurs with the scientific literature which states that elderly with a migration background are often characterised by more adversities and less resources. Further, we observe that second generation immigrants are a little bit less lonely than natives, but this difference is not significant.

This does not concur with our hypothesis, namely that second generation immigrants would be significantly lonelier than natives.

Second, from the final model we observe that elderly in both northern and eastern and southern Europe are significantly more lonely than elderly in central Europe (with elderly in eastern and southern Europe being the most lonely). While in the first two models elderly from northern Europe were still significantly less lonely than those of central Europe, this changes when we insert health- and network related variables (in model 3 and model 4). This is an indication that elderly in northern Europe have a different health situation, which results in a lower prevalence of loneliness, in comparison with elderly from central Europe. The ascertainment that the prevalence of loneliness is higher in (eastern and) southern European countries than in central and northern European countries does not concur with our simplified views on 'anomie' in northern countries and 'gemeinschaft' in southern countries such as Italy and Spain. Indeed, indicators of intimacy and community (which are assumed protective against loneliness) are more common in southern European countries, and household atomisation and solitary living (which are presumed to be related to higher loneliness levels) first took place in northern countries. This makes us suppose that the expectations with regard to the social network vary according to different European regions (with higher expectations in the southern countries). In this respect, research shows for example that in southern countries the expectations with regards to family support for ageing parents are higher and those with respect to institutionalised care lower (Sundström et al., 2009). Further, the 'norms of filial obligation' are more endorsed by people in southern European countries. Next, increasing life expectancy, changing characteristics of the family structure and familial support systems also differ according to different countries, which may affect loneliness differently (Fokkema et al., 2012). Further, there is more formal social participation in northern European countries (where individualistic values and norms are more central), and in those regions formal social participation is also deemed more important than in southern countries. Indeed, while the link between social participation and higher quality of life is found in northern Europe, this link is not significant in southern Europe, which shows that the role of social participation for quality of life depends on the country. In line with this, the possibilities to participate socially are also more enhanced in northern countries (Heylen & Mortelmans, 2009). In sum, these ascertainments make us conclude that it are not only individual and relational characteristics which explain feelings of loneliness, but also contextual and cultural factors. As a result, country-tailored interventions should be put into place to alleviate feelings of loneliness in Europe.

Third, with respect to age, we find that older elderly are a little bit lonelier than younger elderly (in all models). This is the inverse of what we have seen for our analyses in Belgium (see Table 3.53), where in the final model older elderly are a little bit less lonely than younger elderly. Nevertheless, in both Belgium and Europe this effect is very small.

Fourth, just like our analyses on the Belgian level, we find no significant effect of gender on loneliness (once controlled for health-related variables).

Fifth, with respect to net household income (in deciles) we find that the two highest income deciles are significantly less lonely than the lowest income decile. Therefore, income does seem to play a role, while controlling for various other variables (such as the social network). Furthermore, we see that while in the first two models deciles 5-10 were significant, this was only the case for the two highest deciles from model 3 onwards. Since in model three we inserted health related variables, this indicates that the effect of income on loneliness was partly due to the worse health situation of people with a lower income.

Next, we see that the household size (which relates strongly to having a partner or not), is extremely relevant for feelings of loneliness in all models. Elderly who live with at least one other person are significantly less lonely than those who live alone.

The same ascertainment can be made with respect to having children or not. Elderly who have at least one child are significantly less lonely than elderly who have no children (in all models).

With respect to the education level, we find that in model 2 this variable is still significant for half of its response categories with a lower education resulting in a significantly higher prevalence of loneliness. However, when we insert health-related variables (in model 3) and social network variables (in model 4) we find that this variable is no longer significant (except for the first education category).

Further, we observe that worse health is significantly related to a higher prevalence of loneliness, and this for the self-perceived health, the number of mobility limitations, depression and the memory learning test (with depression having the most important effect). With respect to the latter, we find that people who do poorly on the memory learning test, are significantly more lonely than those who do 'good' on this test.

Last, we find that the prevalence of loneliness is significantly lower when elderly undertake more activities (during the preceding year), have a big social network and when they are more satisfied with the social network.

Table 3.58 Logistic regression of European elderly (65+) in 2015, with not being lonely as the reference category (in adjusted log odds)

	Model 1	Model 2	Model 3	Model 4
Immigrant generation (natives = ref.)				
2nd generation	0.959	0.981	0.945	0.890
1st generation	1.206 ***	1.222 ***	1.188 ***	1.136 ***
Region (Central Europe = ref.)				
Northern Europe	0.881 ***	0.869 ***	1.182 *	1.249 ***
Eastern and southern Europe	2.228 ***	2.188 ***	2.169 ***	2.111 ***
Age	1.038 ***	1.023 ***	1.006 **	1.007 **
Gender (Men = ref.)				
Women	1.665***	1.402***	1.041	1.090
Net household income (Decile 1 = ref.)				
Decile 2	0.956	0.977	1.076	1.077
Decile 3	0.976	0.906	1.022	1.036
Decile 4	1.030	1.103	1.363	1.372
Decile 5	0.817 ***	0.843 ***	1.005	0.992
Decile 6	0.887 ***	0.905 ***	1.133	1.162
Decile 7	0.652 ***	0.702 ***	0.897	0.920
Decile 8	0.689 ***	0.776 ***	1.012	1.049
Decile 9	0.549 ***	0.607 ***	0.772 ***	0.794 ***
Decile 10	0.595 ***	0.616 ***	0.786 *	0.807 **
Household size (1 = ref.)				
>1		0.448 ***	0.441 ***	0.441 ***
Having a child/children (No = ref.)				
Yes		0.785 ***	0.763 ***	0.862 *
ISCED-97 (Upper secondary = ref.)				
Pre-primary		1.326 **	0.940 ***	0.862 ***
Primary		1.138 ***	0.939	0.871
Lower secondary		1.134 ***	1.047*	0.978
Post-secondary		0.814	0.850	0.852
First stage of tertiary		0.785	0.907	0.889
Second stage of tertiary		1.244	1.367	1.434
Self-perceived health (US-scale) (Good = ref.)				
Excellent			0.916 ***	0.999***
Very good			0.861 ***	0.890**
Fair			1.188 ***	1.153***
Poor			1.053 **	1.005**
Number of mobility limitations			1.037***	1.049***
Euro Depression scale			1.427***	1.410***
Memory test (good = ref.)				
Excellent			0.805 **	0.834 **
Very good			0.924 *	0.952
Fair			1.227 ***	1.232 **
Poor			1.209 ***	1.193 ***
Number of activities				0.963 ***
Social network size				0.949 ***
Social network satisfaction				0.849 ***
N	22,700	22,700	22,700	21,504
Pseudo R (Nagelkerke)	0.08	0.13	0.28	0.30

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.

Source De Witte (2020c)

In Table 3.59, we performed the same analyses, but changed the variable migration generation by migration region. In this respect, we find that there is no significant difference between elderly with a migration background who come from a country outside the EU and elderly with a migration background who come from a country that is part of the EU. Besides not being significant, we also find - contrary to our expectations - that elderly who come from a country outside the EU are less lonely than elderly who come from a country that is part of the EU.

Table 3.59 Logistic regression: European elderly (65+) and migration region in 2015, with not being lonely as the reference category (in adjusted log odds)

	Model 4
Migration region (Other EU- country = ref.)	
Host country	0.940 **
Country outside the EU	0.766
Region (Central Europe = ref.)	
Northern Europe	1.259 ***
Eastern and southern Europe	2.088 ***
Age	1.006 **
Gender (Men = ref.)	
Women	1.093
Net household income (Decile 1 = ref.)	
Decile 2	1.048
Decile 3	1.012
Decile 4	1.340
Decile 5	0.949
Decile 6	1.129
Decile 7	0.867
Decile 8	1.015
Decile 9	0.781 ***
Decile 10	0.781 **
Household size (1 = ref.)	
>1	0.440 ***
Having a child/children (No = ref.)	
Yes	0.837 **
ISCED-97 (Upper secondary = ref.)	
Pre-primary	0.870 ***
Primary	0.872 *
Lower secondary	0.978
Post-secondary	0.842
First stage of tertiary	0.877
Second stage of tertiary	1.469
Self-perceived health (US-scale) (Good = ref.)	
Excellent	1.015 ***
Very good	0.894 ***
Fair	1.147 **
Poor	0.995 **
Number of mobility limitations	1.050 ***
Euro Depression scale	1.407 ***
Memory test (good = ref.)	
Excellent	0.841 **
Very good	0.948
Fair	1.231 **
Poor	1.192 ***
Number of activities	0.957 ***
Social network size	0.948 ***
Social network satisfaction	0.840 ***
N	21,235
Pseudo R (Nagelkerke)	0.30

χ^2-test: *p<0.1; **p<0.05; ***p<0.01.
Source De Witte (2020c)

3.4.4 Conclusion

Based on our regression analyses on both the Belgian and European level (in 2015), we gained more insight into the factors that significantly relate to loneliness (while controlling for other variables).

First, we find that elderly with an immigration background (first and second-generation immigrants) are characterised by a higher prevalence of loneliness than elderly without an immigration background in both Belgium and Europe as a whole. Nevertheless, this difference is only significant for first generation immigrants in Europe. In this respect, we find that while in Belgium second-generation immigrants are lonelier than first generation immigrants, in Europe first generation are the loneliest followed by natives and then second generation immigrants. When we look into the regions European elderly with a migration background come from (both second and first generation), we find no significant difference with respect to the prevalence of loneliness between people whose country of origin is part of the EU and those whose country of origin is not part of the EU. Interestingly, we even find that European elderly whose country of origin does not form part of the EU are less lonely than those elderly whose country of origin is part of the EU.

Second, age is both in Belgium and Europe significantly related to loneliness. However, while in Belgium older elderly are found to be a little bit less lonely (which concurs with the socio-emotional selectivity theory which indicates that older elderly have a lower risk of social loneliness), in Europe older elderly are found to be more lonely than younger elderly. Although this difference is significant, it has only a limited effect on loneliness.

Third, in both Belgium and Europe gender is not significantly related to the prevalence of loneliness. This means that women are not lonelier than men, but that it are rather gender-related factors that result in a higher loneliness among women.

Fourth, we find that the higher the net household income, the lower the prevalence of loneliness in both Belgium and Europe. Nevertheless, this is only significant for the sixth decile in Belgium and the two highest deciles in Europe.

Fifth, living together with one or more other persons (which in practice often refers to still having a partner) has perhaps the most important and significant effect on loneliness in both Belgium and Europe.

Sixth, having one or more children also has a positive effect on loneliness (this is only significant in Europe).

Seven, once controlled for other variables, the education level does not seem to have an important effect on loneliness (it is only significant for the 'pre-primary' response category in Europe).

Eight, the health situation seems to be strongly related to the prevalence of loneliness, with a better health relating to lower levels of loneliness. While in Belgium only depression and scoring 'poor' on the memory test are significantly related to loneliness, in Europe however, all health-related variables are significantly related to the prevalence of loneliness. Depression seems to be related the most strongly to loneliness, followed by the memory test and self-perceived health, and then the number of mobility limitations people have.

Ninth, with respect to the social network variables we find that the more activities people undertake, the larger the network and the more satisfied elderly are with their network, the lower the prevalence of loneliness. Although this difference is not significant for 'number of activities in Belgium', for all other variables these correlations are significant in both Belgium and Europe, with the network satisfaction being to most strongly related to the levels of loneliness.

Tenth, when we study the European level, we find significant differences between the European regions (central, northern and eastern and southern Europe): elderly are the least lonely in central Europe followed by northern and then eastern and southern Europe.

Last, we mention that the effect of various variables decreases significantly or even becomes no longer significant when we control for health-related variables (in model 3): immigrant generation, net household income, gender, age, ... Indeed, health seems to relate strongly to those variables, and therefore explains a significant part of the variation in loneliness according to the different categories

of these variables. In this respect, we found for example that having a migration background (but also gender and age) are significantly related to a worse health situation, and that this health situation determines for a significant part the higher loneliness levels (of elderly with a migration background, women and older elderly).

Conclusion and policy recommendations

About 22% of the Belgian elderly and 27% of the European elderly (+65 years) feel lonely in 2017. While in Europe we see a small increase in the prevalence of loneliness among elderly between 2013 and 2017 (from 26% to 27%), in Belgium we observe a decrease in the same period (from 25% to 22%). Nevertheless, these numbers are alarming: if we extrapolate the prevalence of loneliness of 2017 to our current elderly population, almost 500,000 Belgian elderly and about 28 million elderly in the EU-28 feel lonely in 2020. This would amount to almost 700,000 Belgian elderly and more than 40 million elderly in the EU-28 in 2050 (De Witte, 2020a). This is a severe problem because loneliness has an enormous negative impact on the quality of life, as we have demonstrated in our first research report *'Loneliness and social isolation among elderly. An empowerment perspective'* (De Witte & Van Regenmortel, 2019a). In order to determine effective policy measures to alleviate feelings of loneliness, it is essential to gain more understanding in the factors that are associated to this phenomenon. Therefore, in this research report we analysed SHARE-data on the Belgian and European level, which allows us to formulate a number of policy recommendations that aim to alleviate feelings of loneliness.

Based on our analyses, we find that the prevalence of loneliness is distributed unequally among different groups of elderly in Belgium (and similar conclusions are made on the European level). In general, we find that the prevalence of loneliness is higher among women, 'old' elderly, divorced and widowed elderly, those without children, elderly who live alone, elderly who live in a nursing home, and those with a lower education level. Furthermore, loneliness is significantly related to a bad physical and mental health situation (which is indicated by the number of chronic problems, self-perceived health, mobility limitations, depression, life satisfaction), lower levels of cognitive functioning, and making more use of various health care services (e.g. doctor visits). Next, we observe that loneliness and financial means (e.g. lower income, not being able to make ends meet, ...) are closely entwined, with a higher income relating to lower loneliness levels: while 25% of the elderly in the tenth income decile feel lonely, this amounts to 40% of the elderly in the lowest income decile. However, interesting in this respect is that the prevalence of loneliness decreases with increasing income *until a certain threshold* where the prevalence of loneliness again increases. This concurs with research of Niedzwiedz et al. (2016) which studied the link between loneliness and wealth, and research of Annemans (2018) which studied the link between income and happiness. In line with this, we find that the prevalence of loneliness is significantly higher among elderly who rent a home than those who own their home. Last, we observe that the prevalence of loneliness is significantly associated with participation and the social network. In this respect, we find that high loneliness levels are related to doing less activities, being less satisfied with the activities one undertakes, having less trust in others and a lower feeling of mastery. Further, loneliness is also significantly related to a small network size, network members living remote, a low contact frequency with network members, and the closeness to the network members. Hereby, we find that it is very important that elderly have at least one network member who lives nearby, with who they have a lot of contact and with who they are close.

When we look specifically at the European level, we see that in 2017 the prevalence of loneliness is far greater in eastern and southern Europe (36%) than in central (21%) and northern Europe (20%). This is contrary to our simplified views of 'anomie' in northern countries and 'gemeinschaft' in southern countries, and makes us suppose that the expectations with regard to the social network

vary according to different European regions. Further, we also see that the discrepancy of the loneliness levels between various categories is greater in eastern and southern Europe than in central Europe (and in lesser degree northern Europe). For example: the difference between men and women in both northern and central Europe is 4 percent points in 2017, while this amounts to 16 percent points in eastern and southern Europe. From this we hypothesise that there are more important inequalities in eastern and southern Europe between various groups of elderly (e.g. men/ women, elderly with high/low education levels) concerning the factors that explain feelings of loneliness such as social security, financial means, work situation, health, social network characteristics, ... Another explanation could be that the stigma for men to admit feelings of loneliness is more important in eastern and southern Europe than in northern and central Europe.

With respect to the link between loneliness and migration, our first hypothesis seems to be supported by the data, namely that the prevalence of loneliness is higher among ethnic minorities (people with a migration background) than majorities (people without a migration background). Indeed, in Belgium and most other European countries, elderly who were born in the country of the interview are significantly less lonely than those who were not born in the country of the interview. However, we observe important regional differences on the European level: while our hypothesis is supported in northern and central Europe, in eastern and southern Europe we find no significant difference in this respect. Our second hypothesis is not unambiguously supported by the data, namely that the prevalence of loneliness is highest among first generation immigrants, followed by second-generation migrants, and then natives. In Belgium we find that native elderly of 50 years or older are significantly less lonely than those from the second and first generation (in 2015). This demonstrates that the impact of migration-related factors works through until the second generation in Belgium. However, although elderly of the first generation (of 50 years or older) in Belgium have a higher prevalence of loneliness than those from the second generation, this difference is not significant. As a result, our second hypothesis is not fully supported for Belgium. In this respect, we again find important regional differences in Europe (in 2015). In northern Europe we observe significant differences with regard to the prevalence of loneliness between the first generation, second generation and natives. However, although the first generation has the highest loneliness levels, we find that the second generation has lower loneliness levels than natives, which does not concur with our second hypothesis. The same ascertainment can be made for central Europe. In eastern and southern Europe we do not find any significant differences with regard to the prevalence of loneliness between the first generation, second generation and natives. With respect to our third hypothesis, namely that the prevalence of loneliness of elderly with a migration background from countries outside the EU is higher than that of those from other EU-countries, we find no significant differences on both the Belgian and European level (in 2015). Concerning the correlation between loneliness and the age when first generation immigrants moved to the host country and their length of residence in the host country, we find no clear and significant differences. Hence, our fourth and fifth hypothesis were not supported by the data.

Last, we performed some logistic regression analyses on both the Belgian and European level (in 2015) to verify if the correlation of loneliness with various factors remains significant after controlling for the other variables in the model. Based on these analyses we come to various conclusions. First, *under control of other variables in the model*, elderly with an immigration background are characterised by a higher prevalence of loneliness both in Belgium and Europe (however, this difference is only significant for first generation immigrants in Europe), which concurs with our first research hypothesis. Our second hypothesis, namely that the prevalence of loneliness is highest among first generation immigrants, followed by second generation migrants and natives, is not supported on the European or Belgian level. Next, the effect of age on loneliness remains unclear: while in Belgium older elderly are found to be a little bit less lonely, in Europe they are found to be slightly lonelier. Further, we see that the effect of gender disappears when we control for other variables, and this both in Belgium and Europe as a whole. This implies that women are not lonelier than men, but that

it are different gender-related factors which explain the higher prevalence of loneliness among women (e.g. health or income). Further, we find that a higher income is related to lower loneliness levels (although this is only significant for the sixth decile in Belgium and the two highest deciles in Europe). In addition, we find that elderly who live together with one or more other persons are significantly less lonely than those who live alone (in practice this often refers to having a partner or not, and is perhaps the most important protective factor against loneliness). Further, having one or more children is also protective against loneliness (although this is only significant in Europe), and the education level is not related to loneliness. A very important factor which relates to loneliness is the health situation of elderly, with a better health relating to lower loneliness levels. Hereby, depression is most strongly associated to loneliness, followed by a memory learning test, self-perceived health and the number of mobility limitations. Although all these factors are significant on the European level, in Belgium only depression and scoring 'poor' on the memory learning test remain significant after controlling for other variables. Next, we find that various social network characteristics relate to feelings of loneliness: lower loneliness levels are associated with undertaking more activities, a larger social network, and more network satisfaction. On the European level, we see that even after controlling for other variables, the differences between the European regions (central, northern and eastern and southern Europe) remain significant. Last, health is significantly related to many other factors (e.g. age, gender, income, migration background, ...) and that way affects the prevalence of loneliness. Indeed, the effect of many factors decreases significantly or is no longer significant once controlled for health.

Based on this research report, we formulate a number of policy recommendations that aim to alleviate loneliness in Belgium and Europe as a whole.

1. Counteract depression through affordable psychological support

Depression is one of the factors that relates the most strongly to higher loneliness levels, and remains significant after controlling for various other variables. In our second research report *'Silver Empowerment. Resilience of vulnerable elderly. A narrative research approach'* (De Witte & Van Regenmortel, 2019b), we found that vulnerable elderly could benefit from psychological support, but are often unable to make use of this because of its high cost. Taking away such contextual barriers might result in lower levels of depression and loneliness, and would make elderly more able to improve their social relations.

2. Enhance participation, enlarge the network size and network satisfaction, by taking away contextual barriers and by stimulating the 'power of giving'

In this research report, we find that participation, the network size and the satisfaction with the social network have significant effects on loneliness, even after controlling for various other variables. Hence, it seems essential to stimulate elderly in creating more (satisfying) social bonds with others and participation in general. Our analyses showed that it is important for elderly to have at least one 'close' network member. Hereby, a broad range of interventions is needed: which intervention is best suited for a specific individual, depends strongly on the personal characteristics of the individual, which we demonstrated in our first research report (De Witte & Van Regenmortel, 2019a). While for elderly with little social capacities it might be interesting to work on improving those capacities (e.g. by providing social skill training), for elderly with mobility problems it might be more useful to take away the contextual barriers for social participation (e.g. by providing affordable transportation). This is done for example by Mobitwin, an organisation that offers affordable and individual transportation for vulnerable people. Further, our analyses show that elderly with mobility problems are less satisfied with doing no activities (and thus that those mobility problems presumably relate to elderly doing less activities while they would still like to do those activities). Moreover, those mobility limitations

still have a significant effect on loneliness, even when controlled for various other factors. Therefore, policy makers could investigate this further to gain more insight into the needs and wishes of people with mobility problems, in relation to creating a social network and participation. Further, our analyses on the European level show that income has an effect on the prevalence of loneliness, which suggests that there are still financial barriers to participation and social network creation (e.g. the affordability of psychological support, to undertake activities). However, not all interventions which relate to the creation of social bonds cost money. We found for example that elderly who give a lot of support to others outside the own household are significantly less lonely, which concurs with the idea of 'the power of giving'. *'The power of giving has enormous beneficial effect on both elderly and society in general. Indeed, doing things for other people (individually or through volunteering) is a crucial source of strength, which has numerous positive effects on the quality of life of elderly: increased feelings of self-worth and self-esteem, making them feel good, useful, needed, valued and proud of themselves. Moreover, since the power of giving often includes social contact, it also contains various benefits such as constructing a social network, coming out of the own comfort zone and having a challenge, doing activities that distract from personal sorrows, ... [...] As a result, it is essential that society invests more in seeking how elderly can contribute and participate more to society, by helping them find out what they can (still) do. Furthermore, it is evenly important that policy makers take away the contextual barriers that impede elderly from participating to society, by increasing their mobility, access to health and social services, ...' (De Witte & Van Regenmortel, 2019b, p. 50).* In line with the previous, Van Duppen (2016) showed that 'the power of giving' also has important biological functions: when people help other people, oxytocin is released, a hormone which plays an important role in the mother-child bonding. Not only does this result in a satisfying feeling for the person that helped someone else, but oxytocin is also released in the person who is helped *(Van Duppen & Hoebeke, 2016)*. In this respect, a survey found that while a considerable number of Belgian elderly (more than 60%) are willing to engage in neighbourhood networks, only a few (4%) are in fact engaged in such activities *(Koning Boudewijnstichting, 2017)*. Last, we mention that 'the power of giving' has positive effects on the mastery of elderly, which our analyses have shown to be also related to loneliness. In this respect, various partners of be.Source such as Compagnons Dépanneurs and the Red Cross, stimulate the power of giving by making use of the force of volunteers.

3. Elderly should prepare better for the future (e.g. decease of a partner, going to a nursing home)

Household size (which is a good indicator for having a partner) has perhaps the most important effect on loneliness among elderly. In this respect, the prevalence of loneliness is highest among widow(er)s (in comparison to other marital states), through which it seems important to better prepare for this. We showed in our second research report (De Witte & Van Regenmortel, 2019b) that it would be interesting if elderly already think in advance about possible problems they might face in the future and how they would deal with them, in order to be emotionally and practically better prepared. Indeed, research shows that only one out of three elderly who still live in their own home, have already talked to somebody about how they would like to live in the future, and that the move to a nursing home was not planned for about 40% of the elderly (VandenBroucke et al., 2012).

4. Formulate tailor-made policy measures

Our analyses show that the prevalence of loneliness depends on the geographical region (central, northern and southern Europe, Flanders and Wallonia) which seems to indicate an important link with the specific culture and social context. As a result, measures that aim to tackle loneliness should take into account the national, regional and local context, in order to meet the various specificities of those regions and cultures. Moreover, feelings of loneliness and social isolation come in various forms. Therefore, we state that one-size-fits-all measures do not exist and intervention strategies must be tailored around the specific situation of the elderly whereby they take on a holistic perspective in which not only the specific characteristics of the loneliness and/or social isolation problem (causes,

duration, variation, severity, ...) are taken into consideration, but also the individual characteristics of the elderly and their context (De Witte & Van Regenmortel, 2019a).

5. Strengthen synergetic collaboration between organisations

It seems usefull to stimulate more collaboration between various social work organisations that aim to enhance the quality of life of vulnerable elderly. Indeed, from our first research report we know that loneliness comes in various forms and that there is no such thing as the elderly population. As a result, one-size-fits-all measure do not exist, and a wide range of intervention types are needed to alleviate feelings of loneliness. Moreover, the current research report shows that loneliness is directly and indirectly related to various other life domains, through which it is important to take t those domains into account when trying to tackle loneliness. The partners of be.Source are a good example of a network of social organisations that try to work together to formulate a more integral response to the problems of vulnerable elderly in Belgium.

6. More research about loneliness in old age

Last, we formulate a number of ideas for further research about this topic. First, more research is needed about the different cultural perspectives on ageing, the social network, discrimination, language proficiency, ... between various communities. Indeed, at the moment, it is impossible to formulate substantiated policy recommendations with respect to people with a migration background in Belgium. Second, more research could be done about how elderly can better prepare for stressful life events (e.g. going to a nursing home, the death of a partner). Third, more research would be interesting to verify if the discrepancy of loneliness levels between various elderly groups (e.g. men and women) which is greater in southern Europe than in central Europe, is due to more important inequalities in southern Europe with respect to the factors that relate to loneliness (e.g. health, gender, social security, income, ...). Fourth, more research is needed about the link between cognitive functioning and loneliness, since we have seen that elderly who score 'poorly' on a memory learning test are also significantly more lonely (even after controlling for many other variables). Fifth, more research could be done about the link between loneliness and territorial planning. Sixth, it would be interesting to gain more insight into if loneliness leads to health problems, or rather if health problems lead to loneliness. *'To date, most studies have examined loneliness as a risk factor for a wide range of health-related physical and mental outcomes'* (Vozikaki, Papadaki, Linardakis & Philalithis, 2018, p. 621). In this respect, it would be interesting to gain more understanding of the link between loneliness and depression for example. Next, the gender differences with respect to loneliness are not fully explored (e.g. between male and female widow(er)s, by age groups, ...). In this respect, research indicates that men are more vulnerable when the partner passes away because they have a smaller support network. *'Additional work is needed to examine the different factors that help to explain loneliness among women, which appears to be more complex than compared with men'* (Niedswiedz, Richardson, Tunstall, Shortt, Mitchell & Pearce, 2016, p. 30).

- APPENDICES -

appendix 1 Creation of key variables

a1.1 Loneliness

The SHARE database consists of four variables related to loneliness. The first variable asks the respondents directly about their loneliness, while the other three do this indirectly:

7. How much of the time do you feel lonely?
8. How much of the time do you feel a lack of companionship?
9. How much of the time do you feel left out?
10. How much of the time do you feel isolated from others?

The respondents can answer these questions with 'often', 'some of the time' and 'hardly ever or never'.

We do not use the first variable for our analyses, but instead use the other three variables that together form the short version of the Revised-University of California at Los Angeles Loneliness scale (R-UCLA), which is a validated indicator of loneliness. We prefer this UCLA loneliness scale to the single-item loneliness measure because its reliability is presumably better. Indeed, older people might be ashamed for their feelings of loneliness and mask them (Pikhartova, Bowling, & Victor, 2014). A disadvantage is that these three questions are only asked in wave five, six and seven, through which our analyses are also limited to those (most recent) waves.

We created the loneliness scale by adding the responses on each of the three variables which forms a scale from three to nine (which we recoded to a scale from zero to six). Hereby zero corresponds to not feeling lonely (having answered 'hardly ever or never' three times), and six indicates the highest level of loneliness (having answered 'often' three times). By analysing this loneliness scale for the whole of all SHARE-waves, we find that the three factors all load on the latent variable 'loneliness', with each a loading of more than 0.60. Moreover, we find that this additive Likert-scale is internally consistent since the separate items correlate sufficiently with the total scale (chronbach's alpha = 0.77).

But although previous research often treated this loneliness measure as continuous, we find that the distribution of the responses is not normal. The mean of 'lonely' for the total of the SHARE-waves is 0.9 with a standard deviation of 1.43. Since this scale is not normally distributed, we need to use non-parametric tests, which cannot be combined with a weight factor. As a result, we converted the variable 'lonely' to a binary measure (similar to the method applied by Pikhartova, Bowling & Victor, 2014) so we can perform parametric tests and also make use of (weight factors which are included in the SHARA database). Another advantage of this rescaling this loneliness scale into a binary measure is the clarity: someone is lonely or not.

In this respect, we stated that respondents with a score of 0 or 1 (on the scale from 0-6) are not lonely, and that those who score 2-6 are lonely. This threshold differs from the one Pikhartova, Bowling & Victor (2014) used: they defined respondents with a score of 0-2 as 'not lonely', and those with a score from 3-6 as 'lonely'. We apply a different approach because based on the combination of the scale variable with the single-item loneliness variable, we find that respondents with score 2 on the scale variable, indicate in majority (about 56%) to feel lonely on the single-item loneliness variable.

a1.2 Immigrant generation

We use five different variables in order to make the variable 'immigration generation', which makes a distinction between natives, second generation immigrants, 1.5 generation immigrants and first generation immigrants.

1. Are you born in [e.g. Belgium]?
2. What is the country of birth of your mother?
3. What is the country of birth of your father?
4. In what year did you come to [e.g. Belgium]?
5. Year of birth

We classified respondents who are born in Belgium and both parents are born in Belgium as natives. Respondents who are born in Belgium and at least one of their parents is born abroad we classify as second generation immigrants. Respondents who are born abroad and who migrated to Belgium when they were 12 years or younger are 1.5 generation immigrants. Respondents who are born abroad and who migrated to Belgium when they were 13 years or older are first generation immigrants.

We performed these analyses for all the distinct countries in the SHARE database in order to be able to perform these analyses also on the European level. In this respect we often equated countries that no longer exist (e.g. Yugoslavia) to all the current countries that used to form that country (e.g. Slovenia, Croatia, ...). As a result, we stated for example that a person who is born in Slovenia and whose parents were born in Yugoslavia is a native.

a1.3 Immigrant region

We used three variables to determine the immigrant region for all respondents with a migration background:

1. Are you born in [e.g. Belgium]?
2. What is the country of birth of your mother?
3. What is the country of birth of your father?

Hereby we made a distinction between respondents without a migration background (i.e. who are from the host country), those with an immigration background from a country in the European Union which is not the host country, and those with an immigration background from a country outside of the European Union.

To determine which 'country of origin' to use (of the respondent, his father or mother), we always first looked at the country of birth of the father, than the country of birth of the mother, and last the country of birth of the respondent. This concurs mostly with the definition given by the Flemish commission of 'integration policy' (Integratiebeleid, 2014).

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