# Loneliness within the home-dwelling elderly population in Flanders – a quantitative study to identify areas of improvement in primary healthcare provision

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# 1. Abstract

**Context**: Onderzoek toont aan dat maar liefst 46% van de Belgen zich eenzaam voelt. Bovendien wordt eenzaamheid geassocieerd aan een verhoogde somatische en psychische morbiditeit én een verhoogde mortaliteit. Specifiek bij ouderen leidt dit tot een verhoogde kwetsbaarheid. Huisartsen en andere zorgverleners in de thuissetting worden regelmatig geconfronteerd met deze problematiek. Anderzijds onderkennen zij het probleem of is hun rol onduidelijk. De toenemende vergrijzing, de grotere kwetsbaarheid van ouderen en de oplopende prevalentie van eenzaamheid ten gevolge van de covid-19 pandemie maken van eenzaamheid mogelijks een belangrijk probleem voor de volksgezondheid.

**Onderzoeksvraag:** Om inzicht te krijgen in de huidige situatie met betrekking tot eenzaamheid bij de thuiswonende Vlaamse ouderen onderzoeken we volgende vier onderzoeksvragen: (1) wat is het sociodemografische en het gezondheidsprofiel van een thuiswonende eenzame 65-plusser in Vlaanderen; (2) wat zijn de verschillen tussen sociale en emotionele eenzaamheid binnen deze doelgroep; en (3) in welke mate steunt deze doelgroep op zijn huisarts of (4) formele zorgcontext? Het doel van dit onderzoek is om verbeterpunten te identificeren in het huidige beleid rond eenzaamheid bij ouderen.

**Methode:** Dit is een kwantitatief onderzoek op basis van een bestaande dataset van de Ouderenbehoefteonderzoeken. Hieruit werden alle thuiswonende 65-plussers uit Vlaanderen geselecteerd die als eenzaam gecategoriseerd worden volgens de definitie van De Jong-Gierveld. De studie bevat data verzameld tussen augustus 2004 en december 2020. Via een vragenlijst werd informatie verzameld met betrekking tot sociodemografische gegevens, fysieke en mentale gezondheid en de aanwezigheid van zorgcontext. Beschrijvende statistiek werd toegepast om het profiel van de eenzame oudere te onderzoeken. Voor de vergelijking tussen emotionele en sociale eenzaamheid werden de student t en chi² test gebruikt. Er werd een logistische regressieanalyse uitgevoerd om voorspellers van het gebruik van gezondheidszorg te identificeren.

**Resultaten**: De studiegroep bestaat uit 27 964 thuiswonende eenzame 65-plussers, waarvan 34,3% sociaal eenzaam is, 11,7% emotioneel eenzaam en 54,0% gecombineerd eenzaam. Geen van de theoretische risicogroepen voor eenzaamheid lijken meer frequent binnen de studiegroep ten opzichte van de Vlaamse populatie. Slechts 16,5% van de studiepopulatie is tevreden met zijn sociaal netwerk. Een derde van de eenzame ouderen wordt ondersteund door zijn huisarts (34,9%) of formele zorgverlening (36,6%). Hieronder zijn significant meer emotioneel eenzame ouderen dan sociaal eenzame ouderen.

**Conclusie:** Er bestaat geen typisch profiel dat de eenzame thuiswonende oudere in Vlaanderen beschrijft. Om eenzaamheid beter te detecteren en aanpakken moeten zorgverleners zich ontdoen van hun vooroordelen en hierover durven praten met ál hun patiënten. Ondanks dat emotionele eenzaamheid een zwaardere tol eist, is sociale eenzaamheid meer prevalent en worden sociaal eenzame ouderen minder ondersteund door hun huisarts of formele zorgcontext.

# 2. Introduction

A national survey performed in 2018 reported that 46% of Belgians felt lonely (1). Despite methodological differences in studies on the topic of loneliness (for example different measurement scales and different subpopulations regarding age, gender and cultural aspects), comparable prevalence estimates have been reported world-wide, ranging from roughly 20 to 40% (2–4). Even though anybody can feel lonely from time to time, the issue is often ignored. Its significance is often underestimated, mainly due to prevailing taboo and associated stigmatisation as well as a lack of knowledge on the topic (5).

Loneliness has been defined in different ways in the scientific literature. These share a few characteristics: loneliness is a subjective experience, perceived as a negative one and stemming from a lack of social relationships (6). For the purpose of this thesis, the definition of loneliness proposed by De Jong Gierveld will be used: loneliness is a situation experienced by the individual as one where there is an unpleasant or inadmissible lack of (quality of) certain relationships (7). This definition emphasises that loneliness is a subjective experience, either arising from the discrepancy between the social relations someone has and their preferred amount of social relations or from the lack of intimacy achieved by these social relations (3,8). Weiss previously proposed this distinction of loneliness into two components, with emotional loneliness referring to a lack of an intimate relationship or a close emotional attachment, and social loneliness referring to a lack of a broader social network leading to the absence of a sense of belonging to others (9). These two components can exist simultaneously, but a person can also be considered lonely when experiencing only emotional or social loneliness (10).

It is important to distinguish social loneliness from social isolation, the first being a subjective feeling as opposed to the latter which is an objectifiable, and thus measurable, lack of social contacts (3,10). Logically, isolated people are more at risk for being lonely. However, there is no one-on-one relationship between social isolation and loneliness, since someone with a small social network might not feel lonely, whereas someone with a big social circle might (10). This complex relationship between social isolation and loneliness is illustrated by Dykstra, who noted that, as opposed to what might be suspected, loneliness amongst elderly people is not more common in individualistic countries, with higher levels of social isolation, and on the contrary tends to be higher in societies with predominating collectivistic values (8).

The causes of loneliness are quite diverse and the process leading up to someone feeling lonely can be quite complicated (11). Recently, a conceptual model of loneliness was published by Lim, Eres and Vasan to elucidate these causes of loneliness and their complex interaction (12). This model is based on two elements playing a role in the origin of loneliness: triggers and risk factors of loneliness. A trigger is a significant life-event, either positive or negative, that leads to a change in social identity and can initiate the development of loneliness. Examples are moving to a new home, becoming a parent, an illness, the death of a close friend/family member, a divorce, etc. The risk factors are characteristics of an individual predisposing them to loneliness and are divided into three subgroups according to the model: demographic, health related and socio-environmental factors. Demographic characteristics such as age or marital status have been associated with an increased risk at loneliness. For example, although loneliness is common in all age groups, a peak prevalence is noted amongst young adults (18-35 years old), as well as amongst the oldest group of elderly (> 80 years) (8). Also, a large National survey in the Netherlands reported higher rates of loneliness amongst divorcees, widows and widowers compared to married or unmarried people (13). This survey also found that people with physical disabilities were more likely to be lonely, which illustrates the impact of health-related risk factors. Finally, socio-environmental aspects should be considered as a risk

factor. For instance, people with a low educational level or people living in poverty have been shown to feel lonelier (13). The model of loneliness according to Lim, Eres and Vasan considers loneliness as a consequence of the interaction between triggers and risk factors. The impact or relevance of each of these triggers and risk factors, and whether they will elicit feelings of loneliness for someone, varies between individuals (12). Evidently, the examples given are not the only origins for loneliness and are part of a non-exhaustive list of possible triggers and risk factors.

Research shows that loneliness is associated with negative health outcomes, and this concerns mental as well as physical health (14). For instance, an increased risk of dementia (15–17), depression (18,19) and even suicidal behaviour (20) has been described in literature. Also, an increased risk of hypertension and cardiovascular disease has been shown (21–23). Furthermore, loneliness is associated with an increased mortality (14,24), which might be mediated by the aforementioned physical and mental health conditions. As highlighted by Leigh-Hunt et al., it is difficult to figure out the underlying causal mechanisms between loneliness and its health implications, since research mostly comprises observational studies (14). Some biological pathways have been suggested (e.g., altered hormonal, immune, neurological and endocrine pathways) as well as different health behaviour in lonely people (3,14). For example, studies have shown that lonely people tend to smoke more and are more likely to be overweight (25,26). Whether lonely people are more likely to initiate in other harmful behaviours such as excessive alcohol consumption, lack of physical activity or poor diet has yet to be elucidated (14).

Since loneliness is such a complex issue with multiple causes interacting with each-other, there is no one-size-fits-all solution. Therefore, a myriad of interventions to reduce loneliness have been designed to meet the different needs. These strategies can be grouped into three main categories (13,27):

1. Strategies to develop new relationships or to improve existing ones. This can be achieved by identifying the causes and adjusting them accordingly. The most obvious and therefore widely used approaches to reduce loneliness are:
    a) interventions to improve personal characteristics, such as social skills and self-confidence;
    b) interventions to increase social participation by providing an environment where people can easily interact with each other and form new connections;
    c) interventions to influence societal trends that interfere with making and maintaining relationship (e.g., the prejudices of getting older and the decreasing in inter-generational solidarity);
2. Strategies to adjust high or unrealistic expectations regarding relationships;
3. Strategies to learn to cope with feelings of loneliness by reducing the difference between the existing relationships and desired relationships. This can be attained through distraction, acceptance and putting the situation into perspective.

General practitioners (GPs) and other formal care providers, who provide paid care services to care-dependent people, are quite often confronted with loneliness since they are easily accessible (28,29). Unfortunately, no primary care guidelines on the topic exist and the literature on the subject is limited. Some qualitative studies in the UK, the Netherlands explored, by means of interviews, the experience and perception of GPs regarding loneliness in the elderly patient. GPs feel they know little about loneliness and do not know how to approach the subject with their patients and misjudge who is lonely. Even if they can successfully identify the patients, another problem arises: how can they help them? As mentioned before, there is no straightforward solution for such a complex matter. This lack of therapeutic options is associated with feelings of powerlessness due to the perceived inability to solve the problem (28,30,31). This all, as well as time

constraints, makes GPs shy away from the management of loneliness. Similarly to GPs, home care nurses and other formal healthcare workers reported that their assumptions about who was lonely were not always accurate. Moreover, they found it difficult to approach the subject, partly due to limited time resources and feelings of inadequacy to tackle this issue (29,32).

Loneliness is primarily a societal problem, where the GP and other formal care providers could be part of the solution (28,29,31). While GPs are ideally placed to identify potential lonely people, the question remains whether the GP should tackle loneliness and how. Some GPs questioned whether managing loneliness was even a part of the GP's job description. Nevertheless, patients experiencing loneliness tend to consult primary care providers more frequently (33–35). Moreover, in some cases, the GP or other care providers might even be the only social contact a socially isolated patient has (36). Furthermore, formal care providers were found to be potential actors in alleviating feelings of loneliness in care-dependent home-dwelling elders by providing positive human interaction (37). Unfortunately, research on the patient's perspective of loneliness is limited. The main obstacles in setting up these studies are the difficulties in selecting participants since primary care providers often misjudge who is lonely, as well as the prevailing taboo and stigma keeping lonely patients from participating. Recently, a small qualitative study was set up as part of a master's thesis, investigating the point of view of patients on how GPs should handle loneliness (38). This study concluded that patients primarily expect their GPs to listen, be understanding, empathetic and make time for emotional wellbeing as much as physical wellbeing.

Literature shows that the widely spread assumption that aging is associated with becoming lonely, is a misconception (8). Nevertheless, loneliness makes elderly people more vulnerable, mainly due to the increased morbidity and mortality and decrease in quality of life associated with it (5,39). Currently, one out of five (20,9%) of the Flemish population is over 65 years old (40). The proportion of those over 65 has risen over the last few years and projections show that it will continue to increase in the future (41). The ageing of the population is a worldwide trend and it is estimated that by 2050 the global population over 65 years will have doubled (42). This demographic shift gives rise to various challenges in multiple sectors of society, including the economy, housing and healthcare (43). According to the World Health Organization (WHO) older people especially face physical as well as mental health challenges which have a significant impact on their quality of life and abilities to participate in society (42,44). To address these challenges the WHO promotes "healthy ageing" which is a global initiative to improve the lives of the elderly people and their environment by changing attitudes towards ageism, by encouraging communities to embrace the abilities of the elders and by supporting person-centred care and making it more accessible (42). The WHO recognizes loneliness as an important social determinant of health and a significant risk factor for mortality (45). Thus, loneliness is considered one of many targets to improve healthy ageing.

Loneliness is a matter of public health and more research investigating the problem, and the role of primary care in handling it, is necessary. Even more so since the prevalence of loneliness has risen in the general, as well as in the elderly population during the covid-19 pandemic due to the various isolation measures implemented in attempt to contain the virus (46–48). This paper will focus on loneliness in de elderly population specifically, mainly because of the increasing ageing population and the importance of managing loneliness to improve healthy ageing. But also because loneliness amongst the elderly should be considered as a separate entity given the differences in aspects of loneliness that are seen between ages (49).

The aim of this study is to provide an observational overview of the current situation regarding loneliness amongst the elderly population in Flanders. We will investigate the following research questions:

1. What is the profile of the lonely home-dwelling elders in Flanders in terms of sociodemographic and health characteristics?
2. What are the differences between emotional and social loneliness in this target group?
3. To what extend do lonely, home-dwelling elders in Flanders rely on their GP and are they content with their help? (Marjan)
    a. Are their predictors for the use of care provided by the GP?
4. To what extent do lonely, home-dwelling elders in Flanders rely on other formal healthcare professionals, and are they content with this help? (Roya)
    a. Are there predictors for the use of care provided by these formal healthcare professionals?

By doing so, we try to identify areas for improvement in the current approach of primary care regarding loneliness amongst the elderls living at home in Flanders.

# 3. Methodology

This chapter provides an overview of the methodology used to investigate the research questions. We will describe the data source, inclusion criteria, variables, ethical approval and statistical analysis.

## 3.1. Data source: Belgian Ageing Studies

The data used in this study originates from the ongoing Belgian Ageing Studies (BAS) dataset (50). The BAS is a collaboration project between the Vrije Universiteit Brussel (VUB) and Hogeschool Gent. It assess the quality of life and living conditions of older people in Flanders. The BAS database is the result of a standardized questionnaire filled in by elderly people living at home, including assisted living facilities and intergenerational living complexes. The project is based on data obtained in 140 Belgian municipalities. Each municipality decided whether to participate in the project or not. The same sampling design was used in every municipality: a random sample of the population register of inhabitants was drawn by the local government, according to stratified quota (including age and gender), so that the sample was proportionately identical to the underlying population. This ensures that the sample is representative for its municipality. However, this does not allow the global dataset to be representative at a national level. The sampling fraction depended on the size of the municipality, varying between n = 182 and n = 1 592.

The BAS project uses a participatory methodology, namely peer research: the elderly people were not only the target group of the project but were also involved in the realisation of the research by acting as volunteers. The questionnaire is self-administered, but trained volunteers were allowed to clarify questions when requested by the participant. The questionnaire includes a wide array of topics to obtain information on the elders' perception on different aspects of daily life (i.e. living conditions, health, social participations, feelings of unsafety, etc.). This methodology allowed for a higher response rate, more complete questionnaires and minimalization of social desirability. Depending on the municipality, the response rate was 65 – 85%.

## 3.2. Study population

For the purpose of this study, a sample was drawn from the original BAS dataset which included people aged 65 years and above, residing in Flanders and with a score of two or more on the shortened six-item loneliness scale of De Jong-Gierveld (51). This new dataset included data collected from August 2004 until December 2020. Elders living in health care facilities (such as nursing homes), with family or in group homes were excluded from this study as to only include elderly people living at home or in a service flat.

## 3.3. Variables

Only the variables applicable to the scope of this study were retained from the original BAS dataset. We included information on sociodemographic characteristics, health characteristics, social network and the use of healthcare.

First, the following information on sociodemographic characteristics was included: age, gender, nationality, education, marital status, monthly income and living conditions.

Second, we included questions providing information on the health and wellbeing of participants. Physical health was self-assessed by using the six-item medical health scale (MOS-6) (52). A low score on the MOS-6 indicated that the respondent experienced more interference in their daily physical activities due to their current health status. Further, physical health was assessed through questions regarding recent falls, visual or hearing impairment, polypharmacy and weight loss. Polypharmacy was defined as the chronic use of five or more medications. Additionally, participants were asked if they needed help with personal care, with housekeeping and/or with transfers. Further, mental health was assessed with the 5-item Geriatric Depression Scale (GDS-5) as well as a scale to measure psychological distress. The latter includes six questions to assess the extent to which a participant experiences feelings of distress (i.e. feeling useless, tension, feeling unhappy, being worried and being overwhelmed). A higher score on the scale indicated more psychological distress. The Cronbach's alpha for this scale was 0,877, indicating that it is a reliable scale. Loneliness was measured with the shortened 6-item version of the De Jong Gierveld scale.

Third, information on a person's social network and the use of health care assistance (such as the GP amongst others) as well as the satisfaction with this network and assistance was included. Regarding their social network, participants were asked how much contact, i.e. physical visits as well as phone calls, they had with different members of their family, friends and neighbours. Based on this information, we calculated the relative size of a participants social network, as well as the mean frequency they had contact with members of their social network.

## 3.4. Ethics

The study was approved by the ethical committee of the UZ Brussel (B.U.N. 1432021000692; see Appendix 4).

### 3.5. Statistical analysis

Statistical analysis was performed using SPSS version 28.0 for Windows. Descriptive statistics are expressed as count and percent (%) for categorical variables and as mean +/- standard deviation (SD) for continuous variables. To analyse differences between emotional and social loneliness, a Chi-squared test was used for categorical variables and an independent student's t-test test for continuous variables. Statistical significance was set at the 5% level (p-value < 0,05).

A logistic regression analysis was performed to identify predictors for the use of healthcare (respectively the GP and the formal care providers). Results are expressed as the odds ratio (OR) with corresponding 95% confidence intervals (95% CI). Significance was set at the 5% level (p-value <0,05). The logistic regression analysis incorporated risk factors for feelings of loneliness (including marital status, income, age, psychological distress and having a small social network), variables logically associated with the use of healthcare (i.e. general health, the use of multiple medications, recent falls and the need for help) and the loneliness subdivision (emotional vs. social loneliness). These variables were used in a stepwise regression with forward selection enabling for the creation of a model only incorporating significant variables.

## 4. Results

The following sections provide an overview of the results. First, an outline of the selection of participants from the BAS database is given. Next, we will describe the sociodemographic and health characteristics of the study population and the differences between socially and emotionally lonely elders accordingly. Lastly, the results from the logistic regression analysis are reported to investigate the support provided by the GP and other healthcare professional as experienced by the participants.

### 4.1. Study population

An extract of the original BAS database was drawn including all data between August 2004 and December 2020, which resulted in 82 580 subjects. Of these subjects, 27 964 participants met the inclusion criteria (i.e. age 65 years and above, living at home or in a service flat, residing in Flanders and defined as lonely according to the shortened De Jong Gierveld scale). An overview of the included respondents is provided in figure 1.




***Figure 1: Flow-chart of the participants***

## 4.2. Profile of the study population

The study population consisted of 27 964 lonely home-dwelling people aged 65 and above.

### 4.2.1. Sociodemographic characteristics (Marjan)

An overview of the sociodemographic characteristics of the study population is provided in table I. The mean age of the study population is 74,52 years (6,94 SD). Of the studied population 45,1% were men and 54,9% were women (n = 27 829). The majority of the study population had Belgian nationality (98,0%; n = 5 093).

The largest proportion of the population finished only primary education (37,3%), followed by lower (28,9%) or higher (17,7%) secondary education (n = 27 212). Only 5,8% of the participants did not have an education, as opposed to 7,5% achieving higher education and 2,9% university education.

The majority of the study population lived together with family (i.e. a partner, parent(s), children, grandchildren) or others (74,9%; n = 4 819). About two thirds of the population was either married or had a registered partnership (65,8%) at the moment of the questionnaire. Whereas 30,5% were either widowed or divorced and 3,7% never had been married.

Participants lived in their hometown for a mean of 51,4 years (SD 22,40). Only 13,2% of the participants moved in the past 10 years, with a mean of 4,85 years ago (n = 27 543).

***Table I: Sociodemographic characteristics of the study population***

| **Variable** | | **Outcome** |
|---|---|---|
| Age in years (n = 27 964) | | 74,52 (6,94) |
| Gender (n = 27 829) | Male | 12 551 (45,1%) |
| | Female | 15 278 (54,9%) |
| Nationality (n = 5 093) | Belgian | 4 990 (98,0%) |
| | Other | 103 (2,0%) |
| Educational level (n = 27 212) | No educational degree | 1 575 (5,8%) |
| | Primary education | 10 146 (37,3%) |
| | Lower secondary education | 7 857 (28,9%) |
| | Higher secondary education | 4 810 (17,7%) |
| | Higher education | 2 032 (7,5%) |
| | University degree | 792 (2,9%) |
| Marital status (n = 27 692) | Married / registered partnership | 18 226 (65,8%) |
| | Divorced / widowed | 8 447 (30,5%) |
| | Never married | 1 019 (3,7%) |
| Household income (n = 23 319) | <1 000 euro | 5 397 (23,1%) |
| | 1 000 – 1 499 euro | 9 204 (39,5%) |
| | 1 500 – 1 999 euro | 4 765 (20,4%) |
| | 2 000 – 2 499 euro | 2 205 (9,5%) |
| | 2 500 euro and more | 1 748 (7,5%) |
| How does your household manage with this total income (n = 24 858) | Very difficult | 1 516 (6,1%) |
| | Difficult | 2 796 (11,2%) |
| | Rather difficult | 6 236 (25,1%) |
| | Rather easy | 8 628 (34,7%) |
| | Easy | 4 387 (17,6%) |
| | Very easy | 1 295 (5,2%) |
| Housing type (n = 27 964) | House | 24 126 (86,3%) |
| | Apartment | 3 688 (13,2%) |
| | Studio | 106 (0,4%) |
| | Service flat | 44 (0,2%) |
| Living arrangement (n = 4 819) | Lives alone | 1 211 (25,1%) |
| | Lives with others | 3 608 (74,9%) |
| Years of residence in the current city (n = 26 919) | | 51,4 years (22,40) |

Categorical variables are presented as count (%) and continuous variables as mean (SD).

### 4.2.2. Health, wellbeing and social network (Roya)

Table II summarizes the health, wellbeing and social network characteristics of the study population. Of the 27 964 respondents 54,0% were categorized as both emotionally and socially lonely, 34,3% as socially lonely and 11,7% as emotionally lonely.

The study population had a mean MOS-6 score of 57,11%, indicating a mediocre health status. This, while the majority of the participants reported having no weight loss (81,1%), having an adequate (corrected) hearing (75,3%) and (corrected) vision (91,7%), not having experienced any fall in the previous twelve months (68,5%) and do not use five or more chronic medications (63,8%).

Of the 25 129 respondents 64,3% indicated no need for any help, 27,0% a need for housekeeping assistance, 24,5% a need for help with personal transportation and 13,1% a need for help with personal care.

In terms of mental health, the psychological distress scale measured a rate of 20,5% (n = 24 138). A smaller group (n = 2 816) of the study population filled out the shortened Geriatric Depression Scale, of which 25,4% were identified as possibly having a depression.

The mean size of the participants' social network was 47,6% (n = 27 964), meaning that on average the participants had contact with almost 4 out of 8 questioned members of their social network (children, stepchildren, grandchildren, siblings, parents, other family members, friends and neighbours). Further, the mean frequency of contact with their social network was less than once every month to once a month. Furthermore, only a small fraction reported being satisfied with these contacts (16,5%) and most of the participants reported being neutral towards them (74,4%; n = 6 221).

***Table II: Health, wellbeing and social network of the study population***

| **Variable** | | **Outcome** |
|---|---|---|
| Loneliness (n = 27 964) | Lonely | 27 964 (100%) |
| | Emotional loneliness | 3 261 (11,7%) |
| | Social loneliness | 9 604 (34,3%) |
| | Both | 15 099 (54,0%) |
| Medical outcome scale (n = 24 815) | | 57,11% (38,54) |
| Weight loss (n = 2 782) | None | 2 255 (81,0%) |
| | Between 1 – 3 kg | 355 (12,8%) |
| | 3 kg and above | 172 (6,2%) |
| Hearing (n = 2 781) | Hearing well | 1 714 (61,6%) |
| | Hearing loss without hearing-aid | 685 (24,6%) |
| | Hearing loss with hearing-aid | 382 (13,7%) |
| Vision (n = 2 772) | Adequate vision | 990 (35,7%) |
| | Bad vision without/inadequate prescription glasses | 230 (8,3%) |
| | Bad vision with adequate prescription glasses | 1 552 (56,0%) |

| | | |
|---|---|---|
| Polypharmacy (n = 544) | Yes | 197 (36,2%) |
| | No | 347 (63,8%) |
| Fell in the last 12 months (n = 24 714) | No | 16 930 (68,5%) |
| | 1-4 times | 7 157 (29,0%) |
| | More than 4 times | 627 (2,5%) |
| Need for help (n = 25 129) | Personal care | 3 292 (13,1%) |
| | Housekeeping | 6 787 (27,0%) |
| | Personal transportation | 6 186 (24,6%) |
| | No need for help | 16 156 (64,3%) |
| Psychological distress scale (n = 24 138) | | 20,5% (21,21) |
| Geriatric Depression Scale (n = 2 816) | Risk of being depressed | 715 (25,4%) |
| | No risk of being depressed | 2 101 (74,6%) |
| Social network | Size (n = 27 964) | 47,6% (22,39) |
| | Frequency of contact (n = 26 648) | 2,66 (0,8635) |
| Satisfaction with social network (n = 6 221) | Yes | 1 025 (16,5%) |
| | No | 567 (9,1%) |
| | Neutral | 4 629 (74,4%) |

Categorical variables are presented as count (%) and continuous variables as mean (SD).

## 4.3. Comparison between socially and emotionally lonely elderly groups

To assess the differences between social and emotional loneliness in the elderly population, we selected elders who were identified as being only socially or only emotionally lonely. In total 12 865 elders met this selection criterium with 3 261 (25,3%) emotionally and 9 604 (74,7%) socially lonely elders.

### 4.3.1. Sociodemographic characteristics (Roya)

Table III provides an overview of the sociodemographic characteristics of the study population comparing emotionally and socially lonely elders. The emotionally lonely elderly cohort was slightly older than their socially lonely peers (76,69 years vs. 73,94 years; p-value <0,001) and had been living longer in their current city (56,42 years vs. 50,92 years; p-value <0,001). Further, the emotionally lonely group consisted of more women (65,4% vs. 49,8%; p-value <0,001).

The emotionally lonely group had a higher percentage of respondents being divorced or widowed (51,7% vs. 19,8%; p-value <0,001) whereas the socially lonely group had significantly more respondents being either married or legally cohabitating (76,8% vs. 44,5%; p-value <0,001). More respondents lived alone in the emotionally lonely group (40,2% vs. 15,4%; p-value <0,001), as opposed to more respondents living with others in the socially lonely group (84,6% vs. 59,8%; p-value <0,001).

Regarding socio-economic characteristics, the emotionally lonely group had a higher percentage of either no educational degree (7,8% vs. 4,9%; p-value <0,001) or a primary degree (43,0% vs. 38,0%; p-value <0,001). They also had a higher percentage of respondents earning below 1 500 euros per month (73,7% vs. 59,0%; p-value <0,001) and had more difficulties making ends meet (43,9% vs. 38,4%; p-value <0,001).

Accordingly, the socially lonely group had a higher educational level (57,1 vs. 49,2%; p-value <0,001), had a higher proportion of respondents earning more than 1 500 euros per month (41,0% vs. 26,3%; p-value <0,001) and had an easier time making ends meet (61,1% vs. 56,1%; p-value <0,001).

***Table III: Sociodemographic characteristics between socially and emotionally lonely elderly groups***

| **Variable** | | **Emotionally lonely** | **Socially lonely** | **p-value** |
|---|---|---|---|---|
| Age in years (n = 12 865) | | 76,69 (7,49) | 73,94 (6,69) | **<0,001** |
| Gender (n = 12 796) | Male | 1 124 (34,6%) | 4 787 (50,2%) | **<0,001** |
| | Female | 2 128 (65,4%) | 4 757 (49,8%) | |
| Nationality (n = 2 488) | Belgian | 759 (97,8%) | 1 677 (98,0%) | 0,918 |
| | Other | 17 (2,2%) | 35 (2,0%) | |
| Educational level (n = 12 503) | No educational degree | 250 (7,8%) | 457 (4,9%) | **<0,001** |
| | Primary education | 1 374 (43,0%) | 3 536 (38,0%) | |
| | Lower secondary education | 880 (25,1%) | 2 716 (29,2%) | |
| | Higher secondary education | 470 (14,7%) | 1 606 (17,2%) | |
| | Higher education | 178 (5,6%) | 708 (7,6%) | |
| | University degree | 40 (1,3%) | 288 (3,1%) | |
| Marital status (n = 12 731) | Married / registered partnership | 1 433 (44,5%) | 7 307 (76,8%) | **<0,001** |
| | Divorced / widowed | 1 665 (51,7%) | 1 886 (19,8%) | |
| | Never married | 121 (3,6%) | 319 (3,4%) | |
| Household income (n = 10 481) | <1 000 euro | 818 (29,0%) | 1603 (20,9%) | **<0,001** |
| | 1 000 – 1 499 euro | 1 264 (44,7%) | 2 919 (38,1%) | |
| | 1 500 – 1 999 euro | 443 (15,7%) | 1 642 (21,4%) | |
| | 2 000 – 2 499 euro | 183 (6,5%) | 830 (10,8%) | |
| | 2 500 euro and more | 118 (4,2%) | 662 (8,6%) | |
| How does your household manage with this total income? (n = 11 247) | Very difficult | 187 (6,2%) | 446 (5,4%) | **<0,001** |
| | Difficult | 362 (12,1%) | 888 (10,7%) | |
| | Rather difficult | 765 (25,6%) | 1 842 (22,3%) | |

| | | | | |
|---|---|---|---|---|
| | Rather easy | 1 053 (35,3%) | 2 878 (34,8%) | |
| | Easy | 491 (16,4%) | 1 718 (20,8) | |
| | Very easy | 127 (4,3%) | 490 (5,9%) | |
| Living arrangement (n = 2 333) | Lives alone | 281 (40,2%) | 251 (15,4%) | **<0,001** |
| | Lives with others | 418 (59,8%) | 1 383 (84,6%) | |
| Years of residence in the current city (n=12 325) | | 56,42 (22,23) | 50,92 (21,82) | **<0,001** |

Categorical variables are presented as count (%) and continuous variables as mean (SD).

### 4.3.2. Health, wellbeing and social network (Marjan)

Table IV shows the comparison between emotionally and socially lonely cohort regarding their health, wellbeing and social network.

The emotionally lonely group were more likely to experience interference with their daily physical activities due to their general health, as indicated by a lower MOS-6 score (48,51% vs. 65,42%; p-value <0,001). Also, emotionally lonely elders reported needing help with personal care, housekeeping or personal transportation almost twice as much as their socially lonely counterparts (72,1% vs. 45,4%; p-value <0,001). Furthermore, they were more likely to suffer from weight loss or frequent falls.

When looking at mental health, emotionally lonely elders experienced more psychological distress (25,11% vs. 10,25%; p-value <0,001) and were more at risk of developing depression (27,3% vs. 19,4%; p-value <0,001).

The socially lonely group had a smaller social network (41,96% vs. 50,17%; p-value <0,001). Nevertheless, they had more frequent contact with their network (2,81 vs. 2,75; p-value <0,001). But, they were less satisfied with interactions in their social network.

***Table IV: Health and wellbeing between social and emotional lonely elderly***

| **Variable** | | **Emotionally lonely** | **Socially lonely** | **p-value** |
|---|---|---|---|---|
| Medical outcome scale (n = 10 630) | | 48,51% (38,86) | 65,42% (37,35) | **<0,001** |
| Weight loss (n = 1 369) | None | 400 (76,6%) | 720 (85,0%) | **<0,001** |
| | Between 1-3 kg | 79 (15,1%) | 82 (9,7%) | |
| | 3 kg and above | 43 (8,2%) | 45 (5,3%) | |
| Hearing (n = 1 272) | Hearing well | 310 (59,4%) | 546 (64,2%) | 0,054 |
| | Hearing loss without hearing-aid | 122 (23,4%) | 196 (23,1%) | |
| | Hearing loss wit hearing-aid | 90 (17,2%) | 108 (12,7%) | |

| | | | | |
|---|---|---|---|---|
| Vision (n = 1 368) | Adequate vision | 173 (33,4%) | 345 (40,6%) | 0,018 |
| | Bad vision without/inadequate prescription glasses | 40 (7,7%) | 48 (5,6%) | |
| | Bad vision with adequate prescription glasses | 305 (58,9%) | 457 (53,8%) | |
| Polypharmacy (n = 233) | Yes | 40 (36,0%) | 35 (28,7%) | 0,231 |
| | No | 71 (64,0%) | 87 (71,3%) | |
| Fall in the last 12 months (n = 11 186) | No | 1 876 (63,4%) | 6 073 (73,8%) | **<0,001** |
| | 1-4 times | 960 (32,5%) | 2 026 (24,6%) | |
| | More than 4 times | 122 (4,1%) | 129 (1,6%) | |
| Need for help | Personal care (n = 11 612) | 708 (22,6%) | 772 (9,1%) | **<0,001** |
| | Housekeeping (n = 11 609) | 1 308 (41,5%) | 1 660 (19,6%) | **<0,001** |
| | Personal transportation (n = 11 441) | 1 258 (59,6%) | 1 419 (17,0%) | **<0,001** |
| | No need for help (n = 11 754) | 1 439 (45,4%) | 6 188 (72,1%) | **<0,001** |
| Psychological distress scale (n = 10 594) | End score in % | 25,11% (22,62) | 10,25% (14,03) | **<0,001** |
| Geriatric Depression Scale (n = 1 411) | Risk of being depressed | 146 (27,3%) | 170 (19,4%) | **<0,001** |
| | No risk of being depressed | 389 (72,7%) | 706 (80,6%) | |
| Social network | Size (n = 12 865) | 50,17% (20,96) | 41,96% (23,97) | **<0,001** |
| | Frequency of contact (n = 12 005) | 2,75 (0,87) | 2,81 (0,92) | **<0,001** |
| Satisfaction with the social network (n = 2 209) | Yes | 214 (28,5%) | 347 (23,8%) | **<0,001** |
| | No | 40 (5,3%) | 183 (12,5%) | |
| | Neutral | 496 (66,1%) | 929 (63,7%) | |

Categorical variables are presented as count (%) and continuous variables as mean (SD).

## 4.4. GP support (Marjan)

Table V presents the support of the GP as experienced by the participants. Only a third (34,9%) of the participants reported being supported by their GP (n = 10 349). Emotionally lonely elders felt more supported by their GP compared to their socially lonely counterparts (44,9% vs. 29,0%; p-value <0,001). Additionally, emotionally lonely elders were more satisfied by the support of their GP (79,3% vs. 71,3%; p-value <0,001).

***Table V: GP support***

| GP support | | Yes | No | p-value |
|---|---|---|---|---|
| Study group: lonely elders living at home in Flanders (n = 10 349) | | 3 607 (34,9%) | 6 742 (65,1%) | Not applicable |
| Social vs. emotional loneliness (n = 4 325) | Emotionally lonely | 769 (44,9%) | 942 (55,1%) | **<0,001** |
| | Socially lonely | 758 (29,0%) | 1 856 (71,0%) | |

| Satisfaction with GP support | | Satisfied | Unsatisfied | Neutral | p-value |
|---|---|---|---|---|---|
| Study group: lonely elders living at home in Flanders (n = 3 607) | | 1 966 (73,4%) | 66 (2,5%) | 645 (17,9%) | Not applicable |
| Social vs. emotional loneliness (n = 1 132) | Emotionally lonely | 478 (79,3%) | 10 (1,7%) | 115 (19,1%) | **<0,001** |
| | Socially lonely | 377 (71,3%) | 26 (4,9%) | 126 (23,8%) | |

Results are presented as count (%).

The results of the logistic regression analysis to investigate predictors for the use of GP care are presented in table VI. Only the MOS-6 was found to be a significant predictor for the use of GP care. The model thus showed that the odds were higher for a lonely elderly person to visit their GP if they had a better general health.

***Table VI: Predictors for the use of GP care***

| Variable | Odds ratio | 95% CI | p-value |
|---|---|---|---|
| MOS-6 | 1,018 | 1,007 – 1,028 | **<0,001** |
| Constant | 1,716 | | 0,028 |

Model: $Chi^2$ = 12,701; p-value <0,001; n = 220.
The model was able to correctly predict 77,7% of cases.

## 4.5. Support of formal care (Roya)

Table VII summarizes the prevalence of formal care support (i.e. home nursing, senior sitting, homecare and adult day care centre) and the satisfaction of the study population regarding formal care support.

Of 10 337 respondents, about one third (36,6%) reported having formal care support. A higher percentage of the emotionally lonely elders reported having formal care support (44,2% vs. 29,5%; p-value <0,001).

The respondents were in general satisfied with the received formal care (83,3%). 92,2% of emotionally lonely elders reported being satisfied compared to 77,9% of the socially lonely peers, while socially lonely elders were more likely to be neutral or not satisfied with the support provided by their formal care providers (p-value = 0,001).

*Table VII: Formal care support*

| **Formal care support** | | **Yes** | **No** | **p-value** |
|---|---|---|---|---|
| Study group: lonely elders living at home in Flanders (n = 10 337) | | 3 780 (36,6%) | 6 557 (63,4%) | Not applicable |
| Social vs. emotional loneliness (n = 4 323) | Emotionally lonely | 757 (44,2%) | 954 (55,8%) | **<0,001** |
| | Socially lonely | 770 (29,5%) | 1 842 (70,5%) | |

| **Satisfaction with formal care support** | | **Satisfied** | **Neutral** | **Not Satisfied** | **p-value** |
|---|---|---|---|---|---|
| Study group: lonely elders living at home in Flanders (n = 908) | | 761 (83,8%) | 92 (10,1%) | 55 (6,1%) | Not applicable |
| Social vs. emotional loneliness (n = 386) | Emotionally lonely | 189 (92,2%) | 10 (4,9%) | 6 (2,9%) | **0,001** |
| | Socially lonely | 141 (77,9%) | 23 (12,7%) | 17 (9,4%) | |

Results are presented as count (%).

Table VIII presents the findings of the logistic regression analysis used to investigate predictors for the use of formal care. Age, being married or cohabitant with a life partner, the frequency of having fallen and psychological distress were found to be significant risk factors for the use of formal care.

The model indicates that the odds for a lonely elderly person to rely on formal care increase with age. Furthermore, the odds to use formal care are higher if they fell within the last year or if they experience more psychological distress. Being married or cohabitant is associated with the use of formal care.

*Table VIII: Predictors for the use of formal care*

| **Variable** | | **Odds Ratio** | **95% CI** | **p-value** |
|---|---|---|---|---|
| Age | | 1,152 | 1,093 – 1,215 | **<0,001** |
| Marital status | Married / registered partnership | | | **0,024** |
| | Divorced / widowed | 0,469 | 0,215 – 1,020 | 0,056 |
| | Never married | 5,244 | 0,894 – 30,752 | 0,066 |
| Falls in the last 12 months? | No | | | **<0,001** |
| | 1-4 times | 2,466 | 1,136 – 4,521 | **0,020** |
| | More than 4 times | 54,128 | 5,801 – 505,062 | **<0,001** |
| Psychological distress | | 1,015 | 1,001 – 1,030 | **0,030** |
| Constant | | 0,000 | | **<0,001** |

Model: $Chi^2$ = 70,292; p-value <0,001; n = 220.
The model was able to correctly predict 80,9% of cases.

# 5. Discussion

The aim of this study was to describe the profile of the lonely home-dwelling elders in Flanders, the differences between socially and emotionally lonely elders, and to gain insight in the current role of the GP and other formal healthcare providers in tackling loneliness in Flanders. To the best of our knowledge this is the only quantitative study on this topic.

Noteworthy is that when selecting eligible participants from the original BAS database, we found that approximately 54% of the home-dwelling people aged 65 and up were defined as lonely according to the De Jong-Gierveld scale. Thus, when comparing to the literature, the study population had a higher prevalence of loneliness (2–4). It is even more remarkable since previous research in Belgium reported that only 28,3% of the people aged 70 and up felt lonely (1). This underlines that loneliness is often underestimated and that gaining accurate insight in the magnitude of this problem is difficult. For example, there is no specific ICPC (International Classification of Primary Care) code for loneliness, rather it is categorised under social problems (chapter Z). This makes it impossible to obtain information about the occurrence of loneliness in the Belgian GP practice from the Intego-database (53).

## 5.1. Profile of the lonely home-dwelling elders in Flanders

The sociodemographic characteristics including age, gender, marital status and household income are comparable with the demographics of the Flemish population as published by the Flemish government (54). However, a smaller fraction of the study population lives alone (27%) compared to the Flemish population over 60 years old (42%). This underlines that although living alone is associated with social isolation, there is no one-on-one relationship between social isolation and loneliness (10,11). In general, these results indicate that there is not such a thing as a typical lonely elderly person in Flanders. On the contrary, the sociodemographic characteristics of the lonely elderly are similar to those of the Flemish population (54). None of the theoretical risk factors (e.g. low education, widowhood, etc.) tended to be more present amongst the study population compared to the general population (12,13). This is an important finding since it indicates that everyone can feel lonely, and not only those patients one presumes are at risk of being lonely. This means that every healthcare worker, including the GP, should keep an open mind about loneliness and should be aware that it may occur in every patient. We could state that the detection and management of loneliness starts with discarding ones owns prejudices towards loneliness.

The majority of the study population did not declare any health issues in terms of weight loss, hearing difficulties or visual impairment. Further, the occurrence of polypharmacy (36,2%) and the rate of elderly needing help with personal care (13,1%) in the study population is similar to the Flemish population aged 65 and up, according to the Belgian Health Interview Survey (HIS) (55). However, when comparing the results with the HIS research, the study population tended to have higher rates of elders reporting having fallen in the last year (31,5%), of elders experiencing interference of their health with their day-to-day activities (43,89%), of elders at risk of depression (25,4%) and of psychological distress (20,5%). Thus, our results could suggest that the Flemish lonely elderly tend to have poorer physical as well as mental health as opposed to the general Flemish population. This would be in line with previous research (14–24). Whether poor health outcomes effectually arise from the feelings of loneliness or rather from other confounding factors, should be topic of further research.

Although the mean size of the participants' social network was 47,6% (n = 27 964), meaning that on average the participants had contact with almost 4 out of 8 questioned members of their social network, the mean frequency of contact with this social network was relatively low (between less than once every month and monthly). Additionally, only a small fraction of participants reported being satisfied with their social network and contacts (16,5%; n = 6 221). Although we were not able to compare these results to Flemish data, they show that there is certainly room for improvement in the social network of lonely elderly people. This should be an objective of "loneliness policy" since previous research has shown that a small social network, infrequent contacts and dissatisfaction of adults with their social network are associated with feelings of loneliness (56,57).

## 5.2. Differences between emotionally and socially lonely elders

According to the current study, women are more prone to report emotional loneliness while men are more prone to report social loneliness. These findings confirm results of previous studies (58–62). When looking at marital status, divorced and widowed respondents are more likely to experience emotional loneliness. These findings are consistent with previous research that identified divorce and, in particular, widowhood as risk factors for emotional loneliness (60,63). As Weiss previously stated, emotional loneliness is caused by a lack of a deep and close relationship (9). In this case, emotional loneliness is caused by the loss of that emotional connection due to death or divorce, with widowhood having a greater impact on emotional loneliness than divorce (61). Given GPs have the ability to monitor elderly people closely, they are often aware of the occurrence of such significant events in their patients' lives. Therefore, we could state that the GP is ideally placed to encourage widowers and divorcees to strengthen existing relationships, which might alleviate the burden of emotional loneliness in the long term.

Those living alone are more likely to experience emotional loneliness, while those living together are more likely to experience social loneliness. These findings are consistent with previous studies (58–60). Those findings could imply that those living with others, whether a romantic partner, a friend or family, have a higher probability of having their emotional needs fulfilled, and thus are less emotionally lonely. But, those findings could also imply that those living together experience more social loneliness because their living situation prevents them from developing a social network sufficient to their needs. Although these assumptions fall out of the scope of this study, they indicate that it is important to take someone's living situation into account when researching loneliness.

The results of our study suggest that emotionally lonely elders have a poorer general health than socially lonely elders as indicated by a lower MOS-6 score and a higher proportion of elderly people needing help with personal care, housekeeping and/or personal transportation. Furthermore, the results suggest that emotionally lonely elders have a worse mental health as well, since they experience more psychological distress and are more at risk of developing depression. This is in line with previous research which has shown that emotional loneliness is more strongly associated with overall mortality, depression and psychological distress compared to social loneliness (64–66).

The socially lonely group had a smaller social network and were more likely to be unsatisfied with the interactions in their social network. These results were to be expected given that they are inherently associated with the definition of social loneliness (67).

## 5.3. The GP (Marjan)

Only one third of the study population reported being supported by their GP (34,9%; n=10 349). So even though the GP is ideally placed to identify lonely people since they are easily accessible (28), only a relatively small fraction of the lonely elderly finds their way to the GP practice. This has virtually not been described in literature previously. Still, the majority of these people reported being satisfied with the support offered by their GP (73,4%) as opposed to only a small fraction being unsatisfied (2,5%; n=3607). This indicates that the GP could play an important role in the management of loneliness. Further qualitative research is necessary to investigate patients' incentives and barriers to visit their GP, as well as the GPs' abilities to identify and treat lonely patients.

The GP supported more emotionally lonely elderly than socially lonely elderly and the emotionally lonely elderly were also more satisfied with this support. This is probably a result of the fact that emotionally lonely elderly had a poorer general as well as mental health, which requires them to visit their GP more often. Nevertheless, we could assume that a GP identifies emotional loneliness better than social loneliness, since it is often associated with significant life events as discussed above. On the other hand, this implies that GPs are not yet sufficiently familiar with recognizing and managing social loneliness. More research is needed to determine a more effective approach for the management of social loneliness in the GP practice.

Our analysis shows that the MOS-6 variable was the only significant predictor for the use of GP care in lonely elderly. This means that in our study the odds were higher for a lonely elderly person to visit their GP if they had a better general health. Due to the cross-sectional setup of this study, it is not possible to investigate the causality between this association, namely whether healthier people visit their GP more often, or people are healthier since they visit their GP more often. Nonetheless, no other variables were found to be significantly associated to support offered by a GP. Thus, this supports our previous statement that healthcare workers should keep an open mind towards loneliness in all of their patients, and not only in specific at-risk-groups.

## 5.4. Formal care (Roya)

Only one third of the study population reported receiving formal care (36,6%). As mentioned before, two-thirds of the study population reported not requiring any help. The majority of those receiving formal care were satisfied with the formal care provided (83,3%), whereas a smaller subset were dissatisfied (6,1%). Prior research showed that those who have their home care needs met reported lower levels of loneliness than those with unmet needs (37). Moreover, formal care could aid home-dwelling elderly maintain their autonomy, thereby increasing their personal and social resilience (68). These findings could imply that identifying and providing formal care to the target population with unmet home care needs is important, since it can potentially reduce feelings of loneliness. Further research should focus on identifying risk factors for unmet care needs in (lonely) home-dwelling elderly.

The findings of the current study suggest that emotionally lonely elders use formal care more than their socially lonely counterparts. Moreover, emotionally lonely elders who receive formal care were more satisfied with the assistance provided. This might imply that emotionally lonely home-dwelling elders value the help provided by formal caregivers more. Further research needs to be done on this subject as this is a novel finding in the scientific literature.

Old age, having fallen multiple times and having a higher psychological distress score are correlated with receiving formal care support within the lonely home-dwelling elderly population. Prior research found that old age was associated with an increased need for formal care support in the elderly population (69,70). Although research regarding repetitive falls and formal care utilisation is scarce, one study found a strong correlation between fall incidence rate and the amount of service provided among home-dwelling elders (71). No literature that investigates a possible association between psychological distress and the use of formal care in home-dwelling lonely elderly exists. Due to the cross-sectional nature of the current study, no conclusions could be made regarding the causality between the demonstrated associations.

## 5.5. Recommendations

In the previous sections we discussed all four research questions. Next, based on our findings, we will formulate recommendations to improve the current approach of primary care regarding loneliness amongst the elderly living at home in Flanders.

1. The typical lonely elderly person does not exist. To improve the detection and management of loneliness every healthcare worker needs to discard their own prejudices towards loneliness and dare to talk about it with all their patients to reduce the taboo surrounding loneliness. Especially since loneliness is associated with adverse health outcomes.

2. The majority of the lonely elders are not satisfied with their current social network. The improvement of the elders' social network, by increasing its size or contact frequency, should therefore be a goal in the management of loneliness. We believe that improving someone's social network can alleviate social as well as emotional loneliness. Future research should therefore investigate strategies for improving someone's social network and how healthcare workers can play a part in this.

3. The GP is ideally placed to identify elders who experienced a significant life event such as the loss of a loved one. It should be one of the GP's duties to be alert to emotional loneliness in these people, particularly in women. More so, GPs should encourage them to broaden their social network and strengthen their existing relationships, to ease the toll of emotional loneliness.

4. Even though emotional loneliness takes a heavier toll than social loneliness, the latter is more prevalent and older people suffering from it are less frequently supported by their GP or formal care providers. Future research should focus on the ways in which primary care can alleviate social loneliness.

## 5.6. Strengths and limitations of the study

To the best of our knowledge this is one of the first quantitative studies researching the role of the GP regarding loneliness. One strength of this study is the large sample size (n= 27 964). Due to the way the Belgian Ageing Studies were set up, data are representative for each respective municipality, however not at a national level. Also, the participatory peer research methodology used in the BAS project allowed for a higher response rate, more complete questionnaires and the minimalization of social desirability.

Some limitations of this study should be mentioned. For instance, because the variables are pre-determined in the original database, there was no way to adjust them to better fit the current study purpose if necessary. Nevertheless, by basing our study on the BAS

database instead of designing a new questionnaire more specific to loneliness, we were able to avoid a nonresponse bias and allow for a representative population.

Due to the cross-sectional nature of this study we cannot draw conclusions about causality in our findings, especially since the comparison with elderly who are not lonely fell out of the scope of this study.

All evidence from this study is obtained through self-reported data so there is always a chance of information or recall bias, which can lead to the under- or overestimation of the true values. The impact of this was limited by using standardized and validated scales where possible (e.g. MOS-6, GDS-5, De Jong-Gierveld scale).

Another limitation of this study is that there are some target populations that fell out of the scope of this study. For example, only 0,2% of the study population lives in a service flat. Also, 98% of the study population had a Belgian nationality, suggesting that there is little to no information on residents with a migration background in this study.

Finally, some elements that might be of interest have not been investigated in this study either since it fell out of the scope of this study (for example cognitive deficit, cultural differences) or due to inconsistencies in the answers given on the questions (for example retirement, migration background).

# 6. Conclusion

According to this study, the prevalence of loneliness amongst the home-dwelling Flemish elderly is estimated at 54%. There is no typical profile that fits the lonely home-dwelling elderly in Flanders. This study supports previous evidence demonstrating a poorer physical and mental health in the lonely elderly population. It also confirms the sociodemographic and self-reported physical and mental health differences between emotionally and socially lonely elderly reported in prior research. A novel finding was that about one third of the lonely elderly was supported by their GP or formal healthcare workers. Additionally, a higher prevalence of this support and satisfaction with it was demonstrated in emotionally lonely elders compared to socially lonely peers. Having a higher MOS-6 score was associated with the utilisation of GP care while being older, having multiple falls and a higher psychological distress score were associated with formal care utilisation. Due to the cross-sectional setup of this study the causality of these associations cannot be determined. The findings of this study underline the importance of keeping an open mind towards loneliness in the elderly population. Healthcare workers should never shy away from starting a conversation around loneliness with their patients, and should encourage and help them to strengthen their relationships and expand their social networks. To conclude, loneliness is a societal problem, where the GP and other formal care providers could be part of the solution. More research is necessary to investigate to what extend healthcare workers contribute to reducing loneliness and in which ways they should participate in the management of loneliness.

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# 10. Appendices

## 10.1 Persoonlijke reflectie: Marjan Van Reckem

Een thesis schrijven met een van je beste vriendinnen: een nachtmerrie die je vriendschap om zeep helpt, of een avontuur waarin je enkel het beste uit elkaar haalt. Gelukkig is dat naar mijn aanvoelen voor ons het laatste geworden.

De keuze om samen de masterproef te schrijven viel al vroeg in het eerste HAIO jaar. Tijdens een van de vele gesprekken tussen Roya en ik over ons nieuwe leven als HAIO, kwam al snel een gemeenschappelijke opmerking naar boven. Vele ouderen die we op huisbezoek zagen keken enorm uit naar ons maandelijkse bezoek, terwijl we soms meer over koetjes en kalfjes praatten dan hun fysieke gezondheid. Het leek dat deze ouderen eerder nood hadden aan hun hart luchten. We vroegen ons af wat hiervoor de verklaring was. Zijn deze ouderen eenzaam? En wat kunnen of moeten wij daar als hun huisarts aan doen? Onze gemeenschappelijke interesse leidde aldus tot het thema van deze masterproef, waarmee we heel dankbaar bij Prof. Emily Verté terechtkwamen.

Eenzaamheid bij ouderen is natuurlijk een zeer groot thema. Het onderzoeken van de rol van de huisarts hierin is iets wat moeilijk af te omschrijven is. Het afgebakend houden van ons onderzoeksopzet was dan ook iets waar we in het begin moeite mee hadden, mede door onze eigen interesse om zoveel mogelijk te weten te willen komen over dit onderwerp. Ik ben Prof. Emily Verté en Dr. Julie Vandevenne dan ook zeer dankbaar dat zij ons hierin begeleid hebben, zodat we een concreet en haalbaar onderzoek hebben kunnen uitvoeren.

De eerste vraag die we wilden oplossen was wie nu eigenlijk de eenzame oudere was. Ik verwachtte dat onze studie populatie voornamelijk zou bestaan uit ouderen die alleen wonen en die geen partner meer hebben. Maar daar bleek ik het goed mis te hebben en werd ik geconfronteerd met mijn eigen vooroordelen. Onze studie suggereert immers dat het sociodemografisch profiel van de eenzame oudere vergelijkbaar is met dat van algemene Vlaamse oudere populatie. Om er een schepje bovenop te doen lijkt onze studiegroep zelfs minder vaak alleen te wonen. Hoewel we dit niet statistisch kunnen nagaan is het een belangrijke vaststelling. Meer nog, een waardevolle les om als huisarts te leren. We zijn immers opgeleid om risicofactoren te herkennen in onze patiënten en daarop in te spelen (vb. cardiovasculaire risicofactoren). Ik vermoed dat dit ook een van de redenen is waarom eenzaamheid nog maar al te vaak onder de radar blijft: zorgverleners denken er gewoon niet aan bij patiënten die niet in de risicocategorie vallen. Dat roept de vraag op of we zouden moeten screenen naar eenzaamheid, zeker gezien er nefaste gevolgen op mentale én fysieke gezondheid aan vast hangen. In de literatuur worden deze gevolgen zelfs even ernstig geacht als die van bijvoorbeeld roken of obesitas. Een interessant vervolg aan deze thesis zou daarom een (praktijk verbeterend) project kunnen zijn, waar patiënten geïdentificeerd worden die eenzaam zijn, bijvoorbeeld aan de hand van de De Jong Gierveld vragenlijst. Dat creëert de mogelijkheid om hierover met hun in gesprek te gaan.

Ondanks dat deze masterproef me meer vertrouwd heeft gemaakt met eenzaamheid en zijn determinanten, blijf ik toch nog wat achter met de vraag hoe we daar nu als huisarts mee aan de slag moeten. Ik neem uit onze thesis vooral mee dat we eenzaamheid bespreekbaar moeten maken bij ál onze patiënten. Een luisterend oor is een onmisbare eigenschap als huisarts. Daarnaast moeten we aandacht hebben voor het netwerk van onze patiënten. We kunnen uitpluizen of zij hiermee tevreden zijn en waar nodig patiënten stimuleren om actief te blijven deelnemen aan het leven (vb. vrijwilligerswerk, hobby's, ouderenverenigingen, dagcentra, …). Zo kunnen ze hun netwerk uitbreiden, nieuwe

connecties opbouwen of bestaande relaties versterken. Kortom, een holistische benadering van onze patiënten en hun omgeving moet een kernwaarde van ons beroep blijven.

Daarnaast, besefte ik doorheen mijn opleiding dat wij naast onze rol als medisch deskundige veelal ook de rol van coach opnemen voor onze patiënten. Hun hulpvraag en verwachtingen bepalen immers voor een groot deel hoe we als arts kunnen helpen. Maar hoe coach je iemand? En wat is onze rol in de begeleiding van psychosociale problemen en negatieve affecten zoals eenzaamheid en depressie, naast onder andere psycho-educatie en monitoring van fysieke klachten? Ondanks dat hierover regelmatig keuzeonderwijs wordt aangeboden, vind ik dat dit meer in het vaste curriculum mag worden opgenomen.

Tot slot, wil ik graag Roya bedanken. In de eerste plaats om zo een goede vriendin te zijn. Maar ook omdat ik me geen betere teamgenoot had kunnen inbeelden om deze thesis tot een goed einde te brengen. Ik had steeds het gevoel dat wij elkaar zeer goed aanvulden in ons werk aan deze thesis. Onze gesprekken leidden vaak tot nieuwe ideeën en inzichten bij elkaar waardoor we niet stil vielen tijdens de dataverwerking en het schrijfproces. Roya was voor mij het ideale klankbord en hielp me om structuur te houden in dit brede onderwerp. Bovendien vind ik dat we erin geslaagd zijn om het werk evenredig te verdelen. Ondanks deze verdeling vind ik dat we steeds onze thesis als een geheel hebben beschouwd. We zijn blijvend betrokken geweest bij elkaars 'deeltjes' zodat we beiden volledig achter dit werk staan. Er zijn naar mijn mening ook nooit frustraties geweest ten opzichte van elkaar omdat we steeds snel en open communiceerden met elkaar. Het gevoel dat je er niet alleen voor staat, en het feit dat we samen af en toe ook eens goed konden zuchten over de thesis werkte voor mij dan ook heel motiverend.

## 10.2 Persoonlijke reflectie: Roya Zolfaghari

Gezien de opleiding tot huisartsgeneeskunde een master-na-masteropleiding is, is het schrijven en verdedigen van een thesis één van de vereisten tot het behalen van ons diploma. Dit hele gebeuren was iets dat ik in de bachelor- en masterjaren als zeer pijnlijk ervaarde. Het feit dat ik het geluk had om te kunnen samenwerken met Marjan, een mede-HAIO én zeer goede vriendin, maakte dit proces veel aangenamer. Bovendien verliep het proces vlotter gezien we als duo nooit vastzaten. Kwam er iemand toch vast te zitten bij het opzoeken, analyseren of schrijven, werd die makkelijker op weg geholpen door frisse inzichten van de andere. Het fijne aan zulk samenwerking is dat we ideeën met elkaar konden uitwisselen en elkaar konden aanvullen. Ook begrepen we elkaars frustraties en deelden we elkaars geluk als we vooruitgang boekten. Naarmate het einde in zicht kwam, werd het ook belangrijker om gemotiveerd te blijven. Gelukkig konden we op elkaar rekenen en elkaar motiveren. Deze thesis is het resultaat van een mooie samenwerking waar op voorhand een taakverdeling werd afgesproken, maar waar nodig elkaar geholpen hebben. Marjan, bedankt voor deze fijne samenwerking. Ik kon mij geen beter thesismaatje wensen.

We kozen voor het onderwerp 'Eenzaamheid bij ouderen' gezien we als huisarts in opleiding reeds vele malen in aanraking zijn gekomen met ouderen die zich eenzaam voelen. Tijdens mijn eerste twee maanden als HAIO liet een thuiswonende oudere mij tijdens een huisbezoek voor een medische reden indirect weten dat ze zich eenzaam voelde. Omdat ik wist dat haar familie wekelijks over de vloer kwam, had ik verkeerdelijk aangenomen dat ze niet eenzaam zou kunnen zijn en kwam dit aan als een verrassing. Ik ben er toen ook niet dieper op kunnen ingaan gezien ik niet wist hoe ik haar hiermee kon helpen. Volgens de wetenschappelijke literatuur bleek dat het medische en verzorgende personeel ook geneigd waren om het onderwerp te vermijden. Bovendien dachten zorgverleners verkeerdelijk dat de patiënt zich al dan niet eenzaam voelde.

Ondanks dat dit onderwerp minder medisch gericht was, vonden we dit goed passen binnen onze visie over de huisartsgeneeskunde. Het mooie aan huisartsgeneeskunde is dat men de patiënt bekijkt in al zijn of haar facetten. Als huisarts kijkt men naar de medische en psychologische aspecten van een persoon binnen hun socio-economische leefwereld.

Omdat we geen onderwerp uit de lijst hadden gekozen, moesten we op zoek gaan naar een promotor die thuis was in het onderwerp. Na een aantal mogelijke promotoren te hebben aangeschreven, werden we verwezen naar Prof. Dr. Emily Verté. Initieel wilden we het onszelf onbedoeld moeilijker maken door kwalitatief onderzoek uit te voeren bij (overbevraagde) zorgverleners, thuiswonende ouderen en ouderen woonachtig in het woonzorgcentrum door middel van interviews. Dit allemaal midden in een pandemie. Maar zoals Prof. Dr. Jan Vandevoorde altijd zei: pluk het laaghangend fruit. Best bouwt men voort op wat er al bestaat zonder bepaalde stappen over te slaan. Onze promotoren, Prof. Dr. Emily Verté en Dr. Julie Vandevenne, hebben ons mooi begeleid bij het formuleren van een aantal goed afgebakende en haalbare onderzoeksvragen.

Eén van onze onderzoeksvragen was een profielschets van de eenzame thuiswonende ouderenpopulatie in Vlaanderen. Een opvallende bevinding was dat op vlak van leeftijd, geslacht, huishoudinkomen en burgerlijke staat onze studiepopulatie redelijk overeenkwamen met de cijfers gepubliceerd door Sciensano omtrent de Vlaamse ouderenpopulatie. Op vlak van woonsituatie bleek onze studiepopulatie een lagere prevalentie van alleenwonende te vertonen. Dit was iets dat we eerlijk gezegd niet verwacht hadden.

Een andere opvallende bevinding was dat weduwenaren of alleenwonende eerder emotioneel eenzaam bleken te zijn, wat ook werd bevestigd door de literatuur. Voorafgaand aan ons onderzoek dacht ik dat een mens voornamelijk sociaal eenzaam zou zijn na het verlies van een partner of goede vriend, terwijl dat bij zulke levensgebeurtenissen de kwaliteit van de relatie de doorslag geeft waardoor men zich eerder emotioneel eenzaam zal voelen.

Vertaald naar het werkveld toe betekent dit dat wij als zorgverleners eerst en vooral geen aannames mogen maken omtrent eenzaamheid en een brede kijk moeten behouden. Ten tweede moeten we het gesprek durven aangaan met de patiënten. Er heerst immers nog een taboe rond eenzaamheid, terwijl patiënten eigenlijk verwachten dat we het onderwerp bespreekbaar maken en er aandacht voor hebben. Als zorgverleners zitten we tenslotte in een interessante positie om te polsen naar eenzaamheid. Ten derde kunnen we bij bepaalde sleutelmomenten in iemands leven (overlijden partner of dierbaren, verhuis, ect.) de mensen stimuleren om bijvoorbeeld bestaande contacten uit te diepen om de weerslag op emotionele eenzaamheid te beperken. We kunnen ze ook verwijzen naar bestaande instanties zoals lokale dienstencentra, OKRA, ect. om nieuwe contacten aan te gaan indien gewenst.

Uiteindelijk is het belangrijk om stil te staan bij het feit dat ondanks dat eenzaamheid een weerslag heeft op de mentale en fysieke gezondheid, het niet louter beholpen kan worden door het medisch of zorgpersoneel. Eenzaamheid wordt best op maatschappelijk niveau aangepakt. Het vergt een multifactoriële aanpak, op maat van de noden van de individu en vraagt om een samenwerking tussen verschillende actoren.

## 10.3. Approved protocol

Universitair Ziekenhuis Brussel

Clinical Trial Center

# Study Protocol

**Study Title**: Loneliness within the homebound elderly population in Flanders - a quantitative study to identify potential shortcomings/gaps in primary healthcare provision.

**Study Acronym:** HAIOMVR&RZ
**Phase of Development:** /
**Protocol Number:** 1
**Protocol Version and Date:** version 2, 16/03/2022
**EudraCT Registry Number:** /
**ClinicTrials.gov Registry Number:** /
**Indication: /**
**Investigational product**: /
**Coordinating and principal Investigator:** Prof. Emily Verté

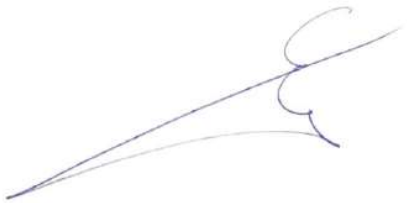
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**PROTOCOL SIGNATURE PAGE**

**Protocol Version and date:** version 2, 16/03/2022
**Protocol Title:** Role of the general practitioner concerning loneliness in homebound elderly, a quantitative study
**Project Number:** HAIOMVR&RZ
**Sponsor: /**
**Principal Investigator:** Prof. Emily Verté

I agree:
- to assume responsibility for the proper conduct of this study
- to conduct the study in compliance with this protocol and any future amendments
- not to implement any deviations from or changes to the protocol without prior review and written approval from the Ethics Committee, except where necessary to eliminate an immediate hazard to the subjects, or for administrative aspects of the study (where permitted by all applicable regulatory requirements)
- that I am thoroughly familiar with the appropriate use of the investigational drug, as described in this protocol
- to ensure that all persons assisting me with the study are adequately informed about the investigational drug and their study-related duties and functions as described in the protocol
- that I am aware of and will comply with the current good clinical practice (GCP) guidelines and ethical principles outlined in the Declaration of Helsinki
- to conduct the study in accordance with all applicable laws and regulations

Printed name Signature Date



Emily Verté 6/4/2022

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## Trial Registration/Protocol Summary

| **Information** | |
|---|---|
| Official Title: | Loneliness within the homebound elderly population in Flanders - a quantitative study to identify potential shortcomings/gaps in primary healthcare provision. |
| Study Type: | Retrospective observational study |
| Objectives: | To identify the socio-demographic profile of a lonely, homebound, elderly person. We will investigate to what extend they rely on their general practitioners (and other health care providers) and their satisfaction with this assistance. By doing so we try to identify shortcomings of the current policy of general practitioners regarding loneliness amongst the elderly. |
| Investigational Product: | Not applicable |
| Interventions: | Not applicable |
| Endpoints: | Not applicable |
| Study population: | Elderly living at home in Flanders |

| | |
|---|---|
| Number of patients: | >80 000 |
| Overview of study design: | Data from a pre-existing dataset will be analysed. This dataset was made for the Belgian Ageing Studies project and is based upon a standardized questionnaire required from the homebound elderly population in Flanders and the Netherlands. From this dataset we will select those elderly who define as lonely according to the De Jong-Gierveld definition. |
| Statistical Considerations: | All data will be analysed with SPSS Statistics. Appropriate tests will be used. Additionally, multiple regression analysis will be applied. |
| Country(ies) of Recruitment: | Belgium |
| Inclusion Criteria: | Elderly aged above 65 years old, defined as lonely according to the De Jong-Gierveld definition/scale, and living at home or in a service flat. |
| Exclusion Criteria: | Residents in The Netherlands. Elderly living in health care facilities (such as nursing homes), with family or in group homes. |
| Date of first enrolment: | Data will be analyzed from August 2004 until December 2020. |

## Protocol Version History

| Version No. | Approval Date Lead EC | Release Date |
|---|---|---|
| **1** | **Not applicable** | **21/01/2022** |
| **2** | | |
| | | |

## Investigators

Emily Verté, Prof. dr. in primary and integrated community care, coordinating and principal investigator
Julie Vandevenne, MD and assisting academic staff, Family medicine and chronic care, co-investigator
Nico De Witte, Prof. dr. in Educational Sciences and Gerontology, principal investigator in Belgian Aging Studies, co-investigator
Marjan Van Reckem, family medicine resident, submitter and co-investigator
Roya Zolfaghari, family medicine resident, submitter and co-investigator
Study sites and co-investigators: VUB

## Introduction

*Study Rationale and Purpose*

Everyone feels lonely from time to time. More so, a national survey performed in 2018 reported that an astonishing number of Belgians, namely 46%, felt lonely (1). Unfortunately, feeling lonely can have adverse consequences. For instance, studies have shown it has an impact on physical health, such as an increased risk of hypertension and cardiovascular disease (2–4). Additionally, loneliness has been shown to influence mental health as well, since an increased risk of dementia and depression have been described in literature (5,6).

Due to the current corona crisis, loneliness became even more hot topic, especially in elderly care. As family medicine residents we noticed this in our day-to-day practice and wondered what our role as general practitioners is in relation to this issue. Unfortunately, no primary care guidelines on the topic exist and the literature on the subject is limited. Some qualitative studies have indicated that general practitioners have little knowledge on the subject (7–9). In addition, these studies have shown that general practitioners also do not know when or how to discuss the topic with their patients, partly due to a prevailing taboo. Moreover, they are uncertain about how to help/treat a patient who is lonely.

It is clear that loneliness is a matter of public health and more research investigating the problem, and the role of primary care in handling it, is necessary

## Study Objectives

The aim of this study is to describe the sociodemographic profile of the lonely elderly living at home in Flanders. We will try to answer the following research questions:

1. To what extend do lonely, homebound elderly in Flanders rely on their general practitioner and are they content with their help?
2. To what extent do lonely, homebound elderly in Flanders rely on other healthcare professionals and informal care, and are they content with this help?
3. For both questions we will investigate if there is a difference between elderly with social loneliness and elderly with the emotional loneliness counterpart.

By doing so, we try to identify the shortcomings in the current approach/policy (or maybe even lack of policy) of primary care regarding loneliness amongst the elderly living at home in Flanders.

## Study Design

Retrospective observational study.

## Subjects

Subjects will be selected from a pre-existing database obtained by researchers of the Belgian Aging Studies.

*Inclusion Criteria*

All people with age > 65 years residing in Flanders with a score of ≥ 2 on the shortened 6-item loneliness scale of De Jong-Gierveld will be included in the study. These elderly must live at home or in a service flat.

*Exclusion Criteria*

Elderly living in health care facilities (such as nursing homes), with family or in group homes.

## Data Collection and Management

*Data Collection*
Data will be collected from a pre-existing database obtained by researchers of the Belgian Ageing Studies. This dataset is based on a standardized questionnaire filled in by elderly people living at home, including assisted living facilities and intergenerational living complexes. The questionnaire was designed by the Belgian Ageing Studies project, a collaboration between the VUB and Hogeschool Gent. This was done before the corona crisis.

Data from August 2004 until December 2020 will be collected and analyzed. We will only include questions regarding sociodemographic characteristics (including living conditions and mobility), screening tools for loneliness depression and cognitive difficulties, questions on a person's general health (for example visual or hearing difficulties, dental hygienics, polypharmacy, weight loss and recent falls), a person's need for help, the use of health care assistance (such as the general practitioner amongst others) and the satisfaction with this assistance. This includes the following questions: 1-8, 11, 13, 15, 17-18, 21, 23, 25-32, 34, 36-39, 43, 45-46, 48, 75-76 and 78-79 of the BAS questionnaire.

*Database Management and Quality Control*
All data will be handled in a GDPR conform manner. The database will be stored in a secured file on the sharepoint of the department of Family Medicine from the Faculty Farmacy of Medicine of the Vrije Universiteit Brussel (VUB). The data will be saved for a period of 3 years (2021-2023) after which it will be deleted.

*Statistical Considerations and Data Analysis*
The outcome parameters will be analysed by Marjan Van Reckem and Roya Zolfaghari, both master students, with help of Prof. Emily Verté and Dr. Julie Vandevenne and Prof. Nico De Witte.
All data will be analysed with SPSS Statistics. Appropriate tests will be used. Additionally, multiple regression analysis will be applied.

## Ethical Considerations

Ethical conduct of the study
*Declaration of Helsinki*
The researchers declare to follow the rules of Good Clinical Practice.

*Ethics Committee*
The study will be presented to the Ethics Committee of the Vrije Universiteit Brussel (VUB) and the University Hospital of Brussels (UZ Brussel) for approval.

Informed Consent
There is no informed consent. However, there is an implied consent, with an information letter announcing the study. Participation is voluntary.

Patient and Study Data Protection
We will work in a GDPR compliant manner.

Subject Identification
Individual data will be anonymized.

Conflict of Interest
The researchers do not declare a conflict of interest

## References

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## 10.4. Approval of the ethical committee

Universitair Ziekenhuis Brussel

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EMILY VERTÉ
VAKGROEP HUISARTSENGENEESKUNDE

Brussels, 2022-04-13

EC number: EC-2021-417

**MEDICAL ETHICS COMMITTEE – OPINION**

Concerning :
Loneliness within the homebound elderly population in Flanders – what is the role of the general practitioner?
**BUN: 1432021000692**

The Medical Ethics Committee of UZ Brussel/VUB reviewed the documents (see annex EC document list) concerning the above mentioned project from the ethical, legal and medical science points of view.

The Ethics Committee decided, during its meeting on 2022-04-13, that there are no objections to the study in its present form.

Please remark that the Green Light Procedure has to be completed before the study can be performed at UZ Brussel.

**This approval is valid for the duration of the trial.** The Committee wishes to obtain an annual trial status. Results of the trial should be transmitted to the Committee at the end of the trial (publication or summary if there is no publication planned). The Committee reminds the investigator of his/her personal responsibility for this project. The Committee does not take any responsibility for its favourable advice of the project. The Ethics Committee is organised and operates according to ICH-GCP and its applicable laws and regulations. The list of members is enclosed.

Kind regards,

Chairman
Vice-Chairman