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The self-reinforcing effects of population decline: an analysis of differences in moving behaviour between rural neighbourhoods with declining and stable populations

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Abstract

The consequences of population decline are present at different geographical scales and are often believed to be self-reinforcing. This means that population decline possibly causes changes in the living environment, which brings about more population decline. This research analysed if population decline at the neighbourhood level has an effect on the probability to move out or within rural neighbourhoods in North-Netherlands. It was expected that a preceding decline of the population in the neighbourhood increased the probability to move out of the neighbourhood, but that this effect differed for categories of the population and for moves over short and long distance. Using register data and additional surveys for 2006, a multinomial logistic regression model was constructed to estimate the effects of a preceding decline of neighbourhood populations on the probability to move over short and long distances for different categories of the population. It was found that a preceding decline of the neighbourhood population increased the probability to move out of the neighbourhood. However, this effect was only found for moves out of the neighbourhood up to 10 kilometres of especially young adults, couples with children, and people aged 65 to 75. Moreover, by calculating estimated probabilities of moving out of neighbourhoods with declining and stable populations, it was shown that the difference between actual numbers of people moving out of these two types of neighbourhoods, was small and could therefore take a long time to have serious impact on the neighbourhood population.

1. Introduction

As a growing number of developed countries and regions across the world are reporting falling population numbers (Lee and Reher, 2011; Martinez-Fernandez et al., 2012), both scholars and public policymakers have become increasingly interested in the issue of population decline over the past decade (Feser and Sweeney, 2003; Stockdale, 2006; Reher, 2007; Haartsen and Venhorst, 2010; Coleman and Rowthorn, 2011; Matanle *et al.*, 2011, Martinez-Fernandez et al., 2012; Bontje and Musterd 2012; Haartsen and Van Wissen, 2012; Hoekveld, 2012). Regardless of the scale at which population decline is being observed, it is clear that such decreases can happen for a variety of reasons, and can have a wide range of consequences. In order to simplify the discussion of these complex processes, scholars often make a distinction between population decline in urban and in rural areas. In this study, we examine rural population decline.

Population decline is sometimes thought to be a self-reinforcing process (Myrdal, 1957; Friedrichs, 1993). The belief in the self-reinforcing effect of population decline is based on two assumptions. First, it is assumed that population decline leads to changes within the areas in which the process occurs. Second, it is thought that the changes that take place within these areas will influence moves to and from these places: i.e., that more people will leave, and/or that fewer people will enter. When taken together, these two assumptions suggest that there is a downward spiral of self-reinforcing population decline.

Until now, the self-reinforcing effects of population decline have been analysed at the national or at the regional level (Myrdal, 1957; Richardson, 1978; Friedrichs, 1993; Lehtonen and Tykkläinen, 2010), but not at the local level, which more closely approximates the direct living environment of an individual than the national or regional level. It is reasonable to assume that population decline at the neighbourhood level interacts with other aspects of the neighbourhood, like housing and services. The availability of population register data in the Netherlands now makes it possible for us to analyse whether there is a self-reinforcing effect of population decline at the neighbourhood level. In this article, the Dutch administrative unit of the neighbourhood is used to operationalise the local level.

One way to determine whether a self-reinforcing effect of population decline exists at the neighbourhood level is to test whether a preceding decline in the population of a neighbourhood has influenced subsequent moving behaviour. Thus, in this study, we will look at whether adults who live in a rural neighbourhood in North-Netherlands where the population has been declining over time are indeed more likely to move than adults who live in a neighbourhood where there has been no decrease in the population in recent years. We have chosen to focus on rural North-Netherlands because in this area the changes in population vary greatly at both the regional and the neighbourhood levels.

An important aspect of rural population decline is selective moving behaviour. In rural regions, talented young adults in particular are more likely than others to move to pursue education and employment opportunities (Zelinsky, 1971; Rees et al., 1997). This is of major concern to local policymakers, who may fear that as a result of brain drain certain neighbourhoods will become repositories for low-educated and unemployed people. Over the past few decades a number of scholars have studied the phenomenon of brain drain, but usually in relation to the regional economy of the sending and receiving regions (Mountford, 1997; Beine et al., 2001; Docquier and Rapoport, 2012). Selective migration has not yet been investigated in the context of neighbourhood-level population decline. Thus, in this research we analysed whether the effect of a preceding decline in the population on moving behaviour varies across different categories of the population.

To analyse how individual out-migration behaviour from rural neighbourhoods in North-Netherlands is affected by a preceding decline in the population at the neighbourhood level, a multinomial logistic regression model is constructed around data from the Dutch population register and other relevant data sources for the year 2006, in which a preceding decline in the population is included as an independent variable. The model is multinomial because a distinction is made in the dependent variable between moves over short, medium, and long distances. This distinction was necessary because moves over short and long distances are different in nature (Biagi, 2011). While the overarching goal of the analysis is to explain the effect of a preceding decline in the population on moving behaviour in general, we pay special attention to the out-migration of categories of people with different educational levels and different occupational statuses.

2. Population decline at the neighbourhood level

Population decline takes place at multiple spatial-scale levels (Bontje and Musterd, 2012). In Europe, for example, population decline at the national level appears to be more prevalent in eastern Europe (Turok and Mykhnenko, 2007), but it has been occurring at the regional level in many parts of western Europe as well (Martinez-Fernandez et al., 2012). Urbanisation is often the driving force behind population decline in developed countries. People leave the countryside and move to urban environments, where they have better job prospects and educational opportunities (Zelinsky, 1971; Rees et al., 1997). Since these migration flows from rural to urban are, in general, not compensated for by sufficient urban to rural migration, this process often results in shrinking rural regions and expanding urban regions, and it takes place in a context of declining or negative natural increase.

The drivers of this macro-trend of rural population decline do not, however, explain why it is the case that within declining rural regions, population numbers are decreasingly sharply in certain places, while in other places numbers are stabilising or even growing. The heterogeneity of rural population trends cannot be explained by the lure of the city alone, which has the potential to affect all of the people who live in rural areas. Local factors are therefore expected to influence the pattern of winners and losers among the different places in rural areas. While these places can be towns, neighbourhoods, villages, hamlets, sparsely settled agricultural lands, or any other administratively bordered area; in this paper we simply refer to them as "neighbourhoods". Statistics Netherlands also uses this term for the lowest spatial scale level, as it is assumed to capture the local living environment of the people.

Although this research focuses on the neighbourhood level, it is important to note that the living environment of individuals is by no means limited to this relatively small area. Across the Netherlands, the average person travels almost an hour a day over approximately 30 km. Because of the lower levels of urbanisation in the region, the average person living in North-Netherlands travels slightly farther in a shorter amount of time (Statistics Netherlands, 2013). People make daily journeys for a variety of reasons. First, people are often employed outside of their neighbourhood. Second, people may travel outside of their rural neighbourhood to provide for their daily needs, which often cannot be met by the services offered within the neighbourhood. Although the prevalence of services in rural areas is declining, most vital services can still be found within 10 km of the neighbourhood (Statistics Netherlands, 2013). The Netherlands can therefore be said to have a dense network of services, even in rural areas. Third, people may leave their neighbourhood to meet with other people, as many residents of rural areas have friends and relatives who live elsewhere. Research has shown that people in these areas travel an average of 5 km a day to meet with other people (Statistics Netherlands, 2013). After combining this information, we identified four levels in the living environment for the purposes of this study: the neighbourhood level (services and social contacts in the immediate vicinity of the residence),

the broader living environment (additional services and social contacts), the region (employment and more specialised services), and the national level (special services and contacts).

2.1 North-Netherlands

North-Netherlands can be considered the most rural area in the Netherlands, based on both its low population density, as well as on the perceptions of the Dutch people (Haartsen, 2002). The area, which has traditionally been dominated by agriculture and other forms of primary production, consists of three provinces: Groningen, Friesland, and Drenthe. The combined population of these provinces in 2006 was around 1.7 million, or about 10% of the total Dutch population. Only six municipalities in the region had more than 50,000 inhabitants (Statistics Netherlands, 2013). Following Haartsen et al. (2003), who defined areas with an address density of fewer than 1,000 addresses per square kilometre as rural, 66% of the North-Dutch were living in rural areas in 2006, compared with only 38% of the population across the Netherlands (Statistics Netherlands, 2013).

<Figure 1 about here>

The population of North-Netherlands is still growing, and will continue to expand up to 2028, according to official projections (Statistics Netherlands, 2013). Within North-Netherlands, however, large differences can be found between regions. For example, North-Drenthe, which is located within an easily commutable distance of the city of Groningen, has been growing since 1996; whereas the more remote Eemsdelta region has been shrinking during this period. In addition to looking at the differences between the regions, it is important that we examine the increasing gaps in population development between the neighbourhoods within the regions. This heterogeneity of population trends can be found at the municipality level, but also at the neighbourhood level. Unlike places that are expanding, remote villages in regions with a declining population face an array of challenges, including increases in the rates of unemployment and poverty, the prevalence of dated and poorly maintained housing stock, and decreases in the availability and quality of public and private services (Steenbekkers and Vermeij, 2013).

<Figure 2 about here>

Figure 2 illustrates the heterogeneous character of population change at the neighbourhood level in North-Netherlands. It is important to note that in this figure the neighbourhoods with larger surfaces often represent areas of agricultural production with few inhabitants. Because these areas are large, their colouring dominates the map, creating a distorted picture of population trends. The impact of population decline in these areas is, however, not as big in absolute terms as it is in the smaller neighbourhoods, which often represent villages and towns with larger populations. Nonetheless, it appears that the prevalence of declining neighbourhoods is greater in the more remote regions in the north and the east, and that growing and stable neighbourhoods can be found in the central and more southern parts of the region. Relatively few neighbourhoods are experiencing household decline: only 5% of the people are living in rural neighbourhoods which faced household decline during the period of observation.

2.2 Moving behaviour
Within North-Netherlands, the larger urban zone (LUZ) of Groningen can be seen as a good example of an escalator region, as described by Fielding (1992). Groningen city has approximately 200,000 inhabitants, and Groningen LUZ has slightly more than 340,000 residents (Eurostat, 2013). This metropolitan area hosts the only university in North-Netherlands, and has the most highly skilled jobs in the area. It therefore attracts young adults from all over North-Netherlands who are hoping to achieve

upward social mobility by attending university or gaining work experience. Large shares of these college and university graduates who have started or advanced their career in the city of Groningen then move to the principal economic area in the west of the Netherlands, where they step onto another escalator (Venhorst et al., 2010). This pattern is illustrated by the finding that more than 50% of all of the individuals aged 18 and over who moved to Groningen in 1999-2000 had left the urban zone five years later (Latten et al., 2008). Groningen LUZ profits from this migration of talented people from other areas in North-Netherlands, as their presence increases Groningen's population and human capital.

Moves which are instigated by the prospect of accumulating human capital are often long-distance moves. Neoclassical economic migration theory postulates that individuals move to places with opportunities which fit their capabilities to the greatest extent possible, and which provide the greatest possible benefits (Sjaastad, 1962). Moves over shorter distances, or residential mobility, are usually undertaken in response to shifts in family composition, as different types of households may need more or less space in various living environments (Rossi, 1955; Mulder, 1993). Because the reasons for moving over short and long distances differ, the effects of neighbourhood population decline are also likely to differ depending on whether the moves are over shorter or longer distances.

Whether people move and how far away they move is largely dependent on personal characteristics. Different categories of people have different needs, and their resources for fulfilling these needs also vary. The individual characteristics which have been shown to affect moving behaviour are sex, age, household position, and educational level. In rural areas, men are less likely to move than women because of their higher degree of involvement in agricultural production (Ní Laoire, 2001). Young people are more likely to move than older people, although a bump in migration among retirees has been observed in some cases (Rogers and Castro, 1981 and 1986). People of foreign descent are more likely to move than natives, although this can depend on the population composition of the neighbourhood. (Van Ham and Feijten, 2008). A large number of studies have looked at the effect of household position on moving behaviour, and have found a wide variety of effects in different circumstances. In general, single people are more likely to move than families, while families with children are less likely to move than families without children (Rossi, 1955). In addition, highly educated people have been found to be more likely to move than less educated people (Long, 1973; Börsch-Supan, 1990).

3. Population decline as a self-reinforcing process

In order for population change to become self-reinforcing, an intermediating force between the preceding and the subsequent population change is needed. Myrdal (1957) has argued that the economy is an intermediating force. He theorised that an increase in the number of people boosts economic output by spurring consumption, which stimulates production and the demand for labour; and that this higher demand attracts even more people, thereby restarting the process. By contrast, a decrease in the number of people depresses economic output, which leads to a further decline in the population. Agglomeration effects, in which urbanised regions gain and other regions lose population, have been extensively documented in the economic literature (among many, Glaeser et al., 1992; Feldman, 1999; Puga, 2010). Matanle and Rausch (2013) further observed that as decreasing levels of social and human capital can lead to a decline in the quality of life, these factors may also contribute to the cumulative self-reinforcing patterns of population decline.

While theories of negative cumulative causation driven by the economy are generally applicable at the regional level, citing this type of cumulative causation seems less useful when the goal is to explain population change at the neighbourhood level in rural North-Netherlands. As people are now

commuting to work over longer distances than they were in the past, we can assume that they are becoming less dependent on the employment and the consumption opportunities within their neighbourhood of residence. Intermediating forces related to the quality of the neighbourhood do, however, seem be involved in the self-reinforcing population decline at the neighbourhood level (Clark et al., 2006). There are four phenomena related to the quality of the neighbourhood which may be affected by population decline, and which may therefore add to the self-reinforcing processes of population decline: the availability of local services, the availability and quality of housing, the population structure, and the image of a neighbourhood. This list is certainly not exhaustive, and not all of these issues can be addressed in the current analysis. The purpose of exploring these issues is to provide a basis for testing the hypothesis that a preceding decline in population at the neighbourhood level is a self-reinforcing process.

It is generally assumed that population decline leads to a decrease in the number of potential users of services, which could force these services to close. In turn, a decrease in the availability and accessibility of services could have negative effects on the quality of the neighbourhood, not only because the people in the neighbourhood have to look elsewhere to satisfy their needs, but also because the abandoned service buildings may become eyesores. Although factors such as changing consumption patterns, increased mobility, and the pressure for economies of scale are more likely to lead to the demise of local services in rural neighbourhoods than population decline, a decrease in population numbers can accelerate the process (Van Dam, 1995; Stockdale, 2004). The reduction in services—and, consequently, a reduction in the quality of the neighbourhood—could be a reason for people to leave the neighbourhood (Van Ham and Feijten, 2008; Verwest, 2011). The closure of primary schools (Forsythe, 1984; Witten et al., 2001; Egelund and Laustsen, 2006), public transportation links (DETR, 2000), community centres, and other public sector services have been related to the quality of neighbourhoods (Kearns and Mason, 2007), and could therefore be part of the self-reinforcing process of population decline.

The local housing market is also generally seen as contributing to the self-reinforcing process of population decline, as a decrease in the demand for housing can have an effect on the value, the vacancy rates, and the quality of housing. Population decline has been found to cause a decrease in housing values (Glaeser and Gyourko, 2005). This results in losses for those individuals who invest in a house in a declining neighbourhood, and could provide a reason for people to leave the neighbourhood in order to limit their financial losses. Conversely, a family might be unable to sell their house because they cannot afford to lose money on the transaction, or because no buyer is willing to invest in a house in a declining neighbourhood. Moreover, in response to a loosening of the housing market, housing corporations might refrain from investing in declining neighbourhoods. This could lead to a decrease in the quality of the existing housing stock, creating a discrepancy between the demand for housing and the aspirations of the (future) inhabitants (Kintrea, 2007). Moreover, housing corporations might stop building new housing, which is needed to counter the effect of decreases in household size and to maintain a stable, if not growing, population in the neighbourhood. Long-term housing vacancies could furthermore result in abandoned housing, which again has a negative effect on the quality of the neighbourhood, and increases the probability that people will move out (Clark et al., 2006).

Population decline as a result of selective moving behaviour can disrupt the neighbourhood population structure in terms of age and human capital. Kearns and Parkes (2003) have found that the age structure of a neighbourhood population may provide an incentive to leave the neighbourhood, but they did not specify which age structures might trigger this effect. Lehtonen and Tykkyläinen (2010) showed that in places where the elderly make up a large proportion of the population, younger people are more likely

to leave. More generally, Schelling (1969, 1971) has argued that there is an interaction between individual characteristics and neighbourhood characteristics, which suggests that certain population structures are more desirable for some people than for others. Van Ham and Feijten (2008) found strong support for this claim by showing that when a large share of the population of a neighbourhood belongs to an ethnic minority, the probability that people who are not part of this group will move increases. They also showed that a similar effect may occur in a neighbourhood with a large share of low-income households, but these results were less conclusive. It therefore appears that individuals have a tendency to live close to their peers. It is thus also very likely that self-reinforcing selective moving behaviour could occur in certain places, with the young and the talented leaving in disproportionate numbers. Moreover, declining levels of human and social capital could reduce the chances of neighbourhood regeneration in rural areas (Stockdale, 2006).

A final and more latent self-reinforcing effect of local population decline is the reputation of a neighbourhood. This psychological factor could be a driving force in the downward spiral, because it relates to all of the effects mentioned above. Although these effects on services, housing, and population structure do not necessarily occur immediately as the neighbourhood population starts to decline, they may gradually gain momentum if the local population's perception of the neighbourhood starts to deteriorate. Research has shown that neighbourhood reputations can affect moving intentions (Permentier et al., 2009). If people generally believe that the population in a particular neighbourhood is declining—regardless of whether this perception is valid—the likelihood that people will move out of the neighbourhood increases. Thus, the reputation of a neighbourhood, while less tangible, could add to the self-reinforcing processes.

4. Category-specific effects of self-reinforcing population decline at the neighbourhood level

The consequences of a preceding decline in the population are likely to affect moving behaviour differently across the various categories of the population. Some groups of people might be unaffected by the consequences of population decline, while others could face multiple problems simultaneously. We believe that young adults, families with children, the elderly, and the unemployed are among the categories of the population for whom moving behaviour is especially influenced by the effects of a preceding decline in the population.

In the self-reinforcing process of population decline, an essential question is whether people are willing and able to respond to changes in the neighbourhood by moving out. In some instances, however, population decline could have multiple effects, but with an unknown direction on moving behaviour. Different processes occur at the same time, which sometimes makes it difficult to assess beforehand whether population decline will reinforce itself for a specific category. Moreover, as research on the way in which population decline on the neighbourhood level affects moving behaviour is virtually non-existent for different categories of the population, which causes some assumptions to be only more or less plausible. Thus, in the following sections we are unable to produce clear hypotheses of the effects of population decline on the moving behaviour of young adults and unemployed people. For older people and families with children, the effects of population decline on moving behaviour seem to be more unidirectional.

4.1 Young adults
Young adults are important to rural neighbourhoods because they are at the beginning of their productive careers. They will start working and investing in their human and social capital, which could contribute to the quality of the neighbourhood going forward. Young adults are more likely to move than

any other age group, over both short and long distances (Li et al., 1996). They usually leave the parental home in order to live with a partner, gain personal independence, or take advantage of educational or occupational opportunities elsewhere (De Jong Gierveld et al., 1991). Those young people who leave the parental home to gain personal independence or to live with a partner generally do so over short distances, and often have lower levels of education and qualifications (Stockdale, 2002). By contrast, the young adults who move to take advantage of educational or occupational opportunities often have higher levels of education, and generally move over longer distances.

The effect of population decline on the moving behaviour of young adults depends on the type of housing they are seeking. Since in the Netherlands members of this group typically have fewer financial resources than older adults, they have been found to be the most likely to move into rental accommodations (Mulder and Hooimeijer, 2002). As rental housing is generally less available in rural areas than in urban areas, young adults are more likely to leave rural neighbourhoods and move to more urbanised areas (Clark and Dieleman, 1996). Moreover, housing corporations in the Netherlands have been demolishing or trying to sell out-dated rental accommodations in small and declining villages (PBL, 2008; SEV, 2012). This further decreases opportunities for young adults to find suitable rental housing within declining neighbourhoods. Young adults looking for rental housing nearby are thus expected to be more likely to move out of a neighbourhood with than without a preceding population decline.

For a smaller group of young adults who have the financial resources to move into home-ownership—typically couples who start living together (Mulder and Hooimeijer, 2002)—it is unclear how their moving behaviour is affected by neighbourhood population decline. Although they are affluent enough to become home-owners, their financial options may still be limited, which could lead them to look for housing in places where the prices are low. Since population decline is often associated with a decrease in housing prices (Glaeser and Gyourko, 2005), it can be argued that these young adults will be more likely to find housing they can afford in a neighbourhood with a preceding population decline. However, young people may be reluctant to invest in a house in a declining neighbourhood if they are concerned that the prices could continue to decrease.

Highly educated young adults are unlikely to favour neighbourhoods where the population is declining. These young adults often have to commute to urban areas, where universities and highly skilled jobs are concentrated. Because young adults often do not own a car, they tend to be more dependent than older adults on public transportation, which is often not adequate in rural areas (Glendinning et al., 2003). Moreover, in places where the population is declining, the availability and accessibility of public transportation may further deteriorate, making it increasingly difficult for people living in these areas to reach higher education institutions and workplaces with highly skilled jobs (DETR, 2000). This process could lead to an increase in the probability that highly educated young adults will decide to leave a neighbourhood facing population decline to move to an urban area.

4.2 Older people
Population decline and ageing in rural regions are often seen as two sides of the same coin (Lee and Reher, 2011). Young adults are more likely to leave rural regions to pursue educational and occupational opportunities in urban areas, while older people are more likely to be settled, and thus less inclined to move. Age migration schedules occasionally show a retirement bump and a small increase in migration rates at older ages (Rogers and Watkins, 1987; Scholten and Van der Velde, 1989), but the vast majority of older people prefer to age in place (Pope and Kang, 2010). These simultaneous trends of population decline and ageing have been cited as being among the main challenges facing rural regions in a number of countries (Bermingham, 2001; Coulmas, 2007; Reher, 2007).

At the neighbourhood level, however, other forces might be in play which could result in a departure of older people from neighbourhoods facing population decline. Ageing in place has been defined as "individuals growing old in their homes with an emphasis on using environmental modification to compensate for limitations and disabilities" (Alley et al., 2007, p. 2). Since the neighbourhood is part of the living environment, but is not as easily modified as the residence, older people might decide to move when the available services do not adequately support their needs. Fokkema and Van Wissen (1997) have further shown that older people frequently engage in anticipatory moving behaviour if they believe that their current living situation will become inadequate in the short term. Litwak and Longino (1987) described two types of moves among older people which are relevant to the discussion of neighbourhood population decline: moves motivated by the desire for amenities and comfort, and moves at advanced old age related to the need for institutional care.

A decline in the availability of services and housing for older people in a neighbourhood could constitute a self-reinforcing process in itself. In the Netherlands, retirement homes which provide housing and care for older people are generally located in the vicinity of services like a supermarket, a general practitioner, and a dentist. If the services disappear as a result of population decline, the management of the care institution might decide to relocate, or to merge with another care institution located in a neighbourhood that offers these services. Similarly, housing corporations might choose to invest in housing for older people only in those neighbourhoods that have a stable level of services. Because the decline in services is accompanied by a decline in suitable housing, it is expected that older people will be more likely to leave neighbourhoods with declining populations than those with stable populations.

4.3 Families with children
The survival of primary schools and other child-related services is dependent on a steady inflow of children. This makes families with children an interesting category to study in greater detail. Moreover, children who grow up in rural neighbourhoods can develop strong ties to their neighbourhood, making them more likely to stay in the neighbourhood after they have grown up. Moves made by families with children are often related to family expansion, and therefore usually take place over short distances (Rossi, 1955).

As families with children are deciding where to move, they are likely to favour neighbourhoods which provide benefits that make it easier to raise children. The availability and accessibility of child-related services could thus be a consideration in choosing the neighbourhood of residence. The closure of a primary school could, for example, decrease the quality of the neighbourhood from the perspective of families with children, and increase the probability that these families will leave the neighbourhood. Furthermore, an initial decline in the number of families with children might reinforce itself, because people like to live close to their peers (Schelling 1969, 1971; Van and Feijten, 2008). Parents often consider it important that their children have contact with other children with whom they can play and form friendships. A declining number of families with children in the neighbourhood could therefore be a good reason for the remaining families with children to move to a neighbourhood with a stable or increasing share of families with children. It is therefore expected that families with children will have a higher probability of moving out of declining neighbourhoods than out of non-declining neighbourhoods.

4.4 The unemployed
Depending on its duration, unemployment can result in an increase or a decrease in an individual's propensity to move. According to economic theory, unemployed people will move more frequently than those who are employed, because unemployed people will relocate in order to find a job, or they will

make a prospective move to a place with more employment opportunities (Van Dijk, et al, 1989; Pissarides and Wadsworth, 1989; Herzog *et al.*, 1993). Because people are generally willing and able to commute to a new job if it is not too far away from their current home, a move undertaken after accepting a new job is likely to be over a long distance. In the Netherlands, the majority of moves for employment reasons are over 35km or more (Goetgeluk, 1997). However, the long-term unemployed are less likely to move than the short-term unemployed (Herzog *et al.*, 1993), because people who have been unemployed for a long time may have insufficient resources for moving. The types of resources that may be depleted through long-term unemployment are not just financial, but may also include a lack of information about the available housing and employment opportunities elsewhere. Other research has therefore shown that unemployment is actually associated with a decrease in the likelihood of moving (Antolin and Bover, 1997; Tervo, 2000; Lehtonen and Tykkyläinen, 2010).

Living in a declining neighbourhood is expected to have an effect on the likelihood that a person will leave the neighbourhood to move to a distant location for employment reasons. However, the direction of such an effect is uncertain. An upward effect may result from the limited accessibility of the majority of declining neighbourhoods, which makes it more difficult to commute to a new job, and thus increases the need to relocate. By contrast, a downward effect may apply to homeowners in declining neighbourhoods, who could find it difficult to sell their homes for two reasons. First, the number of potential buyers is expected to be lower for such homes, as the return on the investment is uncertain for newcomers. Second, it could be difficult for existing homeowners in declining neighbourhoods to sell their home because a decrease in the value of the property as a result of population decline would leave them in debt.

The expected size and direction of the effect of living in a neighbourhood with a declining population on the moving behaviour of long-term unemployed people, who are more likely to have limited resources than short-term unemployed people, is also uncertain. On the one hand, population decline can result in more housing vacancies at lower housing prices, which could increase the probability that the long-term unemployed will stay or move within the neighbourhood. On the other hand, in the context of a region with neighbourhoods with and without a decline in the population, housing corporations could decide to focus on the neighbourhoods without declining populations, where they can get a greater return on investment. This could result in the demolition of or the failure to continue to maintain social housing in declining neighbourhoods. This in turn reduces the availability of suitable housing for long-term unemployed people in declining neighbourhoods, and therefore increases the probability that they will move out. Furthermore, a decrease in the availability of services increases the distance that people have to travel in order to meet their daily needs. Because the long-term unemployed are less likely than their employed counterparts to own a car, many of them may find travelling these distances too expensive, which could further increase the probability that they will move to a neighbourhood with a stable or increasing level of services.

The effect of living in a neighbourhood with a declining population on the moving behaviour of unemployed people is thus not easy to predict. The relationship between housing and the resources of unemployed people is an important factor, but the effects may vary depending on the individual motivations for a relocation decision. Moreover, within a neighbourhood upward and downward effects can be at work at the same time.

4.5 The impact of population decline
To assess the impact of neighbourhood population decline on moving behaviour, it is important that both the impact on the propensity to move and the impact on the numbers of people moving are taken

into account. It is expected that the impact on the propensity to move is strongest for older people, because they are generally less self-reliant. Their need for suitable services and housing could force them to relocate to places where these services and types of housing are available. Numerically, the impact of neighbourhood population decline on moving behaviour is expected to be strongest among young adults, because young adults are more likely to be mobile than people in other population categories. A small effect of neighbourhood population decline on the moving behaviour of young adults can therefore lead to more people moving than a large effect would have on the moving behaviour of, for example, older people, who are not as likely to move in the first place.

5. Data and methods

To test the hypotheses, we used data from the Dutch population register, the socio-economic category register, the labour force survey, and neighbourhood statistics provided by Statistics Netherlands. These data were matched by using an individual identification number. The population register contains data on personal characteristics and moving behaviour, while the socio-economic category register contains data on the occupational status of individuals, the labour force survey has data on the educational levels of individuals, and the neighbourhood statistics contain information on the changes in population in a neighbourhood and on the prevalence of certain categories in the neighbourhood population. The year of observation is 2006 for all of the data sources, except for the neighbourhood statistics, which were included in order to measure population change from 1999 to 2006. Only individuals aged 18 years and older were included in the sample. A further selection of these data was made on the basis of the degree of urbanisation of the neighbourhood, and on the availability of data on educational level in the labour force survey. For older people the data on educational level in the labour force survey was obtained from a questionnaire. For younger people, the information was taken from education registers. This led to an overrepresentation of young people in the survey, and reduced the sample size.

Neighbourhoods were selected in the sample only if they were rural and were located in the NUTS-1 region of North-Netherlands. The degree of urbanisation of a neighbourhood was defined by its address density. We considered neighbourhoods with fewer than 1,000 addresses per square kilometre to be rural, because they are generally perceived as being rural by the Dutch people (Haartsen et al, 2003). Rural neighbourhoods were excluded from the sample if they hosted a centre for asylum seekers during the period of observation, because the opening or closing of such a centre could cause a sudden increase or decrease in the population of a neighbourhood, and an inflation of the migration data. The neighbourhoods themselves are "administrative areas dominated by a homogenous socio-economic structure or planning" (Statistics Netherlands, 2013). While all of these neighbourhoods belonged to municipalities, some were parts of towns, others were independent towns or villages, and still others were less dense areas in the open countryside. The administrative boundaries of the neighbourhoods were determined by the municipalities in co-operation with Statistics Netherlands. Across the Netherlands, the average neighbourhood had 1,412 people in 2006. Using the selection criteria, 1,700 rural neighbourhoods out of 2,466 neighbourhoods in North-Netherlands were selected for the sample, which contained 186,420 individuals, or about one-sixth of the total rural population of North-Netherlands.

The dependent variable in the models is a categorical variable indicating moving by distance class, based on information collected from the Dutch population register. Five categories of moving were identified: staying, moving within the neighbourhood, moving out of the neighbourhood over a distance of up to 10 km, moving out of the neighbourhood over a distance of between 10 and 35 km, and moving out of the neighbourhood over a distance of more than 35 km. A distinction in moving behaviour is made at 10 km because neighbourhood population decline is expected to have effects primarily in the neighbourhood.

This could cause people who are satisfied with their broader living environment, but not with their immediate neighbourhood, to move to a neighbourhood that is relatively close to their old neighbourhood. Conversely, people who are satisfied with both their broader living environment and the conditions in their neighbourhood are expected to relocate within the same neighbourhood. The distance of 10 km was selected based on research by Feijten and Visser (2005), who found that in the Netherlands the peak moving distance from one municipality to another is between zero and 10 km. Meanwhile, moves out of a neighbourhood over a distance of more than 35 km are a form of migration that is most likely motivated by a desire to pursue employment or educational opportunities (Goetgeluk, 1997). Based on this distinction, we created a remaining category of people who moved over a distance of between 10 and 35 km. People who may not have been satisfied with their direct and broader living environments, but who did not relocate to pursue employment or educational opportunities, were placed in the category of residential movers. If people moved several times during 2006, only the first move was used in the analyses. Thus, the moves of people who moved often were underrepresented in the sample. The distance of the move was calculated by drawing straight lines between the centre points of the neighbourhoods of departure and destination.

Neighbourhood population change, which is the most important independent variable in our model, was measured by comparing the neighbourhood population sizes of 1999 and 2006. This time span was used because neighbourhood population numbers can fluctuate from year to year, and it might take time for a change in these numbers to have an effect on migration behaviour. We constructed a variable with three categories based on the distribution of neighbourhood population change. A declining neighbourhood was assigned to the lowest quartile (-4.5%), while a growing neighbourhood was placed in the highest quartile (+5%). Neighbourhoods with stable populations were placed in the quartiles in between. Although household decline is an important aspect of population decline, it was not added to the model because the number of neighbourhoods that underwent household decline was very low during the period of observation. The independent variable occupational status—i.e., whether a person was (self-)employed, short- or long-term unemployed, a student, or a pensioner—was determined by looking at the predominant source of the individual's income. For movers, we used the occupational status before moving. For stayers, who could belong to several occupational categories over the course of a year, the most common occupational status for that year was used. Statistics Netherlands distinguished between those who were short- or long-term unemployed based on the type of social benefit the person was receiving. The individual's educational level was determined by Statistics Netherlands in two ways. For younger age groups, data on educational attainment were taken from education registers. Information on the educational levels of members of older age groups came from the Dutch labour force survey.

The other variables included in the model were sex, age, descent, household position, the population size of the neighbourhood, the prevalence of certain population categories in the neighbourhood, and the share of unemployment in the region. The first three individual characteristics are known to have an effect on moving behaviour. This is also the case for household position, which was included in recognition of the fact that migration decisions are taken in a household context. Moreover, age and household position are necessary for pinpointing the selected categories of the population. Neighbourhood population size was included because it controls for the fact that people from smaller neighbourhoods are less likely to find a suitable residence within their neighbourhood than people from larger neighbourhoods with more housing. The prevalence of certain population categories in the neighbourhood controls for the tendency of people to live close to their peers. Regional unemployment controls for the assumption that people are more likely to migrate out of regions with high unemployment levels. The value of this variable was similar for all of the people living in the same

COROP region (NUTS 3 level), because the labour market generally operates on a regional scale rather than on a neighbourhood or a municipal scale. Table 1 shows descriptive statistics of the variables included in the model.

<Table 1 about here>

We constructed multinomial logistic regression models to determine the effect of neighbourhood population decline on moving behaviour over different distances. Because individuals are subject to similar conditions within neighbourhoods, we accounted for intra-class correlation by using robust standard errors (Huber, 1967). The first model we estimated included the full sample and investigated whether neighbourhood decline had an effect on moving behaviour, and at what distances such an effect could be observed. To allow us to determine whether an effect of neighbourhood decline existed within different categories of the population, the models were separately estimated for these categories. We were able to optimise these separate models by excluding non-relevant variables and variable categories (such as students over age 65), and including the corresponding neighbourhood prevalence of a specific age category. To assess the effect of neighbourhood population decline more thoroughly, the probabilities of moving were estimated for people with different profiles within the category models. Through the use of this approach, we were able to analyse what the effect of a preceding decline in the population of a neighbourhood was on the propensity to move, and how this effect translated into numbers of people moving.

6. Results

Table 2 displays the results of the multinomial logistic regression analysis for the total sample. It shows that after controlling for other independent variables, there was an effect of a preceding decline in the population of a neighbourhood on moving behaviour. Compared to having a stable population, the effect of a preceding decline in population on moving behaviour was negative for moves occurring within the neighbourhood, and positive for moves out of the neighbourhood up to 10 km. No significant effect of neighbourhood population decline was found for moves over longer distances. This finding confirmed the first hypothesis, which stated that a preceding decline in the population of a neighbourhood increases the probability that people will move out of the neighbourhood.

<Table 2 about here>

Surprisingly, a similar effect on moving behaviour was found for living in a neighbourhood with a preceding increase in the population, but not for living in a neighbourhood with a stable population. A full interpretation of this effect is beyond the scope of this article. However, a possible explanation for this finding could be that the effects observed for growing neighbourhoods were caused by new housing construction. This would have brought in a larger group of newcomers with weaker ties to the neighbourhood who may have been more prone to move again. Moreover, as it seems unlikely that these newcomers would have exchanged their recently constructed residence for another recently constructed residence in the same neighbourhood, we can assume that most of the people in this group did not move within the same neighbourhood.

The remaining variables in the model showed effects which were largely in line with the findings of the existing migration literature. The results showed that men were less likely than women to have moved over any distance, and that young people were more likely to have moved than older people. However, the likelihood of moving decreased with age up through ages 45-64. People aged 65 and older moved more frequently over short distances than people in the age category 45-64, but they were less likely to

have moved over longer distances. People of foreign descent were more likely to have moved out of the neighbourhood than people of Dutch descent. Members of families with children were less likely to have moved than individuals in any other household position. When families with children did move, they were more likely than single people to have moved over short distances. Highly educated people were more likely to have moved than less educated people, especially over longer distances. Unemployed people were more likely to have moved than (self-)employed people, except when moving within the neighbourhood. This corresponds with neo-classical migration theory, which predicts that unemployed people will move to places where they can find employment. Surprisingly, both short-term and long-term unemployment were found to have had positive effects for moving over distances of up to 10 km. At the neighbourhood level, people from smaller neighbourhoods were less likely to have moved within the neighbourhood, and were more likely to have moved out of the neighbourhood than people from larger neighbourhoods. Finally, higher levels of unemployment at the regional level, showed a small downward effect of on moving within the neighbourhood, and an upward effect on moving up to 10 km.

6.1 Young adults
In the separately estimated model for young adults, the expected effect of level of education on moving over longer distances was found. Highly educated were more likely to have moved over any distance, but the size of the effect increased with distance. The pattern of the effect of population decline for the category of young adults was similar to the pattern found for the total sample. Young adults from population declining neighbourhoods were less likely than young adults from stable neighbourhoods to have moved within the neighbourhood, and were more likely to have moved out of the neighbourhood within 10 km. No significant effect of a preceding decline in the population of a neighbourhood was found on moving over distances above 10 km. Effects of similar directions and sizes were also found for growing neighbourhoods. No relationship between level of education, neighbourhood population change, and moving behaviour could be established. Highly educated young adults were more likely to have moved than less educated young adults, but this pattern was not found to have been affected by neighbourhood population decline.

<Table 3 about here>

Table 4 shows that the estimated probabilities of moving out of the neighbourhood within 10 km for the different profiles were between 0.09 and 0.15, depending on occupational status and level of education. The differences between the estimated probabilities for declining and stable and neighbourhoods were roughly between 0.01 and 0.02. These differences appear to be small. However, since these are annual estimated probabilities of moving, over time they might have led to large absolute differences between the populations of two neighbourhoods with the same initial number of young adults.

<Table 4 about here>

6.2 Older people
When the models were estimated separately for the older age categories, this pattern of a small likelihood of moving was reflected in highly negative constants. Furthermore, highly educated older people aged 65-74 were found to have been less likely to have moved within the neighbourhood than less educated older people aged 65-74, but significantly more likely to have moved over longer distances. For people aged 75 and over, no significant effects of educational level and of a preceding decline in the population were found. Thus, the results of the separately estimated model for people aged 75 and over are not displayed. In Table 5, we can see that people aged 65-74 from neighbourhoods with a preceding decline in the population were more likely to have moved out of the neighbourhood to

locations up to 10 km away, and were less likely to have moved within the neighbourhood than older people aged 65-74 who were living in stable neighbourhoods. The pattern of moving behaviour among those aged 65-74 from neighbourhoods with a preceding decline in the population was therefore similar to the pattern of neighbourhood population decline observed in the model for the total sample. Nevertheless, the hypothesis that older people who were living in declining neighbourhoods would have been more likely to move over short distances than elderly people who were living in stable neighbourhoods was only partly supported, because no significant effect of neighbourhood population decline was found for elderly people aged 75 and over.

<Table 5 about here>

The observed differences in moving behaviour for the two groups of older people could be explained by general motivations for moving among the different age categories. People aged 65-74 may have been moving at higher rates because they anticipated becoming older and less vital. When people aged 75 and older move, it is often because their health has deteriorated and they are no longer able to age in place. It appears that the moves of an anticipatory nature among people aged 65-74 were affected by a preceding decline in the population of a neighbourhood, while the health-related moves among people aged 75 and over were not. Thus, it seems that when people still had a choice to move or stay, they were more likely to leave neighbourhoods with a preceding decline in the population, and were more likely to stay in stable neighbourhoods. Once this age category of anticipation had been passed, people tended to age in place as long as possible in both declining and stable neighbourhoods. The difference between the moving behaviour patterns of people aged 65-74 from declining and stable neighbourhoods could result in higher shares of elderly people living in neighbourhoods with a stable population. This is uncertain because those people who move into the neighbourhoods are not considered in this research. Moreover, the estimated moving probabilities in Table 6 show that such a process takes very long to have a noticeable absolute impact on neighbourhood elderly populations, because the estimated probabilities of moving among older people are low.

<Table 6 about here>

6.3 Families with children
The constants found for the different distances in the separately estimated model for adult members of families with children, as shown in Table 7, confirmed that families with children did not move very often, and that when they did so they were more likely to have moved over short than over long distances. Furthermore, the results of this model indicated that younger families with children were more likely to have moved than older families with children, which is in line with our assumption that people tend to become settled as they grow older and do not move as often. Members of families with children who were long-term unemployed were also significantly more likely to have moved than individuals with a different occupational status. While this finding appears to contradict the assumption that long-term unemployed people tend to get stuck in their neighbourhood, the results also showed that individuals in this group were significantly more likely to move within their neighbourhood. These effects were equally present at all of the moving distances. Educational level was found to have affected moving behaviour among members of families with children only over the longer distances. This finding is in line with migration theory, which argues that people move over longer distances in order to achieve upward social mobility, which is more common among highly educated people than among less educated people.

<Table 7 about here>

The hypothesis that members of families with children from neighbourhoods with a preceding decline in the population are more likely to move than members of families with children from stable neighbourhoods was supported, because the model showed that there was a significant effect of a preceding decline in the population of a neighbourhood for moves out of the neighbourhood of up to 10 km. Table 8 demonstrates that younger families with children had higher estimated probabilities of moving, and that the differences in the numbers of people moving was therefore also larger for these categories than for other age categories. The estimated probabilities of moving increased when the neighbourhood population size decreased.

<Table 8 about here>

6.4 The unemployed
The separately estimated models for unemployed people showed mixed results for the effect of a preceding decline in the population of a neighbourhood on moving behaviour. For short-term unemployed people, no significant effects of a preceding decline in the population of a neighbourhood were found, and the model is therefore not shown here. In the model for long-term unemployed people, which is found in Table 9, there was a positive effect of neighbourhood population decline on moving within the neighbourhood. This is in line with the assumption that long-term unemployed people tend to look for less expensive housing, which they are more likely to find in declining neighbourhoods. This process would appear to confirm the claim that declining neighbourhoods could evolve into repositories for the unemployed. It should be noted however, that the higher probability of moving within the neighbourhood does not necessarily mean that long-term unemployed people in declining neighbourhoods were less likely to have left the neighbourhood than long-term unemployed people in stable neighbourhoods. As no significant negative effects of neighbourhood population decline on moving out of the neighbourhood were found, it could be the case that long-term unemployed people in stable neighbourhoods simply moved less frequently within the neighbourhood. A possible explanation for this finding is that the housing in declining neighbourhoods may have been demolished or vacated for renovation, which could have resulted in a forced relocation within the neighbourhood.

<Table 9 about here>

When the estimated probabilities of moving within the neighbourhood for long-term unemployed people are shown in Table 10, we can also see that these estimated probabilities were especially high for younger people living in larger neighbourhoods. One explanation for this finding is that neighbourhoods with larger populations tend to be more urban in nature, and therefore have more social housing. Thus, the long-term unemployed people may have had more options for relocating within these larger neighbourhoods. In contrast, there was only a small probability that a long-term unemployed person had moved within a small neighbourhood. The absolute impact of population decline was therefore also much smaller. If long-term unemployed people were to become clustered in declining neighbourhoods, this would most likely have taken place in the larger declining neighbourhoods.

<Table 10 about here>

7. Conclusion
This research shows that in rural North-Netherlands two separate processes of population change with different dynamics are taking place. On the one hand, we observed a process of urbanisation, in which people undertook long-distance moves in order to take advantage of employment and educational

opportunities not available in rural areas. This type of moving behaviour is generally unaffected by neighbourhood circumstances, and therefore does not seem to contribute to population decline as a self-reinforcing process. On the other hand, the group of people who moved distances of up to 10 km did seem to be affected by neighbourhood circumstances. This means that members of some categories of the population are more likely to leave a declining than a stable neighbourhood in order to move over a short distance. Moves of this kind contribute to population decline becoming a self-reinforcing process at the local level. This local process thus has the potential to increase the heterogeneity of neighbourhood population structures in rural North-Netherlands.

The higher share of young adults and families with children who move to other neighbourhoods indicates that the dejuvenation of rural areas could occur at a faster rate in neighbourhoods with declining populations. At the other extreme of the population distribution, we observed that although ageing and population decline in rural areas are often seen as parallel processes, older people seem to be less likely to age in place in declining than in stable neighbourhoods. Furthermore, declining neighbourhoods could become repositories for low-skilled unemployed people, especially in larger neighbourhoods where they can find suitable housing and services nearby.

The estimated moving propensities of the selected categories of the population showed that the differences in the absolute numbers of the people who moved were quite small. This demonstrates that additional out-migration as a result of a preceding decline in the population is a slowly evolving process which can be explained by the simple fact that the overwhelming majority of people do not move, regardless of the neighbourhood circumstances. Many people are strongly attached to their direct living environment, and are able to cope with changes in their neighbourhood. Others may be unable to move because they cannot sell their house. This group of involuntary stayers are confronted with the effects of population decline at the neighbourhood level, which could affect their quality of life. Nevertheless, over time small annual differences in the moving behaviour of different groups in the population could result in large differences in the prevalence of different categories within the neighbourhood population. The extent to which this becomes a problem depends on the categories of the population who remain.

A limitation of this research is the fact that we analysed the self-reinforcement of population decline only from the perspective of moving out of the neighbourhood. This does not take into account the fact that people are also moving into the neighbourhood. Thus, we were unable to determine with absolute certainty whether neighbourhood population decline was a self-reinforcing process. The categories of people who left neighbourhoods with declining populations could, for instance, have been replaced by similar people, which would even out the balance. This may have been the case for young people, but it seems very unlikely for the older categories of the population.

For policymakers, this research shows that only local moving behaviour is significantly related to a preceding decline in the population of a neighbourhood. Possible efforts to retain people in declining neighbourhoods should therefore be aimed at the category of local movers. However, in rural areas where the autonomous process of urbanisation will only further erode the potential population numbers, there will always be winning and losing neighbourhoods. If the losing neighbourhoods are made up of individuals who can cope with declines in local services and the loss of housing value, there is little need to worry about the future of these areas. However, some residents of these neighbourhoods may have more difficulties than others in dealing with certain transformations in the direct living environment, which is illustrated by the finding that long-term unemployed people are more likely to stay in a declining than in a stable neighbourhood.

Finally, this research has shown that population decline in a neighbourhood may be self-reinforcing, and that distinguishing between the moving behaviour patterns of different categories of the population is important. However, the exact mechanisms that drive these processes of self-reinforcement remain largely unknown. The need for additional research is exemplified by the effects found for neighbourhoods with a preceding population increase. These effects are similar to those of population decline in some instances, but are unlikely to be caused by the same processes. Future research on population decline at the neighbourhood level should therefore seek to disentangle the reciprocal relationship between population decline and the circumstances of a neighbourhood, and to determine which intermediating forces are most important in this context.

References

Alley, D., Liebig, P., Pynoos, J., Banarjee, T. and Choi, I. H., 2007. Creating elder-friendly communities: preparations for an aging society. Journal of Gerontological Social Work 49(1/2), pp. 1-18.

Antolin, P. and Bover, O., 1997. Regional migration in Spain: the effect of personal characteristics and of unemployment, wage and house price differentials using pooled cross-sections. Oxford Bulletin of Economics and Statistics 59(2), pp. 215-235.

Beine, M., Docquier, F. and Rapoport, H., 2001. Brain drain and economic growth: theory and evidence. Journal of Development Economics 64, pp. 275-289.

Bermingham, J. R., 2001. Immigration: not a solution to problems of population decline and aging. Population and Environment: A Journal of Interdisciplinary Studies 22(4), pp. 355-363.

Biagi, B., Faggian, A. and McCann, P., 2011. Long and short distance migration in Italy: the role of economic, social and environmental characteristics. Spatial Economic Analysis 6(1), pp. 111-131.

Bontje, M. and Musterd, S., 2012. Understanding shrinkage in European regions. Built Environment 38(2), pp. 153-161.

Börsch-Supan, A., 1990. Education and its double-edged impact on mobility. Economics of Education Review 9(1), pp. 39-53.

Clark, W. A. V. and Dieleman, F. M., 1996. Households and Housing: Choice and Outcomes in the Housing Market. Center for Urban Policy Research.

Clark, W. A. V., Deurloo, M. C. and Dieleman, F. M., 2006. Residential mobility and neighbourhood outcomes. Housing Studies 21(3), pp. 323-342.

Coleman, D. and Rowthorn, R., 2011. Who's afraid of population decline? A critical examination of its consequences. Population and Development Review 37, pp. 217-248.

Coulmas, F., 2007. Population Decline and Ageing in Japan: The Social Consequences. Routledge.

De Jong Gierveld, J., Liefbroer, A. C. and Beekink, E., 1991. The effect of parental resources on patterns of leaving home among young adults in the Netherlands. European Sociological Review 7(1), pp. 55-71.

DETR, 2000. Our Countryside: The Future. A Fair Deal for Rural England. London.

Docquier, F. and Rapoport, H., 2012. Globalization, brain drain, and development. Journal of Economic Literature 50(3), pp. 681-730.

Egelund, N. and Laustsen, H., 2006. School closure: what are the consequences for the local society? Scandinavian Journal of Educational Research 50(4), pp. 429-439.

Feijten, P. and Visser, P., 2005. Binnenlandse migratie: verhuismotieven en verhuisafstand. Bevolkingstrends 2, pp. 75-81.

Feldmann, M. P., 1999. The new economics of innovation, spillovers and agglomeration: a review of empirical studies. Economics of Innovation and New Technology 8(1/2), pp. 5-25.

Feser, E. and Sweeney, S., 2003. Out-migration, depopulation, and the geography of U.S. economic distress. International Regional Science Review 26(1), pp. 38-67.

Fielding, A. J., 1992. Migration and social mobility: South East England as an escalator region. Regional Studies 26(1), pp. 1-15.

Fokkema, T. and Van Wissen, L., 1997. Moving plans of the elderly: a test of the stress-threshold model. Environment and Planning A 29(2), pp. 249-268.

Forsythe, D., 1984. The social effects of primary school closure. In: Bradley T. and Lowe, P., Editors, 1984. *Locality and Rurality: Economy and Society in Rural Regions*, Geobooks, Norwich.

Friedrichs, J., 1993. A theory of urban decline: economy, demography and political elites. Urban Studies 30, pp. 907-917.

Glaeser, E. L. and Gyourko, J., 2005. Urban decline and durable housing. Journal of Political Economy 113(2), pp. 345-375.

Glaeser, E. L., Kallal, H. D., Scheinkman, J. A. and Schleifer, A., 1992. Growth in cities. Journal of Political Economy 100, pp. 1126-1152.

Glendinning, A., Nuttall, M., Hendry, L., Kloep, M. and Wood, S., 2003. Rural communities and well-being: a good place to grow up? The Sociological Review, 51(1), 129-156.

Goetgeluk, R. W., 1997. Bomen Over Wonen. Woningmarktonderzoek met Beslissingsbomen, Netherlands Geographical Studies 235, Utrecht.

Haartsen, T., 2002. Platteland: Boerenland, Natuurterrein of Beleidsveld? Een Onderzoek naar Veranderingen in Functies, Eigendom en Representatie van het Nederlandse Platteland. Grafisch Centrum Rijksuniversiteit Groningen, Groningen.

Haartsen, T., Huigen, P. P. P. and Groote, P. D., 2003. Rural areas in the Netherlands. Tijdschrift voor Economische en Sociale Geografie 94(1), pp. 129-136.

Haartsen, T. and Venhorst, V. A., 2010. Planning for decline: anticipating on population decline in the Netherlands. Tijdschrift voor Economische en Sociale Geografie 101(2), pp. 218-227.

Haartsen, T. and Van Wissen, L., 2012. Causes and consequences of regional population decline for primary schools. Tijdschrift voor Economische en Sociale Geografie 103(4), pp. 487-496.

Herzog, H., Schlottman, A. and Boehm, T., 1989. Migration as spatial job–search: a survey of empirical findings. Regional Studies 27, pp. 327-340.

Hoekveld, J. J., 2012. Time-space relations and the differences between shrinking regions. Built Environment 38(2), pp. 179-195.

Huber, P. J., 1967. The behavior of maximum likelihood estimates under nonstandard conditions. Proceedings of the fifth Berkeley Symposium on Mathematical Statistics and Probability, pp. 221-233, University of California Press, Berkeley, CA.

Kearns, A. and Mason, P., 2007. Mixed tenure communities and neighbourhood quality. Housing Studies 22(5), pp. 661-691.

Kearns, A. and Parkes, A., 2003. Living in and leaving poor neighbourhood conditions in England. Housing Studies 18(6), pp. 827-851.

Kintrea, K., 2007. Housing aspirations and obsolescence: understanding the relationship. Journal of Housing and the Built Environment 22, pp. 321-338.

Latten, J., Das, M. and Chkalova, K., 2008. De stad Groningen als roltrap van Noord-Nederland. Bevolkingstrends 2, pp. 52-59.

Lee, R. D. and Reher, D. S., 2011. Introduction: the landscape of demographic transition and its aftermath. Population and Development Review 37, pp. 1-7.

Lehtonen, O. and Tykkyläinen, M., 2010. Self-reinforcing spatial clusters of migration and socio-economic conditions in finland in 1998-2006. Journal of Rural Studies 26, pp. 361-373.

Li, F., Findlay, A., Jowett, A. and Skeldon, R., 1996. Migrating to learn and learning to migrate: a study of the experiences and intentions of international student migrants. International Journal of Population Geography 2(1), pp. 51-67.

Litwak, E. and Longino, C. F., 1987. Migration patterns among the elderly: a developmental perspective. The Gerontologist 27, pp. 266-272.

Long, L. H., 1973. Migration differential by education and occupation: trends and variations. Demography 10(2), pp. 243-258.

Matanle, P. and Rausch, A. S., 2011. Japan's Shrinking Regions in the 21st Century: Contemporary Responses to Depopulation and Socioeconomic Decline, Cambria Press, Amherst, NY.

Matanle, P. and Sato, Y., 2010. Coming soon to a city near you! Learning to live 'beyond growth' in Japan's shrinking regions. Social Science Japan Journal 13(2), pp. 187-210.

Martinez-Fernandez, C., Kubo, N., Noya, A. and Weyman, T., 2012. Demographic Change and Local Development: Shrinkage, Regeneration and Social Dynamics. OECD.

Mountford, A., 1997. Can a brain drain be good for growth in the source economy? Journal of Economic Development 53, pp. 287-303.

Mulder, C. H., 1993. Migration Dynamics: A Life Course Approach. Thesis Publishers, Amsterdam.

Mulder, C. H. and Hooimeijer, P., 2002. Leaving home in the Netherlands: timing and first housing. Journal of Housing and the Built Environment 17, pp. 237-268.

Myrdal, G., 1957. Economic Theory and Underdeveloped Regions. Duckworth, London.

Laoire, C. N., 2001. A matter of life and death? Men, masculinities and staying 'behind' in rural Ireland. Sociologia Ruralis 41(2), pp. 220-236.

Permentier, M., Ham, M. v. and Bolt, G., 2009. Neighbourhood reputation and the intention to leave the neighbourhood. Environment and Planning A 41, pp. 2162-2180.

Pissarides, C. and Wadsworth, J., 1989. Unemployment and the inter-regional mobility of labour. The Economic Journal 99, pp. 739-755.

Pope, N. D. and Kang, B., 2010. Residential relocation in later life: a comparison of proactive and reactive moves. Journal of Housing For the Elderly 24(2), pp. 193-207.

Puga, D., 2010. The magnitude and causes of agglomeration economies. Journal of Regional Science 50(1), pp. 203-219.

Rees, P., Stillwell, J., Convey, A. and Kupiszewski, M., 1997. Population Migration in the European Union. John Wiley & Sons, New York.

Reher, D. S., 2007. Towards long-term population decline: a discussion of relevant issues. European Journal of Population 23, pp. 189-207.

Richardson, H. W., 1978. Urban Economics. Dryden Press, Hinsdale, IL.

Rogers, A. and Castro, L., 1981. Age patterns of migration: cause-specific profiles. In: Rogers, A., Editor, 1997. *Advances in Multiregional Demography*, Institute for Applied Systems Analysis, Laxenburg.

Rogers, A. and Castro, L. 1986. Migration. In: Rogers, A. and Willekens, F., Editors., 1986. *Migration and Settlement: a Multiregional Comparative Study*, Riedel, Dordrecht.

Rogers, A. and Watkins, J., 1987. General versus elderly interstate migration and population redistribution in the United States. Research on Ageing 9, pp. 483-529.

Rossi, P. H., 1955. Why Families Move: A Study in the Social Psychology of Urban Residential Mobility. Free Press, Glencoe, IL.

Schelling, T. C., 1969. Models of segregation. The American Economic Review 59, pp. 488-493.

Schelling, T. C. 1971. Dynamic models of segregation. Journal of Mathematical Sociology 1, pp. 143-186.

Scholten, H. and Van de Velde, R., 1989. Internal migration: the Netherlands. In: Stillwell, J. and Scholten, H., Editors, 1989. *Contemporary Research on Population Geography*. Kluwer, Dordrecht.

Sjaastad, L., 1962. The costs and returns of human migration. The Journal of Political Economy 70(5), pp. 80-93.

Statistics Netherlands, 2013. Statline. http://statline.cbs.nl/statweb/, accessed October 30, 2013.

Steenbekkers, A. and Vermeij, L., Editors, 2013. De Dorpenmonitor: Ontwikkelingen in de Leefsituatie van Dorpsbewoners. Sociaal en Cultureel Planbureau, Den Haag.

Stockdale, A., 2002. Towards a typology of out-migration from peripheral areas: a Scottish case study. International Journal of Population Geography 8, pp. 345-364.

Stockdale, A., 2004. Rural out-migration: community consequences and individual migrant experiences. Sociologia Ruralis 44(2), pp. 167-194.

Stockdale, A., 2006. Migration: pre-requisite for rural economic regeneration? Journal of Rural Studies 22, pp. 354-366.

Tervo, H., 2000. Migration and labour market adjustment: empirical evidence from Finland 1985-90. International Review of Applied Economics 14(3), pp. 343-360.

Turok, I. and Mykhnenko, V., 2007. The trajectories of European cities, 1960-2005. Cities 24(3), pp. 165-182.

Van Dam, F., 1995. Meer voor Minder: Schaalveranderingen en Bereikbaarheid van Voorzieningen in Landelijke Gebieden in Nederland. Netherlands Geographical Studies 188, Utrecht.

Van Dijk, J., Folmer, H., Herzog, H. and Schlottman, A., 1989. Labor market institutions and the efficiency of interregional migration: a cross nation comparison. In: Van Dijk, J., Folmer, H., Herzog, H. and Schlottman, A., Editors, 1989. *Migration and Labor Market Adjustment*, Kluwer, Dordrecht.

Van Ham, M. and Feijten, P., 2008. Who wants to leave the neighbourhood? The effect of being different from the neighbourhood population on wishes to move. Environment and Planning A 40, pp. 1151-1170.

Venhorst, V. A., Van Dijk, J. and Van Wissen, L., 2010. Do the best graduates leave the peripheral areas of the Netherlands? Tijdschrift voor Economische en Sociale Geografie 101(5), pp. 521-537.

Verwest, F., 2011. Demographic Decline and Local Government Strategies. Radboud University Nijmegen, Nijmegen.

Witten, K., McCreanor, T., Kearns, R. and Ramasubramanian, L., 2001. The impacts of a school closure on neighbourhood social cohesion: narratives from Invercargill, New Zealand. Health & Place 7, pp. 307-317.

Zelinsky, W., 1971. The hypothesis of the mobility transition. Geographical Review 61, pp. 219-249.

Table 1: Summary statistics (N=186,420)

Variable	Category	N(%)
Migration distance		
	Stay (Ref.)	161941 (86.87)
	Within	4309 (2.31)
	0-10	7990 (4.29)
	10-35	5268 (2.83)
	35+	6912 (3.71)
Sex		
	Female (Ref.)	92660 (49.71)
	Male	93754 (50.29)
Age		
	18-25	55579 (29.81)
	26-34	35420 (19.00)
	35-44	39643 (21.27)
	45-64	44810 (24.04)
	65-74	7426 (3.98)
	75+	3542 (1.90)
Descent		
	Dutch (Ref.)	174099 (93.39)
	Foreign	12321 (6.61)
Household Position		
	Single	17442 (9.36)
	Family without children	47887 (25.69)
	Family with children	65349 (35.05)
	Other	55742 (29.90)
Education followed		
	Primary or Secondary (Ref.)	109422 (58.70)
	High	76998 (41.30)
Occupational status		
	(Self-)Employed	119734 (64.23)
	Short-term unemployed	2092 (1.12)
	Long-term unemployed	2853 (1.52)
	Pensioned	14543 (7.80)
	Student	28529 (15.30)
	Other	18669 (10.01)
Neighbourhood population change [1]		
	Decline (1st quartile)	25479 (13.67)
	Stable (2nd + 3rd quartile)	120022 (64.38)
	Growth (4th quartile)	40919 (21.95)
Neighbourhood population size [2]		
	<704 (1st quartile)	46636 (25.02)
	704-1829 (2nd quartile)	46902 (25.16)
	1830-3914 (3rd quartile)	46136 (24.75)
	>3914 (4th quartile)	46746 (25.08)
Neighbourhood prevalence young adults [3]		
	Mean: 7.78 SD: 2.15 Range: 0-58.82	
Neighbourhood prevalence 65-74 years [3]		
	Mean: 8.04 SD: 2.86 Range: 0-42.86	
Neighbourhood prevalence members of couples with children [3]		
	Mean: 11.33 SD: 3.95 Range: 2.48-81.84	
Neighbourhood prevalence long-term unemployed [3]		
	Mean: 41.38 SD: 8.21 Range: 0-86	
Regional Unemployment - COROP (Cont. variable)		
	Mean	6.43
	SD	0.737
	Range	5.5-7.9

[1]Quartiles based on non-weighted distribution of all neighbourhoods in North-Netherlands

[2]Quartiles based on weighted distribution of all neighbourhoods in North-Netherlands

[3] Percentage of total neighbourhood population. Based on all neighbourhoods in the sample

Source: Statistics Netherlands

Table 2: Multinomial logistic regression model for total sample

		Distance category (ref: Staying)			
		in	0-10	10-35	35+
Sex (ref: female)	Male	-0.195 ***	-0.321 ***	-0.251 ***	-0.111 ***
Age (ref: 45-64)	18-25	1.665 ***	1.703 ***	1.621 ***	1.499 ***
	26-34	1.340 ***	1.230 ***	1.230 ***	1.308 ***
	35-44	0.770 ***	0.706 ***	0.702 ***	0.721 ***
	65-74	0.400 **	0.183	0.207	-0.297
	75+	0.638 ***	0.649 ***	0.052	-1.470 ***
Descent (ref: Dutch)	Foreign	-0.058	0.229 ***	0.299 ***	0.779 ***
Place household	Family without children	-0.422 ***	-0.520 ***	-0.780 ***	-1.117 ***
(ref: single)	Family with children	-0.422 ***	-0.790 ***	-1.266 ***	-1.409 ***
	Other	-0.171 *	-0.139 **	-0.035	0.132 *
Level of education (ref: low/middle)	High	-0.029	0.114 ***	0.407 ***	0.609 ***
Occupational status	Short-term unemployed	0.180	0.330 ***	0.280 *	0.561 ***
(Ref: (Self-)employed)	Long-term unemployed	0.189	0.262 ***	0.230 *	0.242 *
	Pension	-0.302 *	-0.235 *	-0.390 *	0.037
	Student	0.646 ***	-0.425 ***	0.184 ***	0.469 ***
	Other	-0.042	-0.129 ***	0.318 ***	1.109 ***
Neighbourhood population change	**Decline**	**-0.215 ****	**0.182 ****	-0.045	0.040
(Ref: Stable)	Growth	-0.243 ***	0.117 **	0.080	0.085 *
Neighbourhood population size	<704	-1.335 ***	0.213 ***	0.027	0.143 **
(Ref: 4th quartile)	704-1829	-0.582 ***	0.230 ***	-0.030	0.032
	1830-3914	-0.174 *	0.152	-0.050	0.092
Regional unemployment	% of population 15-65 years	-0.098 **	0.845 **	0.009	0.033
Constant		-3.077 ***	-4.258 ***	-4.221 ***	-4.582 ***

N=186,420 | R^2=0.0874

***p<0.01 **p<0.05 *p<0.1

Table 3: Multinomial logistic regression model of moving for individuals aged 18-25

		Distance category (ref: Staying)			
		in	0-10	10-35	35+
Sex (ref: female)	Male	-0.455 ***	-0.631 ***	-0.485 ***	-0.328 ***
Descent (ref: Dutch)	Foreign	-0.106	0.292 ***	0.274 ***	0.484 ***
Place household	Family without children	-0.552 ***	-0.754 ***	-1.044 ***	-1.816 ***
(ref: single)	Family with children	-0.888 ***	-0.930 ***	-1.428 ***	-1.633 ***
	Other	-0.584 ***	-0.530 ***	-0.382 ***	-0.539 ***
Occupational status	Short-term unemployed	0.977 ***	0.948 ***	0.581	-0.104
(Ref: (Self-)employed)	Long-term unemployed	0.334 *	0.144	0.211	-0.184
	Student	-0.636 ***	-0.455 ***	0.190 ***	0.491 ***
	Other	-0.006	0.092	0.476 ***	1.217 ***
Level of education (ref: low/middle)	High	0.114 *	0.234 ***	0.489 ***	0.584 ***
Neighbourhood population change	**Decline**	-0.151	**0.186 ****	-0.060	0.085
(Ref: Stable)	Growth	-0.294 ***	0.160 *	0.069	0.121 **
Neighbourhood population change	**High x Decline**	-0.413	-0.105	-0.018	-0.071
x Education	High x Growth	0.098	-0.043	-0.145	-0.108
Neighbourhood population size	<704	-1.423 ***	0.132	-0.052	0.155 **
(Ref: 4th quartile)	704-1829	-0.689 ***	0.163	-0.036	0.057
	1830-3914	-0.235 **	0.106	-0.123	0.155 *
Neighbourhood prevalance 18-25	% of total population	0.046 ***	0.014	-0.082 ***	-0.025
Regional unemployment	% of population 15-65 years	-0.130 **	0.076 *	0.001	0.007
Constant		-1.104 ***	-2.113 ***	-1.438 ***	-1.988 ***

N=55,579 | R^2=0.0343

Variable age omitted from the model

***p<0.01 **p <0.05 *p<0.1

Table 4: Estimated probabilities of moving out of the neighbourhood up to 10 km for different profiles of young adults

Profile	Est. moving probability		
Sex, household position, occupational status, level of education	Decline	Stable	Diff
Female, Living with parents, Student, High level of education	0.1017	0.0946	0.0072
Female, Living with parents, Student, Low/middle level of education	0.0905	0.0763	0.0142
Female, Living with parents, (Self-) Employed,Low/middle level of education	0.1356	0.1153	0.0204
Female, Living with parents, (Self-) Employed, High level of education	0.1515	0.1413	0.0101

[1]Neighbourhood % young adults 8.18% and Regional unemployment 6.45% for all profiles

Table 5: Multinomial logistic regression model of moving for individuals aged 65-74

		Distance category (ref: Staying)			
		in	0-10	10-35	35+
Sex (ref: female)	Male	-0.357 **	-0.032	0.221 ***	0.342
Descent (ref: Dutch)	Foreign	0.157	0.269	-14.02 ***	0.101
Place household	Family without children	-0.294	-0.217	-0.100	0.214
(ref: single)	Family with children	0.267	-1.105	0.556	0.594
	Other	-0.009	0.104	-0.680	0.069
Level of education (ref: low/middle)	High	-0.866 *	-0.693 *	0.385	1.255 ***
Neighbourhood population change	**Decline**	**-1.297** **	**0.754** **	0.570	-0.341
(Ref: Stable)	Growth	0.281	0.153	0.392	0.242
Neighbourhood population size	<704	-1.979 ***	0.958 **	1.795 **	1.096 *
(Ref: 4th quartile)	704-1829	-1.041 ***	0.329	1.386 *	0.594
	1830-3914	-0.077	0.252	1.505 *	0.847
Neighbourhood 65-74 years	% of total population	-0.079 **	-0.049	-0.078	0.004
Regional unemployment	% of population 15-65 years	0.106	0.402 ***	0.153	0.236
Constant		-4.951 ***	-6.611 ***	-6.881 ***	-8.215 ***

N=7,426 | R^2=0.0542

Variable age omitted from the model

***p<0.01 ***p* <0.05 *p<0.1

Table 6: Estimated probabilities of moving for different profiles of people aged 65-74

Profile	Est. moving probability		
Sex, household position, level of education, neighbourhood size	Decline	Stable	Diff
Moving within the neighbourhood			
Female, Family without children, low/middle education, nbh 704-1829	0.0003	0.0012	-0.0009
Female, Family without children, high education, nbh 704-1829	0.0001	0.0005	-0.0004
Moving out of the neighbourhood 0-10 kilometres			
Female, Family without children, low/middle education, nbh 704-1829	0.0365	0.0175	0.0190
Female, Family without children, high education, nbh 704-1829	0.0186	0.0088	0.0098

[1]Neighbourhood % 65-74 years 9.1% and Regional unemployment 6.41% for all profiles

Table 7: Multinomial logistic regression model of moving for members of families with children

| | | Distance category (ref: Staying) | | | |
		in	0-10	10-35	35+
Sex (ref: female)	Male	0.064	0.062	0.269 ***	0.345 ***
Age (Ref: 45-64)	18-25	1.668 ***	1.796 ***	1.895 ***	1.714 ***
	26-34	1.377 ***	0.971 ***	1.348 ***	1.098 ***
	35-44	0.924 ***	0.565 ***	0.670 ***	0.643 ***
Descent (ref: Dutch)	Foreign	-0.111	0.018	0.308 **	1.124 ***
Level of education (ref: low/middle)	High	-0.066	0.005	0.433 ***	0.643 ***
Occupational Status	Short-term unemployed	-0.314	0.169	0.600 **	0.911 ***
(Ref: (Self-)employed)	Long-term unemployed	1.068 ***	0.966 ***	1.344 ***	1.794 ***
	Pension	0.009	-0.992	-12.62 ***	1.179 ***
	Student	-0.040	0.380 **	0.586 **	0.878 ***
	Other	-0.063	-0.185 *	0.505 ***	1.090 ***
Neighbourhood population change	**Decline**	-0.157	**0.241** **	-0.142	0.110
(Ref: Stable)	Growth	-0.039	0.108	0.341 ***	0.103
Neighbourhood population size	<704	-1.224 ***	0.160	0.436 ***	-0.012
(Ref: 4th quartile)	704-1829	-0.435 ***	0.334 **	0.137	-0.059
	1830-3914	-0.075	0.286 **	0.147	-0.187
Neighbourhood % couples w. ch.	% of total population	-0.011	-0.001	-0.024 ***	-0.017
Regional unemployment	% of population 15-65 years	-0.099 *	0.111 *	0.237 ***	0.123
Constant		-3.344 ***	-5.209 ***	-6.587 ***	-6.599 ***

N=64,662 | R^2=0.0387

Variable household position omitted from the model

***p<0.01 **p<0.05 *p<0.1

Table 8: Estimated probabilities of moving out of the neighbourhood up to 10 km for different profiles of members of families with children

| Profile | Est. moving probability | | |
Sex, Age, Occupational status, Neighbourhood population size	Decline	Stable	Diff
Male, 26-34, Employed, 704-1829	0.0496	0.0394	0.0102
Male, 26-34, Employed, 1830-3914	0.0474	0.0376	0.0098
Male, 35-44, Employed, 704-1829	0.0336	0.0266	0.0070
Male, 35-44, Employed, 1830-3914	0.0321	0.0254	0.0067

[1]Neighbourhood couples with children 42.5% and Regional unemployment 6.4% for all profiles

Table 9: Multinomial logistic regression model of moving for long-term unemployed people

		Distance category (ref: Staying)			
		in	0-10	10-35	35+
Sex (ref: female)	Male	0.359	-0.026	0.338	0.288
Age (Ref: 45-64)	18-25	1.716 ***	1.672 ***	1.864 ***	0.878 ***
	26-34	0.790 **	1.216 ***	1.112 ***	0.619 **
	35-44	0.555	0.719 ***	1.200 ***	0.073
Descent (ref: Dutch)	Foreign	-0.779 *	0.151	0.712 ***	1.852 ***
Level of education (ref: low/middle)	High	-0.332	-0.225	-0.610 *	-0.678 *
Place household	Family without children	0.246	0.664 **	-0.841	-0.017
(Ref: single)	Family with children	0.992 ***	0.164	-0.469	0.111
	Other	-0.199	-0.052	-0.393	-0.151
Neighbourhood population change	**Decline**	**0.613** *	0.049	-0.273	-0.431
(Ref: Stable)	Growth	0.283	0.133	0.357	0.196
Neighbourhood population size	<704	-0.772 **	0.868 ***	0.691 *	0.597
(Ref: 4th quartile)	704-1829	-0.654 **	0.439 *	0.026	0.253
	1830-3914	-0.088	0.264	-0.136	0.476
Neighbourhood % LT unemployed	% of total population	0.003	0.014	0.015	0.008
Regional unemployment	% of population 15-65 years	0.100	0.064	-0.158	-0.159
Constant		-4.661 ***	-4.549 ***	-3.600 ***	-3.613 ***

N=2,808 | R^2=0.0800

Variable household position omitted from the model

***p<0.01 ***p* <0.05 *p<0.1

Table 10: Estimated probabilities of moving within the neighbourhood for different profiles of long-unemployed

Profile	Est. moving probability		
Sex, Age, Neighbourhood population size	Decline	Stable	Diff
Male, 18-25, 704-1829	0.048	0.027	0.021
Male, 45-64, 704-1829	0.009	0.005	0.004
Male, 18-25, >3915	0.089	0.050	0.039
Male, 45-64, >3915	0.017	0.009	0.008

[1]Neighbourhood long-term unemployed 13.3% and Regional unemployment 6.4% for all profiles

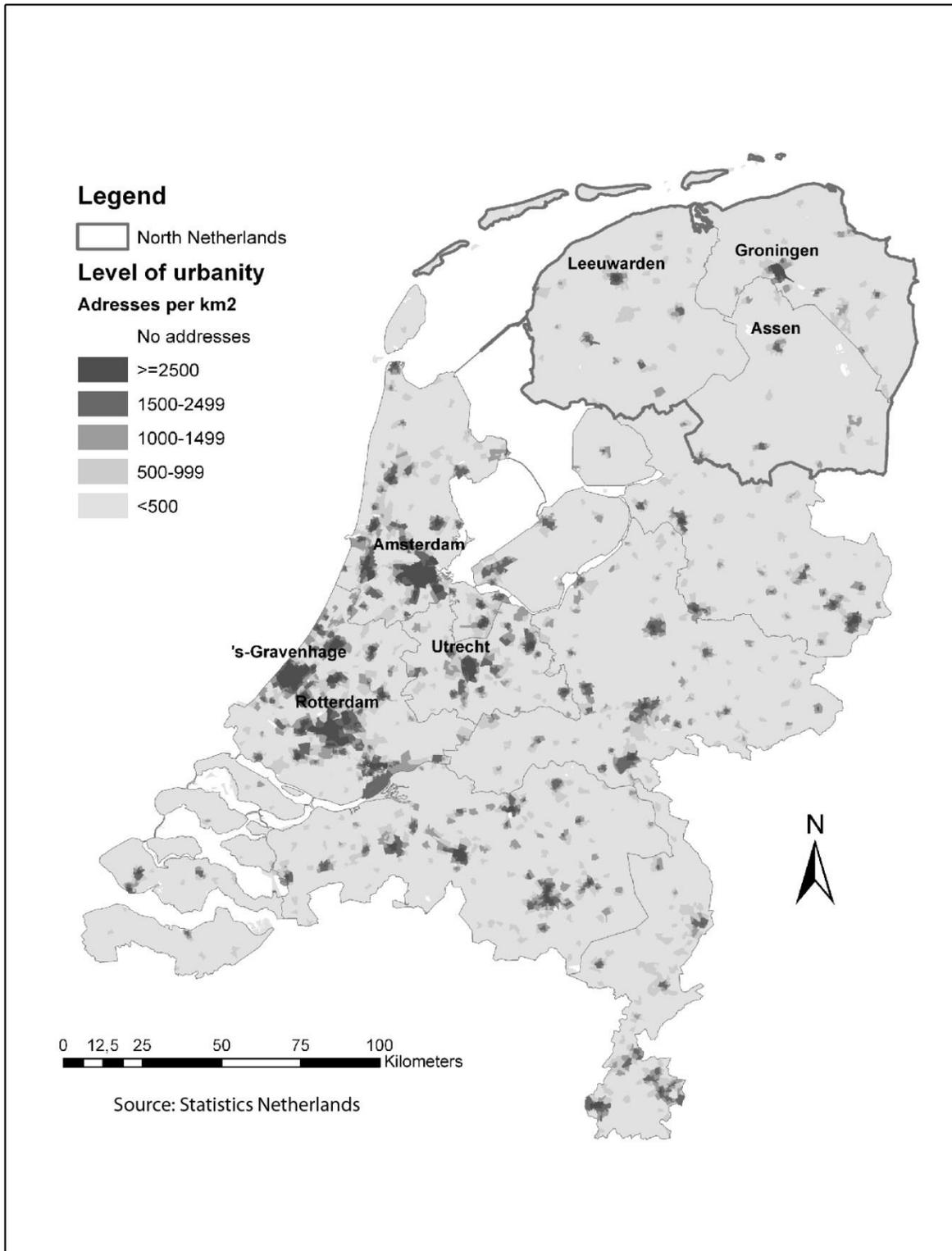**Figure 1: Population density, the Netherlands, 2006**

Figure 2 : Population change 1999-2006, rural neighbourhoods of North-Netherlands

Legend

Population change

- Decline
- Stable
- Growth
- Urban area or not inhabited

0 10 20 40 Kilometers

Source: Statistics Netherlands
Production: Groningen University