

## Geographies of Ageing in Flanders (Belgium)

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### 1 ABSTRACT

In line with other regions and countries in Europe, Flanders (Belgium) is characterized by an ageing population. The share of population older than 65 will increase from approximately 20 percent in 2018 towards 25 percent in 2030. Of course, this goes together with several challenges, not only related to the sustainability of the healthcare and retirement system, but also in terms of housing, mobility and planning. Although ageing-in-place is stimulated from a policy perspective, there is very limited insight into which neighbourhood characteristics stimulate or limit the possibility to get older at home and if family networks are capable of taking up a bigger role in informal care. Although several indicators point to less potential informal caregivers in the future, a geographical perspective on informal care and the importance of distance in informal care provision are largely lacking. For tackling this a clear view on patterns of ageing can be seen as a precondition. Therefore this paper sheds more light on the relation between ageing-in-place and informal care, both from a theoretical as from a policy perspective. Furthermore it tries to set the scene in terms of geographies of ageing in Flanders on which future research can build. In this way more insight can be gathered in the tensions mentioned above and in factors that can potentially contribute to age-friendly care environments, as well as more insight in neighbourhoods that are suitable for ageing-in-place. In other words, this paper tries to disentangle geographies of aging by following a multiple-scale approach making use of national population databases (2002 – 2017). It looks into patterns of ageing on different spatial scales (ranging from NUTS 2 to statistical districts). The results clearly indicate that there is not a single ‘wave’ of ageing characterising every locality in the same way. Although regional differences are relatively easy to interpret and straightforward, on a lower level patterns become more complex and less clear. A cluster analysis re-arranges the data in an attempt to get better insight in different ageing profiles on the level of municipalities and statistical districts.

Keywords: Distance, Informal care, Ageing, Flanders, Belgium

### 2 INTRODUCTION

Although ageing is slowly gaining attention in the fields of geography and urban planning, it is still an under researched and underdeveloped theme. In general there is a lack of insight in the conditions of neighbourhoods or homes that support or limit the possibility to get older at home. The negligence of elderly is not limited to geography and urban planning. There is a need for more trans- or multidisciplinary research when it comes to ageing-in-place (Woolrych & Sixsmith, 2017). Our research is part of a four-year research project in which we try to disentangle the concept of ageing in place and try to enhance our knowledge about this concept from a perspective of geography, architecture and social sciences. The emphasis in the geographical part of the research is focusing on “environment”, “distance” and “sustainability”. Environment relates in this study to age-friendly neighbourhoods and the presence or lack of facilities and care networks. Sustainability is not only considered from an urban planning perspective, but also from a more social perspective, namely in terms of inclusive space, whereby for example gender relations in care are considered as well. Distance is thereby seen as a relative concept with both a physical and a social component. More specifically, from a geographical perspective, this research project wants to develop a better understanding of the geographical setting when it comes to aging and care relations. In terms of physical distance it aims at getting more insight in distances between older people and adult children as well as patterns of co-residence and how these shift over time (including moving patterns). When it comes to the emotional or social distance, family solidarity and informal networks, as well as characteristics of the living-environment are at stake. In all of the abovementioned aims and goals there will be a specific focus on informal care, due to an increasing importance appointed to this from a policy perspective.

This specific paper aims at presenting a framework for other research(ers) to build upon, by providing more insight in geographies of aging based on general population statistics. Although this sounds like a

straightforward proces, until now there is very limited insight and the ageing of the population is often assumed to be more or less evenly spread (with the exception of differences between rural and urban areas). Section 3 focuses on ageing-in-place from a theoretical and general viewpoint, while section 4 looks into ageing-in-place from a policy perspective in Flanders. In section 4 the methodology will be explained in more detail as well as the data used. Section 5 will present the results followed by some reflection as well as desirable next steps in the last section.

### 3 AGEING-IN-PLACE

#### 3.1 Ageing-in-place: preference or imposed from above?

Ageing-in-place or getting older at home is not something new, although it gets more attention in policy making since the 1990s (Skinner et al., 2015; Wiles et al., 2012; Andrews et al., 2007). Several reasons can be distinguished. Although it is often seen as a way for the government to stabilize or even decrease the expenses towards the health sector, it is in line with the wish of most elderly people (Wiles et al., 2012; Milligan, 2009; Ahn & Goss, 2006). Although motivated by cost savings the results are at least ambiguous (Huduser, 2013; Graybill et al., 2014). In the American context the so-called ‘woodwork effect’ is often mentioned (Doty, 2000). This means that people who are not eligible for institutional care will make use of community-based home care, offsetting initial planned cost savings (Weissert & Frederick, 2012), although others do not find such an effect (Berish et al., 2018). Furthermore ageing-in-place can lead to higher costs when needs are not detected in time and certain treatments would have been preventable in an earlier stage (e.g. Horner & Boldy, 2008).

In the European context, the Netherlands provides an example where the long-term (elderly) care system was reformed and became more decentralized and thus largely a responsibility of local municipalities. Institutional care homes saw their roles being changed and were largely closed (Verbeek-Oudijk & Campen, 2017). This is partly a consequence of a decline in the amount of people staying in care homes due to the preference of ageing-in-place (Alders & Schut, 2019), and partly as a consequence of the reforms focused on increasing the financial sustainability of the care system (Maarse & Jeurissen, 2016). However, Alders & Schut (2019b) point to a probable mismatch between supply and demand for institutional care, in the Netherlands as well as in other OECD countries. They stress that although ageing-in-place initially lowers the demand in institutional (residential) care, there will be a bounce back in the demand, especially when it comes to higher-need institutional care. In other words, while there is (currently) an oversupply in low-need institutional care, there will be a (further) lack of supply when it comes to more higher-need care (ibid.).

In practice, this is confirmed by several recent statements of the Association of Dutch Municipalities who are worried about increasing costs for elderly care not only due to a need for expensive facilities for home care (VNG, 2019; 2019b), but also due to a large gap between ageing-in-place and institutional care (VNG, 2020). The commission ‘Future Care- Independent living at home’ published a report ‘Old and Independent in 2030’ in which this gap is also mentioned combined with an advise to re-consider and revalue collective and semi-collective living arrangement for older people (Dutch Government, 2020). It stresses that independent living should not (always) be understood as ‘living longer at home’. This is in line with several researchers who point towards a too narrow or ambiguous definition of ageing-in-place (Martens, 2018). Fret et al. (2018) stress that ageing-in-place in Belgium is not necessarily affordable for everyone and that especially older women, older tenants on the private market and bigger households are at risk. This is confirmed by other researchers (Ewen et al., 2017; Kendig et al., 2010), who also stress that both, in general and for specific groups, care needs are not always easily detectable combined with ageing-in-place (De Witte et al., 2010; Pijpers, 2019).

Even as there are some (very small) recent shifts and developments ageing-in-place is still the main policy mantra in most OECD countries. The foregoing indicates that ageing-in-place is not always the best option – either due to financial troubles or due to a specific care need- but that other options or choices are not always available. Nevertheless, it should be prevented that people are forced to age-in-place and that it becomes too much of a normative framework in which moving to institutional residential care is seen as a failure of both the person itself and policy (e.g. Vasara, 2015). As active ageing is not possible or desirable for everyone (e.g. Golant, 2011; Holstein & Minkler, 2003) the same can be said regarding ageing in place. We should not forget that a home that is not adjusted to older age, can limit the competence and autonomy of elderly people

(Golant, 2011) while an unsafe and non-supporting neighbourhood limits the quality of ageing-in-place (Lee et al., 2017). From this perspective we should ask ourselves if we should stimulate a moving in time framework instead of ageing-in-place (Golant, 2015; De Decker et al., 2018). Therefore, there is a need to look in more detail into the consequences of ageing-in-place and changes in geographies of care and ageing as well as the impact of the neighbourhood and home.

### 3.2 Ageing-in-place: shifting geographies of (informal) care

It is already stressed implicitly that ageing-in-place is related to changes in care relations, but also with shifts in the localities in which care is provided. Milligan (2009) points to the impact of extramuralisation and the institutionalisation of the home. Ageing-in-place is often combined with more attention and pressure on informal care whereby care is often seen as a shared responsibility. Fret et al. (2018) speak in this respect about the ‘socialisation of care’, which fits into the broader trend of rolling back or reconfiguring the welfare state. In Flanders this is presented as the so-called ‘re-communitizing’ of care (e.g. Flemish Government, 2016;2016b). Furthermore, the emphasis on informal care is often combined with a decentralisation or re-scaling of governmental care responsibilities (with or without transfer of financial responsibilities) towards regional or local governments. The example of the Netherlands was already mentioned, but also in Japan there is a trend towards community-based integrated care and a decentralisation of responsibilities to make ageing well in place possible (Morikawa, 2014; UNESCAP, 2015). In this ‘Community-based Integrated Care system’ informal care (of the family and broader society) has an important role to play which is reflected in the core components of the system: self-help (Ji-Jo), mutual aid (Go-Jo), social solidarity care (Kyo-jo) and governmental care (Ko-Jo) (Sudo et al., 2018). Of course one can imagine several consequences, some of them being regional (spatial) differences in care provision and resilience or the care capacity of an community. It is clear that a more decentralised implementation of care leaves room to take the local context better into account and consequently deliver better (integrated) care. The Japanese system can be traced back to a specific rural village, which was characterised by a higher share of older population compared to adjacent regions. It was able to develop and implement a new community-based integrated system which led to less bedridden elderly and lower costs and which was later seen as an example throughout reforms in Japan as a whole (Hatano et al., 2017). On the other hand, it can lead to (even stronger) regional and spatial differences in terms of care provision and supply and discrepancies in (un)met care needs of several groups. Traditionally, several researchers point to differences in acces to health care between urban and rural areas. Dewulf et al. (2013) found through a spatial analysis that mainly rural and suburban areas (in Belgium) are characterized by a shortage of physicians, while the same can be true when it comes to home care provisions (e.g. Mitchell et al., 2006; Allan & Cloutier-Fisher, 2006; Van Noort et al., 2018). At the same time it should be noticed that most research on formal care does not take into account informal care (e.g. Allan & Cloutier-Fisher, 2006). Although some researchers point to the more close-knit network in rural areas, others indicate the higher availability of services in urban areas (e.g. Vanhoof et al., 2018). Therefore, it is difficult to decide which neighbourhood might be the best to age-in-place (Chaudbury et al., 2012). Insights in geographies of aging and movement patterns between parents and children can help to gain more insight in these complexities.

#### 3.2.1 (In)formal care and distance

Although the emphasis on informal care is not completely new – around 58% of care in Europe is informal (Verbeek-Oudijk et al., 2014)- the context changed considerably. We can refer to globalization and related aspects such as increased mobilities, different perceptions of distance, changes in neighborhood compositions, changing family arrangements and individualisation. This can have impact on the identification with a specific place and thus challenge the concept of ageing-in-place, but also on the social network and the possibility to receive informal care (Thómese et al., 2018; Buffel et al., 2018). Some insights can be gained from a broader European perspective, although results are often ambiguous and loaded with uncertainties. Hank (2007) emphasize that 85 percent of all people aged 50+ in Europe have at least one child living within 25 kilometres. Nevertheless, Knijn and Liefbroer (2006) mention that distances below or above 5 kilometres can make a big difference when it comes to exchange of care and support (in the Netherlands). Although there are some indications that a need for care and/or support leads to smaller distances, this is often not in function of the older generation (Michielin & Mulder, 2007). Van Diepen & Mulder (2009) and Mulder & Kalmijn (2016) confirm this, pointing out that distance between parents and

children is mainly influenced by the presence of grandchildren. Van der Pers & Mulder (2013) show regional differences (in the Netherlands) when it comes to intergenerational proximity, which can be explained by the level of urbanisation and the regional culture. Nevertheless, they stress that, in general, the distance between adult children and parents increases with age. Furthermore an effect is found related to urbanisation: while parents have a bigger chance to live close to their children when they live in an urban area, for adult children the chance to live closer to parents is bigger while living in a more rural areas (ibid.).

When discussing the relation between distance and informal care, we should not forget the gender dimension. Blaauboer et al. (2011) found that married couples live closer to the parents of the man, due to a greater importance of the socio-economic position of the man when it comes to locational decisions, which is in line with the male dominance in migration in general. However, when there are young children the distance to the woman's parents is decreasing while the distance to the man's parents remains stable (ibid.). Van der Pers & Mulder (2013) also stress that sons live closer to parents than daughters, although this is less explicit when parents are older. Considering that women in general fulfill more care tasks than men, the results are at least partly surprising and ask for more insight in the relation between informal care and distance. At the same time we should not forget that distances, gender roles and informal care are concepts that can be interpreted in different ways. In some families specific tasks are appointed to women while, in other families, the same tasks are considered as typical for men (e.g. Potting, 2001). The same is true for distance, for some 5 kilometers is already considered a hindrance to provide care, while others are happy to travel 50 kilometres multiple times a week (ibid.). For example, in Flanders there are indications that people with a migration background have a higher tendency for multigenerational living and another interpretation of distance (Draulans & De Tavernier, 2016). In addition it can be mentioned that there is often a too big focus on the primary informal carer, while informal care is often a shared responsibility. This can not only result in an overestimation of the care load of the primary carer, but also in an underestimation of the tasks of others, and men in particular (Potting, 2001), without denying the potential for conflict when care tasks are shared (e.g. Luyten & Emmery, 2016). A lot of people do simply not consider themselves as informal carers, while they actually are (Vandeurzen, 2016b).

Except for the importance of distance, it can be mentioned that the link between formal and informal care (in combination with distance) is not always clear. Verbeek-Oudijk et al. (2014) stress for example that while there are indications that in the Netherlands formal and informal care seems to be complementary, in Germany it seems more justified to consider them as substitutes. Bremer et al. (2017) also found a substitution effect (across Europe), whereby more informal care is connected to a lower demand for formal care services at home among people with dementia. Brandt et al. (2009) find not such an effect and speak about a specialization whereby the state takes care of physical care and children help parents with other less intensive tasks. Although Hank (2007) finds differences across European countries when it comes to familial solidarity, there are no indications that solidarity is declining throughout generations. However, the Dutch case warns us that even though informal care and solidarity may not decline, it does not mean it will automatically fill the gap left behind by a policy that emphasize informal care (Kromhout et al., 2018).

### 3.3 Ageing-in-place from a health policy perspective in Flanders

Although the focus in this section is on the specific health care policy targeted at the elderly, it should be stressed that the social policy in Flanders, in general, is putting more emphasis on informal care (e.g. Dermaut et al., 2019 – related to care for disabled people) and thereby following the earlier mentioned international trend of reconfiguration of the welfare state. From this perspective, the policy in Flanders can therefore not be seen in isolation from the World Health Organization (WHO) policy and initiatives on the level of the European union. It should be stressed that (elderly) care in Belgium is to a large extent a responsibility of the regions (Walloon region, Flemish region, Brussels Capital region) and that therefore the focus in this section is on Flanders (northern Dutch speaking part). In the Flemish governmental policy agreement it is explicitly mentioned that one tries to stimulate to 'live as long at home or in the neighbourhood'. This is also reflected in the other policy papers, in which it is furthermore stressed that one tries to strengthen the social tissue and cooperation between citizens and (in)formal caregivers (Vandeurzen, 2014). At the same time it is acknowledged that the demand for care will increase due to shrinkages in the social network, which seems to be in contrast with the foregoing. Except for the general health and care policy we can point to a policy paper which specifically focuses on the welfare and care policy for elderly,

and which can be seen as the framework for (future) policy. According to this document the main goal is: “To realize a demand-driven and person-centred care for elderly. Thereby, they are supported by an individual care budget [...]” (Flemish Government 2016b:4, translated from Dutch). Furthermore, the vision consists of several core concepts or principles which are considered as starting points for further (local) policy making. Most of them have a strong link with ageing-in-place. It emphasizes the own competences and capabilities of elderly, while it acknowledges a role for the family, community and the government. This comes together in the principle of “vermaatschappelijking” (re-communitizing) in which it is stressed that when someone needs care, this must be provided in the own environment (neighbourhood) and by the ‘own environment’, being the family, friends and the broader local community.

As a conceptual framework the Flemish policy uses the framework as proposed by the WHO (2015) (figure 1). This framework consist of several concentric circles in which the previously mentioned principles are used. It illustrates that the person with a care need can be seen as a focus, whereby care needs are a shared responsibility between the family, the community and the government, which cannot be separated from each other and are embedded in a specific context. This context has to provide a universally accessible, person-centred and integrated care and support system. Of course this implies a holistic view on ageing, whereby it is also necessary to take into account the living environment and stress interdisciplinary cooperation. It is therefore not surprising that these aspects are reflected by the 15 objectives (or so-called) perspectives which are described in the Flemish policy paper.

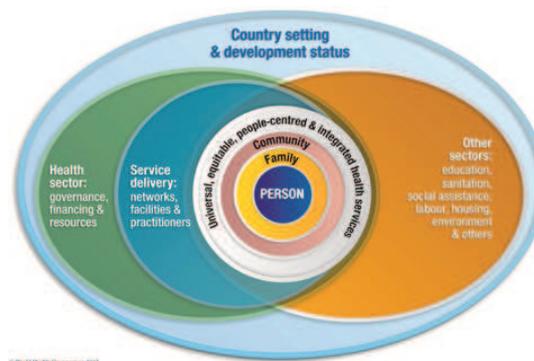


Figure 1 Conceptual framemework person-centred and integrated care and support (WHO, 2015: 13)

Besides the fact that the objectives remain very abstract, most of them relate to the activation or stimulation of social participation, self-development and ageing in the own environment. Although it is mentioned that both, the house as the neighbourhood, need to be suitable and adjusted, very little attention is paid to this. Nevertheless, several other policy documents look into this in (slightly) more detail. First of all it is useful to consider the policy on residential elderly care, even when focusing on ageing-in-place. It should be stressed that only elderly with the highest care needs are admitted to residential care settings, which means that on average more care and expertise is needed to fulfill the needs of the inhabitants, compared to a situation in which also elderly with a lower care profile are admitted to these facilities. Nevertheless, the residential care facilities are evolving into a kind of local care hub in which expertise is also related to for example day care or respite care and functioning as an important link within the primary health care (Flemish Government, 2017). It is stressed that a residential care facility is and should be part of the society and is not to be considered as something closed. In line with this, residential care facilities are an important link between the different kind of housing and care options. The activation and strengthening of the social network(s) is consequently seen as an important role for these facilities as well. They should contribute towards the liveability and social cohesion in the neighbourhood and thus contribute to a neighbourhood-centred approach on housing and care with the end goal of creating “lively and careful neighbourhoods” (ibid.).

The Flemish Government (2017b) listed some transition priorities in their ‘vision 2050’ one of them being ‘care and living together’. In this, the two concepts of ‘social cohesion’ and ‘vermaatschappelijking’ are at the core. The latter is defined as: “the shift in the care sector which aims to give people with disabilities, the chronically ill, and frail elderly their own position in the society, and support them and deliver the care as integrated as much in the society” (Flemish Government, 2017b:3). Thereby it is mentioned that (specialized) institutional care should be the exception and that self-care, family care and informal care will receive priority. Although it is mentioned that this priority should be considered as interdisciplinary and thus

beyond the departments of welfare, health, culture and sport, the link or referencing towards other disciplines and departments seems to be rather limited. The importance of ‘health in all policies’ is stressed but no explicit link with urban planning or housing and attention to age-friendly environments is lacking. Even the policy paper which is explicitly focused on neighbourhoods: “Caring Neighbourhoods” (Vandeurzen, 2018) remains abstract and vague and does not mention explicit measures or goals. It rather tries to spark a discussion on the role of the neighbourhood and which factors can contribute to the so-called caring neighbourhoods.

As became clear from the foregoing, the focus on informal and family care is increasing. ‘Shared responsibility’ and ‘re-communitizing’ can be seen as the keywords. But as mentioned before, this cannot simply be an assumption and thus requires an extensive and well-balanced policy towards informal care. At the same time and as mentioned before, there is often a lack of information related to informal care, especially when it comes to distance. The most important policy document in this respect is the so-called ‘Flemish Family Care plan’ (Vlaams Mantelzorgplan – Vandeurzen, 2016b) in which the focus is explicitly on family care. Several broader demographic and social changes are mentioned influencing the demand and supply for informal family care. Thereby it is mentioned that distances are getting bigger, although this is a mere assumption not supported by data. Most data about family carers is based on the so-called ‘social-cultural shifting’ surveys (2014, in Vandeurzen, 2016b) and on numbers of officially registered family carers, as well as the ‘health survey’ (2013, in Vandeurzen, 2016b). The latter for example concludes that 8 percent of people (15+) provide informal care at least once a week. Based on the SCV-surveys and registered family carers it becomes clear that most informal family carers are between 45 and 64 years old, although the share of older people providing care should not be underestimated. In general, there are more female informal carers, which is especially true when it comes to persons with heavy care needs. Regarding the socio-economic position it is mentioned that informal family carers, in general, have a lower labour participation and educational level. Although most informal family carers fulfill care tasks in the own household or family, slightly less than one fifth of the care is provided to neighbours or friends. More than half of the informal family carers living in the same household are over 65, which implies providing care to a spouse. This is often done to prevent a move to a residential care facility, which is reflected in a stronger intensity in the informal care provided (Vermeulen & Declerq, 2011 in Vandeurzen 2016b). That there is a need for additional attention for informal carers is also illustrated by Bronselaer et al. (2016) who stress that the quality of life of informal family carers is lower than average. It is therefore not surprisingly that “supporting informal family carers to limit the burden and increase the capacity” is one of the main policy goals, as well as “acknowledging and recognizing informal family carers” and “improving the cooperation between formal and informal carers”. It is acknowledged that better information provision for informal carers is needed, as well as a pro-active stance to reach them. The stimulation of social cohesion and adjustments to home are mentioned as well, as is the focus on digital health and care. Furthermore it stresses that the informal carer should be seen as a fully acknowledged actor in the care system, which means that there is need for a better integration.

### 3.4 Ageing-in-place from a housing and spatial policy perspective in Flanders

Although, from a health perspective, it is acknowledged that there should be a more interdisciplinary approach towards aging, and the importance of housing is often briefly mentioned, we cannot speak about a real integrated policy perspective. The same can be said when we look in more detail into the housing and planning policy in Flanders. In general it can be mentioned that there is very little attention being paid to the elderly when it comes to housing. Although there is a strategic goal related to quality, sustainability and a tailor made housing offer, whereby there is a reference towards the extramuralisation of care and demographic change, no specific or tangible measures are mentioned (Homans, 2014). Not much is mentioned about adjustments of the housing stocks for older people or policy related to this. Also when it comes to communal living or other housing alternatives there is barely attention for the elderly. This is especially surprising since it is acknowledged that there is a discrepancy between supply and demand on the housing market. Most properties which are available on the market are larger suburban houses which are not suitable for most elderly. The aim is to come to a better balance on the housing market and at the same time stimulate housing mobility. Thereby, it is stressed that living in the same home during the complete life course is often not the best solution (Agentschap Wonen, 2018). Stimulating housing mobility is also something which is stressed in the policy paper “intelligent housing and living”. In this document 4 pillars

are distinguished: sustainable homes and environments, the right location, fulfilment of the needs and wishes, influencing and trying to shift the ideal picture of living (from a detached house with a garden towards more compact living arrangements). It is for example stressed that there is a need for more flexible, compact, and multi-functional arrangements, specifically at well-connected locations, whereby the link with spatial planning is mentioned. There are high expectations with regard to technological developments which are seen as a transversal innovation. Nevertheless, also when it comes to this policy paper there are no concrete measures or objectives. It aims at creating a platform where several policy domains can discuss future challenges and start some experiments (Agentschap Wonen, 2017).

When it comes to the spatial planning policy there is barely attention for the needs of the elderly. Belgium is characterised by a high level of urban sprawl and spatial fragmentation (ribbon development). This is especially true in Flanders with a population density of more than 450 inhabitants per square kilometre (Verbeek & Tempels, 2016). Flanders and Belgium in general are considered to have one of the highest levels of urban sprawl in Europe (EEA, 2016). Furthermore, the level of sprawl is still increasing, partly due to path dependency (EEA, 2016; De Decker, 2011). Verbeek et al. (2014) stress for example that the length of ribbon development increased considerably between 1989 and 2012. Poelmans & Engelen (2014) stress that the additional net land take per day is around 6 hectare. Nevertheless, and as mentioned in an earlier paper (Gruijthuijsen et al., 2018) the Flemish policy is focused on limiting additional land take by focusing on concentration, increasing the spatial yield, increasing densities and stimulate multifunctional and mixed land-use and interweaving of activities. In other words, it is aiming at a more sustainable management of land, whereby the aim is to avoid additional land take altogether in 2040 (Departement Ruimte Vlaanderen, 2018). Thereby it should be stressed that it is still only limited to a strategic vision, and no decrees were yet agreed on or adopted, which means no changes are visible at the moment.

And although the potential shift in spatial planning means there are possibilities to limit the sprawl and sustain or create more open space and benefit for example from shrinkage in certain localities (Segers et al., 2020), there are also potential conflicts between the spatial policy on the one hand and the health policy on the other hand, especially when one takes into account the needs and capabilities of elderly. A strong concentration of facilities in well-connected localities can result in a limited access to facilities for the elderly which not seldom live in suburban areas characterised by a strong sprawl. Cant (2019) for example shows that there are so-called 'food-desert' detectable in Flanders, in particular in suburban localities with an increasing share of older inhabitants. The same is probably true when it comes to formal care facilities, which makes it even more important to get insight in the relation between informal care and distance and if informal care can bridge spatial developments and compensate for a lack of facilities. Furthermore, it is conceivable that a lack of facilities not only limit the possibilities for formal care, but also complicates informal care provision and is therefore not always stimulating or facilitating ageing-in-place. There is need for strategic cooperation between different policy domains, and this requires more insight into geographies of ageing and care. This not only true when it comes to planning on the national, regional or provincial level, but also when it comes to the neighbourhood.

There is in general a lack of insight into the factors that can contribute to an age-friendly environment (e.g. Scharlach, 2017; Hwang, 2017). There are some initiatives in the right direction such as the WHO Age-Friendly Cities – which also list up several indicators, but no Belgian municipality is part of this initiative which also indicates a lack of attention at the local level. According to Scharlach (2017) these initiatives often neglect the more dynamic relation between the person and the environment. Furthermore, there is limited (academic) evidence for the effectiveness of these initiatives. Sun et al (2018) stress that even when it goes about the person-environment fit, this is often limited to housing and thus neglecting the neighbourhood. Greenfield et al. (2019) therefore bring the term 'community gerontology' to the forefront. They argue that much of the research is either focused on the macro-level (housing policy) or on the micro-level (house), while the meso-level is largely neglected. And this is true for the case of Flanders. There is very limited information about for example the relationship between neighbourhood or environmental characteristics and formal and informal care. Vandenboer et al. (2010) and Demaerschalck et al. (2012) can be mentioned as exceptions. They conclude that municipal characteristics have no influence on informal care. Contrary to the expectation, the offer of formal care is not influencing the use of informal care, although a higher use of formal care can be noticed. Besides, they conclude that the higher the ratio of the population older than 80 compared to the population of 50 – 59 years, the higher the chance to use formal

care. In other words, the less potential caregivers, the higher the usage of formal carers (Vandenboer et al., 2010; Demaerschalck et al., 2012). As will be illustrated later, this ratio is increasing, which means that it is likely that there will be an even bigger pressure on informal caregiving in conjunction with the current health policy. This also makes it more relevant to look into geographies of ageing.

#### 4 METHODOLOGY AND APPROACH

As mentioned in the introduction we used general population statistics to get more insight in geographies of aging (and care) and demographic developments. The focus is on ageing, both the share of elderly in the general population as well as ratios between older people and for example the working population or the population that traditionally provides most care. In total around a dozen of ratios were used, based on common definitions (e.g. Statistics Belgium, 2019) of which the following can be considered the most important:

- 1) Ageing: Population aged 65 or above in % of total population
- 2) Silvering: Population aged 80 or above in % of total population
- 3) Old age dependency ratio: Population aged 65 or above compared to the population between 20 and 64
- 4) Family care ratio: The ratio between the population with the biggest care needs and the population that provide most informal care: population aged 80 or above compared to the population aged between 50 and 59.

The data we used is received from Statistics Belgium and relates to the period between 2002 and 2017 (Algemene Directie Statistiek – Statistics Belgium, 2019). Calculations are made by making use of Excel and SPSS and visualized by making use of ArcGis. With regard to the visualization we used the authentic source of the Belgian administrative borders (FOD Financien, 2019). It concerns the version of 2018 due to merging of some municipalities in 2019.

As a first step we visualized several of these shares and ratios for both Flanders, Walloon and Brussels Capital Region and looked into general patterns. At first instance we did this on both the spatial level of the provinces (NUTS 2) and the administrative regions (NUTS 3). Afterwards, we tried to discover more fine-grained and detailed ageing patterns at the level of the municipalities and statistical districts (being the level of the neighbourhood). In this paper we will show a very limited selection of this, focused on Flanders. Thereby, we interpreted the results mainly based on visual aspects combined with some descriptive statistics.

As a second step we used cluster analysis to get more insight in different ageing profiles across both administrative regions, municipalities and statistical districts. In this paper we will mainly focus on the latter. For identifying the clusters we used both ArcMap (Spatial Statistics Toolbox) and SPSS. We mainly used K-means clustering and the two-step cluster method. K-means clustering divides a data set in several clusters and attempts to minimize the difference within a cluster, while the difference between clusters is maximized (Heremans, 2001). This method comes with several drawbacks, the most important being that the results depend on the chosen parameters and pre-defined number of clusters. Therefore, we used other clustering methods to get better insight in the optimized amount of clusters through this method. Furthermore, we worked with standardised scores (Z-score) to circumvent the sensibility of the method for measurements on different measurement levels. An advantage of this method is that it can handle large datasets, although only on ratio or interval level. The two-step cluster method can also handle categorical variables and is thus mainly used when it comes to enrichment with for example urbanization typologies or other datasets. This method pre-clusters data in a first step before carrying out a conventional hierarchical cluster analysis (e.g. Norusis, 2011). Another advantage is that it automatically select the optimal number of clusters. Although the method assumes that variables are not strongly correlated and are normally distributed, a lack of this does not seem to influence the robustness of the method, whereby an interpretation can give the decisive answer (ibid.). It is mainly in the third step that we make use of this method. After the identification of the initial cluster based on only demographic data, the third step tries to enrich the results. In this paper we will only focus on the level of urbanization, but several other enrichments will be possible as well, depending on the research goal. To name an example, we compared some results from the first step with the availability of facilities, in which there are indications that the municipalities with the highest level of ageing do not necessarily have the best facilities for the elderly, something which will also be possible to relate the different clusters.

## 5 INSIGHTS IN GEOGRAPHIES OF AGING

The first step and visualization of different demographic ratios informs us already that there are several differences visible across Belgium, both on the regional level (Flanders, Walloon, Brussels Capital Region) (see figure 2), but also on the level of provinces and municipalities (figures 3 and 4). Figure 2 shows that the ageing of the population increased, although not uniform across the country. Although the differences between the regions were relative small in 2001, we can notice that there was not an uniform path towards ageing across the country. While in Belgium the share of population older than 65 increased from 16,9% in 2002 towards 18,7% in 2018, in Brussels Capital region it decreased from 16,5% towards 13,2%. In Flanders the increase (from 16,9% to 20,0%) was larger than in the other regions. In Flanders differences between provinces can be detected. Figure 2 shows that even though in all provinces the level of ageing is stronger than in Belgium as a whole, there is one province where the level is considerable higher than the others and is characterised by a stronger growth. In West-Flanders, the share of population aged 65 or above evolved from 18,3% in 2002 towards 23,0% in 2017. When looking into a lower spatial level and by visualizing the data per municipality (figure 3 & 4), we see again considerable differences. It becomes clear that especially at the seaside there is high level of ageing (already in 2002) as well as a relatively large growth in the period 2002 – 2017, while in other municipalities in the same province the share of people aged 65 or above even decreased during that period. This is not surprisingly since the seaside is traditionally an area which is characterised by retirement migration (e.g. Provincie West-Vlaanderen, 2017). The pattern becomes even more complex when looking into the more detailed and lower level of the statistical districts (not shown), where for example at the seaside it is noticeable that ageing is mainly located at the direct seaside and already more limited in the direct hinterland.

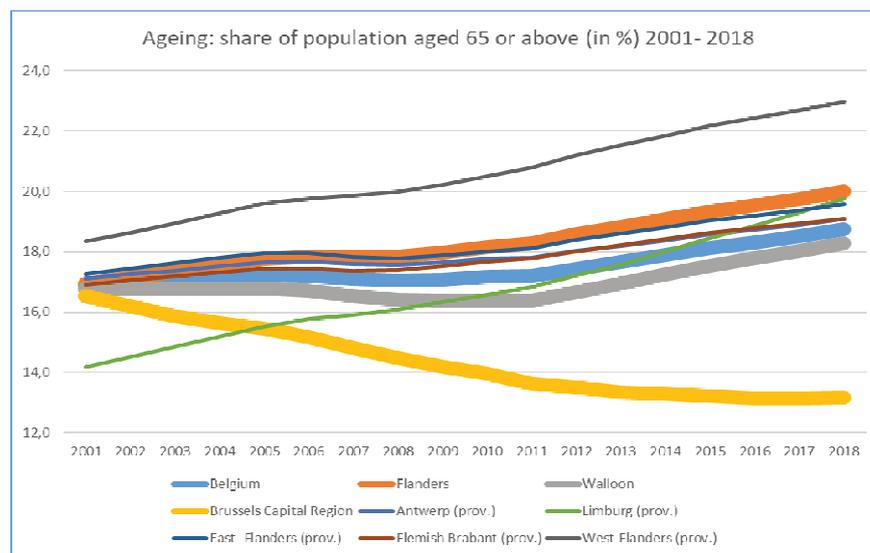


Figure 2: Ageing per region and province in Belgium, 2001 - 2018

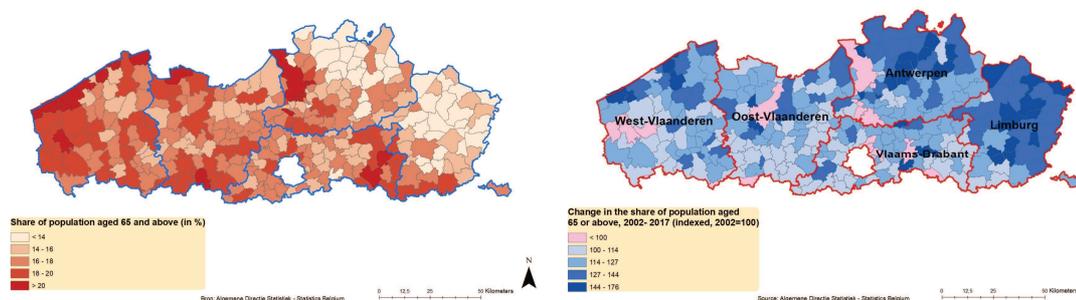


Figure 3: Ageing in Flanders, 2002, Figure 4: Indexed numbers ageing, 2017 compared to 2002, per municipality, Flanders

Figure 4 shows furthermore that especially the eastern parts of Flanders (especially in Limburg and some parts of Antwerp) are characterized by a relatively strong growth during the period 2002- 2017. This is partly the consequence of a catch-up since figure 3 shows that exactly these areas were characterized by a lower level of ageing in 2002. Moreover, most of the municipalities in these regions are still being characterized by a lower level of ageing compared to average (not shown). This lower starting position in

2002 can mainly be explained by labour migration in the period after World War II resulting in a younger population. The contrast between on the one hand the western part of Flanders and on the other hand the eastern part of Flanders, is something that is also reflected when we look into other ratios. In general, it can be mentioned that based on these visual interpretation of patterns some dynamics become visible as well as some indications of the existence of spatial clusters (e.g. based on a high level or a fast(er) growth). Although the figures above do only relate to ageing, it is interesting to reflect as well on for example the so-called family care ratio (population aged 80 or above compared to the population between 50- 59). Thereby it can be stated that also this ratio is higher in the western part of Flanders, while the eastern part is characterised by a strong(er) growth. However, also in this case patterns become more complex on a lower spatial level. We should furthermore not forget that the consequences of this ratio can differ between both urban and rural regions, but also between regions which already adjusted to this reality compared to regions who are characterised by a more recent growth (and decline in potential informal carers). This points to the need to get for example more insight in distances between parents and children and residential movements.

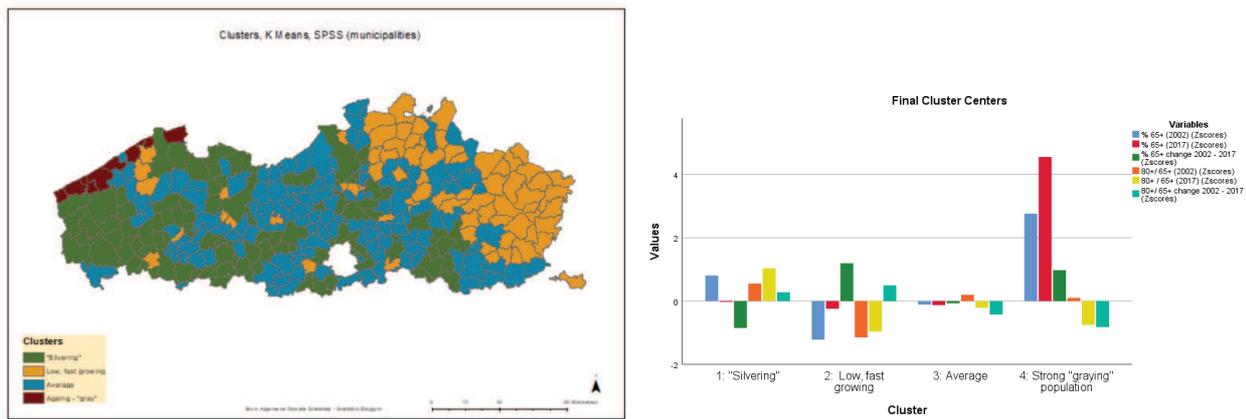


Figure 5: K-Means clustering (demographic ratios), municipalities, Flanders . Figure 6: Clusters (municipalities)

Two Step Cluster - Statistical districts - demographics and population density

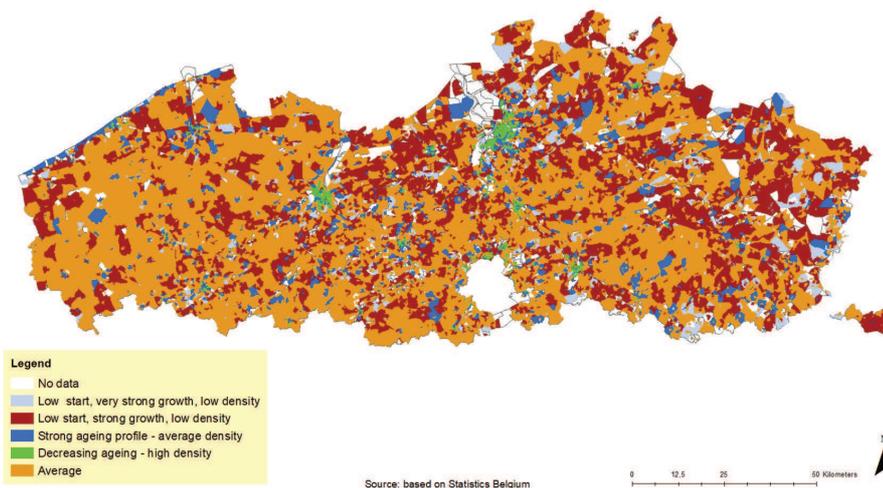


Figure 7: Two-step cluster approach relating to statistical districts and making use of demographics and population density

As a second step a K-means cluster approach was used to divide the municipalities (n=308) based on their ageing profile. Thereby we made use of the share of population older than 65 (in 2002, 2017 and the growth between 2002- 2017) and the share of the oldest old compared to the older population (in 2002, 2017 and the growth between 2002 – 2017). Thereby we identified four clusters, which partly relate to the results and insights described in the foregoing. First of all, a small cluster of municipalities at the seaside are identified as localities with a high level of ageing (n=8), while mainly in the eastern part of Flanders we see a concentration of municipalities who can be considered as being characterized by a relatively low level in 2002 but a fast growth level (n=71). However, most municipalities (n=131) can be characterized as having

an average ageing profile. The remaining ones ( $n=98$ ) are characterized especially by a high level of inhabitants older than 80 years, while the level of ageing (65+) is decreasing. This is for example the case in large cities, which were traditionally characterised by an older population but have seen an influx of younger population and migrants. But also several rural municipalities show the same development. In other words, more insights are needed in for example the impact of population densities and levels of urbanization.

As an example of the third step, figure 7 shows a cluster approach whereby we took into account the population density, this time on the level of the neighbourhood (statistical district). Although figure 8 shows us that further refinements in terms of clusters are desirable, the results are nevertheless interesting. Except for a further subdivision, the demographic characteristics of the clusters itself are not that much different from the ones identified in figure 5. However, it is clearly visible that the pattern on a lower spatial level is much more complex. Furthermore, the (larger) urban areas (e.g. Antwerp, Ghent, Mechelen, Leuven) are clearly defined as a specific cluster characterized by a high population density and a level of ageing which decreased between 2002 and 2017.

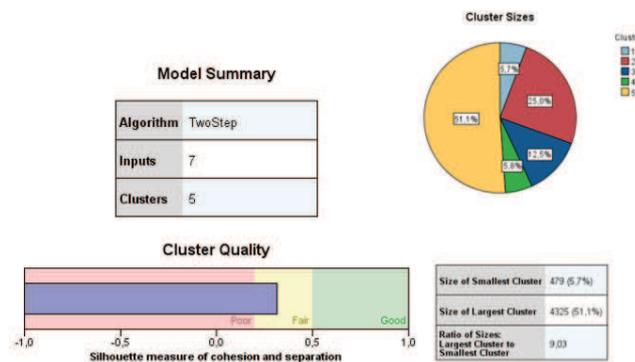


Figure 8: Model summary related to figure 7

## 6 DISCUSSION AND CONCLUSION: TOWARDS NEXT STEPS

This paper started with pointing towards the need to get more insight in geographies of ageing and care which are too often neglected or downplayed. More insight is needed to support ageing-in-place and better define the environmental characteristics that stimulate this. Although ageing-in-place is stimulated from a policy perspective it is often not clear if for example (potential) informal care is available in every region. The aim of the paper was to present a framework or starting point for research into these aspects and stimulate better integrated policy making, as well as research into informal care related to ageing-in-place. To realize this we used macrodata obtained from the statistical office to visualize several demographic ratios throughout the period 2002 – 2017. Based on these visualizations we could already confirm the existence of ‘geographies of ageing’ and differences across spatial scales. On a higher spatial scale differences in ageing are relatively easy to explain by migration patterns and residential movements, while on the level of the neighbourhood patterns are more complex and less straightforward. Therefore, we carried out several cluster analysis to emphasize more fine-grained and detailed ageing patterns at several spatial levels, in which we also took into account the population density.

Further research can for example compare and/or enrich the results with aspects such as formal care facilities, retail activities and mobilities and transport. Although macrodata (aggregated) can already give improved insight into geographies of ageing and care, there is need for making use of microdata to get more detailed patterns and insights in residential movements and distances. This is especially true in a context in which informal care is more and more emphasized. In Flanders there is a lack of information about for example distances between parents and children and if informal care can compensate for the (potential) decline in formal care. Microdata can be useful here, also to see regional differences in this respect, as well as how distances between family members evolve over time. It will also enable to us to look into gender differences when it comes to distances, as well as potential biases in clusters for which macrodata is not suitable. Furthermore, as informal care and distances are relative concepts, qualitative research can shed light on the negotiating of distances and informal care, and enhance our knowledge about ageing-in-place, also by complementing quantitative approaches to interpret patterns.

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